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Evaluating Regulatory Frameworks for Commercial Construction: A Comparative Analysis of LDA and DHA Bylaws in Lahore

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Abstract

Commercialization is a global phenomenon and has adversely affected all the world's metropolises. Lahore, a commercial hub of Pakistan, has also endured extreme commercialization in the past few decades. New commercial markets have been constructed, and many residential areas have been commercialized to cater to the increasing demand, and some consider it a merely revenue-generating policy of the LDA (Lahore Development Authority). Building bylaws have always been a source of truth for construction activities for centuries. A stable built environment can only be created with the help of building codes and regulations, and some authorities to enforce those regulations. The research primarily examined the origins of building regulations and regulatory authorities to illustrate the reasons for their emergence and how these regulations and authorities have evolved. LDA's history and its part in shaping Lahore's commercial markets were discussed. A collection of issues emerged due to the heavy commercialization of Lahore. The study then aimed to find solutions to these problems by using DHA as a model example, as it exemplifies the building regulations and enforcement process. Johar Town was selected for the study because it exemplifies the issues caused by the Lahore Development Authority's (LDA) poor commercial planning and commercialization. A detailed comparison of the LDA and the Defence Housing Authority (DHA) was conducted, focusing on their bylaws and enforcement processes. Case studies of the G-1 Market in Johar Town and the DHA Phase-1 Market further supported this comparison. Experts in the field were interviewed, and a survey was conducted to develop corrective conclusions addressing all identified issues.

Keywords Commercialization, Urban Landscape, Vitality, Market Place, Building Regulations, Building Bylaws.

Introduction

In the discipline of architecture, regulatory frameworks and building bylaws serve as the foundational instruments for shaping the built environment. These regulations, developed over generations through the combined expertise of architects, planners, engineers, and allied professionals, are intended to guide the physical growth of cities, ensure safety, preserve aesthetics, and promote community well-being. Every country, region, and urban authority establishes its version of these rules, contextualized to local needs, cultural expectations, environmental conditions, and developmental aspirations (LDA PHS rules, n.d.) (Shoaib & Azka., 2019).

Architecture has always played a pivotal role in defining the character of historical epochs. From ancient civilizations to modern metropolises, architectural expressions have remained integral to the socio-political and economic narratives of their times. With rapid advancements in technology ranging from digital design tools to innovative construction techniques and materials, the possibilities in contemporary architecture have expanded exponentially. However, without a robust regulatory

framework, such possibilities could easily lead to disorder, architectural incongruity, and urban dysfunction (Asim, Gulzar, Sherwani, & Arif, 2017).

Building bylaws exist to regulate and, where necessary, constrain the design process, imposing checks that balance creative freedom with practical, legal, and social responsibilities. These constraints are not merely bureaucratic hurdles; they reflect the collective wisdom of ensuring safety, sustainability, accessibility, and functional urban form. Yet, in practice, these bylaws are often manipulated or circumvented. Architects and developers, under pressure from clients or motivated by economic incentives, may exploit loopholes, offer bribes, or seek exemptions to push their agendas. Such actions can significantly compromise the usability, aesthetics, safety, and long-term resilience of urban spaces (Zaman, 2012).

This thesis aims to conduct a critical analysis of commercial building bylaws through a comparative lens, focusing on two major urban regulatory bodies in Lahore: the **Lahore Development Authority (LDA)** and the **Defence Housing Authority (DHA)**. While LDA is a public institution with jurisdiction over vast areas of metropolitan Lahore, DHA functions as a semi-autonomous entity with its own planning and development code. Both bodies play significant roles in shaping the commercial landscape of the city.

The study explores not only the written regulations but also their practical implementation. Through selected case studies of commercial markets developed in different time periods across both LDA- and DHA-governed zones, this research will examine the extent to which architectural design adheres to—or diverges from—the respective bylaws. Furthermore, insights will be gathered from officials within LDA, DHA, and relevant residential societies to better understand the challenges of enforcement, the influence of political or economic pressures, and the evolving interpretation of these regulations (Chadwick, 1842) (LDA, 2019).

By juxtaposing the regulatory environments of LDA and DHA, this research seeks to highlight systemic strengths, identify critical loopholes, and propose actionable recommendations for improving regulatory coherence and architectural quality in commercial developments across Lahore.

Scope of Work

The study examines the Defence Housing Authority (DHA) of Pakistan and compares it with the Lahore Development Authority (LDA) by analyzing their Commercial Building bylaws from initial publications to their current versions. It discusses the changes made and their impacts, supported by interviews with representatives from DHA and LDA. Additionally, the commercialization of Lahore and Johar Town is explored, identifying key issues arising from this growth and suggesting remedies. Case studies focus on the G-1 market in Johar Town and the Phase-I H Block market in DHA, assessing the differences between ideal conditions and the actual state of these markets.

A survey is conducted among stakeholders, including architects, consultants, builders, investors, and authority representatives, to gather their perspectives. The conclusions of the study are based on the bylaws, historical context, case studies, interviews, and survey results.

Objectives and Findings

The study aims to provide visual and written representations of the true nature of the subject. It will highlight the effects of the vast commercialization that Lahore has experienced over the past two decades. Specifically, it will examine how Lahore has transformed from a city of gardens into a national and multinational corporate hub. Additionally, the study will assess the current Lahore Development Authority (LDA) bylaws and how frequently they are bypassed. It will identify the entities responsible for enforcing these bylaws and gather responses from architects, builders, and investors regarding the current situation. Most importantly, it will explore the adverse effects that these practices have on the community.

The research will also track how the bylaws have been amended or updated over the years, what improvements have been made to date, and what further enhancements are necessary. The generated report is intended to serve as a guideline for LDA officials to refine their bylaws and improve infrastructure implementation. The study aims to provide visual and written representations of the true nature of the subject. It will highlight the effects of the vast commercialization that Lahore has experienced over the past two decades. Specifically, it will examine how Lahore has transformed from a city of gardens into a national and multinational corporate hub (Rana & Bhatti, 2017).

Building Regulatory Authorities

The authorities that regulate structures, construction jobs, and various occupational groups in the construction industry also establish building performance standards.

Objectives of Building Regulatory Authorities

The following goals are pursued by the building regulatory authorities:

1. Ensuring the Health and safety standards of buildings for people in and around.
2. Ensuring standardized building, conversion, and extension procedures.
3. Research and Development on existing bylaws and procedures for their improvements.

Methodology

This research adopts a ***Mixed-Methods Approach***, integrating both ***Qualitative and Quantitative Data*** to critically analyze and compare commercial building bylaws under the jurisdictions of the Lahore Development Authority (LDA) and the Defence Housing Authority (DHA). The mixed-method framework enables a more comprehensive understanding of both the written regulations and their practical implications in commercial construction. The study investigates how these bylaws align with core regulatory principles, such as those defined under international models like the Building Act, which emphasize *performance-based standards, legal compliance, professional accountability, and consumer protection.* These frameworks regulate the design and construction process through mechanisms such as the ***Building Code and Building Control systems***, which set minimum standards for structural performance, health, safety, and sustainability. By analyzing LDA and DHA codes in the light of such international benchmarks, this study evaluates their robustness and responsiveness to evolving urban needs.

Quantitative data is gathered through structured surveys and document analysis, including zoning maps, approved commercial layouts, building plans, and approval/rejection records from both LDA and DHA. These materials help measure compliance levels, frequency of deviations, and types of regulatory interventions. Meanwhile, qualitative data is collected through semi-structured interviews with stakeholders such as architects, planners, LDA/DHA officials, society representatives, and end-users. These interviews explore practical challenges in the implementation of bylaws, such as political pressures, client-developer dynamics, and the functional limitations of regulatory bodies. Key themes include the adequacy of inspection procedures, accreditation of professionals, and the role of implied warranties and regulatory responsibilities among designers, builders, and suppliers. Special attention is given to whether LDA and DHA provide sufficient consumer safeguards, and how their regulatory environments affect architectural creativity, construction quality, and urban integrity.

Through this mixed-method strategy, the research triangulates stakeholder perspectives with hard data to identify critical gaps, strengths, and contradictions in the current regulatory landscape. This not only supports an empirical evaluation of the bylaws but also enables policy-level reflections on how performance-based, consumer-centered, and innovation-enabling frameworks can be better adopted within Pakistan's urban development institutions.

The Act stipulates that:

1. Requirements for construction work (the Building Code and Building Control).
2. The functions of the Ministry of Business, Innovation and Employment (MBIE), territorial authorities, and Building Consent Authorities (BCAs), as well as their accreditation and licensing of building practitioners.
3. Consumers benefit from mandatory contracts and implied warranties, as well as specified obligations for owners, designers, builders, and manufacturers/suppliers, as well as regulatory guidelines.

Each category of regulations goes into great detail about specific building controls. This includes the Building Code, which establishes the minimum performance requirements for structure, health, safety, and sustainability of the buildings.

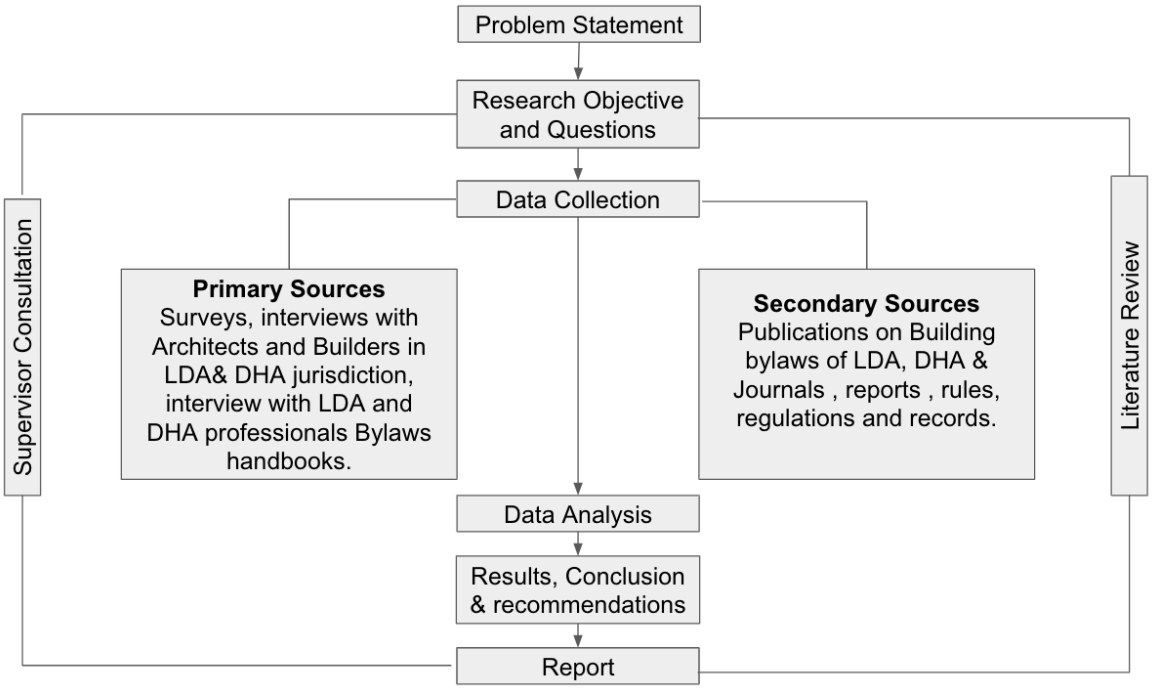

Figure 1: Methodology Flowchart

Study Area

Study area in this research was limited to Johar town Commercial markets and DHA Commercial areas. Johar town G1 markets were selected to study the commercial markets that come right under LDA jurisdiction. DHA H-1 market is very coherent and organized in nature and it was taken as a standard commercial market to be compared with the other.

