

# AT THE CROSSROADS OF REFORM AND SURVIVAL: THE UNSTRUCTURED BUS SYSTEM OF KARACHI

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## **ABSTRACT**

This study maps Karachi's unstructured bus network as of January 2026, offering the first citywide, system-level view of its informal public transport. It examines route density at the district and town levels in relation to land area and population, and assesses accessibility to education, healthcare, and employment through this network. The research further analyses spatial overlap with the emerging BRT system to evaluate the role unstructured buses continue to play in urban mobility. Using a mixed-methods approach, the study combines spatial analysis with field-based data on operations, challenges, and future trajectories of Karachi's oldest and most extensive bus transport system. Findings reveal significant spatial variation in access to colleges, universities, hospitals, and employment zones. They also show that actors within the unstructured bus sector remain largely excluded from Karachi's fragmented transport policymaking and are not envisioned by authorities as part of the city's future mobility system. As a result, the sector continues to operate under increasingly precarious conditions, struggling for survival despite its central role in everyday urban mobility.

**Keywords:** Informal public transport, Transport accessibility, Route Maps, Spatial analysis, GIS-based analysis, Karachi.

## **PREFACE**

This research project undertakes the first systematic documentation and spatial mapping of Karachi's unstructured bus network. Despite transporting millions of passengers daily, this system operates without an official route map, digital platform, or publicly accessible database. For most commuters, information about routes and stops circulates informally through word of mouth rather than through institutional channels. In a city that has historically lacked a consistent and reliable public transport system, unstructured buses have continued to serve as a critical backbone of everyday mobility.

The primary purpose of this study is to produce a comprehensive, citywide understanding of how Karachi is connected through its bus network. By generating route maps and spatial datasets, this project seeks to make visible a system that has long remained undocumented yet central to urban life. Beyond mapping, the research also aims to provide policy-relevant insights into the structure, functioning, and challenges of the sector, particularly in light of emerging formal transport initiatives.

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This project would not have been possible without the dedication of our field mappers, who tirelessly documented routes across the city under challenging conditions. We acknowledge Aamena Shafi, Aimen Imtiaz, Ali Tufail Arbab, Dua Mohtashim, Hasnain Raza, Hibah-al-Hussaini, Hooria Iftikhar, Insia Fatima, Kashaf Naeem, Khudaija Reza, Madiha Qasmi, Maria Hyder, Muhammad Omer Ali Khan, Noor-ul-Yen, Rosa Gardens, Sara Atiqi, Subhana Fatima, Umer Ahmed Khan, Zaafir Baig, and Zayaan Delawalla for their commitment and hard work. We would also like to mention the efforts of our transcribers Hooria Iftikhar, Aliza Shah, Madiha Qasmi, Daniya Shahid, Rosa Gardens and Insia Fatima in transcribing and translating hours of interviews for this project. We also thank our digital mappers, Fatima Aslam and Olive Sarwar, for compiling and spatially organizing data on colleges, universities, and health facilities across Karachi.

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## **ABBREVIATIONS**

ADB	Asian Development Bank
BHU	Basic Health Unit
BRT	Bus Rapid Transit
DG	Director General
DIG	Deputy Inspector General of Police
DSG	Deputy Superintendent of Police
GP	General Public
IBA	Institute of Business Administration
ITDP	Institute for Transport and Development Policy
JICA	Japan International Cooperation Agency
KCR	Karachi Circular Railway
KDA	Karachi Development Authority
KMC	Karachi Metropolitan Cooperation
KTI	Karachi Transport Ittehad
MVI	Motor Vehicle Inspection
NOCs	No Objection Certificates
OCD	Obsessive Compulsive Disorder
PBS	People's Bus Service
RQ	Research Question
RTA	Regional Transport Authority
SDGs	Sustainable Development Goals
SMTA	Sindh Mass Transit Authority
SPs	Superintendents of Police
UTS	Urban Transport Scheme

## INTRODUCTION

Karachi has long struggled to develop an adequate public transport system for its rapidly growing population, which now exceeds 20 million people. By 2030, the population is expected to surpass 30 million, greater than many countries of the world. This creates significant challenges in achieving several Sustainable Development Goals (SDGs), particularly SDG 11 (URC, 2017). The city grapples with issues like congestion, accidents, and pollution due to a limited and deteriorating road network, unreliability of local private buses, and increasing reliance on private transportation. While a major government-led public transport restructuring project is underway, privately owned minibuses, coaches, and paratransit services (such as Qingqi rickshaws) have remained in operation since their introduction in 1971 and 2009, respectively. However, these services face numerous issues, including the absence of formal bus stops, over speeding, poor roadworthiness, and frequent delays. Despite these challenges, these modes of transport are the primary option for Karachi's lower and lower-middle classes, given the lack of affordable alternatives. Government-launched transportation services, however, have consistently failed to adequately serve the city's low-income, underserved areas.

Karachi experienced an annual growth rate of 13.35% between 1955 and 2010 and continues to grow at an alarming rate (Li et al., 2023). As urban sprawl extends further, more areas require connectivity to the city centre. Unfortunately, as many of these developments are unplanned, essential public services and employment opportunities remain concentrated in central Karachi. Most of the city's public colleges, universities, and major hospitals are located in these central areas, leaving lower-income populations dependent on the local transit system to access them.

Despite operating since the 1970s, these buses have avoided modernization, and their routes continue to be communicated informally by word of mouth. While regular commuters may be familiar with the often complex and frequently changing bus and Qingqi networks, new users have to rely on the conductor's announcements to understand which routes the vehicles follow. With no formal documentation or accurate online information available, this study filled this need of local commuters by mapping the routes of privately operated buses in Karachi. This research would benefit not only the owners, operators, and users of these services but also enable the government to better regulate them and make more informed decisions regarding the ongoing mass transit project. Given the economic, political and technical complexities involved, it is more practical for the government to work in collaboration with these existing services rather than bypassing them (Wani & Manwaring, 2021).

Although the SMTA is pursuing several transport initiatives in Karachi, no comprehensive transportation policy, plan, or strategy has been devised yet. Current projects have been outsourced to international organisations without adequate baseline mapping or stakeholder engagement. A holistic baseline study of Karachi's transport system is critical to meeting the targets of SDG 11 and making the city more liveable. This would also lead to improved health outcomes and a reduction in climate impacts by fostering a more financially and environmentally sustainable transit system.

This research investigates the structure, operations, and challenges of Karachi's unstructured transit system, specifically privately owned buses and Qingqi rickshaws, to address the city's pressing urban

mobility issues. By mapping operational routes, identifying major transit corridors, and analysing the integration of Qingqis within the broader transportation network, the study assesses how these unstructured modes support access to essential services like healthcare, education, and employment.

It further examines the decision-making processes behind route development, profitability, and the spatial expansion of these services. Through geospatial analysis and engagement with key stakeholders, the research has generated an evidence-based understanding of Karachi's unstructured transport sector. The goal is to inform the development of urban mobility policies that are equitable, sustainable, and better integrated with formal initiatives, such as the Karachi BRT systems, thereby contributing to a more efficient, inclusive, and climate-resilient transportation framework for the city.

This paper is structured into four main sections. Following the Introduction, the Literature Review synthesizes existing scholarship on Karachi's transit system, with particular attention given to studies on unstructured bus services and Qingqis. The Research Methodology section then outlines the study's research questions and the methods employed to address them. The subsequent section presents the Research Findings and Discussion, answering the research questions by integrating spatial analysis with qualitative insights from fieldwork and interviews. The paper concludes with a summary of key findings in the Conclusion section, followed by a set of evidence-based Policy Recommendations aimed at strengthening and improving Karachi's public transport system.

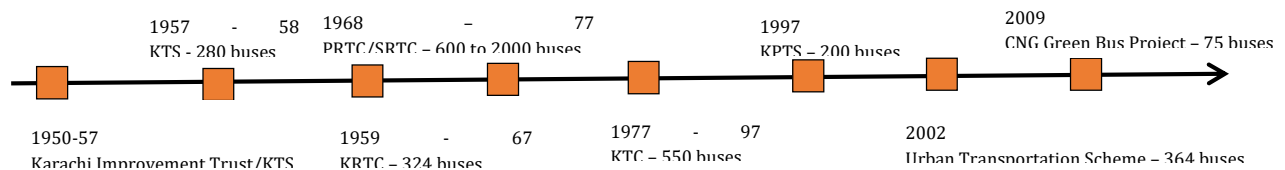
## LITERATURE REVIEW - A STORY OF KARACHI'S URBAN TRANSIT SYSTEM

Karachi, a metropolis of over 20 million residents, was long regarded as an anomaly among the world's megacities. Until January 2022, it remained the only megacity without a functional mass public transport system. This changed with the launch of the Karachi Breeze Bus Rapid Transit (BRT) Green Line, which marked the city's first step toward an organized, large-scale transit solution. Drawing on this landmark development, the literature review is structured in two parts: (i) the state of Karachi's urban transit system prior to the introduction of BRT, and (ii) the transformation of the urban transit landscape following the operationalization of the Green Line BRT.

### 2.1. Urban Transit System of Karachi - Before January 2022

Post-Independence, Karachi followed a perfect example of Multimodal Transit System that now many developed cities aspire to build. With buses, trams, taxis and horse drawn carriages it was a well networked alternative transportation system that did not rely heavily on single mode. With the influx of migrants from India and other parts of the country post-independence, and new towns being created under the Karachi Resettlement Plans, new transport services were initiated by the government to meet the ever-increasing demand, shown in the image below:

*Figure 1 Karachi Public Transport Initiatives Timeline*



*Source: Authors' compilations.*

Karachi's history of government-backed bus initiatives reveals a repeated cycle of ambitious starts followed by financial collapse, mismanagement, or external shocks. From the 1950s through the 2000s, every major effort, from the Karachi Transport Syndicate to the Karachi Road Transport Corporation, Sindh Road Transport Corporation, Karachi Transport Corporation, and later schemes like KPTS, the Urban Transportation Scheme, and the Green Bus Project, failed to sustain operations. The core reasons were consistent: weak financial models, poor maintenance, lack of subsidies, competition with informal minibuses, political violence, and investor withdrawal. Despite multiple large-scale fleets being introduced that sometimes were in the thousands, the system repeatedly broke down, leaving Karachi dependent on informal, unregulated transport. This pattern explains why, until the BRT's arrival, Karachi remained an anomaly among megacities, with decades of failed public sector transit experiments and no enduring mass transport system.

### 2.2. Unstructured Buses

Following the repeated failures of government-backed transport initiatives, privately owned buses emerged as the backbone of Karachi's transport system. They quickly became the primary mode of transit, particularly serving the growing demand in peripheral settlements located far from the urban core. Their dominance was cemented in 1971, when the government introduced the Free Transport Policy, which allowed any individual able to purchase a bus to apply for a route permit from the Regional Transport Authority (RTA), Government of Sindh. This policy gave rise to the city's iconic

minibuses, distinguished by their vibrant truck art (Hasan & Raza, 2015; Anwar et al., 2018; Imran, 2009).

Contrary to perceptions of chaos, these buses operate within a privately managed but relatively structured network, following verified RTA-issued routes, using designated parking areas, maintaining timetables, and cultivating informal relationships with the police (Hasan & Raza, 2015).

In recent years, however, the operations of these buses have witnessed a rapid decline. A comparative analysis by Noman et al. (2020) shows that the number of public transit routes dropped significantly, from 149 in 2012 to 90 in 2017, with the Karachi Transport Ittehad reporting a further reduction to just 71 routes in its latest update. Despite this contraction, buses and minibuses continue to meet more than half of Karachi's transport demand (Qureshi & Huapu, 2007). Still, accessibility remains constrained: many potential users are unaware of existing routes due to poor communication, while even regular commuters may lack knowledge of more efficient connections to their destinations.

### **2.3. Para-Transit (Qingqi Rickshaws)**

Qingqi rickshaws were introduced in Karachi in 2009 and quickly gained popularity as a solution to the city's public transport crisis. By 2014, they had captured 66% of the market, offering a cheaper and more flexible alternative, thereby significantly reducing the dominance of minibuses (Maher, 2014). By 2015, the number of Qingqis surged to over 40,000, although it was reported that more than 10,000 Qingqis were unregistered with the Qingqi Welfare Association (Hasan, A., & Raza, 2015).

Currently, no updated figures are available on the total number of Qingqis. These vehicles serve short-distance commuters, especially within local streets and minor arterial roads, effectively filling the gap left by the declining bus services and their shrinking routes. Despite lacking formal government licenses, the Qingqi Welfare Association, a private body, oversees various aspects of their operation. This includes route allocation, fare setting, establishing parking stands, managing informal payments to local authorities, and maintaining records of drivers and owners. It also addresses complaints, manages route registration, and ensures some compliance with traffic regulations. However, many Qingqis operate outside the association's purview, and underage drivers are a known issue. The welfare association has expressed interest in government regularization, but no substantial steps have been taken by the authorities (Hasan, A., & Raza, 2015).

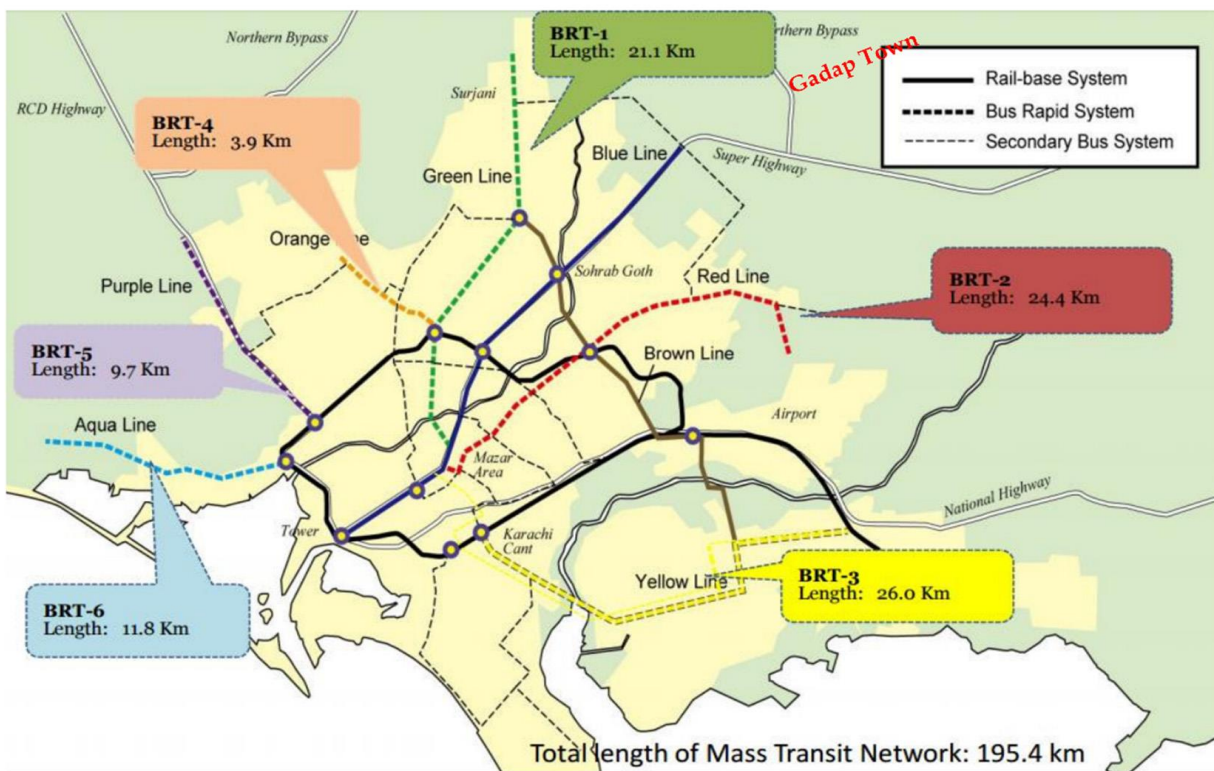
The legal status of Qingqis has evolved over time. In 2018, the Sindh government allowed them to operate on certain routes, provided they obtained fitness certificates and licenses (ARY News, 2018). Despite this, concerns about safety and reliability persist, particularly regarding their operation on major arterial roads. Although Qingqis offer advantages such as low fares, flexibility, and quick service, they continue to face challenges. Many commuters, especially women, prefer Qingqis over buses or taxis due to their openness, affordability, and accessibility (Hasan, A., & Raza, 2015). Over the years, Qingqis have become an essential part of Karachi's para-transit system, helping to alleviate transport challenges in the absence of a well-organized public transit system. Experts suggest that a long-term solution involves integrating these informal transport services into a broader, comprehensive transport plan.

## 2.4. Urban Transit System of Karachi - After January 2022

Karachi’s pursuit of a mass transit system has spanned decades but repeatedly failed due to political upheaval, weak institutions, and governance deficits. The first initiative in the 1970s, a light rail and Circular Railway upgrade under the Karachi Master Plan, was abandoned after the 1977 coup despite securing funding. In 1990, the Karachi Mass Transit Programme, backed by World Bank consultants, proposed six bus corridors, but political shifts toward a light rail system and resistance from civil society derailed investor interest. Subsequent proposals, including cost-effective KCR revival plans by local railway engineers in the mid-1990s, were ignored. Later, the JICA-supported Karachi Transportation Improvement Project (2010–12) envisioned six BRT corridors and KCR revival, but resettlement disputes, institutional fragmentation, and political inertia stalled implementation, escalating costs from Rs 147 billion in 2009 to Rs 246 billion in 2012. As a result, while many global megacities consolidated mass transit decades ago, Karachi entered the 2020s without one, relying instead on fragmented BRT corridors and unstructured transport systems.

Finally, in December of 2021, one of the BRT corridors was completed and the Green Line became operational in January 2022 followed by the Orange line in September 2022. The Red and Yellow lines are under construction with the Blue and Brown lines in the planning phase. Another government sponsored project became operational in Karachi called the People’s Bus Service in June 2022. In total 10 routes are operational in the city with an additional 5 routes on Electric buses connecting Malir to other parts of the city.

Figure 2: BRT Routes



Source: JICA (2012).

Several studies have highlighted the efficiency and inefficiencies of the current BRT system of Karachi. A study by [Akber \(2024\)](#) using ITDP (Institute for Transport and Development Policy) standards, scored the BRT Green Line at 66.28. This assessment highlighted critical deficiencies, including poor integration with other transport modes.

## **2.5. Research Gap**

Despite Karachi's size and economic centrality, scholarly work on its transport system remains limited. As a result, the city's extensive unstructured bus network, which continues to serve a substantial share of daily commuters, remains largely unmapped, undocumented, and analytically under-examined. There is currently no comprehensive spatial account of its route structure, coverage, density, or interaction with the emerging formal transport corridors. This gap is significant, as policy discussions increasingly prioritize formalized systems while overlooking the operational realities of the informal sector that sustains everyday mobility.

This study addresses this gap by systematically mapping Karachi's unstructured bus network, analysing its spatial overlap with the BRT system, and assessing the accessibility it provides to citizens across districts and towns. By generating spatially grounded evidence on coverage and access to essential services and employment zones coupled with perspectives from key stakeholders, the research contributes policy-relevant insights into the current and future role of unstructured transport within Karachi's evolving mobility landscape.

## **RESEARCH METHODOLOGY**

### **3.1. Research Objectives**

1. To map and examine the spatial distribution and operational routes of privately owned buses and selected paratransit-Qingqi services in Karachi, with a focus on identifying key nodes and transit corridors.
2. To investigate the role of Qingqi routes within the existing public transit system of Karachi, assessing their integration with privately owned buses and evaluating how they can contribute to enhancing public transit.
3. To conduct a spatial analysis of the accessibility of these modes of transport in relation to health, education, and employment opportunities, population density to evaluate the services.
4. To investigate the operations, spatial growth, profitability, route selection and service expansion of bus and Qingqi routes in Karachi, providing insights for improved governmental and community transit planning.
5. To propose policy recommendations aimed at improving the efficiency, safety, and accessibility of the informal public transport sector, ensuring it serves the broader population more effectively as part of an integrated urban transit system.

