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The Influence of Big Tech on Spatial Planning and Policies in Bengaluru: A Study of a Global City

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Suhas Shiva Shankar

Abstract

The transformation of Bengaluru into a global technology hub, popularly known as the "Silicon Valley of India," is one of the best examples of how large-scale technology companies affect urban growth and spatial planning practices through their increasing power as urban actors. This dissertation examines the interrelationship between Big Tech and spatial planning in Bengaluru, focusing on the influence that the IT sector has exerted over urban policies and the developmental trajectory of the city. This study thus explores the critical question of the involvement of big technological firms in the metropolitan planning of Bengaluru.

With the help of mixed-methods approach, the research behind this dissertation used both qualitative and geospatial analysis methodologies into the three phases: an in-depth literature review, bringing together scholarship on regional advantage in Silicon Valley, the notion of speculative urbanism, and the idea that Big Tech companies operate as urban actors; the second phase involved data collection through maps and interviews; the third phase consisted in the visual representation (using GIS tools) and analysis of the spatial implications of Big Tech in Bengaluru.

The findings show that Big Tech's significant contribution to Bengaluru's urban economy has driven the prioritization of high-value urban projects such as IT parks, transportation corridors, and rapid urban transport infrastructure. Although these transformations have significantly enhanced Bengaluru's international standing and economic growth, they have simultaneously intensified spatial disparities, sidelined at-risk communities, and favored a corporate-oriented approach to urban governance. The research shows the ecological repercussions of unregulated urban development and highlights the need for redirecting urban strategies towards inclusive and sustainable urban planning. This dissertation thus contributes to the debate on urban governance and the socio-spatial implications of technology-driven urbanization.

Keywords: Big Tech, Bengaluru, spatial organization, global city, urban planning, sustainable development.

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0.1 Overview

0.1.1 Background

The rise of modern town planning as a practical profession coincided with the development of industrialization in Europe from the early 19th century. The rapid urbanization process led to problems such as inadequate housing, the spread of slums, poor living conditions, and public health hazards like plague, smallpox, typhus, and tuberculosis. These challenges gave way to the need for the municipal authorities of Europe to adapt organized methods in city growth management, hence developing the field of town planning and urban design. These disciplines have since contributed frameworks and models to address urban issues for more coherent, sustainable, and resilient development within cities. Visionaries like Ebenezer Howard, Ernst Burgess, Chauncy Harris, and Edward Ullman proposed several urban models: the Garden City, the Concentric Zone Model, the Multi-Nuclei Model, among others. Then came a few prominent architects like Le Corbusier with his "City of Tomorrow" and Frank Lloyd Wright with his "Broadacre City," trying to integrate open green spaces with systems of transportation and production. These foundational programs paved the way for advanced urban planning visions worldwide (Galleon and Eisen, 1963).

The evolution of urban planning in the second half of the 20th century was shaped again by industrialization, with post-World War II reconstruction, the rise of automobile culture, social movements, and the information technology era. With the massive use of automobiles during the 1950s and 1960s, for example, cities experienced serious urban sprawl, environmental degradation, and worsening traffic congestion. These changes encouraged urban planners to implement sustainable and community-focused approaches toward building pedestrian-friendly neighborhoods and expanding their public transit systems (Bocquet, 2023). Urban planning was also impacted by the social justice and environmental movements of the 1960s and 1970s. In particular, the movement for "New Urbanism" began promoting integrated development and walkable communities around this time (Czarnecki and Chodorowski, 2021).

In the late 20th century, another industrial shift took place, with computational

technologies and the Internet giving way to the information era. New urban planning paradigms arose with connectivity and information flows (Castells, 1996). On the other hand, globalization and technological advances made many large cities into world financial centers. In response, urban planners have progressively embraced interdisciplinary methodologies, integrating ideas such as smart cities and resilient development, to address the complexities introduced by globalization. In this context, Big Tech companies – large technology corporations like Google, Amazon and Uber – are the industrial players of the 21st century, shaping urban practices, policies and planning in cities across the world (Vinod Kumar & Dahiya, 2016).

However, much of the scholarship on this topic has focused on cities like London, Berlin, and San Francisco, neglecting Global South cities which also have made strong contributions to the global economy of technology. This is the case for Bengaluru, the setting of this study. As a global city, known for its IT industry and as India's "Silicon Valley" or "Silicon Plateau", Bengaluru's urban development trajectory has been shaped by the presence and the power of Big Techs. Therefore, this dissertation asks the following question: if urban planning as a discipline was shaped by the industrial changes of the early modern era, how do the new industries of the 21st century shape planning practices and decisions in a technology capital of the Global South?

0.1.2 Bengaluru as a tech capital

Bengaluru is a center for the country's technological and research center for defense with the help of already existing infrastructure of the industries and research center. This key event laid the foundation for Bengaluru's change into a worldwide center of software development and innovation, winning it the moniker of the Silicon Plateau and setting up its notoriety as a driving center of the program benefit industry. The industrialization of the Western world was, in various regards, predicated on the plunder of colonies as sources of raw materials. Colonizers methodically destroyed local manufacturing capacities, consigning colonies to being sources of raw materials. Nevertheless, amid this background of violence, certain regal territories like Mysuru (Mysore) sought a diverse direction. By developing a commonly useful relationship with the British, Mysuru (Mysore) was able to overcome the complexities of colonialism while charting its course toward industrialization. Mysore state's key organization

together with the British managed its certain preferences within the realm of mechanical improvement. Recognizing the significance of education and research as driving factors of mechanical advancement, Mysore set up Bengaluru as a center for learning and innovation. The city has risen as a hub for preparing engineers and specialists, preparing them with the abilities vital to impel Mysore's mechanical aspirations forward. This venture in human capital laid the basis for the region's development as a dynamic entrepreneurial environment, setting the organization for Bengaluru's momentous change within the decades to come. The concerted endeavors of Mysore to advance education and research in Bengaluru yielded critical profits, situating the city as a hotbed of innovation and business. The foundation of teaching and research centers pulled in skilled people from all over the nation, cultivating a culture of inventiveness and collaboration. Bengaluru's fame as a center of excellence, started to draw into consideration the worldwide arrangement, drawing intrigue from multinational draw into consideration the worldwide arrangement, drawing intrigue from multinational enterprises and venture capitalists alike. The seeds sown by Mysore in Bengaluru's entrepreneurial environment bore the fruits within the last-mentioned half of the 20th century, as the city developed as a worldwide pioneer within the field of innovation and computer program administration. The joining of ability, framework, and investment transformed Bengaluru (Bangalore) into the Silicon Plateau, a reference to its enabled status as a worldwide center of software development. Companies like Infosys, Wipro, and Tata Consultancy Services, rose to conspicuousness, spearheading India's rise as a major player in the global IT industry. Nowadays, Bengaluru stands as a confirmation of the transformative control of key planning and speculation in human capital. The city's journey from a regal province's economical and industrial center to a worldwide software service monster serves as a show for yearning for advancement in environments around the world. By cultivating a conducive environment for inventiveness, collaboration, and business, Bengaluru has carved out a permanent mark on the worldwide organization, reaffirming its status as a guide of development and advancement within the 21st century (Rawat, (n.d.); Sudhira et al., 2007).

0.1.3 Big Tech as urban players

Big Tech refers to the most prominent and powerful tech companies, including Google, Amazon, Facebook, and Apple, which hold extraordinary economic influence and social power. These corporations are now important urban actors due to their ability to shape urban environments, economies,

and social relations. Their presence in a place can mean more investment in infrastructure, housing, and community facilities but can also exacerbate problems like income inequality and housing affordability. For instance, cities like Silicon Valley and Bengaluru have experienced rapid growth due to the influx of technology companies, resulting in economic opportunities along with issues of urban sustainability and social equity (Brookings Institution, 2022).

To understand Big Tech's role as urban player, we must understand by the concept of Speculative urbanism refers to types of real estate development and urban planning driven more by speculative investment rather than by needs and sustainable practices of a community model based on priorities that favor short-term financial returns over long-term urban resilience and social equity. This has manifested in a stark rise in property values and the displacement of low-income residents in places like Silicon Valley. In a similar vein, the rapid development of technology parks and upscale residential enclaves in Bengaluru has led to marked socio-economic inequality across the city (BlueMagnet, 2024). Understanding these dynamics is critical in confronting the impact of Big Tech on urbanization and ensuring that benefits of technological development are equitably shared between all citizens of the urban landscape.

0.1.4 The significance of this study

Big Tech companies are having a huge impact on urban planning and policymaking; this factor is acutely felt in cities like Bengaluru. The economic contributions that big tech giants make, often through the medium of IFIs to the urban economy, have indirectly influenced the reforms in the frameworks and policies of urban planning to align with corporate interests. In Bengaluru, the "local" economy that sustains livelihoods for most residents is becoming a contrast with the "corporate" economy of the IT sector. Inequality in the access to land, infrastructure, and basic services for the local economy most often results in growth stimulated by corporate interests (Benjamin, 2000).

The so-called "mega projects" in Bengaluru predominantly cater to corporate interests, often undermining local economic endeavors. These initiatives tend to elevate land values, disrupt local livelihoods, and diminish the self-sufficiency of communities. This phenomenon is indicative of a wider pattern in which non-spatial planning entities, including technology corporations, exert significant influence

over spatial planning and policy formulation. Analyzing these dynamics proves beneficial for understanding the broader consequences of globalization and digitalization on urban development (Benjamin, 2000).

0.1.5 Research Questions

This dissertation aims at answering the following questions:

1. How do Big Tech companies influence the spatial planning and policy landscape of a global city like Bengaluru?

2. How are the economic effects of Big Techs specifically on policymaking and transport infrastructural development in the city of Bengaluru?

3. What are the implications of such corporate influence on the needs of local communities and the search for just urban development?

This research, through the analysis of spatial planning, seeks to trace policy changes at various levels of government in the complicated interaction of digital transformation with corporate goals and urban development within a digital-era framework.

0.2 Methodology

To answer my research questions, this dissertation is anchored to a mixed-methods framework, combining spatial and qualitative methodologies to provide a comprehensive understanding of the interrelation between technological players and urban planning in the city. The methodology is subdivided into three interconnected steps: a literature review, data collection and analysis, and visualization and synthesis. Each stage helps in the discovery of the mechanisms through which Big Tech has reshaped Bengaluru's urban fabric.

The research adopted a mixed-methods approach, merging qualitative

and quantitative viewpoints to achieve an encompassing analysis of Big Tech's impact on Bengaluru's spatial development. The three main phases through which the research has been carried out are: literature review, data collection, and the visualization and analytical synthesis of results.

Phase 1: Literature Review

The first step involved a comprehensive review of existing academic and policy literature to develop a theoretical and contextual framework for the research. This review focused on identifying key themes that would be important in understanding the dynamic interaction between Big Tech and urban planning in Bengaluru. Among the central themes examined were the role of Big Tech in shaping urban economies and infrastructure, the transformation of Bengaluru into the "Silicon Valley of India," and comparative insights from established global tech hubs like Silicon Valley. The review also analyzed theoretical perspectives on speculative urbanism and global city frameworks, contextualizing Bengaluru's development trajectory.

The literature review was done to place the study within the prevailing academic discourse and identify lacunae in understanding the role played by Big-tech firms in altering spatial planning in Bengaluru.

Phase 2: Data Collection

The following stage of the research involved collecting and analyzing primary and secondary data to find out the specific impacts that Big Tech has had on the spatial and socio-economic environment of Bengaluru. The sources of data for this stage were quite varied.

The data for literature review were sourced from academic journals, research papers, and theses that explored topics such as the role of Big Tech in urban governance, the information technology boom in Bengaluru, and the city's spatial restructuring. Secondary data were also extracted from official and institutional documents, including the Census of India and publications of the Bengaluru Development Authority (BDA) and other parastatal organizations. These sources provided critical insights into changes in land use, policies governing urban

growth, and demographic shifts. Additionally, I gathered data through interviews with experts in the field, including urban practitioners, researchers, academics, and key stakeholders in parastatal organizations in Bengaluru. These interviews aimed to get first-hand opinions on the influence of Big Tech on urban planning decisions, community engagements, and policy frameworks in the city. The knowledge acquired from these experts enriched the analysis by providing contextually relevant interpretations of issues such as gentrification, infrastructure pressure, and sustainable development initiatives.

Through these phases—literature review, data collection, and interviews with experts—the research attempts to build a varied picture of how Big Tech functions as an influential urban player within the evolving landscape of Bengaluru.

Phase 3: Visualization and analytical synthesis

The concluding phase of the methodology emphasized the integration of the findings and their representation through visual instruments. These instruments were instrumental in clarifying the geospatial and temporal aspects of Bengaluru's development, thereby rendering the research results understandable and accessible.

Geographic Information Systems (GIS) were used to create maps that depicted, in graphic form, changes in political boundaries, governance structure, and the development of economic zones and transport infrastructure over time. The maps demonstrated the spatial dynamics of Bengaluru's growth and highlighted areas where the influence of Big Tech firms was most pronounced. In addition, these findings were also supported by the findings through our expert interviews and literature review to help explain trends and relationships between indicators of urbanization and the growth of the tech industry.

This synthesis provided a coherent narrative of the spatial and economic impacts of Big Tech in Bengaluru, bridging geospatial insights with interview data. The visualizations helped in effectively communicating complex findings, depicting the multivariate nature of the city's transformation.

0.3 Contribution

This dissertation examines the influence of Big Tech firms on the transformation of Bengaluru. It applies to a mixed-method framework combining spatial analysis with qualitative insights to better understand how tech firms' interface with urban planning processes. The findings show that Big Tech has not only driven economic growth but has also reshaped social relations, governance systems, and urban morphologies.

One of the important contributions of this research has been to add to the discussion of Big Tech's impacts on urban development. Its literature review contributes to a few important themes: speculative urbanism, infrastructure development, and the social and economic impacts of technological growth. Situating Bengaluru within a global context with other prominent international tech hubs like Silicon Valley fills up certain gaps in academic discourses around the rapid technological changes happening within the field of urban planning and governance.

The study also includes varied perspectives from experts in the fields of urban planning, policymaking, and academia, through interviews—a feature that makes the analysis rich with real-world insights into community engagement and local governance. It emphasizes challenges such as gentrification and infrastructure issues arising from tech expansion.

In conclusion, the use of Geographic Information Systems (GIS) brings about visual representations of the urban environment in Bengaluru, showing the strong influence of Big Tech. The main purpose of this research is to enlighten policymakers and urban planners on the implications of technology on urban areas, encouraging sustainable and equitable urban development approaches.

Chapter 1. Conceptual Framing (Big-Tech & Silicon Valley; California)

Chapter 1. Conceptual Framing (Big-Tech & Silicon Valley; California)

To comprehend Bengaluru's evolution into India's Silicon Valley, one must examine the development of California's Santa Clara Valley. This region served as a foundational model for tech hubs worldwide, influencing cities in their quest to become centers of innovation and technology.

Bengaluru's transformation began in the 1970s when the Indian government invested in the IT sector, attracting multinational corporations like Texas Instruments and IBM. By the 1980s, a skilled workforce, government support, and strategic location facilitated rapid growth in the tech industry. Today, Bengaluru is home to major companies such as Infosys and Wipro, along with over 10,000 startups, making it a vital player in the global tech landscape. The city's IT sector is projected to expand from $100 billion to $250 billion by 2025, driven by advancements in artificial intelligence and cloud computing, and a burgeoning middle class demanding technology solutions (Singh, 2023; hiristBlog, 2024; Wikipedia, 2024).

This trajectory mirrors that of Santa Clara Valley, which became synonymous with technological innovation, setting a precedent for cities like Bengaluru to follow in establishing themselves as global tech hubs (Radekjedrej@gmail.com, 2024; Dennis, 2024; Marshall, 2024).

1.1 Silicon Valley

World War II played a significant role in transforming Silicon Valley from an agricultural region to a hub of industrialization. The Pacific War hostilities attracted a large workforce to engage in war-related industries, while Stanford University's Engineering laboratory received considerable funding from the Pentagon for electronics research that continued post-war. Established electrical and electronics firms started to establish themselves in the region to access the technological advancements emerging at Stanford and the growing aerospace markets. Stanford's engineering dean, Frederick Terman, supported aspiring

entrepreneurs like William Hewlett and David Packard, fostering a culture of informal cooperation and collaboration in the region. By the 1960s, Silicon Valley became known for its high-tech entrepreneurship and industrial recombination, with new firms emerging regularly, largely founded by engineers leaving other technology companies in the area. Fairchild Semiconductor Corporation played a critical role in this recombination process, with many semiconductor ventures in Silicon Valley originating from Fairchild. The sense of community and collaboration among engineers in Silicon Valley was fostered by experiences at Fairchild, leading to networks of trust and loyalty that extended to competing companies. The Stanford Science Park also provided a physical environment conducive to networking and information-sharing, although its impact was not as significant as the region's broader technical and social environment. While Stanford University and the Science Park were less relevant to the increasing technology firms in the 1970s and 1980s, their role in educating engineers and managers remained vital. (Castells, 1996)

The venture capital industry in Silicon Valley grew alongside the concentration of technology enterprises, with successful entrepreneurs reinvesting in new startups and contributing expertise, enhancing informal cooperation and networking. Military spending and government contracts played a crucial role in the development of Silicon Valley, with the Department of Defense investing heavily in semiconductor contracts, spurring innovation and entrepreneurship. Liberal licensing, second sourcing, and technology-sharing practices facilitated technology diffusion and new firm formation. The region's dense social and technical infrastructure supported ongoing entrepreneurship and innovation, distinguishing Silicon Valley from other U.S. high-tech regions dominated by established firms. The unique culture of collaboration, loyalty, and innovation in Silicon Valley, fostered by wartime influences and ongoing industry practices, set it apart as a dynamic center of technological development that continues to thrive today. Other regions that have attempted to replicate Silicon Valley's success have struggled to generate comparable rates of innovation and entrepreneurship due to a lack of similar cultural and structural characteristics. (Saxenian, 2012)

In the 1970s, the region saw high levels of job-hopping and entrepreneurship, leading to the formation of new technological enterprises. Engineers in the region developed a technical culture and loyalty to the industry rather than individual firms. The process of starting new firms was common, with most being started by engineers with business experience acquired from working in other small firms.

The industrial structure of Silicon Valley included extensive vertical and horizontal disaggregation, allowing small, specialized firms to thrive. The region fostered innovation through decentralized information flows and technical expertise, leading to rapid technical advances. Local venture capital networks supported entrepreneurial recombination and innovation, with cooperation and competition playing key roles. Private institutions like the American Electronics Association and SEMI emerged to support the region's industrial structure. Consulting firms, market research agencies, and training programs also played a role in the region's development. By the late 1970s, private business services and trade associations were the main institutions supporting innovation in the region. As Silicon Valley entered the 1980s, private institutions continued to dominate, with little public involvement in industrial development. The region's success was seen because of individual entrepreneurial efforts, leading to a lack of collective oversight or representation for workers in high-tech firms. Foreign competition in the 1980s challenged the region's individualistic worldview and dominance in world markets. Silicon Valley was driven by a culture of innovation, entrepreneurship, and collaboration among specialized firms. Private institutions and networks played a crucial role in supporting the region's dynamic industrial environment, leading to continuous technological advancements and high levels of resilience among firms. (Saxenian, 2012)

During the 1980s, Silicon Valley experienced significant growth and diversification in its dynamic industrial complex, with computer systems producers dominating the regional economy. New firms emerged, like Sun Microsystems and Conner Peripherals, while established companies like Hewlett-Packard and Intel grew larger. The region also expanded geographically beyond Santa Clara County. Despite its global orientation, Silicon Valley is interconnected with the international marketplace and heavily reliant on its skilled workforce and supplier network for success. The region's resilience was tested when the semiconductor industry faced a crisis in the mid-1980s, leading to fears of decline. However, new ventures emerged, and by 1989, employment levels had rebounded. In response to increased international competition, local firms formed organizational networks to enhance cooperation. While these adjustments were successful, the region remained vulnerable due to the lack of institutional infrastructure to address shared challenges. Exclusive regional institutions and access limitations to venture capital could hinder innovation and hinder the region's growth. The region also faces external threats like macroeconomic shocks and technological breakthroughs elsewhere. Without collective action and institutions to coordinate

responses, Silicon Valley risks falling behind. The need for long-term thinking and strategic planning among local producers is crucial to address challenges like traffic congestion, housing affordability, and environmental hazards. Establishing collective institutions that collaborate with existing private entities and local governments can help address these issues and maintain Silicon Valley's technological leadership. These institutions would focus on developing strategies for education, supporting research, and promoting infrastructure development, while also providing a forum for collective responses to competitive threats. Silicon Valley's success has been built on innovation and autonomy, but the intensifying competition highlights the need for institutional oversight to ensure continued growth and dynamism. By creating forums that balance collective responses to challenges with individual autonomy, the region can safeguard its position as a leading center of innovation in the tech industry. (Saxenian, 2012)

1.2 Big Tech

The term 'Big Tech' refers to the multinational corporations Apple, Amazon, Microsoft, Alphabet/Google, and Facebook/Meta, BATX. Others have used a variety of terms to refer to these corporations, as well as several other tech companies based in the USA (e.g. Uber, Netflix). Big Tech is a more useful and consistent term to deploy if we want to grapple with some of the analytical uniqueness of these digital leviathans, their scale, and their scalability. (Birch & Bronson, 2022)

Big Tech is becoming the watch word for corporate surveillance, monopoly, and market power. They are defining institutions today, dominating our political economies, societies, together with Big Oil or Big Banks from older times.

