Introducing the New Cities Map

newcitiesmap.com

September 2024
Tommie Thompson, Kurtis Lockhart, Gilbert Siame

CHARTER CITIES INSTITUTE

Table Of Contents

Acknowledgements

We'd like to thank the International Growth Centre, which partially funded the creation and dissemination of the New Cities Map project (Grant #: ZMB-22052)..

CHARTER CITIES INSTITUTE

The Future of Development

Empowering new cities with better governance to lift tens of millions of people out of poverty.

The Charter Cities Institute is a non-profit organization dedicated to building the ecosystem for charter cities by:

- Creating legal, regulatory, and planning frameworks;
- Advising and convening key stakeholders including governments, new city developers, and multilateral institutions;
- Influencing the global agenda through research, engagement, and partnerships.

Abstract

New cities are increasingly defining urbanization around the world. These are deliberate, master planned, city-scaled megaprojects built for hundreds of thousands to millions of residents. Unlike traditional urban expansion, new cities are built top-down "from scratch" in a short period of time. Since 1945, there have been 353 new cities projects targeting a population of over 100,000 people. Over 3/4th of these cities have been or are being built in the Global South and nearly half were announced in just the past 20 years. However, despite the phenomenon's prominence and impact, it has received very little scholarly attention. This paper introduces the New Cities Map (NCM),[1] an open-source research database that catalogues every new city from 1945 to 2021. The database includes data on each city's location, management, finances, and governance, which we independently collected over 18 months using publicly available sources. This paper discusses the NCM's design, data collection, limitations, and potential uses. We also provide some descriptive statistics that quantitatively summarizes the ongoing "new cities wave."

1. Quantitative Research at the Charter Cities Institute and Principal Investigator of the New Cities Map. Contact at tommie@cci.city.
2. Executive Director of the Charter Cities Institute. Contact at **kurtis@cci.city**.
3. Department of Geography and Environmental Studies, the University of Zambia.
4. The project was managed and implemented by the Charter Cities Institute, a nonprofit research organization focused on new cities, special jurisdictions, and economic growth in the Global South.
5. **www.newcitiesmap.com**

1. Introduction

The past few decades have experienced a global construction boom of "new cities." These are comprehensive, master planned, city-scaled megaprojects with their own distinct political, economic, and social identities built for hundreds of thousands to millions of new residents. More than 160 new cities aiming to accommodate over 100,000 residents have been announced in just the past 20 years, and there have been hundreds – if not thousands – more planned communities built since the end of World War II. In just China alone, government statistics estimate that 200 new towns were under development in 2013, and others have estimated as many as 3,800 new towns have been built in China since 1945 (Shepard, 2017; Xu, 2021). While building cities from scratch is not new to human history – Alexander the Great was building cities as far back as 336 BCE – it has never been done on such a massive scale in such a short amount of time.

"New cities" – defined here as deliberate, master planned cities built "from scratch" – reflect a tremendous scale of public and private investments made by international conglomerates and national governments in almost every country on Earth. Many of these projects are taking place in the Global South, where rapid urbanization is quickly overburdening existing urban infrastructure. Africa alone has over 40 new cities currently being planned or built, each targeting at least 100,000 residents. Indonesia, Egypt, South Korea, and the Philippines are each building new administrative capitals.

However, while the "new cities wave" promises to have long-lasting consequences for global urban development, it has received very little scholarly attention. The substantial share of academic and policy research on new cities are generated by a relatively small group of scholars from a narrow set of disciplines (urban planning, geography, and urban studies). The extant literature focuses on in-depth qualitative case studies of specific new cities projects or theoretical and historical framings of the phenomenon. There are almost no rigorous, quantitative, large-N, social science research that attempts to estimate precise economic, political, and social impacts of the phenomenon.

The literature's focus on qualitative and historical investigations has left substantive theoretical and policy questions unanswered. Most fundamentally, there is no consensus on the extent of the contemporary new cities wave. Both the boundaries of "contemporary" (i.e., when did the uptick in new cities construction begin?) and the scale of the phenomenon (i.e., how many new cities are being or have been built?) are contested. In the policy domain, there are few precise estimates of the economic, social, and political impacts of new cities. Understanding the economic and spatial effects of large master planned communities is crucial to help policymakers improve and regulate these projects. New cities are also often bundled with promises of social benefits, but there are few attempts to verify the extent these claims are realized.

To fill the empirical gap, the New Cities Map (NCM) was developed to make new cities research more accessible for a wider group of scholars. Our goal was to release a comprehensive database with detailed information on contemporary new cities aimed at a global social science research audience. The relatively low social science research interest, in our view, is driven by the lack of high-quality, accessible data on new cities. Statistical analysis relies on comprehensive datasets that (1) are based on transparent and consistent sampling approaches and (2) include enough information to control for confounding relationships.

To construct the NCM, we developed a new conceptual framework for new cities and operationalized it to guide novel data collection. This includes both an inclusion criteria and structured codebook on city-specific information. Data was collected using publicly available online sources reviewed by our research team. The data was packaged into an accessible dataset that can be downloaded for free..

While the NCM was developed as an academic resource, it also provides an answer to one of the fundamental research questions of the new cities literature: how many new cities are there? We identified 353 new cities from 1945 to 2021 that aimed to have or currently has over 100,000 residents. The NCM project also contributes to the literature by generating a more well-defined understanding of the new cities phenomenon, including its scale and geographic distribution. The very idea of "cities" is elusive – What is a city? What makes a city "new"? Where is the line between cities, towns, and real estate developments? – and the literature has not settled on clear definitions for both the "new" and "cities" in "new cities" (Jo, 2018). One of the principal contributions of this paper is the development of a definition for new cities suitable for quantitative analysis.

For the most part, we use analogous terms for new cities interchangeably in this paper. This includes "new towns," "new cities," "new settlements, "satellite cities," and "planned communities." This interchangeability mirrors how the extant literature approaches the subject (e.g., Keeton and Provoost, 2019a). Conceptually, the differences in terminology reflect differences in scale; while a "planned community" of just 30,000 people may be referenced as a "new town," a community planned for 250,000 people would be better described as a "new city." However, both share the same core characteristics: top-down, master planned, and built "from scratch." Admittedly, the definitional ambiguities accepted by the literature also introduces empirical complications. Namely, it makes it difficult to distinguish between "natural" urban growth, which increasingly takes form as large-parcel, master planned, new district developments, and "new" cities and towns, which encapsulate a "distinct" socio-political environ from an existing urban area. This paper attempts to resolve this conflict when developing the conceptual framework for the NCM.

This paper introduces the NCM in the context of historical new cities construction, the contemporary new cities wave, and existing gaps in the academic and policy research literature. The paper is organized into four sections. First, we review the literature on historical master planned communities (typically referred by scholars as "new towns") and contemporary 21st century new cities. Next, we describe the NCM in detail, including the data collection protocols and variable construction. This section also includes a discussion of our conceptual framework and definition for "new cities," an exercise that required parsing through numerous contradictory terminologies employed in the urban studies discipline. Third, we discuss the research, policy, and applied uses of the NCM. Last, we provide brief descriptive statistics of the new cities wave using novel data.

2. Background

2.1 A Brief History of New Cities

Developing master planned cities "from scratch" is not a new phenomenon. Humans have engaged in new cities construction throughout history, leading to modern cities like Baghdad (762), Kyoto (794), Mexico City (1521), St. Petersburg (1703), Washington, DC (1790), Nairobi (1899), and Abuja (1991). In many cases, new cities were built as isolated projects driven by a specific historical motivation. For instance, Washington, DC's founding in 1790 came from a

political desire to relocate the United States capital to a geographically "neutral" location closer to the American South. In 794, Japan also moved its imperial capital from Nara to Kyoto. Modelled after the city of Chang 'an, the capital of the ruling Tang Dynasty in China, Kyoto was intended to symbolize Japan's shift towards a bureaucratic state (Stavros, 2014).

At the same time, new cities also fit into broader "waves," where their development coincides with historically situated and concentrated regional and global demand for master planned communities. Military expansion has been a common rationale and motivator for concentrated periods of new cities construction. One of the earliest waves emerged from the military campaigns of Alexander the Great. From 336 BCE to 323 BCE, Alexander founded between six to 13 new cities that still stand today (Hammond, 1998). Both the Roman and Aztec empires likewise coupled their territorial growth with a series of colonial master planned towns and cities. In the 4th and 3rd centuries BCE, the Roman Republic maintained a structured colonial policy. Master planned towns and cities (*coloniae*) were established primarily to fortify new territories in Europe (Yeo, 1959; Abbott, 1915). The Republic sent between 200 to 6,000 Roman families to populate new settlements, although some colonies (e.g. Venusia) were given as many as 20,000 families (Yeo, 1959). By the late 2nd century BCE, under the influence of Tiberius and Gaius Gracchus, colonies became social instruments that provided beneficial urban environments for poor and middle-class Roman citizens. Throughout this period, either intentionally or de facto, colonies facilitated the cultural romanization of provincial territories.

City-building also formed core strategies of European colonialism in the 16th to 20th centuries. The colonial planning practice can trace its heritage directly to the Roman *coloniae*, both in intention and implementation (Stanislawski, 1947; Home, 1996). Of the colonial powers, Spain had the most prolific and codified planning practice. The Spanish Empire already planned and built over 225 new towns in the Americas by 1573. Just 60 years later, that number rose to 300 new towns (Kashima, 2016; Lemoine, 2003). This period saw the origins of contemporary cities like Santo Domingo (1502), San Juan (1509), Havana (1515), Mexico City (1521), Buenos Aires (1536), and Santiago (1541). In the first 20 years of Spain's colonization of the Americas, their planners took a relatively unstructured urban development approach. In many cases, cities were built on pre-Colombian ruins and conquered towns (Mundigo and Crouch, 1977). By 1513, the Spanish royalty began issuing loose decrees to guide urban planning. These guidance's were eventually formalized in 1573 by King Philip II's *Ordinances of the Laws of the Indies*, which established 148 ordinances regulating new towns planning, construction, and management in the colonies. The most prominent feature was the "checkerboard" or grid layout.

However, Spanish colonial town planning was more than a matter of urban development and territorial consolidation. It was an imperial tool to impose cultural and political hegemony on indigenous subjects (Fraser, 1990). For example, Ordinance 36 of the 1573 Laws of the Indies states that the site of a new town: "should be populated by Indians and natives to whom we can preach the gospels since this is the principal objective for which we mandate that these discoveries and settlements be made" (Mundigo and Crouch, 1977). The Spaniards perceived urban living as emblematic of civilization, which imbued a moral purpose to new cities development (Higgins, 1991; Fraser, 1990). These values were reflected in the urban plans and architecture.

The Spanish were not the only city builders of the colonial period. Home (1996) has labeled the British Empire the "chief exporter of municipalities." He describes three key ideologies that shaped British colonial city-making. First, the British Crown saw

colonial development as a state mandate. The government established new public institutions (e.g., the Colonial Office) to handle colonial affairs, and colonial governors exercised political authority through physical form. Cities, for example, were planned to reflect European aesthetics and design (e.g., grid street layouts). Second, capitalist sentiments prioritized profit over social welfare. To maximize wealth from resource extraction and colonial production, the British government and the businessmen that worked closely with it minimized public expenditure. This meant that few resources were given to municipal infrastructure and administration. Third, new cities reflected utopian idealism. The blank slate of relatively sparely populated colonial territories, especially in Ireland, North America, and Oceania, gave European idealists an opportunity to experiment with social organizations via town planning. Of course, like with the Spanish planners, many of these urban philosophies reflected the religious convictions of the time, and while colonial planners framed their designs as "civilizing" social progress, they were in practice racially discriminatory (Home, 1996; Njoh, 2007). Over time, the British Empire progressively standardized its new towns and cities planning in a series of legislations and administrative institutions, much like the Spanish *Laws of the Indies*. Many of these laws still exist in the local planning regulations of former colonies.

It is worth noting that although historical colonial city planning may appear to have been comprehensive, their implementations were often messy and incoherent. Urban plans and legislative decrees are better thought of as idealized frameworks that were disrupted by the realities of the political and cultural contexts. Colonial planners often misunderstood local urban dynamics, leading them to develop ill-suited policies that had to be frequently revised. For instance, the British remaking of Zanzibar City was plagued by colonial bureaucratic inefficiency and financial mismanagement (Bissell, 2011).

The idea of "new towns" itself was also flexible to colonial governments. Whereas the term evokes greenfield developments, in practice, new towns planning was applied to the remaking and, in cases where indigenous settlements were razed, rebuilding of cities. Mexico City, built by Hernan Cortes in 1521 according to the directives and specifications of the Spanish royalty, laid on top of the ruins of Tenochtitlan, the Aztec capital destroyed by Cortes and his conquistadors (Tenochtitlan itself was a new city founded in 1325) (Stanislawski, 1947). Likewise, while Home (1996) described the British Empire's town planning model as "deliberate urbanization," which explicitly favored planning and constructing towns "from scratch," he also identified Hong Kong as a quintessential British new city. However, Hong Kong was far from a greenfield development, as the island already had several small villages and a population of around 7,000 people by the time Britain took possession in 1841.

For much of history, new cities waves have tended to follow themes of military conquests and overt territorial expansion. However, a comparatively peaceful wave of new cities construction emerged at the turn of the 20th century. Motivated by social changes and a spirit of reform, urban planners and social theorists looked at new cities as an instrument of social engineering (Hardy, 1991). This wave traces its intellectual start to Ebenezer Howard's Garden Cities movement. Concerned about the dismal state of late-Victorian industrial urban living, which saw pollution, crime, overcrowding, and other "urban diseases," Howard (1902/1965) proposed building master planned, self-sustaining, government-funded, tree-lined satellite cities on the fringes of major British municipalities. These new cities were to follow detailed prescriptions, which dictated acreage, population, layout, and dimensions.

Howard and his Garden Cities Association, formed in 1899, managed to establish only two garden

cities, Letchworth (1903) and Welwyn Garden City (1920) (Hardy, 1991). However, his parochial English ideas eventually broadened into an international phenomenon (Hardy, 1991; Wakeman, 2016). Dubbed the New Town Movement by urban scholars, planners across the world sought to build their own utopian communities on their urban fringes. New towns were built in Sweden, France, Singapore, Hong Kong, Russia, and the United States. In the United Kingdom, the concept received renewed interest after World War II, and the practice was institutionalized in the *New Towns Act* of 1946. In the United States, "model cities" were built under Lyndon B. Johnson's The Great Society and War on Poverty policy agendas. Examples including Columbia, Maryland and Reston, Virginia. Russia, which received a translated version of Howard's writings in 1908, built more new towns than any other country (Wakeman, 2016).

As the West embarked on new towns enthusiasm in the mid-to-late 20th century, the Global South was experiencing its own new cities boom. The postcolonial period following World War II saw newly independent states eager to modernize their economies and join the international stage. New cities were integral to these efforts. Postcolonial governments hoped that building new cities, with upgraded infrastructure and "Western" aesthetics, could attract international market participation and foreign direct investments. They also saw new cities as political signals of post-independence competence and pride (Vale, 2008; Watson, 2009; Abubakar and Doan, 2010). In order words, new cities were instruments of nation-building. However, although distinct, the Global South new cities experience cannot be divorced from the Garden Cities and New Town Movement in the West. Postcolonial governments relied heavily on Western planning ideas and consultants to craft their own new cities (Wakeman, 2016). For instance, the Indian planned city of Chandigarh was designed by the French planner Le Corbusier (Rodriguez-Lora et al, 2021).