### **3.2. Research Questions**

Based on the research objectives of this research devised earlier and now with quantitative and qualitative data collection, following research questions have been derived:

- RQ1.** How are unstructured local bus services spatially distributed across Karachi, and what are the key nodes and transit corridors of these services?
- RQ2.** In what ways do Qingqi routes overlap with, complement, or diverge from existing public and private unstructured bus networks in Karachi?
- RQ3.** To what extent do the current services provide access to essential services and opportunities such as health care, education, and employment?
- RQ4.** What patterns or systems, if any, can be observed in the operations, route selection, and service expansion of unstructured bus and Qingqi services in Karachi?
- RQ5.** What policy measures could improve the efficiency, safety, and inclusivity of Karachi's informal public transport sector as part of an integrated urban mobility system?

### **3.3. Data Collection**

To address the research questions, this study adopted a mixed-methods research design, integrating quantitative spatial analysis with qualitative inquiry to comprehensively document and evaluate Karachi's unstructured transit network. The data collection process was designed to accurately capture on-ground operational realities while also incorporating institutional and user perspectives. It consisted of three main components: route mapping, semi-structured interviews, and a participatory post-mapping workshop.

### ***3.3.1. Mapping of Bus Routes and Facilities***

Primary spatial data on Karachi's unstructured bus network was collected through extensive field mapping. Students and early-career researchers were recruited to map bus routes from 'adda' to 'adda', covering the full length of each route from first to last stop. Recruitment was conducted through an open call for applications shared on LinkedIn, followed by screening interviews held via Google Meet. Applicants were shortlisted based on availability and commitment to the project.

A total of 22 students and alumni from IBA, Habib University, and NED University participated in the route mapping exercise, collectively mapping 59 bus routes. For safety and technical reasons, mappers generally worked in pairs during fieldwork. Prior to deployment, all mappers participated in structured training sessions that introduced the project background, field protocols, and technical tools. Training covered the use of Kobo Toolbox for data collection, Geo Tracker for GPS-based route recording, and QGIS for data processing and validation.

In addition to route mapping, four additional mappers were hired to manually map tertiary education institutions and healthcare facilities across Karachi. This primary spatial dataset was essential in addressing the first three research questions related to access and spatial distribution.

### ***3.3.2. Open-Ended Semi-Structured Interviews***

To complement the spatial analysis, open-ended semi-structured interviews were conducted with key stakeholders in Karachi's transport sector. An initial list of stakeholders was developed based on the literature review and desk-based research and subsequently refined with input from project mentors. Dr. Naeem-uz-Zafar facilitated an initial connection with Mr. Ashar Lodhi, Director of Transportation and GIS at Exponent Engineers, whose expertise and networks proved instrumental in identifying additional interviewees.

Using a snowball sampling approach, interviews were conducted with ten stakeholders from both public and private sectors. These included representatives from consulting firms, public transport authorities, transport associations, academia, and frontline operators. Interviewees included the Director of Exponent Engineers, General Manager of a BRT corridor, President of the Karachi Transport Ittehad, a bus driver who transitioned from unstructured services to BRT, current and former representatives of the All Karachi Qingqi Rickshaw Welfare Association, an urban planner, the Managing Director of the Sindh Mass Transit Authority, a professor from NED University, and a representative from the Regional Transport Authority.

Interview guides were tailored to each stakeholder category and aligned with the relevant research questions. Where possible, guides were shared with interviewees in advance. Interviews were conducted at participants' offices, and verbal consent for audio recording was obtained. All recordings and related data were securely stored on a restricted-access online drive.

For transcription and, where necessary, translation, six transcribers were hired. Access to recordings was granted only after signing confidentiality agreements and contracts, ensuring data security and ethical compliance.

These interviews were critical in addressing research questions related to governance, regulation, and the future of unstructured transit systems.

### ***3.3.3. Post-Mapping Participatory Workshop***

To triangulate findings and incorporate passenger perspectives, a post-mapping participatory workshop was conducted with the field mappers. The workshop employed qualitative research tools such as story circles, story mapping, and role-playing exercises to document mappers lived experiences as both researchers and passengers of unstructured buses.

Participants also shared testimonials and observations gathered from fellow commuters during fieldwork. This component provided rich contextual insights into everyday travel experiences, challenges, and coping strategies, and significantly informed the analysis and discussion related to the final research question.

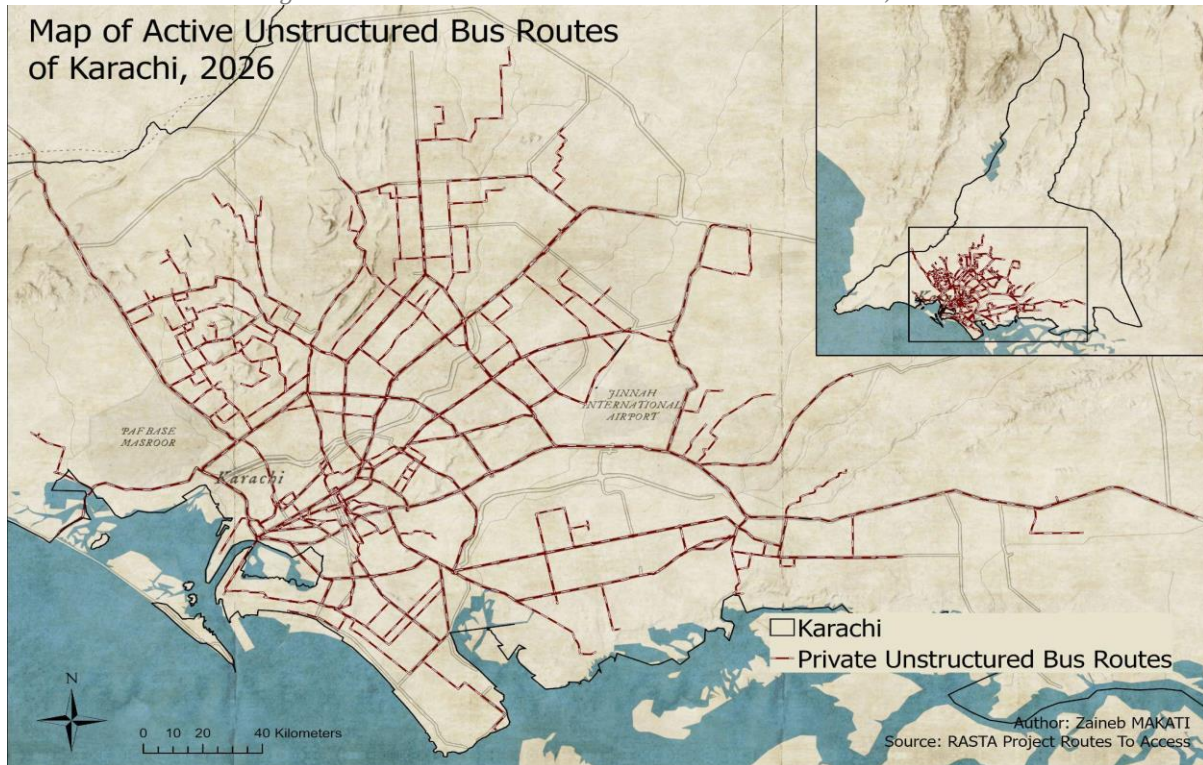
## FINDINGS AND DISCUSSION

This section will be divided in 4 parts to answer our first 4 research questions. Starting off from spatial analysis to answer RQ1, RQ2 and RQ3, and then a thematic analysis to answer RQ4:

### 4.1. RQ1: Spatial Distribution and Network Structure of Unstructured Bus Services in Karachi

The bird-eye view of the bus transit system of Karachi is represented in Figure 2, which includes both structured and unstructured routes. Spatial overview shows that unstructured bus services provide extensive geographic coverage across Karachi, particularly along major arterial corridors. However, this coverage is uneven, with high route density concentrated in central and older districts, while peripheral towns exhibit sparse service availability. For the scope of this study we focus mainly on the unstructured routes of the city represented in Figure 2 below.

Figure 3: Functional Unstructured Bus Routes in Karachi, 2026



Source: Authors' compilations.

We mapped a total of 59 routes of varying lengths summarised in Table 1 below:

Table 1: Unstructured Bus Route Length Details

Routes	Mean	S.D	Min	Max
59	34.76	11.3	5.99	57.58

Source: Authors' compilations.

The longest route was of the bus F-11 of approximately 58 kms while the shortest was of bus 11-C running a route of around 6km. Gulistan coach however has the most extensive route passing over 9 districts and cantonment areas of Karachi. KL-1 and Rind coach each pass only from 2 districts of the city. The detailed maps of all the bus routes can be found on the project's website (<https://sites.google.com/view/routestoaccess/home>).

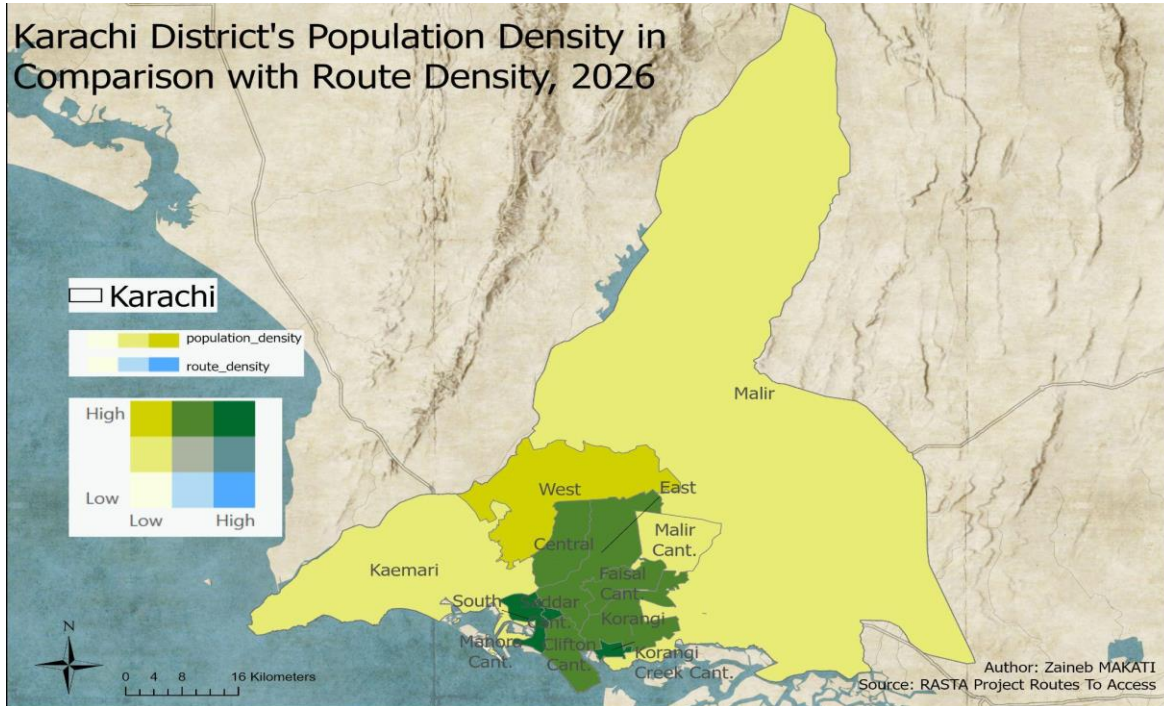
The data for population in this analysis were sourced from World Pop's 2025 gridded estimates, which provide high-resolution spatial population distribution data (WorldPop, 2025). These estimates were used instead of Pakistan Population Census 2023 data because population counts are not available along with spatial boundaries. Therefore, WorldPop data is used for spatial analysis by aggregating 1x1km population estimates at district and town level.

#### **4.1.1. District-Level Analysis**

Karachi is administratively divided into 13 administrative territories including 7 districts and 5 cantonments. District Malir is the largest in terms of area while Manora cantonment is the smallest. In terms of population and population density, Central is the biggest district and Manora is yet again the smallest. Manora is an island adjacent to Karachi and is connected by a thin strip of road to the city but no bus route public or private connects it to the main city. The last stop on Imran coach is Kakapir approximately 8 kms away from Manora. Mostly people travel on boats to the island which is yet another private unstructured mode of transport facilitating the residents.

District East is the most well connected by the unstructured bus system of Karachi with 48 buses passing through it while Malir Cantonment is connected by only 8 routes. This is also due to the reason that buses are not allowed in most of its territory due to safety and security reasons. The highest route density (sum of route length in km/area in [sq.km](#)) of 231km/sq/km is recorded in Saddar Cantonment district followed by 47km/[sq.km](#) in district South. In terms of accessibility or first mile access of these routes, district Saddar Cantonment ranks highest with 99.8% of its area being accessible by a bus route within 500 meters. The Figure 3 below shows the district level map of Karachi with population vs route density.

*Figure 4: Comparison of Population Density and Unstructured Bus Route Density in Karachi's Districts, 2026*



Source: Authors' compilations.

This method allows for an intuitive assessment of spatial equity in transit access and is commonly used in urban and transport geography to compare overlapping socio-spatial variables (Slocum et al., 2009). The map shows that Karachi's core urban districts, such as Central, East, South, and Korangi, exhibit high population density alongside high route density. The areas which appear in darker green shades, reflect the historical concentration of residential, commercial, and employment activities in the city centre and inner districts. The dense clustering of unstructured bus routes in these districts suggests that private operators have over the years responded to high passenger demand and economic viability, reinforcing these areas as the primary transit corridors of the city. This pattern is consistent with findings from other large cities in the Global South, where informal transit systems tend to follow demand rather than planned service coverage (Cervero, 2013).

In contrast, peripheral districts such as Malir, Malir Cantonment, and parts of Keamari are characterised by low population density and low route density, shown in lighter shades on the map. These areas are generally more peri-urban in nature, with larger land parcels, industrial zones, or recently urbanising settlements. The limited presence of unstructured bus routes in these districts reflects both lower passenger demand and higher operational costs for private operators, resulting in weaker transit coverage and greater dependence on private modes of transport.

Importantly, the map also reveals that district West has high population density, but route density is comparatively lower, indicating a mismatch between demand and service provision. These imbalance zones are particularly significant from a policy perspective, as they point to underserved populations who rely heavily on limited and often overcrowded transit services. Such mismatches are a common outcome of unplanned urban expansion and weak regulatory oversight, where transport services evolve in response to profitability rather than equity or accessibility

considerations (Sohail et al., 2006). Table 3 in the appendix shows district information with area, population, population density, number of routes and route density.

#### **4.1.2. Town-Level Analysis**

Karachi's seven districts (excluding cantonments) are administratively subdivided into 25 towns, which allows for a more granular assessment of spatial inequities in public transport provision. While Gadap is the largest town by area and Liaquatabad the smallest, population density varies sharply across the city: Gadap remains the least dense, whereas Nazimabad emerges as the most densely populated town. Mapping population density alongside route density at the town level reveals patterns that are not visible at broader district scales, underscoring the analytical value of localized spatial analysis.

Several centrally located and older towns of Mominabad, Liaquatabad, Nazimabad, Lyari, Chanesar, and Shah Faisal, exhibit both high population density and high route density. These areas represent long-established residential and employment zones where transport routes have historically evolved in response to sustained demand. In contrast, peripheral and semi-rural towns such as Gadap, Mauripur, Manghopir, Sohrab Goth, Safoora Town, Malir Cantonment, and Ibrahim Hyderi display low population densities alongside sparse route coverage, reflecting both lower demand and weaker integration into the city's transport network.

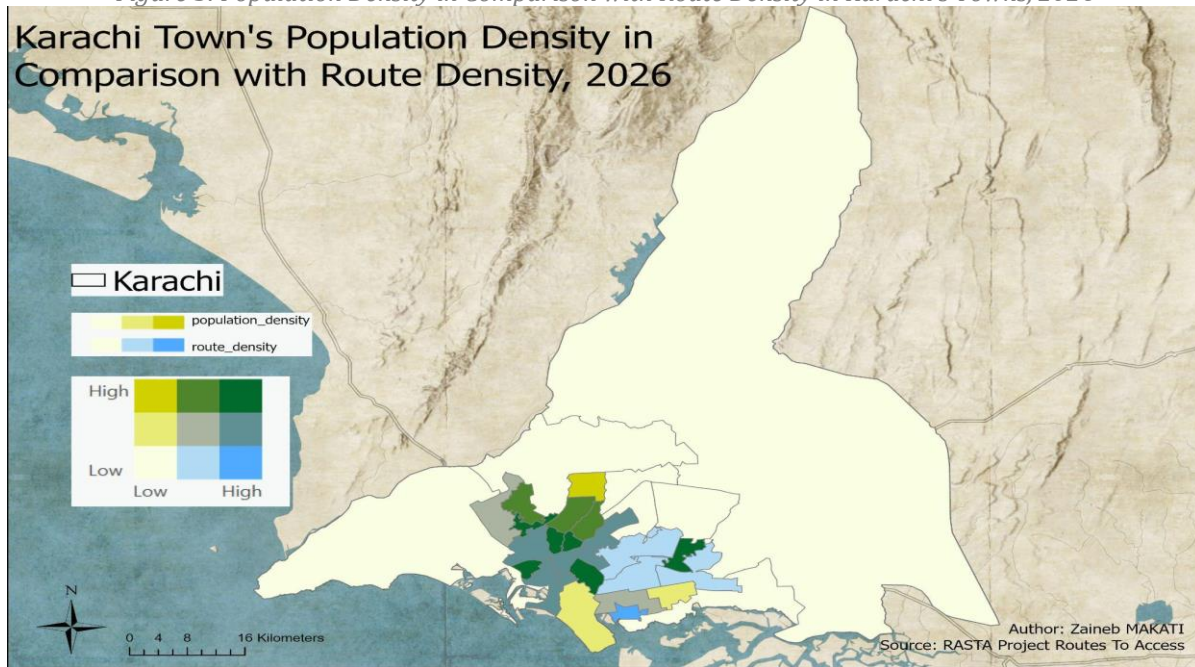
Notably, two spatial anomalies emerge. New Karachi demonstrates high population density but relatively low route density, indicating a clear mismatch between residential concentration and transport provision. Conversely, Korangi Creek Cantonment shows high route density despite a low residential population. This can be attributed to its strategic role as a transport corridor linking Karachi's South District with Korangi's and Landhi's industrial and employment zones, rather than serving local residential demand. Such corridor-driven route concentration is consistent with findings that transport supply often prioritizes movement efficiency and economic connectivity over local accessibility (Cervero, 2013).

Further disparities become evident when comparing towns with dense populations but limited route coverage such as Orangi, North Nazimabad, Gulberg, Clifton Cantonment, and Landhi against towns like Jinnah Town, Gulshan Town, Mominabad, Saddar, Malir, Model Colony, and Faisal Cantonment, which exhibit higher route densities relative to their population size. This uneven distribution points to a broader east-west divide in Karachi's transport geography, with eastern towns generally better served by routes relative to population density than western towns. Similar spatial inequities have been documented in other Global South cities, where informal and semi-formal transport systems tend to concentrate along economically significant corridors while peripheral residential areas remain underserved (Salon & Gulyani, 2010).

It is important to note that the district West which was primarily underserved shows a different pattern at town level where towns which are high population have high route density and vice versa. On the other hand, district Central which also showed a high-medium population-route density relationship has towns like New Karachi which has a medium-low population-route density relationship. It is imperative to see the results at local level rather than as aggregation covers up local realities.

Overall, the town-level analysis highlights a persistent spatial mismatch between population concentration and route availability in Karachi. Rather than reflecting systematic transport planning, route density appears shaped by historical development patterns, corridor importance, and informal operational logics. This reinforces the argument that private transport operators in Karachi prioritizes network survival and economic flows over equitable accessibility, deepening mobility disadvantages for residents of high-density but poorly served towns.

Figure 5: Population Density in Comparison with Route Density in Karachi's Towns, 2026



Source: Authors' compilations.

#### 4.1.3. Transit Nodes

The spatial distribution of major transit nodes along unstructured bus routes in Karachi reveals a corridor-based and highly nodal transport system rather than a uniformly connected network. High-order nodes, defined as locations with 6 or more route connections, are concentrated along key east-west and radial corridors linking peripheral residential areas to central commercial and industrial zones. Locations such as Surjani Town, Sohrab Goth, Nazimabad, Tower, Korangi Crossing, Quaidabad, and Malir Halt function as dominant informal interchanges, structuring everyday mobility across the city.