1.2.1 Big Tech: Scale, Platform, and Governance.

Big Tech dominance can be understood in the two key aspects of their social and market power and the subsequent need to find new governance mechanisms to manage the societal fallout from this power. Their sheer scale is often used to explain their dominance. Researchers point to consequences of this scale, including network effects, winner-takes-all dynamics, and financial leverage. The monopoly resulting from this is embedded in the scale of Big Tech

firms, meaning that they can finance their operations at a lower cost. (Birch et al., 2021; Birch 2022)

Platform and platformization reflects a more expansive view of Big Tech as dominating digital infrastructure, boundary technologies, rules and regulations, and users, competition, and customers. Much of this analytical examination of the platforms is not based on scale/size, but on examining the techno-economic extension of the platform boundaries to enroll a range of other social actors. (Helmond, 2015; Hein et al., 2020)

The governance response to address the public, political, and policy fallout from the Big Tech through two key dimensions, scale/scalability and platformization often by emphasizing on increasing 'individual control' as the solution to increasingly egregious societal effects, especially those resulting from the massification of personal data collection and its uses by Big Techs. The tendency to frame governance as an issue of individual privacy and data protection creates a very narrow spectrum for a potential politics to respond to the techno-economic effects of Big Tech. Moreover, narrow legal forms on data privacy and protection are compatible with corporate values such as profitability, setting legal compliance as a low bar for Big Tech. (Birch et al., 2021; Birch & Bronson, 2022)

Viewing Big Tech from a Science & Technology Studies (STS) perspective.

In this section, examining Big Tech as a distinct form of modern technoscientific capitalism, characterized by monopolies and market influence, both theoretically and through research. These setups require the evaluation and control of social interactions and behaviors through specific technological and economic practices, influenced by certain technological and economic principles and broader socio-technical concepts. The focus is on beliefs, claims of knowledge, tools for measuring, standards, practices within organizations, expertise, creativity, and business tactics, as well as policy discussions that support the growth of Big Tech. Instead of viewing Big Tech as a monolithic entity, this analysis highlights the diverse data collection and usage practices across different industries, societies, and legal jurisdictions. By examining these variations, we gain insights into how large corporations operate within distinct societal contexts, challenging the notion of a singular dominant technology industry. The exploration

also identifies four types of digital rent-seeking pursued by Big Tech companies in their quest for various economic advantages:

1. Enclave Rents: Profits derived from exclusive access to resources or markets.

2. Anticipated Monopoly Rents: Gains expected from establishing monopolistic control.

3. Engagement Rents: Revenues generated from user engagement and interaction.

4. Reflexivity Rents: Benefits arising from the ability to adapt based on user behavior and feedback.

This nuanced understanding encourages a more comprehensive view of the technology landscape and its implications for society. It also differentiates between the monopoly power held by present-day tech companies and those in recent times, showing the transformation of Big Tech firms from computer makers to digital platforms affecting urban change. Furthermore, the involvement of governments in shaping the relationship between technology and society is analyzed, especially in the framework of the policy change concerning the implementation of COVID-19 contact tracing. (Birch & Bronson, 2022)

Big Tech is viewed as a techno-economic arrangement.

Big Tech is both created by and creates a larger societal change. This setup goes beyond the limits of organizations to include a constantly growing 'ecosystem' made up of various technical devices, platforms, users, developers, payment systems, legal contracts, rights, claims, standards, and more. The effects of Big Tech are generating increasing attention towards the 'politics of scaling' and the 'politics of modularity' in order to pinpoint areas for intervention in the expanding digital ecosystems of Big Tech. The concept of scaling in politics involves a policy focusing on size, such as that of a large technology company, and the principle of being able to adapt in size. Investors and financiers are interested in scalable technologies and business models that create network

effects or winner-takes-all dynamics, as they believe that scaling up will lead to dominating the market. Yet, the foundational work supporting digital technologies - the aspects that cannot be easily expanded - frequently stays concealed and unseen due to being outsourced. Scalability is not built into specific technological or economic configurations; rather, it depends on where project limits are defined, supporting specific visions of corporate futures. Therefore, in order to achieve scalability, it is necessary to actively define the limits of Big Tech as a techno-economic structure, which involves more than just its size. Big Tech involves not just a politics of expansion but also a politics of compartmentalization. These companies go beyond their internal and external limits, creating specialized technoscientific tools such as APIs, SDKs, and plugins to involve other stakeholders in a controlled ecosystem. Modularity requires the inclusion of additional social actors in a system and creating technical and economic systems to facilitate this integration and compatibility. Big Tech's uniqueness as a techno-economic setup is found in its ability to mix scalability and modularity, giving it the power to manage an ecosystem. Large technology companies create 'boundary assets.' In the techno-economic configuration, Big Tech firms are increasingly defined as gatekeepers. This gatekeeper role can be understood through the dual politics of scalability and modularity we have outlined here, as well as the tensions that arise from it. Big Tech has both the scale size to engender certain outcomes like network effects and the integrative capacity to constitute and control a broader ecosystem of social actors, devices, legal mechanisms, etc. (Birch & Bronson, 2022)

1.2.2. Understanding the influence of the Big Techs in San Francisco

In the mid-2010s, business commentators began to speak with increasing frequency of "unicorns," private firms with substantial venture capital (VC) investment that had achieved valuations of at least US$1 billion. This would not be so surprising given the global fame of the region's Silicon Valley, were it not for a further statistic: 40% of the unicorns are based in the municipal boundaries of San Francisco, as against 23% in the Valley. These include globally recognizable firms such as Airbnb, Uber, Twitter, Pinterest, and Dropbox, all of which have been rapidly expanding into major global markets. By 2015, Uber had achieved a valuation of $51 billion, Airbnb $25 billion, and both were scaling rapidly worldwide. (McNeill, 2016)

Another round of globalization in San Francisco:

The waves of technological changes that have periodically "disrupted" the established economic order, transforming manufacturing markets, financial industries, and real estate markets within the American and Californian economies. These shifts increasingly integrated San Francisco with the edge cities and suburban counties dotted around the Bay between San Francisco, Oakland, and San Jose. The 2000s have further transformed the Bay Area: the growth of internet-based e-commerce and business enterprise; the rise of social media; the development of mobile, and especially smartphone technology, with associated "apps"; and the increasing significance of server-based "cloud" computing and data storage infrastructure. As a result, the Bay Area now possesses a far more complex set of investment sites than before, where different formations of capital—hitherto little interested in cross-investment—are coming together as "strange new hybrids" of "Silicon Valley innovation, VC investment and Wall Street financialization, and digital transformations of circuits of production and consumption". (Walker, 1996)

Restructuring of San Francisco by tech and VC: Influence on the real estate

The abrupt changes occurring in San Francisco's urban economy can be attributed to several dynamics within what could be called technology investment capital. This can be defined as being of three main types: (1) angel investment, referring to the initial funding given to develop a proof of concept and (largely untested) launch product; (2) VC, which is further broken into bigger and bigger rounds (usually running from A to at least D) as the firm moves toward public listing (an IPO); and (3) acquisition capital, which has an important and often less acknowledged role in technology growth. (McNeill, 2016)

Technology investment capital has had a major impact on San Francisco for four reasons. First, the Bay Area—centered on Menlo Park in Silicon Valley—has emerged as a key location for the VC industry. This is usually attributed to the commercialization and reinvestment strategies that followed the invention of the semiconductor, the growth of firms such as Hewlett-Packard, the presence of the engineering and technology- oriented Stanford University, and various US government defense contracts (Saxenian, 1989). VCs operate with a "distance factor", the partners in leading firms often spend their whole careers in these firms,

rather than moving between firms. As such, they possess a "deep understanding of industrial, technological, legal and managerial issues" which allows them to adapt to economic and innovation cycles. Second, the technology investment which is taking place in Silicon Valley and San Francisco is multisectoral, with platform innovators (such as social media platforms) driving innovation in other areas. VCs may play important roles in securing acquisitions, as opposed to IPOs, for start-ups within corporations that they have helped fund. In 2013, the acquisition of Instagram by Facebook for staggering $1 billion, only 22 months after the company's founding, illustrated several key drivers of the Bay Area tech economy. The ability of mobile- as opposed to web-configured apps to generate huge usage numbers worldwide in a very short space of time through "fire hosing" (using multiple social media distribution channels to build customer base). San Francisco has become a key industry center of early product adopters: Instagram followed Twitter in generating much of its early viral success from residents of the city. Third, there has emerged in San Francisco and Silicon Valley what could be called a reflexive start-up economy. The conscious creation of business formation vehicles that comprise business advice, mentoring, seed funding, and peer-to-peer advice has led to the creation of several key unicorns, including Airbnb and Dropbox. The existence of a sizable set of angel investors, and the creation of coworking and living spaces (sometimes referred to as "hacker houses"). The locational geography of these start-ups was notable: many would often emerge from residential shared housing and begin in small, subdivided offices or coworking spaces which began to flourish, sometimes in the Valley, but also in the city itself. Stanford University retained its preeminent reputation in providing computer engineers with an education in entrepreneurship, along with a strikingly integrated alumni network. In addition, the likes of San Jose State University and Berkeley generated a constant supply of programmers, joined by some of the finest programmers from both the United States and worldwide. Facebook, which began at Harvard, made a major relocation to Silicon Valley both for proximity to skilled labor and VC, but also to be close to the many start-ups producing innovative plug-ins that could augment the site. Fourth, there are complex locational issues facing many tech firms in Silicon Valley and San Francisco, which in turn has created various public policy problems (for an overview of the economic geography of the region, see Walker & Schafran, 2015). A small number of major firms (such as Google, Apple, Oracle, Facebook, Yahoo, LinkedIn, and Palantir) have dominated commercial real estate in the small, "slow growth" and largely anti-development Valley towns such as Palo Alto and Mountain View, with a similarly constrained residential market. This influenced the venture capitalists

of Menlo Park in Silicon Valley have now increasingly focused their attention on the rapid growth in potential investment returns offered by youth-oriented social media "early adopters," which in turn is reflected by the locational choice of San Francisco over the suburban Valley. (McNeill, 2016)

Influence of the VC in 2011 and 2015 municipal elections

The first internet boom in the late-1990s had a noticeable impact on housing affordability, but also urban cultural politics. The tech employees brought two forms of disruption to the existing spatial fabric of the city: a relative youth in comparison with the city's age structure, and a high disposable income; enough to significantly increase the cost of housing in the city for both buyers and renters. A careful analysis of the social distribution of the tech boom, undertaken by Silicon Valley Joint Venture (SVJV), suggested that it was increasing socio-spatial inequality within the region. The housing pressure in areas such as the Mission led to protests, including The Anti-Eviction Mapping Project (2015), which provided a fine-grained urban geography of evictions, speculative property development, and public space conflicts. This was particularly noticeable because the optimal location of these firms was the light industrial office premises of South of Market and the Mission, and the commercial and residential rent increases in the area caused an identifiable process of displacement. Furthermore, "the Net economy took root in San Francisco rather than Silicon Valley precisely because it was a refuge for alternative thinking and boasted a resident labor pool of creative workers. For this reason, San Francisco has retained its reputation as a self-referential political habit characterized by its single-issue propositions through citizen initiatives-where, after a certain number of signatures have been gathered, voters can vote on specific urban policy issues, which were influenced by VC's. For these reasons, San Francisco municipal politics has tended to be dominated by shifting and sometimes surprising coalitions of interest. The late 2012 San Francisco's tech boom and sustainability of the boom, drawing parallels to the crash of the late-1990s. For example, Housing activists in San Francisco, the gentrification process that had slowed in the mid-2000s was being replayed with even greater intensity, with rising evictions and a doubling in the city's property costs, shows the impact of the tech sector on the city's real estate. This significantly increases the cost of housing in the city for both buyers and renters. A careful analysis of the social distribution of the tech boom suggested that it was increasing socio-spatial inequality within the region. The housing pressure in areas such as the Mission led to protests, including The Anti-Eviction Mapping Project (2015), which provided a fine-

grained urban geography of evictions, speculative property development, and public space conflicts. (McNeill, 2016)

At the same time, several venture capitalists and technology business leaders have begun to consider how best to influence urban politics, given the city's growing importance as an industry's location. Ron Conway, a leading angel investor, played a particularly significant role. He donated $49,000 to the Mayor Ed Lee for San Francisco Committee and worked behind the scenes to help unseat one of Lee's biggest opponents. He encouraged other technology businesses to support the election campaign of David Chiu, the president of the Board of Supervisors, with a $100- a-plate fundraiser known as "Innovate SF". He also focused on funding single-issue propositions, particularly the campaign in favor of Proposition E, which mandated the removal of the city's payroll tax, to which he donated $275,000. This tax levied an additional 1.5% rate on city companies with payrolls over $250,000 per year. Initiated in 1970, the tax had been brought in for spatially redistributive or free-rider reasons—to pay for the cost of servicing nonresident commuters who paid low rates in neighboring suburban municipalities but used the city's services during the working week. For Conway and others, this disproportionately affected start-up companies and disincentivized firms from adding jobs that would push them over the threshold. This was particularly important in San Francisco, where product development and company take-off were geared tightly against low salary but high equity teams. So, to maximize the number of firms in his portfolio that could move to an "exit" Conway needed to control as many of the cost variables as he could. To optimize success, factors shaping hiring practices —which ranged from company taxation to public transport efficiency to loosening the real estate blockages in the central city—headed up the political wish list of the technology reformers. The proposition was carried in a November 2012 ballot with slightly over 70% support, which perhaps reflected assessment that the shift would be revenue neutral for the city and resulted in a phased replacement of the tax by a gross receipts tax from 2014. The election of Lee as mayor of San Francisco in 2011 coincided with the establishment of an organized coalition of tech firms that would, both individually and collectively, make a substantial impact on the city's politics (McNeill, 2016).

The coalition between the tech chamber and politics

The tech industry in Silicon Valley holds an ambivalent stance

towards organized politics. Hence, they explored ways to bypass state institutions. Also, in the start-up ecosystem government institutions are always viewed as moribund and standing in the way of technological processes. To overcome this issue, Conway's strategy was first to do political intervention through corporate philanthropy and worked to construct 'a digital growth coalition' which brought both political and key players in tech together. Also, after Lee's election to give institutional focus on policy of payroll tax, he launched a new organization sf.citi (San Francisco Invents the Tech Chamber of Commerce) and quickly signed up most of the city's tech firms as members. The main objective of the organization was to encourage member firms to make pro-bono interventions in the city's infrastructure. One of the key allies in influencing the city's urban policy was Marc Benioff, CEO of Salesforce, a firm which specializes in customer relations management software as a service. By the mid-2010s it became the second largest occupant of commercial real-estate second only to Wells Fargo and one of its largest employers. (McNeill, 2016)

San Francisco's real estate valorization through tech capital (McNeill, 2016)

The San Francisco Bay Area has established itself as a leading global tech hub, housing some of the world's most influential technology companies. This evolution has not only reshaped the local economy but has also significantly impacted the real estate landscape. The relationship between the tech industry and real estate dynamics has led to notable changes in property values, housing availability, and urban development. Here, we discuss the process of the tech sector that has catalyzed the revaluation of San Francisco's real estate market.

The Emergence of a Tech Capital

San Francisco's rise as a tech capital began in the late 20th century with Silicon Valley's expansion. Major companies like Apple, Google, and Facebook have set up headquarters in the region, attracting numerous startups and tech firms. This concentration of innovation has spurred substantial economic growth. McNeill notes that urban centers often thrive economically due to their ability to attract talent and investment. As of 2023, tech jobs constituted nearly 30% of employment in San Francisco, driving an influx of skilled workers seeking opportunities in the area and intensifying demand for housing and commercial spaces. The tech industry's hallmark is its competitive salary offerings, which

have drawn high-income earners to the region. This influx has led to increased competition for housing in neighborhoods near major tech hubs, resulting in significant price hikes and gentrification that alter the socio-economic fabric of these communities. (McNeill, 2016)

Revalorization of Real Estate

The surge in housing demand driven by the tech sector has led to dramatic increases in property values across San Francisco. Neighborhoods such as South of Market and the Mission District have transformed due to their proximity to tech offices. Areas once deemed affordable are now populated with luxury developments tailored for high-income tech workers. This revalorization reflects how new economic activities can reshape urban landscapes, as evidenced by the conversion of warehouses into modern office spaces and lofts. In response to evolving work environments there has been a notable shift towards flexible office spaces. The convergence of technology and real estate—termed PropTech—has introduced innovative solutions that enhance property management and user experiences. Companies like Zillow and Redfin have transformed home-buying processes through big data analytics and algorithms that offer personalized recommendations. These advancements have streamlined urban development processes, impacting both residential sales and commercial leasing strategies. Due to this, investors are increasingly drawn to high-end properties equipped with modern amenities that cater to tech workers' preferences. This trend signifies a broader shift where real estate investments align closely with technological advancements and changing workforce dynamics. Developers are prioritizing smart buildings—structures designed with advanced technologies that improve energy efficiency and tenant experiences—catering specifically to tech firms seeking innovative workspaces. Despite the economic advantages brought by tech companies, soaring property prices have exacerbated housing affordability issues for long-term residents. The displacement of lower-income communities presents significant social challenges requiring balanced policy responses. Data indicate that nearly 60% of renters in San Francisco are cost-burdened, spending more than 30% of their income on housing. This crisis underscores an urgent need for affordable housing initiatives that accommodate both new arrivals attracted by tech jobs and existing residents. (McNeill, 2016)

1.2.3 Big Tech as Global Urbanists

Big Tech companies have increasingly positioned themselves as global urbanists, influencing urban development and social dynamics through their platforms and services. Big Tech firms, such as Google, Amazon, Twitter, and Facebook, shape urban environments by providing digital infrastructure that facilitates communication, commerce, and transportation. Their platforms often dictate how cities function, impacting everything from local economies to social interactions. For instance, services like ridesharing (Uber) and home-sharing (AirBnB) not only alter traditional business models but also challenge regulatory frameworks in urban settings. The rise of these companies has prompted discussions about governance and regulation. As they expand globally, there is a growing concern over their influence on local policies and economies. Countries are grappling with how to manage these entities that operate across borders while maintaining national sovereignty and protecting citizen rights. This collaborative approach to consumption is termed as sharing economy. The sharing economy has led to increased flexibility in urban lifestyles but also raises questions about equity and sustainability. For example, while platforms like Airbnb can provide affordable housing options, they may also contribute to housing shortages in certain areas by converting residential properties into short-term rentals. This duality illustrates the complexity of Big Tech's role in shaping urban landscapes. Big Tech operates as a powerful force in global urbanism through its influence on economic structures and social practices. The sharing economy framework provides a lens to examine these dynamics, revealing both opportunities and challenges for urban development. (McNeill & Pollio, 2018; Ferreri & Sanyal, 2018)

Chapter 2. Globalization, global outsourcing and making of a world-city

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Globalization is a multifaceted process characterized by the increasing interconnectedness and interdependence of economies, cultures, and populations across the globe. It encompasses various dimensions, including economic, political, cultural, and technological aspects. Economic globalization involves the expansion of international trade, investment, and capital flows, leading to the integration of markets worldwide. This integration has been facilitated by advancements in technology and communication, allowing for the rapid exchange of information and goods (Held et al., 1999).