2.2 New Cities in the 21st Century

Today, we are experiencing another wave of city-making. Many of these projects are taking place in the Global South, particularly in Africa, the Middle East, and Asia. Since the early 2000s, governments and private developers have partnered to dramatically reshape the urban landscapes of emerging economies, and in doing so, they hope to accelerate modernization and economic growth. Examples include Tatu City in Kenya, Eko Atlantic City in Nigeria, NEOM in Saudi Arabia, and Forest City in Malaysia. These projects reflect substantial public and private investments, and many are ambitiously targeting a population of hundreds of thousands to millions of residents. These cities often align with national development agendas. For instance, Tatu City is the flagship project for the Kenya Vision 2030 agenda, NEOM is an initiative of Saudi Vision 2030, and Rwanda is building six satellite cities for the urbanization pillar of its Vision 2050.

Attempts to rigorously catalogue the current wave have been difficult and inconsistent. Moser counts nearly 150 ongoing developments in over 40 countries, with 70 of those projects taking place in Africa (Moser & Cote-Laurence, 2020; Moser et al, 2021). However, Keeton and Provoost (2019) identified 109 new city projects in Africa since 2000, and Jo and Zheng (2020) found at least 200 new developments in China alone. The NCM includes 164 new cities announced since 2000.

The discrepancy is largely due to definitional inconsistency. Jo and Zheng note that these cities are often referenced using a variety of conflicting terminology, such as "satellite city," "new town," and "new urban area." Moser also highlights the "definitional problem" of the subject (Moser & Cote-Roy, 2020; Wade, 2007). The incoherence is further complicated by differences in how national governments define their own urban hierarchy and

real estate developers brand their projects. For instance, developers in the West are reluctant to brand projects as "cities," instead preferring to call them "communities" even if they are being built for a city-scaled population. Similarly, Chinese projects are often branded as "districts" rather than cities. In contrast, developers in Africa and the Middle East are quick to brand projects as "cities," even if their projects better resemble a modest neighborhood. As such, scholars are left struggling to define various projects by approximating the social heuristic (i.e., by asking themselves, what would 'most' people consider a new city?). These efforts have not coalesced into a census, which creates a disjointed literature.

The ambiguity and incoherence lie in the conceptual challenges of defining "new cities." Urban developments are on a spectrum, and dividing these environments into meaningful categories requires theoretical considerations and subjective judgements. How do we differentiate between city districts and independent satellite cities? The answer is not as simple as assessing governance responsibilities, since these often overlap. For example, Metro Manila is nominally 16 contiguous "cities," each with their own elected mayor, unified by an overarching administrative government. Likewise, what constitutes a "newly built" city as opposed to one organically grown? More abstractly, what are "cities?" While we may see them as distinct political-legal jurisdictions, cities are also often conceptualized as sociological communities with fuzzy boundaries (Post, 2018).

These methodological difficulties and the new cities wave's novelty have limited the literature to ad hoc conceptual "agenda setting" (i.e., identifying open research questions to be explored in future research) (Watson, 2013, van Noorloos & Koosterboer, 2017; Moser & Cote-Roy, 2020; Moser et al., 2021; Goldman, 2011; Jo, 2018) and qualitative case studies of specific projects (Moser, 2019; Moser et al., 2015; Cain, 2014; Datta, 2015; Ondrusek-Roy, 2020; Mahmoud & El-Sayed, 2011). However, there are few rigorous quantitative, political, or economic studies of these projects and their consequences, and the phenomenon has been largely ignored by social scientists.

Despite these ambiguities, scholars have loosely identified several common characteristics among new city projects this century. These cities are primarily being built in the Global South, especially in Africa, Asia, and the Middle East. A key distinguishing feature of the current wave is the substantial private sector involvement, in contrast to the largely government-directed new cities and new towns of the past. Contemporary new cities are typically financed by public-private partnerships and motivated by market-driven profit opportunities (van Noorloos & Kloosterboer, 2017; Moser et al, 2015, Moser & Cote-Roy, 2020). Aesthetically, they are packaged as investment vehicles and their brandings are reminiscent of consumer products. For instance, a slew of cities shares the same "eco city" and "smart city" brandings. In extreme cases, new cities are listed on stock markets and managed by CEOs rather than governments (Moser et al, 2015). For example, King Abdullah Economic City, Saudi Arabia and Gurgaon, India are both privately-run cities.

Although most scholars time the city-making surge to the start of the 21st century, many have noted an acceleration following the 2008 Global Financial Crisis. They speculate that this may reflect a search for new profit opportunities after the weakening of real estate markets in the West (Watson, 2013). This explanation for the sudden proliferation of new cities is more broadly rooted in the "financialization" of the global economy, a process that accelerated in the 1990s (Moser, 2020; Su, 2023).

Another explanation may be weak state capacity in rapidly urbanizing settings. The Global South, especially Sub-Saharan Africa and India, are

experiencing fast growth in their urban population. Sub-Saharan Africa alone will add almost one billion people to its cities by 2050 (OECD/SWAC, 2020). However, low-capacity governments are unable to keep pace with the growing demand for urban housing and infrastructure. Li and Rama (2023) developed a game theoretic model showing that in low-capacity/high-urbanization contexts, the private sector engages in city-making to fulfill the supply gap unaddressed by the state. This can lead to large private investments in municipal development and even private governance.

Tied to the privatization of city-making is the emergence of a global "industry of new cities." A set of established firms and players have solidified their role as urban planning "gurus" that help Global South governments plan, build, and manage their new cities ambitions (Moser, 2020; Chakravarty et al, 2022). Examples include Rendeavour, the largest city builder in Sub-Saharan Africa, and Deloitte, a prominent player in the international smart cities market (Deloitte, 2018). The new cities "industry" is also represented by state-owned enterprises from countries like China, Singapore, and South Korea – places with a credible history of building cities "from scratch" (Moser et al., 2021; Cain, 2014). Singapore's state-owned investment firm Temasek, for example, is planning to commit $150 billion to build 123 new cities in Africa (Sguazzin, 2023). The largest driver of these "South-South, public-public partnerships" is China. Through its Belt and Road Initiative (BRI), China is spending over $575 billion on infrastructure development across Eurasia (World Bank, 2019). While not exclusively focused on building new cities, the BRI has involved itself in some of the largest new cities projects to date (Shepard, 2016; Peters, 2015).

Another distinguishing feature of the ongoing wave is scale. Historical ambitions for new cities have been relatively modest. As such, scholars studying master planned communities have preferred the term "new towns." Past projects have tended to target smaller populations of under 100,000 people. Most were conceptualized by their founders as isolated "strongholds" in relatively scarcely populated regions, as was the case during military and colonial expansions, or suburbs of established urban centers. It was only later that they evolved into modern metropolises. Many recent new cities projects, however, are envisioned as fully-fledged cities from the beginning, and they are built to house large populations in expansive areas. Developers are building skyscrapers, conference centers, hospitals, schools, and other urban amenities long before the city has its first residents.

2.3 Criticisms of New Cities

For the most part, new city projects are examined by geographers and urban scholars from a critical lens. Their criticisms fall into two categories. First, scholars argue that new cities are often wasteful manifestations of "speculative urbanism" and "urban fantasies" (i.e., vanity projects that do not fulfill a true public need for urban development) (Goldman, 2011; Watson, 2013). Developers and governments tend to frame these projects as reactions to changing national trends, particularly a rising middle class and accelerating rural-to-urban migration in the Global South. However, urban scholars doubt that this underlying demographic narrative is accurate. That is, they are skeptical that the developing world truly has a growing middle class or substantial rural-to-urban migration (Pieterse, 2019). As such, they argue, building new cities will wastefully divert important resources away from existing communities and risk creating uninhabited ghost cities (e.g., Shepard, 2015).

Second, and more substantively, urban scholars fear that new cities will reinforce and exacerbate political oppression. Broadly, these cities are part of a larger national narrative for economic development, in

which governments in the Global South hope to replicate the rapid success of cities like Singapore, Shenzhen, and Dubai (Goldman, 2011). The logic proposes that building new cities in impoverished regions can help attract investment, spur business formation, and energize local economic growth. However, Bhan (2014) contends that in addition to the built environment, governments also hope to replicate the semi-authoritarian policymaking of Singapore and Dubai as a method for rapid industrialization. It is argued that this pursuit for "fast development" (Datta, 2015) will ignore important voices in society by bypassing the more cumbersome but participatory processes inherent in democratic deliberation (Milton, 2018). Critics have also pointed out that massive foreign investments into urban and infrastructure projects in the Global South may lead to adverse consequences for recipient countries. Already, there are concerns that BRI-financed projects may burden recipient countries with excessive debt to China (Hurley et al., 2018).

Moser (2020) further criticizes new cities as environments of social exclusion. She relates them to the problematic colonial practices of city-making in the 19th and 20th centuries, calling the ongoing wave "new wine in old bottles" (Moser, 2015). Indeed, many of the characteristics common among new cities — greenfield sites, utopian narratives of economic development, and top-down policymaking — were prevalent in the colonial cities of the past. They also exhibit some of the same consequences. For instance, colonial cities incorporated exclusionary design principles meant to segregate indigenous populations from colonial residents (Home, 1996; Njoh, 2007). Likewise, Moser (2020) notes that new cities can resemble gated communities that cater to an elite economic class rather than public spaces accessible to all citizens.

Jo (2018) challenges the critical perceptions prevalent in the literature. Focusing on Chinese new cities, she argues these new cities can resolve industrial market failures and generate positive social externalities. Her model outlines how new city making can be seen as a type of industrial policy, enabling the agglomeration of firms into new cities to create new industrial clusters of economic activity. Due to classic coordination problems, these clusters arguably would have not formed (at least as rapidly as they did) without the state's industrial policy playing an important coordinating role.

While top-down industrialization has traditionally been led by the state, Jo (2018) suggests that private actors have a role to play in regions with weak state capacity. Leveraging urban development as a vehicle for national development requires expertise and foresight, in which effective industrial policy must credibly coordinate numerous actors, assume long-term financial risks, and "pick winners" given asymmetric information. To achieve this, regions with weak state capacity will need to partner with resourceful private actors with the prerequisite technical expertise. However, states will also need to strategically structure partnerships to disincentivize private actors from pursuing short-term financial gains at the expense of broader economic growth (Engel et al., 2014). For example, Jo's research cites Gu'an New Industry City in China as an illustrative case of effective urban development via public-private partnerships in the face of weak public sector capacity. Her argument echoes those made by Li and Rama (2023), which frames new cities as a response to pre-existing policies, weak state capacity, and market failures, rather than as intentionally rent-seeking policies by corrupt actors.

2.4 Gaps in Research

While the extant literature has conceptually framed the new cities wave within a longer historical pattern of master planned communities and identified the common characteristics of existing projects, it still

leaves many questions unanswered. For instance, the existing literature still has no agreed upon answer to the fundamental question: how many new cities are there? The relatively homogenous research space, largely confined to urban planning and geography scholars utilizing qualitative and historical methods, creates an empirical gap in inquiry. Specifically, there is less attention paid to examining the phenomenon in its entirety, as opposed to through inductive inferences from in-depth case studies. There is also a gap in policy relevant research that can help policymakers and developers improve new city projects. That is, how to ensure these projects attract productive economic activities, address rapidly growing demand for urban living, and refrain from becoming socially exclusionary spaces or white elephants.

Scholars have also not sufficiently investigated new cities using micro-level empirical methods, which can help causally link these projects to precise economic, social, and political outcomes in their local surroundings. How do new cities affect local labor markets and consumer prices? To what extent do they attract foreign investments? What are the economic models dictating public-private new cities cooperation? Does political ideology (e.g., authoritarianism, clientelism, technocracy) correlate with new cities development? Will new cities increase social inequality? Here, scholars can take inspiration from the extensive special economic zones (SEZs) and industrial parks literature, which has attempted to answer these questions using statistical methods (e.g., Neumark & Simpson, 2015; Wang, 2013; Alkon, 2018).

For example, Frick et al (2019) use a novel dataset of global SEZs to estimate zone impact on local economic growth. Using satellite nightlight data as a proxy for economic activity and controlling for SEZ-specific characteristics provided in the dataset, they find that SEZs generate beneficial economic spillovers in their immediate surroundings. However, these benefits decayed further away from the zone boundaries. Looking at a more granular level, Brussevich (2020) uses a matching technique and household surveys to test whether SEZs in Cambodia generated district-level socioeconomic spillovers. She finds that SEZs improved women's economic empowerment and reduced income inequality. However, wage growth did not keep pace with SEZ-induced increases in land value.

There is also a small, but growing, empirical literature directly investigating the impacts of new towns and greenfield developments in the Global South. Michaels et al (2021) evaluated the long-term impacts of the 1970s Sites and Services program in Tanzania. The program constructed basic infrastructure (plot delineation, water and sewage pipes, roads, etc.) in greenfield sites on the urban fringes of existing cities (de novo development), then gave locals the opportunity to build their own houses for a minimal fee. Using a spatial regression discontinuity design, they find that de novo developments are causally linked to more regular street layouts, bigger buildings, and higher-quality housing.

Similar spatial methodologies are suitable for studying new cities. Likewise, the same set of research questions relevant for place-based policies like SEZs and greenfield developments are pertinent for new cities developments.

3. The New Cities Map (NCM)

In the context of an increasingly important and salient, yet understudied, new cities trend, we developed the New Cities Map. The NCM is a comprehensive map and database of contemporary (1945 - 2023) master planned cities across the world. The NCM establishes a present-day "snapshot" of contemporary new cities. It does not track cities over time or adjust measures

for differences in project age. The NCM systematically catalogs information on each city's planning, construction, implementation, geography, and governance using publicly available sources. The database is published under an Open Data Commons Open Database License (ODbL), and it is freely available for anyone to download and use. The NCM can be accessed at **www.newcitiesmap.com**.

3.1 Motivation

The NCM was motivated by two goals. First, we wanted to conclusively catalog the new cities wave. While there have already been attempts to measure the breadth of contemporary new cities construction, we found the existing resources too limited for large-N statistical analysis. Specifically, these resources used opaque methodologies and did not readily package their data for analytical research. Table 1 summarizes the characteristics of the three existing new cities databases, in addition to the NCM. Of the three databases, two (New Cities Lab and International New Towns Institute) did not provide a way for the public to download the underlying data. These databases also did not define their inclusion criteria and scopes. As such, it was not clear why they included specific projects and how their operationalized new cities and new towns. While this approach may be sufficient to derive a general picture of the overall new cities trend and facilitate theorizing the phenomenon, statistical analysis requires a detailed explanation of the sampling approach.

