



FROM CANTONMENT NODE TO URBAN BOTTLENECK: COLONIAL PLANNING LEGACIES AND TRAFFIC CONGESTION AT GIRJA

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Abstract

Girja Chowk, located within the historic Mian Mir Cantonment of Lahore, represents a critical urban intersection where colonial-era planning principles confront the realities of contemporary metropolitan expansion. Originally conceived as part of a rigorously ordered military grid designed for low-density movement and controlled circulation, the Chowk was structured around a circular geometry anchored by St. Mary Magdalene Church and wide axial roads intended to serve a self-contained cantonment community. In the decades following Pakistan's independence, however, rapid urbanization and large-scale residential developments—most notably the Defence Housing Authority (DHA) and Askari housing schemes—have transformed Girja Chowk from a peripheral colonial junction into a high-intensity metropolitan arterial node. This study employs a qualitative, historical-analytical research design, supplemented by spatial and traffic flow analysis, to examine how inherited colonial infrastructure has become misaligned with present-day mobility demands. Drawing on archival maps, planning records, municipal and GIS data, field observations, and informal stakeholder interviews, the research situates Girja Chowk within intersecting narratives of colonial urbanism, post-independence metropolitan growth, and contemporary traffic congestion. The findings reveal that the original roundabout geometry and spatial hierarchy of the Chowk are structurally inadequate for managing modern, heterogeneous traffic flows characterized by high vehicle volumes, mixed transport modes, and informal roadside activities. These pressures have resulted in chronic congestion, spatial dysfunction, and a gradual erosion of the site's heritage character. The study argues that Girja Chowk exemplifies a broader condition prevalent in South Asian cities, where colonial-era planning frameworks persist without adequate adaptation to contemporary urban realities. It concludes by emphasizing the need for integrated urban and transport planning approaches that reconcile mobility efficiency with heritage conservation, positioning Girja Chowk as both a cautionary case and a strategic opportunity for sustainable urban intervention in Lahore.

Keywords: *Girja Chowk, Lahore Cantonment, colonial urban planning, traffic congestion, metropolitan expansion, heritage preservation, urban mobility, post-colonial cities, spatial analysis, sustainable urban planning*

Introduction

Lahore is a multilayered metropolis where multiple historical epochs coexist and overlap, producing a complex urban palimpsest (Mumtaz, 2002; Qadeer, 1983). Within this urban tapestry, Lahore Cantonment—a meticulously planned, segregated military and residential zone inherited from the British Raj—stands out as a distinctive colonial spatial construct. Designed according to principles of grid planning, low-density development, and strict architectural uniformity, cantonment areas were conceived as controlled environments that ensured security, hygiene, and administrative efficiency for colonial forces (King, 1976; Hosagrahar, 2005). These areas functioned as insulated islands of tranquillity and ordered infrastructure, deliberately detached from the organic growth patterns of indigenous cities (Qadeer, 2010).

However, in the twenty-first century, these colonial blueprints are increasingly stressed by unprecedented metropolitan expansion. Rapid population growth, motorization, and commercialization have pushed urban activity far beyond the infrastructural capacities and geopolitical logic for which cantonments were originally designed (UN-Habitat, 2016). Infrastructure intended for low traffic volumes and limited civilian access now confronts constant congestion and spatial conflict. Girja Chowk lies at the nexus of this tension.

More than a simple traffic intersection, Girja Chowk represents a critical geographical, historical, and economic pivot point within Lahore's urban structure. Named after the adjacent St. Mary Magdalene Church—*Girja* being the local term for church—it functions as a primary connective node linking the historic military zones of the cantonment with the rapidly expanding commercial and residential districts of metropolitan Lahore. This paper posits that Girja Chowk operates as a microcosm of the systemic challenges faced by post-colonial cities, where inherited colonial infrastructure remains fundamentally ill-equipped to accommodate the exponential demands of contemporary demographic growth, commercial intensity, and mobility patterns (King, 1976; Qadeer, 2010; Mumtaz, 2002).



Fig 1: Map of Central Cantonment Area Intersection and Key Landmarks

Landmarks around Girja Chowk St. Mary Magdalene Church Lahore Cantt

St. Mary Magdalene Church, Lahore Cantonment, was constructed in 1856 and is located at the heart of the Mian Meer Cantonment, one of the earliest British military settlements in the region (Mumtaz, 2002; Qadeer, 1983). It is recognized as the first garrison church of Lahore and was designed by Major G. N. Sharpe, an army officer serving in the Engineer Battalion of the Bengal Regiment (Gazetteer of the Punjab, 1883–84). Following the consolidation of power in Lahore by the East India Company in 1852, British authorities directed that a church be established as a formal expression of Christian devotion and imperial presence (Latif, 1892). Initially, religious services were conducted in a temporary wooden structure known as the Mian Meer Church; however, this building was later severely damaged by fire during periods of conflict between Sikh forces and the British army (Qadeer, 2010). After the British secured political control over the Lahore region, Major G. N. Sharpe was commissioned to redesign and construct a permanent masonry church, which was subsequently dedicated to St. Mary Magdalene as both a garrison facility and a symbolic marker of colonial authority and victory (King, 1976; Mumtaz, 2002).