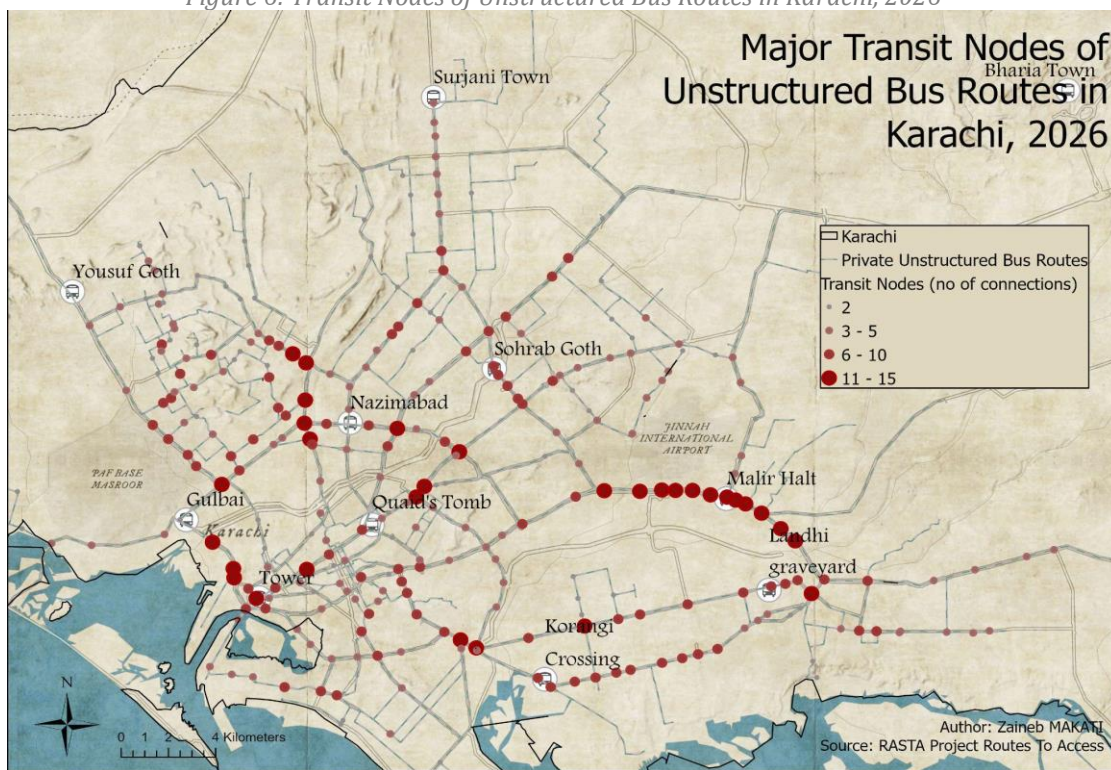
These nodes have not emerged through formal planning but through cumulative operational decisions by private operators responding to passenger demand, road hierarchies, and economic viability. This reflects broader patterns observed in informal transport systems in the Global South, where route overlap and interchange points evolve organically through trial-and-error rather than coordinated network design (Cervero & Golub, 2007; Behrens et al., 2016). In Karachi, nodal concentration enables passenger capture and route sustainability but also produces congestion and service unreliability at key transfer points.

Peripheral nodes such as Surjani Town and Sohrab Goth act as gateways connecting low-income residential areas to employment centres, reinforcing the central role of unstructured transport in serving the urban poor (Salon & Gulyani, 2010). In contrast, southern nodes like Tower reflect historical and commercial centralities rooted in colonial-era urban form, demonstrating how informal systems may reinforce, rather than redistribute, existing spatial hierarchies.

The map also highlights uneven accessibility across the city. Several growing areas remain weakly connected, reflecting a “network survival logic” in which routes cluster where passenger turnover is most reliable rather than where social need is greatest (Lucas, 2012). As a result, accessibility advantages accrue to areas already embedded within dense corridors, while peripheral neighbourhoods experience compounded exclusion.

Overall, the nodal structure suggests that Karachi’s unstructured bus system operates as a collection of loosely connected route bundles anchored around informal hubs rather than as an integrated citywide network. While this configuration allows flexibility and rapid adaptation, it shifts coordination costs onto passengers and limits system-wide efficiency (Gwilliam, 2008; Schalekamp et al., 2016). Recognizing these entrenched nodal logics is critical for understanding why formal interventions such as BRT often struggle to integrate with existing systems, and why any restructuring effort must engage with, rather than bypass, these informal transit hubs.

Figure 6: Transit Nodes of Unstructured Bus Routes in Karachi, 2026



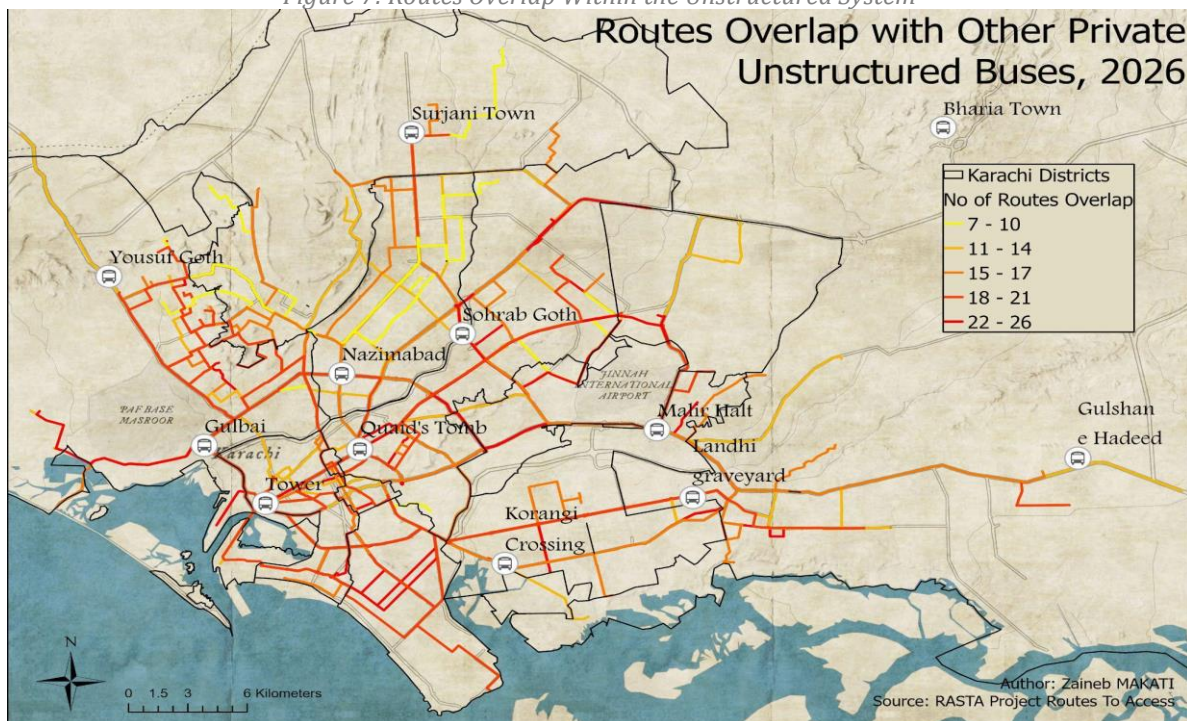
Source: Authors' compilations.

#### 4.1.4. Overlap Analysis

The overlap analysis reveals significant heterogeneity in the degree to which individual bus services intersect with other routes, underscoring the structural organization and path dependency of Karachi’s unstructured transit network. Among private-private services, several routes such as *Al-Qadri* (86 % with Sheraz coach), *Muslim Coach* (90 % with Al-Rizwan coach), *C-1* (83 % with Mashriq coach), and *Z-18* (81 % with Ilyas coach), exhibit high overlap percentages, indicating sustained co-location with other services along substantial portions of their alignments. These high-overlap routes typically function along major urban corridors that serve as the backbone of the informal network, including the north–south axis through Nazimabad and the east–west spine connecting Landhi, Korangi, and central Karachi.

By contrast, routes with lower maximum overlap, such as *Gulistan coach* (31 %) or *Bus 7C* (21 %), tend to occupy more peripheral or specialized segments, reflecting localized service niches rather than backbone connectivity. The total number of overlaps adds further nuance: while some routes share high proportional overlap with only a few others, others intersect moderately with many, suggesting differences between deep structural redundancy (few but high overlaps) and broad network interweaving (many but lower overlaps). These patterns resonate with findings in transport network theory, where informal systems often evolve around dense corridor clusters that maximize passenger capture and operational viability without formal planning (Cervero & Golub, 2007; Behrens et al., 2016). High overlap also reflects competitive pressures and potential service redundancy, which can destabilize route economic sustainability and create congestion unless governed by negotiated informal norms or regulated by the authorities.

Figure 7: Routes Overlap Within the Unstructured System



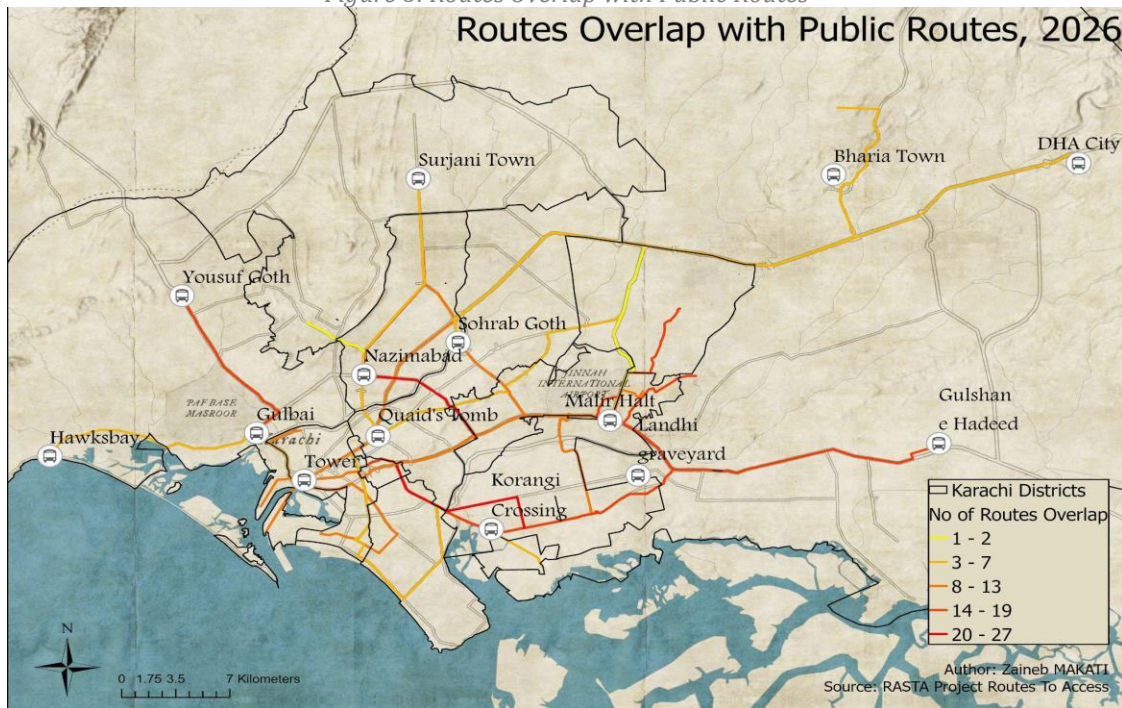
Source: Authors' compilations.

Similarly, public routes show high overlap with private services which can create sustainability issues for both services. Notable exceptions include *R\_9* (91%), *R\_12* (70% with KL-1), and *R\_13* (69%), which overlap extensively with high-overlap private routes of *Muslim*, KL-1 and *Al-Qadri coach*, respectively. Other public lines (e.g., *R\_3* with bus C-1 at 53%) exhibit moderate overlap but overall, every route shows a considerable overlap with the private unstructured system, suggesting strategic avoidance or segmentation between public and private alignments.

The overlap patterns thus reflect an emergent, functionally adaptive network logic: informal and formal services coexist and compete along corridors of high demand, while peripheral and lower-demand areas remain served primarily by niche or independent alignments. These dynamics have significant implications for understanding accessibility, congestion, and equity in Karachi’s transport landscape, as high overlap may indicate both network robustness (multiple alternatives) and inefficient duplication of services in the absence of coordinated planning and regulation.

In summary, the spatial configuration of Karachi’s unstructured bus network reflects a system that has evolved incrementally over decades through organic and ad hoc processes rather than through coordinated planning. The analysis reveals pronounced disparities at the town level, including mismatches between route density and population concentration. Furthermore, the emergence of transit nodes without supporting infrastructure, along with significant route overlap both within the informal system and with the formal public transport network, underscores the absence of integrated network design. Although the unstructured bus system remains a critical provider of mobility for large segments of the population, its current spatial patterns point to inefficiencies and inequities that require systematic, evidence-based planning and regulatory intervention.

Figure 8: Routes Overlap with Public Routes



Source: Authors' compilations.

## **4.2. RQ2: Route Overlaps and Network Interactions between Qingqi Services and Unstructured Bus Systems**

Qingqis are motorcycle-based, three-wheeled vehicles that operate as an informal mode of public transport in Karachi, providing short-distance and point-to-point mobility. Initially, Qingqis were intended to serve low-volume urban streets and residential neighbourhoods where formal bus routes were absent (Adnan, 2015). Over time, however, they have become a prominent component of the city's transport system, particularly as unstructured bus services declined in both number and quality. Their low operating costs, flexible routing, and affordability have made them an attractive alternative for both operators and commuters. From the perspective of Qingqi operators, their services fill a substantial mobility gap left by formal and mass-transit systems, which serve a significant portion of total daily travel demand in the city.

The introduction of Qingqis in Karachi dates to the early 2000s, with their expansion accelerating after 2007–2008 following the import of Chinese-manufactured “Qingqi” vehicles. The term “Qingqi” subsequently became generic, used to describe similar vehicles regardless of brand (Muzzammil et al., 2017). The sector is majorly represented by the All-Karachi Qingqi Welfare Association, which manages and advocates for Qingqi operators and has played a central role in negotiations with the state regarding their legality and right to operate. Despite their longevity as a public service vehicle, Qingqis continue to occupy an ambiguous position within Karachi's transport governance framework.

The relationship between Qingqis and unstructured bus services has largely been competitive. As bus fares increased due to rising fuel costs and as vehicle conditions deteriorated, buses lost short-distance commuters to cheaper and more flexible alternatives. Qingqis, built on motorcycle platforms, capitalized on this shift and gradually replaced buses for many everyday trips (Adnan, 2015). Similar patterns have been observed in other Pakistani cities, where the saturation of Qingqi services has displaced bus routes and undermined the financial viability of public transport operators (Starkey et al., 2019). This displacement is particularly damaging to bus services, which rely on steady ridership beyond peak commuting hours to sustain operations.

At the same time, Qingqis have functionally integrated into Karachi's transport system by serving as feeder services and providing first- and last-mile connectivity, especially in areas where buses do not reach. The operations of the Qingqi service differ vastly from the unstructured buses operational model. Unlike bus routes, Qingqi's do not have fixed stops, they provide pick and drop services as per the demand of the passengers, providing flexibility and 'door-to-door' service.

Qingqi routes are often changing, owing to regulatory influences, traffic conditions, and passenger demand and even shutting down at times. The routes may close because of government bans, road conditions and low demand/competition from other transport services. Moreover, Qingqis do not possess official route permits, so they designate names for the routes they frequently operate on. These names are displayed prominently on the vehicle, informing passengers about the Qingqi's intended route.

The regulatory status of Qingqis remains highly uncertain. Qingqis are not clearly defined as a distinct vehicle category under the Motor Vehicle Ordinance, resulting in inconsistent treatment by

authorities. Depending on vehicle type, they are variously classified as motorcycles or rickshaws, while lacking route-specific permits (Vahidi, 2025). Although courts have granted general permission for Qingqis to operate, their movement is typically restricted to link and secondary roads. Periodic government bans, most recently in 2025 on major arterial roads such as Rashid Minhas Road, have further constrained operations (Geo News, 2025). These restrictions are commonly justified on safety grounds.

Safety concerns surrounding Qingqis are well documented. The vehicles have weak structural integrity, are frequently overloaded beyond their approved capacity of one driver and four passengers and are involved in a high incidence of accidents and injuries (Muzzammil et al., 2017). Qingqi drivers are also often young and drive without proper training or licenses. Moreover, Qingqis are manufactured through both formal and informal channels, thus complicating regulation and enforcement (Starkey et al., 2019). Despite these risks, they continue to operate widely due to persistent demand and limited regulatory capacity.

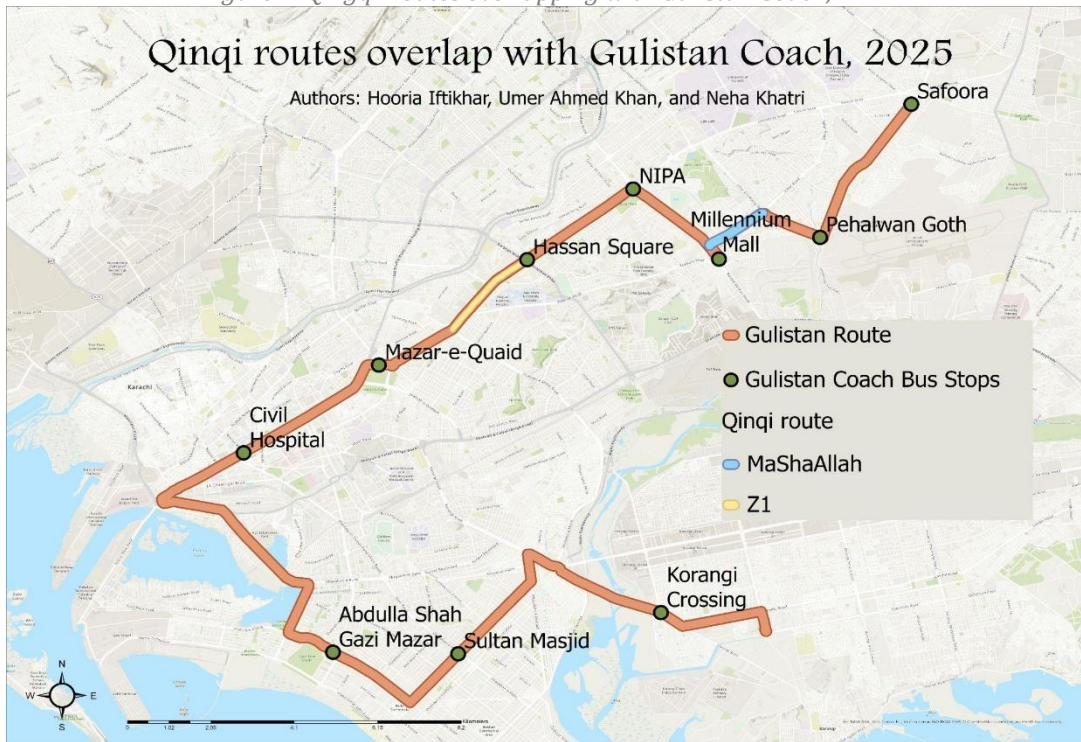
To examine the extent of competition between Qingqis and unstructured buses, this study analysed Qingqi operations along three selected bus routes. The findings reveal significant variation in spatial overlap. Bus Route 4J exhibited the highest overlap, with approximately 79 percent of its route shared with Qingqi services, indicating strong competitive pressure and potential ridership loss. Route 4L showed moderate overlap at 37 percent, while the Gulistan Coach route experienced minimal overlap at 8.8 percent. It is also evident that Qingqi routes are much shorter in length in comparison to bus routes which span a larger area. This highlights the difference in how the passengers utilize the two services. It is important to note that this mapping was conducted after the recent road-specific ban on Qingqis. This has reduced Qingqi presence on some corridors, but evident substantial overlap persists on several routes, underscoring the continued entanglement of informal transport modes within Karachi’s transit landscape.