Global outsourcing is a specific aspect of globalization that refers to the practice of relocating business processes or services to external suppliers, often in different countries. This strategy is primarily driven by the desire to reduce costs and increase efficiency. Companies may outsource manufacturing, customer service, or IT services to countries where labor is cheaper or where specific expertise is available. While outsourcing can lead to significant cost savings for businesses, it also raises concerns about job displacement in higher-cost countries and the potential exploitation of workers in lower-cost regions (Gereffi & Fernandez-Stark, 2016).

The concept of "World City" refers to urban centers that play a crucial role in the global economy due to their influence on international finance, trade, and culture. These cities serve as hubs for multinational corporations, financial institutions, and cultural exchanges. Characteristics of world cities include advanced infrastructure, a diverse population, and a concentration of economic activities that attract global talent and investment. The emergence of world cities is closely linked to globalization as they facilitate the flow of goods, services, and information across borders (Sassen, 2001).

The divide between the Global North and Global South represents a socio-economic disparity between developed and developing nations. The Global North typically includes wealthy countries with advanced economies, while the Global South encompasses poorer nations that often face challenges such as poverty, political instability, and limited access to resources. This divide is not merely geographical but reflects historical power dynamics rooted in colonialism

and economic exploitation. The Global North tends to dominate global governance structures and economic policies that disproportionately benefit its interests (Castells, 2010).

In analyzing these concepts through the lens of urban sociology and globalization theories, it becomes evident that cities are not only shaped by global processes but also actively contribute to them. Urban centers in both the Global North and South are increasingly interconnected through networks of trade and migration. However, disparities persist in terms of access to resources and opportunities for development (Sassen, 2001 & Castells, 2010).

But some cities from the global south took advantage of the situation to streamline their development into a new economy. The emergence of cities in the Global South that have successfully leveraged globalization to foster economic development represents a significant shift in the global economic landscape. Several factors contribute to this phenomenon, allowing these urban centers to capitalize on their unique advantages and transform into dynamic players in the global economy.

Many cities in the Global South have embraced "economic diversification" as a strategy to reduce dependency on traditional sectors such as agriculture or raw material extraction. By investing in technology, services, and manufacturing, these cities have created a more resilient economic base. For instance, cities like "Bengaluru" in India have become prominent tech hubs, attracting both domestic and international investment. The establishment of tech parks and incubators has fostered innovation and entrepreneurship, enabling local startups to compete on a global scale (Saxenian, 2012a).

Cities in the Global South often benefit from "strategic geographic locations" that facilitate trade and connectivity. For example, Dubai has transformed itself into a global logistics and trade hub due to its strategic position between Europe, Asia, and Africa. Significant investments in infrastructure, such as airports, ports, and transportation networks, have enhanced its ability to serve as a gateway for international commerce. This infrastructure development not only attracts multinational corporations but also stimulates local economies by creating jobs and improving access to markets (Rodrigue et al., 2013).

Participation in global value chains (GVCs) has enabled cities in the Global South to integrate into the global economy effectively. By positioning themselves as key nodes within these chains, cities can attract foreign direct investment (FDI) and develop specialized industries. For instance, Ho Chi Minh City has become a crucial manufacturing center for electronics and textiles, benefiting from FDI that seeks cost-effective production solutions. This integration allows local economies to grow while providing employment opportunities for residents (Gereffi & Fernandez-Stark, 2016).

Rapid urbanization in many Global South countries has resulted in a significant influx of labor into cities. This demographic shift creates a large pool of workers who can be trained in various sectors, particularly in services and manufacturing. Cities like Nairobi have capitalized on this labor force by promoting sectors such as information technology and business process outsourcing (BPO). The availability of skilled labor combined with lower operational costs has attracted companies looking to outsource services (World Bank, 2020).

Effective governance and supportive policy frameworks play a critical role in enabling cities to harness globalization for development. Many successful cities have implemented policies that promote investment, innovation, and entrepreneurship. For example, Santiago has developed policies that encourage public-private partnerships and support small and medium-sized enterprises (SMEs), fostering an environment conducive to economic growth (OECD, 2019).

The ability of certain cities in the Global South to streamline their development into a new economy illustrates the potential for growth amidst globalizations. By focusing on economic diversification, strategic infrastructure development, participation in global value chains, leveraging urbanization dynamics, and implementing effective governance policies, these cities are not only overcoming historical disadvantages but are also positioning themselves as vital contributors to the global economy.

In summary, globalization encompasses a range of processes including economic integration and cultural exchange; global outsourcing serves as a mechanism for businesses to optimize operations; world cities emerge as pivotal players in this global landscape; and the Global North-South divide highlights ongoing inequalities that affect development trajectories across nations.

Chapter 3. The restructuring of Bengaluru

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Historically, all the cities around the world have restructured over time to the ever-changing urban dynamics like population growth, change in demographics, economic aspects, public infrastructure of the city. Like other cities, even Bengaluru, restructured itself through the changing needs of the city due to policy decisions taken by the governments in power. Being situated on a ridge in the southern peninsula, it enjoys a pleasant climate throughout the year. It is the focal point of highways, railways, and airports; therefore, it is very well connected with other metropolises in the country. Availability of the land, skilled labor, and other facilities have contributed to the growth of industries in and around Bengaluru. Bengaluru's restructuring could be understood through the following stages.

- 19th Century,
- Pre-Independence,
- From 1950s-80s,
- Mid 1980s-2006,
- 2006 - Present

3.1 Bengaluru: Until 19th Century

The city was founded by Kempe Gowda I in 1537, consisted of a mud fort with residential locality called 'pettah' on the western part of the city, with the present day Avenue road and Chickpet road occupied by different professionals as could be seen by the names of the streets still used in the old city area even today, viz., Cottonpet, Akkipet, Ragipet, Balepet, Kumbarpet, Gollarpet, etc. At that time city limits were marked by the four watchtowers at cardinal directions constructed by Kempe Gowda; these towers are situated at Lalbagh Hillock, Kempambudhi Tank bund, palace orchards, and Ulsoor Tank bund, which can be seen even today. Afterwards, the control of the city was transferred to the

Wodeyars, who were the rulers of Mysore. However, in the late 18th century, it was granted as a Jagir to Hyder Ali, giving him the authority to govern and collect taxes. Hyder Ali and his son, Tippu Sultan, played a significant role in the expansion and progress of Bengaluru by constructing the summer palace and Lalbagh. Indeed, Bengaluru was already the business hub during the rule of Tippu Sultan and the second most significant city after Srirangapatna, Tippu's capital. In the 1800s, the city had a wide variety of coins from various regions and kingdoms, indicating a thriving trade and business. Moreover, Tipu Sultan possessed a strong inclination towards science and constantly engaged in experiments with innovative European weapons. Being a passionate enthusiast of technology, he had a keen interest in European creations like barometers and thermometers. He actively worked towards promoting the production of innovative devices in different cities within the state, notably in a place called Taramandal Pet, where one such establishment still exists today. This place, situated in the historic part of Bengaluru, accommodates numerous small workshops and power looms. "These were the equivalent of his era's 'Technology Parks'. After the capture of Bengaluru during the Second Mysore War in 1792, it is possible that this event also contributed to the defeat of Tippu Sultan in the Third Mysore War of 1799. As a result, Bengaluru became a strategic location for the British forces and witnessed the establishment of the Cantonment in 1802. British dominance over Bengaluru was first established through an indirect relationship with the Maharaja of Mysore. The Wodeyar rulers, like Haider Ali and Tipu Sultan before them, carried on the tradition of showing interest in European technology and engineering projects that aimed to benefit the public. The Wodeyars created several educational institutions with the aim of promoting fundamental technical abilities within the local community. The British assumed control of the city's administration in 1831. Once they had established their dominance in the area, the British made the decision to construct a highly impressive military base in Bengaluru. They dedicated their utmost efforts to it. During the time of British colonial rule, the British utilized advanced methods and technologies to design and construct the infrastructure for the Bengaluru cantonment. During the time of British rule in India, advanced technology was introduced mainly in military cantonments. In 1862, two separate municipal boards were formed to govern Bengaluru: Bengaluru City Municipality for the older regions, and Bengaluru Civil and Military Station Municipality. (Rawat,n.d; Rame Gowda, 1972; Sudhira et al., 2007)

The 1800s witnessed significant turmoil within Indian society. British liberal education had a significant influence, leading to the emergence of various

social reforms and cultural revival movements throughout the nation. A strong movement emerged in India, promoting the growth and assimilation of Western science and technology. Due to the area's rich educational and technical history, the educated upper class was immediately attracted to these hubs of scientific, industrial, and technological development. India's initial recipient of the Nobel Prize, Sir. C.V. Raman was a result of this exciting period of innovation and creativity. He eventually became the inaugural Indian Director of the Indian Institute of Science. (Rawat,n.d)

Bengaluru has been a major trading and manufacturing hub in South India for an extended period. People were involved in producing small and decorative items, cosmetics, and scented sandalwood sticks prior to the British colonial era. The manufacture of gold lace was at its peak until 1870. After that, it declined due to competition from imported lace from France. The climate in Bengaluru provided favorable conditions for the sericulture industry, which flourished with the support of Muslim rulers in the mid-18th century. The industry experienced a significant setback during 1934-35 when Japan flooded the Indian market with large quantities of raw silk, causing disruption. The government adopted a free trade policy for domestically produced goods and imposed restrictions on imported goods to equalize their prices. The cool and stable climate of Bengaluru played a significant role in locating textile industries in the area. The first modern textile mill was established in 1884 by the Maharaja of Mysore. It had 10,416 spindles and 300 looms. The Bengaluru Woolen, Cotton and Silk Mills, Ltd., was established in 1887 by Buckingham Carnatic Mills of Madras, marking a significant development. In 1937, the mill had 3,950 employees. Today, it has grown to employ around 8,000 workers, making it the largest textile mill in the State. The construction of the Madras-Bengaluru broad gauge railway line in 1892 played a significant role in the development of industries in Bengaluru. Migration of industrial workers into the city began in a significant manner during the past century. The presence of the British army in Bengaluru Cantonment, along with the establishment of the Administrative Secretariat and High Court, significantly contributed to the city's development. Bengaluru transformed into a hub for commerce, industry, and administration. (Rame Gowda, 1972)

3.2 Bengaluru: Pre-Independence

The city emerged as a significant industrial hub, with substantial growth in the industrial sector starting in this era. The Maharaja of Mysore, dedicated

to advancing science, technology, and industry, introduced a new industrial and technical education plan at the Mysore Economic Conference in 1911. The economic policies implemented by the Dewans of the old Mysore State, who believed in "industrialize or perish," fostered technical, scientific, and industrial development. Bjorn Hettne characterized the period in Mysore State as a "fascinating experiment in economic development" (Bjorn Hettne 1978 cited in Kaul 1993). During this period, economic policies focused on promoting entrepreneurship and encouraging private involvement in industry and education. Due to these proactive policies, numerous small and medium-sized industries were established. Multiple new factories emerged, while existing ones were revitalized and grew in size. The main reason for this may be attributed to the two world wars. During periods of war, imported goods were not readily available, so the nation relied solely on domestically produced goods. Mysore State was the leader in taking advantage of these opportunities. Bengaluru was chosen by many new industrial companies as the location for their industries due to its strategic location and natural amenities. The industrialization policy implemented by Sir M. led to an increase in economic growth and technological development. This policy has been instrumental in shaping the country's industrial landscape and fostering innovation in various sectors. During the rule of Visvesvaraya, Sir Mirza Ismail, and other Diwans of Mysore, efforts were made to harness the state's natural resources. The Mysore Sandal Soap Factory was founded in Bengaluru by the state government in 1917. In 1921, a new government enterprise was established with the installation of a glycerin recovering plant at the Industrial and Testing Laboratory. Glycerin was produced as a by-product of the soap industry at this facility. In 1925, M/s. Sirur and Co. established a textile mill named Minerva Mill, employing 600 workers operating 19,616 spindles. Until 1930, industrial progress was minimal. However, in the following two years, several industries emerged in the city. The Government Electric Factory, Porcelain Factory, Mysore Lamp Works, and Sri Krishna Spinning and Weaving Mills were the key establishments. In 1933, Amco Batteries was founded, making the city the first producer of electrical batteries in the country. During World War II, the country encountered challenges in foreign trade once more. This led to the establishment of numerous new industries in Bengaluru. When England and the United States went to war with Japan, they required a significant upgrade to the aircraft station and assembly line in India. In 1940, they established Hindustan Aircraft Limited in Bengaluru with the aim of achieving this goal. After the war, the industry was not abandoned. Instead, it was recognized for its usefulness and permitted to grow steadily. Hindustan Aircraft Ltd. has been renamed as Hindustan Aeronautics Ltd. It is now the largest aircraft and

aero engine repair, overhaul, and manufacturing company in the country. The facility covers approximately 445 hectares on the outskirts of the city. Two years later, Radio and Electrical Manufacturing Co. (REMCO) was established in 1945. The Mysore Electrical Industries, Ltd. was started in agreement with M/s. Scutter and Co., Ltd., located in London, specializes in manufacturing switchgear, motor control gear, and related products. Furthermore, several engineering industries, such as handloom and power loom industries, were established in different areas of the city, leading to a significant growth in the manufacturing workforce. As a result, the city experienced a significant population growth leading to issues like overcrowding, congestion, and a decline in housing and environmental quality. (Rawat,n.d; Rame Gowda, 1972; Sudhira et al., 2007)

3.3 Bengaluru: 1950s-1980s

After gaining independence, India recognized the need for industrialization and made significant efforts towards self-sufficiency. Numerous schemes were introduced by both central and state governments, with a limited contribution from private entities. Hindustan Aeronautics Ltd. collaborated with the German firm MANN to manufacture integral coaches as part of a commercial project. In 1948, Hindustan Aeronautics achieved a milestone by designing and developing the HT/2, a modern all-metal aerobatic basic trainer aircraft. The company is currently producing jet fighters and supersonic planes for the Indian Air Force. The establishment of the Indian Telephone Industries and Hindustan Machine Tools in 1948-1949 ushered in a new era of industrialization. The Government of India initiated the establishment of Bharat Electronics Ltd. in 1954 in Bengaluru to produce wireless receivers, general purpose receivers, and electronic equipment, in line with its policy to reduce material imports. In the following years, several industries such as the New Government Electric Factory and the Watch Factory were established. Private individuals and parties played a significant role in the growth of industries in Bengaluru. Much credit for these achievements can be attributed to the Kirloskar Group of Industries. The production of electric motors, transformers, and switch gears began in 1948. The Motor Industries Co. was established in 1953 through a collaboration with the respected German firm Bosch &amp, Co. In addition, numerous ancillary and engineering industries producing various products were situated in various areas of the city. The size of the city increased with the rise of industrial and governmental activities, at times gradually and at other times rapidly. During the post-independence period, the successive five-year plan programs encouraged the establishment of numerous

industries and government offices in and around Bengaluru. In 1956, Bengaluru was made the capital of an expanded State due to the state's reorganization. The addition of new areas to the old Mysore State consolidated administrative activities in Bengaluru, previously spread across various capital cities like Mysore, Mercara, Madras, Hyderabad, and Bombay. This boosted the city's status and attracted a significant influx of the population seeking employment opportunities in both public and private sectors. In 1951, there were 283 units with 45,878 workers. By 1981, the number of units had grown to 5641, with 212,506 workers. The 1981 census reported a total of 869,439 workers in both the organized and unorganized sectors, representing approximately 30 percent of the city's population. These figures indicate that industrial development in Bengaluru is significantly progressive. (Rame Gowda, 1972)

3.4 Bengaluru: Mid 1980s-2006

The period from the mid-1980s to 2006 saw Bengaluru undergo a significant industrial transformation, becoming a prominent center for technology and manufacturing. This period was defined by the rise of private businesses, especially in the electronics and information technology industries, due to policies promoting economic liberalization. The mid-1980s marked the beginning of economic liberalization in India. Bengaluru emerged as a center for private businesses during this time. The government of Mysore promoted the establishment of various industries, specifically in the western part of the city. This resulted in a varied industrial environment, with brick and tile factories coexisting with traditional textile mills. The late 1980s saw a significant change in Bengaluru as it started drawing multinational corporations (MNCs), with Texas Instruments being a notable example by establishing operations in 1985. This was driven by factors such as a skilled labor pool from local educational institutions such as the Indian Institute of Science and an established electronics industry base.

The 1990s marked a transformative period for the information technology (IT) industry in Bengaluru, establishing the city as a significant global technology hub. This growth was driven by several key factors, including policy reforms, the influx of multinational corporations (MNCs), and the emergence of home-grown software companies. Together, these elements contributed to the rapid expansion and global recognition of Bengaluru's IT sector. One of the primary catalysts for this transformation was the Indian government's implementation of crucial policy

changes during the late 1980s and early 1990s. The "1984 Computer Policy" and the "1986 Computer Software Export, Development and Training Policy" facilitated easier access to international technologies, promoting value-added exports of IT products (King et al., 2001). These policies aimed to foster a competitive environment for software development, which was essential for attracting foreign investment. Additionally, the introduction of "Software Technology Parks (STPs)" in the early 1990s allowed companies to operate with reduced bureaucratic constraints, fostering a shift from on-site to offshore service provision (King et al., 2001). This regulatory framework created an environment conducive to growth, enabling Bengaluru to emerge as a focal point for IT innovation. The entrance of multinational corporations into Bengaluru during this decade further accelerated its growth trajectory. Companies like Texas Instruments and Hewlett-Packard established operations in the city, drawn by its skilled workforce and lower labor costs (King et al., 2001). By 1999, software revenues in Bengaluru reached approximately "$3.9 billion", nearly quadrupling those from IT hardware manufacturing, with a compound annual growth rate (CAGR) exceeding "40%" from 1994 to 1999 (King et al., 2001; DSIR, n.d.). The presence of these MNCs not only boosted local employment but also enhanced technological capabilities within Indian firms, creating a symbiotic relationship that fueled further investment and development. Simultaneously, home-grown companies began to emerge as significant players in the global market. Firms such as Infosys and Wipro became leaders in software development and consultancy during this period. Founded in 1981, Infosys rapidly gained prominence as a pioneer in IT services, while Wipro transitioned from its origins as a vegetable oil company to establish itself as a major player in the IT sector. By the end of the decade, these firms contributed substantially to India's total IT revenues, with software accounting for "65%" of this figure (MPRA, 2012). Their success stories inspired a new generation of entrepreneurs and solidified Bengaluru's reputation as an incubator for tech talent. Infrastructure development also played a crucial role in supporting the IT industry's growth. The establishment of educational institutions offering computer science courses significantly increased the availability of skilled labor. By the late 1990s, thousands of engineering graduates were entering the workforce annually, providing a steady stream of talent that fueled further growth in the IT sector (IMD Business School, 2018). This influx of skilled professionals was essential for meeting the demands of an expanding industry and ensuring that Bengaluru remained competitive on a global scale. However, despite these advancements, challenges persisted. The lack of reliable telecommunications infrastructure posed significant hurdles for early software exporters. Nonetheless, as companies

like Texas Instruments established earth stations for satellite communications in Bengaluru, these barriers gradually diminished (King et al., 2001). The resolution of such infrastructural challenges was vital for sustaining growth and attracting further investment.