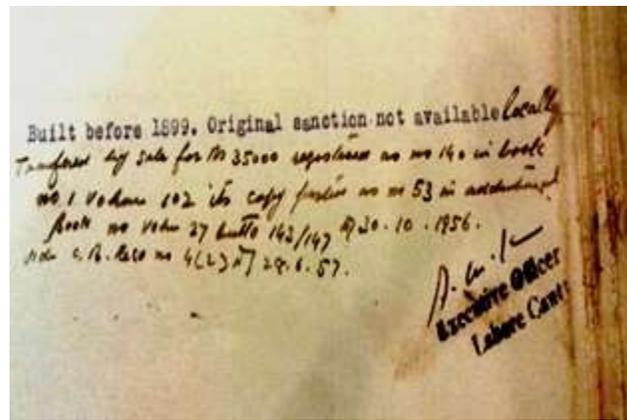


Fig 2: Agreement of Transfer of Land of St. Mary Magdalene Church to Lahore Cantonment Board in 1956

The construction of St. Mary Magdalene Church, Lahore, commenced in 1854, and the building was completed between 1854 and 1856. The church was planned in the Early English Gothic style, a design vocabulary commonly adopted for ecclesiastical buildings during the colonial period due to its symbolic association with spirituality, authority, and permanence (Fletcher, 1999). The structure was constructed using burnt bricks bonded with lime mortar, reflecting the prevalent construction techniques of the mid-nineteenth century in the region. The craftsmanship exhibited throughout the church is of outstanding quality, demonstrating a high level of technical skill and meticulous attention to detail (Medley, 2023). The internal spatial experience of the church is particularly striking, owing to its historical depth and structural antiqueness, which collectively contribute to its architectural significance.

Understanding the archaeological and architectural background of church design is essential for interpreting the historical and symbolic dimensions of such sacred structures. Ecclesiastical architecture is deeply rooted in theological philosophy, where form, space, and structure often carry profound dogmatic and symbolic meanings (Renfrew & Bahn, 2016). Although the pointed

arch and associated Gothic architectural vocabulary were originally developed in Northern France, these elements gradually spread across Europe and were later widely adopted in churches and cathedrals throughout the British Empire, including South Asia (Fletcher, 1999).



Fig 3: map of Girja Chowk, Lahore Cantonment, with St. Mary Magdalene Church complex



Fig 4: Aerial view of a historic St. Mary Magdalene Church complex and its surrounding institutional buildings

The construction of St. Mary Magdalene Church was completed in January 1856; however, the church was formally opened for worship on 23 March 1857 (Latif, 1892; Gazetteer of the Punjab, 1883–84). The total expenditure allocated by the British authorities for its construction amounted to 90,000, reflecting the importance attached to ecclesiastical buildings within the cantonment framework (Qadeer, 1983). Lime mortar plaster was applied to the exterior surfaces of the church, a material choice that not only enhanced durability but also contributed to the perceived sacredness and visual solemnity of the structure (Mumtaz, 2002). Architectural elements such as Gothic roofs and pointed arches, arcaded porticos, the refined use of durable wooden scissor trusses, and stained-glass windows emerged as distinctive features of church architecture across the Indian subcontinent during the colonial period, symbolizing both religious devotion and imperial architectural expression (Vincent, 1970; Fletcher, 1999).



Fig 5: St. Mary Magdalene Church

Mall of Lahore

The Mall of Lahore is a prominent mixed-use complex located in Lahore Cantonment, developed by Bahria Town and spanning approximately 650,000 square feet (Bahria Town, 2018). The project was designed by Nayyar Ali Dada & Associates, one of Pakistan's leading architectural firms, with interior design undertaken by Arshad Shahid Abdulla (Pvt.) Ltd., while construction services were executed by Kingcrete Builders (Dada, 2015). Initially conceived as a Sheraton hotel, the project underwent several programmatic transformations—first into Park Lane Tower and later finalized as the Mall of Lahore—reflecting changing market dynamics and urban development priorities within the cantonment area (Qadeer, 2010).

The finalized structure integrates retail, residential, and commercial office functions within a unified structural and service system, exemplifying a shift from single-use hospitality architecture toward high-density, mixed-use urban development. This transformation aligns with broader trends in contemporary South Asian cities, where land scarcity and increased commercialization have encouraged vertical, multifunctional building typologies, particularly within strategically located zones such as cantonments (Mumtaz, 2002; UN-Habitat, 2016).



Fig 6: Original Mall of Lahore sketch by NADA



Fig 7: Original elevation sketch by NADA

Allama Iqbal International Airport

The current site of Lahore's main airport was established in 1962 as the new Lahore International Airport, replacing the older Walton Airport, which had become inadequate for handling modern jet aircraft and increasing passenger volumes (Civil Aviation Authority Pakistan [CAA], 2005;

Qadeer, 1983). This strategic relocation was crucial for strengthening Lahore's international connectivity, as the new airport was designed with longer runways and expanded aprons capable of accommodating wide-body aircraft, including the Boeing 747 (PIA, 2010). The upgraded facilities enabled Pakistan International Airlines (PIA) to initiate direct international routes from Lahore to major global destinations such as Dubai and London, marking a significant shift in the city's aviation profile (Kazmi, 2008).