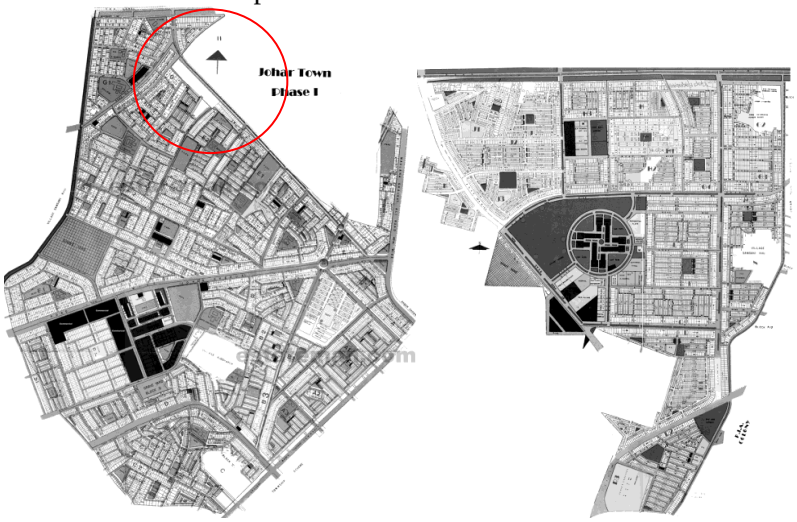

Figure 2: Johar Town Phase 1 - Phase 2 Maps

The study population consists of all entities involved in the development of LDA & DHA bylaws, specifically architects, builders, MEP consultants, and investors from Lahore. A purposive sampling method was employed, allowing the researcher to selectively choose participants for interviews, which facilitates quicker data collection and cost efficiency, particularly with limited resources. For sample size, the central limiting theorem suggests that a sample of 30 is sufficient to represent the overall population; in this study, 31 participants, comprising architects, builders, and regulatory authorities, were surveyed, meeting the necessary requirements.

Literature Review

Building Codes/Bylaws

Building bylaws have multiple definitions in different regions of the world. As in general, it is considered as provisions of compulsory spaces, FAR, vertical length, and parking areas etc. But other

countries have their local understandings regarding the term building by-laws. They outline it as something that is authorized through the government, such as the façade of the construction, texture, outdoor design, window peak, and everything that encompasses the scale and aesthetics of the construction (Tribune.com.pk, LDA Commercialization Policy, n.d.).

As a corollary, presently, building codes in developed countries can be quite intricate and Comprehensive. Ways of development of building codes by an authority, how they are approved by the government, and the framework is adopted to enforce these rules. This approach can vary from country to country. That is the reason behind the difference in the implementation. Somewhere, they are successfully being implemented, but in many developing countries, we face the impediments of building bylaws.

Mostly, two kinds of building codes exist throughout the world. One is the national building codes and the other is the local building codes. National codes are made by the central government and are enforced through the region, but local codes are made by the local authorities to cope with the local needs (Javed & Riaz, 2019) (Mayer & Somerville, 2019).

Comparative Analysis of Building By-Laws Implementation regarding Pakistan

Legislative and Regulatory Structure

In countries like **Canada**, the **UK**, **Australia**, and the **USA**, building regulations are backed by well-defined legislative frameworks that are regularly updated, performance-based, and administered through a combination of national and local authorities. For example, **Australia's Building Code** is centralized but accommodates regional variations, and it is supported by tools like the *Glazing Calculator* and climate maps for energy-efficient designs. Similarly, the **UK's system** uses "Approved Documents" under a national code to guide practical application. In contrast, **Pakistan lacks a unified, updated national building code enforcement system**. While several city-based bodies like **LDA, CDA, GDA**, etc., exist, their performance is fragmented, often inconsistent, and heavily influenced by political and developer pressures (Chaudhry, Masoumi, & Dienel, 2025) (DHA B. C., n.d.).

Compliance and Enforcement Mechanisms

Columbia (British Columbia) and **UK authorities** emphasize both *voluntary compliance* and *legal enforcement* mechanisms. Cities like **Pitt Meadows** focus on soft enforcement through resident engagement before invoking legal channels. In contrast, **Pakistan's enforcement remains weak**; despite regulations being in place, **authorities often fail to implement them due to lack of capacity, political will, and corruption**. Moreover, **approval procedures in Pakistan are unnecessarily complicated**, involving repetitive documentation without a centralized or digital approval system, unlike the streamlined processes seen in **Australia** or **Canada** .

Local Autonomy vs. Central Governance

The **USA** and **India** operate under a **local control model**, where each jurisdiction adopts and customizes the national code. India uses the **National Building Code (NBC)** as a base model, adapted locally. Pakistan's case is similar in structure, but not in practice—**there is no effective coordination between national and local regulations**, and **many municipalities lack the resources and expertise** to tailor or enforce codes effectively. In this aspect, **Pakistan falls behind even developing nations like India**.

Transparency, Accountability & Stakeholder Engagement

Experts like **Liz Lent** and **Dennis Casale** from Canada emphasize **minimal but clear regulations**, community engagement, and the importance of flexible, user-friendly governance in bylaw formation. In Pakistan, however, **stakeholder consultation is rarely practiced**, and **citizens, architects, and developers have minimal say** in rule-making. Additionally, **no established framework exists for regular performance audits or community-led dispute resolution**, which is practiced in Western countries.

Adaptability and Innovation

Most developed countries encourage **performance-based standards**, allowing flexibility and innovation in design and construction. This ensures buildings meet safety and sustainability standards while fostering creativity. In Pakistan, **building codes remain largely prescriptive**, often **restricting innovation** and **lacking provisions for modern materials, green architecture, or climate-responsive designs**. Also, **implementation is focused mainly on high-profile urban projects**,

ignoring the **existing building stock**, especially in secondary towns and rural areas (Khalid, Anwar, & Usman Mazhar, 2025).

Pakistan's building by-laws system, though conceptually structured like in other nations, **falls significantly behind in terms of enforcement, stakeholder participation, adaptability, and technological integration**. While countries like **Australia, the UK, and Canada** demonstrate how structured, consultative, and technology-backed frameworks can lead to successful implementation, **Pakistan's fragmented and politicized system** hampers effective execution. To improve, **Pakistan must revise its legislation**, **enhance capacity in local authorities**, and **ensure transparent, flexible, and tech-integrated enforcement mechanisms**, drawing lessons from global best practices (Abbas & Wakil, 2023).

Lahore

In Lahore, building control falls under the district governments as per the Local Government Ordinance 2001. However, the Lahore Development Authority (LDA) has continued to share this responsibility with the district governments (TMAs), leading to confusion about roles and functions. The city is divided into nine districts managed by TMAs and one cantonment town, with TMAs adhering to city district rules while the cantonment board operates independently with its own regulations.

Overview of LDA

Development authorities are expected to adopt effective planning to manage rapid urbanization, a goal not achieved by previous organizations like the Lahore Improvement Trust (LIT). This thesis focuses on the Lahore Development Authority (LDA), established in 1975 during Pakistan's first democratic government. Formed by the Punjab Assembly, the LDA Act aimed to improve metropolitan planning in Lahore.

Despite being designed for better planning, the LDA faced similar challenges as its predecessor, particularly in providing housing for low-income groups. While LDA has organizational areas such as Katchi Abadis and Housing, its bureaucratic composition, influenced by civil servants and political dynamics, has hindered effective local governance.

The LDA's projects primarily address the needs of its initiatives rather than the broader city housing crisis, reflecting agendas shaped by political interests in real estate. Although guidelines suggest affordable plots, actual affordability remains questionable, as rising market values and speculative investments complicate access for low-income families (Peter Groote, onge, & Dekker, 1989).

Analysis of Commercial Building By-laws under LDA and DHA

The Lahore Development Authority (LDA) governs 256 societies in Lahore, with many adopting their own bylaws based on LDA regulations, including the Defence Housing Authority (DHA). This chapter will compare the bylaws and processes of LDA and DHA.

We will also address the commercialization of residential areas within LDA jurisdiction, alongside an analysis of DHA's commercial markets. Case studies will focus on the implementation of bylaws and the commercialization of Johar Town, overseen by LDA, as well as a model case study on DHA. A comparison between LDA and DHA will enhance the study's findings and recommendations. (Tribune.com.pk, LDA Commercialization Policy, n.d.) (LDA, 2019)

LDA bylaws and jurisdiction

Bylaw: is a rule enacted by a government or organization.

LDA jurisdiction: means the power of the Lahore Development Authority to make legal decisions and judgments.

Lahore Municipal Corporation was in charge of city planning and development after Pakistan gained independence in 1947. The Lahore Improvement Trust was established in 1967, and it is responsible for the city's attractiveness and growth. The Lahore Improvement Trust was superseded by the Lahore Development Authority in 1975, and later, LDA created its own requirements for builders and architects. Building and planning control requirements, building structure, drainage and sanitation, and areas subject to special control and relaxation in the construction of buildings are all addressed in these regulations. (LDA , n.d.)

The Lahore Development Authority is in charge of all new housing schemes in the city. The Lahore Development Authority's control areas were recently revised, and Sheikhupura and Kasur

districts are now included in the new boundaries. The name of the organization has since been changed to Lahore Regional Development Authority (Sherwani, Hashmi, & Khan, 2024).

Amendments in LDA Commercial Building Bylaws over the years

<table>
<tr><th>2008</th><th>2014</th><th>2019</th></tr>
<tr><td>Existing regulations</td><td></td><td></td></tr>
<tr><td>

Set back on upper floors
Regulation:3.1
Plots of 6 Kanals & above located on Roads with minimum 80 ft R.O.W
Building Height, FAR & Ground Coverage -3.1.1

<table>
<tr><th>Height</th><th>FAR</th><th>Ground Coverage</th></tr>
<tr><td>Up to 200 ft (60.97m)</td><td>1:8*</td><td>65%</td></tr>
<tr><td>201 ft (61.28m) to 400 ft (121.95m)</td><td>1:1.2*</td><td>65%</td></tr>
<tr><td>Above 400 ft (121.95m)</td><td>1:16*</td><td>65%</td></tr>
</table>

*the increase in FAR shall be proportionate to the actual proposed height
Mandatory Open Spaces – 3.1.2

<table>
<tr><th>Height</th><th>Building Line</th><th>Rear Space</th><th>Both Side Spaces</th></tr>
<tr><td>Unlimited</td><td>30 ft (9.15m)</td><td>13 ft (3.96m)</td><td>13 ft (3.96 m)</td></tr>
</table>

Set back on upper floors
Regulation:3.1.3
Instead of constructing boxes Architect shall provide a set backs at upper floors after appropriate height intervals for beautification.

</td><td>

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</table>

Set back on upper floors
Regulation:3.1.3
Instead of constructing boxes Architect **may** provide **offsets** at upper floors after appropriate height intervals for beautification.