By the close of the 20th century, Bengaluru had become known as the "Silicon Valley of India" due to its growing software industry, which played a major role in job growth. The creation of Software Technology Parks (STPs) in 1985 was pivotal in promoting a favorable environment for the growth of the IT industry. These parks offered essential infrastructure and benefits to software companies, leading to their growth during the 1990s and early 2000s. By 2003, Bengaluru housed over 375 large and medium-scale industries, with around 100,000 employees working in different sectors. Prior to this growth, Bengaluru's industrial sector relied heavily on public sector enterprises like Hindustan Aeronautics Limited and Bharat Electronics Limited. These entities set the foundation for future private sector expansion by establishing a supportive ecosystem for research and development. The transition from a public sector-dominated economy to one driven by private enterprise was facilitated by government policies aimed at attracting foreign investment. The industrialization process had a significant impact on the demographics of Bengaluru. The surge in job opportunities resulted in rapid urbanization, causing a significant increase in the city's population at that time. By 2001, Bengaluru had become one of the fastest-growing metropolitan areas in India, showcasing its position as a strong economic hub. Despite its successes, rapid industrialization has also led to challenges including inadequate infrastructure, traffic congestion, and environmental concerns. The city faced challenges in meeting the needs of its expanding population and economy, resulting in issues that would require attention in the following years. From the mid-1980s to 2006, Bengaluru experienced significant growth due to economic liberalization and the emergence of the IT industry. This period not only reshaped the city's industrial landscape but also positioned it as a global technology hub. The legacy of this era continues to influence Bengaluru's development trajectory today. (wikipedia, 2024; Pani, 2009; Nair, 2008)

3.5 Bengaluru; 2006 onwards

In the tech world of the 21st century, the revenues generated by the technology industry have a significant impact on government policy, especially

the development strategies of global cities. As technology companies continue to grow and expand their reach, their financial contributions become increasingly tied to city governance and planning, significantly shaping the trajectory of urban development. The revenue generated by the technology industry provides governments with significant resources that can be channeled into various development initiatives and projects in global cities. This influx of capital provides an opportunity for governments to invest in critical infrastructure such as transportation networks, public works, and utilities, thereby improving cities' overall livability and global competitiveness. In addition, the economic impact of the technical industry often encourages the government to adapt its policies and rules to meet these corporate needs and interests. In exchange for tax services, advantageous zoning rules, and other concessions, technical companies can expect the government to determine the priority of the government's innovation, entrepreneurial spirit, and economic growth. In addition, the income created by the technology industry may affect the government's decision on the town's planning and development. Technical companies often have specific spatial requirements for operation, such as office space, research facilities, and data centers. As a result, governments can work closely with these companies to identify technology clusters and innovation districts, thereby fostering cooperation and synergies between industry players. Additionally, financial contributions from the technology industry can influence public policy related to social and environmental issues. Technology companies are increasingly being asked to demonstrate social responsibility and environmental sustainability, and governments are being asked to adopt regulations and incentives that encourage responsible business practices and investment in green technologies. However, the influence of high-tech industry profits on government policy has also raised concerns about potential conflicts of interest, regulatory capture, and the unequal distribution of profits within cities. Governments must balance fostering economic growth and innovation while protecting the interests and well-being of all residents, including those who cannot directly benefit from burgeoning industrial technologies. The revenues generated by the technology industry have a significant impact on public policy and development strategies for global cities in the 21st century. While this impact can lead to positive outcomes such as infrastructure investment, innovation, and sustainability, it also creates challenges related to governance, equity, and social responsibility. As cities navigate the complexities of a technology-driven economy, it is critical that governments adopt transparent, inclusive, and progressive policies that prioritize the long-term prosperity and well-being of all city residents. (Sudhira et al., 2007; Shaw & Satish, 2007; Rawat, n.d)

Chapter 4. Globalization, privatization and regional competition in India

Chapter 4. Globalization, privatization and regional competition in India

Globalization, privatization, and regional competition played pivotal roles in transforming Bengaluru into India's tech capital during the 1990s. This transformation was influenced by a confluence of economic policies, technological advancements, and the city's unique socio-economic landscape.

4.1 Globalization and Privatization in India

In the context of India during the 1990s, globalization was marked by significant economic reforms initiated in 1991. The Indian government liberalized its economy by reducing trade barriers, deregulating industries, and encouraging foreign investment. This shift allowed Indian companies to access global markets and technologies, which was crucial for the growth of the information technology (IT) sector. Bengaluru emerged as a focal point for this globalization process due to its existing educational institutions and a skilled workforce. The city became attractive to multinational corporations seeking to establish software development centers and outsourcing operations. The influx of foreign companies brought not only capital but also advanced technologies and management practices that further enhanced Bengaluru's IT capabilities (Saxenian, 2000).

Privatization involves transferring ownership or management of public services or assets to private entities. In India, the privatization wave in the 1990s was part of broader economic reforms aimed at improving efficiency and stimulating growth. The IT sector was particularly affected by these changes, as many state-owned enterprises were restructured or privatized. The privatization of telecommunications in India played a crucial role in Bengaluru's rise as a tech hub. Improved telecommunications infrastructure facilitated better connectivity for businesses and entrepreneurs, enabling rapid communication and collaboration both domestically and internationally. Additionally, the liberalization of policies governing foreign direct investment (FDI) allowed for increased venture capital inflows into Indian startups, particularly in technology sectors (Gereffi & Fernandez-Stark, 2016).

The Great Inflation of the US in the 1970s

The 1970s were characterized by severe economic instability worldwide, which was largely caused by the event of America's Great Inflation. This was a period of sustained high inflation, with the peak being 13.5% annual inflation between 1980 (Investopedia, 2021). The origins of this crisis lie in a mix of oil shocks, budget deficits, and erroneous monetary policies, which had dire effects throughout the entire world, most especially on Global South nations with destabilized economies, thereby revealing structural weaknesses in the global financial system (Federal Reserve History, 2022).

The Great Inflation was actually a ten-year price rise fueled by a sequence of events. Expansionary monetary and fiscal policy in the 1960s created the foundation for monetary instability. The collapse of the Bretton Woods system in 1971 contributed to this effect by causing the dollar to depreciate, further fueling inflation rates (BNP Paribas, 2021). Furthermore, the 1973 oil embargo raised the production cost significantly, thus inducing inflationary pressures in nearly every sector (NBER, 2021).

With the mounting issues, the Federal Reserve implemented strict monetary contractionary policies in the late 1970s. Though the policy eventually led to moderation in inflation, the cost was disastrous: a steep recession that negatively affected economic growth and employment rates (Investopedia, 2021). The interaction between demand-pull and cost-push inflation over this period illustrated the difficult side of controlling the economy, where stringent monetary policies attempting to curb inflation always pushed unemployment rates high and the economy into recession (Federal Reserve History, 2022).

Briefly, the Great Inflation of the 1970s was a multifaceted crisis that was the product of earlier policy decisions and surprise shocks that left long-lasting impacts on the American and global economies. The lessons of this turbulent period continue to influence economic policy debates today.

Global South Consequences

The economic volatility witnessed in the United States towards the close of

the 20th century had far-reaching and profound implications for nations of the Global South. The global integration of financial systems, as well as the inherent weaknesses that mark developing economies, worked to amplify the effects of these disruptions, leading to severe socio-economic challenges. Some of the prominent implications included debt crises, balance of trade issues, as well as the policy reactions that shaped the economic trajectory of developing countries.

Debt Crises in the Global South

The debt crises of the 1980s were a turning point for most countries in Africa and Latin America. Most developing countries took huge loans from foreign financial institutions during the 1960s and early 1970s, leveraging the low-interest rate environment to finance their enormous projects in industrialization and infrastructure. Yet, America's growing inflationary pressures compelled the Federal Reserve to increase interest rates, thus increasing the debt servicing cost for these countries significantly. By the early 1980s, nations like Mexico, Brazil, and Argentina were confronted with unsustainable debts, leading to default and devastating economic dislocations. The effects of these economic crises were extensive, as foreign lenders demanded stringent austerity as prerequisites for renegotiating loans. Although the aim of these actions was to stabilize economic circumstances, they ultimately served to increase poverty and inequality. Government spending reductions on education, health, and social services reduced human development statistics, which created long-term development issues for the nations involved (Su & Soon, 2024).

Trade Imbalances and Economic Fragility

The inflationary pressures felt in the United States, and the resultant monetary policy shifts, disrupted world trade flows. Global South nations that were reliant on inexpensive products and raw commodity exportation found themselves struggling with lower competitiveness, which was compounded by rising import and production costs. There was also a sharp increase in the cost of importing fundamental products, such as machinery and petroleum. These trade imbalances helped further destabilize economies of these nations, prompting most governments to adopt structural adjustment policies in the face of rising deficits. The transition in favor of export-led growth strategies was at the cost of domestic industrialization and autarky. For example, commodity-export-based

economies such as Ghana and Zambia bore the full force of the volatilities of world demand and prices, a sign of the fragility of their economic systems.

Structural Adjustment Programs and Policy Responses

With rising debt and trade deficits, all governments across the Global South called upon international financial institutions, particularly the International Monetary Fund (IMF) and the World Bank, for assistance. The root policy reaction was the establishment of Structural Adjustment Programs (SAPs), which typically included austerity, deregulation, privatization, and trade liberalization. Governments had to cut public expenditure to manage budget deficits, more often than not by slashing allocations to fundamental social services such as education and health. Industries were deregulated in order to capture foreign investment, and state-owned enterprises were privatized with a view to enhancing efficiency. Meanwhile, the lowering of tariffs and trade barriers facilitated exports and aimed to integrate economies into the global market. The emphasis on liberalization and fiscal discipline, however, had the tendency to fuel social unrest and political turmoil. The SAPs' push for macroeconomic stabilization had the tendency to generate increased income inequality and decreased social protection.

Macroeconomic Restructuring Strategies

Due to inflationary pressures and economic stagnation, countries pursued various macroeconomic restructuring strategies in a bid to reinstate stability.

Tightening of Monetary Policy

The central bankers of affected countries increased interest rates to manage inflation by tightening money supply and stifling demand. This monetarist school of thought, based on theoretical models developed by economists such as Milton Friedman, put price stability at the heart of economic health. Effective as it was in managing inflation, high interest rates starved economic growth, especially in debt- and trade deficit-burdened economies. For instance, in Argentina and Brazil, money was tightened to stabilize prices but initiated recessions, causing disproportionate harm to the poor (Friedman, 1970).

Fiscal Discipline

Governments put in place austerity policies that aimed to reduce budget deficits and ensure fiscal sustainability. These policies included subsidy reductions, downsizing of public sector wages, and reducing expenditures on social infrastructure. Although necessary in stabilizing public finance, these policies were bound to have broad social impacts. In sub-Saharan Africa, the fiscal restraint that accompanied Structural Adjustment Programs (SAPs) resulted in reduced budgetary allocations to education and health and therefore the draining of human capital and vulnerability to external shocks (IMF, 2017).

Exchange Rate Policies

Most nations, in their efforts to respond to inflation pressures, implemented exchange rate policy reform. Floating exchange rates were used to achieve automatic stabilization of currencies by market forces, while devaluations were used to enhance export competitiveness. South Korea and Malaysia, in the Asian region, were effective in leveraging exchange rate adjustments in the generation of export-led economic growth. Nevertheless, devaluations in Africa and Latin America worked to cause imported inflation and more economic volatility, especially for countries reliant on imports (Rodrik & Velasco, 1999).

The US economic crisis unleashed a chain of repercussions for the Global South and, by implication, underscored the exposure of emerging economies to international financial instability. The legacy of debt crises, trade deficits, and Structural Adjustment Programs reconfigured economic and social landscapes, too often imposing tremendous human costs. While macroeconomic reform packages ensured some degree of equilibrium, they also highlighted the difficult issues involved in reconciling short-run financial objectives and long-term development goals.

Lessons from the 1970s Inflation for the Global South

The Great Inflation of the 1970s highlighted the vulnerability of developing economies to global economic shocks. Important lessons learned from this period include the need for diversification of economic structures, reduction in

dependence on external borrowing, and strengthening of institutions that will manage potential crises. Another lesson that developing countries learned was the need for greater regional cooperation in order to share the burden of global financial instability.

In sum, this made the Great Inflation of the 1970s one of the key turning points in world economic history, demonstrating the linkages between financial systems and systemic inequalities faced by the Global South. Responses to this crisis set in motion many of the contemporary debates on sustainable development, economic resilience, and the role of international financial institutions in setting the course for the global economy.

4.1.1 Globalization and Privatization Strategies of India in the 1990s: A Pivotal Transition

The decade of the 1990s was a watershed for India, marked by far-reaching economic reforms that placed globalization and privatization at their center. These policy responses were a deliberate response to both domestic economic challenges and the changed nature of the global economy. This period was transformative in the sense that it paved the way for India's integration into the world market and laid the foundations for its emergence as a major economic power.

Contextual Background: The Global and Domestic Economic Scenario

The economic transformation of India was triggered by a balance of payments crisis in 1991, which marked a watershed in its post-independence history. Decades of centralized economic administration, coupled with protectionist policies, had throttled economic growth and operational efficiency. The fiscal deficit became unbearable, foreign exchange reserves were depleted to precarious levels, and the country faced the real risk of defaulting on its external obligations. This crisis was contemporaneous with broader global economic shifts, such as the end of the Cold War and the emergence of neoliberal economic policies that favor free markets and espouse less government intervention (Bhagwati, 2004).

The then Government of India, headed by Prime Minister P.V. Narasimha

Rao and led by Finance Minister Manmohan Singh, started what is known today as structural adjustments. These indeed were a variety of policies aiming at liberalizing the economy and reducing the share of the state within the economy while creating a free and congenial atmosphere for private enterprise and international trade.

4.1.2 Essential Features of Policies on Globalization and Privatization

The economic reforms implemented in the early 1990s contained a wide-ranging plan for modernizing the entire economic structure of India. The essential elements of this plan included policies directed towards trade liberalization, foreign investment, privatization of public enterprises, and de-regulation of crucial industries.

Trade Liberalization

The protectionist barriers were mostly dismantled by the government, slashing the tariffs, quotas, and import restrictions that had earlier protected domestic industries from foreign competition. This process of integration into the global trade system was intended to provide a larger selection for consumers, efficiency gains, and convinced Indian firms to emulate globally competitive practices (Bhagwati, 2004).

Foreign Direct Investment (FDI)

The reforms, therefore, aimed at capital infusion, technology transfer, and industrial modernization through policies that would attract foreign investment. In light of this, the government relaxed restrictions on foreign ownership, opening up sensitive areas such as telecommunications and energy to bridge the gap in domestic savings and investment requirements (Ghosh, 2006).

Privatization of State-Owned Enterprises (SOEs)

The government began divesting its stake in state-owned enterprises with a view to increasing efficiency and easing fiscal pressures. A major ideological change was made here from the Nehruvian pattern of a state-dominated

economy to one that recognized private enterprise as the engine of growth. Privatization aimed to promote a business environment that increased competition while at the same time easing the fiscal burden of public enterprises that make losses (Kumar, 2002).

Deregulation

The reforms also dismantled the "license raj," a regime characterized by stringent regulations that had hindered entrepreneurial activities and hobbled innovation. In effect, the government succeeded in creating an enabling environment by bringing down bureaucratic barriers and thus facilitating new businesses, resulting in more dynamism in the economic landscape (Rodrik, 2006).

The adoption of globalization and privatization strategies required significant alterations in the governance structures and policy frameworks pertaining to the Indian economy. Such modifications were designed to rectify the enduring systemic inefficiencies that had afflicted the economy while concurrently positioning India in accordance with international economic standards.

Economic Liberalization

These have involved the government's liberalization efforts to reduce state control over various sectors of the economy, allowing market forces greater play in the allocation of resources. This helped to empower private enterprises and increased competition, thus contributing to productivity gains and economic diversification.

Financial Sector Reforms

Reforms in the financial sector helped buttress the overall economic transition. Various measures, such as interest rate deregulation, recapitalization of public sector banks, and allowing private and foreign banks into the market, were taken to improve the efficiency and stability of the banking system. The above changes have broadened access to credit, especially for emerging industries, and thus have served to nurture economic growth (RBI, 1998).

Industrial Policy Reforms

The government redefined its industrial policy in order to create a more investment-friendly environment. This was done by the removal of capacity-expansion restrictions and de-licensing of industries, and with incentives for foreign investors. This policy also catered to promote small-scale industries and technological innovations in information technology and telecommunication sectors (Hemming et al., 1995).

Investment in Infrastructure

Recognizing the critical role that infrastructure plays in generating economic growth, the government focused on transportation, energy, and telecommunications. These types of initiatives were instrumental in overcoming infrastructure constraints that had previously hampered industrial development and urbanization (Planning Commission of India, 2008).

Implications and Significance

The 1990s witnessed a paradigmatic shift in the economic trajectory of India, spearheaded by globalization and privatization policies. This massive integration into the global economy had resulted in a quantum increase in foreign investment, adoption of new technologies, and export growth for India. In particular, IT and services became the new engines of growth, with cities like Bengaluru emerging as global hubs for innovation and entrepreneurship.

Reforms such as these have also brought in a set of challenges. Reduction in governmental control raised social equity concerns, wherein the benefits that globalization brought weren't equally allocated or spread between diverse areas and socioeconomic classes. Metropolitan cities flourished as the rural areas and the weakest population groups could not cope with the rapidly changing times. It has enhanced income inequalities and regional disparities.

The economic reforms implemented in India were indicative of a wider trend of neoliberal globalization that affected numerous nations in the Global South throughout the latter part of the 20th century. These reforms, shaped by

international financial entities including the International Monetary Fund (IMF) and the World Bank, aimed to restore stability to economies facing crises while conforming to the standards of the global market. India's experience underscored the intricate challenges associated with enacting structural reforms in a nation characterized by diversity and a large population, providing significant insights for other countries undertaking analogous transitions.

The policies of globalization and privatization implemented in the 1990s were pivotal for India, altering its economic framework and establishing its role as an essential participant in the global economy. Through the adoption of trade liberalization, foreign investment, and privatization, India established the foundation for ongoing economic growth and modernization. While these policies induced growth in many fields, they simultaneously underlined the need to address social and regional disparities in order to ensure all-inclusive development. This period still remains one of the landmark chapters of India's economic history, reflecting the benefits and challenges that come along with integrating oneself into the world economy.

4.2 Regional competition between states in India

As globalization and privatization unfolded, regional competition intensified among cities in India and beyond. Cities began vying for investment by creating favorable business environments through tax incentives, infrastructure development, and support for innovation ecosystems. Bengaluru distinguished itself from other Indian cities like Hyderabad and Pune by leveraging its existing strengths in education and research. The presence of prestigious institutions such as the Indian Institute of Science (IISc) and numerous engineering colleges provided a steady stream of skilled graduates who fueled the IT industry. Furthermore, Bengaluru's vibrant startup culture attracted entrepreneurs looking to innovate in software development, biotechnology, and other high-tech fields. This competitive advantage positioned Bengaluru as a leading destination for IT services and software development in India (Dahlman & Utz, 2005).

By the late 1990s, Bengaluru had firmly established itself as India's tech capital due to the synergistic effects of globalization, privatization, and regional

competition. The city's ability to attract foreign investment while fostering local entrepreneurship created a robust ecosystem that propelled its growth in the information technology sector. As a result, Bengaluru not only became a hub for software development but also set a precedent for other cities in the Global South aiming to leverage similar strategies for economic advancement.

Bengaluru, now known as Bengaluru, has emerged as a prominent global city and a hub for multinational corporations (MNCs) in India. This transformation has been driven by regional competition among Indian metropolitan cities, as well as strategic policy changes adopted by the Government of Karnataka in alignment with the broader economic reforms initiated by the Government of India in the early 1990s. This response will explore Bengaluru's strengths and opportunities over its competitors, the regional competition dynamics, and the specific policy changes implemented by the Karnataka government from 1999 to 2024.

4.2.1 Regional Competition Between States

The competition among Indian states to attract investment and establish themselves as global cities has intensified, particularly in the context of economic liberalization. Cities like Hyderabad, Pune, Chennai, and Gurgaon have emerged as significant competitors to Bengaluru in attracting MNCs. However, Bengaluru has leveraged its unique advantages to maintain its status as a leading global city.

Strengths and Opportunities of Bengaluru over Hyderabad

Bengaluru has become India's leading hub for technology and innovation, pipping Hyderabad on most strategic counts. The reasons for Bengaluru's strength lie in its exceptional talent pool of highly skilled workers, strong IT infrastructure, exciting entrepreneurial ecosystem, improved quality of life, and excellent level of government support. These have captivated MNCs, entrepreneurs, and professionals

One of the greatest strengths of Bengaluru is its vast reservoir of highly qualified human resources in engineering and information technology (IT) fields. World-class institutions such as the Indian Institute of Science (IISc) and numerous engineering colleges are based in the city, which has enabled the development

of a robust talent pipeline. The steady supply of skilled human resources has been critical in attracting multinational companies (MNCs) to establish and expand their business in the city (Saxenian, 2000).