Table 1: Comparing the NCM with existing new cities datasets

Dataset	Cities	Timeframe	Variables	Download
New Cities Lab (Moser, 2020)	Over 150	Present	-	No
International New Towns Institute (INTI, 2020)	1,234	7500 BCE – 2020	About 20	No
New Towns Initiative (Peiser & Forsyth, 2021)	747	19th Century - 2017	12	Yes
Charter Cities Institute (CCI, 2023)	353	1945 - Present	Over 70	Yes

The database created by the New Towns Initiative was the most comprehensive. Tanaka & Forsyth (2021) go into painstaking detail describing their methodology, inclusion criteria, and uncertainties. They also avail their data for public download. However, their efforts were not sufficient for our use in two ways. First, they focused more broadly on the "new towns" phenomenon. This mean that their sampling methodology included small projects that skirt the line between communities, towns, and cities. However, we wanted a dataset that more directly tackles the growing "new cities" phenomenon. That is, the planning and construction of fully-fledged, expansive metropolises geared towards ambitious populations.

Second, the New Towns Initiative database did not collect deep information on each city. The second goal for the NCM was to catalog an extensive roster of variables for each city so that, in addition to simply counting these projects, we could better understand their characteristics. This includes data on financial planning, project management, corporate marketing, and even governance. Such information is necessary to control for confounders in large-N analysis and answer more substantive, policy-relevant research questions.

3.2 What is a City?

The primary challenge of the NCM was creating a consistent and rigorous definition of "new cities." Human settlements exist on a nebulous spectrum that spans from rural hamlets to highly urbanized metropolises, and dividing urban areas into neat categories is highly subjective. When does a "town" become a "city?" Where is the line between master planned and organic urban growth? At what point is the urban redevelopment of an existing settlement substantial enough to constitute a "new city?" As noted, there is little conceptual agreement among scholars on defining new cities and new towns.

To unify the current wave into a useful conceptual framework suitable for research, Jo and Zheng (2020) offer a working definition of "new cities" based on their common characteristics:

1. Master-planned: they are coordinated, managed, and financed by a small group of primary actors.

2. Rapid: they are perceived as single projects built within a few years or decades. In many cases, they have population and job creation milestones. This contrasts with traditional cities that develop organically in a piecemeal and uncoordinated manner over an undefined period.

3. Greenfield: the project site has little or no prior development (i.e., greenfield sites).

4. Distinct governance: while new cities may be contiguous to an existing urban center, they are still designed to have geographical, fiscal, administrative, and/or social independence. This distinguishes them from urban developments that are simply expansions of existing cities.

5. Pre-determined mixed-use: they are designed as both environments for consumption and production, including residential, commercial, and industrial capacities. In this sense, new cities aim to be fully functioning "cities," as opposed to narrowly defined "bedroom towns," "industrial parks," or "shopping districts."

6. Envisioned as a city: most importantly, these cities are conceived of as a "city" by their planners from the start. This differentiates them from other development projects that may have been initially seen as single-use spaces, but later evolved into mixed-use.

Jo and Zheng's definition formed the basis for our own definition. However, while their definition provided an abstract framework, the NCM required more concrete inclusion criteria. Operationalizing their definition for our use posed two major challenges.

First, we could not rely solely on how developers and public officials framed their projects. Real estate marketing tends to exaggerate ambitions and benefits to capture public support or secure financing. We found that many projects were framed as "cities," even if they were better described as new districts or small communities. This is especially true in the Global South, where developers are leveraging the sudden popularity of new cities construction. For example, India adopted the Smart Cities Mission in

2015, in which the government announced that it would build 100 new smart cities by 2023 (Krishnan, 2023). However, many of these "new smart cities" are better described as minor technological upgrades to existing infrastructure or small "tech zones" within existing cities. Similarly, in 1995, the Bonifacio Land Corporation developed a master plan for a new "city" in Metro Manila. Although they branded the project as Bonifacio Global City, the project ended up being just a district redevelopment project in the existing city of Taguig.

As noted earlier, the West posed the opposite problem. Western developers are reluctant to brand their projects as "cities," instead favoring the terms "communities" and "mixed-use developments." For example, Columbia, Maryland is a city in the United States with a population of just over 100,000 people. It was a product of the Model Cities Movement of the 1960s, which sought to use new cities construction as a social welfare policy. However, throughout the 1960s and up to today, these projects were often discussed as "planned communities." China likewise favors the terms "new district" and "new area" when discussing their master planned satellite cities (at least in English). The Binhai Bay New District is a master planned city in Tianjin, China. At a planned area of over 2279 square kilometers, the "district" is over 12 times larger than Washington, DC.

Second, we could not rely on official jurisdiction boundaries and government definitions of urban areas. The NCM required a consistent definition of new cities that could be applied to any country, and there is substantial variation in how national governments conceptualized their own urban hierarchy. For example, the Constitution of Kenya only recognizes national and county governments. Before the Urban Areas and Cities Act of 2011, modern Kenya had no officially recognized incorporated cities. Even today, much of what we would consider "municipal services" are administered by county-level governments.

There is also inconsistent variation in how countries draw city boundaries. The formal boundaries of Nairobi, Kenya's national capital, matches that of Nairobi County. This means that many official Nairobi statistics include data from the rural areas surrounding the city. China practices a similar style of "expansive" jurisdiction drawing, where city boundaries can include vast swaths of agricultural land. China even has a class of cities called "prefecture-level cities," which would better match states and provinces in other countries.

Within countries, city boundaries are often a consequence of arbitrary political history. San Francisco is itself only 121 square kilometers, but it forms the core of a larger contiguous urban region known as the Bay Area. Unlike New York City and Chicago, each encompassing over 600 square kilometers, San Francisco did not annex its surrounding cities. We can easily imagine an alternate history in which San Francisco successfully annexed neighboring Oakland and Berkeley to form a larger city of over 335 square kilometers. In the megacities of the Global South, colloquial perceptions of a city's boundaries do not always match the underlying administrative organization. Lagos, Nigeria is itself split into 16 "local government areas."

Addressing these issues required making difficult inclusion tradeoffs. This means that our definition may exclude some projects that most people would consider new cities, and include others that people reluctantly perceive as new cities. We defined new cities as cities that are orchestrated by a central planner and guided by a master plan document. These cities are built in a coordinated fashion with a pre-determined and multi-functional mix of uses fit for people of all ages (e.g., not a limited-use central business district, industrial park, or bedroom community). New cities also have a distinct municipal government or local administration that separates them from existing municipal jurisdictions.

We operationalized this definition into six inclusion criteria. These criteria were applied to both built and planned new cities. To be included in the NCM, cities had to meet the time frame criterion and at least three of the five remaining inclusion criteria. If we could not find information on an inclusion criterion, we coded the city as not meeting it.

3.3 Inclusion Criteria

Criterion 1: Time Frame

A. The city plan was announced on January 1, 1945 or later;
B. Cutoff date for new projects is October 1, 2021.

The time frame criterion restricts the NCM to a "contemporary" period that aligns with our focus on the current "new cities wave." The end of World War II was a natural starting point. The post-war era saw a substantial shift in the international political and economic order, and wartime destruction initiated new efforts to rebuild infrastructure across the world. Numerous countries achieved independence closely after 1945, which kicked off a wave of post-colonial cities construction. Many historiographers also treat 1945 as the starting point of the contemporary historical period.

We used the "announcement date," as opposed to the construction start date, since this was more readily available. We also wanted to include speculative cities that may never actually be built. The cutoff date was set as an administrative convenience for the research team. Data collection began on October 1, 2021, and we didn't want to miss any newly announced cities in regions we had already researched. All cities in the NCM met this criterion.

Criterion 2: Explicitly Envisioned as a "City"

A. The project's website, promotional material, marketing resources, or other public documents must explicitly state that it is being developed as a "city" instead of an industrial park, company town, tech hub, etc.

Although project branding was not always reliable, it helped us distinguish between new cities and standard urban development. The vision criterion was particularly useful in differentiating between new cities and major redevelopments of existing settlements, since it indicated that the developer perceived the project as conceptually "new" to the existing area.

Criterion 3: Population

A. The current population is at least 100,000;
B. Or the city has an explicitly stated goal to have at least 100,000 residents.

The population criterion served two purposes. First, it kept the NCM at a reasonable scale. Given limited resources, we had to choose between a "deep" dataset of relatively fewer cities and a "wide" dataset with relatively few variables. The 100,000-population threshold achieves a balanced tradeoff. Second, the population threshold jumps past the fuzzy line that divides cities and towns. New projects that accommodate at least 100,000 people unambiguously fall into the "cities" category.

To meet the population criterion, cities had to have a current population of at least 100,000 or a planned population of 100,000. This is because we wanted the NCM to include cities that were only recently completed or still in the planning stages. When the planning documents were vague, we tried to infer the planned population using supplementary information, such as the number of housing units planned. Consequently, this approach may bias the database to older cities that had time to accrue more residents. There may be new cities that did not plan for 100,000 people, but will nonetheless grow to over 100,000 people in the coming years. These cities did not pass the population criterion.

Criterion 4: School

A. The city has or is planned to have a school.

The school criterion was an elegant way to determine whether a project was planned to be a mixed-use city. We reasoned that planning for schools indicated the intention to build a long-lasting "community" for residents with diverse amenities for all ages. However, the school criterion is not perfect. For instance, developers may build a mining town intended to last only for the duration of mining activities. These towns may include temporary schools to accommodate the children of migrant laborers, but they may not be intended to serve as long-lasting mixed-use cities. However, even in these cases, schools may lay the foundation for the city to continue growing beyond its intended purpose.

Criterion 5: Master Planned and Central Coordination

A. The city's development has a central coordinating entity;

B. If the city has multiple developers or "master planners," then a specific government agency or other entity coordinating their construction efforts must exist. For instance, a public-private partnership may include multiple private planners managed by an overarching public corporation.

The master planned criterion was adopted to exclude cities that formed organically. We defined new cities as intentionally built megaprojects guided by a master plan. While "new cities" may later grow organically, their design as "cities" was intentional.

Criterion 6: Governance

A. The city has a single governance structure distinct from any other city;

B. Or the master plan specifically outlines that the governance structure will be unique from the beginning of the project.

The governance criterion ensured that included projects were separate new cities, as opposed to extensions of existing cities. Granting a city its own administration signaled that the government conceived of it as a distinct community. In the case of private cities, corporate governance is counted as a distinct governance structure. However, the criterion did not always map well to national differences. In some countries, multiple cities are managed by a single higher municipal government.

As we encountered cities that fell into the margins, we developed a set of special rules and exemptions. These can be found in Annex I.

Table 2: Summary of adherence to the inclusion criteria

Inclusion Criteria	**% of Cities in the NCM That Met This Criteira**
Criterion 1: Time Frame	100%
Criterion 2: Explicitly Envisioned as a "City"	90.93%
Criterion 3: Population	98.02%
Criterion 4: School	94.05%
Criterion 5: Master Planned and Central Coordination	98.87%
Criterion 6: Governance	96.88%

3.4 Data Collection

Data collection ran from October 1, 2021 to May 29, 2023.
Collection was broken up into regions. For each region, we assembled a team of research assistants living in or familiar with the countries being researched. To the extent possible, we tried to find at least one person with knowledge of the local language. Otherwise, we prioritized English and Spanish sources or used Google Translate.

Table 3: Data collection timeline

Region	Dates
Latin America	October 2021 - May 2022
India	December 2021 - December 2022
North America	April 2022 - June 2022
Africa	June 2022 - September 2022
Europe	July 2022 - August 2022
Middle East	September 2022 - November 2022
Asia (excluding China and India)	October 2022 - November 2022
China	October 2022 - December 2022

We began by compiling a list of every city in a country using national registers, secondary sources, existing datasets, and *ad hoc* online searches. Research assistants used a pre-defined list of keywords to search for more recent new cities projects:

- New cities;
- Master planned city (cities);
- Planned city;
- Economic revitalization project;
- New town;
- Master city;
- Satellite Cities;
- Smart Cities

Once a list was compiled, we filtered it using the announcement date, population, and master planner inclusion criteria. Research assistants were encouraged to lean towards inclusion when information was ambiguous. Two research assistants were assigned to each country to ensure consistency.

After the initial list of potential new cities was compiled, we began a more substantial inclusion criteria test. Two research assistants scrutinized each city to gauge how well it matched all six inclusion criteria. When there was consensus on a city's inclusion, we added it to the final list of new cities for that country. If there were any edge cases that did not fit the inclusion criteria completely or lacked sufficient information, we initiated an internal group discussion to determine the city's status. The NCM leaned towards inclusion of cities. If a city met the time frame criterion and at least three of the five remaining criteria, we kept it in the final new cities list.

Once the inclusion list was finalized, we began collecting data for each variable in the codebook. The NCM was designed to provide a singular "snapshot" of the new cities wave during the period of data collection (2021 - 2023). For variables that vary over time (e.g., current population, operational budget, etc), we looked for the most recent available

source. Ideally, these sources would reflect data from 2021 to 2023. However, in practice, publicly available sources often had a time delay. For instance, some cities only had population data available from 10 years ago. Each variable includes an archived link to the online source and the year of the data point, so users of the NCM can decide for themselves whether a source is credible and up to date enough for their purposes. These sources can be found in the metadata spreadsheet of the download package.

Research assistants were encouraged to use online encyclopedias (e.g., Wikipedia) as a guide, but they were asked to corroborate that information using a more credible source. There was some internal debate on how strictly to scrutinize source credibility. The issue for new cities projects is that private real estate developers are reluctant to share official information publicly. This forced us to rely on local news outlets and published interviews, which can have questionable credibility. We felt that this is an inherent constraint of a project like the NCM, which tries to codify a phenomenon often hidden behind a private sector veil. To minimize missing data points and create a useful research product, we decided to have a relatively lenient source vetting process. As a last resort, we allowed research assistants to use online encyclopedias as a source (archived to the exact moment they used the document).

We collected two kinds of information for each city. The first was "General Information and Project Details," which includes the city's management structure, budget, timeline, and location. This type of data was the most difficult to collect, since developers do not readily make the information public. The second type of information was "Governance," which looked at the administrative structure and policy making powers granted to each city's government. For the most part, these were identified using higher-level national and provincial laws. Most new city governments inherited the same powers granted to all cities in that nation. However, the new cities wave often intersects with growing demand for special jurisdictions and special economic zones. In these cases, we reviewed special legislations that grant specific new cities special powers. For a detailed variable codebook and explanations for variable inclusion, see Annex II and Annex III.

3.5 Limitations

The NCM provides the most comprehensive and richest contemporary new cities database available. However, it suffers from three limitations. First, by design, it was only meant to capture a "present-day" snapshot of the new cities wave. The NCM does not track cities over time, search for retrospective data, and adjust variables for city age (e.g., we collected data on a city's current population, regardless of whether the city was built 10 years ago or 50 years ago).

The NCM's design reflects tradeoffs in project resources and data availability. As discussed, many new cities projects, especially in the Global South, suffered from low data availability and quality. This constraint made it impossible to construct a consistent time-series database or ensure consistent time periods for every data point. Consequentially, these limitations will impact the types of analysis feasible with the NCM. This also means that the NCM may become less relevant in the future if it is not updated.