For more than four decades, the 1962 terminal functioned as the primary gateway for air traffic in and out of Punjab, supporting both domestic and international travel. The airport played a foundational role in facilitating economic activity, regional mobility, and urban expansion, thereby contributing significantly to Lahore's emergence as a major regional hub within Pakistan's national and international transportation network (Qadeer, 2010; Mumtaz, 2002).



Fig 8: Lahore International Airport (1962–2003)

After 2003, Lahore's airport underwent a major transformation with the inauguration of an entirely new terminal complex in March of that year, driven by rapidly increasing passenger volumes and the growing need for modern aviation infrastructure (Civil Aviation Authority Pakistan [CAA], 2005; PIA, 2010). Concurrently, the facility was renamed Allama Iqbal International Airport (LHE) in honour of Pakistan's national poet-philosopher, symbolically aligning the airport's identity with national culture and intellectual heritage. The architectural expression of the new terminal incorporated contemporary construction technologies while drawing inspiration from Lahore's Mughal architectural vocabulary, particularly in its monumental scale and spatial articulation (Mumtaz, 2002).

Following the inauguration of the new terminal, the older 1962 airport building was repurposed as a dedicated Hajj Terminal, ensuring continued functional use of existing infrastructure while segregating seasonal pilgrimage traffic from regular passenger operations (CAA, 2018). Since then, the airport has undergone continuous upgrades and expansions. Currently, a large-scale development program is underway to enhance operational efficiency and increase annual passenger handling capacity from approximately 6 million to over 20 million, positioning Allama Iqbal International Airport as a world-class aviation gateway capable of meeting Lahore's future regional and international air-travel demands (CAA, 2022; Qadeer, 2010).



Fig 9: Lahore International Airport (2003 onwards)

Garrison High School

Garrison High School in Lahore Cantonment traces its origins to the foundational efforts of the Lahore Garrison Education System (LGES), which has operated for over half a century, providing quality education to children of military and civilian families (Ghazi, 2005; Qadeer, 2010). The first institution under this system, Azam Garrison High School, was established in 1950 to offer co-educational learning and to meet the educational needs of the rapidly growing cantonment population (Rehman, 2002). The increase in student enrollment and demand for gender-segregated education led to the establishment of a dedicated Garrison Boys High School in 1963, ensuring focused academic and extracurricular development for male students within the cantonment framework (Ghazi, 2005).



Fig 10: Garrison High School



Fig 11: Location of Garrison High School

The Sir Michael O'Dwyer Institute, which later became Garrison High School in Lahore Cantonment, was established in 1923 to serve the British troops stationed in the area (Qadeer, 1983; Latif, 1892). The institution was named in honor of Sir Michael O'Dwyer, the Lieutenant Governor of Punjab during the British colonial period. O'Dwyer's administration is historically significant due to its association with the Jallianwala Bagh Massacre of 1919, an event that led to his assassination in 1940 in London by Sardar Udham Singh as an act of revenge for the massacre (Tinker, 1974; Wolpert, 1978). The institute thus occupies a complex place in Lahore's colonial legacy, reflecting both the educational initiatives for British military personnel and the broader historical controversies of the era.



Fig 12: Michael O Dwyer Institute later became Garrison High School in Lahore Cantt.

Lahore Cantonment Through History

The Mian Mir Cantonment, commonly referred to as Lahore Cantonment or simply Cantt, is a major military base in Lahore, Pakistan, established during the British Raj (Qadeer, 1983; King, 1976). Named after the revered 17th-century Sufi saint Hazrat Mian Mir, whose shrine is located nearby, the area was occupied by British forces in 1846 and subsequently planned using a spacious grid-iron layout that distinctly segregated European and native troops (Mumtaz, 2002; Hosagrahar, 2005). Historically, the cantonment held strategic importance and was designed to accommodate a range of colonial-era structures, including barracks, hospitals, churches, and key administrative buildings. Several major roads within the cantonment were named after British officials, reflecting both the administrative hierarchy and the symbolic imprint of colonial authority (Qadeer, 2010).