Besides, Bengaluru boasts a well-developed IT infrastructure characterized by an abundance of technology parks, incubators, and research institutions. This framework not only sustains the development of already established businesses but also promotes innovation and networking among emerging startups. Leading technology firms like Infosys, Wipro, and Tata Consultancy Services have deepened Bengaluru's reputation as the "Silicon Valley of India," thereby increasing its attractiveness to companies seeking a robust technological foundation (Dahlman & Utz, 2005)

Bengaluru has also developed a dynamic startup ecosystem, aided by venture capital funding and a cluster of accelerators and incubators. The entrepreneurial-friendly climate has fueled innovation, attracting multinational corporations that want to partner with startups for technology development. Bodies like NASSCOM have noted the city's thriving startup ecosystem, which has continuously generated high-growth companies and unicorns (NASSCOM, 2021).

Another significant advantage of Bengaluru is its relatively high living standard compared to other Indian metro cities. Bengaluru boasts a fine climate, plenty of green spaces, and cosmopolitan culture, making it a desirable place for expatriates as well as professionals from all over the world. This factor plays an important role in talent retention as well as attracting skilled professionals to the city (Hemming et al., 1995).

Besides, the state government of Karnataka has played an active role in the enforcement of policies to encourage investment in high-technology industries. Policies like the Karnataka Information Technology Policy have offered incentives for companies to set up their operations within the state, further establishing Bengaluru as a world technology hub. The state government's active encouragement has been a key driver of the city's sustained economic growth and attractiveness to investors (Karnataka Government, 2020).

In short, Bengaluru's human resource potential, IT base, entrepreneurial climate, quality of life, and government policy are all better for firms and

professionals than Hyderabad's. All of these have assured Bengaluru a top slot in India's tech future, where it will be able to attract investment and incubate innovation for decades to come.

4.2.2 Policy Changes Adopted by the Government of Karnataka

Strategic Policy Interventions in Karnataka Since 1999; Enhancing Bengaluru's Competitiveness. The economic reforms by the Government of India since 1991 laid the foundation for a new regime of liberalization and globalization, which has dramatically altered the structure and dynamics of regional economies. In reaction to these reforms at the national level, the Government of Karnataka initiated a sequence of specific policy interventions beginning in 1999, aimed at enhancing Bengaluru's status as a competitive and internationally acknowledged economic center. These policies emphasized the utilization of the city's human capital advantages, the promotion of innovation, and the resolution of urban development issues.

Essential Policies and Their Consequences

The Government of Karnataka announced several pivotal policies in line with Bengaluru's growth trajectory. These policies were critical in creating an ecosystem that would help industries, especially the IT sector, grow exponentially and would solve larger issues of economic and urban development.

Karnataka IT Policy (2000)

Karnataka chose the role of a trendsetter in the industry with the announcement of the Karnataka IT Policy 2000, riding on the huge demand for IT services that was witnessed around the globe. The policy involved infrastructure development, skill enhancement programs, and incentives for IT companies. Notably, this included IT parks, tax exemptions, and the establishment of smooth and hassle-free regulatory processes that could attract both foreign and domestic investments. The policy played a significant role in the growth of the information technology ecosystem in Bengaluru, hence solidifying its position as the "Silicon Valley of India" (Karnataka Government, 2000).

Karnataka Industrial Policy (2009)

Recognizing the need to diversify growth beyond the information technology sector, the Karnataka Industrial Policy of 2009 aimed at reviving industrial growth in multiple sectors. The policy focused on upgrading infrastructural facilities, providing fiscal incentives to industries, and encouraging public-private partnerships. It strived to synchronize the development of Bengaluru with the growth of other industrial centers within the state for balanced economic growth (Karnataka Government, 2009).

Karnataka Startup Policy (2015)

The Karnataka Startup Policy of 2015 was aimed at leveraging the rapidly growing startup ecosystem in Bengaluru. By promoting entrepreneurial activities and innovative ventures, the policy created an ecosystem that enabled startups to thrive. It offered financial support, mentorship programs, and access to incubation facilities, thereby making Karnataka one of the leading startup destinations in India. The policy also emphasized collaboration between industry, academia, and government to drive innovation (Karnataka Government, 2015).

Karnataka Electronics Policy (2017)

As a response to the growing demand for electronics manufacturing, the Karnataka Electronics Policy of 2017 aimed at the growth of this sector. Incentives were given to manufacturing units, and considerable employment opportunities were to be generated. By focusing on electronics manufacturing, the government would complement the currently existing IT and software ecosystem with a strong hardware manufacturing base (Karnataka Government, 2017).

Bengaluru Vision Group (2018)

The Bengaluru Vision Group was established in 2018 to develop plans for sustainable urban growth in the city. This group identified and addressed some of the critical problems facing the city, such as infrastructure constraints, traffic congestion, and lack of adequate urban planning. It suggested measures for improving transportation, better methods of waste management, and promoting

sustainability. The group's proposals aimed at balancing the rapid growth of Bengaluru with the maintenance of a good quality of life for all its citizens (Bengaluru Vision Group Report, 2018).

Karnataka Digital Economy Policy 2020

Given this backdrop of rapid digitization, the Karnataka Digital Economy Policy 2020 focuses on positioning the state as a leader in the field of digital economies. This policy emphasized the creation of better infrastructure in terms of digital communication, the area of digital literacy, and attracting investment on the frontier of artificial intelligence, blockchain, and IoT. It strove to see Karnataka become a global leader in the sector through digital innovation, ensuring inclusive development by digitally empowering its people.

Bengaluru Development Plan (2021-2024)

The Bengaluru Development Plan (2021-2024) was a holistic roadmap for the city to meet its urban challenges and thereby move towards sustainable development. This included smart city projects in collaboration with technology for better governance, traffic management, and waste disposal. It also focused on green infrastructure, affordable housing, and improved public transport systems to enhance livability, resilience, and sustainability in the city (Bengaluru Development Authority Report, 2021).

Bengaluru's Emergence as a Global City

The rise of Bengaluru to the status of a global city can be attributed to its unique advantages, which have included highly skilled labor force, strong information technology ecosystem, active entrepreneurial culture, and progressive government policies. The strategic initiatives by the Government of Karnataka from 1999 onward have not only consolidated the competitive position of Bengaluru but also helped it to emerge as one of the preferred destinations for multinational companies looking for regional headquarters in India.

The amalgamation of industrial policies with urban development strategies has facilitated Bengaluru's ability to maintain its growth trajectory while

simultaneously tackling socio-economic inequalities. Nevertheless, obstacles including traffic congestion, insufficient infrastructure, and environmental degradation continue to endure. These challenges highlight the necessity for ongoing policy innovation and cooperation among stakeholders to guarantee equitable and sustainable urban development.

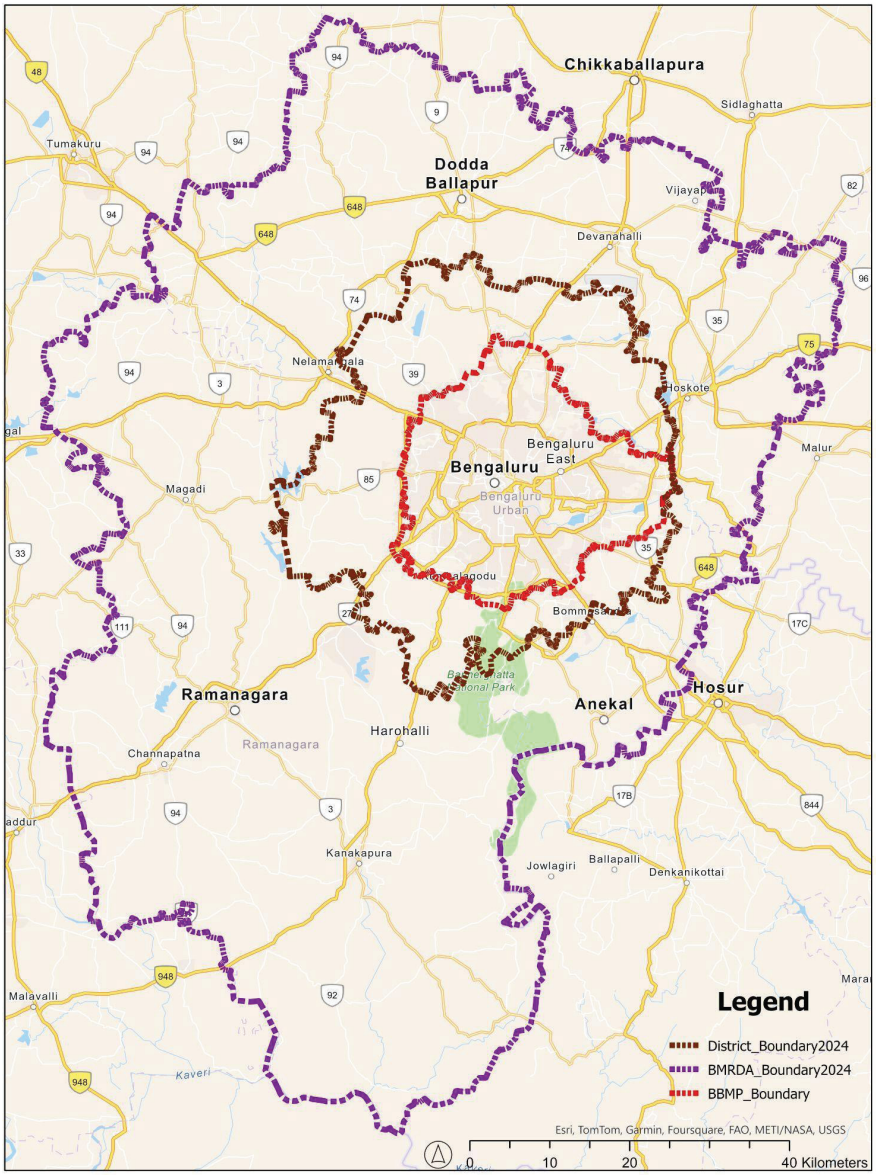
As Bengaluru marches toward its goal of being a premier center for economic and technological activities, the role of the Government of Karnataka becomes even more relevant in providing an overall structure that fosters innovation and addresses challenges the urban environment is facing. Its trajectory is an example of other metropolitan cities moving forward with development and sustainability during this period of globalization.

Chapter 5. Mapping Speculative Urbanism: Big Tech, policies, practices, and perspectives from the field

Chapter 5. Mapping Speculative Urbanism: Big Tech, policies, practices, and perspectives from the field

Bengaluru has undergone significant transformations over the years in its urban governance structure and local economics, particularly in the context of speculative urbanism i.e. a contemporary approach to urban development characterized by the intertwining of real estate capital flows, urban planning, and governance, particularly in cities of the Global South. Speculative urbanism is often associated with creating "World Class" cities through large-scale infrastructure projects to attract global investment. Similarly, in the case of Bengaluru, the practices and policies prioritizing real estate development and economic growth are often at the expense of social equity and environmental sustainability. The evolution of Bengaluru's governance structure has been influenced by its 'urban economy', which in turn shapes the city's development trajectory (Benjamin, 2000; Goldman, 2010). This chapter elaborates the influence of Tech industries on the infrastructure development and planning of Bengaluru in detail with the help from the literature study supported by learnings from the field expert interview and geospatial analysis.

Bengaluru's governance structure has evolved significantly since India's independence in 1947. Initially, the city was governed by a municipal corporation that focused primarily on basic urban services. However, rapid urbanization and population growth in the late 20th century necessitated a more sophisticated governance framework. Map 1 depicts the extent of Bengaluru Metropolitan area of 19500 Sq.Km., inhabited by nearly 14 million people. From the map we can understand broadly the major planning and development authorities in Bengaluru, which are Bengaluru Metropolitan Region Development Authority (BMRDA), Bruhat Bengaluru Mahanagara Palike (BBMP) and Bengaluru Development Authority (BDA). Here, BBMP and BDA share the same boundary but, their responsibilities differ as BBMP is responsible for the services and collection of property tax in the region, whereas BDA is responsible for decisions over land-use and the developmental rights, which is discussed in detail later in this chapter.



Map 1: The map depicts the extent of Bengaluru's metropolitan area of development.

5.1 Reforms in Governance Structure

5.1.1 Urban Development Authorities:

In the 1980s and 1990s, the Karnataka government established various urban development authorities to manage specific areas within Bengaluru. The Bengaluru Development Authority (BDA), formed in 1976, was tasked with planning and implementing urban development projects. This marked a shift towards a more structured approach to urban planning (Karnataka Government, 2009).

The BDA was created under the Bengaluru Development Authority Act of 1976, merging the planning functions of the City Planning Authority with the developmental responsibilities of the City Improvement Trust Board (CITB). This merger aimed to address the rapid urbanization and housing demands of Bengaluru's growing population by implementing a more organized approach to urban development (Timesproperty, 2023). The core competencies were Comprehensive Development Planning (CDP), Infrastructure Development, and Land Allocation. The establishment of the BDA marked a shift towards a more structured urban planning framework in Bengaluru.

Despite its significant contributions, the BDA has faced criticism regarding its functioning and governance since the 1990s. As Prof. SB mentioned in his interview and his research journal, there were systemic issues within the BDA, particularly in the lack of transparency in land allocation processes. He noted that the BDA operated largely under the control of appointed officials by the state government rather than elected representatives, which had led to the disconnect between the authority and the citizens it serves. This governance structure raised concerns about accountability, as most members are directly appointed by the state government, limiting local representation. He pointed out that this lack of oversight has contributed to allegations of systemic corruption within the BDA. He also elaborated that the opaque nature of land allocations has fostered an environment where favoritism and unethical practices can thrive. Many residents have expressed discontent, feeling marginalized by decisions that significantly affect their communities without their input or knowledge. Furthermore, he noted along with Prof. R, that while the BDA was intended to facilitate organized urban development, its operational shortcomings have often resulted in poorly planned residential layouts and inadequate infrastructure.

There was a critical need for reform within the BDA to enhance transparency, accountability, and community engagement in urban planning processes. Around the same time the 74th Constitutional Amendment was introduced which pushed for change in the process.

5.1.2 The 74th Constitutional Amendment Act of 1992

This amendment significantly transformed urban governance in India by empowering municipal bodies and establishing elected city councils. This

legislative change aimed to enhance citizen participation in local decision-making processes, thereby reinforcing democratic principles. Key provisions of the amendment include granting constitutional status to Urban Local Bodies (ULBs), the establishment of elected city councils, ward committees, and planning committees, as well as the devolution of powers to these bodies. The Twelfth Schedule of the Constitution enumerates the functions and responsibilities of municipalities, ensuring a structured framework for local governance (NIUA, 2004; GoI, 74th Amendment, 1992).

Despite these advancements in transparency and local involvement in governance, Prof. S.B. noted that the amendment also introduced complexities into the political landscape. He pointed out that the increased empowerment of local councils led to a divergence in vision and priorities between local governments and state authorities. Following the amendment, there was a notable increase in the direct involvement of the Chief Minister and their Cabinet Ministers in local governance matters. This shift meant that strategies developed at the local level often had to align with broader state objectives, which sometimes resulted in conflicts. He emphasized that this dynamic created chaos within the governance system, as decisions made by local councillors could be overridden by directives from higher state officials. The tension between local autonomy and state control has led to frustration among elected representatives at the municipal level, who may feel their voices and priorities are marginalized in favor of state-level agendas. This situation underscores the ongoing challenges in achieving effective decentralized governance while balancing local needs with state interests.

5.1.3 Bengaluru Metropolitan Region Development Authority (BMRDA)

Established in 1991 by the Government of Karnataka, the BMRDA aimed to promote integrated development across the metropolitan region. This authority plays a crucial role in coordinating development efforts among various local bodies and ensuring sustainable growth. One of its primary objectives is Integrated Development Planning, where BMRDA formulates comprehensive plans that evaluate infrastructure needs, land use, and environmental considerations to ensure balanced growth. Additionally, the authority plays a vital role in Coordination Among Local Bodies, working closely with entities like the Bengaluru Development Authority (BDA) and Bruhat Bengaluru Mahanagara Palike (BBMP) to ensure that town planning aligns with the overall development vision of the region.

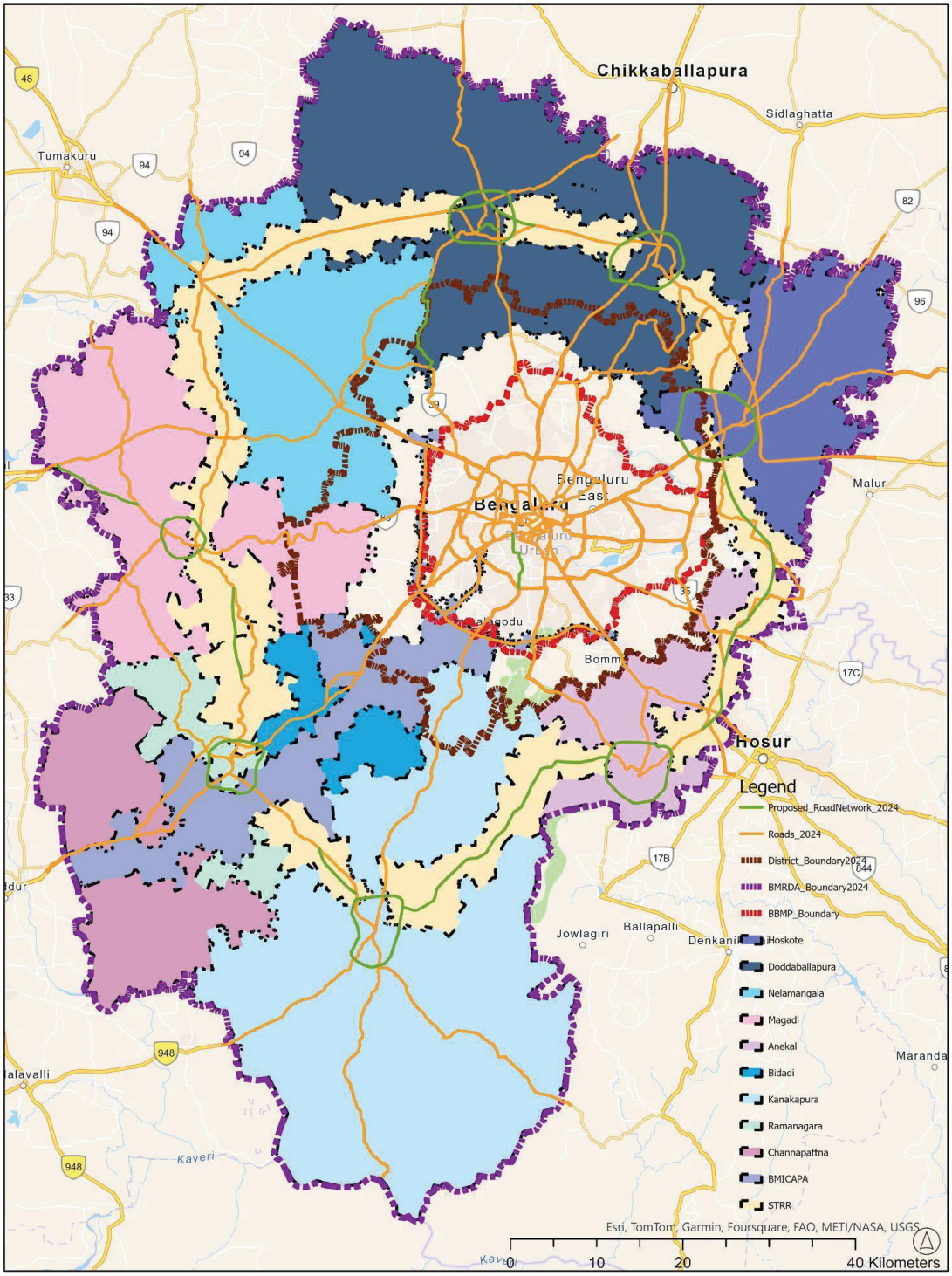
Furthermore, BMRDA is instrumental in Infrastructure Development, focusing on the planning and execution of critical projects such as roads and transportation systems to improve connectivity and alleviate urban mobility issues. Another significant initiative is Satellite Town Development, which aims to decentralize urban growth by promoting the establishment of satellite towns around Bengaluru, thus providing residents with alternative living options and reducing the pressure on the city itself. BMRDA also prioritizes Environmental Management, incorporating sustainable practices into its planning processes, emphasizing the importance of green spaces, waste management, and ecological conservation efforts (BMRDA Report, 2018).