*Table 2: Percentage of Qingqi Route overlapping with Unstructured Bus Routes*

<b>Bus Route</b>	<b>Qingqi Route</b>	<b>Qingqi Route Overlap with Bus Route in %</b>
Gulistan	Z1, MA	8.8
4L	GS, S7, 2D, 8, F12, V1	37
4J	GS, W1, T11, W86, V1	79

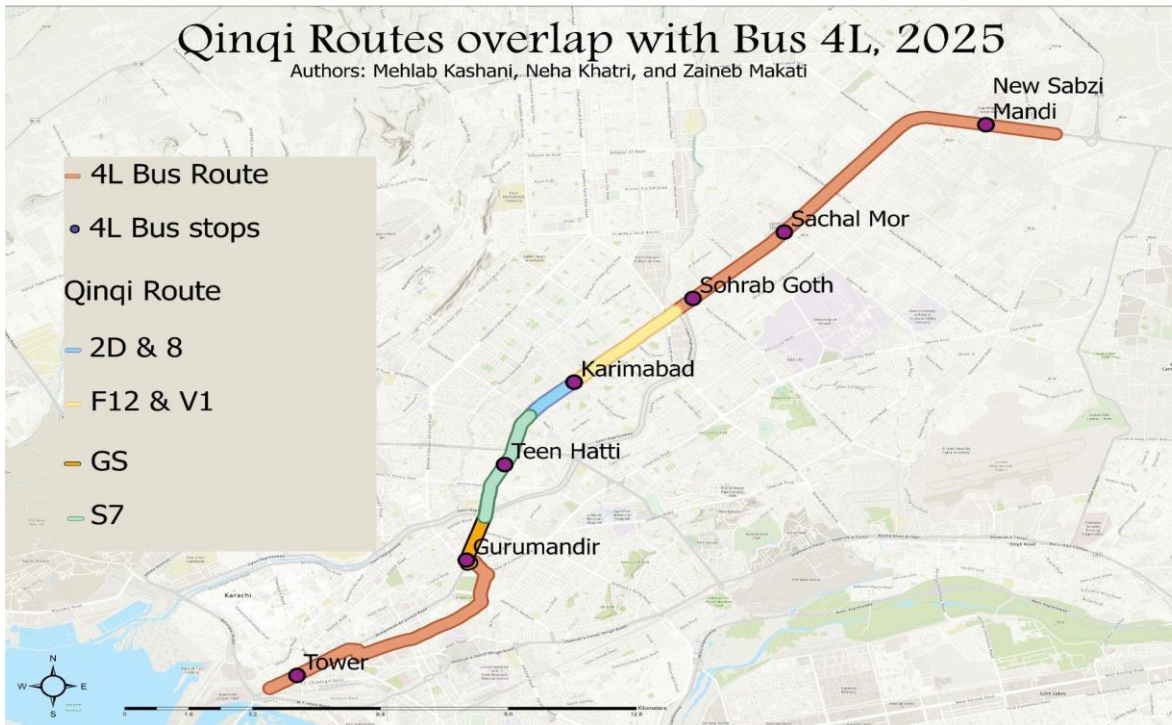
*Source: Authors’ compilations.*

Figure 9: Qinqi Routes overlapping with Gulistan Coach, 2025



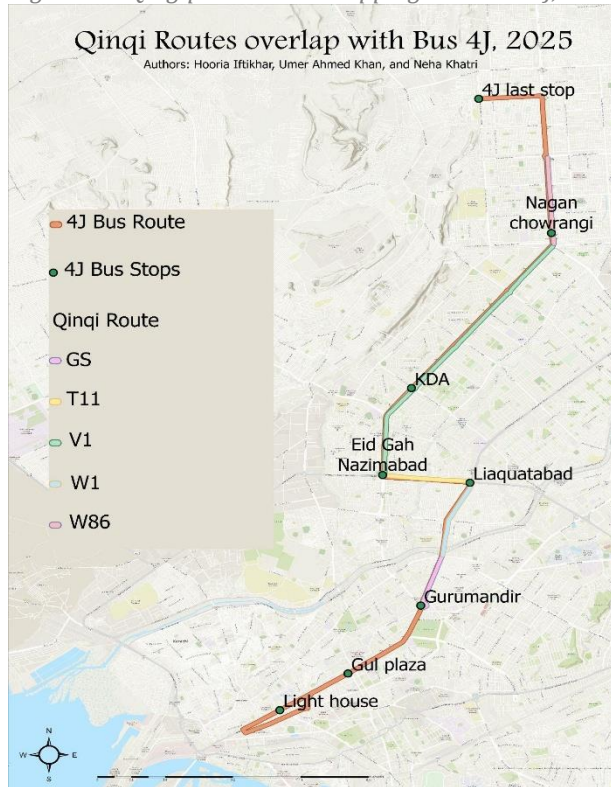
Source: Authors' compilations.

Figure 10: Qinqi Routes overlapping with Bus 4L, 2025



Source: Authors' compilations.

Figure 11: Qinqi Routes overlapping with Bus 4J, 2025



Source: Authors' compilations.

The Qinqqi service provides essential connectivity in the areas of Karachi where other modes of transport do not provide service. However, operational instability, regulatory concerns, issues regarding driver qualifications, highlight the need for a reform in the system to ensure a safe service. It would be advantageous for the government to enhance the Qinqqis rather than banning a service that many commuters depend on. For example, Peshawar successfully overhauled its transit network, integrating the informal system into the public transport system. Similar initiatives can be taken to absorb the current Qinqqi system of Karachi making it safer and greener, providing a key feasible mobility alternative to Karachi citizens.

#### 4.3. RQ3: Accessibility of Essential Services through Karachi's Unstructured Transit Network

Access to essential social services such as education and health services is widely recognised as a fundamental dimension of urban transport equity (Lucas, 2012; Delbosc & Currie, 2011). Public transport systems act as lifelines connecting diverse neighbourhoods to education, employment, and opportunity spaces, especially in highly unequal cities where private mobility is not universally affordable (Poiani & Stead, 2015). In the context of Karachi's unstructured bus system, which remains the predominant mode of mechanised travel for large segments of the population, assessing the spatial distribution of service access reveals where transport supply either facilitates or constrains opportunities for students and other service users.

To conduct the accessibility analysis, we mapped Karachi's health and education facilities using the official lists available on Govt. websites. Data on healthcare establishments was obtained from the

Sindh Healthcare Commission while that of colleges and universities were from College Education Department Government of Sindh, Board of Intermediate Education Karachi, and HEC Pakistan, respectively.

#### **4.3.1. Accessibility to Tertiary Educational Institutes**

The maps, Figure 9 & 10, depicting accessibility to universities and colleges via the unstructured bus network demonstrate both the strengths and limitations of the current system. Many universities located within the central and inner city, such as Nazimabad and Tower, have multiple unstructured bus connections within 500m, indicating that the informal network effectively mediates access to these critical destinations. This pattern aligns with global findings that areas with dense public transport provision tend to offer better accessibility to social services (Lucas, 2012). The green and yellow dots clustered in central Karachi reflect higher connectivity values (7–18 connections), evidencing that students and staff in these parts of the city can rely on the unstructured bus system to reach campus with relative ease.

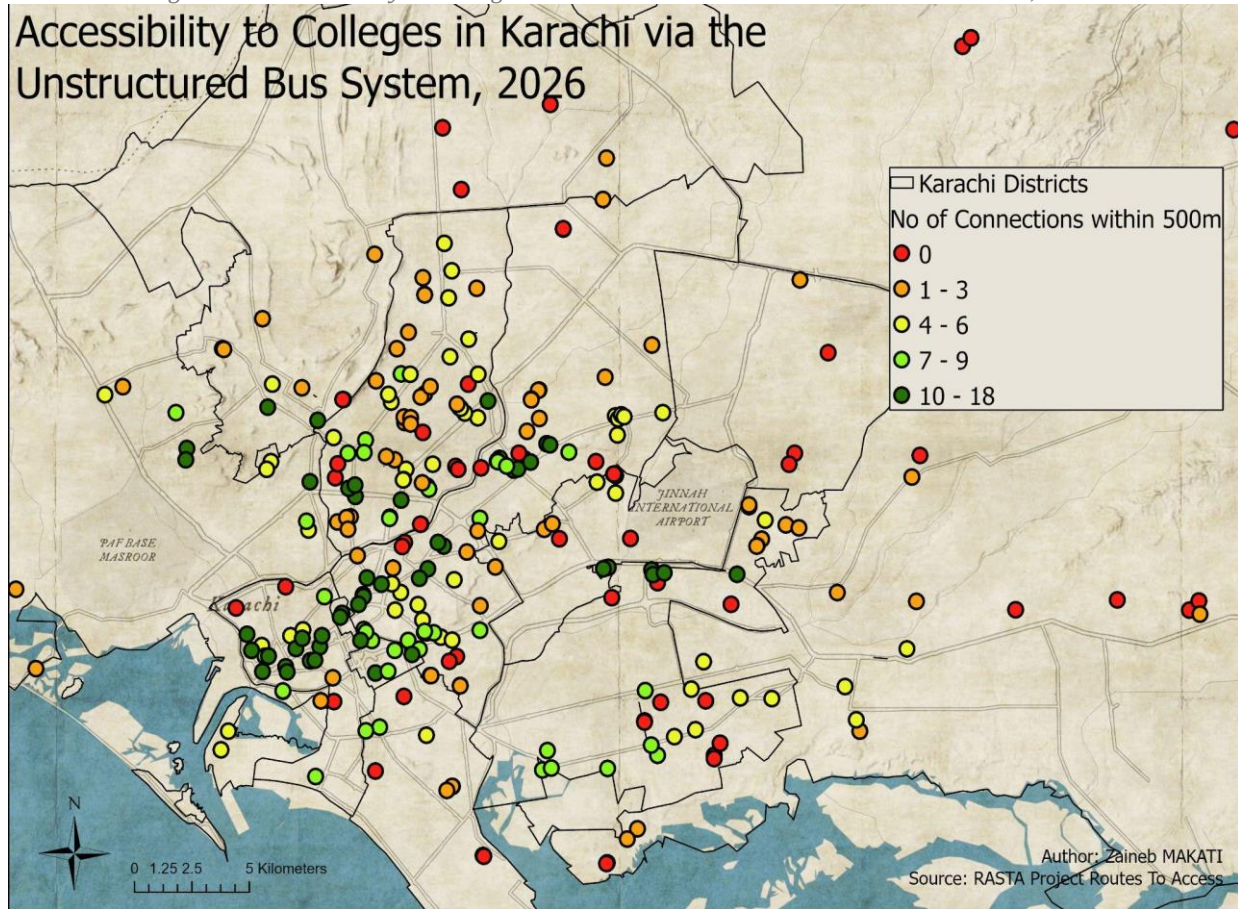
However, the maps also reveal significant spatial disparities in service access. Universities and colleges located in peri-urban or outlying areas, such as Hamdard University in the northwest, Shaheed Benazir Bhutto City University in the northeast, and the Textile Institute of Pakistan in the southeast, show few or no nearby bus connections (red dots), indicating poor integration with the unstructured network. Such gaps suggest that students in these areas either endure long, inconvenient journeys or must resort to expensive private modes, intensifying socio-spatial inequities in opportunity access. Similar patterns have been observed in other rapidly urbanising cities in the Global South, where informal networks provide dense coverage in established zones but offer limited reach to peripheral settlements (Behrens et al., 2016). Consequently, accessibility is tied not strictly to need but to the economic logic of route planning within the unstructured system.

It is also important to recognise that mere proximity to transit does not guarantee meaningful access. Optimal access requires not only *bus availability* within a defined buffer (e.g., 500 m) but also sufficient frequency, reliability, and affordability, dimensions where informal systems may simultaneously excel (in flexibility) and falter (in consistency) (Bocarejo & Oviedo, 2012; Vuchic, 2005). Students in well-connected areas may still face unpredictable travel times due to congestion, frequent stops, and vehicle variability, characteristics typical of unstructured services (Cervero & Golub, 2007).

Importantly, these maps also highlight gendered mobility concerns. Prior research shows that women's access to education can be disproportionately constrained by transport accessibility, safety, and reliability (Lucas, 2012). This is true especially in the context of Karachi and Pakistan where due to cultural, economic and social barriers women are not allowed to drive or ride a bike and are heavily dependent on public transport for mobility. Harassment on public transport which was reported by many female commuters in Karachi in our research also becomes a major barrier. Given that many universities with low connectivity coincide with areas where bus services are sparse, female students in these zones may face compounded barriers that affect enrollment, attendance, and retention (Sharma-Bymer & Sharma, 2021; Kacharo et. al, 2022). Integrating accessibility

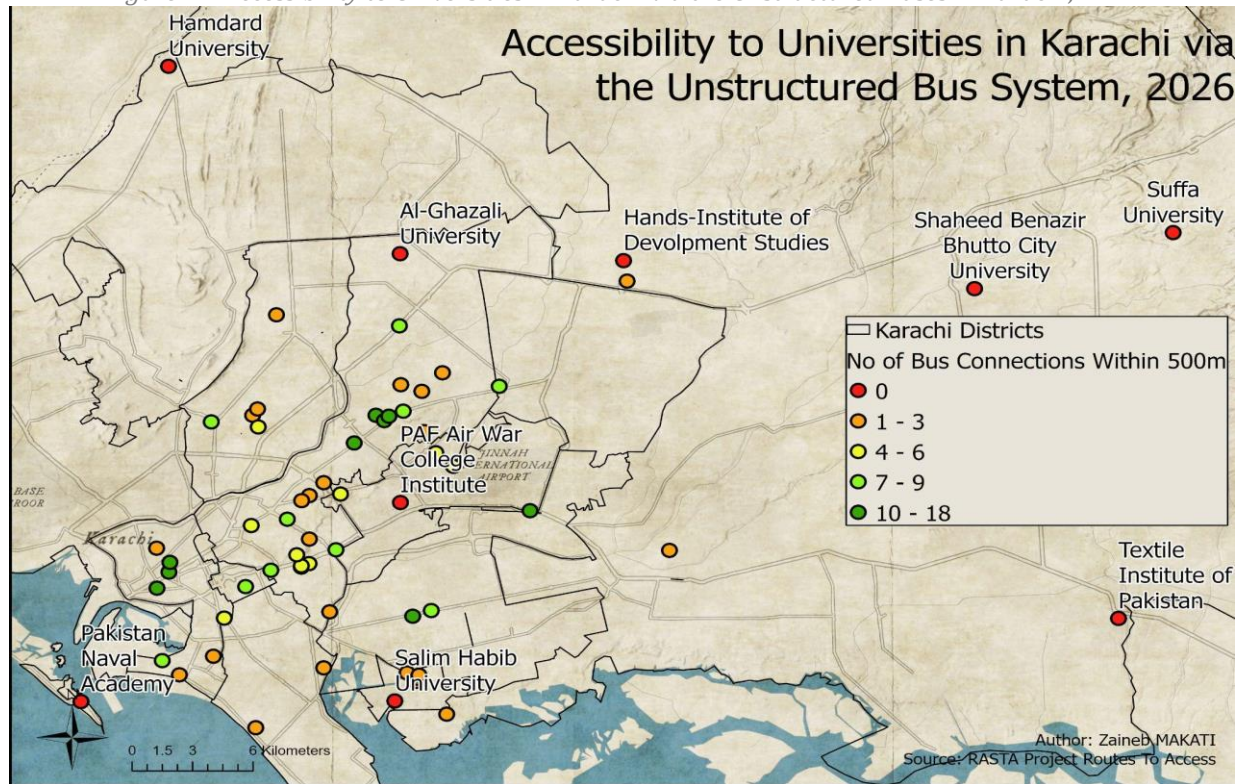
findings with socio-demographic data such as gender, income, and age would be a valuable next step for assessing transport equity more comprehensively.

Figure 12: Accessibility to Colleges in Karachi via Unstructured Buses in Karachi, 2025



Source: Authors' compilations.

Figure 13: Accessibility to Universities in Karachi via the Unstructured Buses in Karachi, 2025



Source: Authors' compilations.

The map of all colleges and universities is available in Appendix C of the report.

#### 4.3.2. Access to Healthcare Facilities

The maps (Figures 11 & 12) below reveal a pronounced core-periphery pattern in hospital accessibility through the unstructured bus system in Karachi. Central and older parts of the city exhibit a higher number of bus connections within a 500-metre radius of both general and maternal hospitals, while peripheral districts, particularly in the eastern and north-eastern extents, show limited or no such connectivity. This uneven spatial distribution reflects long-established relationships between accessibility, urban density, and transport provision, where areas of higher population concentration and economic activity attract greater service intensity (Hansen, 1959; [Guagliardo, 2004](#)). In Karachi, this results in relatively strong access to healthcare facilities in central districts, where multiple unstructured routes converge.

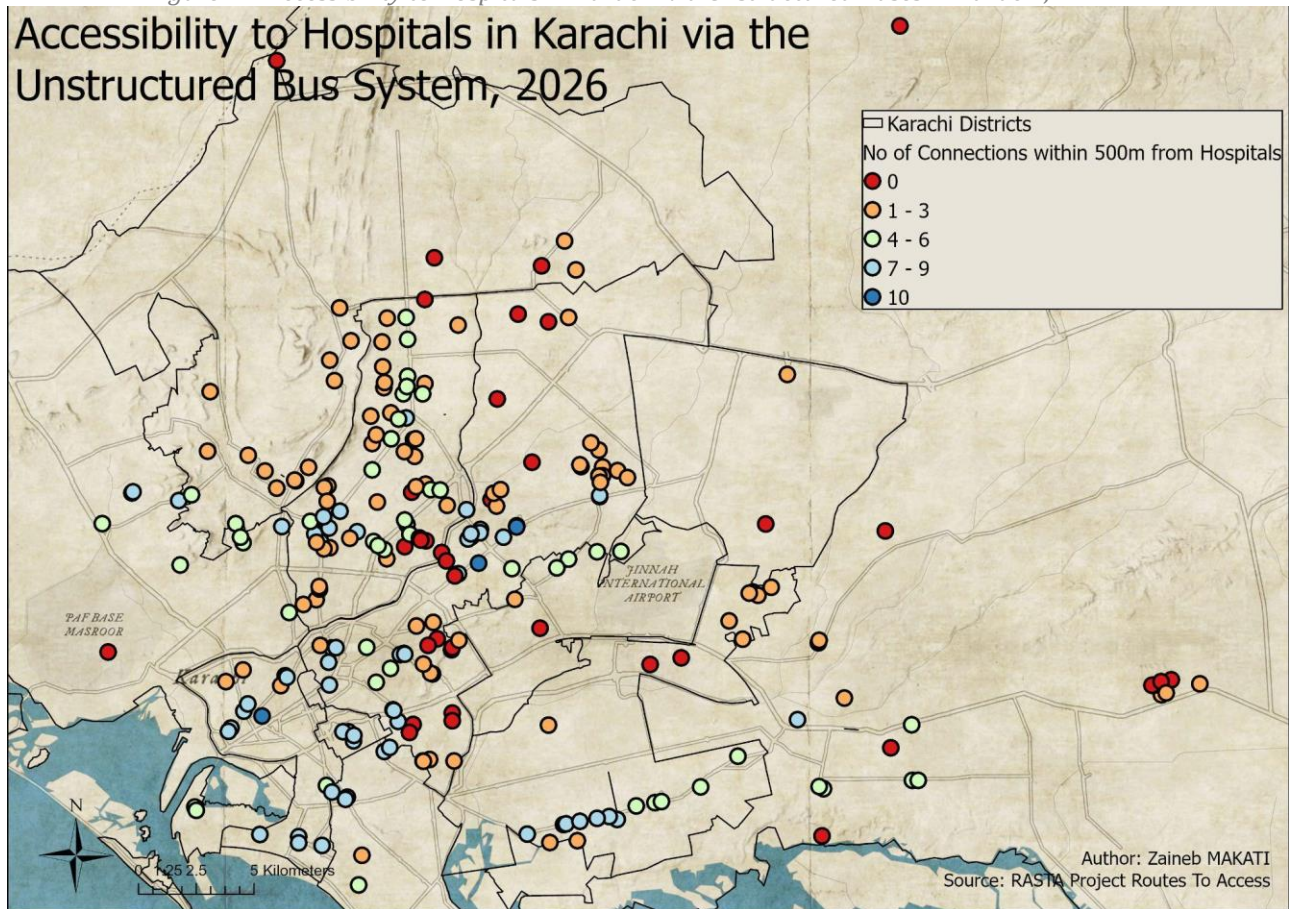
In contrast, peripheral areas display sparse coverage, indicating that residents in these locations may face longer travel times, higher transfer requirements, or complete reliance on alternative modes to reach healthcare facilities. Such spatial inequities are widely documented in transport and health literature, which highlights how peripheral populations, mostly lower-income and more vulnerable in case of Karachi, experience disproportionate barriers to essential services due to limited transport access (Lucas, 2012; [Neutens, 2015](#)).