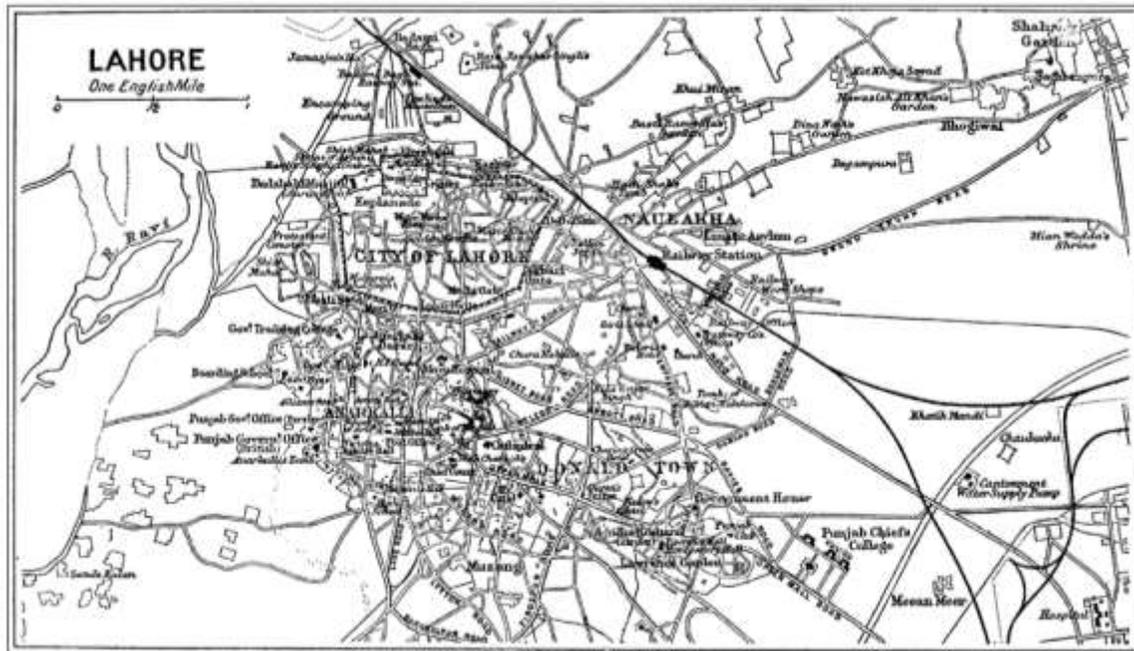


Fig 12: Lahore 1912, Showing the Shrine of Mian Mir (lower right corner)

Important landmarks within the greater **Mian Mir Cantonment** further underscore its historical and administrative significance. The area identified as “Mean Meer” on early colonial maps of Lahore (Lahore Map, 1912)—corresponding to the present-day Mian Mir Cantonment—contained key institutional establishments such as the Government House and the Punjab Chiefs College, reinforcing the cantonment’s function as a central military and administrative hub during the British period (Qadeer, 1983; King, 1976). In addition to these formal colonial institutions, religious and recreational sites including Mian Waddar’s Shrine and Shah’s Gardens are also depicted on historical records, illustrating the spatial coexistence of indigenous cultural landscapes with imposed British planning frameworks (Mumtaz, 2002; Hosagrahar, 2005). In contemporary Lahore, the cantonment continues to function as one of the city’s most prominent military and residential zones, maintaining its legacy as a significant urban, administrative, and historical landscape (Qadeer, 2010).

The Deep Roots of Mian Mir: Colonial Planning and Strategic Design

To understand the current challenges at Girja Chowk, it is essential to first examine its origins within the Mian Mir Cantonment, which was established by the British following the annexation of Punjab in the mid-nineteenth century (Qadeer, 1983; King, 1976). The cantonment’s defining characteristic was its strict adherence to a geometric grid of straight, wide avenues, a planning approach rooted in military logic rather than civilian urban life (Hosagrahar, 2005). This spatial configuration prioritized military efficiency, rapid troop deployment, surveillance, and administrative control, while deliberately enforcing social and racial segregation between European and native populations (Mumtaz, 2002). Such rational, ordered planning stood in stark

contrast to the organic, dense, and incremental growth patterns of Old Lahore, highlighting the enduring dichotomy between colonial military urbanism and indigenous city form (Qadeer, 2010).

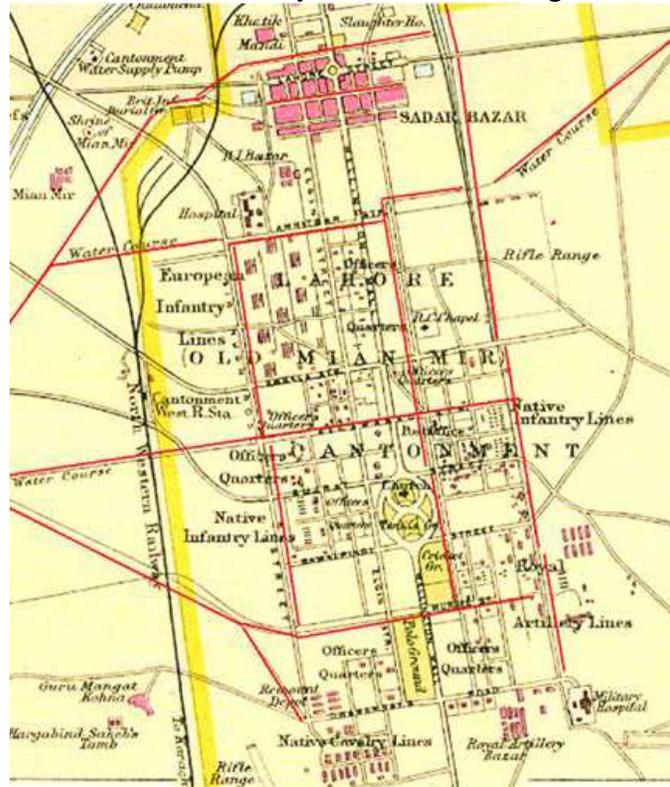


Fig 13: cantonment Lahore 1907

The most significant suburban development depicted in early maps of Lahore is the emergence of the cantonment on the southeastern edge of the city (Survey of India, 1912; Qadeer, 1983). Sir Charles Napier decided to relocate the Anarkali cantonment away from the congested city core on sanitary and strategic grounds, leading to the selection of the present site, which was subsequently laid out by military engineers (Aijazuddin, 2003). To commemorate this decision, a marble slab bearing the inscription, “*This was erected to mark the spot where Lord Napier laid out the cantonment of Mian Mir;*” was installed at the central point of the cantonment. The layout followed a strict grid-iron pattern, characterized by straight north–south avenues intersected by east–west roads, reflecting the rational planning principles of British military urbanism (King, 1976).