Second, the nature of new cities and real estate developments meant that publicly available data was scarce. Consequentially, sensitive questions in the database suffer from high missingness. For instance, we only found data for a project's operational budget for 12% of the NCM. Likewise, since we are relying on public information, inconsistencies found from the underlying data was not corrected. That is, inconsistencies generated by the developers and source documents are present in the database. For

example, the city of Townsend, Ontario was planned for 100,000 residents in an area of 0.28 square kilometers. Such a project would be unfeasible, and the errors may reflect either inconsistent expectations from the developer or mistakes in the source document.

Third, the NCM project encountered resource constraints halfway through the project. This prevented us from collecting all the variables in every region. The full set of variables were collected in the Americas and India. In Africa, we collected general and program details, but did not collect governance data. For the remaining regions, we only collected GPS locations and variables needed to determine inclusion. We plan to complete the project pending additional financing.

Table 4: Current state of the NCM

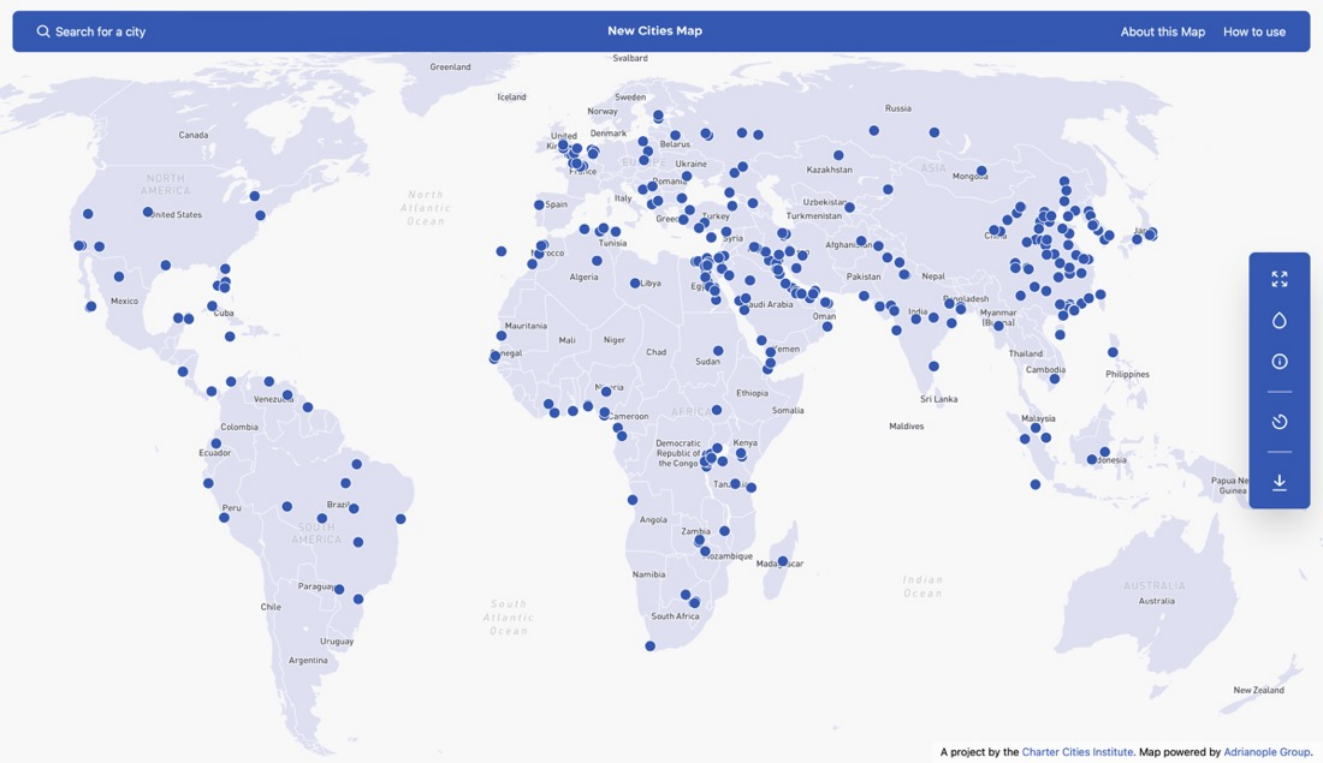
Region	**Variables Collected**
Latin America, North America, and India	All variables
Sub-Saharan Africa and North Africa	All variables except governance
Europe, Middle East, and Asia	GPS location and variables needed for the inclusion criteria test

Despite limitations, the NCM is a tremendous resource for generating novel academic and policy-relevant research on contemporary new cities. Its fundamental contribution is a rigorous count of contemporary new cities announced since 1945. Along with a rich set of variables, developers and policymakers cat find in-depth information on specific projects. This would allow these practitioners to qualitatively evaluate their own projects based on the experiences of similar projects elsewhere. In the past, practitioners would have had to engage in lengthy research to identify comparable case studies to inform their own decision making.

4. Insights into the Contemporary New Cities Wave

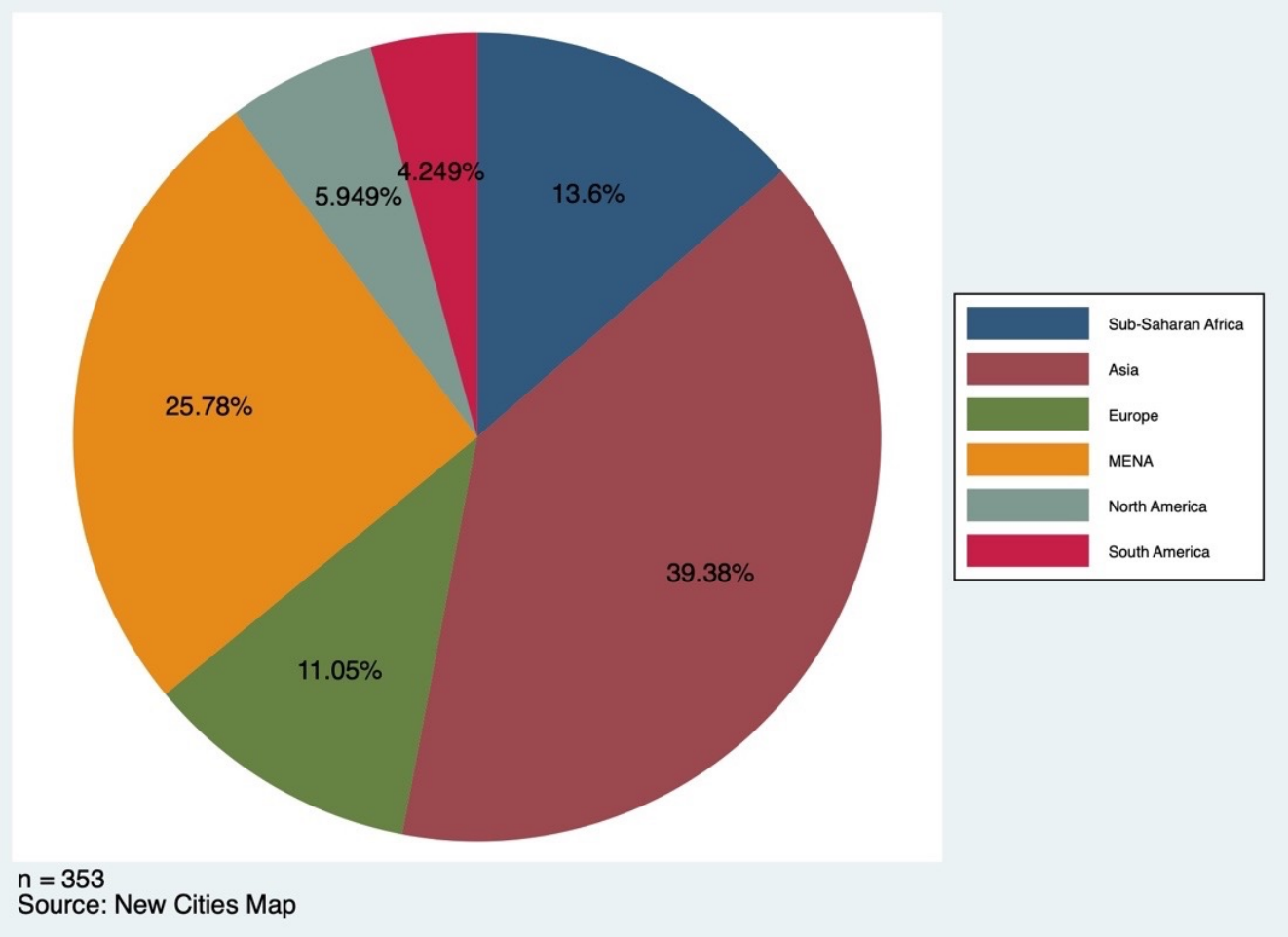
From 1945 to 2021, we identified 353 new cities projects announced around the world. These cities either planned for a population of 100,000 residents or currently have 100,000 residents.

Figure 1: New Cities Map



Asia had the greatest number of new cities announced, representing nearly 40% of all projects since 1945. This is driven mainly by China, which had 61 new cities projects (17.3% of all cities announced in this period, and more than twice as many cities as the second most prolific country, Egypt). Asia also had some of the most ambitious projects. While the average new city planned for a population of 947,374 people, the average Asian city planned for over 1.3 million people. Sub-Saharan African cities followed closely, with the average project planning for 1.2 million residents. The most ambitious project in the NCM, in terms of population, is Ravi City, Pakistan, which is building for 15 million people.

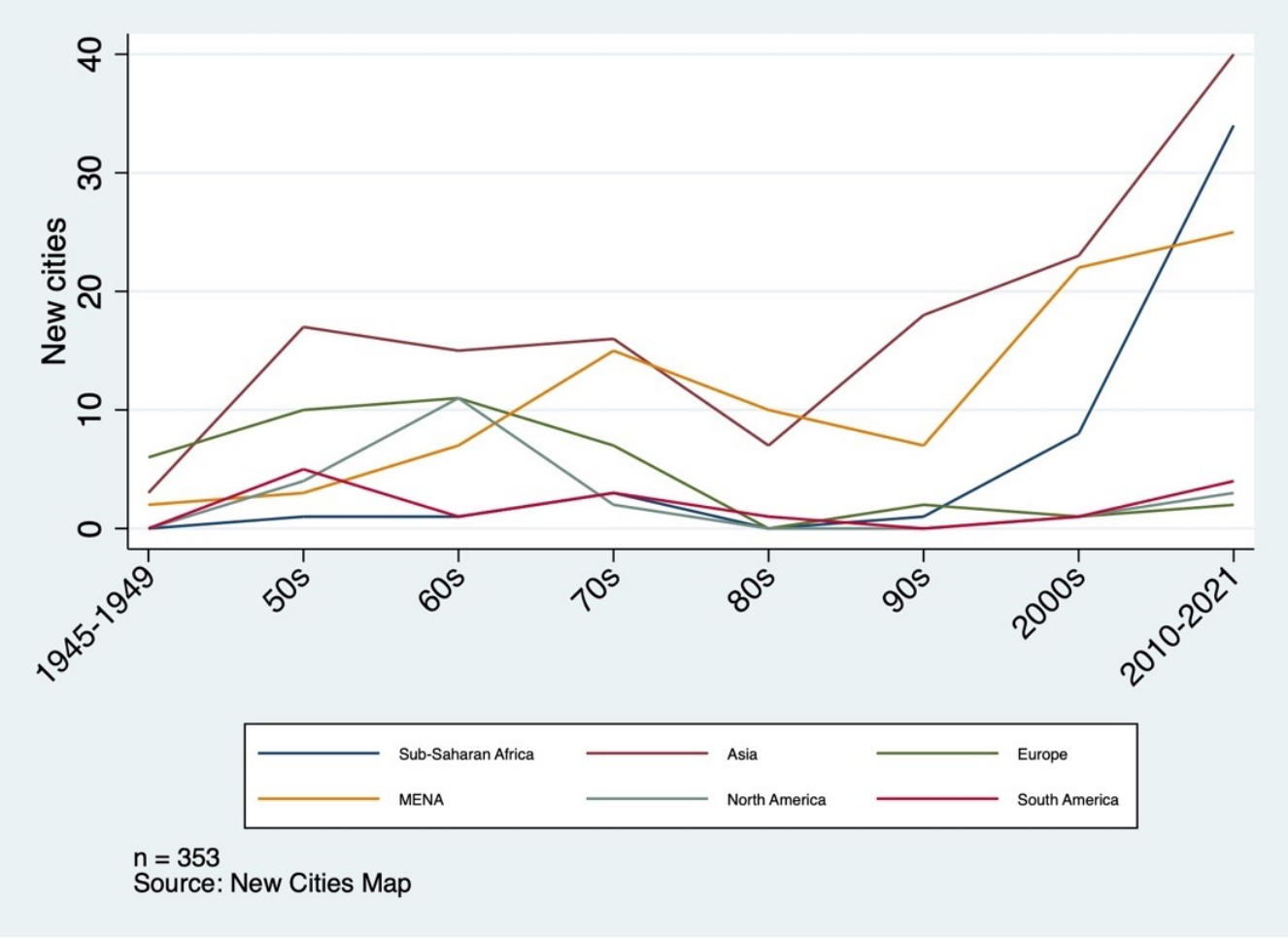
Figure 2: New cities by region



n = 353
Source: New Cities Map

Although Asia has been the most active region for new cities building in the 20th century, Sub-Saharan Africa is quickly catching up. Sub-Saharan Africa's participation in the contemporary new cities wave has only picked up in the past decade. While the region saw just 14 new cities projects before 2010, it has seen 34 projects in just the past 10 years. The Middle East and North Africa region is also experiencing a rapid growth in new cities. In the 21st entury, this region has announced 47 new projects compared to 44 projects in the prior 50 years combined. These trends likely reflect changing global economic and demographic shifts, particularly the rapid urbanization and internal migration taking place in Africa.

