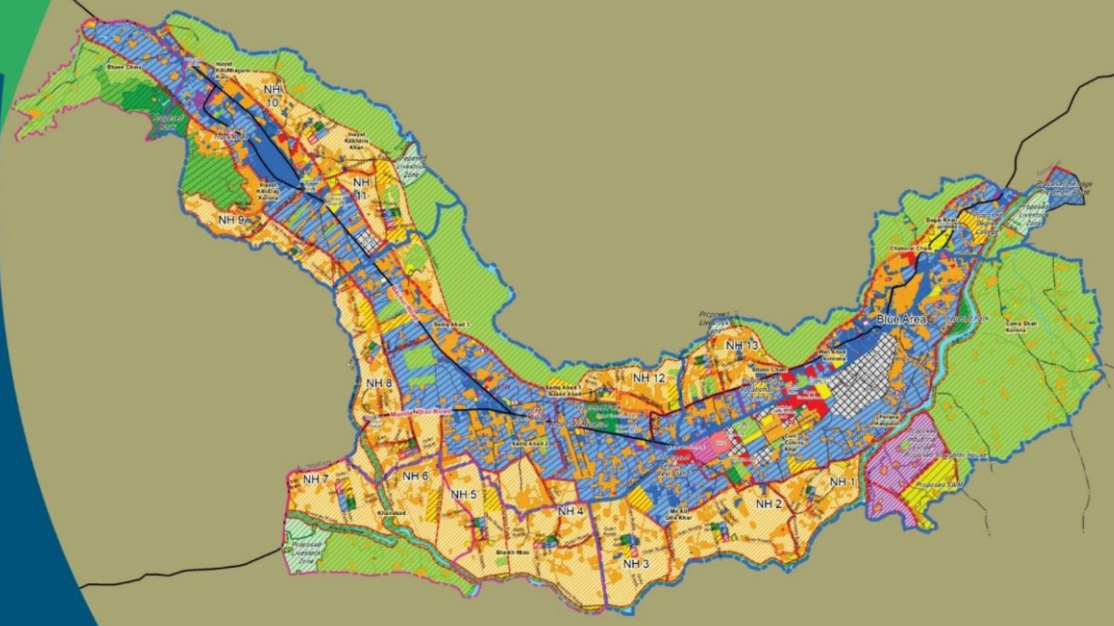
MASTER PLAN OF KHAR URBAN CENTER
DISTRICT BAJAUR 2024-42

VOLUME I



Master Plan Project (MPP)
Urban Policy & Planning Unit

June, 2024

URBAN POLICY UNIT
Planning and Development Department
GOVERNMENT OF KHYBERPAKHTUNKHWA

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GOVERNMENT OF KHYBERPAKHTUNKHWA

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MESSAGE FROM THE CHIEF MINISTER, ELECTIONS, AND RURAL DEVELOPMENT DEPARTMENT, GoKP

Khyber Pakhtunkhwa, the third most populated province of Pakistan, is experiencing rapid urbanization due to various push and pull factors. Lack of proper planning has resulted in overcrowding of all major urban centers coupled with traffic congestion, environmental pollution and ribbon development along main roads. Insufficient investment in urban infrastructure, lack of trained human resource and poor management of key infrastructure are the causes of weak coverage and low service quality. A significant proportion of the urban population continues to live in dilapidated environment and urban slums. The current provincial government has introduced a policy shift from "containing urbanization" to "managing urbanization", adopting an integrated approach that capitalizes on the potential of cities and that can convert this constraint into an opportunity and transform the cities to be engines of economic growth.

The provincial government is aware of these challenges for which it has prioritized an innovative planning approach that would bridge the gap between urban and rural development. Through coordinated efforts, district land use plans for districts and master plans for urban centers across the province have been developed. These master plans are designed to address core urban issues such as traffic congestion, provision of affordable housing, traffic & transportation problems, unemployment, lack of education and healthcare facilities and environmental degradation. These plans provide clear and actionable road maps for decision-makers to guide them towards sustainable development ensuring that both urban and rural areas can meet the needs of growing populations while safeguarding natural resources for future generations.

These achievements wouldn't have been possible without the dedicated and untiring efforts of the Master Plan Project, Urban Policy and Planning Unit of the Planning and Development Department, Government of Khyber Pakhtunkhwa. I would like to extend my gratitude to all stakeholders, community members and local government officials whose contributions have been instrumental in shaping these comprehensive plans.

Looking ahead, these master plans stand as a testament to our government's unwavering commitment to fostering sustainable, inclusive and resilient urban development. Together, we will ensure that Khyber Pakhtunkhwa's cities and towns continue to thrive as hubs of economic activity, cultural heritage and community well-being, securing a prosperous future for all generations to come.

Mr. Ali Amin Gandapur
Chief Minister
Government of Khyber Pakhtunkhwa

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Planning and Development Department
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MESSAGE FROM THE MINISTER LOCAL GOVERNMENT, ELECTIONS, AND RURAL DEVELOPMENT DEPARTMENT, GoKP

The Government of Khyber Pakhtunkhwa is committed to fostering a well-planned, resilient, and sustainable urban future for our cities. Recognizing the rapid pace of urbanization and its associated challenges, we have taken a proactive approach to urban planning and development that aligns with national priorities and international commitments, including the Sustainable Development Goals (SDGs).

Through the Master Plans for Cities, we are laying the foundation for balanced regional development, economic growth, and environmental sustainability. These plans will guide future investments in infrastructure, housing, transportation, and public services to ensure that our cities remain inclusive, competitive, and climate-resilient. Our focus is to bridge the urban-rural divide by ensuring equitable resource allocation and extending modern infrastructure.

The Master Plans represent a vision for progress, prosperity, and sustainability. With strong political will, coordinated action, and community participation, we are determined to transform our cities into hubs of opportunity, innovation, and well-being for all.

The Urban Policy and Planning Unit of the Planning and Development department played a pivotal role in preparing these master plans. These master plans truly reflect the collaborative efforts of a wide range of stakeholders including provincial line departments, district administration, NGOs, local political leadership, and the public at large. I extend my sincere gratitude to UPU and all those who have contributed their expertise and efforts toward creating plans that will not only tackle present challenges but also lay the foundation for a sustainable urban future.

Mr. Arshad Ayub Khan
Minister LGE & RD Department
Government of Khyber Pakhtunkhwa

MESSAGE FROM ADDITIONAL CHIEF SECRETARY, PLANNING & DEVELOPMENT DEPARTMENT, GOVERNMENT OF KHYBER PAKHTUNKHWA

The rapid urbanization across Khyber Pakhtunkhwa has created both opportunities and challenges. On the one hand, urbanization is transforming the socio-economic landscape of the province while on the other, it has caused economic issues such as unplanned expansion, inadequate infrastructure, traffic congestion and increased pressure on public resources. To enhance the economic vitality of urbanization and reduce its negative impacts, there is an urgent need of structured and sustainable urban planning to fully realize the potential of our urban centers.

The formulation of master plans for the towns and cities is a crucial step toward achieving this goal. These plans will provide comprehensive frameworks to guide towards the planning of towns and cities, optimize land use, improving economic productivity and ensuring the equitable distribution of resources. Sustainability remains a key priority in the plans emphasizing environmental protection while aligning resources to meet the growing needs of the urban population. The master plans will serve as structured guidelines for local authorities, district administrations and municipalities to systematically undertake and implement future development initiatives. These plans support the achievements of core urban needs such as housing for all, transportation and public facilities ensuring that cities evolve into resilient, livable and economically viable centers that can meet the aspirations of residents.

The Urban Policy and Planning Unit (UPU) of the Planning and Development department played a pivotal role in preparing these master plans. The plans truly reflect the collaborative efforts of a wide range of stakeholders including line departments, district administration, NGOs, local political leadership and the community. I extend my sincere gratitude to UPU and all those who have contributed their expertise towards developing master plans that will not only tackle present challenges but would also lay the foundation for a sustainable urban growth.

As we move forward with implementation, I am pleased to announce that the projects identified in these master plans shall be included in the upcoming Annual Development Programmes (ADPs) to ensure their timely execution and alignment with provincial priorities. I am confident that these master plans will serve as benchmarks for urban development. They are testament to the government's commitment to foster well-planned and thriving urban centers that support the prosperity and well-being of citizens for all the times.

Mr. Ikram Ullah Khan
Additional Chief Secretary
Planning and Development Department
Government of Khyber Pakhtunkhwa

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Planning and Development Department
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MESSAGE FROM THE SECRETARY LOCAL GOVERNMENT, KHYBER PAKHTUNKHWA

The Khar Master Plan of 2024-2042 represents a significant milestone in our efforts to foster sustainable urban development and shape the future of the city. As Khar continues to grow, there is an increasing need for structured, sustainable and visionary planning to accommodate rising population, promote economic growth and ensure equitable access of all citizens to essential services and resources.

At the Local Government Election & Rural Development (LGE&RD) Department, we are committed to undertake initiatives that contribute to the overall prosperity of Khyber Pakhtunkhwa. The aim is to ensure that each part of the province shall benefit from development strategies. This master plan is a reflection of that vision — offering a comprehensive framework that addresses immediate urban challenges while laying the foundation for a long-term resilient growth.

The Khar Master Plan of 2024-2042 has been designed to maintain an equilibrium between urban expansion and the preservation of valuable cultural heritage and environmental resources including prime agricultural land in the peri urban limits. The plan will create investment and employment opportunities and will generate revenue for further development and enhance the overall quality of life for the people of Khar. Moreover, it underscores the importance of collaboration among public institutions, stakeholders and residents in shaping an inclusive, sustainable and prosperous urban centers.

I would like to commend the Urban Policy & Planning Unit (UPPU) of the Planning and Development Department and all stakeholders for their dedication and hard work in developing this master plan. The successful implementation of the plan will not only transform Khar but would also serve as a model for other cities throughout the province.

We resolve our commitment to fostering inclusive growth, ensuring that development opportunities are accessible to all and contributing to a brighter and more prosperous future for the people of Khyber Pakhtunkhwa.

Dr. Amber Ali Khan
Secretary LGE & RD Department
Government of Khyber Pakhtunkhwa

URBAN POLICY UNIT
Planning and Development Department
GOVERNMENT OF KHYBERPAKHTUNKHWA

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ACKNOWLEDGMENTS

First of all, I am extremely grateful to almighty Allah who enable me and my team to successfully complete this gigantic work of the preparation of Master Plan of Khar City. The preparation of the Khar City Master Plan 2024-2042 has been a collaborative and dedicated effort aimed at ensuring the sustainable development of Khar. This report reflects the collective commitment of all stakeholders toward a rational, balanced, and systematic use of resources to address the city's unique challenges and guide its future growth and development. This Master Plan forms an integral part of the Government of Khyber Pakhtunkhwa broader initiative to promote sustainable urban development across the province. It addresses critical aspects of urban management, including housing, transportation, socio-economic development, and environmental sustainability, providing a comprehensive framework for sustainable growth of Khar City.

I extend my sincere gratitude to the worth Additional Chief Secretary P & DD, Secretary, P & DD, Government of KP for entrusting me and my team with this significant initiative. Special thanks to my existing and former Executive Directors, UPU including Mr. Zubair Asghar Qurashi, Mr. Adeel Shah (current Secretary, P and DD), Mr. Inayatullah Waseem, Mr. Shah Mehmud, Mr. Abdul Basit, Mr. Ifthikhar, and Mr. Fazal Khaliq (current ED, UPU) for their insightful leadership and support throughout the planning process. I am also thankful to all my colleagues in UPU and MPP especially Dr. Muhammad whose expertise and efforts during the conceptualization, data collection, analysis, and review phases were instrumental in shaping this detailed master plan. I am deeply thankful to the officials of the District Administration, including Commissioner Khar Division, Deputy Commissioner Khar, and other key officials for their cooperation, guidance, and active involvement during the course plan making. Their local insights, support, and valuable feedback have greatly enriched the plan, ensuring its relevance to the unique context of Khar.

Special recognition is due to MMP Pvt Ltd for their dedicated efforts in preparing this report. The team's technical expertise, unwavering commitment, and hard work were instrumental in successful completion of this master plan. I am also thankful to Dr. Shabi-ul-Hasan, (MMP Pvt. Ltd) and his team for reviewing various drafts of the Master Plan. Their valuable inputs have greatly enhanced quality of the plan. Finally, I express my appreciation to everyone who contributed to this plan in various capacities. This Plan represents a shared vision for a sustainable, prosperous, and resilient future Khar city.

As this master plan is the first of its kind and will not be free from errors, however, I am fully optimistic about the successful implementation of this plan. In due course of time the plan be reviewed and necessary changes will be made in future revisions. Together, let us work toward building a thriving and sustainable Khar for generations to come.

Adnan Salim,
Project Director, Master Plan Project
Urban Policy Unit, P & DD

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Executive summary

Located in the north-west, Khyber Pakhtunkhwa (KP) is the third-largest province of Pakistan by population. It has an average annual growth rate of 2.89% that is relatively higher than the national average of 2.40% estimated by the Pakistan Bureau of Statistics in 2017 whilst the urban population stood at 5.7 million. The urban growth of KP has grown rapidly mainly due to socio-political situation of the province brought by the Afghan influx and the law-and-order situation in the districts that abut Afghanistan. Subsequently, the urban centres in KP, including Khar, are growing rapidly in haphazard and unplanned manner, mainly promoting ribbon development owing to lack of comprehensive planning initiatives by the Provincial and Local Governments.

Considering the challenging scenario, the Government of Khyber Pakhtunkhwa directed the provincial and local governments to prepare Master Plans of cities and towns that would inform and direct the urban growth, encourage high-density development while protecting the prime agricultural and environmentally significant land. The Urban Policy & Planning Unit (UPPU) of the Planning and Development Department, Government of KP, has commissioned the preparation of Master Plans of Provincial, Divisional and District Headquarters of KP province. This initiative includes the preparation of Khar Urban Centre Master Plan 2042, which would inform and direct the future growth of Khar city in a sustainable way to enhance its productivity and functioning whilst improving the quality of life of its residents. MMP Pvt Ltd has been hired as the Consultant by UPPU to carry out the extensive exercise of the preparation of the Khar Urban Centre Master Plan 2042. The basic objective of the Master Plan is to suggest sustainable, compact, and environment-friendly proposals for the future development of Khar city.

Khar, being the administrative headquarters of Bajaur District in the erstwhile FATA region, is a growing urban centre. However, due to lack of integrated planning practices, the city is witnessing unregulated urban expansion. This unregulated expansion has resulted in the spread of informal settlements, inadequate infrastructure, and strain on municipal services—highlighting the urgent need for comprehensive spatial planning. To ensure balanced development and efficient service delivery, this Master Plan provides a structured framework based on ground realities, technical assessments, and policy direction.

According to the 2022 estimates, the population of Khar was 122,920 which is projected to increase to 259,562 by 2040—an increase of 136,642 people over 18 years. This corresponds to an average annual growth rate of 4.04%, mainly driven by migration trends and natural increase. Keeping this rapid growth in view, the Master Plan proposes land use and spatial development interventions for accommodating the increasing population and economic activities.

The proposed residential zones in the Khar Master Plan provide a comprehensive and strategic solution to meet the city's housing demands through 2042. Through the development of new planned neighborhoods and infill development within existing areas, the plan accommodates the incremental population. The plan proposes the development of 13 self-contained neighborhoods designed on the concept of Clarence Perry's neighborhood unit. These neighborhoods will accommodate 167,099 people, while 92,463 people will be housed in multistory apartments in the central corridor. Efforts have been made to align the housing proposals with land suitability and accessibility, ensuring that future growth is supported through adequate infrastructure and services.

The plan emphasizes land efficiency through a blend of compact development and organized growth, particularly through a Linear Dynapolis development model. This model envisions a high-order "Blue Area" corridor extending along the main road from Khar to Inayat Kali, which will serve as the economic and institutional backbone of the city. The corridor is proposed over an area of 1,066.82 acres and will integrate high-density mixed-use zones including wholesale and retail markets, administrative buildings, educational institutions, healthcare facilities, and multistory residential developments.

To accommodate future needs for social services, the plan proposes 119.5 acres for educational facilities including primary, secondary, and higher secondary schools as well as a degree college. For healthcare, the plan proposes the expansion of the existing 403-bed DHQ Hospital by adding 116 beds, and the establishment of basic health units and dispensaries at neighborhood level, in line with the National Reference Manual (NRM) and WHO standards.

The Master Plan also includes provision for economic development and essential urban services. An area of 118.8 acres is allocated for an industrial estate on the southeastern side of the city. Adjacent to it, the plan reserves 53.7 acres for a solid waste landfill, 1.5 acres for a slaughterhouse, and 29.7 acres for a sewage treatment plant—all located strategically to reduce environmental and social impacts.

The environment of Khar has seen noticeable degradation due to unregulated development. The plan proposes measures for environmental protection including green corridors, afforestation, preservation of open spaces, and proper solid waste management. Land use zoning includes the conservation of agricultural land and the protection of sensitive ecological areas.

Mobility and transportation are critical elements of the Master Plan. The plan proposes improvement and expansion of the existing road network, including new link roads, widening of existing roads, and provision of footpaths and service lanes. Strategic junction improvements and the development of bypasses and interchanges are proposed to improve connectivity and traffic flow within the urban area. A special focus is placed on promoting non-motorized transport and pedestrian accessibility in residential areas.

The city of Khar is also vulnerable to natural hazards such as flash floods and extreme weather events. The plan includes disaster risk reduction strategies such as development control regulations, improved drainage systems, and reservation of safe zones.

The Final Master Plan for Khar provides the foundation for detailed action planning and phased implementation. The city is divided into 18 development sectors, each to be elaborated further through sectoral action plans detailing project proposals, institutional responsibilities, phasing strategies, and budgetary requirements. The implementation of this plan will not only accommodate the future population but also transform Khar into a well-organized and efficiently functioning urban centre in line with provincial and national development policies.