</td><td>

Different categories of Plots falling in Central Business District, Other Commercial areas/roads specified in the Master Plan/any other local areas plan/Action Area Plan and Converted Plots
Regulation:3.1.1
*Allowed Coverage, FAR, No. of Storey's, Height, Plot SIZE, & Minimum R.O.W of Road are as under:
Note: Extra height charges above 38 feet (Rs. 100/- per sft of covered are for apartment building & Rs. 60/- per sft for commercial building)

Main Civic & Commercial Centers & Neighborhood Commercial Areas 3.3
Regulations 3.3.1
No mandatory open spaces are required in commercial /office building use in the main Civic and Commercial Centers as well as Divisional and District Centre and neighborhood, including basement provided the level of arcade shall not be

</td></tr>
</table>

<table>
<tr>
<td>Regulation:3.2.3
Ground Coverage and Floor Area Ratio (FAR)
a) The maximum coverage of the plot area shall be 7/8th on the ground floor and 3/4th on the subsequent floors with maximum FAR of 1:5</td>
<td>Regulation:3.2.3
Ground Coverage and Floor Area Ratio (FAR) for designated commercial plots
a) The maximum coverage of the plot area shall be7/8th on the ground floor and 3/4th on the subsequent floors with maximum FAR of 1:6</td>
<td rowspan="4">more than 6-inches from the adjoining road level.
<u>Building height 3.3.2</u>
**Ground Coverage & FAR is as follow:
a) Only one basement is allowed with a maximum depth of 12ft(3.66m) from the road level for plot area upto 1-kanal. However, plots fall in medium rise zone-2 (upto 120 ft height) may have more than one basement.
b) Amalgamation of plots is allowed, whereas sub division is plot in Civic Center is strictly prohibited.
c) The sponsor/owner may utilize the designated parking apace in front of Commercial building for construction of underground parking after getting plan vetted by TEPA & Town Planning, LDA.
d) As regards, the plots of Timber Market, Fruit & Vegetable Markets and other such scheme where in the past type design buildings, the permission may be given to process case on Low-Rise zones up to 38 feet with one basement (optional).</td>
</tr>
<tr>
<td><u>Regulations 3.3.1</u>
No mandatory open spaces are required in commercial /office building use in the main Civic and Commercial Centers including Divisional and District Centre, including basement except under the arcade.</td>
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No mandatory open spaces are required in commercial /office building use in the main Civic and Commercial Centers as well as Divisional and District Centre and neighborhood, including basement provided the level of arcade shall not be more than 6-inches from the adjoining road level.</td>
</tr>
<tr>
<td>Regulation:3.4.3
Ground Coverage and Floor Area Ratio (FAR)

The maximum ground coverage and FAR shall be as follows:
<table>
<tr><th>Plot size</th><th>Ground floor coverage including arcade</th><th>Subsequent floors coverage</th><th>FAR</th></tr>
<tr><td>Less than 3-Marlas</td><td>7/8th of plot area</td><td>3/4th of plot area</td><td>1:1.6</td></tr>
<tr><td>3-Marlas & above but less than 10-Marlas</td><td>7/8th of plot area</td><td>3/4th of plot area</td><td>1:2.3</td></tr>
<tr><td>10-Marlas & above</td><td>7/8th of plot area</td><td>3/4th of plot area</td><td>1:4</td></tr>
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</tr>
<tr>
<td>Regulation:3.5</td>
<td>Regulation:3.5</td>
<td>Same as 2014</td>
</tr>
</table>

<table>
<tr>
<td>Other Commercial Areas
In all other commercial areas / roads specified in the Master Plan, of the city, the building height, coverage & Floor Area Ratio shall be as specified by the Development Authority for the particular area</td>
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In all other commercial areas / roads specified in the Master Plan of the city/any other Local Area Development Plan/Action Area Plan, the building height, coverage & Floor Area Ratio shall be as specified by the Development Authority for the particular area.</td>
<td></td>
</tr>
<tr>
<td>Regulation:3.6.1
Mandatory Open Spaces
The building lines for all categories of converted plots shall be as specified by the Commercialization Committee. The other mandatory open spaces shall be as follows:
<table>
<tr><th>Plot size</th><th>Rear Space</th><th>Side Space</th></tr>
<tr><td>Less than 5-Marlas</td><td>5-ft (1.52m)</td><td>Not Required</td></tr>
<tr><td>5-Marlas & above but less than 10-Marlas</td><td>5-ft (1.52m)</td><td>Not Required</td></tr>
<tr><td>10-Marlas & above but less than 1 Kanal</td><td>7-ft (2.13m)</td><td>5-ft (1.52m)</td></tr>
<tr><td>Above 1-Kanal but less than 2 Kanal</td><td>7-ft (2.13)</td><td>5-ft (1.52m) on both sides</td></tr>
<tr><td>2-Kanals & above</td><td>13-ft (3.9m)</td><td>13-ft (3.96m) on both sides</td></tr>
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<tr><td>Above 1.5-Kanal but less than 2 Kanal</td><td>7-ft (2.13)</td><td>Not Compulsory</td></tr>
<tr><td>2-Kanals & above</td><td>13-ft (3.9m)</td><td>13-ft (3.96m) on both sides</td></tr>
</table></td>
</tr>
<tr>
<td>Regulation:3.6.2
Building Height

The height of any building shall not exceed 1.5 times the width of the right of way plus the width of the building line in front of the plot plus width of the setback. However, extra height charges will have to be paid above 38 ft (11.58m) height.</td>
<td>Regulation:3.6.2
Building Height

The height of any building shall not exceed 1.5 times the width of the right of way plus the width of the setback. However, extra height charges will have to be paid above 38 ft (11.58m) height.

[Building height = (R.O.W x 1.5) + Setback]</td>
<td></td>
</tr>
<tr>
<td><u>Regulations 3.6.3</u></td>
<td><u>Regulations 3.6.3</u></td>
<td>Same as 2014</td>
</tr>
</table>

The maximum ground coverage shall be 65% of the plot area. The FAR upto 38 ft height shall not exceed 1:1.4. However, the FAR shall increase proportionate to the increase in height subject to maximum of 1:8.	The maximum ground coverage shall be 65% of the plot area. The FAR upto 38 ft height shall not exceed **1:2.4**. However, the FAR shall increase proportionate to the increase in height subject to maximum of 1:8.	
Regulation:3.6.4 Additional Regulations Following additional Regulations shall also be applicable: **c.** Only one vehicular entry and exit shall be provided. **d.** No window and other openings on the upper floors shall be allowed, which may adversely affect the privacy of adjoining properties. **h.** Maximum of four (04) parking basements are allowed upto a depth of 45' from the adjoining road level. **i.** For mega projects, FAR, Ground Coverage, Height and similar architectural/planning aspects shall be decided by the authority (Board of Governors)	**Regulation:3.6.4 Additional Regulations** **Following additional Regulations shall also be applicable:** c. Vehicular entry and exit shall be provided. **d**. No window and other openings on the upper floors shall be allowed, which may adversely affect the privacy of adjoining properties except Emergency Exits. h. Parking Basements can be constructed according to the soil conditions/water table in the particular area. i. For mega projects, FAR, Ground Coverage, Height and similar architectural/planning aspects shall be decided by the Authority (Board of Governor). NEW REQUIREMENTS **j)** For energy efficiency, all new commercial building shall provide LED lights for lighting.	**Regulation:3.6.4 Additional Regulations** **i**. For mega projects, FAR, Ground Coverage, Height and similar architectural/planning aspects shall be decided by the Authority (Board of Governor) on the request of owner in case of any difficulty, hardship pertaining to planning/ building standards and maximum building plan period. Same as 2014

	k) In all new commercial buildings shall provide solar energy systems at least for corridors lights. **l)** For plots abutting on 60-ft and above right of way, separate plans for basement shall be submitted and sanctioned released in the first phase in residential buildings. **m)** Requirement of NOC from the Civil Aviation Authority shall be mandatory as per relevant Rules of Civil Aviation Authority and directions received from time to time in multi-storey building above 300-ft. **n)** For determination of building completion date for issuance of completion certificate of residential buildings the utility bills of electricity & sui gas installation may be considered by the Authority. **o)** For determination building completion date for issuance of completion	

	certificate of commercial and industrial buildings less than 5-marla the utility bills of electricity & sui gas installation may be considered by the Authority. For plots of more than 5-marla the property tax certificate issued by the Excise and Taxation shall be considered by the Authority. **p)** Underground water tank and over head water tank shall be provided in all types of buildings. **q)** In commercial building insulation of outer walls, roofs and windows shall be provided for energy efficiency. **r)** In multi storey buildings, the outer window glass shall be double glazed/heat resistant and tinted in order to control air leakage. **s)** Walls facing sun shall be insulated in residential and commercial buildings. **t)** The roofs and	

	sun facing buildings sides shall be insulated. **u)** Heat/Light repellent paints shall be used on outer walls of buildings. **v)** The lighting system of buildings shall comply with the provisions of Building Code of Pakistan (energy provision-2011) and LED lights shall be installed in commercial buildings in place of conventional incandescent bulbs. **w)** For false ceiling and wooden paneling fire ratted building material shall be used with proper fire safety measures. **x)** No building plan shall be entertained in Area if the sub-division of land or Private Housing Scheme is not approved by the Authority.	
3.8.2 CNG / Petrol Filling Stations **a)** A minimum of 20 ft (6.1m) building line shall be provided. **b)** All structures shall be single storey.	**3.8.2 CNG / Petrol Filling Stations** **Building Plan of CNG / Petrol Filling Station will be approved considering the following requirements:**	Same as 2014

c) A clear space of 5ft (1.52m) shall be provided on both sides and at the rear. **d)** Turning angle for Entry / Exit points from the adjoining road shall be less than 45 degree. **e)** Access shall be limited to only one exist and one entry. **f)** The minimum width, depth and area of the plot shall be in accordance with the notification of the Government **Note: All requirements of Ministry of Industries, Ministry of Petroleum, Civil Defense Department, Explosives Department, EPA and any other concerned agencies shall be complied with by the builder.**	**a)** A minimum of 20 ft (6.1m) building line shall be provided. **b)** All structures shall be single storey. **c)** A clear space of 5ft (1.52m) shall be provided on both sides and at the rear. **d)** Turning angle for Entry / Exit points from the adjoining road shall be less than 45 degree. **e)** Access shall be limited to only one exit and one entry. **f)** The minimum requirements will be as follows: **Note: All requirements of Ministry of Industries, Ministry of Petroleum, Civil Defense Department, Explosives Department, EPA and any other concerned agencies shall be complied with by the builder.**	Note: (2) permission under land use rules will be compulsory from LDA. However, the building plan of CNG/Petrol filling station will be approved by explosive department as per High Court Decision ICA No. 79 of 2009 dated 04-06-2009
Regulation:3.8.4 **N/A**	**Regulation:3.8.4** **Temporary Marquee** Temporary Marquee of steel structure with fire ratted material sheet can be allowed on commercial/converted plots of 4-Kanal and above subject to provision of NOC/certification from Civil Defense/Rescue-1122 and structure stability certificates. The building line of 30-ft and 13- ft mandatory spaces shall be kept clear on both sides and rear of the plot and parking shall be provided as prescribed for marriage halls.	**Regulation:3.8.4** **Installation of Marquee on Permanent Commercialized Land Subject to Fulfillment of Requirements of LDA Land use rules.** Minimum Area of the Land :08-kanal Parking Area: 04-kanals min Front House Line: 30 ft Side Spaces: 13 ft (both sides) Rear Spaces: 13 ft
N/A	**N/A**	Regulation:3.8.5 Requirements for