The principal north–south arteries were named after prominent British officers, including Wellington Mall, Sir Hugh Rose Street, and Elgin Street, while the minor east–west streets were named after major cities of the Punjab province, such as Amritsar Street, Gujrat Street, Rawalpindi Street, and Murree Street (Aijazuddin, 2003). A defining feature of the plan was an oval park located at the centre of the cantonment, flanked by the Anglican Church at one end and tennis grounds at the other. The Garrison Church of St. Mary Magdalene, consecrated in 1857, was widely regarded as one of the most beautiful churches in northern India (Aijazuddin, 2003).

Residential zoning within the cantonment strictly followed military hierarchy: senior officers were housed near the central oval, while subordinate ranks were accommodated progressively farther from the centre. Indian and European troops were segregated spatially, with Indian troops housed

to the north and European troops to the south of the officers' quarters. Each group was accommodated in identical barracks arranged in parallel blocks, reinforcing discipline, order, and surveillance (Qadeer, 2010). For civilian needs, Saddar Bazaar and Royal Artillery Bazaar were planned at distinct locations. Architecturally, the church and surrounding landscape evoked the imagery of a traditional English village. In terms of medical infrastructure, the British Military Hospital (BMH) was established in 1854 north of the Oval Ground, followed by the Indian Military Hospital (IMH) near Royal Artillery Bazaar in 1927. In 1943, both facilities were merged and renamed the Combined Military Hospital (CMH), consolidating healthcare services within the cantonment (Aijazuddin, 2003).



Fig 13: The spacious planning of the Mian Mir Cantonment is visible in this aerial photograph showing the aerodrome and the GOC's residence on the left

Girja Chowk is located along a historically significant urban axis—the road presently known as **Tufail Road**, formerly **Wellington Mall**—which functioned as one of the principal north–south arteries of the Mian Mir Cantonment (Aijazuddin, 2003; Qadeer, 1983). The roundabout's original circular geometry and spatial configuration were calibrated for a low-density traffic profile, primarily accommodating military convoys, horse-drawn carriages, and limited civilian movement. Designed to efficiently manage four-way circulation under controlled conditions, the chowk was structurally robust within the context of nineteenth-century military urbanism (King, 1976).

The historical significance of Girja Chowk is further intensified by its proximity to key heritage landmarks. The presence of St. Mary Magdalene Church, along with institutional anchors such as the adjacent Officers' Club (now the Department of Schools of Management – DeSOM), firmly situates the area within the spatial and social logic of the colonial period (Mumtaz, 2002). Historically, the surrounding roads—including Sarwar Road and Abid Majeed Road—served cantonment residents through small-scale auxiliary bazaars and service-oriented establishments, allowing Girja Chowk to function simultaneously as a military transit node and a self-sufficient community centre (Qadeer, 2010). In the contemporary urban context, however, this historically balanced role has been severely stressed by intense commercialization, increased traffic volumes, and land-use transformation, exposing the limitations of inherited colonial infrastructure in accommodating modern metropolitan demands (UN-Habitat, 2016).



The Forces of Metropolitan Gravity: Urban Expansion and Redefinition

The early 2000s marked a decisive shift in Lahore's urban trajectory with the emergence of large-scale residential and commercial developments that fundamentally altered the city's spatial dynamics (Qadeer, 2010; UN-Habitat, 2016). The rapid expansion of the Defence Housing Authority (DHA) and the construction of high-density, high-rise projects such as Askari 10 and the Mall of Lahore complex have significantly redefined the gravitational pull exerted on the infrastructure of Lahore Cantonment (Mumtaz, 2002). As a consequence, Girja Chowk, once a peripheral and low-intensity intersection within a controlled military environment, has been involuntarily transformed into a primary metropolitan traffic artery.

The area's physical geography compels substantial traffic movement from the inner city toward Cantonment residential zones, DHA phases, and adjacent military installations to pass through Girja Chowk, resulting in an exponential intensification of traffic loads (Qadeer, 1983). This expansion has manifested through three dominant flow vectors. First, residential commuting has increased dramatically, as thousands of residents from DHA and Askari 10 utilize Girja Chowk as the most direct route to workplaces and educational institutions in Gulberg and along Mall Road (UN-Habitat, 2016). Second, commercial penetration within the Cantonment has accelerated, with national and international franchises such as *Layers* and *Subway* establishing outlets at or near Girja Chowk, generating destination-based traffic that was never anticipated in the original colonial planning framework (King, 1976; Qadeer, 2010). Third, the institutional load remains substantial, as the Chowk is surrounded by critical facilities including military offices, healthcare collection centres, and educational institutions, anchoring a consistent and non-negotiable volume of daily traffic (Mumtaz, 2002).