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List of Abbreviations

CBD	Central Business District
DC	Deputy Commissioner
EPA	Environmental Protection Agency
EIA	Environmental Impact Assessment
FGD	Focus Group Discussion
GIS	Geographic Information System
HIS	Household Information Survey
KP	Khyber Pakhtunkhwa
LUBCA	Land Use & Building Control Authority
LSA	Land Suitability Analysis
MCA	Multiple Criteria Analysis
MMP	Mott Macdonald Pakistan
NH	Neighborhood
NC	Neighborhood Council
NEQS	National Environmental Quality Standard
NGO	Non-Government Organization
NDMA	National Disaster Management Authority
NRM	National Reference Manual
OHR	Over Head Reservoirs
PBS	Pakistan Bureau of Statistics
PDMA	Provincial Disaster Management Authority
PSS	Planning Support System
ROW	Right of Way
SDGs	Sustainable Development Goals
SEA	Strategic Environmental Assessment
SWM	Solid Waste Management
TMA	Tehsil Municipal Administration
TMO	Tehsil Municipal Officer
UPPU	Urban Planning & Policy Unit
VC	Village Council
WATSAN	Water and Sanitation
WHO	World Health Organization

1. INTRODUCTION

1.1 Project Background

Khyber Pakhtunkhwa (KP) is a province in the northwest region of Pakistan. Despite covering the smallest land area of 74,521 km², it is the third most populous province, with a population of 30.5 million. In 1998, its population was 17.7 million, showing an annual growth rate of 2.89%, which exceeds the national average of 2.40%. Factors such as a high fertility rate and both temporary and permanent internal migration have contributed to this population growth.

To tackle the challenges posed by increasing urbanization and population growth, the Urban Policy & Planning Unit of the Planning and Development Department, Government of KP, has launched the development of Master Plans for 20 cities/urban centers across

On June 01, 2021, the Urban Policy Unity (UPPU), entered into a Contract Agreement between MM Pakistan (Pvt) Ltd for the Preparation of Master Plan for Urban Centers Merged District, Khyber Pakhtunkhwa- Package – 01 Khar, Bajaur & Ghalanai Mohmand. On the 15 June 2021, MM Pakistan (Pvt) Ltd, singed off the contract to begin the services for the project. This report is issued in accordance with the Contract and SC No. 6.2 and 6.3 respectively and Sr. No. 5. Task-E i.e., Final Master Plan Report.

The Government of the Khyber Pakhtunkhwa intends to develop urban areas of the Merged Districts as sustainable, livable, and well managed engines of economic growth. A comprehensive, strategic, regional, and long-term plan is required for all cities and districts of Khyber Pakhtunkhwa.

This master plan was completed under the following TORs:

1.1.1 Land-use/Land Suitability Analysis

a. Mapping of the historical growth trends of the city:

To understand the pattern and direction of the spatial growth of Kahr city the consultants conducted extensive research on the historical urban growth trends and drivers of urban growth over the period of last twenty years. To identify trends and direction of spatial growth the consultant used various sources for mapping the trends over the last 20 years period including municipal records, population census, libraries and archives, Arial photographs satellite images and other published and unpublished data and records. Latest GIS techniques were used for plotting historical growth trends on GIS maps of the city-region and articulating the drivers of urbanization and urban spatial growth.

b. Housing trends and needs assessment through projected population growth estimates:

The provision of housing for all is a basic objective of the Khar Urban Center Master Plan, therefore, the growth pattern and projected growth needs over the next 20 years (2044) were properly analysed and mapped. The conservation of prime agriculture land located around the city is another important aspect of the Khar Master Plan. Therefore, to reduce urban sprawl and horizontal development, there is a need to promote mixed-use and compact development. To achieve this objective the Master Plan devised policy guidelines for the establishment of high-density mixed-use development within the existing urban boundaries including the future growth areas. The consultants carried out an extensive mapping exercise to showing the existing and proposed high-density mixed-use development.

c. Density Maps:

To reduce urban sprawl, there is a need to promote high-density mixed-use development. Therefore, the consultants will devise policy guidelines for the establishment of high-density mixed-use development within the existing urban boundaries including the future growth areas. The consultants prepared maps showing the existing and proposed mixed-use development.

d. Land use Base map:

For all kind of spatial planning including master plans the preparation of a comprehensive base map is a pre-requisite. Beside other mapping techniques the consultants also used open-source satellite imageries (fresh and archives) to develop an up-to-date map of Khar city including its surrounding areas in order to support suitability analysis of existing and proposed land uses for urban development and other ancillary uses. After preparation of land cover map then extensive field surveys were carried out to identify the specific use of each parcel of land. The consultants prepared Base map with the following details:

a) Counter lines drawn at counter interval of 5 meters.
b) Boundaries (District, Tehsil, City, Neighborhood, UC, Ward).
c) All major and minor streets, roads, railway lines and airports (including encroachments).
d) Water supply, sanitation, sewer, SNGPL and telephone networks.
e) Water bodies (spring, streams, river and other water bodies).
f) Residential (planned and un-planned areas, sprawl, building heights – single, double or multi story, density).
g) Commercial and Mixed Areas (heights – single, double or multi story and type retail, wholesale and warehouses).
h) Industrial (all types).
i) Amenities (education, health, religious, banks, police stations, libraries, and community halls etc.).
j) Parks and playgrounds.
k) Brown fields (for re-development).
l) Open spaces (agriculture all types, vacant, and graveyards etc.).
m) Land Management.

1.1.2 Taxation and Revenue Generation

It is of key importance that urban planning and associated work should be sustainable over long time. To ensure that the entities (Land Use and Building Control Authority, Development Authorities and TMAs etc) responsible for implementation of the Khar Master Plan the consultant conducted a detailed study of the current urban taxation structure and sources including property tax, land tax, capital value tax, stamp duty and proposed suggestions for improvement. Implementation of the PCMP proposals regarding municipal taxation will increase revenue of LU&BCA and TMAs many folds and will ensure sustainability of these organizations.

a) Land and property valuation for collection of property and other taxes.

b) Identify potential revenue sources and design a municipal taxation structure which is to be utilized at municipal level; through a consultative process.

1.1.3 Governance and Institutions

Good governance and efficient institutions are a key to the successful implementation of polies and plans. To ensure that for implantation of the Khar Master Plan required legal and institutional framework are in placed the consultants objectively analyzed and assessed the existing relevant laws/byelaws and institutional capacity of relevant organization responsible for implementation and monitoring of the Master Plan. The consultant also proposed improvements in the existing laws & byelaws and institutional structure(s) for better implementation of the Master Plan.

1.1.4 Land-use Regulations and Plans

The consultants also studied and analysed all existing urban planning, development and environment-related national, provincial laws and regulations (byelaws) and proposed a new set of zoning regulations for each land use zone. The consultants provide extensive input in formulation of Building Regulation 2024 and Housing Schemes Regulations 2024.

1.1.5 Environment

To reduce pollution and create healthy living environment for the residents of Khar city the consultant studied various sources of air, noise, soil and water pollution. The consultants use state of the art techniques and equipment for identification of the level of air, water and noise pollution at various points of the city. The consultant carried out the following surveys:

a) Air quality survey at various points of the city Water quality analysis (drinking water supply and water courses).

b) Soil contamination surveys.

c) Soil and geological survey/data.

d) Analysis of Noise level at various points of the city.

e) Identification of environmentally sensitive areas.

1.1.6 Demography, Livelihood and Housing

The successful implementation of the master plan proposals mainly lies on accurate assessment of the city's demographic pattern, livelihood sources and housing conditions. For the purpose of analysis the consultants divided the city into various zones, calculated its population densities, identified major economic activities and studies housing and related facilities in each zone. Based on these assessments the consultant formulated proposals to revitalize the existing economic base and socioeconomic structure of the city. The consultant conducted the following surveys:

a) a) Housing surveys including house age, height, occupancy and condition surveys.
b) b) Accessibility surveys for emergencies and other vehicles
c) c) Household economic conditions/Livelihood surveys,

The consultants also identified areas with lack of municipal services (slums) and formulated proposals for its rehabilitation/up-gradation.

1.1.7 Urban Transportation, Mobility & Accessibility

One of the major issues of Khar city is traffic congestion and lack of reliable public transport. To resolve the urban transport, mobility and accessibility issues of the city the consultants thoroughly studied the existing traffic and transportation system of the city. To have better understanding of the existing situation the consultant conducted various transportation surveys explored the possible constraints and available opportunities and proposed viable solutions for easing traffic and transportation issues within the city the consultant conducted the fallowing surveys:

a. Development of a detailed roads and parking inventory
b. Origin, Destination, and Cordon Survey
c. Traffic counts at various roads and junctions to determine roads and junction capacities
d. Public Transport User Interview Survey
e. Household Interview Survey (HIS)
f. Traffic Signage Survey (signage relevant to public transport)
g. Parking Survey as parking lots identifications/developments is an important component of this study
h. Mobility survey and to identify synergy between land-use and transport, etc.
i. Traffic flow volume, trend, axle weightage etc. (data from weighing stations and established traffic count permanent stations or any other means, including survey on the main arteries and by-pass roads)

1.1.8 Historical/Social/Culture Heritage Development

The Bajaur region is renowned for its rich history and cultural heritage, making one of the important heritage and cultural center. Therefore, the thoroughly studied and mapped all existing historical monuments/places, socio-cultural heritage of the city and proposed appropriate guidelines for the development of these localities and to capitalize the cityscape to create social, cultural hubs and identify opportunities within and of the city.

1.1.9 Urban Design and Public Realm

Urban Design and Public Realm is an integral part of the Master Plan. Through various surveys and techniques, the consultant analyzed the existing building lines, identified all public spaces, studied in detail vistas, sidewalks, street lighting, monuments, and parks etc. and formulated actionable proposals for improvements. and identified potential areas for new parks, playgrounds and public open spaces. To make the city more attractive and beautify the consultants proposed various urban beatification projects.

1.1.10 Quality of Life

Urban Design and Public Realm is an integral part of the final Master Plan. Through various surveys and techniques, the consultant analysed the existing building lines, identified all public spaces, studied in detail vistas, sidewalks, street lighting, monuments, and parks etc. and formulated actionable proposals for improvements. and identified potential areas for new parks, playgrounds and public open spaces. To make the city more attractive and beautify the consultants proposed various

urban beatification projects.

a) Public spaces (parks, food outlets, libraries, public hall, sports courts/grounds) mapping and state of dilapidation.

b) Heritage sites mapping and their state of preservation as well as trends of encroachment and dilapidation

c) Civic facilities such as Public Toilets, Street Furniture, Streets Lights, Parking Lots and other amenities exist in the city neighborhoods.

1.1.11 Water Supply, Sanitation and Solid Waste Management

The consultants coordinated with the concerned TMA and PHED Department for Water Supply and Sanitation for profiling of all Municipal Services including the identification of new and existing sources of water supply (depletion rates of water and sub-soil aquifer data) & their mapping, sanitation and solid waste management along with existing conditions of (sources of water and their depletion rates as sub-soil aquifer data and surface run off calculation), sewage flows and their mean calculation, solid waste tonnage calculation, methods of collection and disposal (landfills capacity, using and locations) etc. Consultants are required to identify depressed areas in term of services and facilities. Policy directions and action plan is required to generate funds for construction, maintenance and operation of public amenities at feasible locations. The consultants analyzed the existing solid waste management practices and jointly identified land areas for development Sanitary Land Fill Sites and Sewerage Treatment Plants (STP).

1.1.12 Citizens Behavior

BCC is the strategic use of communication approaches to promote changes in knowledge, attitudes, norms, beliefs and behaviours. The provision of physical infrastructure without associated BCC strategies may not be able to achieve the desirable goal of sustainable development. For development of the BCC strategies to ensure that the master plan will be sustainable for a long run the consultants conducted Perception and Behavioural Surveys of local population focusing on issues of urban responsibility using Knowledge, Attitude, and Practice (KAP) methodology based on a valid statistical sample. The purpose of the KAP surveys was to investigate the reasons for and incentives and disincentives of citizens to behave responsibly while utilizing municipal services especially their behavior towards solid waste management, public transport usage, use of public spaces and other social services.

1.1.13 National and International Best Practices

The preparation and implantation of master plans in Pakistan, especially in Khyber Pakhtunkhwa is not common. In the past various types of spatial plans including structure plan and master plans were prepared for major cities but these plans were never implemented. Therefore, to prepare a rational comprehensive master plan for Khar review of the international best practices was included the study Terms of Reference (ToRs). The consultants reviewed planning laws and master plans of various countries having similar socio-economic condition similar to Pakistan including India, Sari Lanka and Malysia and based on the lesson learned developed the PCMP proposals. Studies for the fringe areas were specifically conducted to discouraged sprawl and ensure conversation of prime agriculture land in the vicinity of Khar city.

1.1.14 Task C – Master Plan Strategic Scenario Development/Mapping

a) Showing suitable land parcels based on multi criteria analysis for various activities through viable projections for housing of all income groups, space required for commercial and industrial activities and other necessary component of the city) Land use pattern both existing and future options;

b) Land use mix potential range of uses (residential, work, leisure, services etc.);

c) Infilling, intensification and redevelopment;

d) Natural systems and environmental resources of the district/city;

e) A detail inventory of existing features including topographical and natural constraints,

f) wetlands, agricultural lands, aggregate resources, groundwater recharge areas, floodplains, fisheries, wildlife etc.;

g) Major transportation, Agricultural, tree plantation, and environmental conservation areas; and

h) Allied infrastructure requirements to support Master Plan proposals.

1.1.15 Task D – Preparation of Master Plan Proposals (Action Plans)

For successful implementation of the Master Plan, the consultant will develop a detailed and comprehensive Master Plan proposal (action plans) for various components of the master plan, including but not limited to:

i. Action Plan for zoning, intensification/densification and land management.

ii. Action Plan for future housing of all income groups.

iii. Action Plan for slum up gradation/informal settlements.

iv. Action plan for health facilities.

v. Action plan for educational facilities.

vi. Action Plan for Quality of Life.

vii. Action Plan for WATSAN and Solid Waste Management (SWM).

viii. Action Plan for Transportation and Traffic Management as well as Parking Lots.

ix. Action Plan for Municipal Services.

x. Action Plan for Environmental Management, ii. Disaster Risk Reduction and iii. Emergency Planning.

xi. Action Plan for Rural Urban Fringe and Regional Development.

xii. Action Plan for Tourism Development, Cultural and Heritage Conservation /preservation.

xiii. Action Plan for Economic Development,

- ii. Commercialization,
- iii. Industrialization and
- investment attraction.

xiv. Action Plan for Security Measures of the city

xv. Action Plan for Legal/Regulatory and Institutional Framework implementing MASTER PLAN.

xvi. Action Plan for Behavioral Change Communication (BCC)Structure composition of the Report.

The Master Plan report is structured into three volumes along with a separate detailed report:

- **Volume I:** Master Plan – Offers a comprehensive overview of the core strategies, proposals, and planning framework for Khar urban center.
- **Volume II:** Scenario/Sectoral Maps – Presents a collection of maps illustrating zoning, infrastructure networks, environmental factors, and other key spatial elements essential for urban planning.
- **Volume III:** Action Plans – Details implementation strategies, key initiatives, and step-by-step execution plans for proposed developments.

In addition, a separate Detailed Master Plan Report provides in-depth background studies, analyses, methodologies, and insights from Task C, along with relevant information from Task B.
The Khar City Master Plan was developed through the following Five (06) phases:

- Preparatory Planning Phase
- Vision Formulation
- Data Collection & Analysis
- Master Planning/zoning
- Action Plans
- Integration of Action Plan in the Final Master Plan

Therefore, an independent Master Plan prepared for each headquarter city. The plan will cover 20-year period to cater for the development need of the city.

1.2 Master Planning Process

Urban centers are increasingly recognized as drivers of economic growth and innovation, playing a pivotal role in addressing the global challenges of rapid urbanization. Investing in urban infrastructure and services has proven essential for accelerating economic development, not only within cities but also across their broader regions. Governments and public agencies, particularly in developing nations, acknowledge that achieving sustainability necessitates timely and strategic urban planning, coupled with fostering resilient urban economies.

In this context, a Master Plan is being developed for Khar Urban Center in District Bajaur. This process began with the formulation of a vision, crafted through extensive stakeholder consultations, which was subsequently translated into clear goals and objectives. Comprehensive field surveys and secondary data collection were conducted to evaluate the current conditions of Khar Urban Center. The data were benchmarked against established standards to identify gaps and deficiencies in critical areas such as housing, public facilities, and utility services. Based on these findings, policies and strategies were developed to address these challenges and guide the holistic development of the urban center.

The overall Master Planning Process is illustrated in the figure below:

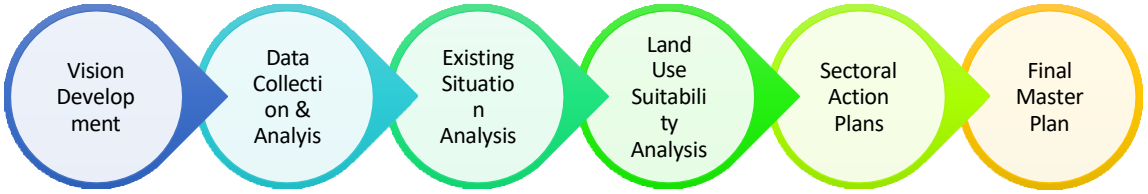


Figure 1-1: Master Planning Process

1.2.1 Vision & Goals of Khar Urban Centre

For the Master planning of Khar Urban Centre, the first step was to develop a vision and converted it into Goals. This stage of the Master Planning process is covered in Task A – Vision Formulation and Community Consultation Report.

The purpose of this document was to establish a vision for the Master Plan Project that would capture the Khar Urban Centre's key values and aspirations for its future.

The Vision Statement painted a picture of what Khar Urban Centre would be twenty years from now through the implementation of the Master Plan. Guiding Principles for future development flowed from the Vision Statement. These principles established policy benchmarks for the rest of the Master Plan process. The principles, along with the issues identified in the stakeholder meeting, were used to help define how future growth should take place, as well as directed the development of alternative proposals for future land use scenarios. The alternatives were defined at a citywide scale and for targeted "areas of opportunity".

The overall vision developed through FGDs and Stakeholders meeting was as follows:

> ***"A safe, clean, and sustainable city with a sense of community that respects the quality of its environment and enjoys the best public services, encouraging the tourism sector and realizing the economic growth through business opportunities to become the economy of choice while preserving its historical and cultural values."***

This vision was converted into the following goals which are to be achieved through Master Planning of Khar:

- **Goal 1:** Urban Governance Body for Legal components/ Institutional Capacity Building, Legislation & Bylaws for Sustainable Development and Building Control
- **Goal 2:** Planned Housing, Urban Growth & Controlling Urban Sprawl
- **Goal 3:** Transportation & Traffic Management / Road Networking/ Parking Areas Provision
- **Goal 4:** Provision of Urban Amenities and Facilities including Safe Water Supply, Power Supply, Sewerage, Storm Water Drainage, and SWM in Khar Urban Centre
- **Goal 5:** Comprehensive Education Services Provision
- **Goal 6:** Comprehensive Health Services Provision
- **Goal 7:** Identification of Flood prone areas and Flood Protection Measures
- **Goal 8:** Income generation activities / Revenue Generation Project / Industrial Zone Establishment
- **Goal 9:** Tourism development / Provision of Recreational Services / Open Space and Sports Facilities Provision / Urban Forestry Conservation
- **Goal 10:** Efficient Environmental Control Planning
- **Goal 11:** Security and Disaster Management

The detailed specific objectives are contained in the Task-A, Vision Development report.