The pattern is particularly concerning in the case of maternal hospitals, where timely access is critical. The limited number of unstructured bus connections serving maternal facilities outside the

urban core reinforces longstanding evidence that physical access and transport availability play a decisive role in maternal health outcomes (Atuoye et. al, 2015; Gabrysch & Campbell, 2009). While the unstructured bus system provides dense coverage in central Karachi, its uneven spatial reach may exacerbate risks for women residing in peripheral neighbourhoods.

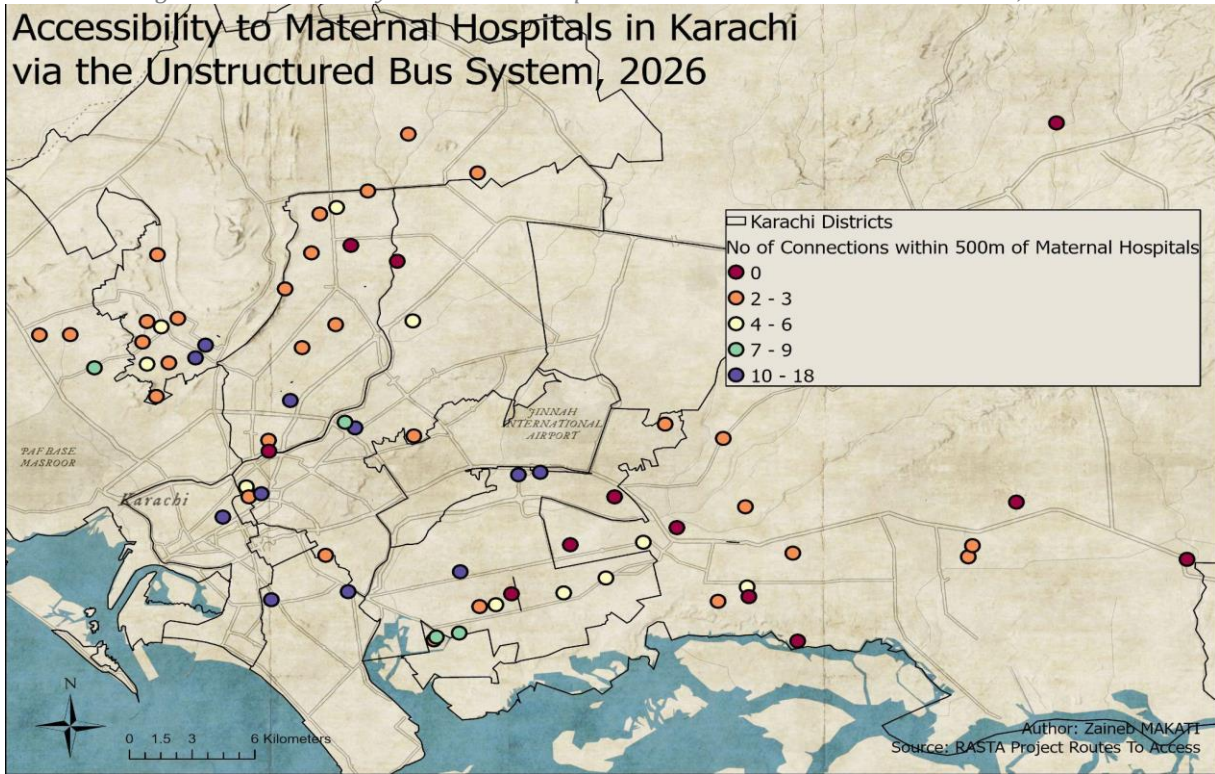
Overall, the maps illustrate how the unstructured bus system simultaneously enhances accessibility in high-demand urban cores while reproducing spatial inequalities at the metropolitan periphery. These findings underscore the need to view informal transport not merely as a mobility solution, but as a system that both responds to and reinforces existing urban spatial structures rather than providing accessibility for all (Cervero & Golub, 2007; **Sheller, 2018**).

Figure 14: Accessibility to Hospitals in Karachi via Unstructured Buses in Karachi, 2026



Source: Authors' compilations.

Figure 15: Accessibility to Maternal Hospitals via Unstructured Buses in Karachi, 2026



Source: Authors' compilations.

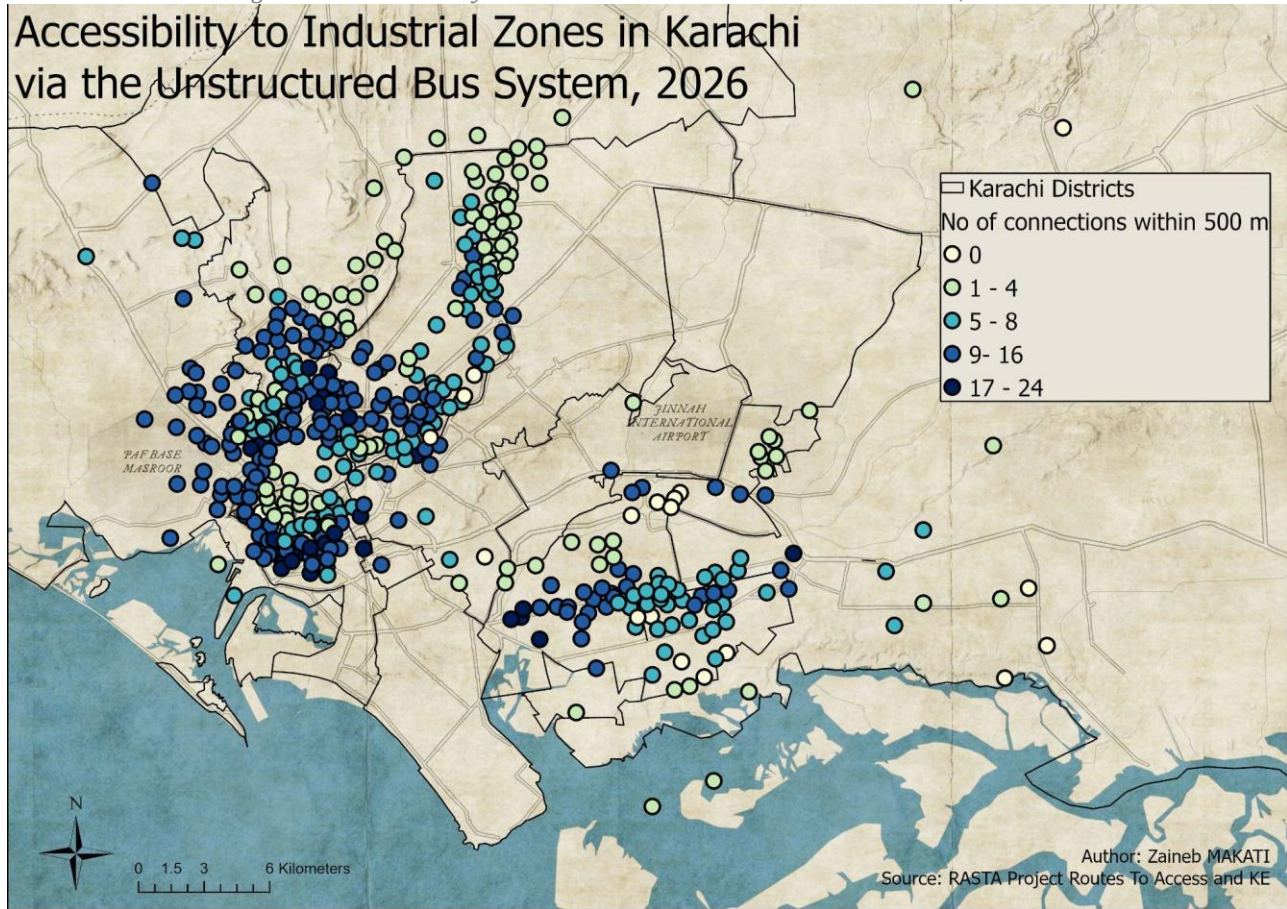
#### 4.3.3. Access to Employment Zones

Employment zones were identified using electricity connection data from KE for the year 2017 (Naqvis et. al (2021)). The grids which have **more than 10 industrial electricity connections** were classified as employment zones. This threshold-based approach follows a growing body of urban research that uses electricity or night light data as a proxy for economic activity, particularly in data-scarce contexts of the Global South (Mellander et. al, 2015). While electricity connections do not directly measure employment, higher concentrations of industrial connections reasonably indicate clusters of production activity and associated labour demand.

Figure 16 illustrates accessibility to these industrial employment zones, measured as the number of bus routes passing within the 500m of these employment zones. The 500m buffer reflects a commonly used approximation of acceptable walking distance to public transport stops in urban accessibility studies (O'Sullivan & Morrall, 1996; El-Geneidy et al., 2014) and is particularly appropriate in Karachi where informal stopping patterns reduce fixed-stop constraints.

The results reveal a highly uneven spatial pattern of accessibility. Industrial zones located in the central and south-western parts of Karachi, notably along major transport corridors, exhibit high levels of route connectivity, with some zones intersected by more than 17 bus routes. These areas benefit from route redundancy and network overlap, suggesting relatively robust access for workers reliant on public transport.

Figure 16: Accessibility to Industrial Zones via Unstructured Buses, 2026



Source: Authors' compilations.

In contrast, industrial zones situated on the urban periphery, particularly in the eastern and north-eastern extents of the city, show very limited connectivity, with several zones having fewer than four intersecting routes or none at all. This spatial disparity highlights a core-periphery divide in public transport provision that mirrors broader patterns of uneven urban development documented in megacities of the Global South (Gwilliam, 2003).

While a high concentration of bus routes around certain industrial zones suggests strong supply-side accessibility, this does not necessarily translate into effective access for workers. Accessibility, as originally conceptualized by Hansen (1959), is inherently relational, depending not only on the presence of transport infrastructure near destinations but also on its ability to connect residential origins to employment opportunities. The clustering of highly accessible industrial zones in already well-connected central areas raises concerns of spatial mismatch, whereby low-income residential neighbourhoods, often located farther from the city core, remain weakly connected to major employment concentrations. Similar dynamics have been observed in other developing cities, where transport networks prioritize commercial corridors over residential-employment linkages, reinforcing socio-spatial inequalities (Lucas, 2012; Bocarejo & Oviedo, 2012).

#### 4.3.4. Limitations

The accessibility analysis to education, health and employment zones does not model travel time, transfer penalties, or origin–destination flows and therefore represents a structural measure of accessibility rather than realized access (Geurs & van Wee, 2004). Nevertheless, by combining infrastructure-based employment proxies with route proximity, the approach provides a spatially grounded approximation of employment accessibility suitable for the context of Karachi where detailed transport or labour market data are publicly unavailable.

#### 4.4. RQ4: Operational Patterns and Governance of Unstructured Bus Services

Karachi’s transport woes are neither unique nor recent. Struggling to develop and meet demand for public transport, the minibuses were regularized by the government in 1971. Since then, the buses have adapted their operation in light of socio-economic factors and insignificant regularization from official authorities. Among the transit sector these buses and associated Chingchi’s have come to be known as the unstructured transport in Karachi. RQ4 specifically aims to understand the unstructured buses in terms of operations, route formation and experiences of different stakeholders using the information recorded from the field, interviews and participatory workshop.

Currently, three separate bus systems are running in Karachi split into Structured and Unstructured transport:

1. People’s Bus Service (PBS)<sup>4</sup>
2. Bus Rapid Transit - Karachi Breeze<sup>5</sup>
3. Minibuses and Coaches<sup>6</sup>

For the purpose of this paper, the unstructured buses are defined by the work of Cervero & Golub (2007) and Behrens et al. (2016), as follows:

*An unstructured bus service is characterized as a multiple passenger vehicle, operating on fixed government regulated routes. The services are private and receive no subsidy. The buses are required to be in good condition and registered with the government with limited top down planning. Prices are among the only aspects influenced by the state.*

*Additionally, in Karachi, these buses may be marked by their decorative exterior characteristic to the city.*

Karachi’s unstructured minibus and coach system, although regulated by the state, has largely evolved as an informal response to the absence of an effective formal public transport network. This evolution is closely tied to the city’s rapid urban growth, increasing travel demand, and limited state

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<sup>4</sup> A public bus service by the government of Sindh, operated privately with all risk assumed on part of the operator.

<sup>5</sup> A public bus service by the government of Sindh. The green and orange lines are functional while the other lines are currently under construction.

<sup>6</sup> Buses regularized by the government but operated privately.

capacity in providing mass transit. According to Anwar et al., (2018), Karachi generates approximately 13.5 million mechanized trips daily, of which 58 percent are made using private modes of transport, highlighting both the city's reliance on individualized mobility and the inadequacy of formal public transport provision.

The pressures on Karachi's transport system intensified following the 1959 Great Resettlement Plan, which accelerated horizontal urban expansion and deepened socio-spatial inequalities. As middle- and low-income populations were pushed towards peripheral areas, daily commuting distances increased, further straining an already fragmented transport system (Hasan & Raza, 2015). This pattern of outward growth has continued over subsequent decades and is projected to intensify, with Karachi expected to become the world's fifth-largest city by 2050, reaching a population of nearly 33 million (UN, 2025).

Within this context, the emergence and persistence of unstructured bus services can be understood as a systemic adaptation to rapid urbanization, spatial mismatches between housing and employment, and weak formal governance of transport. Drawing on Informal Systems Theory, this section conceptualizes Karachi's unstructured bus network as a functional urban system rather than a temporary anomaly. Additionally, the framework of Everyday Urbanism (Chase et al., 1999) is employed to interpret how these services operate through daily practices and lived commuter experiences, shaping mobility in the city beyond formal planning mechanisms.

#### **4.4.1. Structure in the Unstructured**

As one of our field mappers aptly described it, the operation of these buses reflects a *structure within the unstructured*. Building on this insight, the subsections below examine the operational and governance arrangements of Karachi's Unstructured Bus System, drawing on evidence from field mapping, workshop, and interviews:

##### *4.4.1.1. Operations:*

##### A) TYPES OF BUSES:

There are three different categories of these busses:

- i) Bus
- ii) Minibus
- iii) Coach

The difference in bus from minibus and coach comes from the manufactured body of the bus. While the metal frame for a bus is long and rectangular, the frame is smaller for both minibus and coach. According to the president of KTI, the difference in categorization of minibus and coach come from the fact that these were introduced under two different schemes from the government. Registration numbers for both these vehicles are also different. The lettering PE denotes minibus while JE refers to coaches.

##### B) SERVICES:

Each unstructured bus service in Karachi operates under a unique service name—such as G3, G11, G17, Shiraz, or 9C—each corresponding to a specific route vetted and approved by the Regional

Transport Authority (RTA). Under a single service name, multiple vehicles operate along the same route. The service is managed by an operator, also referred to as the owner, under whose name the route permit is registered. However, fleet ownership is often fragmented: not all vehicles operating under a service belong to the registered owner. In many cases, individual vehicle owners sublet their buses to the main operator in order to operate under an established service name. Operators may also share or rent space at an adda (informal terminal), typically for a fee determined through informal arrangements.

Based on field mapping and semi-structured interviews, this study identified 59 unique unstructured bus services currently operational in Karachi. This figure differs from estimates provided by key authorities: the Karachi Transport Ittehad (KTI) reported 54 routes, while official RTA documentation listed 78 routes. The RTA dataset is understood to represent all valid route permits rather than actively operating services, which explains the discrepancies observed between official records and routes documented through fieldwork.

Despite differences in scale and ownership structures, these services operate in broadly similar ways. Each service has a defined starting point, commonly referred to as the adda, which functions as the informal terminal. Routes are cyclical in nature, meaning a trip is considered complete only when the bus returns to its original starting point. The bus also has a prolonged stop at a point mid route, where it often stops longer for about 10 minutes to collect passengers, provide a break to drivers and submit Hazri<sup>7</sup>.

In most cases, buses follow the same alignment in both directions, with only minor deviations necessitated by road conditions, congestion, or temporary closures. Importantly, services operating with valid route permits generally do not deviate from their assigned routes to respond to passenger demand. This adherence appears to be reinforced by an informal mutual understanding among operators to avoid encroaching on one another's service areas.

### C) ADDAS:

This is any area owned/rented by the operator of a service and documented with the RTA, where the bus starts/ends the journey. The RTA mandates the plan to be shared at the time of permit acquisition. As per RTA rules a station must at least have a maintenance or service station, washroom, dining and rest area for the drivers and passengers as per Karachi Bus Association. While most stations offer these amenities to the drivers there is hardly ever any space for passengers to sit, especially female passengers who often wait in scheduled parked buses for their journey to begin. KTI President, owner of F-11 bus service, however, narrates that the F-11 Adda has been made according to the standards of RTA. Throughout the city, it is commonplace to see buses of a service parked together alongside a road or on a plot in what they call the service's Adda.

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<sup>7</sup> A Hazri is a sum of money paid at around three to four checkpoints along the route, given to the munshi in order to be allowed to operate. This informal payment is effectively a bribe and has become a regular daily expense for drivers.

#### D) TIMINGS:

The unstructured bus services in Karachi operate throughout the week, generally between 7:00 a.m. and 10:00–11:00 p.m. Service frequency varies by route: some operate only on weekdays, others exclusively on weekends, while a subset runs seven days a week. For most routes, a single vehicle completes two full round trips per day. A one-way journey from terminal to terminal typically takes between four and five hours, depending on traffic and route length. Route distances vary considerably, ranging from approximately 6 km (e.g., Route 11C) to about 58 km (e.g., Ilyas Coach).

#### E) TIME-KEEPING:

Each unstructured bus service employs a timekeeper (munshi) who is responsible for scheduling daily departures from the adda. The munshi issues each driver a written slip specifying the departure time, the expected time to reach the midpoint of the route, and the time to complete the return journey to the original terminal. These time benchmarks serve as the operational guide for the trip and are checked both enroute and upon completion to ensure adherence to the schedule. Failure to meet the assigned timings can result in deductions from the driver's earnings. While this system is intended to maintain punctuality and regulate headways, it often incentivizes speeding and results in buses bypassing waiting passengers.

In addition to timekeeping, each service operates with an informal but fixed service frequency, typically ranging between 10 and 20 minutes, and in some cases even shorter. For example, the G-17 service maintains an average headway of approximately 12 minutes between consecutive buses.

Despite these internal controls, unstructured bus services operate without an Intelligent Transport System (ITS) or any form of digital monitoring. Consequently, operational decisions are not governed by real-time data, automated enforcement, or centralized oversight. Reflecting on this environment, one field mapper noted that “the lack of accountability just gives a lot of freedom,” capturing both the operational flexibility and the regulatory absence that characterize Karachi's unstructured transit system.

##### *4.4.1.2. Bus Stops:*

A defining characteristic of Karachi's unstructured bus services is the absence of fixed or formally designated bus stops. Instead, drivers and conductors coordinate informally to pick up and drop off passengers at locations of their choosing along the route. As a result, buses may stop as frequently as every 30 seconds to accommodate passenger demand. While this practice minimizes walking distances and is widely regarded by users as a major advantage of unstructured services, it significantly increases travel time for passengers undertaking longer journeys and contributes to overall route inefficiency. Despite its operational and traffic implications, this practice has not been formally discouraged or regulated by government authorities or traffic police through any policy framework.