		Marquee Site(already approved vide decision of authority in its meeting held on 31-05-2018 in light of order of Supreme Court of Pakistan) I. Marquee of steel structure with fire rated material sheet based upon single storey structure abutting on road having R.O.W 60 ft may be installed on land temporary commercialized, except in prohibited area, subject to following: a) Minimum Area of Land: 08-kanals b) Parking Space: 1 car space for every 00 sft of covered area c) Front house Line: 30 ft d) Side Spaces: 13 ft on both sides e) Rear Space: 13 ft Note: the regulations to install marquee prevailing at the time of grant of temporary commercialization of marquees will be applicable. II. Establishment of banquet hall in civic center/commercial center a) Plot size minimum 1 kanal b) Parking requirements: one car space for every 500 sft of covered area in the building or nearby not beyond 100 m approx. III. Restriction and regularization of existing marriage hall/ banquet hall/ marquee
Regulation:3.9.1 **Mandatory Open Spaces,** **Note:**	**Regulation:3.9.1** *****Mandatory Open Spaces** **Note:**	**Regulation:3.9.1** *****Mandatory Open Spaces,**

a. notwithstanding the provision under section 3.9.1 no mandatory open spaces shall be required in case of mosques. **b.** In case of educational institutions, a separate lane for pick up and drop purposes shall be provided within the plot outside the boundary wall.	**a.** notwithstanding the provision under section 3.9.1 no mandatory open spaces shall be required in case of Mosques/Masjid **except front building line/setback according to plot category/zone**. **b.** In case of educational institutions, a separate lane for pick and drop purposes shall be provided within the plot outside the boundary wall **by providing 15-ft wide space within the set back area.**	**Note:** **a.** notwithstanding the provision under section 3.9.1 no mandatory open spaces shall be required in case of Mosques/Masjid except front building line/setback according to plot category/zone. **b.** In case of educational institutions, a separate lane for pick and drop purposes shall be provided within the plot outside the boundary wall **by providing in addition to the building line mentioned table 3.9.1 above**

***Allowed Coverage, FAR, No. Of Storey's, Height, Plot SIZE, & Minimum R.O.W of Road are as under:**

Zones	Max Ground Coverage	F.A.R	Storey	Height (Including Parapet Wall)	Plot Size	Row of Road	Parking Requirements
Low Rise	65%	N.A	G+3	Upto 50 feet	Upto 10-Marla but less than	Min 30 feet	Optional for apartments, shops & offices buildings. For rest of the uses, provisions mentioned at 3.11 shall be applicable
Medium Rise-1	65%	N.A	G+6	Upto 90 feet	Min 1 kanal but less than 2 kanals	Min 30 feet	One floor on entire plot dedicated for parking as per section 5.7.6(a) for apartments and office buildings. For rest of the uses, provisions mentioned at 3.1.1 shall be applicable.
Medium Rise-2	65%	1:5.5	G+9	Upto 120 feet	Min 2 kanal but less than 4 kanal	Min 40 feet	Parking requirements as per specific use mentioned in clause 3.1.1
Highr Rise-1	65%	1:8	G+14+service Floor	Upto 200 feet	Min 4 kanal but less than 6 kanal	Min 60 feet	Parking requirements as per specific use mentioned in clause 3.1.1
Highr Rise-2	65%	1:12	G+23+service Floor	Upto 300 feet	Min 6 kanal but less than 12 kanal	Min 80 feet	Parking requirements as per specific use mentioned in clause 3.1.1
Skyscraper	50%	Above 300 feet increase in FAR @ 4%Proportionate to height (if height is 400 feet	(No Restrictions) NOC from CAA	above 300 feet	Min 12 kanal and above	Min 80 feet	Parking requirements as per specific use mentioned in clause 3.1.1

		then FAR will be 400*0.04= 16)					

****Ground Coverage & FAR is as follows:**

Zones	Ground FLOOR COVERAGE INCLUDIGN Arcade & subsequent floor	F.A.R	Storey	Height (Including Parapet Wall)	Plot Size	Parking Requirements
Low Rise	7/8th of plot area & 3/4th on subsequent floors	N.A	G+2	Upto 38 feet	Less than 4-Marla	Not Required
Medium Rise-1	7/8th of plot area & 3/4th on subsequent floors	N.A	G+5	Upto 72 feet	4 Marla less than 10Marla	Not Required
Medium Rise-2	7/8th of plot area & 3/4th on subsequent floors	1:5.5	G+9	Upto 120 feet	Min 2 kanal but less than 4 kanal	Not Required
Highr Rise-1	7/8th of plot area & 3/4th on subsequent floors	1:8	G+14+service Floor	Upto 200 feet	Min 4 kanal but less than 8kanal	One car space for 1600 sft useable area
Highr Rise-2	7/8th of plot area & 3/4th on subsequent floors	1:12	G+23+service Floor	Upto 300 feet	Min 8 kanal but less than 12 kanal	One car space for 1600 sft useable area
Skyscraper	7/8th of plot area & 3/4th on subsequent floors	Above 300 feet increase in FAR @ 4%Proportionate to height (if height is 400 feet then FAR will be 400*0.04=16)	(No Restrictions) NOC from CAA	above 300 feet	Min 12 kanal and above	One car space for 1600 sft useable area

*****Mandatory Open Spaces, Ground Coverage & FAR is as follows(2014):**

Zones	Building Line	Rear Space	Side Spaces on both sides	Max FAR	Max Ground Coverage
Less than 1-kanal	10 ft (3.05m)	5 ft (1.52m)	5 ft (1.52m)	1:3	65%
Above 1-kanal but less than 2-kanal	20 ft (6.1m)	10 ft (3.05m)	10 ft (3.05m)	1:3	60%
2-kanal & above	30 ft (9.15m)	15 ft (4.57m)	15 ft (4.57m)	1:3	55%

*****Mandatory Open Spaces, Ground Coverage & FAR is as follows (2019):**

Zones	Building Line	Rear Space	Side Spaces on both sides	Max Ground Coverage	Pick & Drop Lane
Less than 1-kanal	10 ft (3.05m)	5 ft (1.52m)	5 ft (1.52m)	65%	Optional
Above 1-kanal but less than 2-kanal	15 ft (4.57m)	10 ft (3.05m)	10 ft (3.05m)	60%	Two lanes (each 10 ft wide)
2-kanal & above	25 ft (7.62m)	15 ft (4.57m)	15 ft (4.57m)	55%	Two lanes (each 10 ft wide)

Table 0-1 : Amendments in LDA bylaws over the years (LDA, 2019)

Defence Housing Authority

Bylaws of DHA Lahore

DHA Lahore bylaws changed with the passage of time. Till 2006, the Lahore Cantt Corporation by-laws were applied. In 2007, DHA Lahore formed its own bylaws. The bylaws were revised majorly in 2014. The 2014 bylaws are currently followed with minor tweaks that happened during this time. The by-laws 2014 DHA Lahore are as follows:

Amendments in DHA Bylaws over the years

If we compare the 2007 and 2014 bylaws of DHA, the major changes done are as following:

1. 8 Marla plot size is introduced in 2014 by-laws.
2. In 2014 by-laws railing/ parapet allow up to 36 inches height on front sunshade of ground and first floor while in 2007 by-laws only 24 inches was allowed.

3. In 2014, 3’ x 5’’ height of plinth of ground floor with basement while in 2007, 3’ x 6’’ were allowed.
4. In 2014, top of ramp and clear spaces more than 12 inches higher than the crown of the front road is allowed while in 2007, only 6 inches were allowed.
5. In 2014, only 2 feet of small plants/ flower bed is allowed while in 2007 strictly prohibited.
6. In 2014, water channel of 3’’ x 3’’ introduced and in 2007, 3’’ x 6’’ exist.
7. In 2014, guard post size changes from 6’ x 6’ and in 2007, its size was 5’ x 5’.
8. 7 Marla covered area in 2004 is 100% on first floor while in 2014, 860 sft should be covered on first floor.

2007-2013	2014-2021
N/A	1. Submission of MEP drawings I. In order to ensure better quality of services ion DHA building construction, it is recommended that MEP drawings should also be required to be submitted at the time of demarcation updated 01 April 2021
N/A	1. Provision of Wheel Chair Ramp with Entrance Steps It is intimated that a wheel chair ramp should be planned with entrance steps of every commercial building. This ramp can be portable or fixed. It shall start in line with the lowers steps and can not be extended in verandah. No drawing will be approved without a ramp in future updated on 28 june2021
a. **Para 23-d** maximum height of sector shops in phase-4 shall be 33 feet, allowing construction of basement, ground with mezzanine & first floors. Height of sector shops in phase-1 having plot area of 4-6 marlas shall be 30 feet allowing construction of ground with mezzanine & first floors but without basement. b. **Para 23-e** : Basement is permitted in sector Shops of phase-4 under the shop area only (excluding verandah). The plinth level of shop shall be 1 foot from road level .	1. Amendments in Byelaws DHA Lahore a. **Para 23-d** maximum height of sector shops in all DHA including Phase-4 & 6 shall be 25 feet, allowing construction of basement, ground with mezzanine & first floors. But if a sector shop is already constructed in an area the new sector shop shall be approved as per the configuration and height already constructed sector shop on case to case basis by BC Branch. The drawing scrutiny charges for all sectors shops shall be Rs. 15/-per sft for proposed drawings and Rs. 12/- per sft for revised drawings b. **Para 23-e** : The plinth level in all sector shops shall be 3 feet or 1 foot from the front road level as approved by Bldg Control Branch
N/A	1. Sub Division of Commercial Plazas I. Management of DHA Lahore feels immense pleasure to inform our worthy members that floor wise transfer of Commercial Plazas has

	been approved. Now there are more opportunities for the owners to sale their plazas floor wise. Instructions on sub-division of plazas are available at DHA website. Flow chart/timeline, changes in bylaws along with financial aspects also available on website as well as DHA Main Office. II. In stage-1, sub division of plaza in Phase-6 & 8 has been approved & after six months it will be reviewed before implementation in whole DHA Lahore. III. It is strongly felt the new concept will fetch rich dividends to our worthy members. updated on 27 oct 2020
N/A	1. Relaxation in excess area fine against installation of solar system I. Due to prevailing energy crisis in the country especially in summer season, there is a need to support solar energy system to resolve our energy crisis II. In the larger national interest and to encourage the residents of DHA towards installation of solar system, it is recommended that 50% of excess area will not be fined in 1 & 2 kanal houses if the owner installs a solar system of 10KW or above **a) 1-kanal house** Total excess area allowed with fine – 200 sq ft (100 sq ft allowed without fine if solar system installed) **b) 2-kanal house** Total excess area allowed with fine – 300 sq ft (150 sq ft allowed without fine if solar system installed) updated on 30 june 2020
N/A	Soil Investigation for Residential made compulsory updated on 10 july 2020
N/A	Structure Drawings made compulsory for residential and commercial buildings both updated on 2021