1.2.2 Mapping, Surveys & Data Collection

This is the second stage of the Khar Urban Centre Master Planning process. The area was mapped using the latest satellite imagery, and a detailed land use survey was conducted to create the existing land use map (shown in Map 2.3) of the Khar Urban Centre. Field surveys, such as the Household Information Survey, Traffic and Transportation Surveys, Commercial Surveys, Public Facility Survey,

and Infrastructure Survey, were conducted, and secondary data was collected from various offices to determine the area's existing situation.

Land Use Survey: A GIS-based base map (1:2000 scale) was created by digitizing a raster map from Google's satellite imagery and dividing it into grids. Android-based software was used for the detailed land use survey, conducted by trained local surveyors. The survey documented land uses, administrative boundaries, contour lines (10-meter intervals), road networks, infrastructure, civic amenities, and brownfields. To ensure accuracy, the base map integrated historical maps and remote sensing imagery and was divided into sheets for ground truthing through on-site verification. Each built-up parcel was assessed for land use, building conditions, and stories, with spatial and attribute data processed in GIS labs for analysis.

Transportation Survey: Various transportation surveys, including the Origin & Destination (O&D) Survey, Traffic Count Survey, Parking Inventory Survey, and Intersection Survey, were conducted across the city. The detailed methodology, maps, and questionnaires for each survey are provided in the Background Study and Analysis Report.

Environmental Survey: Various environmental surveys, including drinking water quality, noise, air, and soil assessments, were conducted at multiple locations across the city with an EPA-approved laboratory. The detailed methodology, maps, and results of each survey are provided in the Background Study and Analysis Report.

Secondary Data Collection: Secondary data was gathered from both published and unpublished government departmental data and reports, Census data, government publications, public records, historical and statistical documents, business reports, journals, and research papers, among others.

1.2.3 Existing Situation Analysis & Problem Identification

The third stage of the Khar Urban Centre Master Planning process was to analyze the current situation and identify problems. Existing data was analyzed using Excel, SPSS and GIS tools to analyze and map the current state of Khar Urban Centre. The Household Information Survey (HIS) data collected during field surveys were analyzed using SPSS, while secondary data on existing facilities like health and education were tabulated. Primary and secondary data were compared with national standards such as NRM and NEQS, as well as international benchmarks, to conduct a gap analysis and identify deficiencies and shortcomings in areas like housing, public facilities, infrastructure, and transportation facilities. Task B, the Background Studies Report, covered these items.

1.2.4 Land Suitability Analysis and Scenario Development

Land Suitability Analysis is a GIS (Geographic Information System)-based method for determining an area's suitability for future proposed land use & zoning, using multi-criteria analysis. In addition, it also enables the relevant governing bodies and institutions to take pragmatic and realistic decisions based on planning proposals. In the fourth stage of the Khar Urban Centre Master Planning process, GIS have been used to conduct a Land Suitability Analysis (LSA). The LSA aimed to identify the most suitable areas for future housing, which would be developed as self-sufficient neighborhoods with facilities like primary schools, parks, open spaces, local retail shopping centers, community centers, mosques, libraries, post offices, police posts, graveyards, and other public facilities. Additionally, the LSA was used to identify the most suitable locations for new central business districts (CBDs) or blue areas (base on future potential areas for commercialization), which would include commercial markets and civic and

administrative uses. The LSA was also used to identify the most suitable sites for small industrial estates, sewerage treatment plant, landfill site.

1.2.5 Development of Final Master Plan

The Final Master Plan was formulated based on a land use planning approach that employed land suitability analysis and the development of alternative scenarios, in accordance with the established theories and practices of land use planning, such as the Multiple Nuclei Theory and Linear Dynapolis concept. Our team of experts meticulously scrutinized each scenario and opted for the most suitable one that took into account the local geographical conditions and the prevailing land use distribution. For Khar Urban Centre, the Linear Dynapolis scenario was chosen deemed the most appropriate, as it would likely help to minimize travel costs and traffic congestion in the area. The self-sufficient neighborhoods will be developed in such a way that promotes walkability and mitigates the carbon footprint of the region. The aforementioned steps in the Master Planning Process have been comprehensively covered in the current Task-C: Development of Final Master Plan.

1.2.6 Action Plans for All Sectors and Final Master Plan

The Action Plan Reports will offer detailed delineations of the eighteen distinct sectors outlined in the Master Plan. These reports will specify proposed development actions for the city, identify the responsible actors and agencies, establish the procedural framework for implementation, and provide cost estimates. Together, these Action Plans form Task D of the Master Planning Process for Khar Urban Centre. Task C (Scenario Planning) and Task D (Strategic Development Action Plans) collectively contribute to the Final Master Plan (Task E) now in hand.

2 GENERAL PROFILE OF PROJECT AREA

2.1 Introduction

Bajaur Agency, is a district in the Malakand Division of Khyber Pakhtunkhwa Province, Pakistan. Prior to 2018, Bajaur Agency was the northernmost component of the Federally Administered Tribal Areas (FATA), a semi-autonomous region along the Afghanistan–Pakistan border. In May 2018, FATA was merged into the larger Khyber Pakhtunkhwa Province (KPK) in an attempt to bring stability to the region, redesignating Bajaur Agency to Bajaur District.

2.2 District Demography

At the time of the 2017 Population Census, Bajaur was classified as an agency, later designated as a district in 2018, comprising 127 councils, including seven Neighborhood Councils (NCs), five of which are within Khar Tehsil, the project area. The defined boundary of Khar Urban Center encompasses 39 major and minor settlements. The figure below gives a demographic overview of the District Bajaur.

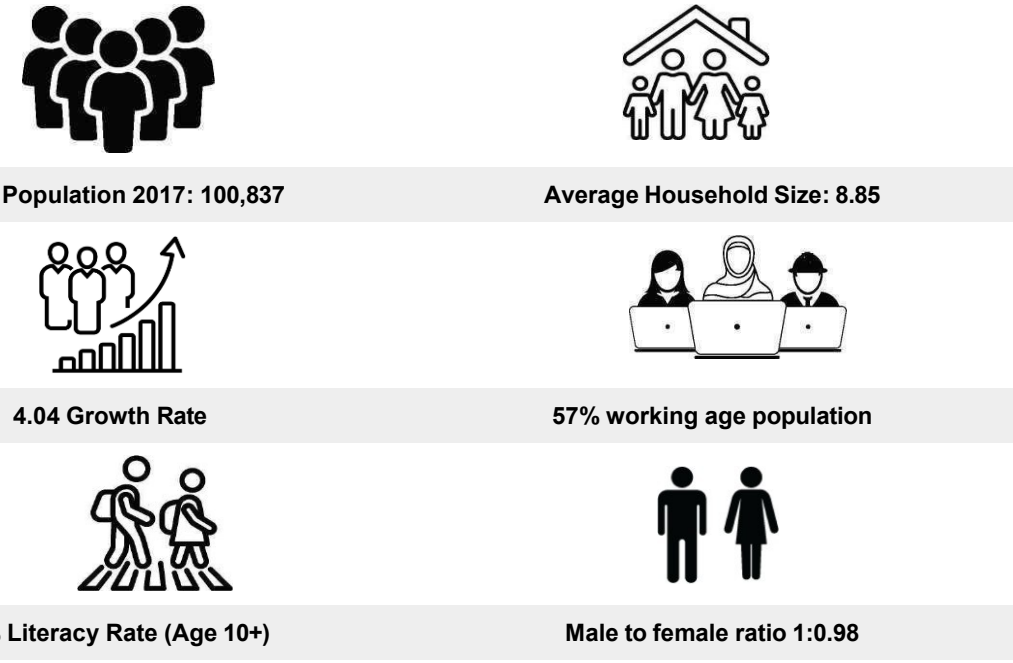


Figure 2-1: District Demographic Overview

2.3 Natural Systems and Environmental Resources of the District

Bajaur district is located in the northwestern region of Pakistan, bordering Afghanistan. The district is known for its rugged terrain, diverse flora and fauna, and unique cultural heritage. The Khar Urban Centre is the administrative headquarters of the Bajaur district. Here are some of the natural systems and environmental resources of the district:

Mountains and Hills: Bajaur district is home to the scenic Hindu Kush Mountain range, which includes the Spin Ghar and Safed Koh ranges. The district also has several hills, including the Shegal, Damadola, and Charmang Hills.

Rivers and Streams: The district is drained by several rivers and streams, including the Panjkora, which is the main river, as well as the Kaga, Salarzai, and Utrot streams. These waterways provide irrigation for agriculture and support biodiversity in the region.

Agricultural Land: Bajaur district has fertile agricultural land, which supports a variety of crops, including wheat and maize. The district also has a rich horticulture sector, producing fruits like apples, apricots, plums, and pomegranates.

Mineral Resources: The district has significant mineral resources, including chromite, marble, and limestone. These minerals are used for construction and industrial purposes.

Cultural Heritage: Bajaur district has a rich cultural heritage, with ancient archaeological sites like the Shahbaz Garhi and Haji Gak excavations, as well as historic forts like the Bajaur Fort, which provide insight into the region's past.

Overall, the natural systems and environmental resources of the Bajaur district are vital to the region's economy, biodiversity, and cultural identity. However, the district faces environmental challenges, such as deforestation, soil erosion, and water scarcity, which require sustainable management practices to mitigate their impact. The existing natural resources of the district along with the detailed quantitative analysis are given in the section below:

2.3.1 Forest & Wildlife

The district has rich forests, which are home to various wildlife species, such as the snow leopard, Himalayan black bear, musk deer, and several species of birds. The forests also provide valuable timber and non-timber forest products, such as medicinal plants and fruits.

According to the District Bajaur Forest Department, the district has 2000 hectares of moist temperate forest, 5001 hectares of sub-tropical Chir Pine, 3543 hectares of sub-tropical broad-leaved forest, 56663 hectares of grass/hill land, and 20235 hectares of plantation. However, there are no managed forests in the district. Most of the forests are located outside the Khar Urban Centre, and there is no forest area within the city itself. **Table 2-1** provides details about the forest types, areas, and percentages in the district.

Table 2-1: Forest Land Cover/Types in Bajaur District

Forest Type	Area (Ha)	Percentage
Moist Temperate Forest	2,000	2.3
Sub-tropical Chir Pine	5,001	5.7
Sub-tropical Broad-leaved	3,543	4.1
Grass/ Hills lands	56,663	64.8
Plantation	20,235	23.1
Total (Ha)	**87,442**	**100.0**

Source: Bajaur Forest Division, 2022.

2.3.2 Geology of the District

Bajaur District is primarily composed of diorite rocks, which are consistent with the metamorphic and igneous rocks found in the northern mountain chain. The valley beds of the district contain young alluvium soil deposits with varying organic content, moisture retention characteristics, and acidity levels.

According to field surveys and data collected from the Mines and Mineral Department of District Bajaur, there are no areas within the city that contain any type of minerals. However, there are marble factories in the city, and existing marble within the district is brought to the city for processing. As of the latest available data[1], the total marble reserves in the district are estimated to be around 500 million tons.

It is important to note that mining and quarrying activities in the district are governed by the Mines and Minerals Act of 2015, which regulates the exploration, extraction, and sale of minerals in the district to ensure sustainable use and environmental protection.

2.3.2.1 Minerals

According to the Pakistan Stone Development Company (PASDEC), District Bajaur is estimated to have approximately 500 million tons of marble reserves and 200 million tons of granite reserves. However, to obtain an accurate estimation of the exact quantities of marble and granite in the district, a thorough survey and assessment are necessary. It is important to note that the mining and extraction of these minerals can have both positive and negative impacts on the environment and local communities. Sustainable management practices and environmental protections are necessary to mitigate any adverse effects and ensure the responsible use of these resources. The known mineral profile of the Bajaur District is presented in the table below:

Table 2-2: Mines and Minerals in District Bajaur[2]

Minerals	Estimated Reservoirs
Marble	500 million tons
Granite	200 million tons
Chromite	0.5 million tons
Soapstone	15 million tons
Quartzite	2 million tons
Iron Ore	0.2 million tons
Copper Ore	0.1 million tons
Lead-Zinc	0.1 million tons
Limestone	10 million tons

It should be noted that these are estimated reserves, and further exploration and confirmation are necessary to determine the exact quantities and quality of these minerals in the district. Moreover, the sustainable management of these resources requires proper planning and implementation of environmental and social safeguards.

1 http://kpboit.gov.pk/bajaur-district/

2 http://kpboit.gov.pk/bajaur-district/

2.3.3 Agriculture Land Resources of District Bajaur

Bajaur District is primarily an agricultural region, with agriculture being the main source of income for the majority of its population. The district has fertile land suitable for various crops, including wheat, maize, vegetables, and fruits. The agriculture sector in the district is primarily rain-fed, with some areas being irrigated.

The land use statistics of District Bajaur indicate a heavy reliance on agriculture, particularly on irrigation for crop production. Additionally, there is a significant amount of land that has not been utilized for agricultural purposes, which may present opportunities for future development or conservation efforts. The detailed land utilization is shown in **Table 2-3** below.

Table 2-3: Land Statistics in District Bajaur[3]

Land Cover	Area (Ha)
Cultivated area	77700
Cropped area	70000
Irrigated area	17000
Culturable waste land	12000
Area under forest	25000

2.3.3.1 Crop Production in District Bajaur

The Khar Urban Centre has no crop production statistics available. However, the district-level statistics were obtained from the District Agriculture Office, Bajaur, and the Pakistan Bureau of Statistics. According to the Khyber Pakhtunkhwa Development Statistics, 2021 there are various crops grown in the district.

According to Pakistan Bureau of Statistics, Wheat is one of the mjor crop grown on large tract of land. In the 2017-18, wheat was grown on an area of 34,523 hectares, producing a total of 25,410 tonnes, with a yield per hectare of 736 kg. In the following year (2018-19), the area under wheat cultivation increased slightly to 34,535 hectares, and the total production increased to 26,410 tonnes, resulting in a slightly higher yield per hectare of 765 kg.

Similarly, the maize was grown on 5,870 hectares in the 2017-18 season, producing 7,503 tonnes, with a yield per hectare of 1,278 kg. The area under maize cultivation increased to 6,123 hectares in 2018-19, but the total production decreased slightly to 7,035 tonnes, resulting in a lower yield per hectare of 1,273 kg.

Rice was grown on 4,711 hectares in the 2017-18 season, producing 7,028 tonnes, with a yield per hectare of 1,492 kg. In the following year, the area under rice cultivation remained almost the same at 4,700 hectares, and the total production increased slightly to 7,035 tonnes, resulting in a yield per hectare of 1,497 kg.

The Rabi vegetables were grown on 1,190 hectares in the 2017-18 season, producing 11,011 tonnes, with a yield per hectare of 9,253 kg. In the following year, the area under cultivation decreased slightly

[3] https://bajaur.kp.gov.pk/page/agriculture_department

to 1,184 hectares, and the total production decreased to 10,765 tonnes, resulting in a lower yield per hectare of 9,092 kg.

The Kharif vegetables were grown on 379 hectares in the 2017-18 season, producing 2,087 tonnes, with a yield per hectare of 5,507 kg. The area under cultivation increased to 387 hectares in 2018-19, and the total production increased to 2,138 tonnes, resulting in a slightly higher yield per hectare of 5,525 kg. The detailed crop production per hectare is shown in the **Table 2-4** below.

Table 2-4: District Bajaur Wheat Production Statistics [4]

Crops	2017-18			2018-19			2019-20		
	Area (Hectare)	Production (Tones)	Yield per Hectare (Kg)	Area (Hectare)	Production (Tones)	Yield per Hectare (Kg)	Area (Hectare)	Production (Tones)	Yield per Hectare (Kg)
Wheat	34,523	25,410	736	34,535	26,410	765	34,540	27,190	787
Maize	5,870	7,503	1,278	6,123	7,035	1,273	6,125	7,798	1,273
Rice	4,711	7,028	1,492	4,700	7,035	1,497	4,773	7,144	1,497
Rabi Vegetables	1,190	11,011	9,253	1,184	10,765	9,092	1,194	10,616	8,891
Kharif Vegetables	379	2,087	5,507	387	2,138	5,525	406	2,279	5,613

2.3.4 Water Resource

According to the Survey of Pakistan Atlas, the District Bajaur area consists mostly of hills that consist predominantly of sedimentary rocks belonging to the tertiary and quaternary periods. The percentage of plain area in these catchments is small (Geological Survey of Pakistan, 1997). There are no major water bodies in the area. None of the district's major rivers are located within the project area. Several springs and streams run throughout the city, providing clean water for irrigation. The mainstream known as Rud runs from the southwest to the northeast and empties into Munda Khwar at the settlement of Kuala, which drains the main Khar-Nawagai valley (Bajaur).

2.4 Project Area

Khar Urban Centre serves as the administrative headquarter of Bajaur District, lies within the geographical coordinates of 34°30' and 34°58' north latitudes and 71' 11° and 71' 48° east longitudes. Khar is located within Tehsil Khar, District Bajaur, formally known as Bajaur agency before merging into Khyber Pakhtunkhwa (KP) province. The city is comprised of four distinct neighborhoods, namely Wali Ahad Korona, Mir Ali Qilla, Sadiq Abad-1, and Inayat Killi/Miagano Koro, covering a total area of 5820.97 acres three neighboring Village Councils, Ali Jan Kalai, Tank Khatta, and Sheikh Kali, occupy an area of 1158 acres and stretches from Jar to Zorbandar in the east-west direction and from Tangai to Inzari in the northwest-southeast direction as shown in **Map 2-2**.