The convergence of these residential, commercial, and institutional pressures means that Girja Chowk is no longer regulating a controlled or hierarchical flow of movement; instead, it is processing chaotic, metropolitan-scale traffic volumes. Roads within the Cantonment—originally wide yet designed for low-speed, low-density circulation—are now characterized by stop-and-go congestion typical of Lahore's most intensely commercialized zones. This has resulted in a fundamental functional redefinition of the area, one that the inherited colonial infrastructure is structurally and operationally incapable of accommodating efficiently (Qadeer, 2010; UN-Habitat, 2016).

The Consequence: Traffic Flow Challenges and Design Inadequacy

The most visible consequence of this transformation is the severe and predictable chronic traffic congestion experienced at Girja Chowk on a daily basis. Colonial-era traffic circles, while theoretically efficient under low-volume and homogeneous traffic conditions, fail significantly when contemporary traffic volumes exceed their designed capacity, particularly in contexts characterized by weak lane discipline and heterogeneous traffic mixes involving cars, motorcycles, rickshaws, and service vehicles (Khisty & Lall, 2003; Qadeer, 2010).

The fundamental design inadequacy lies in the intersection's geometry. The traditional circular format compels all vehicular flows to merge and diverge within a confined spatial envelope. As traffic volumes have escalated dramatically, this merging process has deteriorated into persistent gridlock, transforming the intersection into a critical chokepoint along vital corridors such as Tufail Road and Bagh Ali Road (UN-Habitat, 2016). This condition is further aggravated by roadside



parking and informal stopping associated with newly established commercial outlets, which immediately reduce effective carriageway width and, consequently, road capacity (IRC, 2012). Current traffic management practices largely depend on rudimentary and reactive measures, including manual traffic direction by police personnel, which may offer temporary relief but fail to address the underlying structural issue of inadequate intersection capacity (Khisty & Lall, 2003). The predicament of Girja Chowk thus exposes a broader failure to adapt inherited colonial infrastructure—originally conceived for controlled military movement—to the requirements of a contemporary metropolis. The absence of grade-separated interchanges, intelligent signal prioritization systems, and dedicated mass-transit corridors underscores this mismatch. Consequently, an urban form designed to efficiently mobilize limited military traffic now struggles to accommodate millions of daily commercial and commuter trips, highlighting the systemic incompatibility between colonial planning logic and modern metropolitan mobility demands (King, 1976; Qadeer, 2010).

Literature Review

Colonial Urban Planning and the Cantonment Model

Cantonments such as Mian Mir were conceived as instruments of order, discipline, and military efficiency, structured through rigid grid systems of straight, wide roads that contrasted sharply with indigenous urban forms (King, 1976; Qadeer, 1983). Scholars emphasize that segregation—racial, functional, and spatial—was a deliberate feature of colonial urbanism, ensuring control, surveillance, and hygienic separation (Hosagrahar, 2005). St. Mary Magdalene Church (completed in 1856), designed by Major G. N. Sharpe of the Engineer Battalion, functioned as a prominent landmark within this ordered landscape. Its Gothic architectural language and substantial construction budget illustrate how cantonments operated as symbolic landscapes of empire, blending utilitarian military planning with cultural and religious projection (Mumtaz, 2002; Aijazuddin, 2003).

Historical Significance of Girja Chowk

The centrality of Girja Chowk is intrinsically linked to its proximity to St. Mary Magdalene Church. The church's formal opening in 1857—on the eve of the Indian Rebellion—highlights the convergence of military discipline, religious authority, and colonial governance within the cantonment (Aijazuddin, 2003; Metcalf, 1995). Historically, the Chowk functioned as a key connective node within the Mian Mir grid, facilitating controlled movement across major north-south and east-west axes (Qadeer, 1983). The recent restoration of the church (2024–2025) by the Walled City of Lahore Authority (WCLA) underscores the site's enduring heritage value and its continued presence within contemporary discourses of conservation and identity (WCLA, 2025).

Urban Expansion and Metropolitan Growth

Following independence, Lahore experienced rapid urban expansion, with large-scale residential developments such as Askari 10 and the Defence Housing Authority (DHA) progressively integrating formerly peripheral cantonment areas into the metropolitan core (Qadeer, 2020). These developments have significantly altered land-use patterns and urban mobility flows, transforming intersections such as Girja Chowk from low-intensity colonial nodes into high-pressure metropolitan bottlenecks. Recent urban scholarship identifies such locations as critical interfaces where inherited colonial grids intersect with uncoordinated contemporary urban growth, producing



spatial, infrastructural, and mobility-related stress (UN-Habitat, 2020; Alam et al., 2021). Traffic Congestion and Mobility Flows

The colonial cantonment layout, characterized by wide but low-capacity roads, now struggles under exponential increases in traffic volume. Urban transport research consistently identifies cantonment intersections as congestion hotspots due to their connector role between historic cores and new suburban developments (Khisty & Lall, 2003; Qadeer, 2010). Girja Chowk is frequently cited as emblematic of this condition, where merging traffic streams overwhelm colonial-era geometries. Mobility studies emphasize that such intersections reveal the inherent tension between imposed order and contemporary urban chaos, while prevailing traffic management practices remain largely reactive and insufficient to address systemic design inadequacies (UN-Habitat, 2016).