N/A	1. Installation of Fire Safety Equipment-Commercial Buildings With immediate effect, the fire safety items/equipment will be marked on the fire fighting/ safety Building Drawings of Commercial Buildings as per the details given at Anx-A updated on 20 Dec 2019
N/A	The minimum internal width of bathroom/Laundry/Store must not less than 4' & total area must not less than 20 sq ft updated on 16 sep 2019
N/A	1. Marking location of spiral stair in rear clear passage a) Location of spiral stair will be marked in rear clear space on ground floor, first floor and site plan drawings, if servant quarter is located at first floor or if there is no access through internal stair of house. b) Any part/portion of spiral stair should not be visible in side clear spaces c) No platform or landing shall be provided with spiral stair in side clear space d) Sun shade shall not be used as platform/walkway e) Entry for servant Quarter in front of spiral stair be marked on first floor & should not be more than 3'-0" updated on 26 July 2019
N/A	1. Addition of Bylaws DHA Lahore A. Green Rooftop I. Green roof only allowed in 1 kanal & above II. Plants height should not be more than 4'-0" III. No pergolas/shed are allowed to be constructed IV. No louvers/railing will be fixed on 3 feet parapet wall V. NOC required from neighbors B. Height of machine room in residential area

	I. In residential buildings, maximum height of the machine room shall be 41 feet and maximum area shall be 75 sq ft. II. The maximum allowable height of the remaining portion of the mumty & rest of the building will remain the same as 35'-0". Updated on 21 May 2019
Applicable but not forcefully	Certificate of architect along with architectural submission drawings made compulsory updated on 13 June 2018
N/A	1. Submission of Drawing (Commercial Buildings) With immediate effect, structure drawing of generator pad at roof top will be submitted along with structural drawings of all commercial buildings. Moreover, roof top plan will also be included in building drawings showing location of generator pad. updated on 29 Nov 2017
N/A	1. Submission of drawings for approval III. Every proposed/revised drawing will bear the signature & stamp of architect and structure engineer as per attached specimen (Anx-A) IV. Structure stability certificates will be placed as per specimen attached (Anx-B) V. All basements will be planned with proper cross ventilation VI. All commercial buildings should have services ducts to ensure proper ventilation at each floor with enough space for emergency fire exit. Updated on 15 June 2016
N/A	1. Placing of Generator on Rooftop-Commercial/Public Buildings a) Proper generator mounting will be designed by structure engineer b) Generator set will not rest on slab, but its load will be

	transferred through proper beams/ column arrangement. c) Sound proof canopy be provided to ensure its noise level to the lowest Updated on 19 August 2016
	1. Submission of drawings for approval I. Catering to the seepage problem it has been decided that the outer wall thickness should not be less than 9". Niches created in the outer walls will not be approved by DHA. II. The sunken area should be designed according to the sketch attached. The section through the sunken area is mandatory updated on 25 Sep 2014
IV. **Para 24 (a):** Maximum height of residential building of any type shall not exceed 30 feet from road for phase I-IV whereas it can be 35 feet for such buildings in phase V and onwards V. **Para 30 (a)-Staircase(Mumty):** a. 10 Marla & below -100 sq ft b. More than 10 Marla to 1 kanal plot- 175 sq ft c. 2 kanal & above plot – 225sq ft VI. **Para 50 (b)-Privacy:** Keeping in view the sanctity of the privacy of the neighbors window cills and pardoh walls of the servant's quarters shall be kept at 7 VII. **Para 51a -Generator:** Noise beyond the boundary limit shall not be more than 15 decibels. From 2007 Bylaws	1. Following amendments in DHA Construction & Development Regulations-2014 may please be incorporated I. **In addition to Para 26 b:** Installation of maximum2 feet high electric wire fence on common boundary wall may be erected after obtaining NOC from neighboring houses. However, total height of wall and security fence will not be more than 9 feet (7+2). However, installation of concertina wire is not allowed. (Auth: Executive Board meeting 51st) II. **Para 26 sub para h:** Installation of door or removal of common boundary wall between two houses in case of blood relation ownership. However, in case of transfer of house (excluding Hiba), the owner will have to close the door or reconstruct common boundary wall before transfer.(Auth: Executive Board meeting 51st) III. **Para 26 sub para i:** In case of ownership by first blood relatives one constructed house is allowed to use up to two adjacent empty plots as lawn or vacant plot between two constructed houses can be used as lawn. However, in case of transfer of house/plot (excluding Hiba), the

	owner will have to close the door or reconstruct common boundary wall and convert the lawn into open plot before transfer. (Auth: Executive Board meeting 51st) IV. **Para 23 (a):** Maximum height of residential building of any type shall not exceed 35 feet from crown of road for all phases. V. **Para 30 (a)-Staircase(Mumty):** d. 10 Marla & below -175 sq ft e. 1 & 2 kanal – 300 sq ft VI. **Para 54 (c)-Privacy:** 7 feet instead of 5 feet (Sill level of servant's quarter window shall net be less than 7 feet) VII. **Para 55a (2)-Generator:** 95 decibels instead of 15 decibel (Noise beyond the boundary limit shall not be more than 95 decibels.) (Auth: Executive Board meeting 58th) updated after 2014 Bylaws
1. 7-Marla Plot I. Clear space for 7-Marla plot R Front-5'-0" Rear-3'-0" Side – 3'-0" II. Covered are of First floor of 7-Marla (100% of G.F covered area)	1. 7-Marla Plot amendments I. Clear space for 7-Marla plot Revised Front-7'-0" Rear-3'-0" Side – 3'-0" II. Covered are of First floor of 7-Marla (75% of G.F covered area) updated after 2014 Bylaws
N/A	8-Marla plot introduced updated after 2014 Bylaws
1. **Para 19 (q)- Building plan:** Assessment of electric load in the proposed building	N/A
Para 26-(Height of plinth level above ground/road level): Top of ramp from crown of the front road is allowed only 6 inches	**Para 25-(Height of plinth level above ground/road level):** Top of ramp from crown of the front road is allowed only 12 inches
Para 28-(Disposal of surface water): A water channel of 3 inch x 6 inch size shall be constructed in line with boundary wall inside the gate	**Para 27-(Disposal of surface water):** A water channel of 3 inch x 3 inch size shall be constructed in line with boundary wall outside the gate
Para 36-(Guard Post): In a residential building, a guard post may be constructed having size of 5ft x 5ft with a maximum	**Para 34-(Guard Post):** In a residential building, a guard post may be constructed having size of 6ft x 6ft with a maximum
height of 8 feet from the road level adjoining to the main gate towards the lawn	height of 8 feet from the road level adjoining to the main gate towards the lawn

Table 0-2: Amendments in DHA Commercial Building bylaws over the years (DHA B. C., n.d.)[1]

Case studies

Case Study-1 Johar Town

Johar Town in Lahore, named after prominent Muslim leader Maulana Mohammad Ali Johar, is strategically located near major roads like Multan GT Road and Motorway-2. According to LDA (2014), its total area is 1,872 hectares, with a recorded population of 132,222 in 1988, resulting in a density of 71 per hectare. Recent developments show population growth due to ongoing residential construction, placing Johar Town in a low to moderate density zone within the Lahore Metropolitan Area. Rapid commercialization and inadequate planning have disproportionately impacted low-income groups.

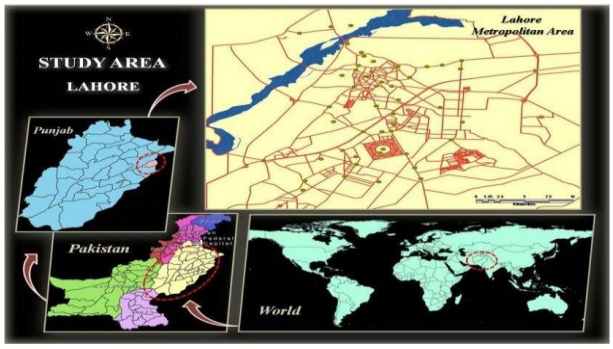


Figure 3: Lahore Metropolitan Area

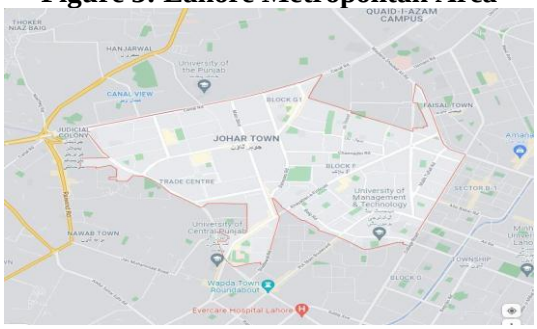


Figure 4: Johar Town Lahore *(Google Maps, n.d.)*

Subdivisions of Johar Town

Johar Town Lahore is located along Canal Bank and is mainly divided into two phases: 1 and 2. Both of these phases are further subdivided into many blocks. Phase 1 features blocks from A to G, on the other hand, its second Phase is designed with Blocks H to R.

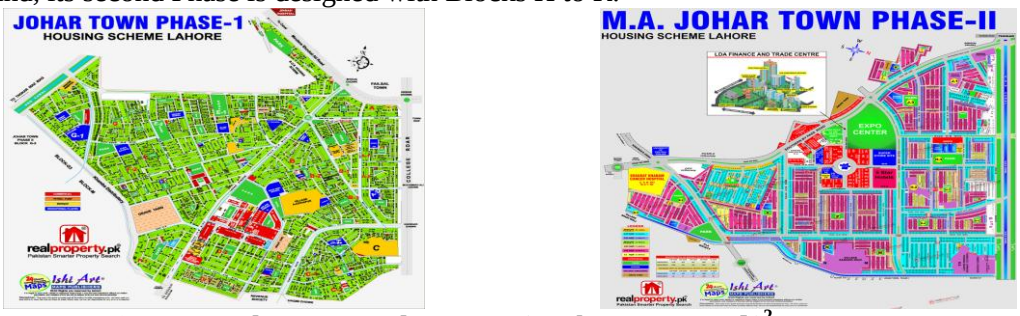


Figure 5: Johar Town Phase 1- 2 *(Real Property, n.d.)*[2]

There are a total of two phases of Johar town Lahore, Phase I and Phase II have different blocks as follows:

Phase-I	Phase-II
A - A1, A2, A3	G- G2, G3, G4
B - B1, B2, B3	H- H1, H2, H3
C- C1, C2	I
D - D1, D2	J-J1, J2, J3
E- E1, E2	K

F- F1, F2	L
G- G1	M
	N
	P
	Q
	R- R1, R2, R3

Table 1: Johar town Phases & blocks

History

A town reflects a portion of the national fabric, showcasing key elements of societal continuity and change. Urbanization is a global trend, and towns often struggle to accommodate growing populations. Lahore, the heart of Pakistan, has expanded beyond its historical walls since the British period (1848-1947), when areas like Civil Lines and Model Town were developed for the elite. The Lahore Improvement Trust (LIT) began its master plan in 1936, but progress was hindered by World War II. After independence in 1947, rapid construction took place to accommodate migrants, leading to the establishment of new colonies on the outskirts, including Gulberg, Shad Bagh, and Johar Town (Creswell, 2011).

Planning and Development

Johar Town, a luxury housing development in Lahore, stands out for its timeless grandeur and charm. Although newer upscale communities like WAPDA Town and Valencia Town have emerged, Johar Town remains one of the largest and most successful projects by the Lahore Development Authority (LDA).

Located close to the motorway, it offers a mix of classic and modern homes, catering to both upper middle and upper-class investors. The neighborhood boasts excellent public services, including parks, schools, and a robust transportation system, making it highly desirable for residents.

Johar Town is also home to the Emporium Mall, featuring local and international brands, as well as the state-of-the-art Shaukat Khanum Hospital and Lahore's largest trade center. Its strong rental market performance, driven by high demand, makes it an attractive option for investors seeking properties with good returns and increasing values.