Furthermore, the city's population and economy are projected to grow in the coming years. It is estimated that the boundary of Khar Urban Centre will expand from the current 23.57 sq. km to 28.25 sq. km by the year 2040, driven by population growth and economic development. Khar Urban Centre

[4] Source: https://kpbos.gov.pk/

serves as the administrative headquarter of Bajaur District, lies within the geographical coordinates of 34°30' and 34°58' north latitudes and 71' 11° and 71' 48° east longitudes stretch from Jar to Zorbandar in the east-west direction and from Tangai to Inzari in the northwest-southeast direction. The consultant has proposed an area from village council Sheikh Killi to neighborhood council Mirali Qilla with stakeholders and district administration for the preparation of the master plan for next 20 years indicated in **Map 2-2.**

The administrative areas are listed in the table below:

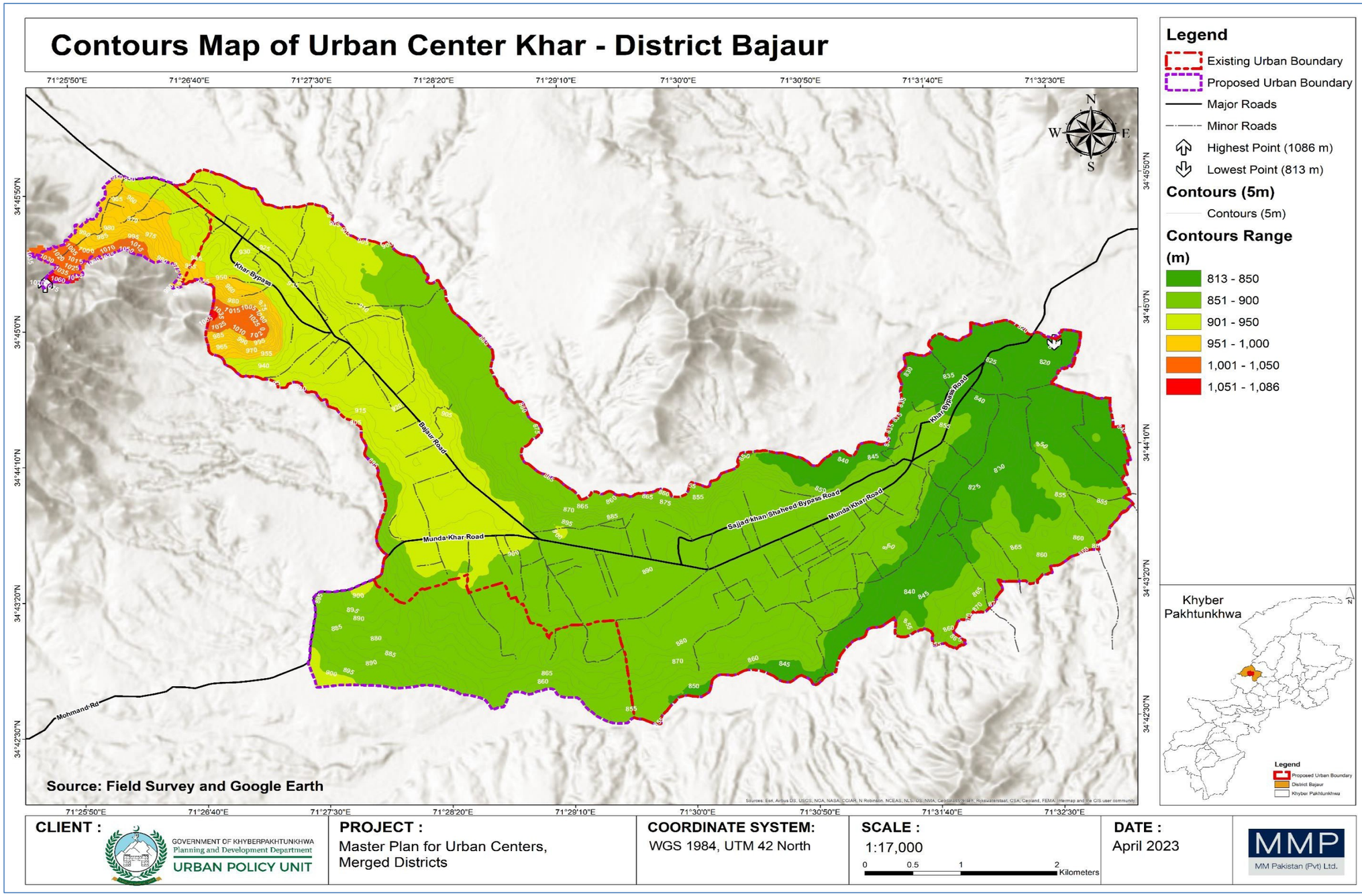
- Neighborhood Council Killi/Miagano Koro;
- Neighborhood Council Sadiq Abad-1;
- Neighborhood Council Wali Ahad Korona;
- Neighborhood Council Mir Ali Qilla;
- Village Council Sheikh Kali;
- Village Council Tank Khatta; and
- Village Council Ali Jan Kalai;

2.4.1 Topographical and natural constraints (Hilly Areas, Steep Slopes)

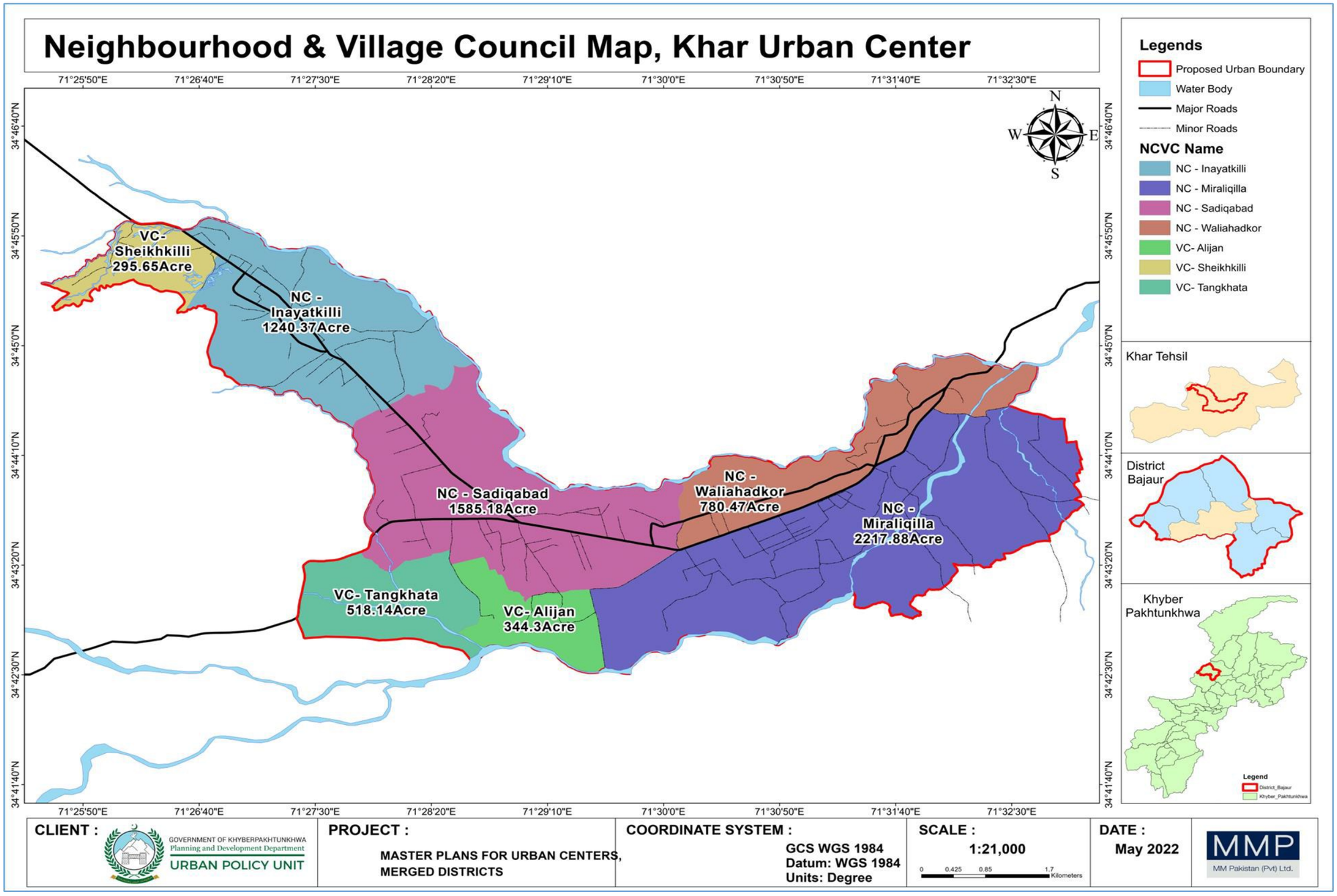
Khar Urban Centre is located in the Bajaur district of Pakistan, between 34° 30' and 34° 58' north latitudes and 71' 11° and 71' 48' east longitudes. The topography of the city is a mix of plain and undulating areas, with steep hills on the north and south boundaries. The district has a mountainous and hilly terrain, with mountain ranges reaching a height of 3,000 meters in the northern part of the district. The height of the terrain gradually declines towards the south, with peaks slightly above 2,500 meters on the southern border. The height continues to decrease in the central part of the district. The land in the north-western half slopes down to the southeast direction, while the middle part slopes towards the northeast through the Jandol Khwar and Panjkora rivers.

The Panjkora River flows in a southerly direction and meets a river along Bajaur's eastern border. Bajaur also has a mountain spur from the Kunar range that curves eastward and ends at the peak of Koh-i-Mor, which can be seen from the Khar valley.

The highest elevation in Khar Urban Centre is 1086 meters, and the lowest is 813 meters. The detail is given in **Map 2-1** below.



Map 2-1: Contour Map of Khar Urban Centre



Map 2-2: Administrative areas Boundaries in the Project Area

2.5 Projected Population of Khar Urban Center

Khar Urban Centre is expected to grow significantly by 2040, with its area expanding from 23.57 sq. km to 28.25 sq. km due to population growth and economic development, considering its natural resources and strategic location. The projected population statistics are presented in the figure below:

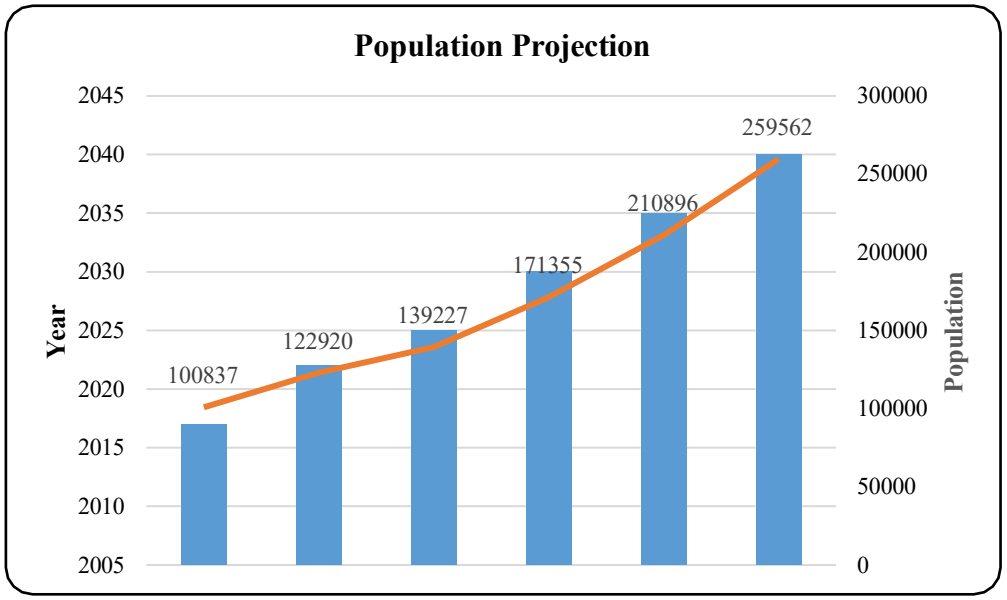


Figure 2-2: Projected Population of Khar Urban Centre

2.6 Existing Land Use of the Project Area

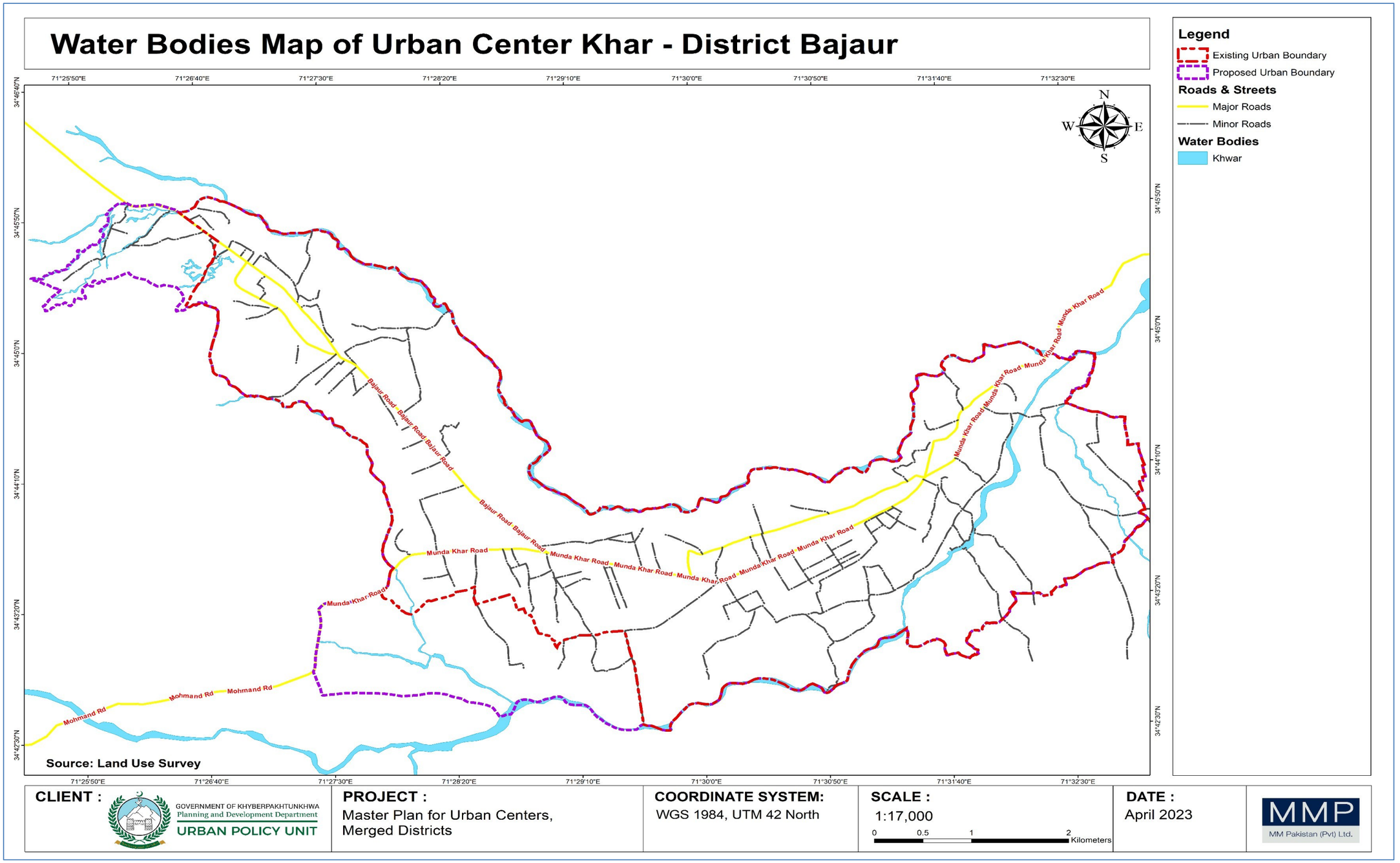
Land is a finite resource that plays a critical role in supporting a variety of life forms and economic activities. In Khar Urban Centre, agriculture is the major land use, accounting for approximately 60 percent. However, rapid changes in land use patterns have seen a shift towards other uses such as residential, commercial, and industrial.

A land use survey conducted in Khar Urban Centre in 2022 primarily employed observational techniques. Additionally, to enhance the understanding of building ages, land ownership, and land values, consultations with local residents were carried out. Based on the data gathered during the survey, Map 2-5 provides a visual representation of the distribution of various land uses across the city.

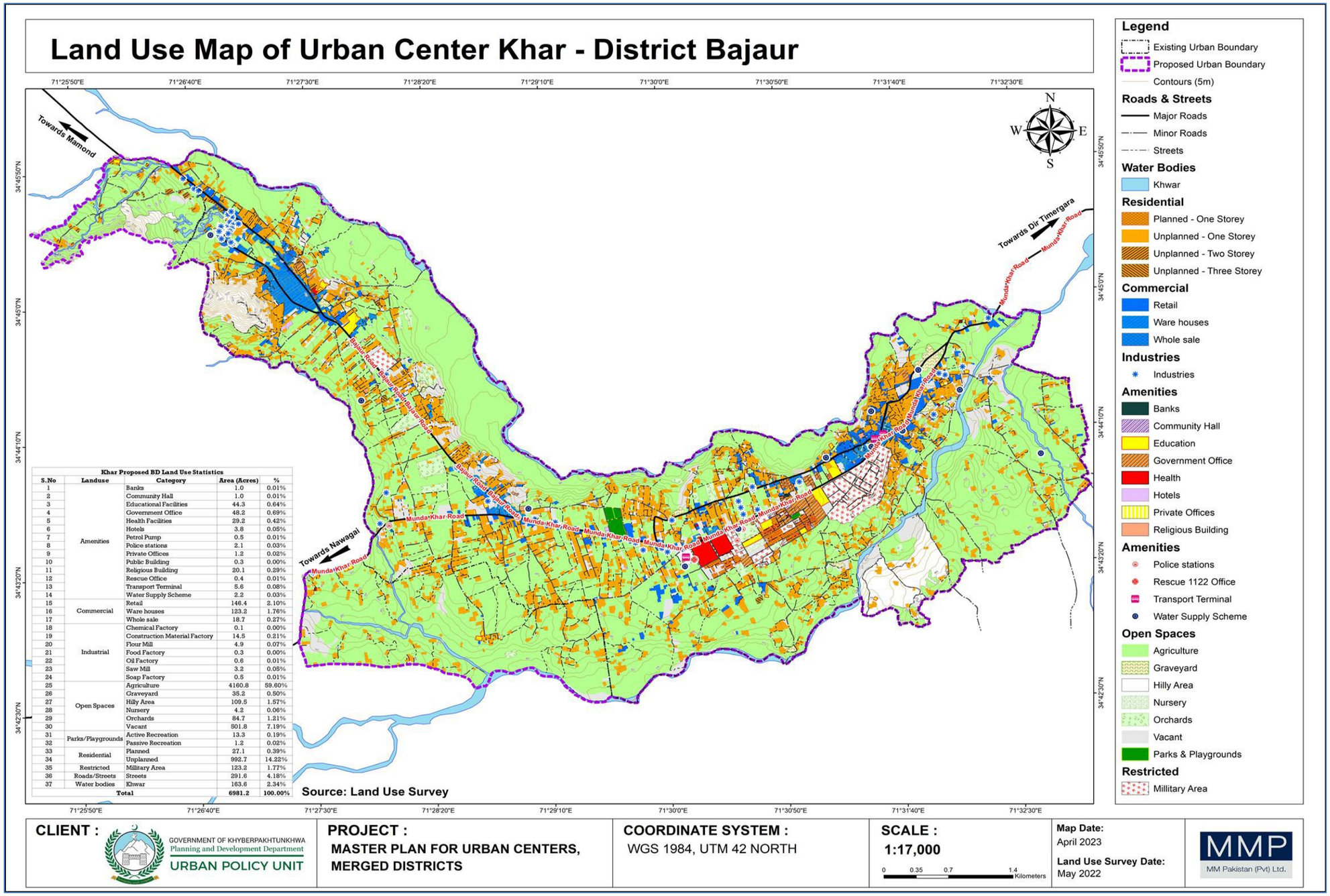
Table 2-5: Land Use Distribution of Khar Urban Centre