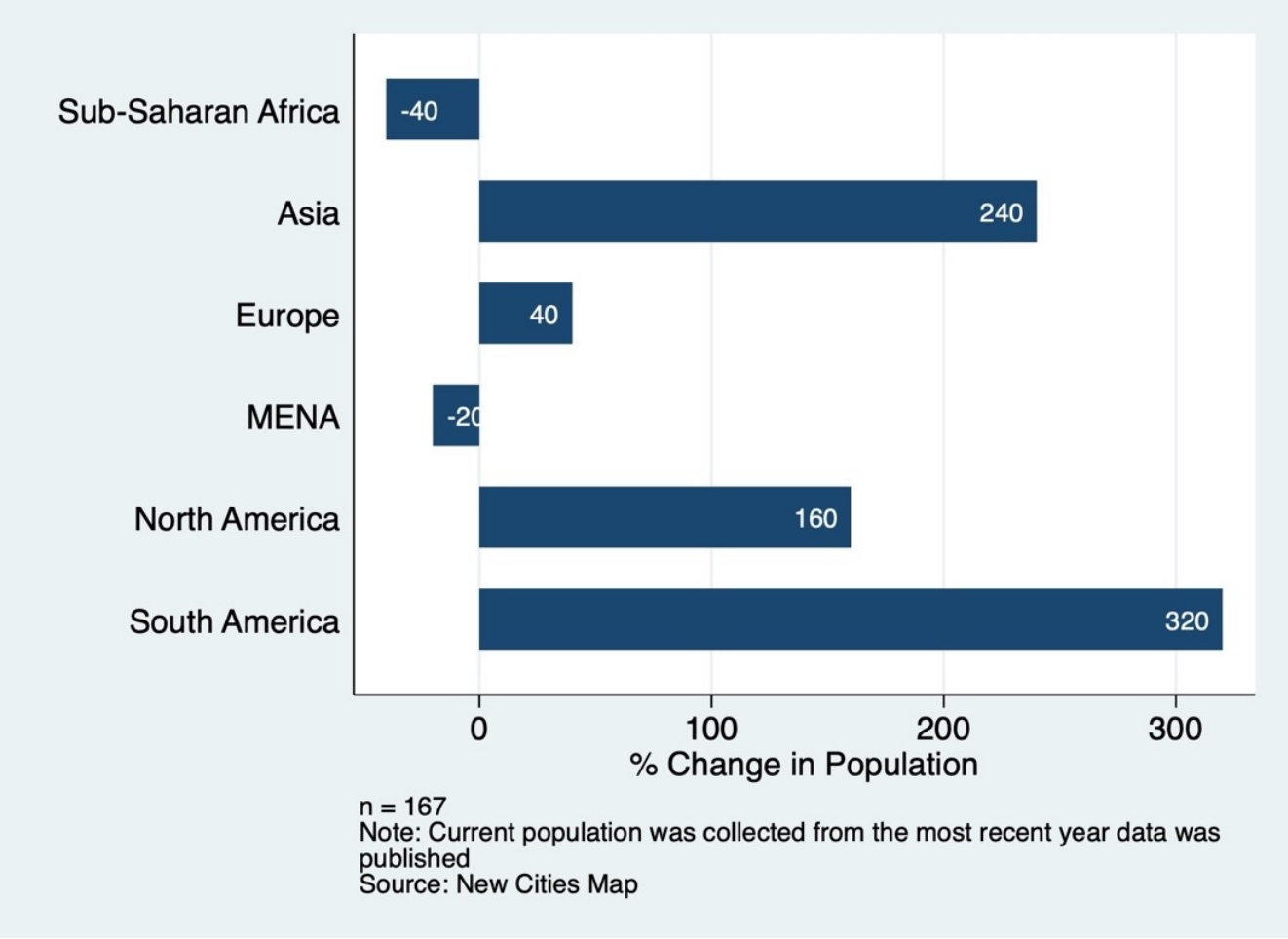
Figure 3: New cities announcements by decade



Unsurprisingly, Sub-Saharan Africa also has the youngest new cities projects. The average age of their projects, as of 2022, is 13 years since project announcement. Europe has the oldest new cities, at an average age of 47 years. Historically, this reflects Europe's post-World War II construction boom, which saw substantial investments urban development. North America has also relatively old new cities, with an average age of 48 years.

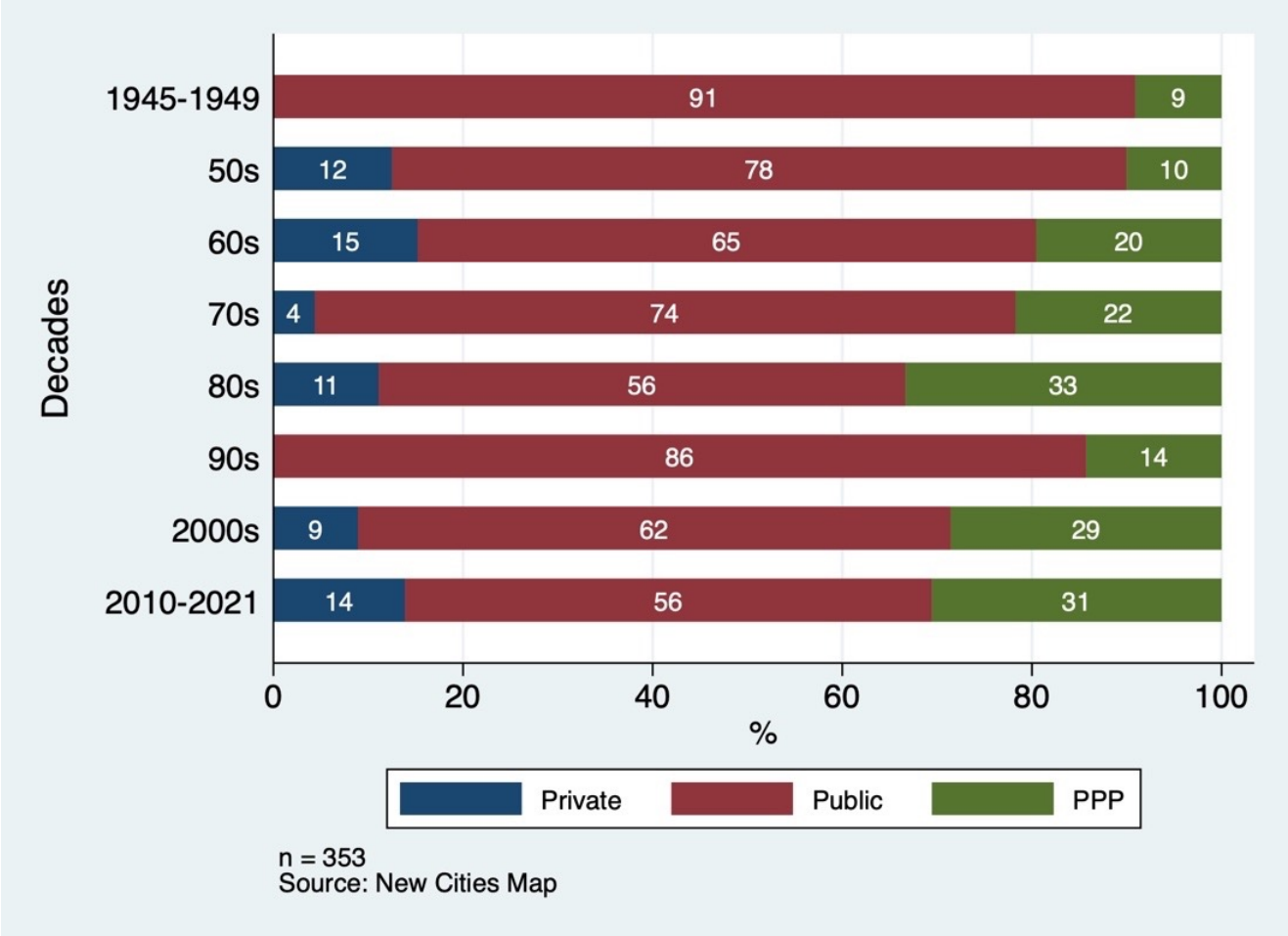
We also looked at how well projected population aligned with reality. Asian and South American projects appear to have exceeded their planned populations by the most. The average Asian project has a current population 240% higher than planned, and South America has a current population 320% higher than planned. In contrast, both Sub-Saharan Africa and MENA have average city populations less than planned by developers. While these trends may reflect predictive accuracy and developer optimism, especially given the political motivations of many new cities, it more likely correlates with project age. Both Sub-Saharan Africa and MENA for example, have the youngest city projects. As such, their average city may not have existed long enough to have reached its planned capacity. On the other hand, the exceptional population growth of Asia's cities runs counter to critiques of premature urbanization and concerns over ghost cities. Rather, this analysis suggests that with sufficient time, many new cities will likely fil in with residents (Shepard, 2015; Brautigam, 2014).

Figure 4: Percent population change between planned and current population by region



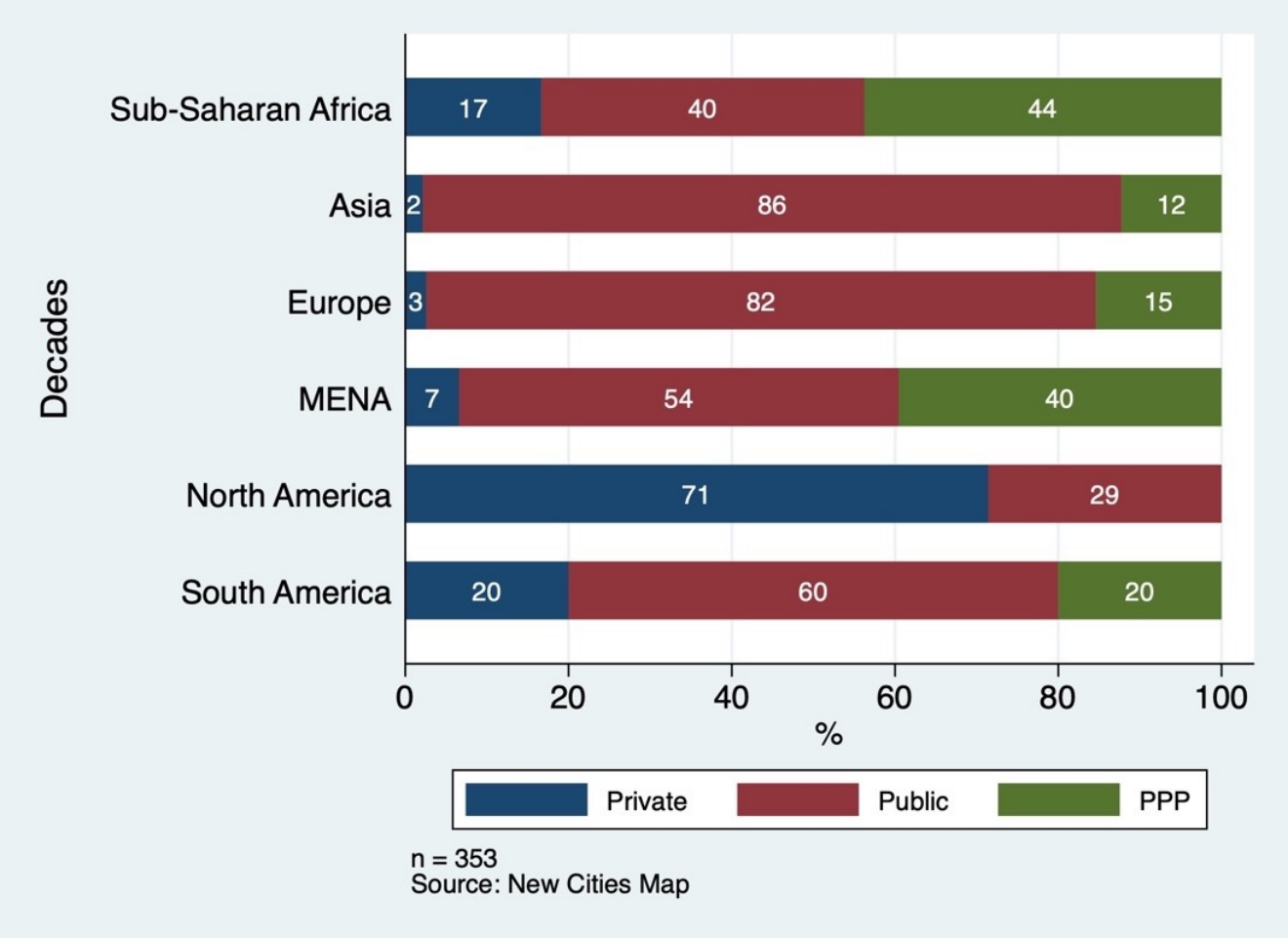
New cities are also developed using various contractual arrangements. Breaking it down by private, public, and private-public partnerships (PPP), we see some growth in the use of PPPs over time. In the 40s and 50s, only around 10% of projects utilized PPPs. By the 21st century, this number grew to around 30% of projects. Using a bivariate linear probability model (LPM), we find a statistically significant growth in PPP projects by 2.8% per decade. This growth likely replaced public projects, which saw a declined of 3.2% per decade since 1945. The share of private new cities projects however, remained constant.

Figure 5: Project type by decade



The Americas and Europe are the least reliant on PPPs, with most countries preferring to implement public projects. However, North America has a strong preference for private-led projects. Over 70% of their projects are private, and in the United States, every project since 1945 has been private. We also found a statistical correlation between Global South status and an aversion to private projects. Global South countries were 10.8% less likely to structure new cities as fully private projects than the North. There was no difference in public and PPP projects, however.

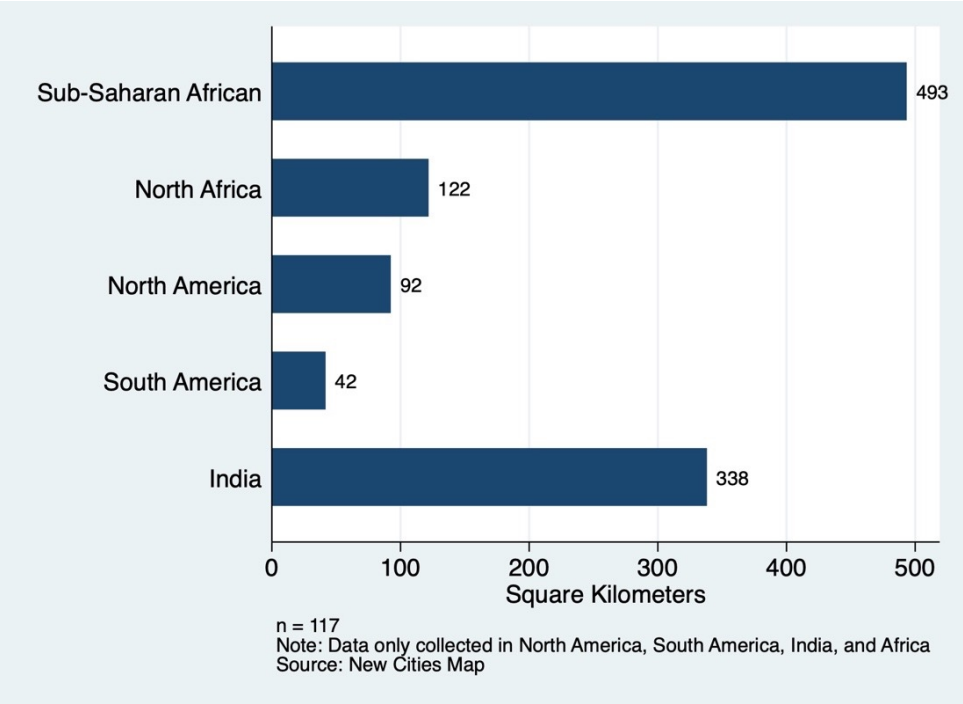
Figure 6: Project type by region



Although the full scope of data was not collected in every region, we can still derive some insights from a limited analysis. Looking at just the Americas, India, Sub-Saharan Africa, and North Africa (the regions with complete general and program data), we find that the median new city since 1945 was planned for 51.11 square kilometers (roughly half the size of San Francisco). The largest city in the NCM is Ramciel, the proposed new capital of South Sudan. Spanning 19,000 square kilometers, it would be three times the size of present-day Shanghai. However, while shocking, it is worth noting that Ramciel is envisioned as both a new city and a national territory, and its planners may have included surrounding unurbanized land as part of the city's boundaries.