Area of study - G1 Market Johar Town

G-1 Market is round 1 km distant from Johar Town and is domestic to numerous eateries, a gym, a snooker club, Millat Digital Printing, and a well-known book store (Qasim Old Book City). You will even discover famous uniforms and jewelry shops within the G1 Market.

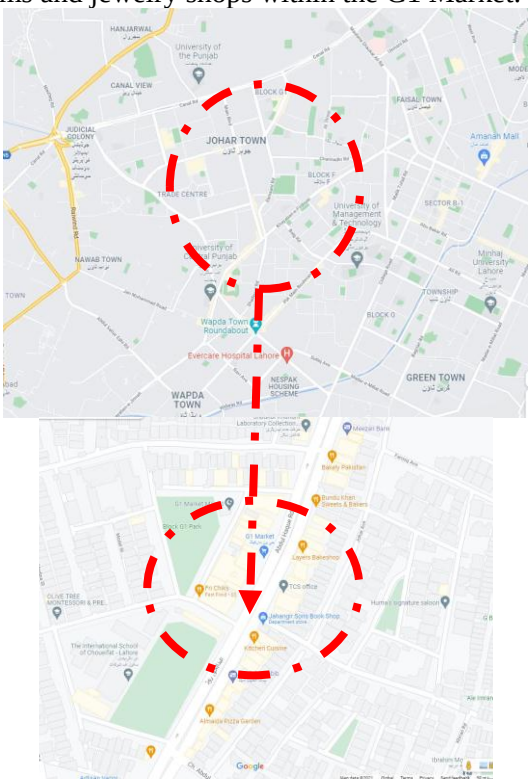


Figure 6: G1 Market Johar Town Google Maps

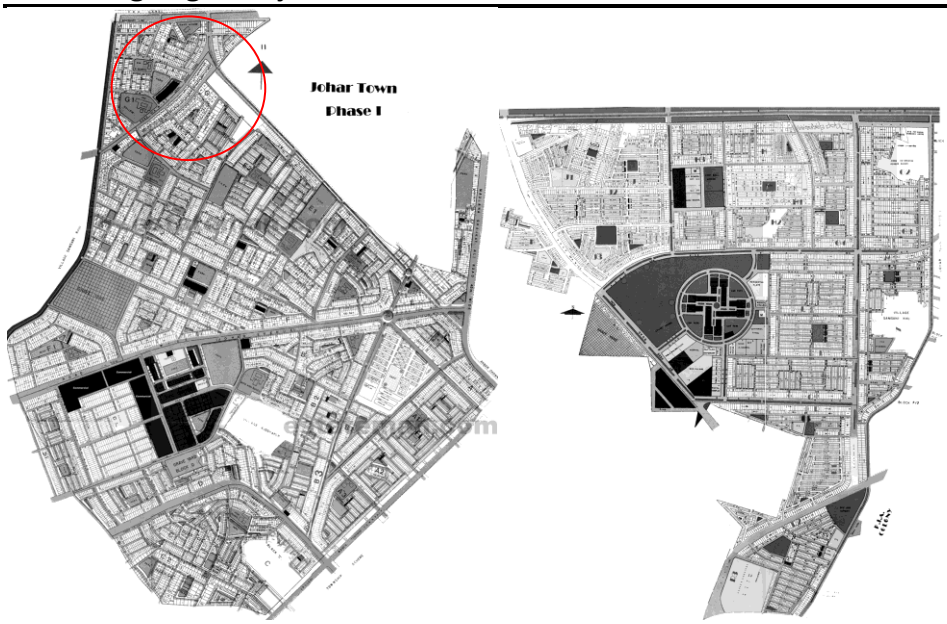


Figure 7: Johor Town Phase 1&2 Maps

Analysis of G-1 Market

Owing to ongoing commercialization trends in Johar town and conforming to socio-economic and environmental transformation, a proposal of annual commercialization or semi-commercialization was proposed by LDA a few years ago, but this led to the unchecked growth of commercial areas, resulting in anthropogenic urbanization crises, visualized as under:

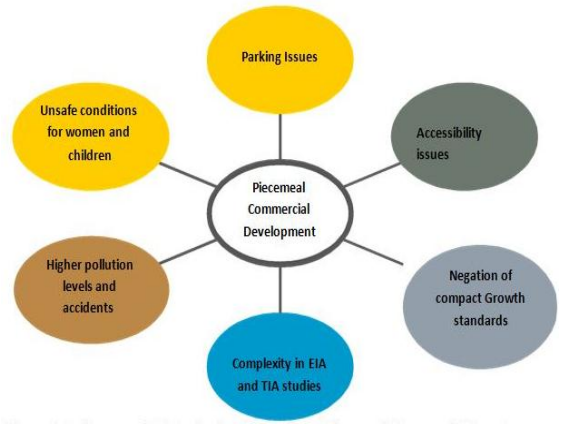


Figure 8: : Issues in G1 Market

The analysis of existing state of **G-1 Market Johar Town** reveals two different types of developments,

1) Existing commercial market of G-1
2) Commercialization of Residential Area

1. Existing Commercial G-1 Market

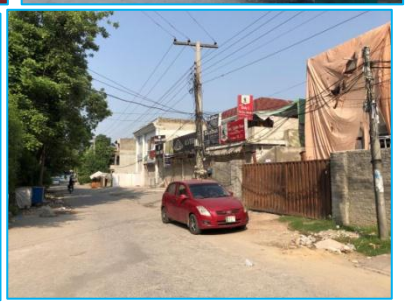
One side of the G1 market has been commercial since the first lay out was done and it has been this way since then. First, will analyze this part.

a. Pictorial analysis of G-1 Market

Survey is conducted during a day at different time of hours to study the flux of traffic at normal and peak hours of the day





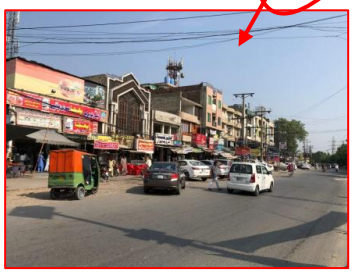



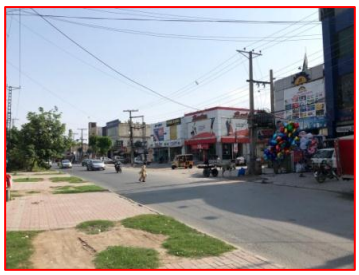
Back side of G-1 Market

At 8:30 am on September 17, 2021

Front side of G-1 Market

At 8:30 am on September 17, 2021


Back side of G-1 Market

At 4:30 pm on September 17, 2021

Front side of G-1 Market

At 4:30 pm on September 17, 2021

b. Analysis and Discussion

TEPA LDA recently (September 2020) conducted Topographic Survey of G-1 Market for its detailed study to resolve the present issues and proposed a solution too which is still pending. Issues pointed out at G-1 Market are as follows:

a) Vehicular load has increased and traffic jams (figure 4-8) have become a common problem especially during peak hours

b) Due to non-availability of parking space, people have to face embarrassment
c) Sprouting up of several huge modernist hoardings and neon signs is adversely affecting the visual quality of built environment
d) Drainage problem is another severe issue
e) Encroachments on parking space provided for G-1 Market in front of shops resulting in vehicular congestion
f) Exposed electric poles with no setbacks can create safety issues

Residential Area

Residential Area

Figure 9: Actual existing G-1 market survey from TEPA

c. Solutions and Discussion

TEPA LDA suggested following solutions at G-1 Market are as follows:

a) Access control points proposed there to control vehicular movement and encroachments on shops front
b) Drain was proposed to deal with the drainage problems there
c) Paid parking was proposed
d) Relocation of electrical poles to avoid any emergency
e) setbacks around the electrical poles in the form of landscape was also proposal
f) sign boards redesign to every shopkeeper was suggested
g) same building line was proposed to have a symmetrical shops front and avoid illegal encroachments

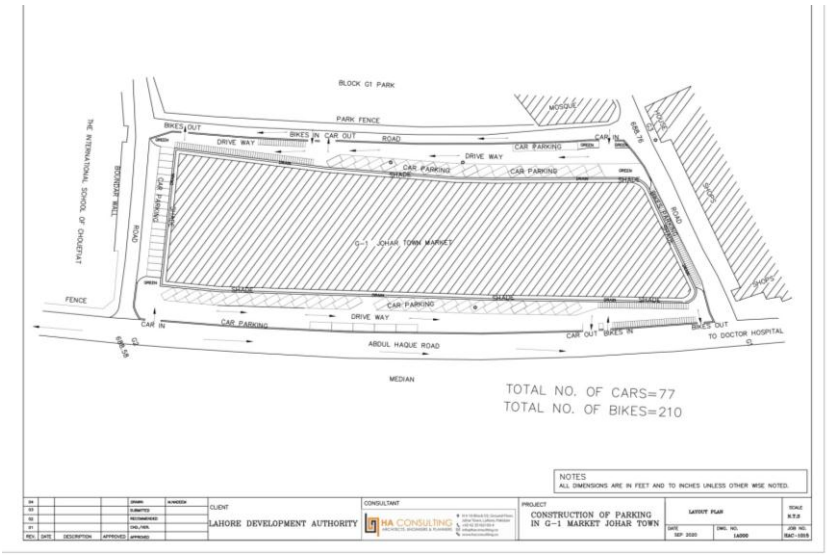


Figure 1: G1 Market Survey by HA Consulting for TEPA

Commercialization of Residential Area

In recent years, there was a massive migration of commercial enterprise hubs, offices, industrial or combined-use homes, and traders from faraway regions of Lahore to Johar Town. Due to this growing call for this area, the unlawful commercialization of residential homes happening in multiple blocks of Johar town led to chaotic and overcrowded encroachments.

Initially G-1 Market was designed for the residents of G-1 Block as a community center like in other blocks of Johar Town. With an increase in population and increased demand for commercial areas, G-1 market is now home of food outlets, garments, offices, etc.

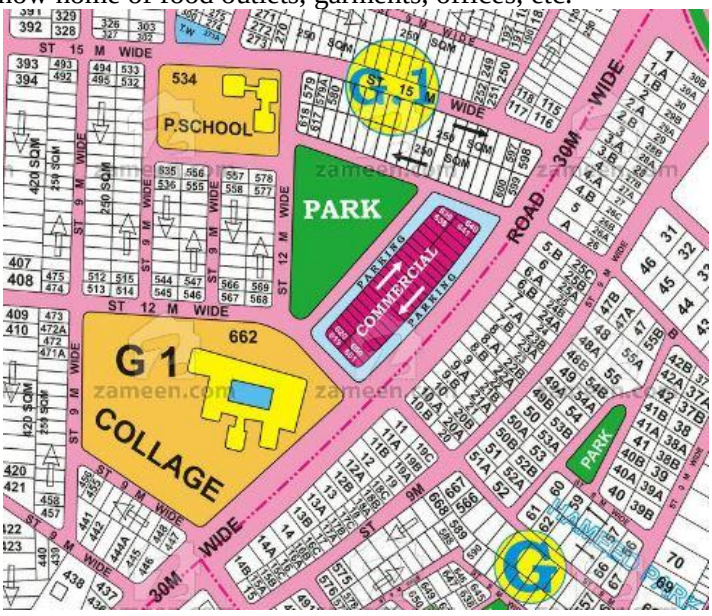


Figure 2: Initial Proposed Master Plan of G-1 market, Johar Town *(Zameen.com, n.d.)*[3]

Commercial area Residential area

Figure 4-11 shows the initial master plan of Johar Town, is shows the proposed commercial area years ago. As a result of the commercialization policy, the main front of the Abdul Haque Road residential area has been converted into a commercial area without addressing the present issues of the existing G-1 Market. Perhaps greed was the motivator, and public interests were thrown away like a worn-out garment. Instead of reining in illegal commercialization, the authority has considered it a revenue opportunity and allowed annual commercialization of properties in residential areas.