Land use	Category	Area (Acres)	Percentage
Amenities	Banks	1.0	2.29%
	Community Hall	1.0	
	Educational Facilities	44.3	
	Government Office	48.2	
	Health Facilities	29.2	
	Hotels	3.8	
	Petrol Pump	0.5	
	Police stations	2.1	
	Private Offices	1.2	

Land use	Category	Area (Acres)	Percentage
	Public Building	0.3	
	Religious Building	20.1	
	Rescue Office	0.4	
	Transport Terminal	5.6	
	Water Supply Scheme	2.2	
Commercial	Retail	146.4	4.13%
	Warehouses	123.2	
	Wholesale	18.7	
Industrial	Chemical Factory	0.1	0.35%
	Construction Material Factory	14.5	
	Flour Mill	4.9	
	Food Factory	0.3	
	Oil Factory	0.6	
	Saw Mill	3.2	
	Soap Factory	0.5	
Open Spaces	Agriculture	4160.8	70.13%
	Graveyard	35.2	
	Hilly Area	109.5	
	Nursery	4.2	
	Orchards	84.7	
	Vacant	501.8	
Parks/Playgrounds	Active Recreation	13.3	0.21%
	Passive Recreation	1.2	
Residential	Planned	27.1	14.61%
	Unplanned	992.7	
Restricted	Military Area	123.2	8.21%
Roads/Streets	Streets	291.6	
Water bodies	Khwar	163.6	
Total		6981.2	100.00%



Map 2-3: Spatial-Temporal Analysis of Growth of Khar Urban Centre 2002-2022



Khar Proposed BD Land Use Statistics

S.No	Landuse	Category	Area (Acres)	%
1	Amenities	Banks	1.0	0.01%
2		Community Hall	1.0	0.01%
3		Educational Facilities	44.3	0.64%
4		Government Office	48.2	0.69%
5		Health Facilities	29.2	0.42%
6		Hotels	3.8	0.05%
7		Petrol Pump	0.5	0.01%
8		Police stations	2.1	0.03%
9		Private Offices	1.2	0.02%
10		Public Building	0.3	0.00%
11		Religious Building	20.1	0.29%
12		Rescue Office	0.4	0.01%
13		Transport Terminal	5.6	0.08%
14		Water Supply Scheme	2.2	0.03%
15	Commercial	Retail	146.4	2.10%
16		Ware houses	123.2	1.76%
17		Whole sale	18.7	0.27%
18	Industrial	Chemical Factory	0.1	0.00%
19		Construction Material Factory	14.5	0.21%
20		Flour Mill	4.9	0.07%
21		Food Factory	0.3	0.00%
22		Oil Factory	0.6	0.01%
23		Saw Mill	3.2	0.05%
24		Soap Factory	0.8	0.01%
25	Open Spaces	Agriculture	4160.8	59.60%
26		Graveyard	35.2	0.50%
27		Hilly Area	109.5	1.57%
28		Nursery	4.2	0.06%
29		Orchards	84.7	1.21%
30		Vacant	501.8	7.19%
31	Parks/Playgrounds	Active Recreation	13.3	0.19%
32		Passive Recreation	1.2	0.02%
33	Residential	Planned	27.1	0.39%
34		Unplanned	992.7	14.22%
35	Restricted	Millitary Area	123.2	1.77%
36	Roads/Streets	Streets	291.6	4.18%
37	Water bodies	Khwar	163.6	2.34%
Total			6981.2	100.00%

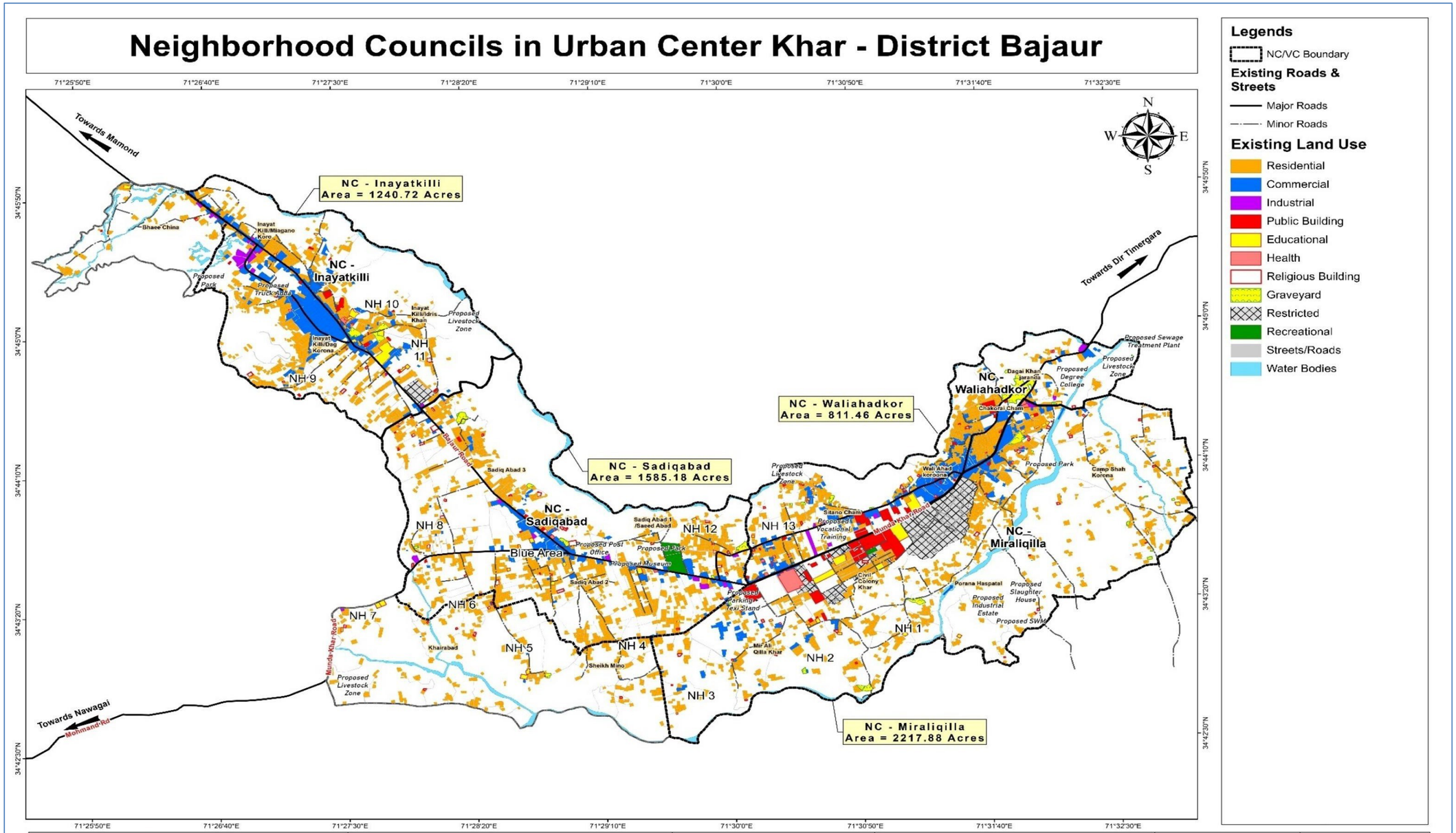
Map 2-4: Existing Land Use Distribution in Khar Urban Centre

1.1.1 Existing Land Use Distribution in Neighborhood Councils of Khar Urban Centre

In the Khar Urban Centre, there are four neighborhoods: Wali Ahad Korona, Mir Ali Qilla, Sadiq Abad-1, and Inayat Killi/Miagano Koro, with a total area of 5,820.97 acres. The most prominent land use in the neighborhoods is agriculture, which spreads over an extensive area of **3,256.51** acres and contributes 60% of the total neighborhoods area, followed by residential which spreads on **920** acres area and contributes to 15% of the total area. The detail land use distribution is listed in the **Table 2-6** below:

Table 2-6: Existing Land-Use Distribution of Neighborhoods within Khar Urban Centre

S.No	Land use	Category	Existing BD	
			Area (Acres)	Percentage
1	Amenities	Banks	0.96	2.66%
2		Community Hall	1.02	
3		Educational Facilities	40.92	
4		Government Office	48.24	
5		Health Facilities	28.74	
6		Hotels	3.78	
7		Petrol Pump	0.54	
8		Police stations	2.13	
9		Private Offices	1.17	
10		Public Building	0.26	
11		Religious Building	18.9	
12		Rescue Office	0.41	
13		Transport Terminal	5.57	
14		Water Supply Scheme	2.21	
15	Commercial	Retail	144.22	4.92%
16		Warehouses	123.17	
17		Wholesale	18.69	
18	Industrial	Chemical Factory	0.09	0.37%
19		Construction Material Factory	13.68	
20		Flour Mill	4.88	
21		Food Factory	0.28	
22		Oil Factory	0.58	
23		Saw Mill	2.33	
24		Soap Factory	0.51	
25	Open Spaces	Agriculture	3256.51	67.32%
26		Graveyard	34.6	
27		Hilly Area	82.76	
28		Nursery	4.22	
29		Orchards	82.49	
30		Vacant	458.92	
31	Parks and Playgrounds	Active Recreation	13.32	0.25%
32		Passive Recreation	1.21	
33	Residential	Planned	27.15	15.81%
34		Unplanned	892.96	
35	Restricted	Military Area	123.24	2.12%
36	Roads/Streets	Streets	262.45	4.51%
37	Water bodies	Khwar	117.89	2.03%
Total			**5,820.97**	**100.00%**



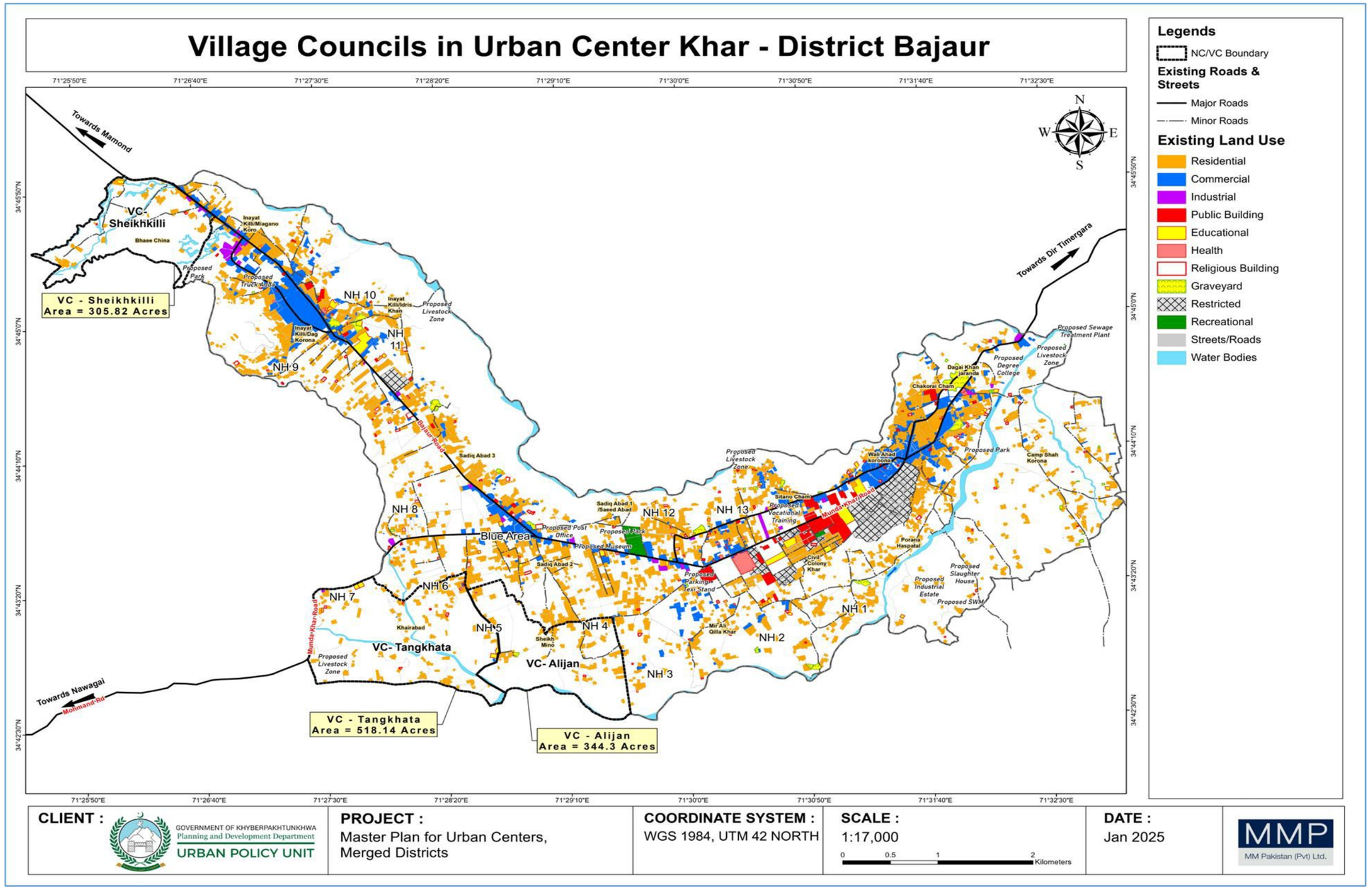
Map 2-5: Existing Land Use of NC's

2.6.1 Existing Land Use Distribution in Village Councils in Khar Urban Centre

In the Khar Urban Centre, there are three adjacent Village Councils: Ali Jan Kaley, Tank Khatta, and Sheikh Kali, with an area of 1,158.08 acres. The most prominent land use in the neighborhoods is agriculture, which spreads over an area of **903.65** acres, while the second most prominent area falls under the categorization of residential. **Table 2-7** below shows the detailed breakdown of the land use within the Village Councils in Khar Urban Centre. This information will be valuable in understanding the current state of land use within the city and the potential impacts of any proposed changes or developments.

Table 2-7: Existing Land Uses of Village Councils in Khar Urban Centre

S.No	Land use	Category	Area (Acres)	Percentage
1	Amenities	Educational Facilities	3.43	0.45%
2		Health Facilities	0.43	
3		Religious Building	1.23	
4	Commercial	Retail	2.18	0.19%
5	Industrial	Construction Material Factory	0.82	0.14%
6		Saw Mill	0.84	
7	Open Spaces	Agriculture	903.65	84.47%
8		Graveyard	0.56	
9		Hilly Area	28.95	
10		Orchards	2.2	
11		Vacant	42.83	
12	Residential	Unplanned	99.74	8.61%
13	Roads/Streets	Streets	28.67	2.48%
14	Water bodies	Khwar	44.72	3.86%
	Grand Total		**1158.08**	**100.00%**



Map 2-6: Existing Land Use of VC's

2.7 Spatio-Temporal Analysis of Khar Urban Centre

A multi-temporal technique was used to analyze the growth trend of various land uses for the year 2002, 2007, 2012, and 2017. The growth trend analysis of the project area reveals that urban centers has experienced rapid and uneven physical expansion over the past 20 years. Khar Urban Centre has experienced accelerating residential growth, with significant increases in parcels and land use driven by high demand. Similarly, the commercial area has emerged primarily along the main road passing through the center of the city, which has become the primary commercial hub of Khar Urban Centre. Whereas, the slow pace of industrial development in Khar Urban Centre has been observed due to the lack of basic facilities necessary for industrialists to establish units in the city.

The cumulative analysis of growth pattern shows that urban centers has grown multiple times in twenty years.

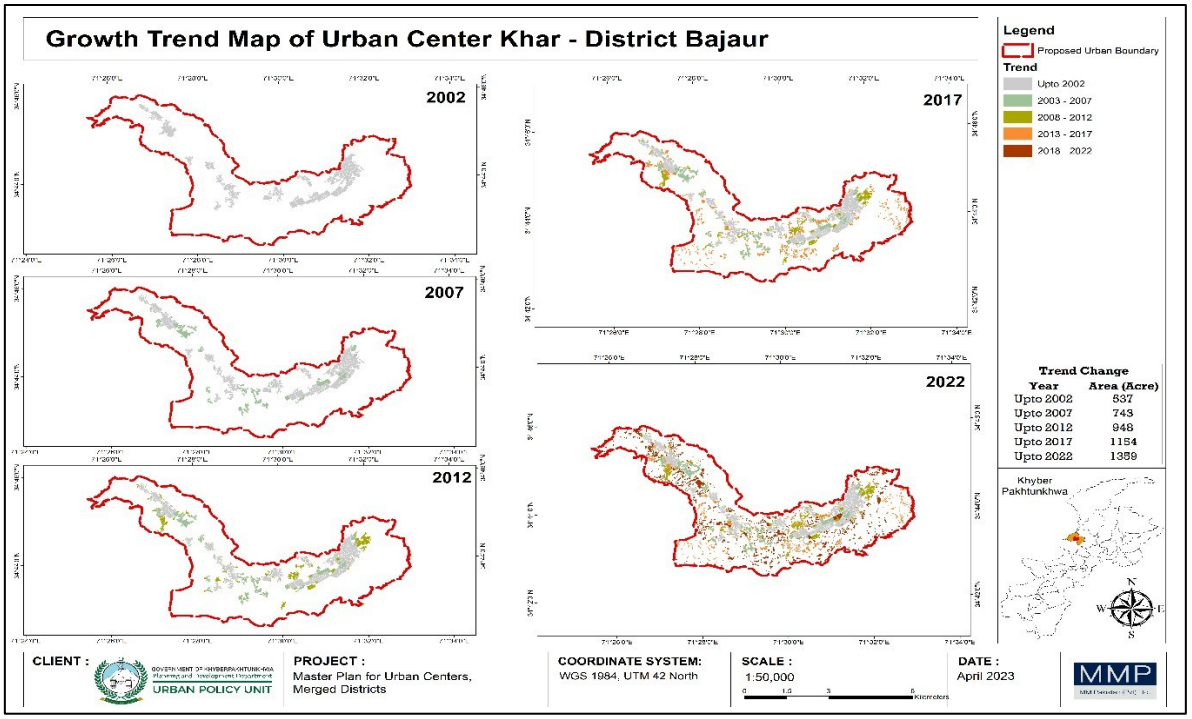


Figure 2-3: Urban Growth analysis of Khar 2002-2022

3 APPRAOCH & METHODOLOGY

3.1 Introduction

A structured and data-driven methodology is essential for effective urban planning to ensure sustainable development and optimal land use allocation. The methodology adopted for the Khar Urban Centre Master Plan is designed to address the region's current and future urban challenges by integrating technological tools, empirical research, and stakeholder engagement. By leveraging Geographic Information Systems (GIS) and a Spatial Decision Support System (SDSS), the planning process ensures that land-use decisions are informed, efficient, and sustainable. This approach not only considers existing conditions but also anticipates future growth patterns, enabling a balanced and resilient urban framework that enhances livability, economic opportunity, and environmental sustainability.