Heritage Preservation and Urban Modernization

Girja Chowk today embodies a fundamental tension between heritage conservation and infrastructural modernization. While conventional responses often prioritize flyovers and road widening, these interventions risk undermining the historical character of cantonment landscapes (Mumtaz, 2002). The recent restoration of St. Mary Magdalene Church demonstrates a parallel commitment to preserving colonial-era heritage. Scholars argue that sites of this nature demand integrated planning strategies that reconcile conservation imperatives with metropolitan mobility needs, a dilemma clearly exemplified by Girja Chowk's adjacency to a major Gothic landmark (Hosagrahar, 2005; Pendlebury, 2013).

Theoretical Frameworks and Synthesis

This analysis is informed by three interrelated theoretical lenses: Urban Morphology, which examines the evolution of spatial form under expansion (Conzen, 2004); Mobility Studies, which analyze traffic flow, congestion, and infrastructural capacity (Khisty & Lall, 2003); and Heritage Urbanism, which seeks to balance preservation with adaptive transformation (Pendlebury, 2013). Across the literature, three converging themes emerge:

- Colonial Legacy—order, faith, and controlled connectivity;
- Urban Expansion—intensified congestion and altered land use;
- Heritage versus Modernization—a persistent planning dilemma within post-colonial cities (King, 1976; Qadeer, 2010).

Gaps in the Literature

Despite extensive scholarship on colonial urbanism and metropolitan growth, notable gaps remain. There are limited site-specific studies on Girja Chowk, a lack of empirical traffic-flow data quantifying congestion at the intersection, and an absence of integrated analytical frameworks that combine heritage urbanism with transport planning. By synthesizing the architectural history of St. Mary Magdalene Church and the role of its designer, Major G. N. Sharpe, this study positions Girja Chowk as a palimpsest where colonial planning, cultural symbolism, and contemporary urban challenges intersect.

Methodology

This study adopts a qualitative, historical-analytical research design, enriched through spatial and traffic flow analysis, to situate Girja Chowk within the intersecting narratives of colonial planning, metropolitan expansion, and contemporary mobility challenges (King, 1976; Creswell, 2014). The



methodology is triangulated, integrating historical inquiry into colonial-era planning and architecture, urban studies analysis of expansion patterns and land-use change, and traffic and mobility assessment of congestion dynamics and infrastructural interventions (Denzin, 1978; Qadeer, 2010).

Data are drawn from a diverse range of sources, including archival colonial maps, planning records, and institutional reports, which provide insight into the original cantonment layout and planning ethos (Metcalf, 1995; Hosagrahar, 2005). Contemporary urban and spatial data are sourced from municipal records and GIS-based mapping, enabling analysis of metropolitan growth, land-use transformation, and connectivity patterns (UN-Habitat, 2016). These are supplemented by field observations and informal stakeholder interviews, which capture everyday mobility practices and on-ground congestion dynamics not always reflected in formal datasets (Creswell, 2014).

The analytical framework employs historical analysis to reconstruct the colonial planning rationale underpinning the Mian Mir Cantonment (King, 1976), urban expansion analysis to trace post-independence metropolitan growth and its spatial impacts (Qadeer, 2010), and traffic flow analysis to synthesize vehicular movement patterns and intersection performance under contemporary loads (Khisty & Lall, 2003). A heritage preservation assessment is further applied to evaluate conservation strategies and their implications for mobility interventions at historically significant sites (Pendlebury, 2013).

While certain limitations remain—such as fragmentary archival data, reliance on secondary studies and observational evidence rather than new quantitative traffic modelling, and the informal nature of stakeholder interviews—this integrated methodological approach provides a robust, multidimensional framework for understanding Girja Chowk as both a critical metropolitan traffic intersection and a significant colonial-era heritage site (Denzin, 1978; Hosagrahar, 2005).

Findings

The findings of this study indicate that Girja Chowk functions as a critical and contested urban site, where the enduring legacy of colonial-era planning is in direct and escalating conflict with the pressures of contemporary metropolitan expansion. This conflict manifests in systemic traffic congestion, spatial dysfunction, and declining mobility performance, reflecting a broader structural mismatch between inherited urban form and present-day metropolitan demand (Qadeer, 2020; UN-Habitat, 2020). Rather than operating as a neutral traffic junction, Girja Chowk has emerged as a spatial arena in which historical planning ideologies, contemporary land-use change, and unregulated mobility flows collide.

Historically, the significance of Girja Chowk is deeply embedded within the Mian Mir Cantonment grid, a spatial system imposed during the British colonial period and preserved through post-colonial institutional continuity. Recent urban history scholarship emphasizes that colonial cantonments were not merely residential enclaves but highly controlled spatial devices designed to enforce order, hierarchy, and military efficiency through rigid geometry and regulated circulation (Yousaf & Hasan, 2023). Within this system, Girja Chowk was conceived as both a symbolic and functional pivot, anchored by the presence of St. Mary Magdalene Church, a landmark that continues to structure spatial orientation and heritage value in the area. Contemporary heritage urbanism studies reaffirm that such colonial religious and institutional



landmarks retain a powerful organizing role in post-colonial cities, shaping movement patterns long after their original administrative logic has faded (Doucet & Lee, 2022).