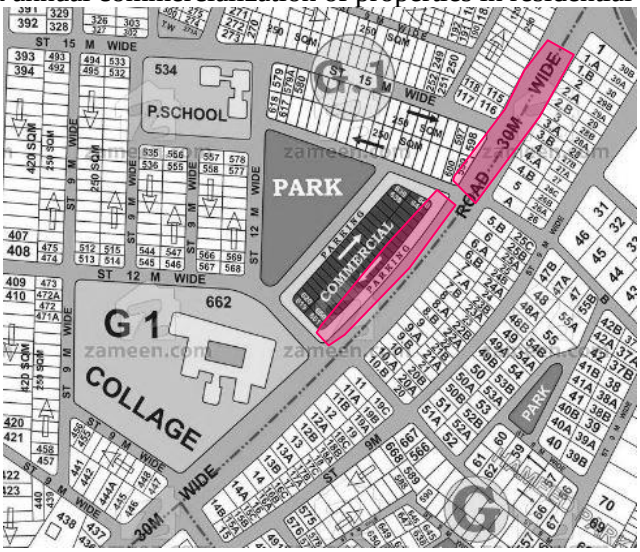
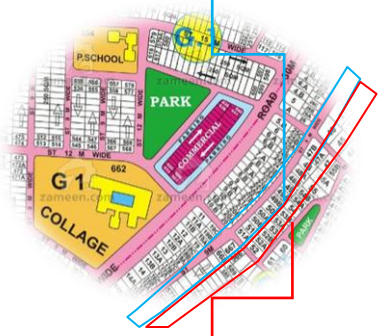


Figure 3: G1 market - Existing and converted..

Existing commercial G-1 Market Proposed commercial market

a) Pictorial analysis of the extension of G-1 Market

Converted commercial area on Abdul Haque Road



Existing Residential area

b) Analysis and Discussion

Commercialization of residential areas generated footloose and piecemeal development trends in different parts of Lahore city, including Johar Town. (Tribune.com.pk, LDA Commercialization Policy, n.d.) Issues pointed out at the extension of G-1 Market are as follows:

a) Vehicular load has increased, and traffic jams have become a common problem, especially during peak hours
b) The drainage problem is another severe issue
c) Encroachments on parking by the vendors thus reduced the sight distance necessary for the visibility of the driver (Tribune.com.pk, n.d.)
d) Commercialization policy with no structural changes brought a hodgepodge skyline of buildings, which has changed the entire neighborhood
e) Privacy issues for the residents as the front commercial plots have a common boundary wall with the residents' plots
f) Noise pollution has increased for the residents, created by the converted commercial plots
g) Safety and security issues and fear generated among the residents, forcing them to install gates at every block. (Dawn, n.d.)

Model Case Study-2 DHA Lahore

History

DHA Lahore (Defense Housing Authority Lahore) is a housing society in Lahore, Punjab, Pakistan, originally established for army officers but now serves both military retirees and civilians. The area

has experienced significant gentrification, attracting a more affluent population and new developments.

Phase 6 is developing a golf resort in partnership with Bandar Raya Developments of Malaysia, while Phase 2 features a shopping and office complex with Global Haley from the UK. Notable shopping centers include the Y-block and H-block markets, with amenities like a sports club, gym, and a large swimming pool.

The DHA main office has moved to Phase VI, Sector A, to accommodate increasing visitors, while smaller markets like T block host various cafés and the Olympic Pool exhibition center.

Two international-standard sports complexes have been proposed for the region, with building beginning in 2011.

Figure 4: Populated areas to buy property in Lahore.

This graph shows the popular areas of Lahore where people buy plots, and DHA is top of the list.

Planning and Development

The DHA now has nine phases open for civilian occupancy, ranging from phase 1 to phase 9. The final two phases of extensive development, from phase 10 to phase 11. Each phase is divided into several sectors or blocks with English alphabet names that are further subdivided into plots for the construction of residences ranging in size from five marlas (about 1361 square feet) to two kanals (approx. 10890 square feet). Each phase also has a core business centre with local shops and offices. Phases 1 to 6 have the most construction and population, while Phases 7, 8, and 9 have the least.

Phases 1 to 4 of the general design show an older style of town development with narrower roads, streets, and grassy areas, as well as no underground cabling for electrification and no sector mosques. Phases 5, 6, and 7 are the most current in terms of planning and development, and they include sixty-foot roadways and wider streets, as well as underground electrification and a mosque for each sector or block. The first 'dolmen' branded mall in Lahore is currently under construction in Phase 6.

The DHA announced the completion of a signal-free corridor for vehicle traffic connecting Walton Road and Phase-exit V's on November 29, 2018. This fast-track traffic facility is available to all sectors along this route, including Phases I, II, and V.

Subdivisions

Defence is organized into ten subdivisions (or phases), each of which is further divided into blocks. Each phase also includes a core commercial center for the benefit of the surrounding community. Construction of housing began with Defense I and spread east and south to what is now known as Defence VII. Defence VIII, IX, XI, and XII are currently in development. Housing plots range in size from five marlas (about 1361 square feet) to two kanals (approximately 1361 square feet) (approx. 10890 square feet). The central headquarters were originally located in Defence III, Sector Y, but

were later moved to Defence VI, Sector A to accommodate more citizens in the area (DHA B. C., n.d.).

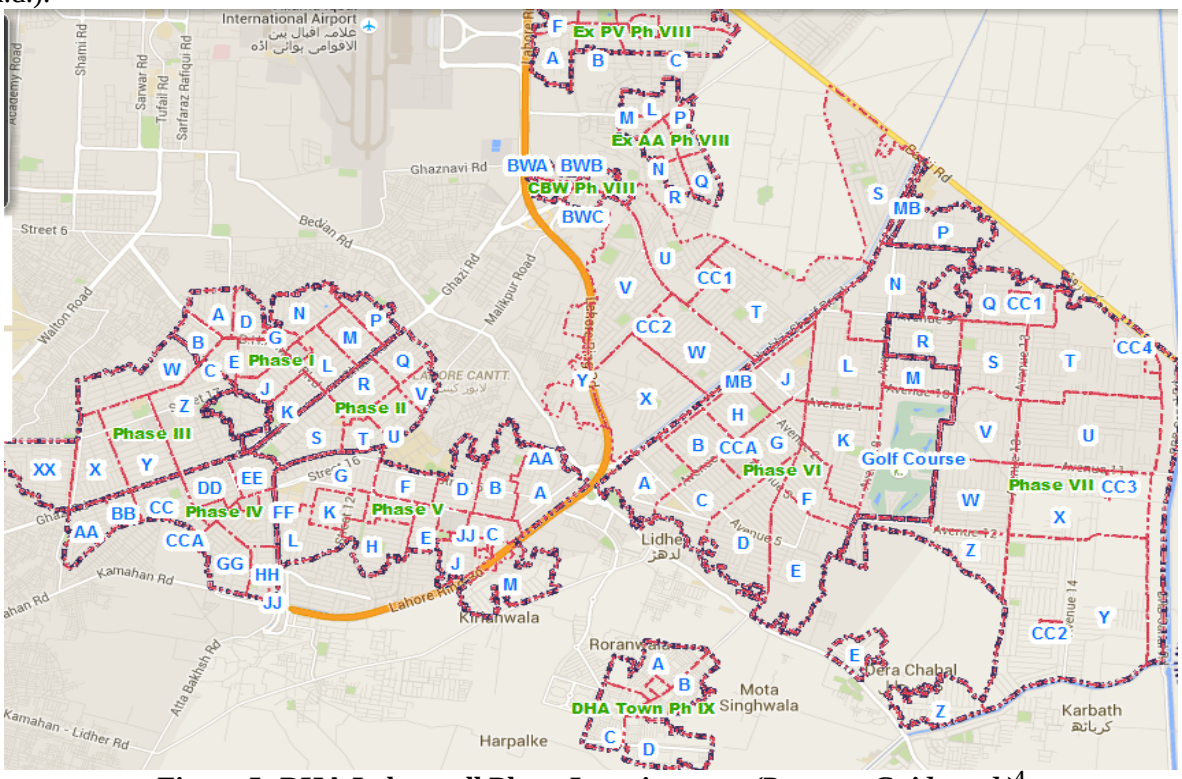


Figure 5: DHA Lahore all Phase Location map *(Property Guide, n.d.)*[4]

Commercial Markets in DHA

Lahore, Pakistan's second-largest city, boasts a rich culture, history, and culinary heritage. As a growing metropolis, it attracts investment, particularly in the DHA Lahore area, known for its elegance and structured into 12 phases.

As of April 2019, DHA remains a top choice for home buyers. Notable shopping areas include DHA Phase 1 Commercial, home to essential institutions like The Leads Academy and DHL Express, alongside popular restaurants such as Subway, KFC, and Al Fateh Mall.

DHA Phase 2 Commercial features Times Fitness and several banks, including Meezan and Askari Bank, with convenient ATM services. Phase 3 offers establishments like Broadway Pizza and the Rising Sun Institute for Special Children. Phase 4 is known for its community club and fitness centers, while Phase 5 hosts Shapes DHA, a well-regarded health facility. Phase 6 includes Al Baraka Bank, Habib Bank, and recreational venues like an Olympic-size swimming pool and the nearby Defense Raya Golf Club (Forest, 1914) (Nespak, 2021).

Analysis and Discussion

DHA Lahore commercial properties are centrally located in each phase. They are well-planned with adequate parking facilities. Commercial areas in DHA Lahore do not mix with residential areas, and it is strictly prohibited to use residential property for commercial use. All commercials are now installed with elevators, firefighting, and safety equipment. These well-planned commercial areas are suitable for all sorts of companies, including multi-nationals.

Every phase of DHA is well planned. For a model study, we will discuss phase 1 for analysis.