In contrast, bus stops associated with earlier public transport systems, such as the Urban Transport Scheme (UTS), continue to be recognized as valid and functional by certain government agencies. However, only a subset of these stops is actively maintained. Paradoxically, major high-traffic nodes such as NIPA and Gulbai lack officially designated bus stops altogether. As a result, passengers

experience considerable inconvenience, including the absence of seating or shelter and the disorderly sharing of road space, where people and buses stand anywhere on the road.

#### *4.4.1.3. Fares:*

The bus services operate on a cash-only basis and lack a formal ticketing system. Despite this, fares are not set arbitrarily. According to the President of Karachi Transport Ittehad (KTI) Bus Association, the government, specifically the RTA, determines fares, which are communicated through the Secretary of RTA. This information is then forwarded to KTI, which reviews it and, when necessary, negotiates with the government. Officially, any fare increase is finalized through a stakeholder meeting convened by the government. However, president expressed dissatisfaction with the process, highlighting the limited influence of the association:

*"We submit an application. We write it down. But what we write down gets less consideration."*

As a result, some operators deviate from the government determined fares, as confirmed by the president:

*"These days each rider is setting the fare as per his convenience due to inflation. But that's not how it's supposed to be."*

Fares are collected manually by conductors from passengers. While a rate list is sometimes displayed inside the bus, it is often unavailable. This is likely because most passengers are daily commuters and already familiar with the standard fares. At the time of fieldwork, the general rate was 20 PKR per 10 km.

Moreover, fare affordability remains a major concern for passengers, particularly for socio-economically vulnerable commuters, where even a small increase of 10 PKR can significantly impact their monthly expenses. Although a formula-based fare system exists, it requires better communication and enforcement. Government-issued tickets could help streamline fare collection and ensure consistency. No fare is charged for children, but this does not guarantee them a seat. Children are accommodated on women's laps and may be given a seat only if it is not required by another paying passenger. One of our field mappers recounted an incident where she offered her seat to a child, but despite her request, the child was not seated, leaving the seat empty.

#### *4.4.1.4. KTI and Challenges Faced by the Operators:*

The Karachi Transport Ittehad (KTI) Bus Association, established in 1984, represents operators of unstructured bus services and acts as an intermediary between owners, drivers, conductors, and government authorities. Membership requires adherence to association-level rules, and KTI serves as a collective platform for negotiating operational concerns with the state. According to the association, the sector's decline is primarily shaped by fuel-related policy shocks and rising competition from alternative transport modes.

#### **A) FUEL COSTS AND MOTORBIKES:**

Minibuses and coaches have operated in Karachi since the mid-1960s and once formed the backbone of the city's transport system, with some individual owners managing fleets of over 150 vehicles. This dominance began to erode following a major shock in 2008, when international oil prices surged to

nearly USD 150 per barrel. In response, operators successfully lobbied for fares to be indexed to diesel prices on a 1:1 basis, such that every one-rupee increase in fuel costs was directly passed on to passengers. While this mechanism protected operators in the short term, it triggered a broader shift in travel behaviour across the city.

Rising fares made motorcycles an increasingly attractive alternative due to their lower operating costs and greater flexibility. Leasing companies accelerated this transition by offering motorcycles on low monthly instalments, sometimes as little as PKR 5,000. At the same time, the proliferation of Qingui rickshaws drew away short-distance commuters, further weakening minibuses ridership. As Ashar Lodi of Exponent Engineers observed, these combined pressures “basically destroyed public transport.” Urban planner Farhan Anwar similarly notes that the convenience of motorcycles discourages bus use, contributing to the gradual disappearance of minibuses from Karachi’s streets. This trend is reflected in empirical evidence: Noman et al. (2009) document a steady decline in public transport routes, from 149 in 2012 to just 90 by 2017.

Policy instability around fuel use compounded these structural pressures. In the early 2000s, diesel-based buses were required to convert to compressed natural gas (CNG), imposing significant financial burdens on operators. Soon after, persistent CNG shortages prompted a policy reversal, forcing operators to revert to diesel. KTI leadership cites this sequence as emblematic of weak policy planning and inadequate risk assessment, with compliance costs consistently transferred to private operators.

Following the return to diesel, fuel prices continued to rise, creating operational strain for owners, income insecurity for drivers, and safety risks for passengers. Many owners are now unable to fill a full 80–100-liter fuel tank at once. To manage costs and reduce concerns over fuel theft, operators store diesel in 10–20-liter containers placed inside buses and used as auxiliary fuel tanks. Despite the evident safety risks, this practice has been informally normalized. When raised with the Ittehad, concerns were dismissed on the grounds that diesel is unlikely to ignite, framing accidents as matters of misfortune rather than preventable risk. Notably, this practice persists in plain view without regulatory intervention. The risks are especially acute for female passengers, who are often seated near these containers and report fear for both their personal safety and clothing.

Despite these cumulative pressures; rising costs, policy reversals, modal competition, and safety concerns; the association remains cautiously optimistic about the sector’s survival. This resilience is attributed to the continued reliance on minibuses in peripheral and low-income settlements, where formal public transport alternatives remain absent or inadequate.

#### B) LICENSING PRACTICES AND INFORMAL COMPLIANCE:

The Karachi Transport Ittehad (KTI) recognizes the formal requirement for drivers of public service vehicles to hold valid driving and public service licenses. However, KTI leadership questions the practicality of enforcing these requirements within Karachi’s unstructured transport sector. As the association’s president noted, while licenses can be obtained, the cost and procedural complexity make them largely inaccessible to low-income drivers, rendering the requirement ineffective in practice.

According to KTI, the licensing process was considerably more accessible prior to 2000. Drivers could enrol at training centres, receive practical instruction, and be certified as fit for public service at a nominal cost of PKR 200–300. These centres conducted basic but essential assessments, including eyesight tests and evaluations of a driver’s ability to operate large vehicles. The process relied largely on verbal instruction and minimal paperwork, which lowered barriers for participation and facilitated sector-wide compliance.

In contrast, the current licensing system is characterized by extensive documentation, higher costs, and prolonged bureaucratic procedures. KTI leadership views this shift as a departure from earlier efforts that supported the functioning of public transport systems. As a result, many drivers reportedly operate without valid licenses, not due to disregard for regulation, but because of structural and financial constraints. At the same time, accounts from former drivers suggest that increased enforcement in recent years has prompted a partial return to formal licensing, indicating uneven but growing compliance driven by state pressure rather than institutional support.

### C) OPERATIONAL COSTS:

Rising inflation has significantly increased the operational costs of unstructured bus services. Beyond fuel expenses, operators face high maintenance costs driven by expensive and increasingly scarce spare parts, frequent repainting, and recurring adda-related expenses. According to KTI, essential vehicle parts are now difficult to procure and prohibitively expensive. As buses operate daily on deteriorating road infrastructure and in congestion, damage is inevitable; without timely repairs due to part shortages, vehicles deteriorate rapidly and are rendered unfit for service.

The absence of subsidies constitutes a second major challenge for unstructured bus operators, particularly in comparison to government-run services that continue to receive financial support. Operators argue that despite charging low fares comparable to subsidized public buses, they receive no state assistance. While this claim often overlooks the fact that the government absorbs financial risk for its own fleets, operators point out that their livelihoods are directly shaped, and constrained, by government policies and regulatory decisions. Moreover, the anticipated expansion of mass transit systems and the Peoples Bus Service (PBS) has heightened this uncertainty. During field mapping, operators and drivers frequently expressed fears of displacement, asking researchers, “So now you’ll run your own buses and shut ours down?” In the absence of subsidies and long-term policy clarity, several owners have sold their vehicles at significantly reduced prices, anticipating the sector’s decline. At the same time, a counter-narrative of resilience persists, with others asserting that government transport projects are transient and that informal buses have survived similar disruptions in the past.

Security and safety concerns form a third, less discussed but critical dimension of vulnerability. Unstructured buses have historically been targets during episodes of political and ethnic violence in Karachi. The President of KTI recalled the loss of hundreds of buses during protests led by a major political party, underscoring the exposure of private operators to unrest-related destruction without compensation or protection. Such incidents further compound financial instability and reinforce the precarious nature of operating within the informal transport sector.

#### 4.4.1.5. Route Formation and Permit Process:

Unlike the BRT system, route selection for unstructured minibuses and coaches is not informed by transport modelling, household surveys, or demand forecasting. Instead, routes emerge through an iterative, practice-based process grounded in operators' long-term observation of commuter flows and neighbourhood linkages. Routes typically connect low-income residential areas to employment and commercial centres. Importantly, route proposals originate solely from operators; neither the Regional Transport Authority (RTA) nor the Traffic Bureau proactively plans or proposes routes. While drivers often describe these routes as inherently profitable and bearing "no loss," field interviews revealed contradictions, including cases where routes were discontinued due to low ridership.

All services are required to hold a route permit valid for three years, which remains eligible even if operations temporarily cease. While RTA officials claimed that many buses operate without permits, interviews with operators, drivers, and Karachi Transport Ittehad (KTI) leadership suggest that informal payments are common within the enforcement process. To obtain a permit, each vehicle must be registered and undergo periodic fitness inspections conducted by the Excise Department: annually for newer vehicles and every six months for older ones. However, limited transparency regarding inspection criteria raises concerns about their practical effectiveness.

#### ROUTE APPROVAL PROCESS (STEPWISE):

The time required for a new route approved can range from 15–20 days to several months depending on the government's timeline:

- The operator submits a written application to the RTA detailing the proposed route.
- The RTA forwards the application to the Traffic Bureau for a route survey<sup>8</sup>
- The Traffic Bureau assesses route alignment, purpose, and overlap with existing services and issues either a No Objection Certificate (NOC) or a rejection with stated reasons.
- Upon preliminary approval, the RTA requires the operator to publish the proposed route in national newspapers (e.g., *Dawn* and *Jang*).
- A 14-day objection period follows, during which concerns raised by the public, civil society, or businesses are reviewed and resolved.
- The Traffic Engineering Department prepares a route map, including stops and operational details.
- The proposal is circulated through the police hierarchy, from Station Officers to DSPs, SPs, and finally the DIG, for comments and endorsement.
- After review, the DIG returns the signed approval to the RTA.
- The proposal is then presented to a multi-agency board comprising the Commissioner, DIG, SPs, Secretary RTA, Secretary Transport, and other members.

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<sup>8</sup> The survey is based on the Traffic Bureau's observations and their previous knowledge base of the routes. No data is collected by the Traffic Bureau before issuing an NOC.

- Following board approval, the route permit is formally issued, and the service is authorized to operate.

Official permits allow between 10 and 80 buses per service; however, this limit is weakly enforced, with some operators exceeding it. There are no minimum or maximum route length requirements, and route extensions or modifications are introduced on an ad hoc basis, driven largely by profitability. Any formal change requires the same approval process and acquisition of fresh NOCs.

Although the RTA remains the designated authority for route permitting, its regulatory capacity has diminished significantly. Following the withdrawal of magistrate powers after 2008, the department lost effective enforcement authority. Interviews with BRT officials described the RTA as an “outdated” institution, and in practice the route approval process functions more as a mechanism of legitimization than as a tool for strategic transport planning or oversight of safety, service quality, and operational standards.

#### *4.4.1.6. Labour and Working Conditions in Unstructured Bus Operations*

Recruitment of drivers in the unstructured bus sector is informal and ad hoc. Unlike the BRT system, which relies on public advertisements, formal selection, and structured training, there is no standardized recruitment or capacity-building mechanism for minibuses and coaches. Entry into driving is largely experienced-based and mediated through existing operators and drivers, with skills acquired on the job rather than through formal instruction.

Bus operations are continuous and physically demanding. Drivers and conductors typically begin work between 6:00 and 6:30 a.m. and operate until 9:00 or 10:00 p.m., often with only one to two hours of rest depending on fleet size. A vehicle is assigned to a driver for the entire day, and departures follow a fixed order among vehicles operating on the same service. Services run in all-weather conditions, including heavy rainfall, and drivers contend daily with Karachi’s deteriorating roads and chronic congestion, increasing travel time, fatigue, and accident risk.

Driver earnings are directly tied to daily ridership. After handing over the operator’s fixed share, drivers must cover multiple expenses, including hazri payments, penalties for late arrivals, informal payments to traffic police, minor accident costs, conductor wages, and food. As a result, net earnings are minimal and highly variable, with no fixed salary, job security, insurance, or welfare support. This incentive structure fuels competitive driving practices, commonly referred to as the “bus race,” as drivers attempt to maximize passenger intake within limited time windows.

Conductors, hired and paid by drivers, function as multi-task assistants, managing boarding and alighting, token slips, cleaning, food procurement, negotiation with traffic authorities, and resolving fines. Despite the absence of a formal ticketing system, conductors maintain fare accuracy and passenger recall under constant time pressure. Many conductors aspire to become drivers, receiving informal training when allowed to operate the bus toward the end of routes.

Operators intervene minimally in day-to-day operations, typically only engaging when legal issues arise, such as the registration of an FIR. If a driver must attend court, they forfeit the day’s income, compounding financial and operational loss. In contrast, BRT drivers operate under regulated

conditions, including fixed shifts, scheduled days off, capped working hours, fixed salaries, and health and life insurance, with limited passenger interaction. While BRT drivers work in a controlled environment, unstructured bus drivers bear disproportionate operational, financial, and legal risks with little institutional support.

#### *4.4.1.7. Passenger Experiences:*

Despite providing critical connectivity from peripheral areas to the city centre and offering highly flexible boarding and alighting, passengers report low overall satisfaction with unstructured bus services. Testimonies from interviews and participatory workshops highlight several recurring concerns. Passengers frequently cited long, irregular, and undefined waiting times as a key drawback. Delays are caused by traffic congestion, vehicle breakdowns, and prolonged stoppages at selected locations where buses wait to attract additional passengers. Once on board, these pauses can extend travel times by an additional 20–30 minutes.

Moreover, overcrowding inside vehicles remains a persistent issue. High and unregulated demand pushes buses well beyond their intended capacity, with conductors continuing to board passengers even when no standing or seating space remains. This is particularly challenging for women, whose designated compartment typically contains only 8–12 seats. During peak hours, women often struggle to board safely. A field mapper recalled a woman protesting, “Are you going to make us sit on your heads now?” Overcrowding also heightens fears of harassment, especially during nighttime travel. One passenger described night journeys as the most distressing, noting that buses become so full they visibly tilt.

Pickpocketing is another frequently mentioned issue that contributes to passenger anxiety. Many commuters reported remaining constantly vigilant throughout their journey, holding their belongings tightly due to the density of passengers and lack of surveillance.

Additionally, road safety and driving practices emerged as major concerns. Drivers occasionally hand over control of the bus to conductors toward the end of routes, many of whom lack adequate driving experience. At the same time, drivers aged 65 and above are common, reflecting both lifelong dependence on the sector and the absence of retirement or health safeguards. Rash driving to meet strict time targets is widespread, often resulting in near collisions. As one participant noted, “In one journey there are just too many close calls... you’re constantly thinking it will crash.” Bus racing between competing services further exacerbates safety risks. Certain locations, such as Ghani Chowrangi, were repeatedly identified as points where drivers accelerate aggressively to outpace rivals. During these races, passenger requests to stop are ignored. One commuter stated, “Once the race starts, the race is the priority. You don’t matter at all.”

Finally, drivers also rarely come to a complete stop when passengers disembark, expecting them to alight while the bus is still moving. Limited consideration is extended to women and aged passengers, largely because the vehicle design, with high steps and narrow doors, is unsuitable for those requiring more time to board or exit. Passengers additionally reported inconsistent driving patterns, with slow speeds at the start of routes and excessive speeding toward the end, increasing both travel time uncertainty and discomfort during peak hours.

Nevertheless, as discussed earlier, it is important to note that drivers operate under constant internal and external pressure. They bear frequent pressure from timekeepers and harassment from traffic police and law enforcement agencies, at times from passengers themselves. These conditions shape driving behaviour and contribute to the overall sense of insecurity experienced by commuters.

#### ***4.4.2. At the Crossroads of Reform and Survival, Unstructured Bus System of Karachi***

Karachi's unstructured bus system exemplifies what Cervero & Golub (2007) term as informal systems theory, where weak planning and regulatory failure create space for informal operators to meet unmet demand. As Imran (2009) notes, limited attention has historically been paid to improving the quality of public transport as a means of managing demand. The inefficiencies observed in Karachi's bus system are therefore not the result of deliberate neglect, but rather of prolonged institutional weakness, fragmented governance, and inadequate transport planning.

In this context, informal operators have expanded to fill service gaps left by the state. Over time, rising operating costs, limited public investment, and weak regulatory capacity have contributed to service deterioration. Yet, despite being labelled "unstructured," these services follow recognizable and repeatable operational logics shaped by cost pressures, passenger demand, and governance constraints. Inflation, fuel prices, licensing barriers, encroachments, congestion, inconsistent law enforcement, and the uncoordinated introduction of BRT, PBS, and chingchi services have collectively shaped the current state of the sector.

The micro-level functioning of these services such as frequent stopping, fare flexibility, route persistence, and labour practices, can only be understood in relation to these macro conditions. Daily operational decisions are shaped by fuel prices, licensing costs, informal payments to authorities, and accident risks. Precarious labour conditions for drivers and conductors reflect efforts to keep services financially viable under constrained circumstances. Passengers, in turn, bear the consequences through uncertainty, crowding, discomfort, and longer travel times in exchange for affordability and accessibility.

Despite minimal government support, the sector has survived through self-organisation. Estache (2001) argues that privatized transport systems require strong regulatory capacity to ensure service quality, safety, and accountability. In Karachi, limited oversight has instead allowed operators to function at the margins of legality, addressing demand but without mechanisms to protect workers or passengers. The concerns raised by commuters, alongside poor working conditions for drivers and conductors, are direct outcomes of this regulatory vacuum.

This situation is compounded by deep institutional fragmentation. Urban planner Farhan Anwar highlights the siloed nature of transport planning in Karachi, arguing that the absence of a centralized authority with a clear mandate has produced an ad hoc and broken transit system. Interviews reveal conflicting visions for the future of unstructured buses: while some consultants advocate integration with BRT systems, officials at the Sindh Mass Transit Authority view these services as obsolete. The operational split between SMTA-led BRT systems and the National Radio & Telecommunication Corporation's management of the People's Bus Service further underscores the lack of coordination in a sector that requires centralized oversight.

Stakeholder exclusion further weakens policy outcomes. Operators of unstructured buses remain largely absent from formal planning and consultation processes. Public trust in government-led transit initiatives is also fragile, shaped by Karachi's history of failed transport projects and prolonged construction disruptions. Experiences from cities such as Accra demonstrate that introducing mass transit systems without meaningful integration of informal services can lead to ineffective outcomes (Durant et al., 2023).

Behavioral change presents another challenge. With private motorcycles and informal transport deeply embedded in everyday mobility (Anwar et al., 2018), shifting commuters toward formal public transport will require sustained behaviour-change strategies similar to those employed by Transport for London (TfL, 2018). Just as decades of neglect reshaped travel behaviour, reversing these patterns will take time.

The future trajectory of unstructured buses suggests a growing socio-spatial marginalization of the service. Rather than disappearing entirely, these buses risk being relegated to serving only the working class populations living on the city's peripheries. As Mansoor Raza observed, government-operated services tend to align routes and investments toward corridors that primarily serve middle-income areas of the city. In contrast, both the People's Bus Service and BRT are widely perceived as cleaner, safer, and more respectable modes of transport, reinforcing their appeal among middle-class commuters. This emerging pattern points toward a classed restructuring of mobility in Karachi, where formal systems cater to select populations while unstructured buses increasingly become residual services for those with limited alternatives.

At the same time, complete absorption or elimination of these buses risks erasing an important dimension of Karachi's cultural and social life. Participants in the participatory workshops consistently described minibuses as spaces of everyday community formation. From conductors ensuring women are safely dropped at the last stop, to small acts of care in the women's section, offering a toffee or calming a crying child, these interactions produce a sense of belonging during daily travel. As one participant reflected, "You don't feel a sense of belonging [on the People's Bus Service]. On public buses it feels like these are my people." Another added, "We want this [minibuses]. Look, there's air, you can talk to people, and this is right for us." Viewed through the lens of Everyday Urbanism (Chase et al., 1999), these routine interactions illustrate how urban systems are shaped not only by formal planning but by lived practices that reproduce social relations along the route.