The Chowk's original design—characterized by a circular intersection geometry and wide axial roads such as present-day Tufail Road (formerly Wellington Mall)—was rationally calibrated for a low-density, military-oriented traffic regime. Recent transport-history analyses argue that colonial road hierarchies prioritized predictability, ceremonial movement, and controlled access rather than capacity maximization or flexibility (Marshall et al., 2021). In this context, Girja Chowk functioned efficiently as part of a self-contained cantonment ecosystem, supporting controlled troop movement, limited civilian circulation, and localized commercial activity without significant external traffic pressure. The findings confirm that the intersection's geometry and surrounding street widths were never intended to function as components of a metropolitan-scale mobility network.

This historical planning logic, however, has been fundamentally overturned by post-independence metropolitan expansion, particularly the rapid growth of large-scale residential developments such as Defence Housing Authority (DHA) and Askari housing schemes, including Askari 10. Contemporary urban studies identify these developments as powerful generators of new mobility demand, restructuring travel behavior and redirecting traffic through previously insulated institutional zones (Qadeer, 2020; Shah & Ghauri, 2022). As Lahore expanded outward, the spatial boundaries of the cantonment became increasingly porous, and Girja Chowk was involuntarily redefined from a peripheral junction into a primary metropolitan arterial node.

The findings reveal that this functional transformation is marked by an exponential intensification of traffic vectors, fundamentally altering the role of the Chowk within the city's mobility network. First, the intersection now processes high-volume residential commuting flows, as residents of DHA and Askari developments rely on Girja Chowk as one of the most direct connections to employment centers, educational institutions, and commercial districts in Gulberg, Mall Road, and the inner city. Recent mobility studies in Lahore demonstrate that such radial commuting patterns place disproportionate stress on intermediate junctions that were not designed as high-capacity collectors (Alam et al., 2021). Second, Girja Chowk has become a destination in itself due to rapid commercial intrusion, with restaurants, retail outlets, and service franchises generating short-duration trips, informal parking, and pedestrian-vehicular conflicts. Third, the Chowk continues to support a persistent institutional load, generated by nearby military offices, healthcare facilities, and educational institutions, which produce daily, non-negotiable traffic volumes regardless of congestion levels (UN-Habitat Pakistan, 2021).

As a result of these overlapping flows, the spatial character of Girja Chowk has shifted dramatically. The findings indicate a transition from a strategically ordered cantonment junction to a high-intensity urban bottleneck, a transformation for which the inherited infrastructure is fundamentally inadequate (Marshall et al., 2021). Although cantonment roads remain visually wide, their functional capacity is compromised by intersection geometry, access conflicts, and unregulated curbside activity. Peak-hour observations reveal persistent queuing, spillback onto approach roads, and unstable circulation patterns, confirming that the Chowk now operates beyond its sustainable capacity.

At the core of this dysfunction lies a design failure rooted in the colonial-era roundabout geometry. Contemporary transport engineering literature emphasizes that traditional roundabouts are highly



sensitive to traffic volume, entry balance, and driver behavior (Rodrigue et al., 2020). Under modern conditions characterized by heterogeneous traffic—including private cars, motorcycles, rickshaws, delivery vehicles, and informal stopping—the theoretical efficiency of the circular intersection collapses. The findings confirm that Girja Chowk’s roundabout is structurally incapable of safely and efficiently managing sustained high-volume flows, particularly when multiple dominant approaches compete simultaneously for entry.

These geometric limitations are further intensified by contextual factors typical of South Asian metropolitan environments. Recent studies highlight poor lane discipline, weak enforcement, and informal driving practices as critical contributors to congestion at intersections across Pakistani cities (Batool et al., 2021). At Girja Chowk, these issues are compounded by extensive roadside parking and curbside activity associated with commercial development, which significantly reduces effective carriageway width and disrupts traffic circulation. The findings align with broader urban mobility research indicating that land-use change without corresponding transport management leads to rapid capacity erosion, even on relatively wide roads (Shah & Ghauri, 2022). Collectively, these conditions have cemented Girja Chowk’s status as a critical chokepoint within Lahore’s urban mobility network. The findings demonstrate that congestion at the Chowk is not an isolated technical failure but a structural outcome of institutional inertia, fragmented governance, and the unresolved tension between heritage preservation and infrastructural modernization. While cantonment regulations emphasize conservation and controlled development, metropolitan mobility demands increasingly require adaptive interventions such as signal optimization, access management, and grade separation. However, recent heritage urbanism scholarship cautions that such interventions must be carefully integrated to avoid eroding the historical identity and spatial coherence of protected sites (Doucet & Lee, 2022).

In this sense, Girja Chowk functions as a microcosm of Lahore’s broader urban dilemma: how to reconcile the spatial legacy of colonial planning with the realities of twenty-first-century metropolitan growth. The findings underscore the urgent need for integrated planning approaches that simultaneously address traffic capacity, land-use regulation, and heritage conservation. Without such integration, Girja Chowk will continue to exemplify the growing disconnect between inherited urban form and contemporary urban life, reinforcing congestion, inefficiency, and spatial conflict at one of Lahore’s most historically significant intersections.

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