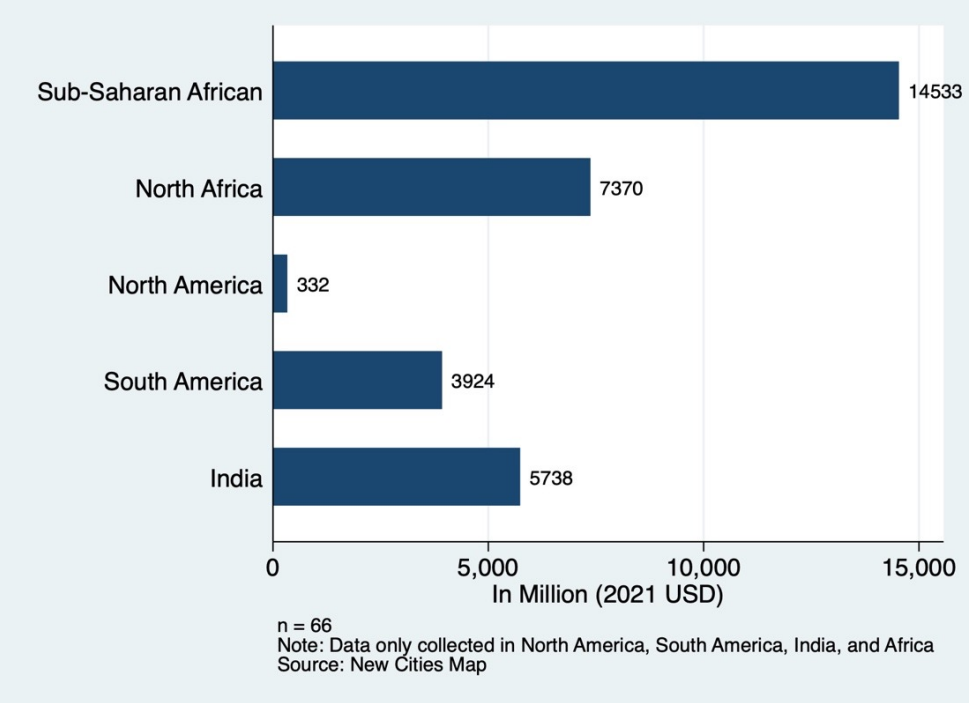
However, even if we exclude Ramciel, Sub-Saharan Africa still has some of the most ambitious projects by size. The average new city announced in the region was 433 square kilometers. In contrast, South America's average new city project was only 42 square kilometers.

Figure 7: Planned area by region



Africa also has some of the most expensive new cities projects. The average Sub-Saharan African new city costs or is expected to cost around $14.5 billion to build (2021 USD).

Figure 8: Initial budget by region



5. Discussion and Conclusion

The scale and prominence of the ongoing new cities wave deserves scholarly attention. Yet, there remains a lack of academic research and publicly available resources on the topic. The NCM addresses the gap by providing a novel and expansive database of contemporary (1945 to 2021) new cities projects across the world. The NCM is designed as a quantitative tool to enable high-quality social science research methods. In addition to simply counting the new cities wave, we also catalogued detailed characteristics on project location, management, finances, and governance. Admittedly, the NCM faces certain limitations. The database only includes "present-day" information for each city, which means researchers will need to rely on technical methods to control for time and age-specific confounders when comparing projects and deriving causal relationships. Likewise, the database will become less useful the further away we get from its launch. The most glaring limitation, however, is the NCM's incomplete state. Currently, it lacks data in the Middle East, Europe, and Asia.

Despite these issues, the data has great potential to inform the new cities literature. In just this paper, we have been able to offer a more definitive count of new cities and their geographic distribution. We have also been able to validate and refute casual observations in the literature. For instance, while the data does corroborate theoretical discussions highlighting the excessive privatization of recent new cities, it also suggests that "white elephant" critiques are incorrect. Even with incomplete data, the NCM is still the most comprehensive database on new cities currently available.

The database richness allows it to inform more nuanced and in-depth research questions. For instance, the extensive roster of governance information enables researchers to better understand how governance and political decentralization affects a new city's success. Such research would help policymakers design the administrative structures of new projects. The management variables, which includes information on contractual arrangements, can be used to answer questions around public-private cooperation, coordination constraints, and social equality. For example, does involving for-profit mechanisms in expansive residential projects motivate exclusionary design? This outcome is strongly theorized, but corroborating evidence is largely qualitative. While there is already general research comparing public, private, and public-private infrastructure development (e.g., Grimsey & Lewis, 2002; Engel et al, 2020; Peterson, 2019), none specifically tackle new cities developments.

Another promising contribution of the NCM will come from merging it with other sources of data. The cities in the NCM are geolocated with GPS information, which can facilitate rigorous spatial analysis. As previously discussed, spatial boundary analysis is a staple of SEZ and place-based policy research. Researchers can use the NCM in conjunction with supplementary geocoded economic and social datasets to estimate the impact of new cities on policy outcomes. The NCM may also be merged with political datasets, such as the V-Dem dataset on democracy, to investigate the political motivators of new cities construction. These forms of research were not previously feasible.

Likewise, the NCM lays the groundwork for a more technical new cities research agenda. Provided additional resources, the current database can be expanded into various avenues to generate a better picture of the phenomenon. For instance, the database could incorporate more detailed information on projects than already included. The metadata included in the NCM already identifies key documentations that can be further coded. The NCM can also be reworked into a time-series database that tracks cities over time.

The NCM is open-source, publicly available, and free. There are no plans to monetize it. Our hope was to develop a resource that is both useful and transparent, even if the endeavor presented inherent barriers that were difficult to overcome. New cities are an incredibly important and consequential policy intervention that has flown under the radar of many experts. While their developments are often tied to controversy, the inescapable reality is that new cities are being built. There are no signs that the new cities wave will slow down, and if anything, the trend appears to be accelerating. This creates a responsibility for researchers and policymakers to be more involved in understanding these projects and directing them with informed policies that will benefit humanity.

References

Abbott, Frank Frost (1915). "The Colonizing Policy of the Romans From 123 to 31 BC." *Classical Philology* 10(4): 365-380. **https://www.jstor.org/stable/261627**.

Abubakar, Ismaila R. Doan, Petra L (2010). "New Towns in Africa: Modernity and/or Decentralization?." Presented at the 53rd African Studies Association AnnualMeetings, San Francisco. **https://www.researchgate.net/publication/259647235_New_towns_in_Africa_Modernity_andor_Decentralization**.

Alkon, Meir (2018). "Do Special Economic Zones Induce Developmental Spillovers? Evidence From India's States." *World Development* 107: 396-409. **https://doi.org/10.1016/j.worlddev.2018.02.028**.

Bhan, Gautam (2014). "The Real Lives of Urban Fantasies." *Environment & Urbanization* 26(1): 232-235. **https://doi.org/10.1177/09562478135143**.

Bissell, William Cunningham (2011). *Urban Design, Chaos, and Colonial Power in Zanzibar*. Bloomington, IN: Indiana University Press.

Brautigam, Deborah (2014). "Chinese-Built Angolan 'Ghost Town' Wakes Up?." *China in Africa: The Real Story*. **http://www.chinaafricarealstory.com/2014/04/chinese-built-angolan-ghost-town-wakes.html**.

Brussevich, Mariya (2020). "Socio-Economic Spillovers from Special Economic Zones: Evidence from Cambodia." *IMF Working Paper* 20/170. **https://www.imf.org/en/Publications/WP/Issues/2020/08/21/Socio-Economic-Spillovers-from-Special-Economic-Zones-Evidence-from-Cambodia-49679**.

Cain, Allan (2014). "African Urban Fantasies: Past Lessons and Emerging Realities." *Environment & Urbanization* 26(2): 561-567. **https://doi.org/10.1177/0956247814526544**.

CCI (Charter Cities Institute) (2023). *New Cities Map* [August 4, 2023] [Database]. Charter Cities Institute. **www.newcitiesmap.com**.

Chakravarty, Surajit. Bin Mansoor, Mohammad S. Kumar, Bibek. Seetharaman, Priya (2022). "Challenges of Consultant-led Planning in India's Smart Cities Mission." *Environment and Planning B: Urban Analytics and City Science* 50(5). **https://doi.org/10.1177/23998083221137**.

Datta, Ayona (2015). "New Urban Utopias of Postcolonial India: 'Entrepreneurial Urbanization' in Dholera Smart City, Gujarat." *Dialogues in Human Geography* 5(1): 3-22. **https://journals.sagepub.com/doi/10.1177/2043820614565748**.

Deloitte (2018). *Building the smart city* [Brochure]. Deloitte.

Engel, Eduardo. Fischer, Ronald D. Galetovic, Alexander (2014). *The Economics of Public-Private Partnerships: A Basic Guide*. Cambridge: Cambridge University Press.

Engel, Eduardo. Fischer, Ronald D. Galetovic, Alexander (2020). "When and How to Use Public-Private Partnerships in Infrastructure: Lessons From the International Experience." *NBER Working Paper* 26766. **https://www.nber.org/papers/w26766**.

Fraser, Valerie (1990). *The Architecture of Conquest: Building in the Viceroyalty of Peru 1535–1635*. Cambridge: Cambridge University Press.

Frick, Susanne A. Rodriguez-Pose, Andres. Wong, Michael D. (2019). "Toward Economically Dynamic Special Economic Zones in Emerging Countries." *Economic Geography* 95(1): 30-64. **https://doi.org/10.1080/00130095.2018.1467732**.

Goldman, Michael (2011). "Speculative Urbanism and the Making of the Next World City." *International Journal of Urban and Regional Research* 35(3): 555–581. **https://onlinelibrary.wiley.com/doi/10.1111/j.1468-**

2427.2010.01001.x.
Grimsey, Darrin. Lewis, Mervyn K. (2002). "Evaluating the Risks of Public Private Partnerships for Infrastructure Projects." *International Journal of Public Management* 20(2): 107-118. **https://doi.org/10.1016/S0263-7863(00)00040-5**.
Hammond, N. G. L (1998). "Alexander's Newly-founded Cities." *Greek, Roman, and Byzantine Studies* 39: 243-269.
Hardy, Dennis (1991). *From Garden Cities to New Towns: Campaigning for town and country planning*, 1899-1846. New York: Chapman & Hall.
Higgins, James (1991). "Review: Empire-Building in South America." *Oxford Art Journal* 14(2): 108-111. : **https://www.jstor.org/stable/1360530**.
Home, Robert (1996). *Of Planting and Planning: The Making of British Colonial Cities*. Oxfordshire: Routledge.
Howard, Ebenezer (1902/1965). *Garden Cities of To-Morrow*. Cambridge, MA: MIT Press.
Hurley, John. Morris, Scott. Portellance, Gailyn (2018). "Examining the Debt Implications of the Belt and Road Initiative from a Policy Perspective." *Center for Global Development Policy Paper* 21. **https://www.cgdev.org/sites/default/files/examining-debt-implications-belt-and-road-initiative-policy-perspective.pdf**.
INTI (International New Towns Initiative) (2023). *Database* [August 4, 2023] [Database]. International New Towns Initiative. **http://www.newtowninstitute.org/newtowndata/**.
Jo, Angie. Zheng, Siqi (2020). "New Planned Cities as Economic Engines. Global Trends and Our Conceptual Framework." in *Toward Urban Economic Vibrancy: Patterns and Practices in Asia's New Cities*. Edited by Siqi Zheng and Zhengzhen Tan. Cambridge, MA: MIT Press.
Jo, Heeyoung Angie (2018). "Coordination vs Control: Planning New Cities as New Economic Engines in China." *MIT Unpublished Manuscript*. **https://dspace.mit.edu/bitstream/handle/1721.1/123961/1140447488-MIT.pdf?sequence=1&isAllowed=y**.
Kashima, Akihiro (2016). "Determining Factors for the Urban Form and Its Orientation in Spanish Colonial Town Planning: Planning the Town of Guatemala in the 18th Century." In *International Planning History Society Proceedings*, 17th IPHS Conference, History-Urbanism-Resilience, TU Delft 17-21 July 2016, V.01 p.235, TU Delft Open. **http://dx.doi.org/10.7480/iphs.2016.1.1218**.
Keeton, Rachel. Provoost, Michelle (2019a). *To Build a City in Africa: A History and* Manual. Rotterdam: nai010.
Keeton, Rachel. Provoost, Michelle (2019b). "To Build a City in Africa." In *To Build a City in Africa: A History and Manual*. Edited by Rachel Keeton and Michelle Provoost. Rotterdam: nai010.
Krishnan, Murali (2023). "India's Smart Cities Project Hounded by Delays." *Deutsche Welle*. **https://www.dw.com/en/indias-smart-cities-project-hounded-by-delays/a-66355352**.
Ladner, Andreas. Keuffer, Nicolas (2021). "Creating an Index of Local Autonomy - Theoretical, Conceptual, and Empirical Issues." *Regional & Federal Studies* 31(2): 209-234. **https://doi.org/10.1080/13597566.2018.1464443**.
Ladner, Andreas. Keuffer, Nicolas. Baldersheim, Herald (2015). *Local Autonomy Index for European countries* (1990-2014). Release 1.0. Brussels: European Commission.
Lemoine, Rene Martinez (2003). "The Classical Model of the Spanish-American Colonial City." *The Journal of Architecture* 8(3): 355-368. **https://doi.org/10.1080/1360236032000134844**.
Li, Yue. Rama, Martin (2023). *Private Cities: Outstanding Examples from Developing Countries and Their Implications for Urban Policy*. Urban Development Series. Washington, DC: World Bank.
Mahmoud, Ayman Hassaan Ahmed. El-Sayed, Marwa Adel (2011). "Development of Sustainable Urban Green

Areas in Egyptian New Cities: The Case of El-Sadat City." *Landscape and Urban Planning* 101(2): 157-170. **https://doi.org/10.1016/j.landurbplan.2011.02.008**.

Michaels, Guy. Nigmatulina, Dzhamilya. Rauch, Ferdinand. Regan, Tanner. Baruah, Neeraj. Dahlstrand, Amanda (2021). "Planning Ahead for Better Neighborhoods: Long-Run Evidence from Tanzania." *Journal of Political Economy* 129(7): 2112-2156. **https://www.journals.uchicago.edu/doi/10.1086/714119**.

Milton, Ash (2018). "Why Charter Cities Won't Lead to Decentralized Government." *Palladium Magazine*. **https://palladiummag.com/2018/10/08/why-charter-cities-wont-lead-to-decentralized-government**

Moser, Sarah (2015). "New Cities: Old Wine in New Bottles?" *Dialogues in Human Geography* 5(1): 31-35. **https://doi.org/10.1177/2043820614565867**.

Moser, Sarah (2019). "Forest City, Malaysia, and Chinese Expansionism." *Urban Geography* 39(6): 935-943. **https://doi.org/10.1080/02723638.2017.1405691**.

Moser, Sarah (2020). "New Cities: Engineered Social Exclusion." One Earth 2. **https://doi.org/10.1016/j.oneear.2020.01.012**.

Moser, Sarah. Cote-Roy, Laurence (2020). "New Cities: Power, Profit, and Prestige." *Geography Compass* 15(1): 1-15. **https://doi.org/10.1111/gec3.12549**.