This cultural framing, however, is not uncontested. Some stakeholders rejected the idea of minibuses as cultural assets, pointing instead to their material decay and poor conditions. Mansoor Raza remarked: "You mean the ones whose windows are broken, whose seats are filthy, with spit stains inside, where after one ride you feel like washing your clothes? Is this the culture you are referring to?" which points towards the struggling state of the system. Echoing this perspective, the Director of SMTA suggested that these buses belong "only in museums or pictures." Together, these contrasting views highlight the central tension facing Karachi's transport future: how to reconcile cultural value and everyday sociality with legitimate concerns around safety, dignity, and service quality?

Despite their flaws, unstructured buses continue to provide critical connectivity in peripheral and low-income neighbourhoods such as peripheral communities of Orangi Town, Ittehad Town, and Keamari areas not yet served by BRT or PBS. Their continued operation reflects both state failure and community resilience. These decorated minibuses remain a powerful cultural marker of Karachi's transport history, embodying both systemic neglect and everyday ingenuity. Replacing these systems with uniform, imported models without addressing underlying governance failures risks reproducing exclusion rather than resolving it.

## CONCLUSION

This research concludes that Karachi's unstructured bus system is not a transitional anomaly but a self-organized transport network produced through prolonged policy instability, weak regulation, and uneven state investment. Rising fuel costs, abrupt policy reversals, absence of subsidies, and fragmented governance have collectively transferred risk onto private operators, shaping unsafe practices, precarious labour conditions, and uneven service quality. Yet, despite these pressures and the impending expansion of mass transit, the sector continues to sustain mobility in peripheral and low-income settlements where formal alternatives remain insufficient.

The findings highlight a persistent disconnect between transport planning institutions, operators, and users, resulting in ad hoc interventions rather than coherent regulation or integration. District- and town-level analysis further reflects this disconnect, particularly in the mismatch between population density and route densification. A similar pattern is observed in the emergence of transit nodes, which have developed over time without planning, infrastructure, or capacity-building in these areas and along key corridors. In addition, overlap analysis reveals high levels of duplication within unstructured bus routes and with structured systems such as PBS and BRT, creating challenges related to connectivity, congestion, and transport equity in the city.

The study also highlights that Qingqis, although legal vehicles, are functioning illegally on unauthorized routes. They are encroaching on bus routes and have taken over a significant share of ridership. Nonetheless, a large proportion of the population depends on them for commuting due to minimal waiting times, ease of access, and their role in providing first-mile and last-mile connectivity. It is therefore crucial for relevant government authorities to modify and regulate Qingqi services through formal route authorization, improved safety measures, and stricter enforcement to ensure an accessible and reliable transportation system, particularly for peripheral communities.

In terms of accessibility to essential health and tertiary education facilities, the study finds that unstructured bus routes provide higher connectivity in central areas of the city, but limited to no connectivity for institutions located in peripheral or suburban areas. Similar patterns are observed in access to employment zones, where, apart from central and south-western industrial areas, many zones remain underserved by the current bus network. Further research incorporating travel day-time analysis and origin–destination data is required to strengthen these findings.

On the supply side, with approximately 4,500 buses active, the unstructured bus sector employs a minimum of 10,000 workers, if not more (KTI, 2025). As a source of livelihood, emerging discussions around integration and livelihood restoration policies suggest a possible absorption of these services. However, the continued exclusion of unstructured operators from meaningful policy dialogue risks future implementation challenges. Ultimately, the study underscores that service deterioration, safety risks, and passenger discomfort are not inherent to informality itself, but are direct outcomes of limited state oversight and planning capacity.

Recognizing these buses as both functional infrastructure and cultural capital is essential. Any sustainable transport future for Karachi must move beyond eradication narratives and acknowledge the role unstructured buses have played, and continue to play, in the city's mobility landscape. Until mass transit systems are fully implemented, these buses should be treated as an operational asset,

governed through coordinated institutional frameworks and regulatory mechanisms that reflect the everyday practices shaping mobility in Karachi.

## POLICY RECOMMENDATIONS

- 1. Aligning Routes with Population and Essential Services:** Transport authorities need to advise transport operators to adopt population density as a key criterion for route allocation and service frequency, ensuring route planning must go beyond central, high-demand corridors and ensure connectivity across all parts of the city, especially underserved peripheral and suburban areas. Secondly, route design should explicitly incorporate access to essential services, including healthcare, education, and employment zones to ensure that residents across the city can reasonably access these critical destinations.
- 2. Livelihood Safeguards during System Transition:** A policy for the assimilation of existing transport personnel has already been formulated and approved as part of ADB funding conditions. A key recommendation is to ensure that no loss of livelihood occurs during this transition, as displacement would negatively affect social development among a large and vulnerable population. Breeze Karachi, SMTA, and the Sindh Government must ensure the effective and transparent implementation of this policy.
- 3. Integration of Unstructured Buses:** Following a formal technical evaluation by the RTA, existing buses may be repurposed as feeder services to the BRT and PBS. Alternatively, BRT and PBS vehicles may draw stylistic inspiration from existing buses to preserve the city's cultural and visual transport heritage, supporting public acceptance.
- 4. Integration of Qingqis:** Once the Qingqi is redesigned into a safer vehicle and approved by the relevant authorities including the Pakistan Standards and Quality Control Authority and the Engineering Development Board with strict safety measures in place, the government should incorporate the Qingqi's as a feeder service in the BRT and PBS system.
- 5. Interim Regulation of Unstructured Services:** Given the delays in construction of the BRT infrastructure, unstructured buses will continue to serve as one of the primary modes of transport in the near future. The RTA must therefore assume a stronger regulatory role to ensure smooth operation of these buses and passenger safety. Vehicles with severe structural damage, missing windows, or unsafe fuel storage practices should be phased out immediately. The regulatory authorities should advise and support operators in maintaining minimum safety and operating standards.
- 6. Coordination and Dialogue among Stakeholders:** There is an urgent need for structured engagement between government authorities, transport operators, and relevant agencies to collectively address service quality, safety, and operational challenges. Regular dialogue can support realistic, context-sensitive improvements rather than abrupt system disruption.
- 7. Developing Supporting Urban Infrastructure:** The Karachi Metropolitan Corporation (KMC), Karachi Development Authority (KDA) and Sindh Mass Transit Authority (SMTA) should prioritise the maintenance and improvement of supporting infrastructure, including roads, bus stops, bus station, pedestrian bridges and connected walkways, which directly affect service efficiency and passenger experience.

**8. Public Communication Strategy for Public Transport in Karachi:** Given widespread mistrust and limited public information, a comprehensive communication strategy is required to restore public trust in public transport. This should clarify its routes, purpose, utility, procedures, and safety benefits while promoting transparency and two-way communication between government institutions and the public.

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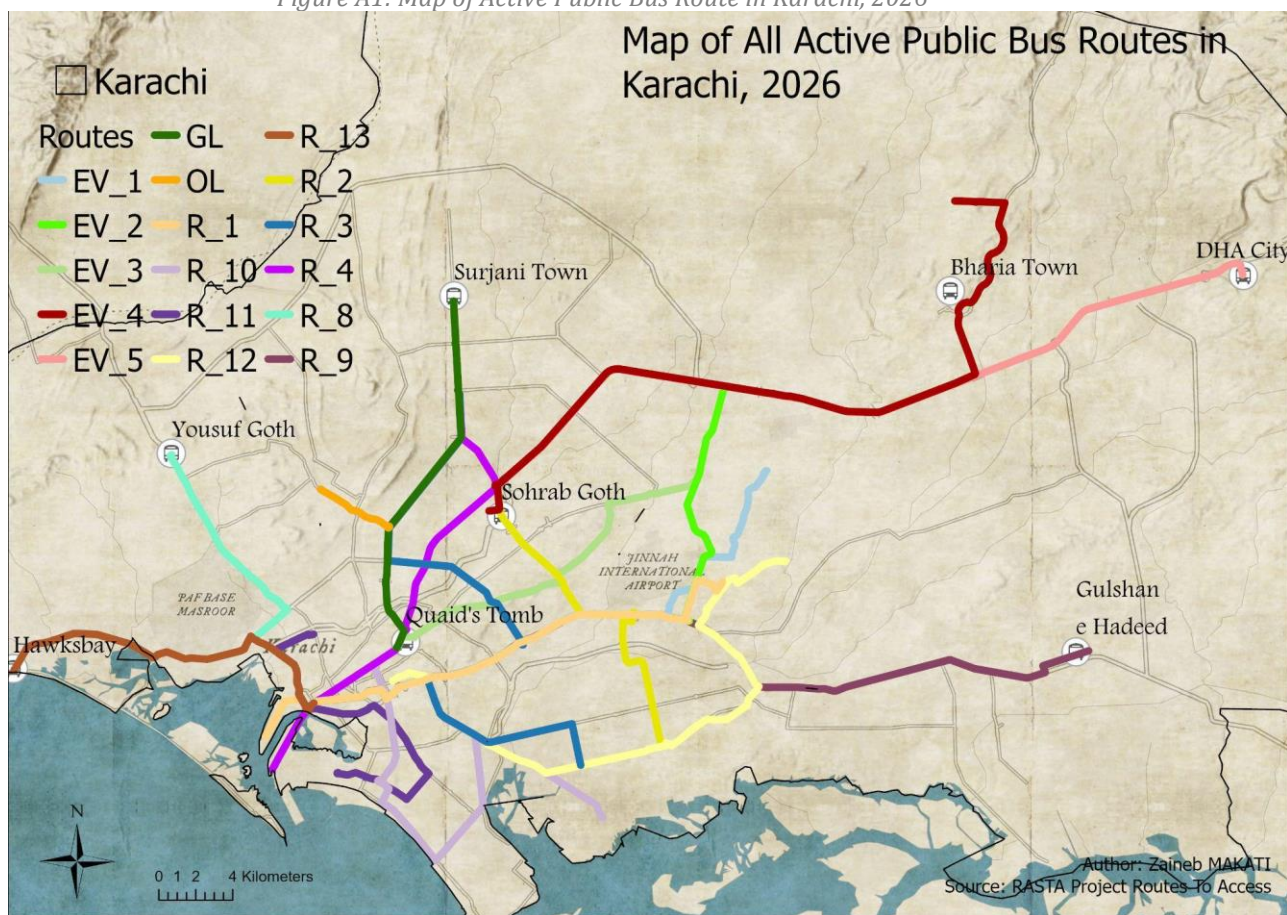
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## APPENDICES

### Appendix A: Maps of Unstructured and Public Bus Routes

Figure A1: Map of Active Public Bus Route in Karachi, 2026



Source: *Think Transportation (2025)* and *Baig, S (2024)*.

### Appendix B: Unstructured Bus Route Details

Table 3: District-wise Route Details

District	Area (sq.km)	Population	Accessible Area (sq.km)	Accessibility	Population Density (no/sq.km)	No. of Routes	Total Route Length (km)	Route Density (km/sqkm)
Manora Cant.	1.73	496.16	0	0%	287.49	0	0	0
Malir	2537.74	2518141.9	66.29	3%	992.28	25	1006208.1	0.4
Kaemari	443.52	2208639.8	76.77	17%	4979.84	38	1436481.8	3.24
West	240.54	2287623	52.83	22%	9510.36	23	905231.3	3.76
Malir Cant.	69.68	171431.69	17.27	25%	2460.25	8	297931.4	4.28
Korangi	82.33	2367069.5	43.48	53%	28752.07	32	1241941	15.09
Central	63.5	3517581.8	54.32	86%	55397.1	26	969426.5	15.27
East	115.71	2868666.9	70.77	61%	24791.82	48	1807868.6	15.62

Clifton Cant.	45.51	1339439.2	29.4	65%	29429.87	24	902169.84	19.82
Faisal Cant.	41.08	413661.9	18.97	46%	10069.24	22	860584.3	20.95
Korangi Creek Cant.	8.19	80737.14	3.38	41%	9858.82	9	356837.9	43.57
South	27.41	1123603.6	23.71	87%	40985.26	39	1312020.2	47.86
Saddar Cant.	4.6	145799.77	4.59	100%	31721.53	30	1064243.2	231.55

Source: Authors' compilations.

Table 4: Town-wise Route Details

District	Town	Population	No of Routes	Total Route Length (km)	Area (sq.km)	Population Density (no/sq.km)	Route Density (km/sq.km)
Central	New Karachi	849753.1016	8	275.1944	18.058	47056.878	15.239
Central	Gulberg	787073.8965	13	459.5543	14.052	56011.521	32.704
Central	North Nazimabad	1042086.274	13	478.0711	18.384	56684.414	26.005
Central	Liaquatabad	318360.6836	16	596.677	5.511	57768.224	108.27
Central	Nazimabad	520307.8789	15	583.9151	7.493	69439.194	77.928
Clifton Cantonment	Clifton Cantonment	1339439.239	24	902.16984	45.513	29429.817	19.822
East	Sohrab Goth	530179.7209	10	336.1264	33.206	15966.383	10.122
East	Safoora Town	577044.4911	16	594.2964	32.062	17997.77	18.536
East	Gulshan Town	428506.9993	23	910.3986	19.768	21676.801	46.054
East	Jinnah Town	664369.2656	30	1146.7691	17.015	39046.093	67.398
East	Chanesar	668566.4502	25	961.71484	13.729	48697.389	70.05
Faisal Cantonment	Faisal Cantonment	413661.896	22	860.5843	41.082	10069.176	20.948
Kaemari	Mauripur	475351.8901	25	952.7287	387.586	1226.442	2.458
Kaemari	Baldia	889088.2907	25	994.5654	32.532	27329.654	30.572
Kaemari	Moriri MirBahar	844199.6494	30	1140.2737	23.399	36078.45	48.732
Korangi	Model Colony	491419.6823	22	861.7632	29.093	16891.338	29.621
Korangi	Korangi	666707.188	19	753.9629	22.477	29661.751	33.544
Korangi	Landhi	624686.6483	7	277.7329	16.649	37520.971	16.682
Korangi	Shah Faisal	584255.9268	15	569.8529	14.107	41416.029	40.395
Korangi Creek Cantonment	Korangi Creek Cantonment	80737.14356	9	356.8379	8.189	9859.219	43.575
Malir	Gadap	888897.8462	12	455.6833	2418.67	367.515	0.188
Malir	Ibrahim Hyderi	1039635.966	13	556.3556	81.141	12812.708	6.857
Malir	Malir	589608.0637	24	980.6802	37.93	15544.637	25.855
Malir Cantonment	Malir Cantonment	171431.6864	8	297.9314	69.681	2460.236	4.276
Manora Cantonment	Manora Cantonment	496.156189			1.726	287.46	

Saddar Cantonment	Saddar Cantonment	145799.7695	30	1064.24324	4.596	31723.187	231.559
South	Saddar	736939.3945	37	1247.83174	20.607	35761.605	60.554
South	Lyari	386664.1855	20	738.1852	6.808	56795.562	108.429
West	Manghopir	837740.3818	9	350.9388	214.851	3899.169	1.633
West	Mominabad	384632.293	17	652.4374	7.479	51428.305	87.236
West	Orangi	1065250.337	12	429.2773	18.21	58498.096	23.574

Source: Authors' compilations.

Table 5: Major Transit Nodes and Connections

S.No	No of Connections	Major Transit Nodes	S.No	No of Connections	Major Transit Nodes
1	11	Banaras chowk	17	12	Urdu bazaar
2	13	KalaBoard	18	11	Hassan Square
3	12	Malir Court	19	12	New Town
4	13	Malir Halt Flyover	20	12	Jail Chowrangi
5	12	Drigh Road	21	11	Banaras Chowk
6	14	KPT Flyover	22	13	Malir 15
7	11	Tower	23	12	Malir River Bridge
8	12	Shah Faisal Colony Turn / Metro	24	11	Chamra Chowrangi
9	12	Nata Khan Bridge	25	12	Chota Gate
10	12	Wireless Gate	26	13	Nauras Chowrangi
11	13	Malir Halt	27	15	Habib Bank Chowrangi
12	13	Walika Chowrangi	28	11	Dawood Chowrangi
13	12	Agra Taj Colony	29	14	Liaquatabad 10 No
14	14	Lyari gate	30	14	J. Roundabout Main Korangi Rd
15	12	Sher shah stop	31	14	Wazir mansion
16	12	Star Gate			

Source: Authors' compilations.

Table 6: Overlap between the Unstructured Bus Routes

Bus Name	Max Overlap Percentage	Maximum Overlap With	Total Number of Overlaps	Bus Name	Max Overlap Percentage	Maximum Overlap With	Total Number of Overlaps
Khan Coach	43%	4J	16	W55	28%	Khan	7
Bus 4L	52%	4Q	10	G-27	44%	G-11	8
W-11	45%	4Q	11	Bus 7C	21%	G-19	7
Z2	57%	Bus 20	16	G-11	38%	G-27	11
4Q	67%	4L	16	G7 full route	54%	G-3	19
Bus 55	69%	Bus 51	11	Sheraz Coach	46%	G-3	22
Bus 51	66%	Bus 55	15	A3	29%	G-7	26
Ilyas Coach	59%	Abdullah coach	23	G3	63%	G-7	23
Imran Coach	58%	Abdullah coach	15	Mehsood Coach	36%	M-Shuttle	19
9C	55%	Marwat coach	18	X8	36%	N4	18

Awaan coach	47%	MashAllah	17		New Afridi Coach	62%	N5	20
C-1	83%	Mashriq	17		11-C	66%	SL-1	10
M Shuttle	45%	Mehsood	11		H	45%	SL-1	12
Al Rizwan	70%	Muslim	13		D7	61%	W-18	24
D1	56%	Muslim	18		F-11	30%	W-22	13
N4	44%	New Afridi	23		Bilal coach	50%	X-23	19
N5	48%	New Afridi	21		G-17	33%	A-25	15
Al-Qadri	86%	Sheraz	13		Rind Coach	34%	X-8	13
Gulistan coach	31%	Sheraz	23		Bus 20	33%	Z2	17
16	69%	Al Rizwan	13		A-25	28%	D-11	16
Muslim Coach	90%	Al Rizwan	15		Marwat Coach	45%	D-11	26
MashAllah Coach	59%	Awaan	15		D-11	48%	D1	23
W-25	32%	Awaan	8		Seven Star Bus	76%	D1	23
Mashriq coach	44%	Bilal	20		w18	51%	D7	16
X23	65%	Bilal	16		KL-1	39%	F-11	17
G-19	28%	Gulistan	14		S2	64%	F-11	17
Abdullah coach	72%	Ilyas	21		SL-1	64%	F-11	13
X10	31%	Ilyas	19		Super Hasan Zai	51%	F-11	24
Z-18	81%	Ilyas	19		W22	42%	F-11	16
4J	66%	Khan	17					

Source: Authors' compilations.