The primary and secondary data collection was carried out. Primary data collection involved extensive field surveys, laboratory analyses, and community engagement activities, while secondary data collection entailed reviewing reports and background documents from government and departmental sources. The methodology adopted is shown in Figure 3 1 below:

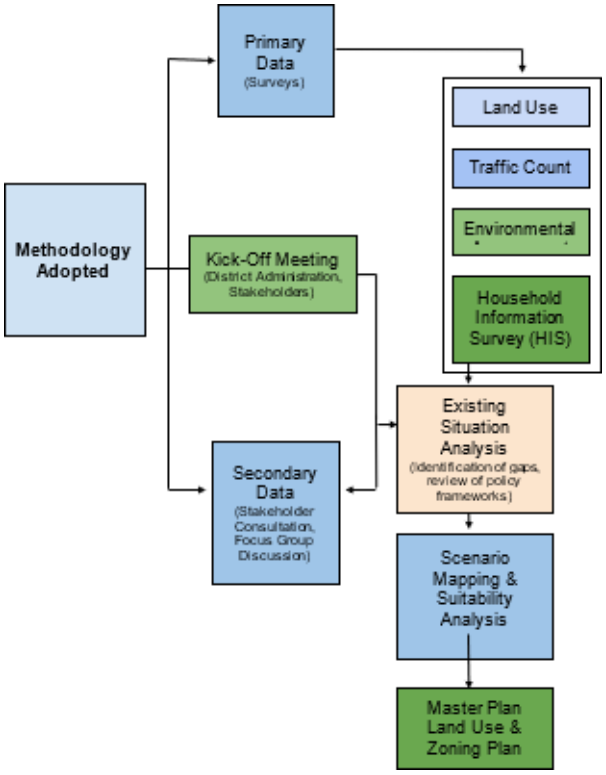


Figure 3-1: Methodology Adopted for Land Use & Zoning

3.2 Primary Data Collection

The project area was mapped using the latest satellite imagery, and a detailed land use survey was conducted to create the existing land use map of the Khar Urban Centre. Field surveys, such as the Household Information Survey, Traffic and Transportation Surveys, Commercial Surveys, Public Facility Survey, and Infrastructure Survey, were conducted, and secondary data was collected from various offices to determine the area's existing situation.

3.3 Secondary Data Collection

Secondary data were obtained from reviewing relevant reports and background documents of the line departments. It is worth informing you that most of these departments have recently been established since the merger of Bajaur in the KP province and are therefore not fully functional. However, the information documented from the secondary sources, especially about the Human Environment, included the district / provincial head offices of the Forest Dept.; TMA office Khar; Public Health Eng. Dept.; Local Government and Rural Development Dept.; Dist. Education Office; DHO; C & W; Highway Authority and the Revenue Department.

3.4 Land Use Suitability Analysis

To determine the suitability of each land parcel for a particular land use, predefined criteria were established for each land use and were categorized into three classes of suitability: most suitable, moderate, and least suitable. Each class was assigned a corresponding score of three, two, and one, respectively, to facilitate the evaluation process.

Next, all the criteria for each land use were intersected, resulting in a score for each land parcel. For instance, if a parcel was located in an area where all criteria were classified as most suitable, its score would be calculated as the product of the number of criteria and their corresponding score. For example, if there were four criteria with a score of three each, the total score for that land parcel would be 12. For further detail please refer to Task-C Report.

This process was repeated for all land parcels across different land uses, allowing for a comprehensive evaluation of land suitability based on multiple criteria. It provides valuable insights into which land parcels are best suited for particular land uses. Furthermore, the resulting scores can be used to develop a suitability map, which provides a visual representation of the suitability of different land parcels for each specific land use.

After conducting a comprehensive multi-criteria analysis, the results of the land suitability assessment were generated to inform the future development of residential, CBD, and industrial estates. The suitability map can assist in the decision-making process by identifying the most suitable areas for specific land uses.

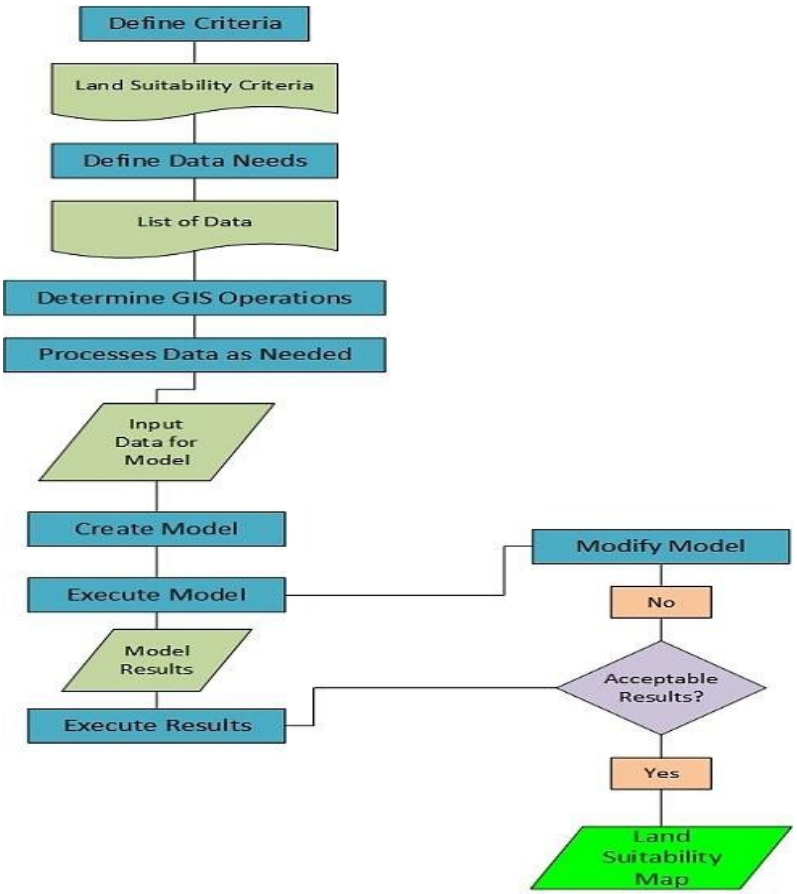
The process of land suitability assessment allows for the consideration of various factors that could impact the future use of the land, such as environmental factors, infrastructure, and accessibility. By evaluating these factors, the assessment can aid in identifying potential risks and opportunities for future development.

3.5 Land Use Suitability Through Multi-Criteria Analysis

The Multiple Criteria Analysis (MCA) techniques has been utilized to identify suitable parcels for different land uses, such as residential, commercial, and industrial, by performing a vector-based overlay analysis. This analysis was conducted in two phases, where initially different constraints were erased from the project boundary, resulting in a file containing parcels available for any kind of future development. In the second phase, land use-specific criteria were then applied to the resultant file to find Land use-wise suitability.

The detail methodology adopted for land use suitability analysis using multi-criteria is shown in the figure below:

To determine the suitability of each land parcel for a particular land use, predefined criteria were established for each land use and were categorized into three classes of suitability: most suitable, moderate, and least suitable. Each class was assigned a corresponding score of three, two, and one, respectively, to facilitate the evaluation process.



Next, all the criteria for each land use were intersected, resulting in a score for each land parcel. For instance, if a parcel was located in an area where all criteria were classified as most suitable, its score would be calculated as the product of the number of criteria and their corresponding score. For example, if there were four criteria with a score of three each, the total score for that land parcel would be 12.

This process was repeated for all land parcels across different land uses, allowing for a comprehensive evaluation of land suitability based on multiple criteria. It provides valuable insights into which land parcels are best suited for particular land uses. Furthermore, the resulting scores can be used to develop a suitability map, which provides a visual representation of the suitability of different land parcels for each specific land use.

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Furthermore, the process of land suitability assessment allows for the consideration of various factors that could impact the future use of the land, such as environmental factors, infrastructure, and accessibility. By evaluating these factors, the assessment can aid in identifying potential risks and opportunities for future development.

Overall, the process of land suitability assessment is a valuable tool for land use planning, providing insights into which areas are most appropriate for different land uses while considering multiple criteria and factors. The resulting suitability map is a useful visual tool that can inform decision-making and resource allocation for future development.

3.6 Land Use Models for Khar Urban Center

Better land utilization is the foundation for sustainable urban development. A city's land use refers to how it is currently used and how it plans to be utilized in the future. Other city elements, such as housing, environmental resources, and infrastructure, are also supported by land use. For instance, a land use plan directs the availability of land for residential, commercial, and industrial uses or protects open space to safeguard biotic resources.

The scenarios are developed based on the following major land uses:

i) Urban Residential Land Use: The neighborhood units with a mix of single-family homes, townhouses, and apartments. All the neighborhood units will be developed as a self-sustained residential area having a neighborhood center having a Primary School, Neighborhood Park (including a Tube Well and OHT for water supply), a Commercial area (including shops, restaurants, and a service industry, such as tailor's shop, laundry, etc.) and a Civic and Administrative area (including a community center, post office, police post, library, etc.). There may be small parks and playgrounds, and community gardens located within the residential blocks.
ii) Industrial Land Use: An area with factories, warehouses, and distribution centers. This area will consist of a planned small Industrial Estate. There may be heavy truck traffic and loading docks, and the land may be zoned for specific uses such as manufacturing or storage. Moreover, the Sewage Treatment Plant, Slaughterhouse, and Sanitary Landfill Area (with recycling and composting plants) will also be located in this zone close to the industrial estate.
iii) Agricultural Land Use: An urban fringe area with large tracts of land used for farming, ranching, and forestry. There may be agricultural fields, pastures, orchards as well as cattle farms, fish farms, poultry farms, etc. located in this zone.
iv) Recreational Land Use: An area designated for outdoor activities such as playing, jogging, etc. There may be trails, picnic areas, as well as lakes, rivers, and other natural features located within the town park.
v) Commercial Land Use: Three central business districts (CBDs) with shops, restaurants, and office buildings using the concept of Multiple Nuclei, or under the Linear Dynapolis concept a continuous strip of Blue Area will be developed in the center of the city. There may be parking lots and sidewalks, and the area may be designed for pedestrian and vehicle movement separately.
vi) Mixed-Use Land Use: A neighborhood or district that combines different land uses, such as residential, commercial, and industrial. There may be a mix of homes, businesses, and factories, with sidewalks and streets connecting them.

vii) Natural Land Use: An area of land that is left in its natural state, such as a forest, wetland, or wildlife sanctuary. There may be limited human development, and the land may be protected for conservation or recreational purposes.

3.7 Scenarios Selection Using Decision Support System (DSS) for Khar Urban Centre

The Decision Support System (DSS) was used to develop scenarios for Khar Urban Centre based on the criteria suitable for future planned growth and resource allocation. For this purpose, the two scenarios were developed for future land use and the growth direction of Khar Urban Centre. The scenarios would be based on the data analysis and the decision support system would generate the best possible recommendations for future land use and growth direction of Khar Urban Centre, it would also help in resource allocation and assessing the feasibility of the recommendations. The detailed land use scenarios according to the land use theories and suitability for Khar Urban Centre are given below:

3.7.1 Scenario A: Multiple Nuclei Model

The Multiple Nuclei Model (1940s) explains city growth through new economic centres (nuclei) rather than uniform expansion. Cities develop multiple business districts, reducing congestion and travel costs. This model recognizes various growth hubs, such as colleges, parks, and commercial centres, creating a more realistic representation of urban development.

- **Pros of Multiple Nuclei**
  - Explanation of why some areas of a city grow faster than others
  - Recognition of the role of specific industries and events in urban growth
  - Integration of Historical, economic, and political factors in understanding urban development
- **Cons of Multiple nuclei**
  - Limited ability to predict future urban growth patterns
  - Difficulty in applying the model to different cultural and geographical contexts
  - Overgeneralization of the role of certain industries and events in shaping urban form
  - Neglect of other factors such as zoning, transportation, and demographics in shaping urban development.

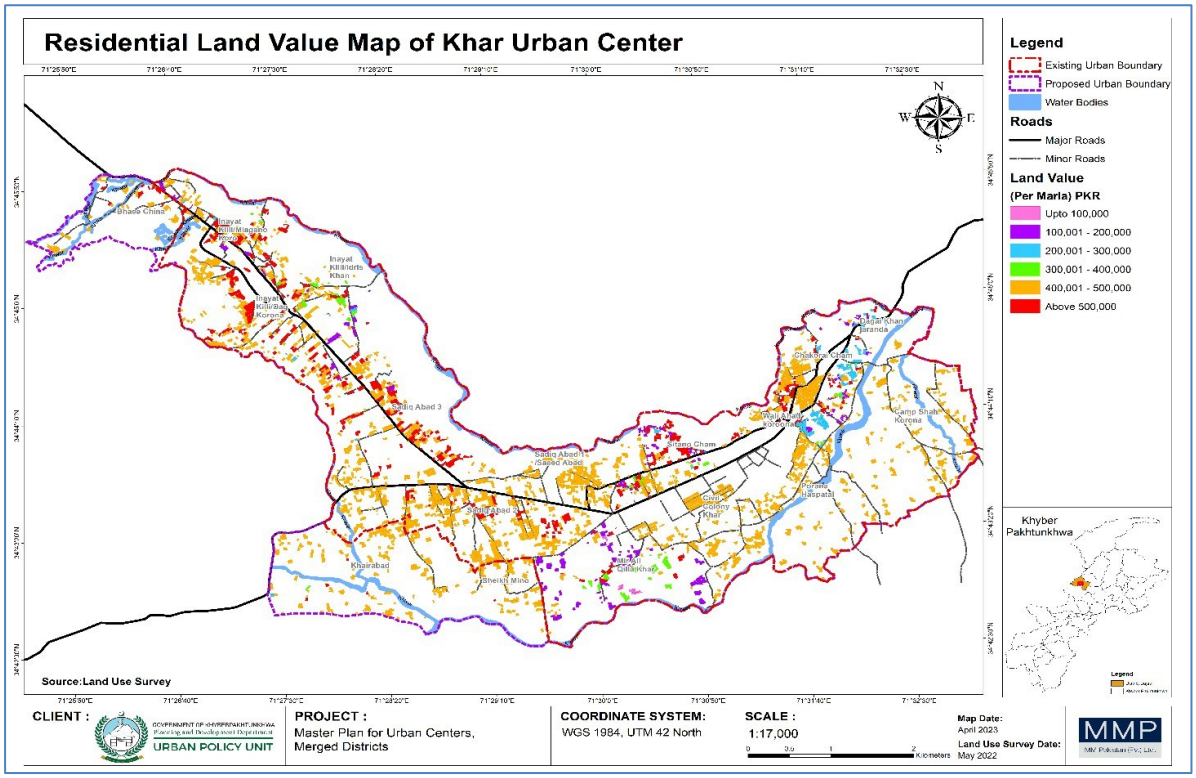
Khar Urban Centre's multiple nuclei model features three Central Business Districts (CBDs): Khar Main Bazar, Pathak/Sadiq Abad, and Inayat Kali CBD. The area is divided into residential zones, industrial zones, and protected areas. However, high land prices in the urban centre, particularly in Khar Old Bazar, Inayat Kali Bazaar, and Khar-Munda Road, make it challenging for low-income residents to live near these centres, discouraging the multiple nuclei model.