Moser, Sarah. Cote-Roy, Laurence. Korah, Prosper Issahaku (2021). "The Uncharted Foreign Actors, Investments, and Urban Models in African New City Building." *Urban Geography*. **https://doi.org/10.1080/02723638.2021.1916698**.

Moser, Sarah. Swain, Marian. Alkhabbaz, Mohammed H. (2015). "King Abdullah Economic City: Engineering Saudi Arabia's Post-Oil Future." *Cities* 45: 71-80. **https://doi.org/10.1016/j.cities.2015.03.001**.

Mundigo, Axel I. Crouch, Dora P. (1977). "The City Planning Ordinances of the Laws of the Indies Revisited. Part I: Their Philosophy and Implications." *The Town Planning Review* 48(3): 247-260. **https://www.jstor.org/stable/40103542**.

Neumark, David. Simpson, Helen (2015). "Do Place-Based Policies Matter?" *Handbook of Regional and Urban Economics* 5: 1197-1287. **https://doi.org/10.1016/B978-0-444-59531-7.00018-1**.

Njoh, Ambe J. (2007). "Colonial Philosophies, Urban Space, and Racial Segregation in British and French Colonial Africa." *Journal of Black Studies* 38(4). **https://doi.org/10.1177/0021934706288**.

OECD/SWAC (2020). *Africa's Urbanisation Dynamics 2020: Africapolis*, Mapping a New Urban Geography. Paris: West African Studies, OECD Publishing. **https://doi.org/10.1787/b6bccb81-en**.

Ondrusek-Roy, Joanna (2020). "'Tunajenga Taifa Letu' (We are Building Our Nation): The Emergence and Evolution of New City Building in Post-Socialist Tanzania." *McGill University Unpublished Manuscript*. **https://escholarship.mcgill.ca/concern/theses/qv33s2066**.

Peiser, Richard. Forsyth, Ann (2021). *New Towns Database Without Sources*]August 4, 2023] [Database]. New Towns Initiative, Harvard Graduate School of Design. **https://docs.google.com/spreadsheets/d/11VPxuhA-Z182MCSVC3slDgMHUNC-zZE6d6ih4IVkng0/edit#gid=160203357**.

Peters, Adele (2015). "In Africa, Chinese Developers Are Building A Mini-China." *Fast Company*. **https://www.fastcompany.com/3050167/in-africa-chinese-developers-are-building-a-mini-china**.

Peterson, Ole Helby (2019). "Evaluating the Costs, Quality, and Value for Money of Infrastructure Public-Private Partnerships: A Systemic Literature Review." *Annals of Public and Cooperative Economics* 90(2): 227-244. **https://doi.org/10.1111/apce.12243**.

Pieterse, Edgar (2019). "Debunking Myths about African Urbanisation." *In To Build a City in Africa: A History and Manual*. Edited by Rachel Keeton and Michelle Provoost. Rotterdam: nai010.

Post, Alison E. (2018). "Cities and Politics in the Developing World." Annual Review of Political Science 21: 115-133. **https://doi.org/10.1146/annurev-polisci-042716-102405**.

Rodriguez-Lora, Juan-Andres. Rosado, Ana. Navas-Carrillo, Daniel." Le Corbusier's Urban Planning as a Cultural Legacy. An Approach to the Case of Chandigarh. *Designs* 5(3): 44. **https://doi.org/10.3390/designs5030044**.

Shepard, Wade (2015). *Ghost Cities of China: The Story of Cities without People in the World's Most Populated Country*. London: Zed Books.

Shepard, Ward (2015). "The Myth of China's Ghost Cities." *Reuters*. **https://www.reuters.com/article/idUS170445800220150422**. `

Shepard, Wade (2016). "Khorgos: Why Kazakhstan Is Building A "New Dubai" On The Chinese Border." *Forbes*. **https://www.forbes.com/sites/wadeshepard/2016/02/28/will-a-place-called-khorgos-become-the-next-dubai/?sh=2f038036f4b7**.

Shepard, Wade (2017). "Why Hundreds of Completely New Cities Are Being Built Around The World." *Forbes*. **https://www.forbes.com/sites/wadeshepard/2017/12/12/why-hundreds-of-completely-new-cities-are-being-built-around-the-world/?sh=7cf3aa4414bf**.

Squazzin, Antony (2023). "Temasek Subsidiary May Back $150 Billion Plan to Build 123 New Cities in Africa." *Bloomberg*. **https://www.bloomberg.com/news/articles/2023-06-08/temasek-african-union-take-interest-in-plan-for-123-new-cities#xj4y7vzkg**.

Stanislawski, Dan (1947). "Early Spanish Town Planning in the New World." *Geographical Review* 31(1): 94-105. **https://www.jstor.org/stable/211364**.

Stavros, Matthew (2014). *Kyoto: An Urban History of Japan's Premodern Capital*. Honolulu: University of Hawaii Press.

Su, Xing (2023). "Building New Cities in the Global South: Neoliberal Planning and Its Adverse Consequences." *Urban Governance* 3(1): 67-75. **https://doi.org/10.1016/j.ugj.2022.11.002**.

Tanaka, Adam. Forsyth, Ann (2021). "Appendix 2." In New Towns for the 21st Century: *A Guide to Planned Communities Worldwide*. Edited by Richard Peiser and Ann Forsyth. Philadelphia, PA: University of Pennsylvania Press.

Vale, Lawrence (2008). *Architecture, Power, and National Identity*. London: Routledge.

Van Noorloos, Femke. Kloosterboer, Marjan (2017). "Africa's New Cities: The Contested Future of Urbanisation." *Urban Studies* 55(6): 1223-1241.

Watson, Vanessa (2009). "'The Planned City Sweeps the Poor Away…': Urban Planning and 21st Century Urbanization." *Progress in Planning* 72(3): 151-193. **https://doi.org/10.1016/j.progress.2009.06.002**.

Wakeman, Rosemary (2016). *Practicing Utopia: An intellectual History of the New Town Movement*. Chicago, IL: University of Chicago Press.

Watson, Vanessa (2013). "African Urban Fantasies: Dreams or Nightmares?" *Environment & Urbanization* 26(1): 215-231. **https://doi.org/10.1177/0956247813513705**.

Wang, Jin (2013). "The Economic Impact of Special Economic Zones: Evidence from Chinese Municipalities." *Journal of Development Economics* 101: 133–47. **https://doi.org/10.1016/j.jdeveco.2012.10.009**.

World Bank (2019). *Belt and Road Economics: Opportunities and Risks of Transport Corridors*. Washington, DC: World Bank.

Xu, Bogian (2021). "China's New Towns in Controversy: A Literature Review." *Journal of Planning Literature* 37(2). **https://doi.org/10.1177/08854122211051614**.

Yeo, Cedric A (1959). "The Founding and Function of Roman Colonies." *The Classical World* 52(4): 104-107 + 129-130. **https://www.jstor.org/stable/4344123**.

A1 Annex I: Special Rules and Exemptions to the Inclusion Criteria

During data collection, we encountered unusual cities that required us to create special inclusion criteria rules and exemptions. We list these here to be transparent about our choices.

Included in the NCM

- Cities with a master plan, even if the master plan was not strictly followed. Master plans are very rarely adhered to, but they still signal an intention to create new master planned cities.
- Cities with a master plan that is short or "only on paper." It is less important that cities followed a plan than that they were perceived as "master planned" entities.
- Cities that are still in planning stages. We collected what data we could and coded these cases as "speculative cities."
- Cities that were master planned, but later combined with another city.

Excluded from the NCM

- New cities that rebuilt a "recently" destroyed city (e.g., a city burns down, so a new master plan is drafted to rebuild it).
- Chinese prefecture-level cities. Although they are called "cities," they are more analogous to states and provinces in other countries. Shenzhen is a prefecture-level city and was excluded from the NCM.
- Cities that were initially master planned, but then shifted into organic growth before any top-down coordination occurred. Although new cities did not need to adhere to their master plan to be included, they still needed to have maintained a master plan. We excluded cities that completely scrapped their master plans before any implementation.

Special Notes

- Some cities were built on top of pre-existing smaller cities as large-scale redevelopment projects. While we may consider most forms of redevelopment as organic urban growth, we believe there is a type of redevelopment that is substantial enough to fit within the "new cities" trend. This includes megaprojects that pair an extensive city-scale master plan with a philosophical vision to establish a "city." A quintessential case is Shenzhen, China, which was "built" on top of an urban area with over 300,000 existing residents. Another example is Amman, Jordan. Although Amman has existed since the 13th century BCE, its 1987 master planned redevelopment felt substantial enough to count as a new city. These cases are hard to differentiate, so we relied on both interpreting the scale of the project and its intention as stated by the developers. However, we did not include redevelopments that were intended to "rebuild" a destroyed city (e.g., post-war Berlin and Tokyo are not "new cities").

- It is also worth noting that true greenfield developments are rare. For example, although Nairobi was claimed to have been built on "uninhabited" swamp land in 1899, that land was in fact the grazing territory of the pastoralist Maasai people. Just because land may not have physical houses does not mean it is uninhabited. We included the new towns of Singapore and Hong Kong. Although these two countries are often treated as city-states, they each underwent significant waves of new towns construction. Many of their "towns" meet our inclusion criteria, including the 100,000-population threshold, so they may be better described as cities.

A2 Annex II: Variable Codebook

We collected three kinds of variables:

1. General Information: general information of the city, including its name and geographic location.
2. Program Details: information on the city's management, construction, and master plan.
3. Governance: information on the city's governance structure, such as its administrative organization and policy making powers.

Unless otherwise stated, we looked for the most recently available information on each city. The NCM is intended to be a present-day snapshot of the new cities wave. It is not a time-series database or a continuously updated tracker of new cities projects. The specific dates and sources used for each variable can be found in the metadata spreadsheet.

Coding Notes:

<blank> = we could not find information on this variable for this city.
NC = we did not collect information on this variable for this city.

1. General Information

Variable	Variable Name	Description	Responses
cityid	City ID	City ID number.	[numeric]
name	City Name	City name.	[text]
province	Province	Province or sub-national location.	[text]
country	Country	Country location.	[text]
region	Region	Regional location.	Africa Asia Europe North America South America
sister	Sister City	Sister city or twin town of the city.	[text]

lat	Latitude	When possible, we used the coordinates of the city hall or another official administrative building that is centrally located in the city. For cities undeveloped or still undergoing development, we used the master plan to best approximate the center of the development site.	[latitude]
long	Longitude	When possible, we used the coordinates of the city hall or another official administrative building that is centrally located in the city. For cities undeveloped or still undergoing development, we used the master plan to best approximate the center of the development site.	[longitude]

Inclusion Criteria

Variable	Variable Name	Description	Responses
A	Inclusion Criterion A: Time Frame	The city meets Inclusion Criterion A: Time Frame.	No Yes
B	Inclusion Criterion B: Vision	The city meets Inclusion Criterion B: Vision.	No Yes
C	Inclusion Criterion C: Population	The city meets Inclusion Criterion C: Population	No Yes
D	Inclusion Criterion D: School	The city meets Inclusion Criterion D: School	No Yes

E	Inclusion Criterion E: Master Planned	The city meets Inclusion Criterion E: Master Planned	No Yes
F	Inclusion Criterion F: Governance	The city meets Inclusion Criterion F: Governance	No Yes

2. Project Details

Variable	Variable Name	Description	Responses
website	Website	Official website for the project. For most cities, this links to the municipal government's website. For newer cities, this may link to the developer's website for that project.	[website]
date_announce	Announcement Date	Date that the project was first publicly announced.	[date]
date_construction_start	Construction Start Date	Date that construction started. Construction is defined as physical work on the site beyond initial planning.	[date]
date_construction_end	Construction End Date	Date construction ended or is expected to end. Many completed cities do not have an official construction end date. For cities undeveloped or undergoing development, we looked for an expected construction end date.	[date]

planner	Master Planner	Self-identified name of the master planner. The master planner is the organization that created the master plan for the city.	[text]
planner_type	Master Planner Entity Type	Whether the master planning entity is fully private (private), fully public (public), or a public-private partnership.	Private Public Public-Private Partnership
management	Management Company	Self-identified name of the management company. Some (but not all) projects have a management company/operator which manages the day to day operations. Fully privatized cities are more likely to have a management company.	[text]
area_planned	Planned Area	Total planned area of the city according to the master plan. Units: square kilometers.	[numeric]
pop_plan	Planned Population Capacity	Total resident population that the master plan planned for the city.	[numeric]
pop_curr	Current Population	Total population of the city.	[numeric]
pop_curr_year	Current Population (Year)	Year of current population data. We used the most recent year with reliable population data.	[numeric]

budget_initial_lcu	Initial Budget	Planned construction budget for the city. In most cases, it was not clear what is included in the initial budget (e.g., construction cost, future operational costs, etc).	[numeric]
budget_initial_curr	Initial Budget (Currency)	Currency of initial budget.	[currency]
budget_initial_year	Initial Budget (Year)	Year in which the initial budget was set.	[year]
budget_initial_usd	Initial Budget (2021 USD)	Initial budget in 2021 USD.	[numeric]
budget_op_lcu	Operational Budget	Annual operational budget for a city in the latest available year. For completed cities, we used figures from the latest available municipal budget. Cities undeveloped or undergoing development tended not to have an operational budget available.	[numeric]
budget_op_curr	Operational Budget (Currency)	Currency of operational budget.	[currency]
budget_op_year	Operational Budget (Year)	Year in which the operational budget was set.	[year]
budget_op_usd	Operational Budget (2021 USD)	Operational budget in 2021 USD.	[numeric]
master_plan	Master Plan	First master plan of the city.	[website]
guiding_principles	Guiding Principles	Subjective assessment of the guiding principles based on the city's about page and self-documentation.	[text]

city_focus	City Focus	City's focus according to the master plan. Administrative City: A city that serves as a political and decision making center for the national, provincial, or local government. Eco City: A city focused on ecological sustainability. Industrial City: A city focused on the production and commercialization of goods and services, usually of a specific sector. Smart City: A city with a mission to integrate modern technology and digital solutions to its services, functions, and economic development. Residential City: A city focused on providing residential accommodations for the labor force of nearby industrial activity (e.g. mining towns). Resort City: A city focused on tourism. Port City: A coastal city focused on the import and export of goods. Satellite City: A city planned within the natural growth pattern of another major city. General City: A city without a specific focus.	Administrative City Eco City Industrial City Smart City Residential City Resort City Port City Satellite City General City

city_status	Development Status	Status of the city's development as of 2021. Active: Project is active and growing organically. Under Development: Construction is underway, and there may be residents living in the city. Early phases of the Master Plan. Speculative: City only exists on paper. Discontinued: City project has been abandoned.	Active Under Development Speculative Discontinued
city_site	Development Site	Type of site on which the city was planned to be built. Greenfield: Land not previously developed. Brownfield: Land formerly used for solely industrial purposes. The land typically has some level of environmental pollution. Former military base: Land previously used for military activities. Redevelopment: Major replacement, rehabilitation, or repurposing of an existing non-military developed site (e.g. a village expanded into a city by a master plan).	Greenfield Brownfield Former Military Base Redevelopment

eia	Environmental Impact Assessment (EIA)	Whether the developer conducted an Environmental Impact Assessment (EIA) for the new city project. Some countries require an EIA for all projects, but most do not.	No Yes
eia_link	EIA document.	Link to the EIA for the city. For some city projects, the documentation may reference an EIA even if it is not released publicly. Older cities usually do not have an EIA.	[website]
doc_other	Other Documents	Additional documents that may be useful.	[website]
sez_law	SEZ Framework	Name of the special economic zone legal framework, if applicable.	[text]
notes	Notes	Miscellaneous interesting information about the project.	[text]