The complexity of the coordination of development of the Bengaluru metropolitan region is represented in Map 2 below. It shows the administrative limits of multiple town municipalities within the metro region and their assigned areas for integrated action. These areas are vital for the planning and execution of development projects, particularly in the case of infrastructure projects like the Satellite Town Ring Road (STRR). The STRR serves as a critical connector, enabling the connection between the satellite towns surrounding Bengaluru and increasing their connectivity to the city center. By providing seamless connectivity, the STRR is expected to help achieve fair regional growth, decongestion of traffic choke points, and better incorporation of these peripheral towns into the metro structure. Map 2 displays the sort of joint effort among local governments that these large-scale urban infrastructure projects will require in implementation, also citing the importance of well-planned governance and strategic planning that shapes the course of the city of Bengaluru and its neighboring regions.

Map 3 also presents the existing major road infrastructure network crucial for the connection of the urban core of Bengaluru to its surrounding satellite towns and other important regional centers. This includes state and national highways crucial for the enhancement of inter-city and inter-state connectivity. The map highlights the connections to major urban centers, such as Tumkur and Mysore, and hence shows the important role these highways play in regional mobility and integration. It also indicates linkages to the neighboring state of Tamil Nadu, further solidifying Bengaluru as a major transportation hub within Southern India. These highways, planned and managed by the National Highways Authority of India, form the backbone of the region's transport infrastructure. The map shows how important strategic planning of infrastructure is, and what role NHAI can play in driving regional connectivity to support broader goals of economic growth and

urban development.

The following maps (Maps 2, 3) illustrate the intricate coordination efforts of the Bengaluru Metropolitan Region Development Authority (BMRDA) in collaboration with other state-level parastatal organizations and national agencies and the functions of these organizations are briefly mentioned in Annexure A. At the state level, the development and administration of town municipalities and the Satellite Town Ring Road (STRR) are the responsibility of state authorities, ensuring that the infrastructural needs of the metropolitan region are adequately addressed. Also, national bodies like the National Highways Authority of India (NHAI) and the National Industrial Corridor Development Corporation (NICDC) play a major role in planning and executing infrastructure projects that cut across state boundaries and their efforts will go a long way in laying the connectivity that further connects Bengaluru with broader national and industrial networks. The multi-layered approach shows all-important cooperation among regional and national entities in creating and maintaining the infrastructure that can be used to deal with problems of urbanization and regional economic development. These maps visually explain this interagency governance overlap; in other words, they indicate that urban and infrastructure planning projects are overseen and managed by various levels of governance.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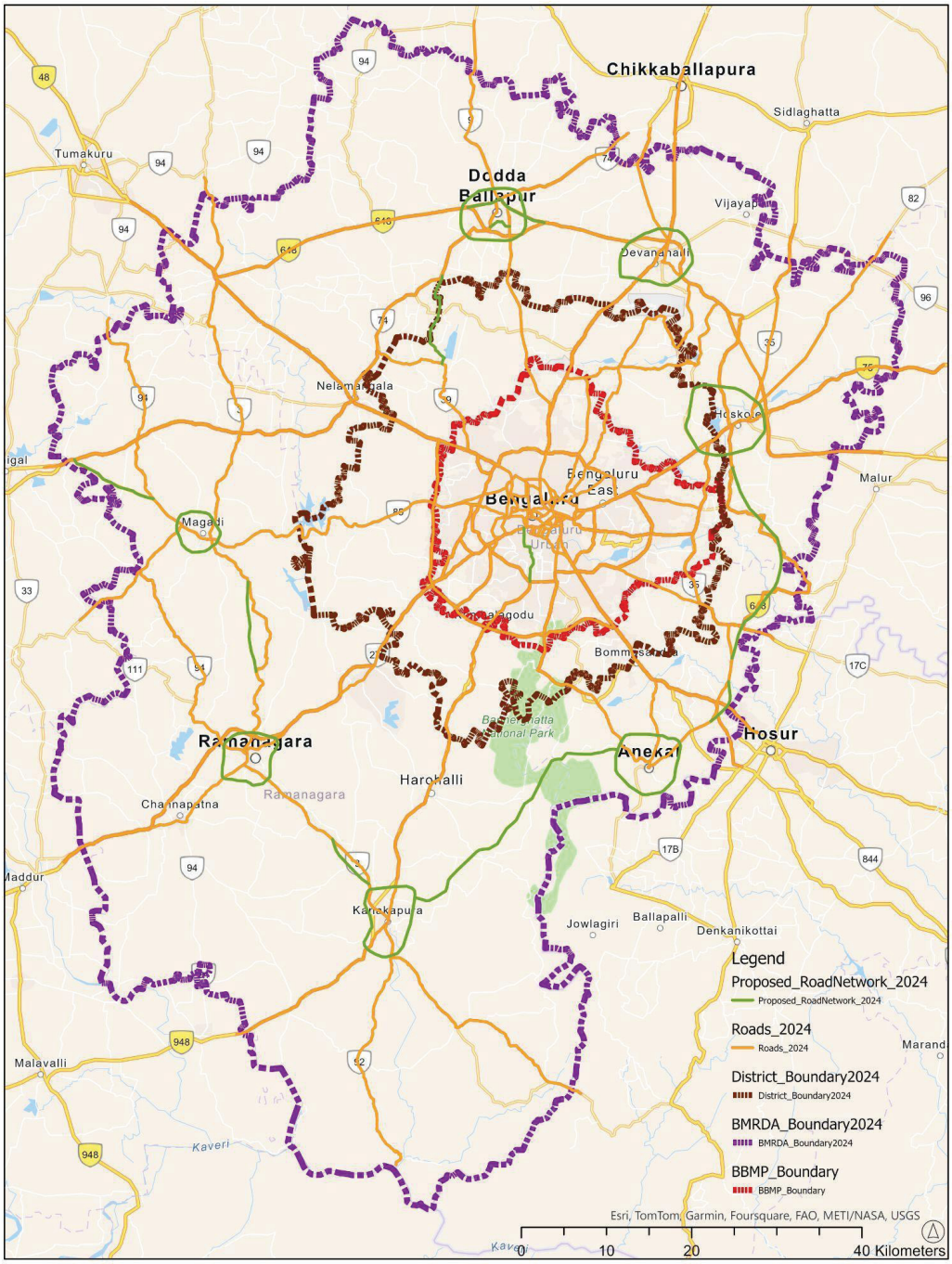


Map 3: The map illustrates the road infrastructure connecting Bengaluru's urban core to its surrounding satellite towns, emphasizing linkages to the city's IT industry.

In an interview, a government official from BMRDA underscored the authority's significance in Bengaluru's developmental landscape. The official described BMRDA as a crucial apex body that coordinates various developmental projects to align state objectives with local needs. This role is essential for ensuring that development plans are not only comprehensive but also responsive to the specific requirements of local communities. The official highlighted that BMRDA's

collaborative approach involves engaging multiple stakeholders, including local planning authorities and state government departments. By organizing joint planning workshops and facilitating interagency coordination, BMRDA ensures that diverse voices are heard in the decision-making process. This collaborative spirit not only enhances transparency but also fosters a sense of ownership among local stakeholders regarding development initiatives. Moreover, the official noted that BMRDA's efforts in data sharing and analysis enable informed decision-making based on current trends and community needs. By integrating public services into its planning framework, BMRDA aims to improve the overall quality of life for residents across the metropolitan region.

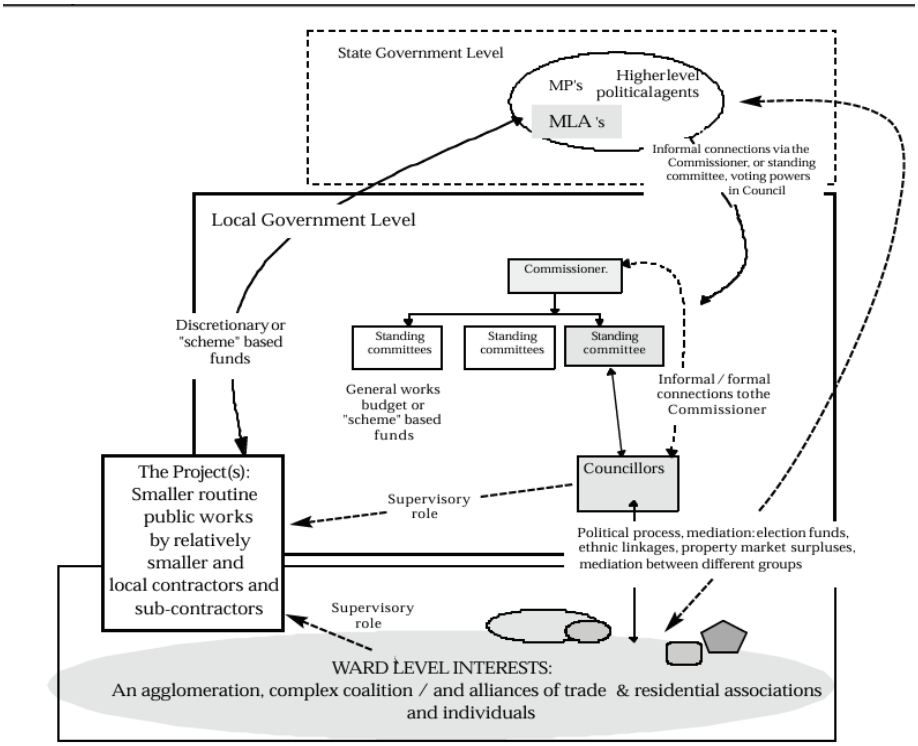


Figure 1: © Benjamin, S. (2000). Governance, economic settings and poverty in Bengaluru. Environment and Urbanization, pg-52

In reference to these policies and structural changes discussed above, the Urban Governance structure of Bengaluru today can be understood from the figures below. Figure 1 represents the structure involved in the decision-making process for routine developmental work at the local level.

In Figure 2 we can see the structure involved in the decision-making process for an urban design project in making a "World Class" city.

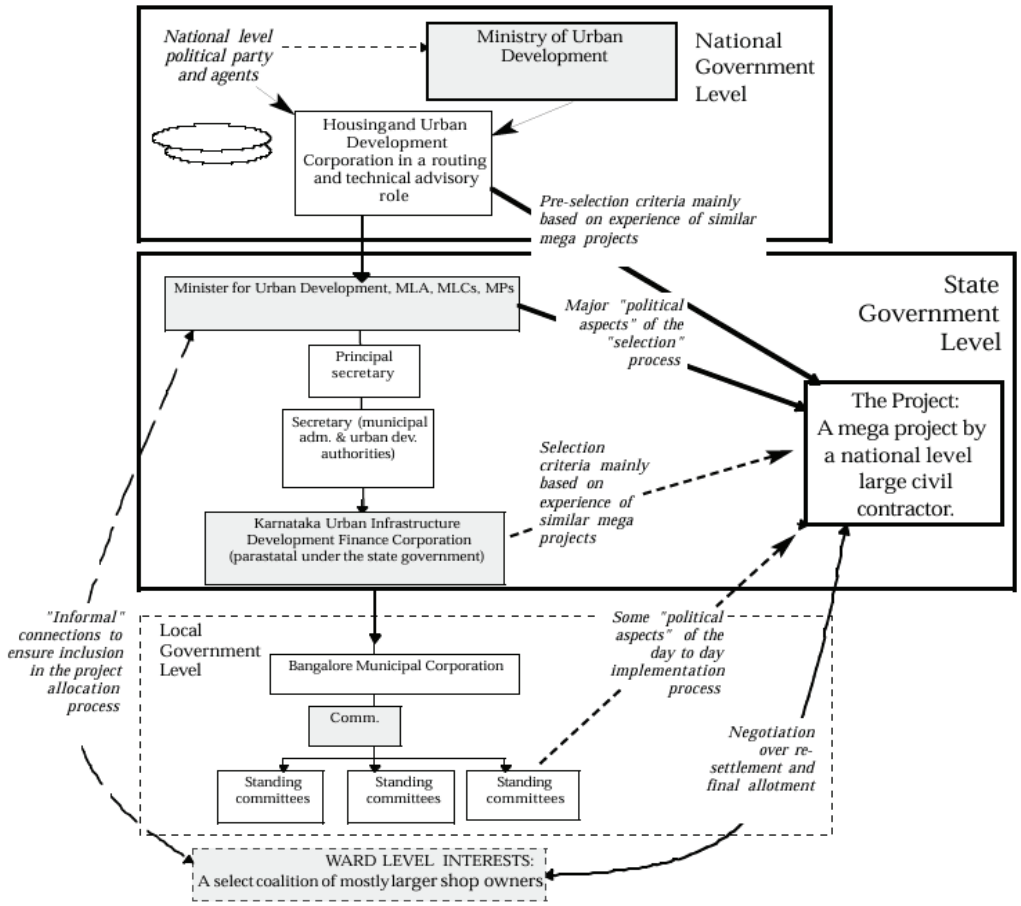


Figure 2: © Benjamin, S. (2000). Governance, economic settings and poverty in Bengaluru. Environment and Urbanization, pg-53

In recent years, there has also been a push for greater transparency and accountability in governance through initiatives such as e-governance and citizen engagement platforms. The introduction of smart city initiatives aims to leverage technology for better service delivery and urban management (Karnataka Government, 2020)

5.2 Urban economies as drivers of governance

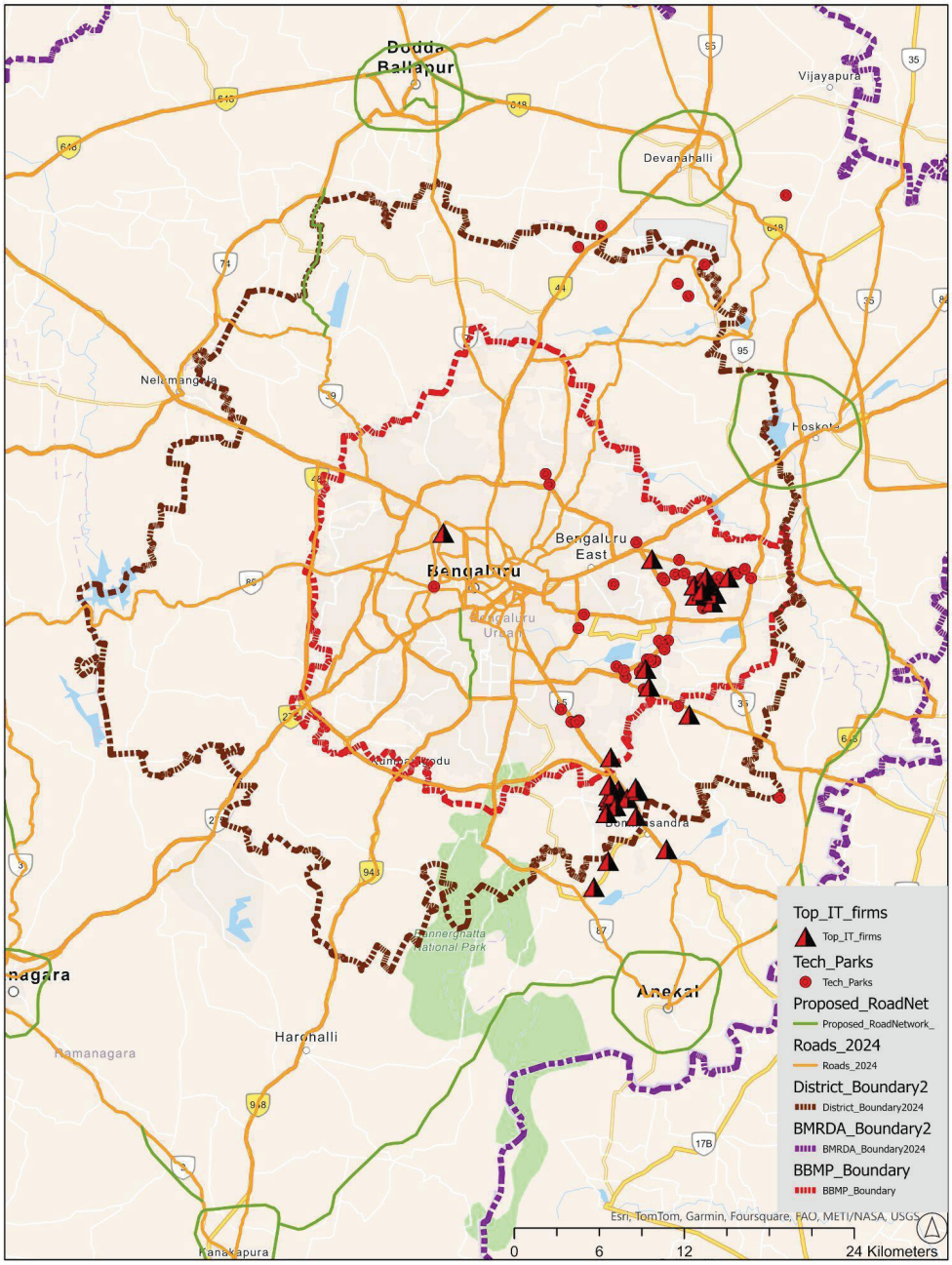
Urban economic activities significantly influences governance structures by shaping policy decisions related to land use, infrastructure development, and economic growth strategies.

5.2.1 Economic Drivers

The rapid influx of IT companies and MNCs has led to a booming real estate market in Bengaluru. This economic driver has prompted local governments to

prioritize infrastructure projects that support commercial activities, such as roads, public transport systems, and utilities. The emphasis on real estate development often leads to speculative practices where land is developed without adequate consideration for social equity or environmental impacts (Saxenian, 2012a).

According to Professor R, the influx of capital from the IT industry has dramatically increased demand for office spaces, driving property prices to unprecedented levels. He emphasized that this rapid escalation in real estate costs often occurs without regard for the local social context, as the government promotes a vision of a "World Class" city. Professor SB echoed these concerns, highlighting that the prioritization of IT firms' needs often overshadows local social aspects and community needs. Professor AR added that the locations chosen for IT firms are primarily based on access to critical services and infrastructure. This strategic placement has profound implications for social dynamics within the city. The emphasis on commercial growth has led to significant dissatisfaction among local political entities and communities, who feel overlooked and disregarded in the planning processes. Such disconnect between state-level initiatives and local community needs has contributed to tensions in governance. Local councilors and residents express frustration over decisions made without adequate consultation or consideration for their impact on social equity and environmental sustainability. As a result, the rapid development driven by the IT sector has not only reshaped Bengaluru's skyline but also strained its social fabric.



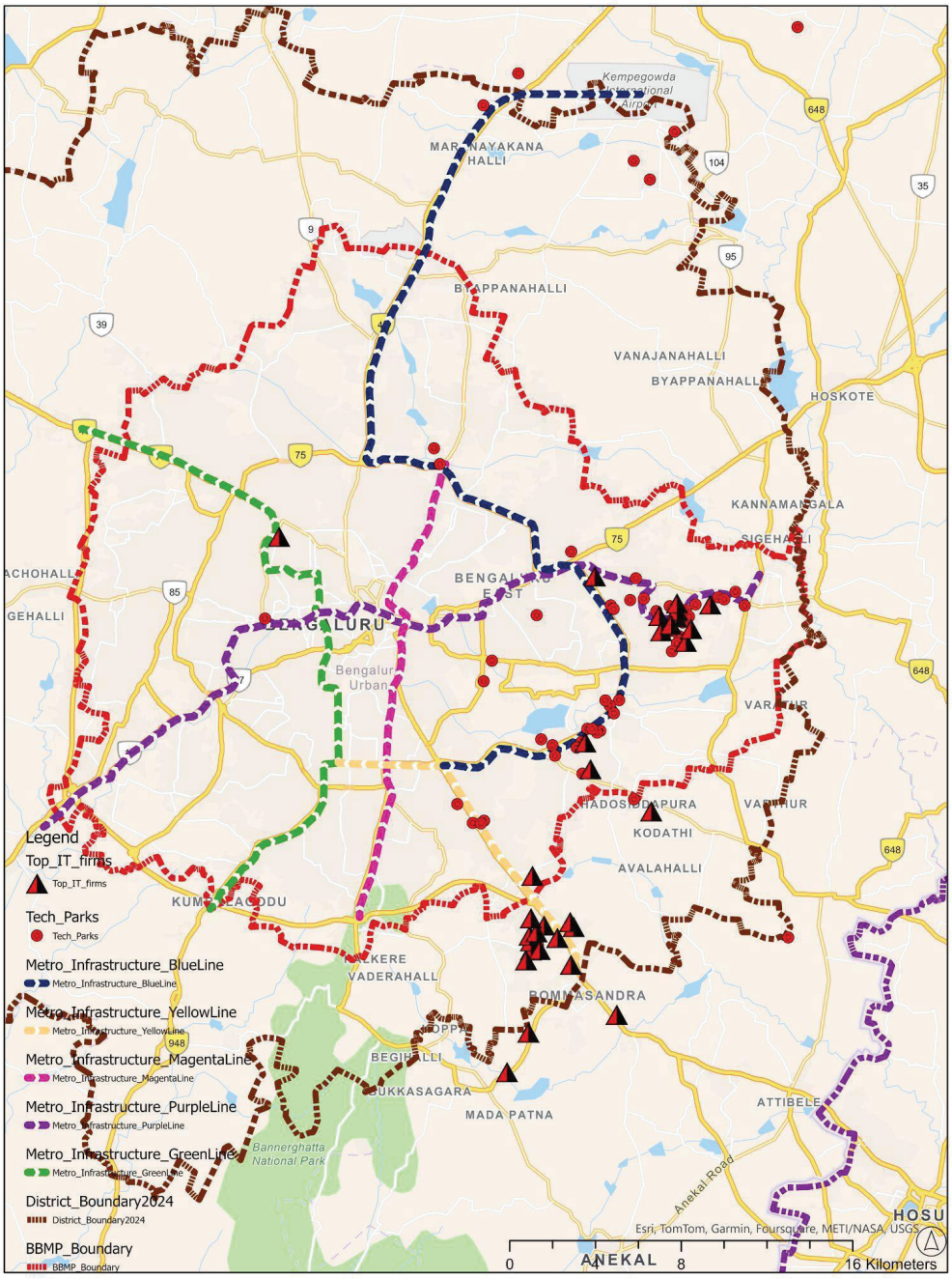
Map 4: The map illustrates the development of Bengaluru's road network, with a focus on its alignment to support Special Economic Zones (SEZs) that have driven the city's exponential growth.