Table 3-1: Land Value in Khar Urban Centre

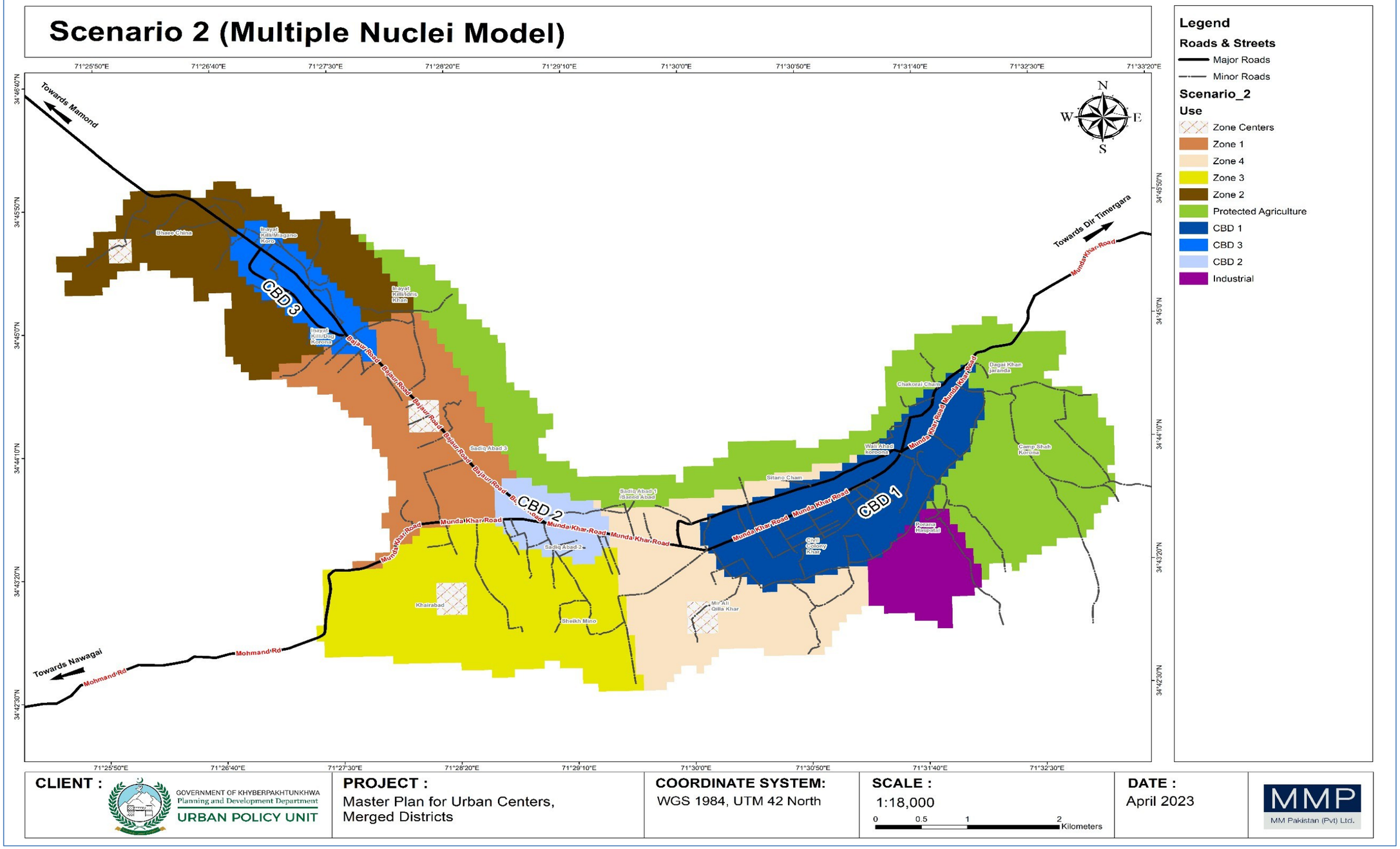
Land Prices Range (Per Marla)	No's of Land Parcels	Percentage (%)
Up to 100,000	31	1%
100,001 – 200,000	406	7%
200,001 – 300,000	163	3%

Land Prices Range (Per Marla)	No's of Land Parcels	Percentage (%)
300,001 – 400,000	175	3%
400,001 – 500,000	4131	70%
Above 500,000	957	16%
Total	**5863**	**100%**

Source: MMP – Master Planning Survey of Khar urban center, 2022



Map 3-1: Residential Land Value Map of Khar Urban Centre, 2022



Map 3-2: Scenario Based on Multiple Nuclei Model for Khar Urban Centre

3.7.2 Scenario B: Linear Dynapolis Model

The Linear Dynapolis concept was given by C.A Dioxides. The Dynapolis is described as a dynamic city having the potential for dynamic development as opposed to the static city of the past and able to develop freely and naturally along a planned and predetermined course*5*.

The four planning and design principles of Dynapolis that must be considered for the future city are:

- Unity of Purpose
- Hierarchy of functions
- Freedom to develop dynamically- the four dimensions
- Built on various scale

The theme of the Linear Dynapolis model for Khar Urban Centre is to avoid congestion and move away from the monumentality and permanence of traditional city centers. This model is based on the concept of a "dynapolis" which is a dynamic metropolis that changes over time and allows for continuous development of its urban core in a unidirectional manner. In this model, commercial and residential areas would expand along an axis, while industrial regions would be pushed to the outskirts.

3.8 Justification for the Selection of Linear Dynapolis for Khar Urban Centre

The selection of the Linear Dynapolis model for the Khar urban Centre was based on several factors that make it a desirable choice. Firstly, the model promotes efficient land use by expanding commercial and residential areas along a central axis while pushing industrial regions to the outskirts. This avoids congestion and overcrowding in the city center, creating a more livable and sustainable urban environment.

Secondly, the unidirectional nature of the Linear Dynapolis model allows for continuous development of the urban core, which is particularly beneficial for a city like Khar experiencing rapid population growth and economic development. This flexibility allows the city to adapt and evolve to meet changing needs.

Thirdly, the model promotes functional separation of residential, commercial, and industrial areas, resulting in a more organized and efficient urban structure. This can improve the quality of life, enhance economic opportunities, and contribute to a more sustainable urban environment.

The Linear Dynapolis model is a suitable and desirable choice for the Khar Urban Centre due to its ability to promote efficient land use, continuous development, and functional separation, all contributing to a livable and sustainable urban environment. The city's dynamic character, based on a parabolic settlement, is shown in the figure below:

[5] Doxiadis, C. A., 1960a. Islamabad program and plan- DOX-PA 88. Volume1.

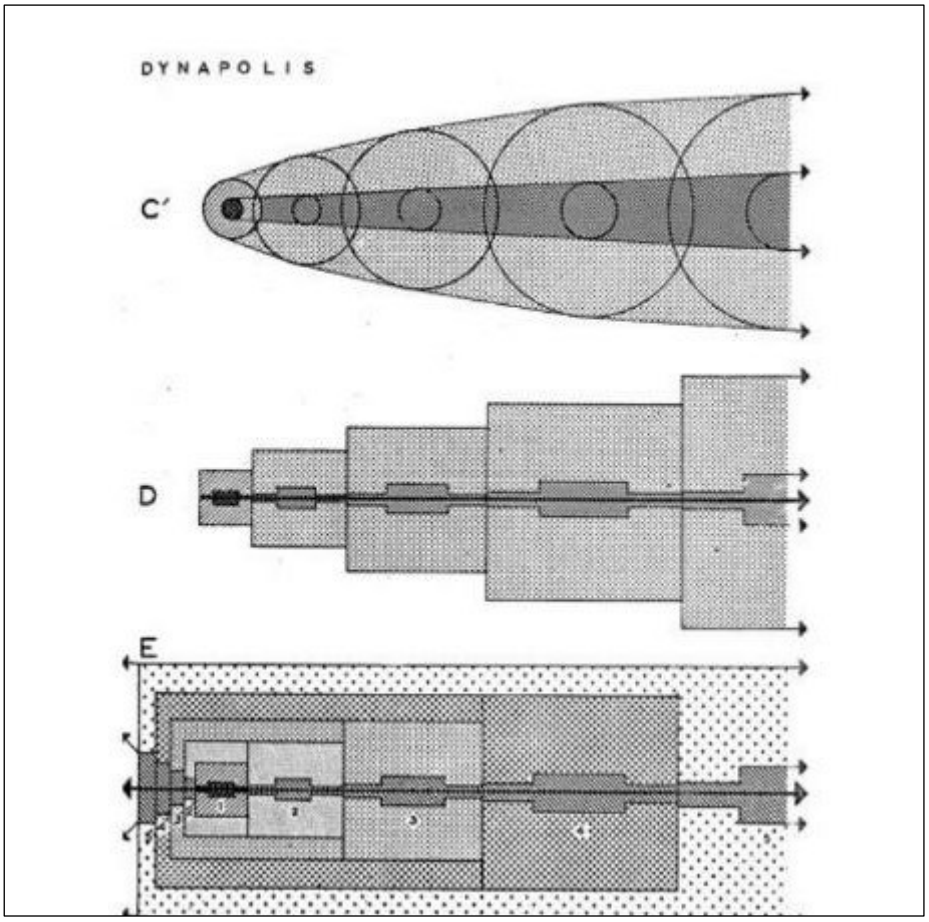
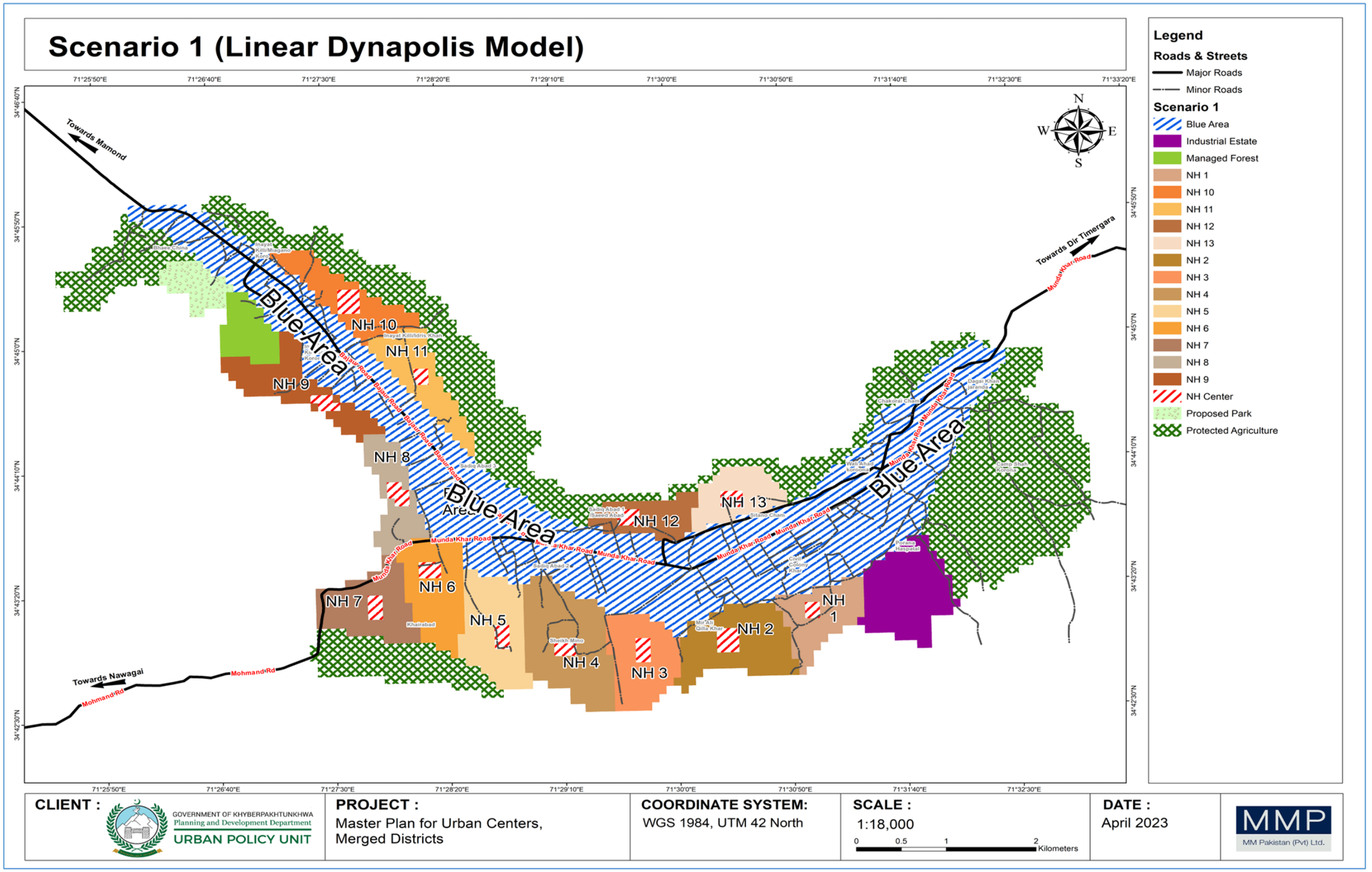


Figure 3-2: Dynapolis city model

Source: Doxiadis, C. A., 1960a. Islamabad program and plan- DOX-PA 88. Volume1.

Based on the analysis of the existing city and its potential for future growth, the Linear Dynapolis model has been identified as a suitable choice for Khar Urban Centre. This is due to the city's current layout, which is spread along the Khar Main Road and expands along the road with a significant concentration of commercial activities.

In summary, based on the analysis and graphical representation of the proposed model, it can be concluded that Khar Urban Centre is fit for the Linear Dynapolis model.



Map 3-3: Scenario based on Linear Dynapolis Model for Khar Urban Centre (2024-2042)

4 FINAL MASTER PLAN 2042

The results of the suitability maps have been utilized to develop a comprehensive land use zoning and master plan for Khar Urban Centre. Careful consideration was given to allocating proposed land uses to land parcels that are situated in highly suitable areas for each respective land use. By doing so, the zoning plan ensures that land uses are efficiently distributed and allocated in a manner that promotes sustainable development and improves the quality of life for residents. The zoning plan will serve as a crucial tool in guiding future development decisions in the Khar Urban Centre.

The proposed land use plan for Khar Urban Centre has been developed with the following principles in mind:

i) Priority will be given to the development of vacant areas within the contiguous built-up areas through "infill development".

ii) Future residential areas will be designed as sustainable and self-sufficient neighborhoods, with existing housing incorporated as part of the planned neighborhoods.

iii) Slum areas will be improved through a slum improvement plan that includes street pavement, water supply and sewerage schemes, street alignment, and the provision of missing public facilities and open spaces.

iv) Public facilities, such as education, health, and entertainment facilities, will be distributed throughout the city according to their need and catchment areas.

v) Parks and playgrounds will be distributed throughout the city and neighborhoods based on a hierarchical distribution order.

vi) The Central Business District (CBD) will be designed according to the Linear Dynapolis concept of planning. The Blue area, located along the main road of Khar and Inayat Kali, will encourage commercial, civic, administrative, and mixed-use development.

vii) The Neighborhood Centers will be established near the geographic center of every neighborhood throughout the city to provide residents with easy access to daily necessities within a walking distance to reduce travel time, petrol consumption, and travel costs.

viii) An industrial estate will be developed on the southeastern corner of the city to provide job opportunities for the local population.

ix) Standardized hotels will be distributed within the Blue Area along the central corridor of the city, the areas of scenic beauty, and near transportation hubs.

The land use plan for Khar Urban Centre has been developed with a focus on sustainable and self-sufficient neighborhoods, efficient use of land, and the separation of residential, commercial, and industrial areas. The plan also aims to improve the quality of life for residents through the provision of public facilities and open spaces. The zoning plan for Khar Urban Centre has been developed based on the results of land suitability analysis maps to ensure that proposed land uses are allocated in highly suitable areas near the other compatible land uses. The incompatible land uses such as industrial estate, solid waste dumping ground, etc. have been separated from the residential areas using a green buffer area.

4.1 Neighborhood Development in Khar Urban Centre

4.1.1 Self-Sufficient Neighborhoods (SSN) Concept

The proposed self-sufficient neighborhood (SSN) in the master plan is designed to meet the basic needs of its residents without relying on resources from outside the community. The SSN will feature a mix of residential, commercial, and service industrial land uses, allowing the community to produce and sell goods and services and provide employment opportunities for residents.

To support the community's self-sufficiency, the SSN will include infrastructures such as water supply and wastewater treatment facilities and transportation options. The community will also prioritize environmental sustainability, with green spaces and shared resources available for residents to use.

The SSN concept is closely related to other sustainable development concepts such as smart cities, green cities, and eco-cities. SSN can be applied in both urban and rural settings and can be integrated into existing communities or incorporated into the new development.

The success of the SSN depends on the active participation and engagement of its residents. To encourage community involvement, the master plan includes opportunities for residents to take ownership of the community's sustainability initiatives. The SSN is also designed with adaptability in mind, allowing the community to adapt to changing circumstances and continue to meet the needs of its residents over time.

4.1.2 Key Components of Neighborhood Units

i) **Infrastructure:** One of the key challenges in creating a self-sufficient neighborhood is ensuring that the necessary infrastructure is in place to support the community's needs. This can include things like water supply and sewerage systems, energy systems, and solid waste management.

ii) **Mixed land use:** To be truly self-sufficient, a neighborhood should have a mix of residential, commercial, civic, and local administrative land uses. This will allow the community to produce and sell goods and services, as well as provide employment opportunities for residents.

iii) **Walkability:** The proposed neighborhoods are small in size and encourage walkability by the provision of primary and middle schools, parks, shopping centers, mosques, community centers, dispensaries, and other civic amenities in the neighborhood center at 5 to 10 minutes walking distance. This will reduce the use of motor vehicles and thus help in reducing travel costs, fuel consumption, air and noise pollution, and carbon footprint in the city.

iv) **Community involvement:** The success of a self-sufficient neighborhood depends on the active participation and engagement of its residents. It is important to involve community members in the planning process and encourage them to take ownership of the community's sustainability initiatives.

v) **Adaptability:** It is important to consider the long-term sustainability of the community and design the master plan with flexibility in mind. This will allow the community to adapt to changing circumstances and continue to meet the needs of its residents over time.

4.1.3 Salient Features of the Proposed Neighborhood Units

- **Mixed land use:** The SSN will feature a mix of residential, commercial, civic, and administrative land uses, allowing the community to produce and sell goods and services and provide employment opportunities for residents.
- **Infrastructure:** To support the community's self-sufficiency, the SSN will include infrastructures such as water and wastewater treatment facilities, renewable energy systems, and transportation options.
- **Environmental sustainability:** The community will prioritize environmental sustainability, with green spaces and shared resources available for residents to use. This may include things like community gardens, rainwater harvesting systems, and energy-efficient buildings.
- **Social cohesion:** The SSN will be designed to provide residences for mixed-income, class, and creed people to promote social cohesion among various classes and income groups and a sense of connection and belonging among residents. This may include shared spaces and amenities, as well as opportunities for community involvement and decision-making.

4.1.4 Walkability

The SSN has been designed with walkability in mind, to create a community that is safe, convenient, and enjoyable for walking. To achieve this, the following measures have been implemented.

- **Pedestrian-friendly streets:** The streets within the SSN have been designed with pedestrians in mind, with wide sidewalks, pedestrian-friendly intersections, and traffic calming measures to reduce traffic speeds.
- **Mixed land use:** The SSN's mix of residential, commercial, civic, and administrative land uses creates a variety of destinations that are within walking distance of each other.
- **Public transit:** The SSN is well-served by public transit, with frequent bus and wagon services available at the arterial roads provided at the boundaries of the neighborhoods.
- **Active transportation infrastructure:** To encourage active transportation, the SSN includes bike lanes and trails, as well as public transport corridors.
- **Public spaces:** The SSN includes a variety of public spaces, such as parks, plazas, and greenways that are accessible and inviting for pedestrians.

As a result of these measures, the SSN has become a highly walkable community that is safe, convenient, and enjoyable for all residents. Walking will become a preferred mode of transportation for many residents, leading to improved health and well-being, as well as reduced traffic congestion and air pollution.