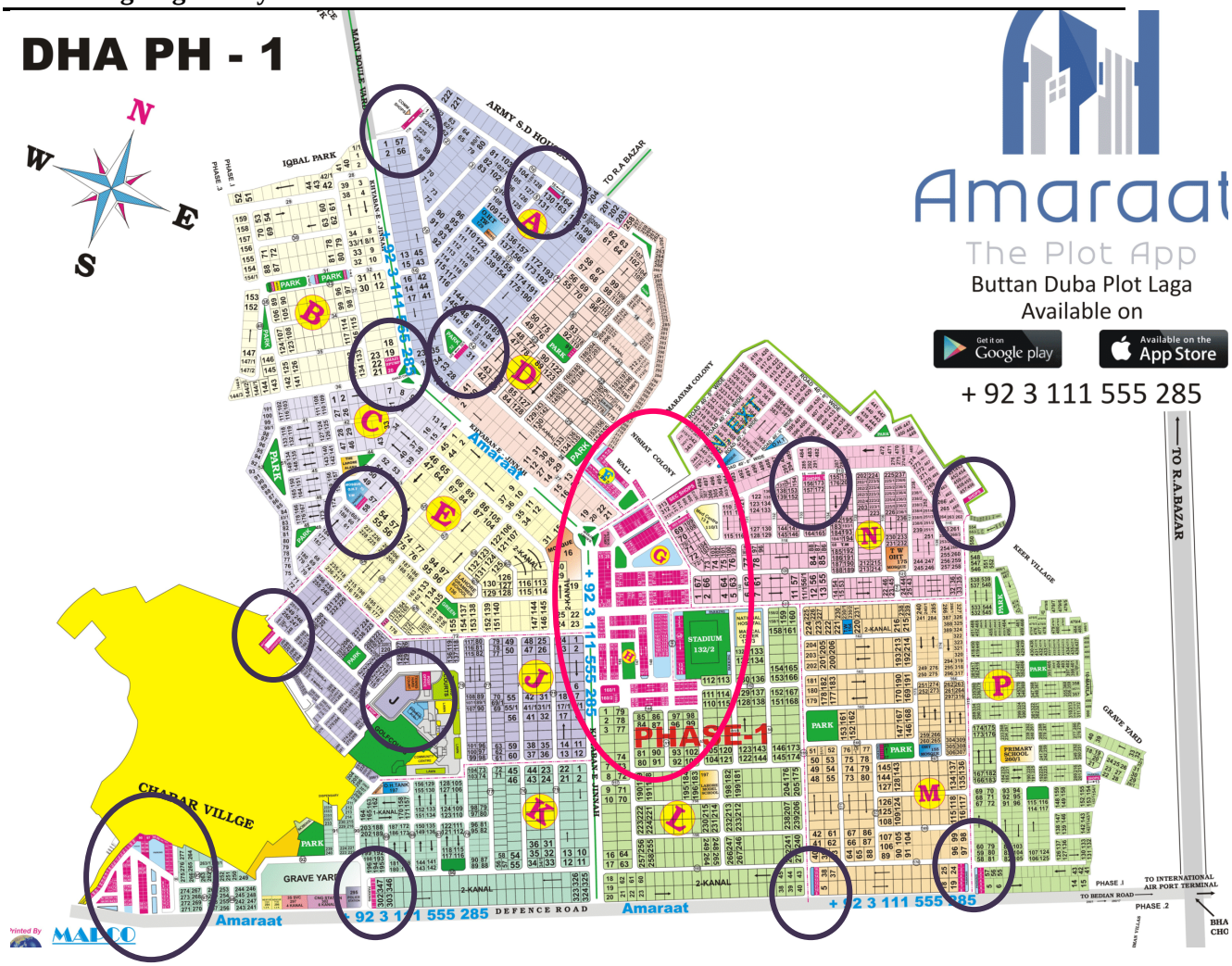


Figure 6: DHA Phase 1 ***(Imlaak, n.d.)***

Main commercial area sector shops

Figure 7: H Block Market, DHA Lahore

1) Planned Commercialization Policy
2) Each phase and sector has its commercial market, resulting in a smooth and healthy built environment

3) Each commercial market has its own adequate parking space
4) Signal-free corridor in most of the phases
5) No encroachment on public utility sites resulting in smooth traffic flow
6) Same building line for commercial area shops, resulting in hierarchy and aesthetics
7) Advertisement-related strict bylaws to avoid a hodgepodge on the facades of commercial areas
8) A proper drainage system in each shop to avoid an inconvenient situation for the users

Comparative Analysis of DHA and LDA Lahore

Sr No.	DHA	LDA
1.	Detailed drawings are required for both residential and commercial submission processes, irrespective of building height.	Detailed drawings are required for the submission process only for large-scale projects; residential drawings up to 45' height just require architectural-related details.
2.	Soil investigation is required for all kinds of residential and commercial projects.	Just applicable for large-scale projects
3.	Firefighting and MEP drawings are also required for both residential and commercial projects, but this is merely a revenue-generating policy by DHA in the case of residential projects.	Firefighting and MEP drawings are required only for large-scale projects.
4.	Structure drawings are required for residential and commercial projects, but this is merely revenue revenue-generating policy by DHA in the case of residential.	Just applicable for large-scale projects
5.	Approved drawings are valid for 2 2-year period if construction does not take place.	One-time approval system
6.	In case of building bylaws violation under the category of relaxation in bylaws by DHA, the two-time submission process is applicable, one is before construction, and the other is at the time of the completion certificate. It is also revenue revenue-generating policy.	N/A
7.	Building bylaws are strictly followed both in drawings and on-site	Building bylaws are just piecemeal and not followed strictly. Submission drawings are made according to the bylaws just for documentation, but on-site drawings are much different.
8.	Construction Supervision phase is strictly followed according to the bylaws on site for every kind of project.	Construction supervision is merely a term used in the LDA Bylaws, only as on-site, it's not followed properly.
9.	A proper pre-planned Master Plan has been executed on site, too, in every phase of DHA.	Pre-planned Master Plan is being changed a lot of times due to poor planning, and for the sake of generating Authority revenue.
10.	Infrastructure design catering to sanitation, drainage, and other built environment problems, on the other hand, there are some issues of traffic due to the increase in population in phase 5 onwards.	Poor infrastructure design results in sanitation, drainage, and other built environment problems
11.	Proper updating system of their registered architects regarding bylaws changes through letters, and also update these changes on their website.	Do not update timely manner.

Table 2: Comparison of LDA & DHA Bylaws

Survey and Results

The building regulations in LDA and DHA are not very different, however, the position of the buildings differs. There are several reasons why the LDA has been unable to apply the building by-laws under its jurisdiction; political influence is one of the most serious roadblocks to the implementation of any department's rule. Most usually, poor and middle-income people fall within the authority of the LDA, which has a bigger household size but extremely tiny land for their residence in

comparison to the household size; as a result, they don't accept house plans and regularly break the construction by-laws.

"Different rules are framed for congested and non-congested areas within the jurisdiction of the municipal councils", said by T.N.Boob, Dr. Y.R.M. Rao.

They have identified three basic reasons for bylaw violations;

1. High land cost
2. Administrative negligence
3. unawareness of building bylaws

Lack of monitoring machinery, scarcity of technical manpower at the municipal level are the predominant factors for municipal councils to avoid such violations from occurring. Some have felt that the nearby political impact is likewise a hurdle in controlling such violations. Hence, a survey and a set of Interviews were conducted to

Conclusions & Recommendations

Perfection is not something that comes naturally; it has to be attained with practice, continuous feedback, and the actions of improvement taken precisely. LDA bylaw, even with all the amendments done past few years, still has room for improvement. This improvement is needed at both ends.

1. Bylaws, their implication & enforcement process
2. Commercialization policy

Now, improvement can only be made if one knows the deficiencies or loopholes in the current system. Therefore, both need to be discussed at the same time.

Bylaws issues

Some individuals in the industry, particularly outside the LDA office, are designing buildings and relying on architects for approval. The LDA website lacks information on Building Bylaws, and the amendments to the LDA Bylaws 2019 are not posted. The bylaws are not design-friendly, and there is ambiguity regarding aspects like elevations and free-standing elements. Additionally, some commercial plot regulations do not align with the 2019 Bylaws and are addressed only on-site. Odd-shaped and converted commercial plots are not categorized in the bylaws. Moreover, LDA officials often require compliance with these bylaws in submissions, yet they can be overlooked on-site for a penalty, seemingly to generate revenue.

Implication and Enforcement Process Issues

1. Construction does not adhere to the submission drawings.
2. Site inspectors fail to visit ongoing sites as required by bylaws.
3. Supervisory staff accept kickbacks from clients to overlook bylaw compliance.
4. The permissible extra area coverage in bylaws is often exceeded, leading to a disorganized building skyline.
5. Although approved drawings are valid for two years, clients often construct whenever they wish, ignoring the timeline.
6. The mandatory 5-foot side setback during basement excavation for adjacent plot safety is frequently overlooked, causing cracks and safety issues.

Suggestions for improvements

Adjustment in bylaws

i. The LDA Bylaws are comprehensive but require improvements:
ii. Bylaws should be available on the LDA website with amendments highlighted in red for clarity.
iii. Require structural drawings for basement submissions to prevent threats to adjacent buildings.
iv. Apply residential bylaws according to R.O.W., similar to commercial bylaws.
v. Enhance site supervision practices by LDA.
vi. Introduce sustainable bylaws (e.g., solar panels) to address the energy crisis.
vii. Expand user-friendly policies like the parking space incentive.
viii. Improve the e-khidmat portal for a fully online system.
ix. Provide clear, updated bylaws and a helpline for guidance.
x. Implement ethical training and penalize employees for corruption to foster integrity.
xi. Create new environmentally friendly bylaws for converted commercialization.
xii. Establish a platform for architects and planners to stay updated on bylaws.

Awareness campaigns

LDA invests heavily in publicity campaigns and should also focus on promoting awareness of bylaws and violations. Bylaw handbooks should be available in hard copy at all LDA offices for a nominal fee.

Key improvements include:

- A web portal for architects to access the latest bylaws
- Inclusion of submission fees in the bylaw book
- Clear mention of penalty fees for better understanding
- Regular updates of bylaws and amendments on the website.

Commercialization Policy Loopholes and Suggestions

Commercialization policy loopholes

1) Unplanned and rampant commercialization had ruined the lives of Lahore citizens. The critics termed the LDA Commercialization policy a "fraud" with the residents of Lahore
2) The visible aim of this policy is to increase revenue, as citizens are using residential properties for commercial purposes in most areas
3) This flawed annual commercialization has changed entire neighborhoods, such as Johar Town, etc.. In several other areas, citizens have established hazardous industries and chemical warehouses.
4) In most areas of several societies, especially in Johar Town, converted commercial plots have a common boundary wall with residential plots, resulting in privacy issues
5) In Johar town, each residential block has its security gates installed due to increasing commercialization in residential areas, creating safety issues
6) Vehicular load has increased, and traffic jams have become a common problem, especially during peak hours
7) Due to the unavailability of parking space, people have to face embarrassment
8) Sprouting up of several huge modernist hoardings and neon signs is adversely affecting the visual quality of the built environment
9) The drainage problem is another severe issue
10) Due to the increasing commercialization rate, the existing infrastructure of Lahore is in danger:
    I. The energy crisis has increased due to the heavy energy load/demand of commercial plots
    II. Existing roads were designed according to residential requirements, hence, the width of existing roads for commercial purposes does not meet the requirements, resulting in heavy traffic blockage
    III. Water consumption of some commercial activities results in a shortage of water supply resources by WASA
    IV. The drainage system was designed according to residential requirements, resulting in drainage problems in some areas where converted commercial buildings are located

Suggestions for Improvement in Commercialization Policy

1. Indiscriminate commercialization should not be permitted in the city for the sake of revenue generation.
2. Regularization of commercialization must be avoided to prevent increased rates of unauthorized activities.
3. LDA should take action against illegal commercial activities and encroachments to ensure residents can live peacefully.
4. Each block in new developments should include a designated commercial zone to prevent future environmental changes.
5. Commercialization near public utility buildings must be restricted to avoid security issues and traffic congestion.
6. Unauthorized commercialization may only be regularized if it does not:
    I. Encroach on public rights of way
    II. Cause traffic congestion
    III. Have negative environmental impacts

IV. Conflict with surrounding land uses

7. Special bylaws should be established for building regulations related to converted commercial plots, including aspects like building lines and parking requirements.
8. LDA should incorporate sustainable practices, such as solar panels and rainwater harvesting, into commercialization policies to address energy concerns.

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