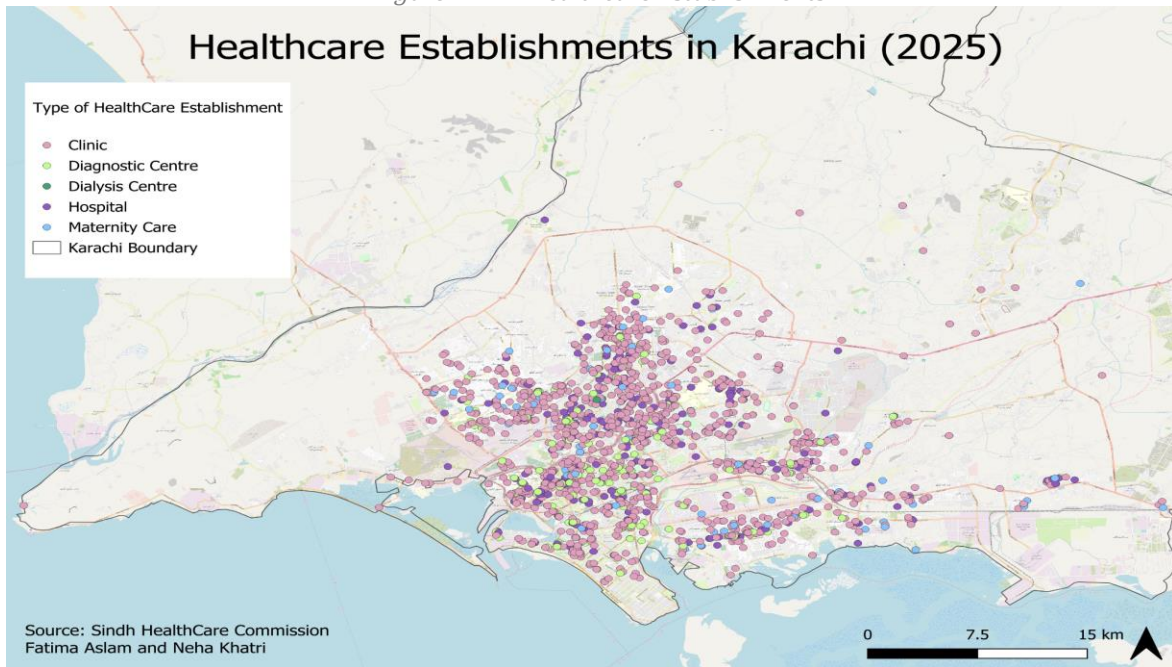
Table 7: Overlap between Public and Unstructured Bus Routes

Public Route	Max Overlap Percentage	Max Overlap With	No of Overlaps
EV_1	43%	9C	18
EV_2	49%	M Shuttle	2
EV_3	26%	Bus 51	4
EV_4	37%	4L	5
EV_5	41%	4L	5
GL	49%	4J	6
OL	13%	W-25	1
R_1	44%	9C	12
R_10	29%	H	6
R_11	24%	N4	12
R_12	70%	KL-1	19
R_13	69%	Al-Qadri	7
R_2	39%	W-18	13
R_3	53%	C-1	27
R_4	63%	W-11	12
R_8	58%	Z-18	16
R_9	91%	Muslim	15

Source: Authors' compilations.

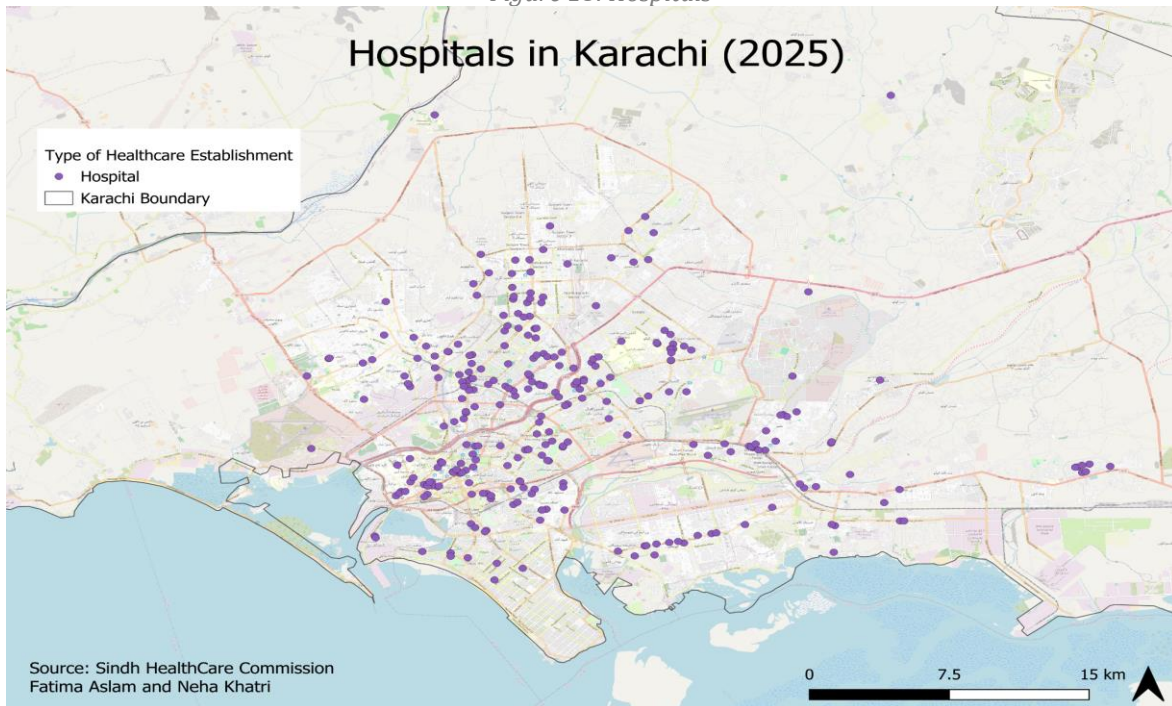
## Appendix C: Maps of Healthcare Establishments, Colleges and Universities in Karachi, 2025

Figure 17: All Healthcare Establishments



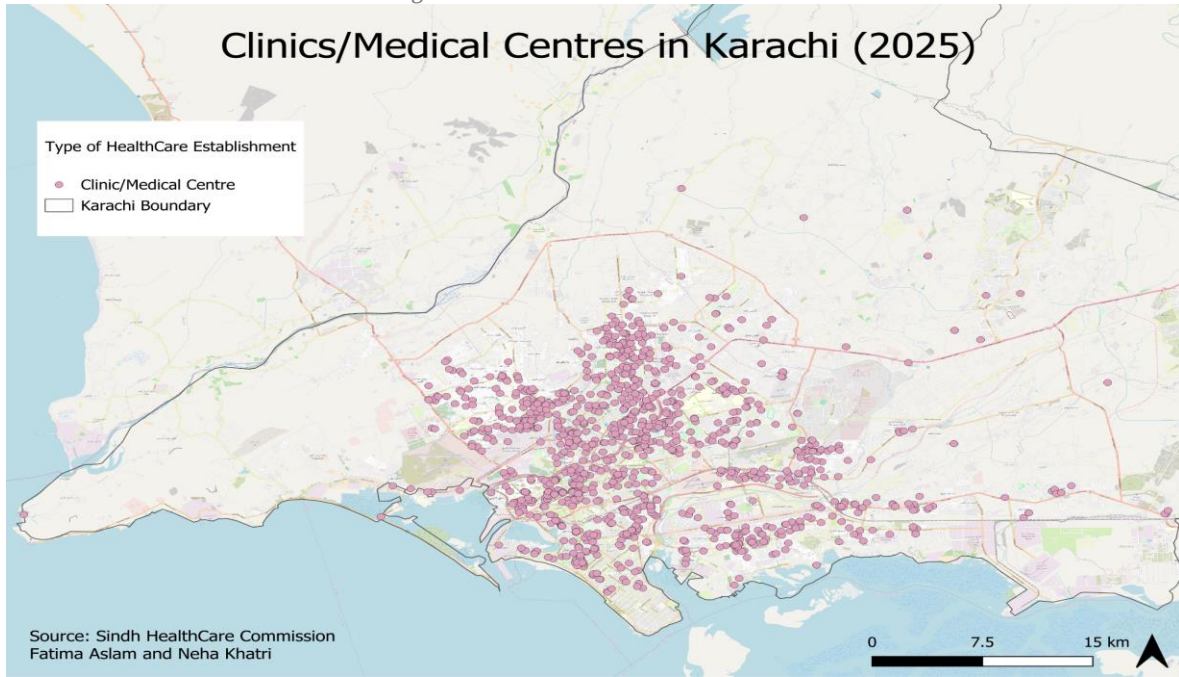
Source: Authors' compilations.

Figure 18: Hospitals



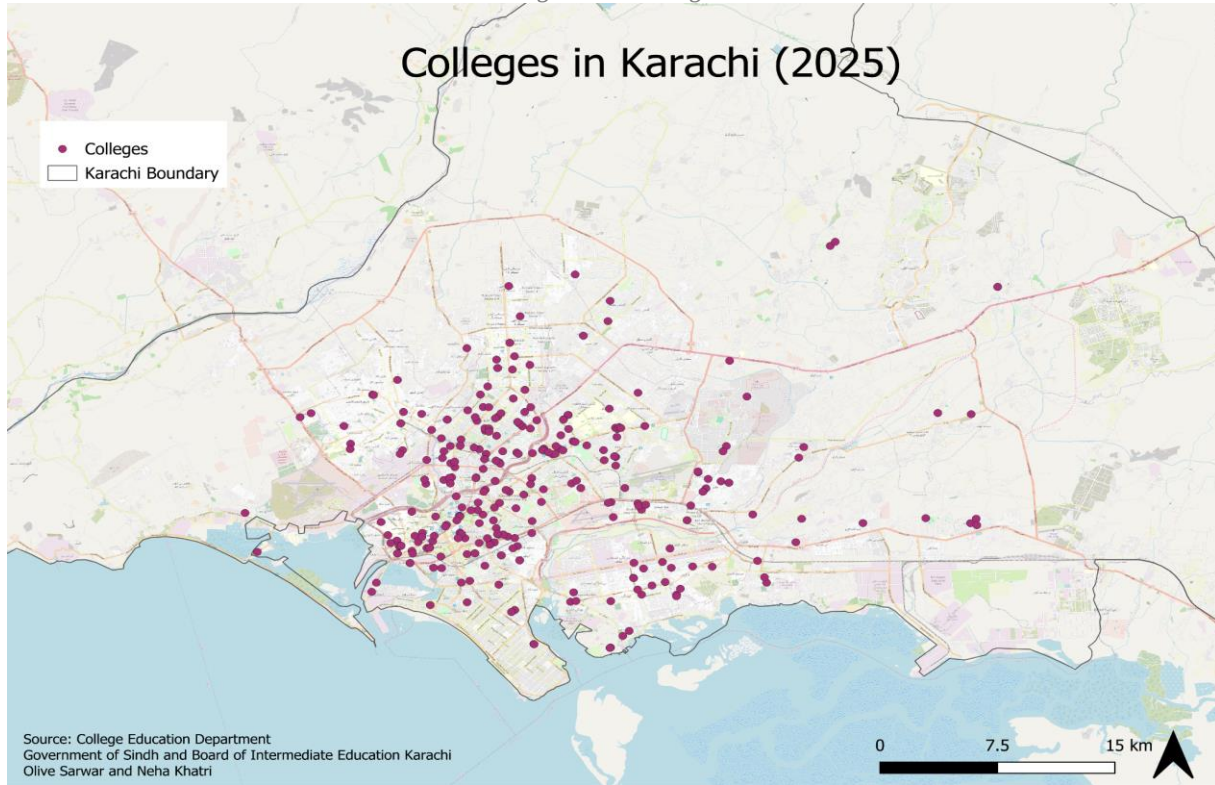
Source: Authors' compilations.

Figure 19: Clinics and Medical Centres



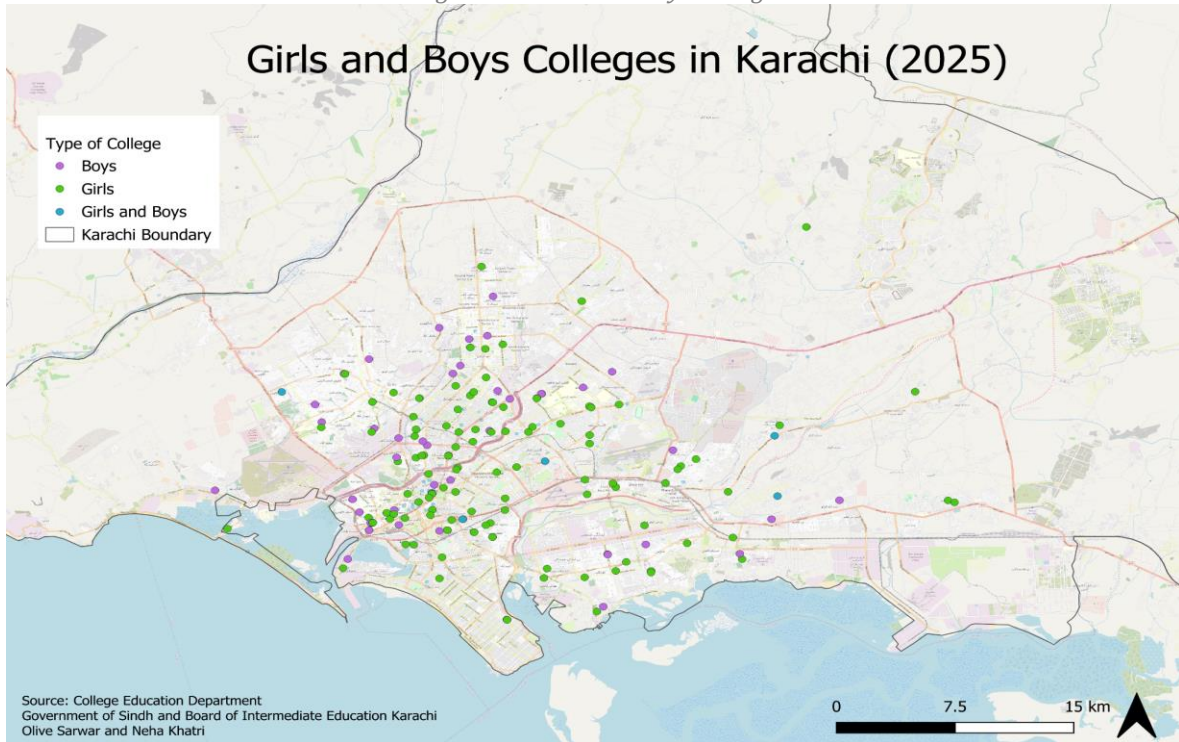
Source: Authors' compilations.

Figure 20: Colleges



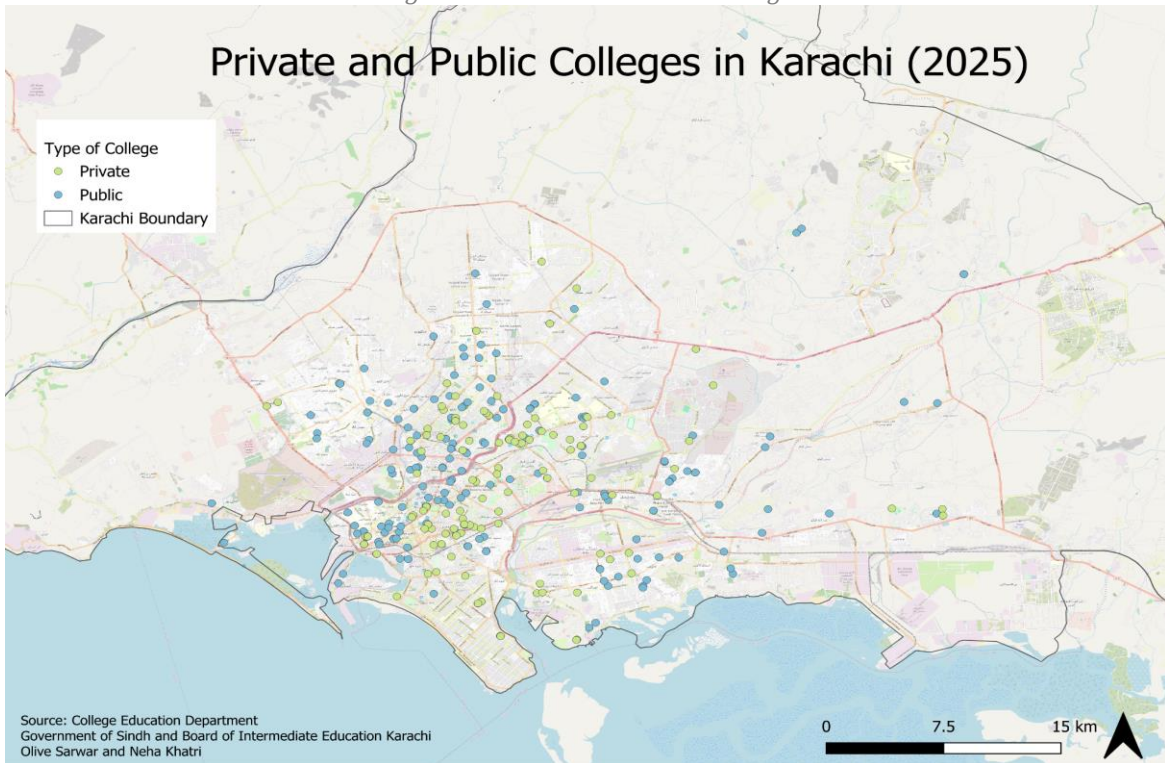
Source: Authors' compilations.

Figure 21: Girls and Boys Colleges



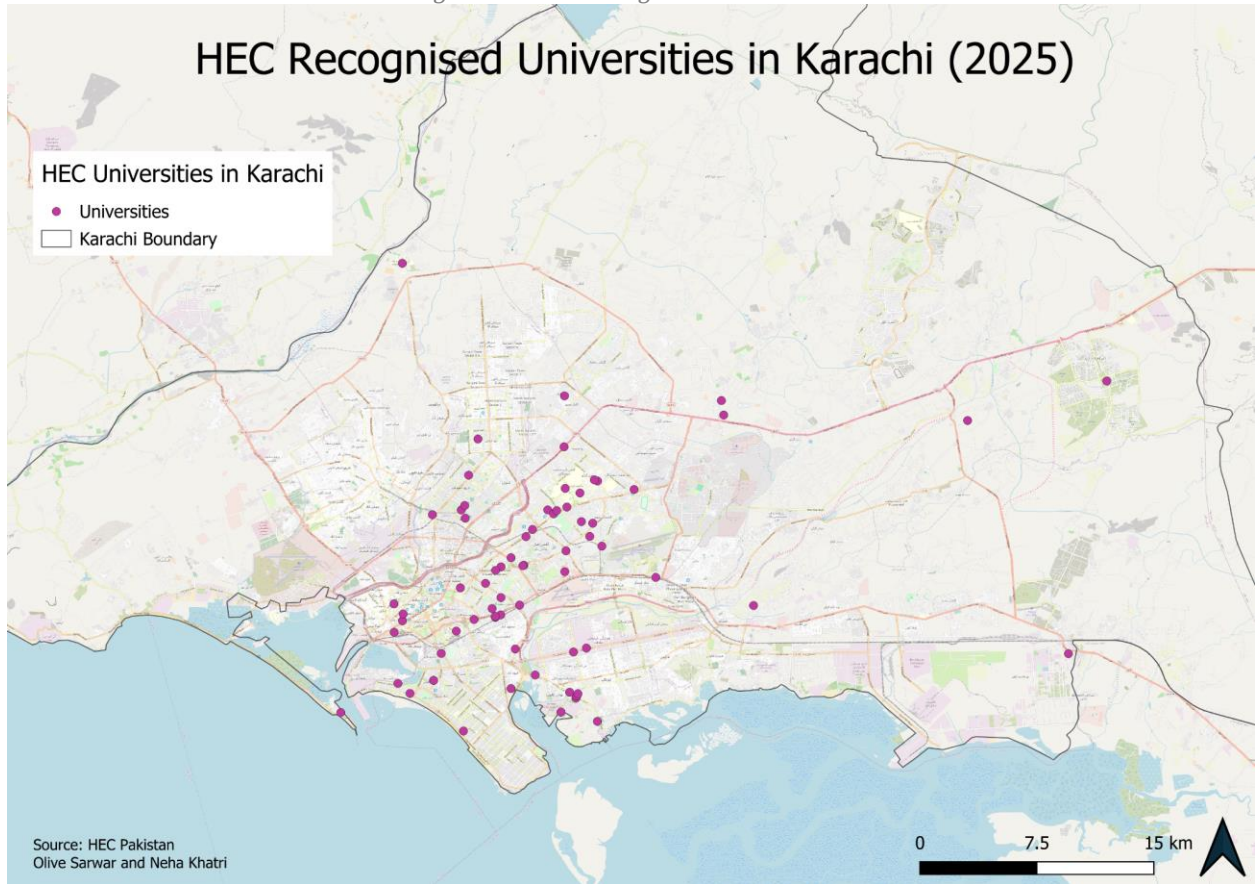
Source: Authors' compilations.

Figure 22: Private and Public Colleges



Source: Authors' compilations.

Figure 23: HEC Recognised Universities



Source: Authors' compilations.