As discussed in the paragraphs above, in Map 4 we can see the spatial overlap of the tech industry and the major roads in and around Bengaluru. Map 4 shows the concentration of these industries in SEZs created by the state government to facilitate the growth and connectivity of the metropolitan area with the tech firms.

Mobily infrastructure systems play a significant role in this story. The government has focused on improving connectivity through projects like the

Namma Metro rail system and upgrading road networks to facilitate easier access for businesses. These investments are essential for maintaining Bengaluru's competitiveness as a global city (World Bank, 2020). As identified in various analyses, including maps of *Special Economic Zones (SEZs)*, many of these zones are located far from the city center, highlighting the urgent need for efficient urban transport infrastructure. Until the late 2010s, Bengaluru primarily relied on an expansive network of roads and a complex local bus system. The introduction of the metro network marked a significant shift towards mass transit solutions. During the planning stages of operational lines, input from representatives in the IT sector was particularly valued, as this sector contributed approximately 40% of the city's total revenue at that time, according to a government official from the Bengaluru Metropolitan Region Development Authority (BMRDA). In the interview, the BMRDA official also elaborated on the collaborative approach taken during the metro's planning phase. The involvement of IT industry stakeholders in the standing advisory committee was critical in shaping transit solutions that would effectively address their needs while also benefiting the broader community. This engagement ensured that the metro system would not only facilitate better access to IT firms but also enhance overall urban mobility for residents. The official emphasized that such infrastructure investments are not merely about improving transport; they are about creating a comprehensive framework that supports economic growth while considering social equity. By integrating feedback from local businesses and communities, BMRDA aims to align transportation projects with the city's development goals. Furthermore, the official noted that as Bengaluru continues to grow, ongoing infrastructure projects like Namma Metro and other transit-oriented developments will play a vital role in reducing congestion and improving quality of life. These initiatives are expected to unlock significant real estate development potential across various areas of the city, thereby contributing to a more balanced urban environment.

As we can observe, the concentration of IT firms in the NE and SE regions of Bengaluru, proves the need of rapid urban transport systems like metro rail, facilitates high-speed connectivity for the techies living in and around the urban core of Bengaluru in Map 5. This supports the statement of the BMRDA official.



Map 5: The map illustrates a new typology of urban infrastructure in Bengaluru, focusing on the metro network and its role in enhancing connectivity to the city's Special Economic Zones (SEZs).

Overall, the insights from the BMRDA official underscore the importance of strategic planning and stakeholder collaboration in developing infrastructure that meets both business needs and community aspirations.

Another facet of speculative urbanism is the presence of Public-Private Partnerships (PPPs). Bengaluru's metropolitan governance structure has increasingly embraced public-private partnerships to finance urban development

projects. These collaborations allow for leveraging private investment while sharing risks associated with large-scale infrastructure projects. However, this model raises concerns about prioritizing profit over public welfare (Hemming et al., 1995).

PPPs have been involved in major infrastructure developments in India prior to the 2000s. In Bengaluru, however, these partnerships extend beyond mere financing; they also play a crucial role in valorizing the key nodes within the infrastructure network. For example, metro stations are not only transit points but also commercial hubs where spaces are leased out to private entities for economic activities. This dual role enhances the financial viability of infrastructure projects while promoting local economic growth and creating pockets of private business in otherwise public infrastructure. In an interview, a government official from the Bengaluru Metropolitan Region Development Authority (BMRDA) elaborated on the multifaceted role of PPPs in Bengaluru's urban development landscape. The official emphasized that PPPs are not just financial arrangements; they are strategic collaborations that involve conducting research on urban infrastructure projects and contributing to policy formulation. This partnership approach allows for a more comprehensive understanding of urban challenges and fosters innovative solutions tailored to the city's specific needs. The official highlighted several successful PPP initiatives that have significantly impacted Bengaluru's urban fabric. For instance, the integration of commercial activities within metro stations has not only generated revenue but has also enhanced user experience by providing amenities and services that cater to commuters. This approach aligns with the broader goal of creating vibrant urban spaces that encourage public engagement through economic activity. Moreover, the BMRDA official pointed out that effective communication and coordination between public and private sectors are essential for maximizing the benefits of these partnerships. Clear guidelines and regulations help mitigate risks associated with transparency and accountability, ensuring that all stakeholders' interests are safeguarded. Despite the advantages, the official acknowledged challenges inherent in PPPs, such as potential conflicts of interest and varying priorities between public entities and private investors.

5.2.2 Social Equity and Environmental Implications

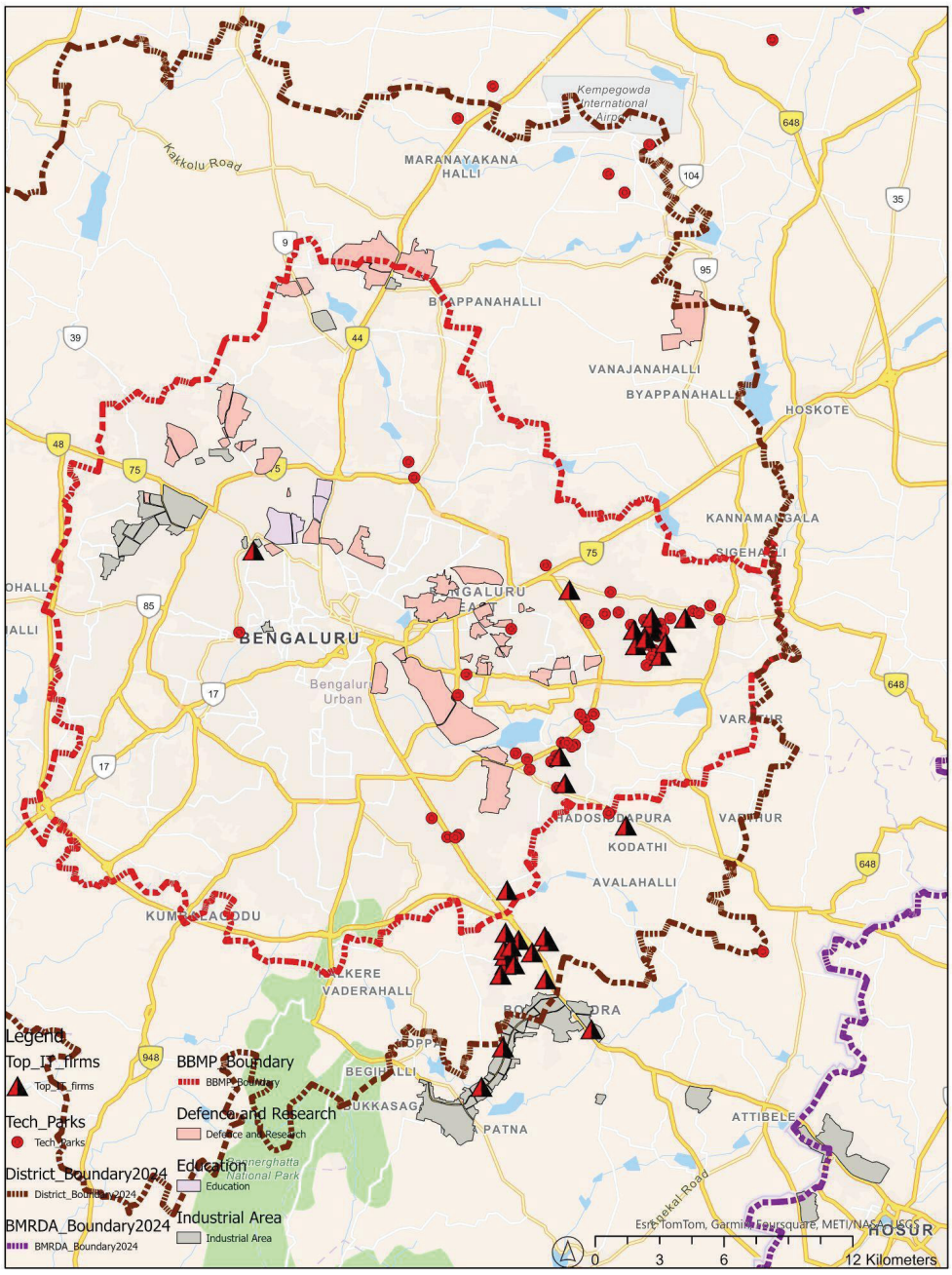
While Metropolitan gross output drives growth and attracts investment, it can also lead to challenges such as displacement of low-income communities due to gentrification and inadequate provision of affordable housing. The focus

on speculative urbanism often results in neglecting social equity considerations within governance frameworks of Global Cities (Sassen, 2001).

Bengaluru's urban governance structure has evolved in response to these economic pressures. The prioritization of real estate development and infrastructure investments aimed at attracting multinational corporations (MNCs) based on the Silicon Valley model" is evident, in Map 6 shown below, highlights the presence of Defence Research, Academia, and Industrial Areas geospatial integration through the transport infrastructure major roads and metro as shown in Map 4 & 5, influencing the development of Bengaluru like San Clara Valley of California. However, this economic growth must be balanced with social equity and environmental sustainability to ensure inclusive urban development. In an interview, a government official from the Bengaluru Water Supply and Sewerage Board (BWSSB) highlighted critical environmental concerns that have arisen since the inception of the IT industry in Bengaluru. The official pointed out that many of the largest tech parks have been constructed on reclaimed land from lakes, often situated in low-lying areas prone to flooding during heavy rains. This practice not only disregards environmental sustainability but also exacerbates urban flooding issues that affect the city's livability. The BWSSB official explained that these developments were expedited through parastatal agencies that fast-tracked approvals for land acquisitions, often without adequate consideration for environmental impacts or community needs. As a result, the city now faces complex challenges related to water management and flood control, which have become increasingly difficult to address due to the scale of urbanization.

Furthermore, the official noted that the earlier lack of stakeholder involvement in urban planning has contributed to an increased demographic load on Bengaluru's service infrastructure. With rapid population growth and insufficient investment in essential services like water supply and waste management, the city's infrastructure is under significant strain. This situation has led to deteriorating living conditions for many residents, particularly those in lower-income brackets who are most vulnerable to the adverse effects of urban development. The interview also touched on broader social issues arising from this rapid urbanization. The displacement of communities due to gentrification has created tensions between long-standing residents and new arrivals drawn by economic opportunities. Also, as we discussed earlier, exponential increases in real estate prices have driven a rise in housing costs in the city. To address these challenges, the BWSSB official emphasized the need for a more inclusive approach to urban

governance that prioritizes community engagement and considers social equity alongside economic growth. This includes integrating feedback from residents into planning processes and ensuring that infrastructure projects are designed to meet the needs of all citizens, not just those benefiting from economic development.



Map 6: The map illustrates Bengaluru's development strategy, which mimics the Silicon Valley model.

Bengaluru's transformation into a global city of technological innovation has changed, in consequence, both its governance structure and the urban development trajectory. Within this new economic context, the kind of speculative urbanism represented in real estate investments, governance policies, and urban planning has stepped up as one of the primary drivers of the process. This raises critical concerns about social equity and environmental sustainability issues because the city has espoused global competitiveness instead of inclusive development.

In the past, the governance of Bengaluru focused on the delivery of basic services through its municipal corporation. Rapid urbanization in the late 20th century prompted the creation of the Bengaluru Development Authority (BDA) in 1976 as a shift toward planned development. However, systemic problems of corruption, lack of transparency, and limited local representation have hindered the effectiveness in the functioning of the BDA. The 74th Constitutional Amendment Act of 1992 was meant to strengthen the role of ULBs and foster participatory citizenship; however, it also created a conflict between local self-government and state control, leading to more administrative tangles. These challenges highlight the inherent contradictions in the process of decentralized governance, in which the balance between local needs and broader state objectives remains an ongoing challenge. Meanwhile, urbanization in Bengaluru has been widely influenced by the growth of Big Tech companies and multinational corporations. The heavy investments of information technology funds in the real estate industry and their involvement in policy formulation have dramatically affected city planning and construction. Policies and programs such as subsidized land allotments in Special Economic Zones (SEZs) and tax incentives on exported services have exploited India's comparative advantage of low-cost labor; however, they have also diverted attention from aspects of social equality and environmental sustainability. Speculation in the real estate sector, driven by international investment flows, has triggered a property boom that has pushed out economically weaker sections of society while prioritizing profit maximization over urban development. Infrastructural projects like the Namma Metro reflect the city's desire for a "world-class" image; however, they often ignore the socio-environmental impacts related to rapid development. Public-Private Partnerships (PPPs) have played a key role in Bengaluru's development by bringing private capital to urban infrastructure projects. While these partnerships have energized the city's economy and brought improved connectivity, they often put a premium on financial returns over public welfare. Take the example of metro station

commercialization; here, PPPs combine economic and functional feasibility with urban needs but concerns around transparency and private interests that correspond to public needs are growing. The environmental consequences of Bengaluru's developmental trajectory are massive. Infrastructure growth has often encroached upon reclaimed wetlands and flood-prone areas, exacerbating urban flooding and putting an extra burden on essential services. Profit-making technology parks and real estate ventures have further aggravated these ecological concerns, with sustainability taking a back seat. The worst sufferers in this scenario are the weaker sections of society, with limited access to life-giving resources and increased exposure to environmental risks. The focus on international competitiveness has sidelined local concerns, creating tension between state-driven development approaches and the needs of communities.

Lastly, Bengaluru's governance and development outline the duality of speculative urbanism: dynamic economic growth versus socio-environmental challenges. Sustainable and inclusive urban development requires that the governance framework be based on principles of transparency, accountability, and active participation of all stakeholders. In leading the way for a holistic urban future, what Bengaluru must do is balance its economic aspirations with social equity and environmental resilience for all its residents. Ultimately, while Big Tech drives growth in Bengaluru, it is imperative for governance frameworks to incorporate social equity considerations and address environmental sustainability.

Chapter 6. Conclusion

Chapter 6. Conclusion

This dissertation sought to examine the significant influence of non-spatial planning entities, namely Big Tech corporations, on the spatial planning and development policies in Bengaluru. Through the examination of this interaction, the study showed how these influences have helped Bengaluru emerge as an international technology center but also brought forward complex challenges associated with social equity, governance, and environmental sustainability. These results offer a direct answer to the main research question about how the relationship between Big Tech and urban planning in Bengaluru has changed and what that change implies for the future of the city. This conclusion reflects further on these insights, their implications, and possible ways forward.

The study showed that big technology firms have played a major role in the urban development of Bengaluru, especially in the establishment of Special Economic Zones (SEZs) and IT corridors. These have attracted multinational companies, triggered rapid economic growth and further solidified the city's position as a global technology hub. However, this development has come at some cost. Urban policies have increasingly focused on the importance of high-value infrastructure projects, such as technology parks, upmarket residential zones, and integrated transportation systems, often at the expense of the needs of marginalized groups. In the process of monetizing land for these developments, economically weaker residents have been pushed to the periphery, where their ability to access basic services and infrastructure is limited. Such spatial marginalization brings into relief the socio-economic inequalities that have been exacerbated by the city's technology-driven growth paradigm.

The mechanisms of governance in Bengaluru have transformed themselves to align with corporate priorities and have substantially changed the way urban planning is conceptualized and practiced. Transparency and citizen engagement, which were core principles part of inclusive urban development, were compromised. More and more, planning processes have focused on the idea of a "world-class" city aimed at global investors and elite urban populations while sidelining the needs of marginalized groups. This has resulted in a disjointed urban structure where the benefits of development are not accruing equitably.

Environmental issues have been one of the main concerns in the context of this research. Rapid urbanization in Bengaluru, mainly due to the IT sector, has encroached into wetlands, green spaces, and natural drainage systems. This has increased the vulnerability of the city to flooding and, at the same time, furthered a larger ecological imbalance. The loss of biodiversity, coupled with increased pollution, points out the unsustainable direction of urbanization in Bengaluru.

The findings of this dissertation have relevance beyond Bengaluru and contribute much-needed insights toward urban governance and planning in an increasingly globalizing and technology-driven world. As cities are competing for global investments and positioning themselves as hubs of innovation, Bengaluru sounds a cautionary tale. While the economic benefits of becoming a tech capital are undeniable, the associated costs—social, environmental, and governance—serve as a reminder of the need for a more balanced approach. This only emphasizes the need for an urban agenda that places social equity at the forefront. There is a huge imperative for cities like Bengaluru to address the rampant inequalities that urbanization brings. Affordable housing, protection of rights of marginalized groups, and ensuring access to services for all need to be reprioritized.

Unchecked urban expansion is a global concern for environmental degradation. The case of Bengaluru shows how preserving natural ecosystems and integrating sustainable practices within urban planning is important to reduce the ecological footprint of urban growth. Moreover, the shift toward corporate-centric models of governance has deep implications for urban democracy. The case of Bengaluru reflects the risks of discounting community participation in the planning process. Strengthening local governance structures and fostering citizen participation is important to ensure that urban policies are representative of the diverse needs of the people. The influence of large tech firms on urban planning raises big questions about accountability and responsibility. While these firms provide momentum for economic progress, their consequences for urban landscapes must be monitored from the viewpoint of serving general welfare.

While important insights are brought out in this dissertation, this research also has its limitations. With a focus on the metropolitan scale, specific experiences across the city in many different neighborhoods and communities were possibly missed, as this dissertation addressed planning and governance issues on a

wide scale. Still, this work highlights the complex interaction between big-tech firms and urbanization in Bengaluru, revealing possibilities and challenges. While the growth of the city into a global technological hub has catalyzed economic growth and innovation, it has also led to a sharp increase in social inequalities and environmental degradation. These challenges can be resolved only by working together through collaboration among all actors—policymakers, businesses, communities, and researchers—to arrive at a future of fair and sustainable urban life.

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Annexure

Annexure A

Urban Parastatal Organizations in Bengaluru

1. BBMP - Bruhat Bengaluru Mahanagara Palike: The municipal corporation responsible for the maintenance and development of local roads and urban services.

2. BDA - Bengaluru Development Authority: Responsible for urban planning, land use zoning, and development projects within the city15.

3. BMRDA - Bengaluru Metropolitan Region Development Authority: Oversees planning and development in the larger Bengaluru Metropolitan Region.

4. BESCOM - Bengaluru Electricity Supply Company: Manages power distribution across the city1.

5. BWSSB - Bengaluru Water Supply and Sewerage Board: Handles water supply and sewage management in Bengaluru.

6. BMTC - Bengaluru Metropolitan Transport Corporation: Operates public bus transport services in the city.

7. BMRCL - Bengaluru Metro Rail Corporation Limited: Responsible for implementing metro rail services in Bengaluru.

8. KUIDFC - Karnataka Urban Infrastructure Development and Finance Corporation: Provides financial assistance for urban infrastructure projects.