3. Governance

Governance Structure

gov1	Initially planned as capital city	City intended to be a capital when initially planned.	No National capital Regional capital
gov2	Currently a capital city	City is currently a capital city.	No National capital Regional capital

gov3	Administrative entities	Administrative entity.	Mayor City Manager City Council Nationally Appointed Leader Private entity (e.g. CEO, board of directors, advisory committee, etc) Other
gov4	Other administrative entities	Specify other.	[text]

Policy Independence

Variable	Variable Name	Description	Responses
	Policy Administration	Policy Administration: Range of policies where the city government or lower is effectively involved in the delivery of the services (be it through their own financial resources and/or through their own staff). For each policy, choose the level of responsibility the city government has over it. Note: If a policy is fully privatized or administered by an entity lower than the city government (e.g. NGO, local governance board, etc), interpret it as city-run (=1). We want to know whether the cities are involved in the provision of these tasks and services. For instance, even if a higher-level government funds a program, the city government may still administer it using provided funds. We are not asking about their decision making ability in each function, which will be part of the next section. Just because a city has an office to administer these policies does not necessarily mean the city itself administers the policy. A higher-level government may simply have a local office. If policies are jointly administered with another city government (e.g. joint management of a shared bus system between two cities), but has no higher-level government involvement, interpret as city-run (=1).	(0) Minimal or no responsibility (0.5) Partial responsibility (joint administration or highly regulated administration) (1) Complete or nearly complete responsibility

admin1	Construction and/or maintenance of primary school buildings	Education: Extent to which the city government is responsible for the construction and/or maintenance of primary school buildings.	
admin2	Primary school teachers' employment, pay, and/or management	Education: Extent to which the city government is responsible for primary school teachers' employment, pay, and/or management.	
admin3	Administering at least one poverty alleviation programs	Social assistance: Extent to which the city government is responsible for administering at least one poverty alleviation program (e.g. cash transfer programs, social safety net, unemployment insurance, vocational training, etc).	
admin4	Construction and/or maintenance of clinics and health centers	Health: Extent to which the city government is responsible for the construction and/or maintenance of clinics and health centers (excludes hospitals).	
admin5	Doctors' employment, pay, and/or management	Health: Extent to which the city government is responsible for doctors' employment, pay, and/or management.	
admin6	Administering building permits	Land use: Extent to which the city government is responsible for administering building permits.	
admin7	Enforcing land zoning	Land use: Extent to which the city government is responsible for enforcing land zoning.	

admin8	Public transit	Public transit: Extent to which the city government is responsible for managing bus services.	
admin9	Police force management	Police: Extent to which the city government is responsible for employing, paying, and/or managing the police force. Includes traffic police and private security, if applicable.	
admin10	Business registration	Business registration: Extent to which the city government is responsible for offering city-level business licenses. Note: if the city only requires businesses to register at a higher governance level, then the city has no responsibility. If the city requires both city-level and higher-level registrations, then the city has partial responsibility. If the city only requires city-level registration, then the city has full responsibility.	
admin11	Electricity provider	Utilities: Extent to which the city government is responsible for delivering electricity to buildings (e.g. excludes street lighting).	
admin12	Water and/or waste management provider	Utilities: Extent to which the city government is responsible for delivering water and/or waste management.	

	Policy Decision Making	Policy Decision Making: the extent to which the city government or lower has real influence (decision making power) over these policies. For each policy, choose the level of influence the city government has over it. Note: If a policy is fully privatized or determined by an entity lower than the city government (e.g. NGO, local governance board, etc), interpret it as city-run (=1). In some cases, a higher-level government may threaten to withhold funds if a city government does not comply with their preferences or suggest policy guidance. In such cases, if the city still has a legal right to dictate the policy, then count that as city-run (=1). If policy is jointly decided with another city government, but has no higher-level government involvement, interpret as city-run (=1).	(0) Minimal or no decision making authority (0.5) Partial decision making authority (joint decision making or restricted decision making) (1) Full decision making authority
pol1	Number and/or location of primary schools	Education: Extent to which the city government can decide on the number and/or location of primary schools.	

pol2	Primary school curriculum	Education: Extent to which the city government can decide the primary school curriculum.	
pol3	At least one poverty alleviation programs	Social assistance: Extent to which the city government can decide the selection criteria for and/or the level of at least one poverty alleviation program (e.g. cash transfer programs, social safety net, unemployment insurance, vocational training, etc).	
pol4	Construction and/or maintenance of clinics and health centers	Health: Extent to which the city government can decide on the construction and/or maintenance of clinics and health centers (excludes hospitals).	
pol5	Public health policies	Health: Extent to which the city government can decide on public health policies.	
pol6	Building permit criteria	Land use: Extent to which the city government can decide on building permit criteria.	
pol7	Land zoning regulations	Land use: Extent to which the city government can decide on land zoning regulations.	
pol8	City bus services	Public transit: Extent to which the city government can decide city bus services.	
pol9	Public order services	Police: Extent to which the city government can decide on public order services.	

pol10	City-level business licensing requirements	Business registration: Extent to which the city government can decide on city-level business licensing requirements. Note: if the city does not require any city-level business registration, then the city has no decision making powers.	
pol11	Electricity regulations	Utilities: Extent to which the city government can decide on electricity regulations.	
pol12	Water and/or waste management regulations	Utilities: Extent to which the city government can decide on water and/or waste management regulations	

Financial Independence

Variable	Variable Name	Description	Responses
fin1	Fiscal Autonomy	Fiscal Autonomy: Extent to which the city government can independently tax its population.	(0) Cannot set base and rate of any tax (1) Sets base or rate of minor taxes (2) Sets rate of one major tax (personal income, corporate, value added, property, or sales tax) under restrictions stipulated by higher levels of government (3) Sets rate of one major tax (personal income, corporate, value added, property, or sales tax) with few or no restrictions

fin2	Financial Self-Reliance	Financial Self-Reliance: Proportion of city government revenues derived from own/local sources (taxes, fees, charges).	(0) Own sources yield less than 10% of total revenues (1) Own sources yield 10-25% (2) Own sources yield 25-50% (3) Own sources yield more than 50%
fin3	Borrowing Autonomy	Borrowing Autonomy: Extent to which the city government can issue municipal bonds. Restrictions: No general obligation bonds No short-term bonds or bonds to finance deficits No borrowing from foreign entities No borrowing above a debt ceiling Note: a higher-level government may not require approvals of municipal bonds, but may still require that the higher-level government check bond compliance to existing restrictions. In such cases, interpret it as not requiring higher-level government approval.	(0) Cannot issue bonds (1) May issue bonds under prior approval by higher-level governments and with one or more restriction A-D (2) May issue bonds under prior approval by higher-level governments, but without any restriction A-D (3) May issue bonds without any prior approval from higher-level governments and with one or more restriction A-D (4) May issue bonds without any prior approval from higher-level governments, but without any restriction A-D

Legal Independence

Variable	Variable Name	Description	Responses
leg1	The extent to which city government decide their own organization and governance system	Organizational Autonomy: Extent to which the city government is free to decide its own organization and governance system. Note: If the city is governed by a private entity, this constitutes the city government. For example, if the owning private corporation makes all governance decisions, then this city would be fully.	(0) City executives are appointed by higher-level authorities, and city authorities cannot determine core elements of their political systems (electoral districts, number of seats, electoral system, how members of the city council are selected) (1) City executives are at least partially selected by the municipal council, directly by residents, or by the private owners (2) City executives are fully selected by the residents, the council, or the private owners (or some combination thereof), but the municipality or private owners may not decide any elements of the political system (3) City executives are fully selected by the residents, the council, or the private owners (or some combination thereof), and the municipality or private owners may decide some elements of the political system

	Organizational Autonomy	Organizational Autonomy: Extent to which the city government is free to make decisions about its civil administration. Identify whether the city government is able to perform each act. In cases where authority is split between the city government and a higher-level government, identify whether the city government has any non-trivial decision making abilities. For the sake of the index, each power will count as only 0.5 points.	(0) Cannot perform this act (0.5) Can perform this act
leg2a	The extent to which city government is free to hire their own staff	Staff: Extent to which the city government is free to hire their own staff.	
leg2b	The extent to which city government is free to fix the salary of their employees	Salary: Extent to which the city government is free to fix the salary of their employees.	
leg2c	The extent to which city government is free to establish legal entities and municipal enterprises	Legal entities: Extent to which city government is free to establish legal entities and municipal enterprises.	

Legal Protection

Variable	Variable Name	Description	Responses
	Legal Protection	Legal Protection: Existence of constitutional or legal means for city government to assert city autonomy. Identify whether the city has the listed power.	(0) Does not possess access to the legal remedy (1) Does have access to the legal remedy
leg3a	Existence of constitutional clauses or other statutory regulations	Constitutional clauses or other statutory regulations (e.g. national law, statutory instrument, etc) protect and establish the city's self-governance.	
leg3b	City authorities have recourse to the judicial system to settle disputes with higher authorities	City authorities have recourse to the judicial system to settle disputes with higher authorities (e.g., through constitutional courts, administrative courts or tribunals, or ordinary courts). If the city has legal remedy for only some things, count as the city government has access to the legal remedy.	

Special Jurisdiction

Variable	Variable Name	Description	Responses
	Preferential Treatment	Preferential Treatment: Does the city or part of the city receive any special treatment or jurisdiction over policies traditionally handled by higher-level governments? For each function, choose the responsibility the city government has over it.	(0) The city or part of the city does not receive any special treatment or jurisdiction (1) The city or part of the city receives some special treatment or jurisdiction as determined by a higher-level government, but the city government does not have a say in the rules (2) The city or part of the city receives some special treatment or jurisdiction, and the city government has some say in the rules
pref1	Immigration	Immigration: city receives preferential treatment on foreign immigration, residency, and refugee rules.	
pref2	Customs	Customs: city receives preferential treatment on customs.	

pref3	City government can set a minimum wage	Labor Laws: the extent to which the city government can establish rules over the minimum wage.	(0) The city has no decision making power over the minimum wage, or the country does not have a minimum wage (1) The city can set a minimum wage, but it must not exceed a higher-level government's rate (2) The city can set the minimum wage, including setting a rate lower than a higher-level government

City Autonomy Index

cai	City Autonomy Index	The City Autonomy Index (CIA) is a constructed value measuring how much "local autonomy" a city has based on its administrative and policy making powers. For more details on the CAI, see Appendix: City Autonomy Index (CAI).	0 - 30.5

A3 Annex III: City Autonomy Index (CAI)

While it is self-evident why General Information and Program Details are included in the NCM, one may wonder why we also collected governance data. Most cities have the same powers outlined in national and regional regulations, so there was unlikely to be substantial within-country differences in governance. The motivation for collecting governance data stems from our and our institution's (Charter Cities Institute) interest in urban governance and special jurisdictions. The new cities wave also intersects with broader renewed interest in special jurisdictions and governance decentralization, especially in the Global South. In some cases, national governments are building new cities as part of a larger special economic zone regime (e.g. King Abdullah Economic City in Saudi Arabia). We collected governance data to answer personal research questions and support additional scholarship on the impact of urban governance on the economic and social outcomes of new cities.

The selected governance variables were inspired by the Local Autonomy Index (LAI), a local government coding scheme and dataset developed by Andreas Ladner, Nicolas Keuffer, and Herald Baldersheim (2015). The LAI is composed of a series of governance indicators that measure how much self-rule local governments have within a given country. In other words, it measures the level and quality of a country's decentralized governance. The initial release of the LAI focused on Western countries, especially members of the European Union. When we began the NCM, the LAI team was in the process of updating their methodology and expanding their dataset to select countries in the Global South.

While our City Autonomy Index (CAI) was directly inspired by the LAI, we made minor modifications to certain indicators. Some changes were made to better align with our research interests, and others were made to account for data scarcity in certain regions of the world. Our governance indicators were also collected at the city-level, so there may be some variation between cities in the same country. The LAI however, collected data on the country level by coding the national and subnational laws dictating urban governance in the country as a whole. They ignored variations rooted in special legislations and zones.

Comparing Components of LAI and CAI

	Institutional Depth (0-3)	N/A
	Policy Scope (0-4)	Policy Administration (0-4)
	Effective Political Discretion (0-4)	Policy Decision Making (0-4)
	Fiscal Autonomy (0-4)	Fiscal Autonomy (0-3)
	Financial Transfer System (0-3)	N/A
	Financial Self-Reliance (0-3)	Financial Self-Reliance (0-3)
	Borrowing Autonomy (0-3)	Borrowing Autonomy (0-4)

2 From Ladner, Keuffer, and Baldersheim (2015)

	Organizational Autonomy (0-4)	Legal Independence (0-4.5)
	Legal Protection (0-3)	Legal Protection (0-2)
	Administrative Supervision (0-3)	N/A
	Access (0-3)	N/A
	N/A	Special Jurisdiction (0-6)
Max	**37**	**30.5**

Constructing the CAI

The LAI aggregates its governance indicators into a single index value representing a country's level of decentralized governance (Ladner & Keuffer, 2021). Their aggregation approach has three steps. First, they collapse all the variables into 11 components. Next, they use weighted formulas to collapse these components into 7 dimensions. Last, they aggregate the 7 dimensions into a single value using another weighted formula. The various weights reflect the theoretical contributions of each component to self-rule.

For simplicity, we only performed the first step. We collapsed all the variables into 8 components using the simple weighting scheme outlined in the LAI methodology. The approach transforms components so that they have relatively similar value ranges. Afterwards, we aggregated the components with a simple linear summation. Conceptually, this means that we assume each of the components are of relatively equal importance to a city's self-rule. The exception is for the Special Jurisdiction component, which has a comparatively large maximum value. In our case, special jurisdiction designation is a unique determinant of new cities independence.

CAI Component Construction

Component	**Construction**	**Max**
Policy Administration	(admin1 + admin2 + admin3 + admin4 + admin5 + admin7 + admin7 + admin8 + admin9 + admin10 + admin11 + admin12)/3	4
Policy Decision making	(pol1 + pol2 + pol3 + pol4 + pol5 + pol6 + pol7 + pol8 + pol9 + pol10 + pol11 + pol12)/3	4
Fiscal Autonomy	fin1	3
Financial Self-Reliance	fin2	3
Borrowing Authority	fin3	4
Legal Independence	leg1 + leg2a + leg2b + leg2c	4.5
Legal Protection	leg3a + leg3b	2
Special Jurisdiction	pref1 + pref2 + pref3	6
	Total	**30.5**

CHARTERCITIESINSTITUTE.ORG

FOLLOW US