9. BMLTA - Bengaluru Metropolitan Land Transport Authority: Coordinates land transport matters across the metropolitan area.

Organizations Related to Transport Infrastructure

1. KRDCL - Karnataka Road Development Corporation Limited: Focuses on road development and management within Karnataka.

2. DULT - Directorate of Urban Land Transport: Works on urban transport planning and policy implementation in Karnataka.

Organizations Related to IT Industry and Industrial Development

1. Karnataka State Electronics Development Corporation (KSEDCL): Promotes electronics and IT industries in Karnataka.

2. Karnataka Industrial Areas Development Board (KIADB): Facilitates industrial development by providing land and infrastructure to industries.

Financial Institutions Related to Big Infrastructure Projects

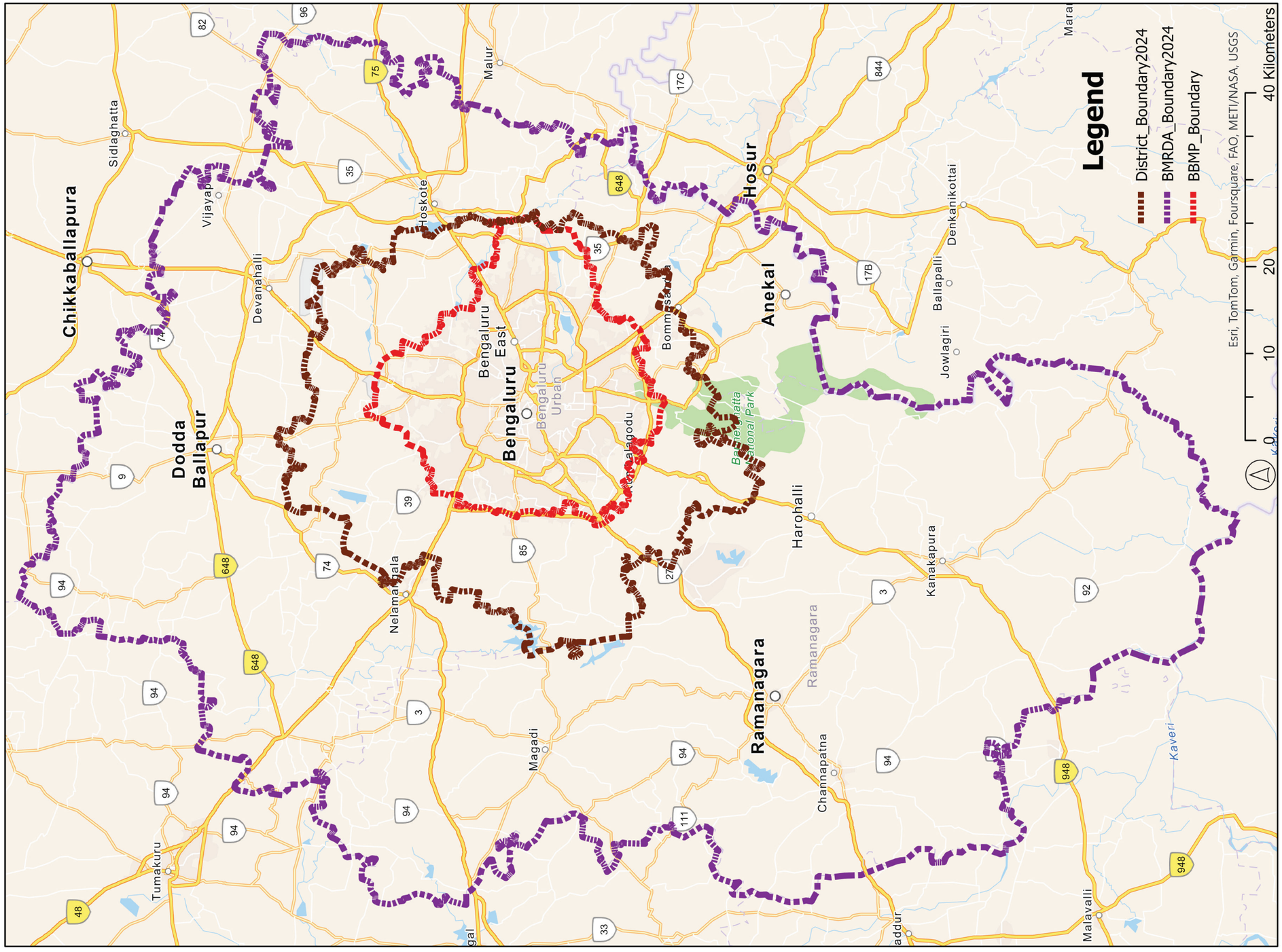
1. HUDCO - Housing and Urban Development Corporation Limited: Provides financial assistance for housing and urban development projects across India.

2. LIC - Life Insurance Corporation of India: Invests in various sectors, including urban infrastructure projects as mandated by government directives6.

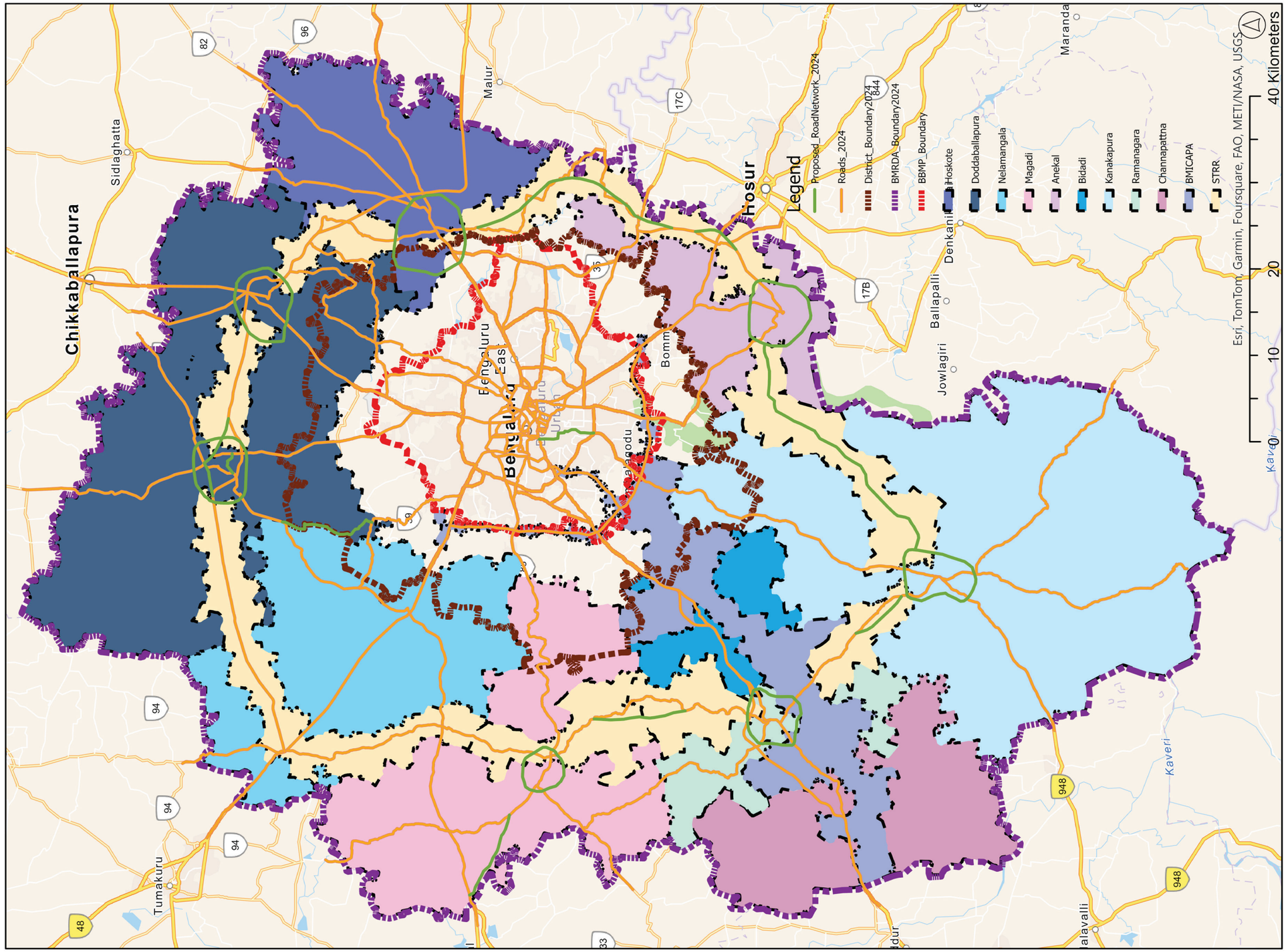
3. World Bank: Provides funding for large-scale infrastructure projects, including those focused on urban development in Bengaluru.

4. Asian Development Bank (ADB): Engages in financing urban infrastructure initiatives through various partnerships with state agencies like KUIDFC

Annexure B: Map 1



Annexure B: Map 2



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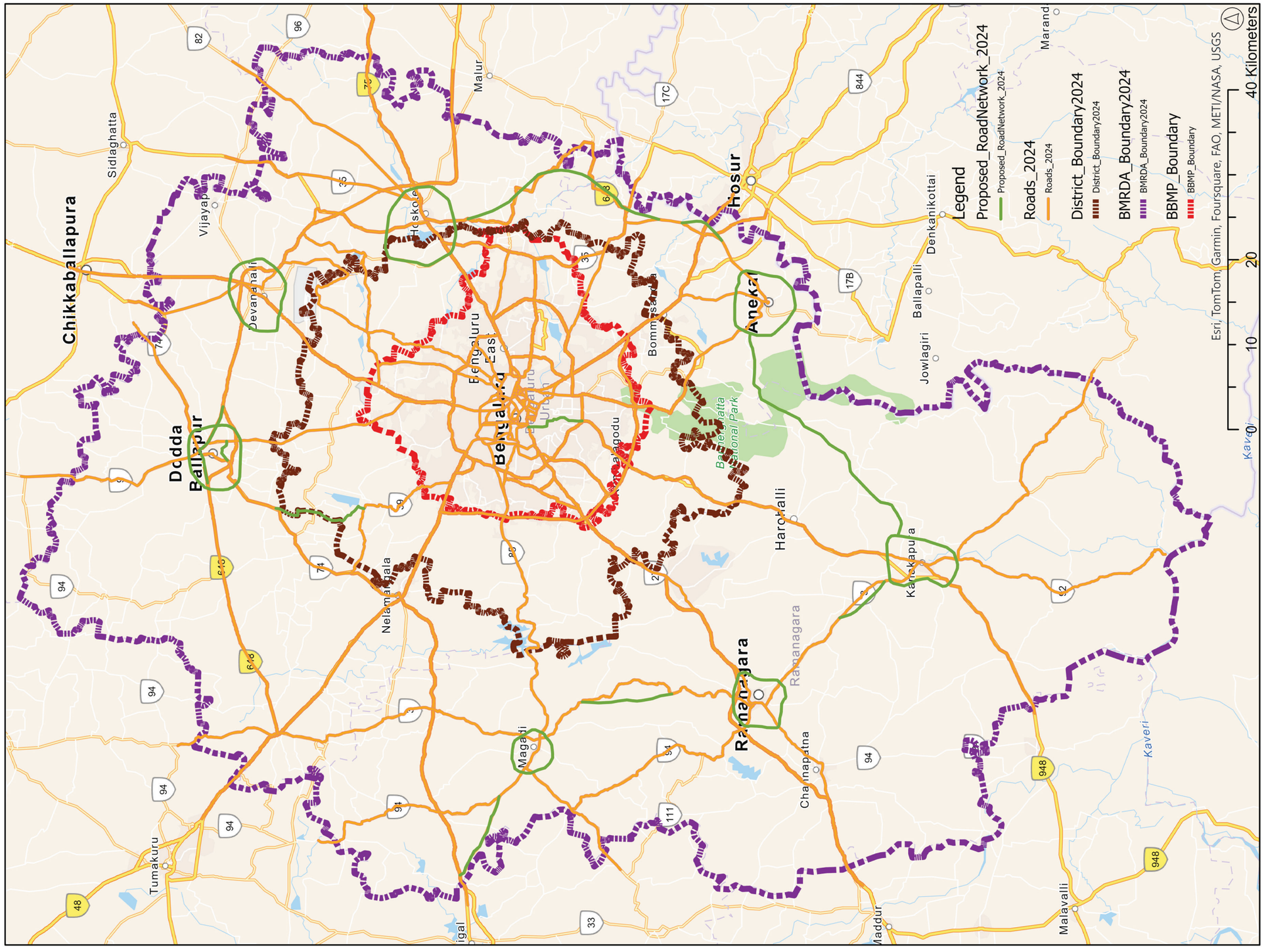

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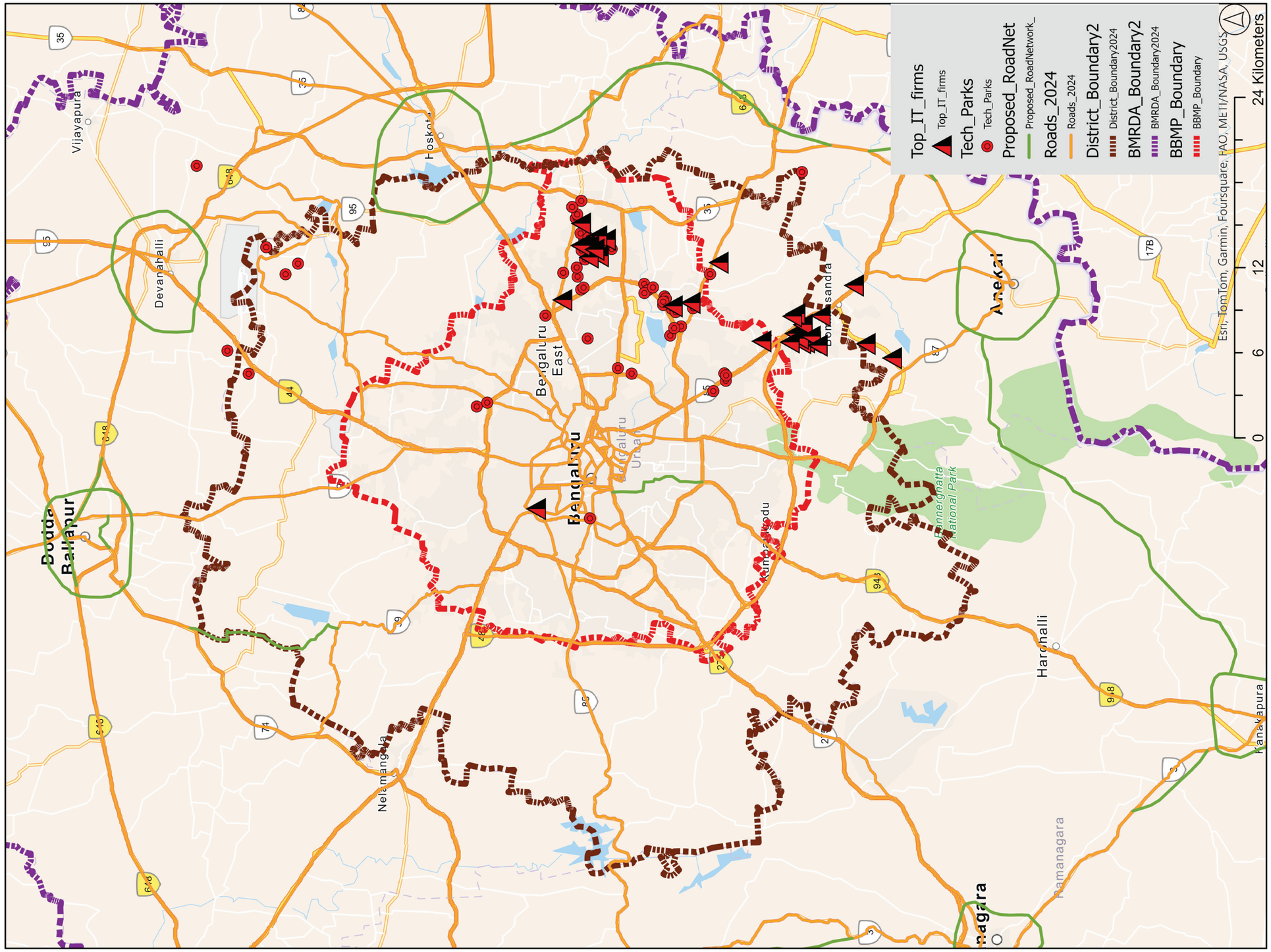
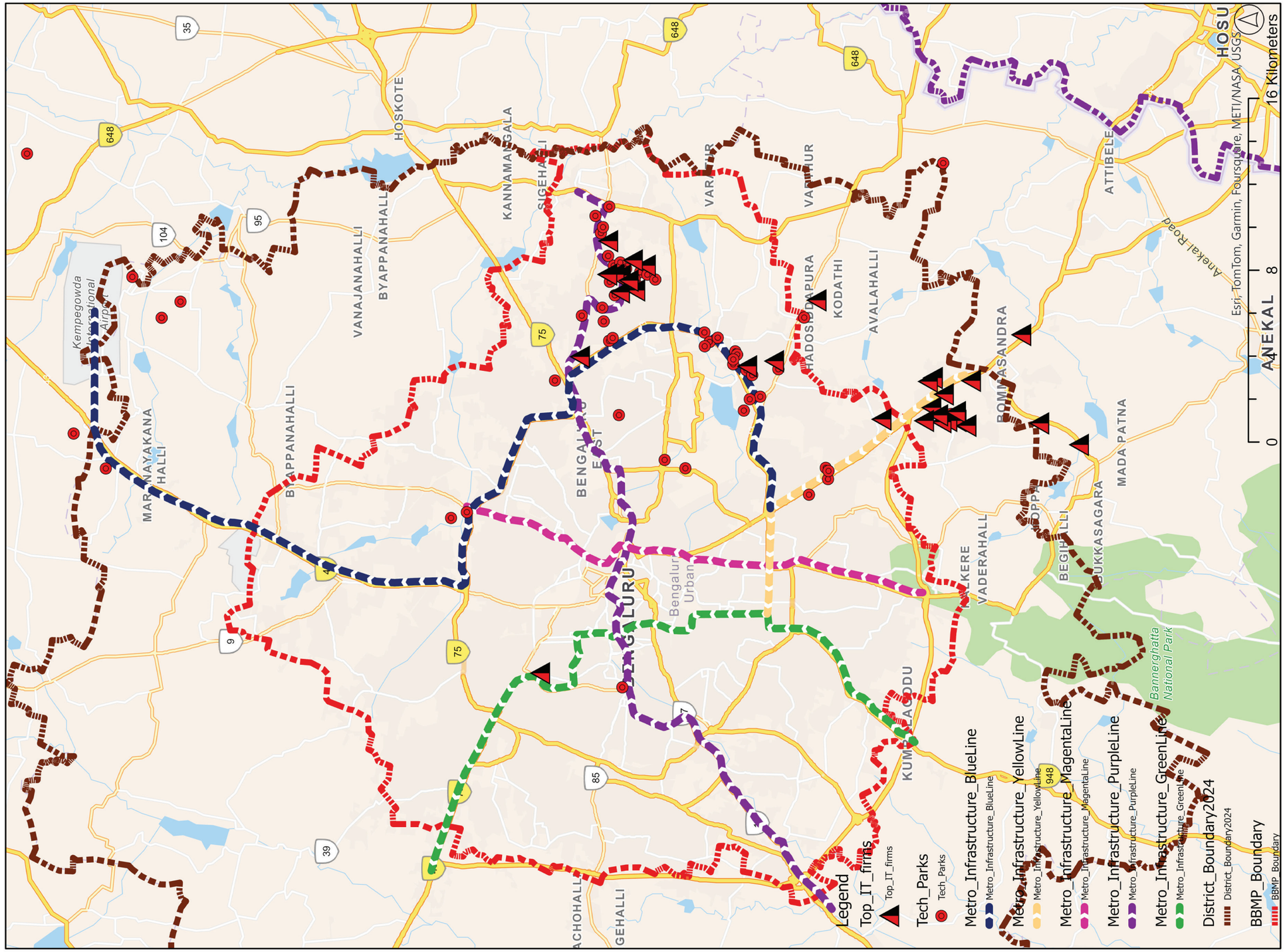


Annexure B: Map 5



Annexure B: Map 6