4.1.5 Planned Neighborhood Development in the Context of Khar Urban Centre

Keeping in view the resident's socio-economic and socio-cultural, climatic, and seismic conditions, planned and well-regulated development is the need of the hour. Leapfrog and scattered development have resulted in the wastage of the scarcely available land and poor infrastructure in Khar Urban Centre. At present, there is no adherence to specific bye-laws like building lines, setbacks, or mandatory open spaces for various types of buildings like residential, commercial, public buildings, mix-use

development, entertainment, and other uses. The master plan envisages future residential development for the growing population in the form of planned neighborhoods. It will lead the city towards controlled development based on specific land uses and building regulations. Planned residential development should be carried out while preserving prime agricultural land to the greatest extent possible, as agriculture is the primary sector of the economy. Due environmental consideration is also very important to be followed including the preservation of forests, flora, and fauna to protect the environment. A very vital consideration is given to the seismic conditions of the city while proposing future residential development and other land uses for future urban development. These neighborhoods will either be developed by TMA or by the private sector through any kind of arrangement for development (public, public-private, or private).

4.1.6 Proposed Neighbourhoods Land Use in Khar Urban Centre

The Khar Urban Centre is divided into four major land uses, the Blue Area (commercial, civic, administration, and mixed-use), residential areas in the form of neighborhoods', industrial estate, and protected areas in the form of agriculture and forests. To accommodate the future population in a planned manner, land suitable for residential areas is divided into thirteen (13) neighborhoods' units. Currently, a major portion of the land in the existing neighborhoods' is used for agriculture, while the rest is used for residential, educational, vacant, and graveyard purposes. However, as the population grows, the agricultural land may be automatically converted into built-up areas without prior planning.

To address this issue, the Master Plan-2042 proposes a development direction/planned growth for Khar Urban Centre. It proposes residential areas on the land allocated for neighbourhoods, and uses the existing vacant and agricultural land for future development. The proposed neighbourhoods are distributed according to the settlements of Khar Urban Centre.

According to the Master Plan-2042, the city's area is divided into four major land uses, with varying proportions of land uses in each neighborhood. The Master Plan of Khar Urban Centre proposes the development of new residential areas on existing vacant and agricultural land, to accommodate the future population in a planned manner. **Table 4-1** shows the area distribution of existing and proposed land uses in the neighbourhoods. The proposed residential area includes the area of neighborhood centers which provide a school, neighborhood park, shopping center, dispensary, mosque, local post office, police post, community center, etc.

Table 4-1: Existing and Proposed Land Uses of Designated Neighbourhoods

NH No	Sr. No	Land Use		Area (Acre)
NH 1	1	Existing	Educational	0.42
	2		Graveyard	1.82
	3		Streets/Roads	6.26
	4		Residential	24.01
	5	Proposed	Proposed Residential	54.93
	6		Proposed Roads/Streets	23.54
	7		Proposed NH Commercial	1.79
	8		Proposed NH Park	1.02
	9		Proposed NH Public Buildings	0.69
	10		Proposed NH School	1.34
	11		Proposed NH Graveyard	0.47
			NH 1 Total	**116**
NH 2	1	Existing	Commercial	4.18
	2		Educational	0.30
	3		Graveyard	2.37
	4		Streets/Roads	5.35
	5		Religious Building	0.50
	6		Residential	29.85
	7	Proposed	Proposed Residential	111.35
	8		Proposed Roads/Streets	47.72
	9		Proposed NH Commercial	2.52
	10		Proposed NH Park	1.46
	11		Proposed NH Public Buildings	1.38
	12		Proposed NH School	2.49
			NH 2 Total	**209**
NH 3	1	Existing	Commercial	2.26
	2		Educational	0.10
	3		Religious Building	0.29
	4		Residential	17.69
	5		Streets/Roads	4.53
	6	Proposed	Proposed Residential	90.50
	7		Proposed Roads/Streets	38.79
	8		Proposed NH Commercial	2.50
	9		Proposed NH Park	1.87
	10		Proposed NH Public Buildings	1.50
	11		Proposed NH School	2.25
	12		Proposed NH Graveyard	0.72
			NH 3 Total	**163**
NH 4	1	Existing	Commercial	0.21

NH No	Sr. No	Land Use		Area (Acre)
	2		Religious Building	0.12
	3		Residential	42.18
	4		Streets/Roads	8.69
	5	Proposed	Proposed Residential	153.69
	6		Proposed Roads/Streets	65.87
	7		Proposed NH Commercial	2.27
	8		Proposed NH Park	1.64
	9		Proposed NH Public Buildings	1.21
	10		Proposed NH School	2.22
	11		Proposed NH Graveyard	1.73
			NH 4 Total	**280**
NH 5	1	Existing	Commercial	0.29
	2		Educational	1.25
	3		Graveyard	0.56
	4		Religious Building	0.10
	5		Residential	16.37
	6		Streets/Roads	3.44
	7	Proposed	Proposed Residential	101.93
	8		Proposed Roads/Streets	43.68
	9		Proposed NH Commercial	2.22
	10		Proposed NH Park	1.83
	11		Proposed NH Public Buildings	1.44
	12		Proposed NH School	2.06
	13		Proposed High + Higher Secondary School	10.55
	14		Proposed NH Graveyard	1.14
			NH 5 Total	**187**
NH 6	1	Existing	Commercial	0.45
	2		Public Building	0.18
	3		Religious Building	0.96
	4		Residential	35.79
	5		Streets/Roads	6.46
	6	Proposed	Proposed Residential	91.22
	7		Proposed Roads/Streets	39.10
	8		Proposed NH Commercial	2.53
	9		Proposed NH Park	2.05
	10		Proposed NH Public Buildings	1.25
	11		Proposed NH School	3.84
	12		Proposed High + Higher Secondary School	11.14
	13		Proposed NH Graveyard	1.00
			NH 6 Total	**196**
NH 7	1	Existing	Commercial	0.04

NH No	Sr. No	Land Use		Area (Acre)
	2		Educational	1.59
	3		Health	0.22
	4		Industrial	0.29
	5		Residential	11.32
	6		Streets/Roads	4.29
	7	Proposed	Proposed Residential	81.25
	8		Proposed Roads/Streets	34.82
	9		Proposed NH Commercial	3.68
	10		Proposed NH Park	2.32
	11		Proposed NH Public Buildings	2.30
	12		Proposed NH School	3.57
	13		Proposed NH Graveyard	1.98
			NH 7 Total	**148**
NH 8	1	Existing	Commercial	0.44
	2		Graveyard	0.25
	3		Industrial	1.25
	4		Public Building	0.10
	5		Religious Building	0.99
	6		Residential	24.41
	7		Streets/Roads	6.21
	8	Proposed	Proposed Residential	63.50
	9		Proposed Roads/Streets	27.21
	10		Proposed NH Commercial	1.99
	11		Proposed NH Park	1.01
	12		Proposed NH Public Buildings	0.91
	13		Proposed NH School	1.86
	14		Proposed High + Higher Secondary School	9.43
	15		Proposed NH Graveyard	0.42
			NH 8 Total	**140**
NH 9	1	Existing	Commercial	3.04
	2		Graveyard	0.16
	3		Health	0.09
	4		Public Building	0.15
	5		Religious Building	0.79
	6		Residential	49.76
	7		Streets/Roads	7.79
	8	Proposed	Proposed Residential	65.07
	9		Proposed Roads/Streets	27.89
	10		Proposed NH Commercial	1.27
	11		Proposed NH Park	0.84
	12		Proposed NH Public Buildings	0.82

NH No	Sr. No	Land Use		Area (Acre)
	13		Proposed NH School	1.28
	14		Proposed NH Graveyard	0.93
			NH 9 Total	**160**
NH 10	1	Existing	Commercial	6.73
	2		Educational	0.16
	3		Graveyard	1.51
	4		Health	0.09
	5		Public Building	0.58
	6		Residential	28.05
	7		Streets/Roads	7.32
	8	Proposed	Proposed Residential	73.58
	9		Proposed Roads/Streets	31.53
	10		Proposed NH Commercial	2.58
	11		Proposed NH Park	1.54
	12		Proposed NH Public Buildings	1.45
	13		Proposed NH School	2.45
			NH 10 Total	**158**
NH 11	1	Existing	Commercial	2.34
	2		Educational	0.95
	3		Graveyard	4.26
	4		Public Building	0.27
	5		Religious Building	0.64
	6		Residential	19.12
	7		Streets/Roads	5.58
	8	Proposed	Proposed Residential	64.20
	9		Proposed Roads/Streets	27.51
	10		Proposed NH Commercial	2.89
	11		Proposed NH Park	2.00
	12		Proposed NH Public Buildings	1.90
	13		Proposed NH School	3.31
	14		Proposed High + Higher Secondary School	20.15
	15		Proposed NH Graveyard	0.37
			NH 11 Total	**155**
NH 12	1	Existing	Commercial	0.48
	2		Educational	0.29
	3		Graveyard	2.07
	4		Religious Building	0.77
	5		Residential	33.91
	6		Streets/Roads	5.01
	7	Proposed	Proposed Residential	42.47
	8		Proposed Roads/Streets	18.20

NH No	Sr. No	Land Use		Area (Acre)
	9		Proposed NH Commercial	1.50
	10		Proposed NH Park	1.22
	11		Proposed NH Public Buildings	0.73
	12		Proposed NH School	1.51
	13		Proposed High + Higher Secondary School	5.20
	14		Proposed NH Graveyard	1.39
			NH 12 Total	**115**
NH 13	1	**Existing**	Commercial	7.93
	2		Educational	1.01
	3		Graveyard	1.13
	4		Industrial	0.53
	5		Religious Building	1.13
	6		Residential	35.74
	7		Streets/Roads	7.84
	8	**Proposed**	Proposed Residential	46.00
	9		Proposed Roads/Streets	19.71
	10		Proposed NH Commercial	2.11
	11		Proposed NH Park	1.65
	12		Proposed NH Public Buildings	1.23
	13		Proposed NH School	1.95
	14		Proposed NH Graveyard	0.85
			NH 13 Total	**129**
Overall Neighborhood Area				**2156**

Source: Consultant Calculation

4.2 Housing Needs Assessment and Future Demand for All Income Groups

Housing need assessment is a technique used to assess the number of houses needed in a city to accommodate the future population. Assessing housing needs is the first step in the process of deciding how many houses needs to be planned for a specific area over a period of time. It should be done independently by determining the amount of housing needed, determining the availability of land, and developing the necessary policies, such as infilling, intensification, redevelopment, and site allocations, etc.

According to the Pakistan Bureau of Statistics, the average household size in Khar Urban Centre is 8.85 persons per house, which is significantly higher than the national average. This suggests that larger houses or multiple dwellings on one property may be required to meet the community's housing needs adequately.

Infilling, intensification, and redevelopment are critical strategies in the development of urban areas as they can revitalize and rejuvenate existing urban areas, increase density and resource efficiency, attract new investment and residents, and promote sustainability and alternative transportation.

4.2.1 Housing Sector Demand Analysis

The existing demarcated area of Khar Urban Centre is approximately 28.25 sq. km. According to the Pakistan Bureau of Statistics, 2017, the population of Khar Urban Centre, was 100,837. Assuming an average household size of 8.85, the total number of households within the city was estimated to be 11,394. Based on population projections for the current year (2022), the total population is expected to be around 122,920. Assuming the same household size of 8.85 people per house, the estimated number of dwelling units required to accommodate the current population is 13,889. By 2040, the population is expected to reach 259,562, and an estimated 29,329 housing units will be required to meet this demand. **Table 4-2** below shows existing households, housing units and projected population accordingly.

Table 4-2: Existing and Future Housing Need in Khar Urban Centre, 2022-2040

Sr. No	Household Size	Population	Dwelling Units
2017	8.85	100,837	11,394
2022	8.85	122,920	13,889
2040	8.85	259,562	29,329

4.2.2 Housing Demand in Khar Urban Centre

According to the 2017 census, the population of Khar Urban Centre was 100,837, and the average number of people per household was 8.85. This means that there were 11,394 households in the area. Based on the estimated population of 122,920 in 2022, it can be assumed that there are approximately 13,889 households with the same average household size. However, currently, there are only 5,792 housing units in the Khar Urban Centre, which may indicate a housing shortage in the area.

The HIS survey shows that 41% of housing units are occupied by single households, while 40% of housing units are occupied by two households. The remaining units are occupied by more than two households, indicating a gap in the demand and supply of housing units. To estimate the demand for housing units, we divide the projected population by the average household size and assume one household per housing unit. The detailed analysis is shown in **Table 4-3**.

Table 4-3: Estimated Housing Gap in Khar Urban Centre

Sr. No	Present Population	Household Size[6]	Existing Households	Existing Housing Units	Existing Gap
1	122,920	8.85	13889	5792	8097

Source: Consultant Filed Data Analysis

The household size of 8.85 is applied to the projected population of 2040. It is estimated that in 2040, the future population will be 259,562, and the number of estimated households will be 29,329. By excluding the present housing demand from the required housing units considering one household per house the additional housing units required for up to the plan period (2040) will be 23,537.

[6] https://www.pbs.gov.pk/

4.2.3 Housing Replacement

According to the data collected from the field survey conducted in 2022, a total of 850 housing units in the Khar Urban Centre are in bad condition, while 205 units are considered dangerous and require replacement. Thus, the total number of housing units that need replacement is 1055. A detailed analysis of the building condition is shown in **Table 4-4**.

Table 4-4: Housing Replacement in Khar Urban Centre

Sr. No	Housing Condition	No. of houses	Replacement Required
1	Bad	850	No
2	Dangerous	205	Yes
Total		**1055**	

Source: MMP Master Planning Survey of Khar Urban Centre, 2022

The housing backlog can be calculated by adding the demand for new units and replacement units in the city. Based on the analysis provided, the current backlog for Khar Urban Centre is 8,302 units.

4.2.4 Area Need Assessment for Low, Middle, and High-Income Housing

The average monthly household income in Khar Urban Centre is Rs. 38,880. However, a significant portion of the population falls into the lower income. Specifically, 3% of households earn Rs. 15,000 or less per month, making them the lowest-income group in the area. The lower-middle-income class, comprising 28% of households, earns between Rs. 15,000 and 30,000 per month. The middle-income group, which makes up 33% of households, has an income range of Rs. 30,000 to 50,000. On the other hand, 26.2% of residents fall into the income bracket of Rs. 50,000 to 100,000, while 8.9% earn over Rs. 100,000 per month. This high-income group is mostly comprised of businesspersons and property owners. In summary, the majority of the population in Khar Urban Centre belongs to the low-income category.

Table 4-5: Monthly Income of Households

Monthly Income	Percentage %
Less than 15,000	3
15,001 to 30,000	28
30,001 to 50,000	33
Low Income	**64**
50,001 to 100,00	26
Middle Income	**26**
100,001 to 200,000	8.9
200,001 to 300,000	0.3
300,001 to 400,000	0.5
More than 1 million	0.3
High Income	**10**
Total	**100.0%**

Source: MMP Master Planning Survey of Khar Urban Centre, 2022

The housing provision is based on the socio-economic conditions and the vision of providing every household a house unit, the proposed housing distribution aims to cater to low-middle and high-income groups in the city. The residential areas in the neighborhoods have been planned with 64% for low-income, 26% for middle-income, and 10% for high-income. The proposed neighborhoods have been designed to accommodate the existing and future population of the city.

After conducting a thorough analysis of the projected population and the existing settlements, it is estimated that 886 acres of land will be required for housing, along with an additional 221 acres for allied infrastructure development. The total area required for housing is 886 acres up to the plan period, of 2040. However, taking into account the entire urban center and its remaining settlements, we have proposed new neighborhoods on all the existing settlements with an area of 1039.69 acres. This proposed residential area accounts for 32% of the total area of the urban center, which is in accordance with NRM standards for this level of the city. This comprehensive approach not only fulfills the projected population's needs but also ensures the sustainable development of the entire urban center.

Table 4-6: Proposed Low, Middle, and High-Income Housing Distribution

Category	Income Level (in 000)	Size (Marla)	Percentage	Units	Area (Marla)	Area (Acre)
Low Income	15,000 – 50,000	5 Marla	64%	15,064	75,318	471
Middle Income	50,001 – 100,000	7 Marla	26%	6,120	42,837	268
High Income	100,001 and above	10 Marla	10%	2,354	23,537	147
Grand Total				**23,537**	**141,693**	**886**

Source: Consultant Calculation

4.2.5 Infill Development

Infill development refers to the construction of new buildings or structures in vacant land between existing structures in the existing urban areas. It aims to make better use of existing urban spaces and increase density in areas, rather than expanding into greenfield sites. Infill development can take many forms, including the redevelopment of brownfield sites, the conversion of industrial or commercial spaces into residential units, and the construction of new buildings on vacant lots. In the existing built-up areas, the vacant land parcels should be developed first according to the demand to promote the compact urban form. There are 114 acres of land available in the Khar Urban Center for infill development.

The details of the proposed infill development are shown in the **Table 4-7** below:

Table 4-7: Proposed Infill Development in Khar Urban Centre

S.No	Land Uses	Area (Acres)
1	Proposed Blue Area	81.14
2	Proposed Residential	30.42
3	Proposed Educational	1.91
4	Proposed Public Building	0.25
5	Proposed Recreational	0.20
6	Proposed Green Belt	0.07

7	Proposed Managed Forest	0.07
8	Proposed Graveyard	0.05
Total		**114.09**

4.2.6 Intensification

Population intensification refers to the process of increasing the density of the human population in a specific geographic area.

Some of the benefits of population intensification include:

Economic growth: A dense population can lead to increased economic activity and improved access to markets, which can drive economic growth.

Improved access to services and infrastructure: With increased population density, there is a greater demand for services and infrastructure such as hospitals, schools, transportation systems, etc., which can lead to their improvement and expansion.

Cultural diversity: Concentrated populations can lead to increased cultural diversity, which can bring new ideas, perspectives, and ways of life to an area.

Job opportunities: As the population grows and the economy expands, there may be more job opportunities available.

Efficient use of land: By increasing the density of populations, more people can be accommodated in a smaller area, making more efficient use of available land.

Access to resources: With increased population density, there may be a better distribution of resources, leading to improved access for all.

In Khar Urban Centre, the minimum to maximum population per square kilometer ranges from 293 persons to 8608 persons per square kilometer. Similarly, there are 1-6 persons per acre are categorized as low density, 6-14 persons per acre in medium, and 14-35 persons per acre in high population density areas. Khar's main localities such as Main Khar Bazar and Inayat Kali due to commercialization and basic facilities have more population density as compared to other surrounding areas in the city.

Overall, the population density in Khar Urban Centre reflects the varying degree of urbanization intensity in the city and highlights the need for careful planning to ensure that urban development is sustainable and equitable for all residents.

The existing population within the proposed neighborhoods is 42,330, while the proposed population to be accommodated within these neighborhoods will be 167,092. The average population density is currently 20.8 persons per acre, while the proposed density will be 77.6 persons per acre.

Through compact urban form in the inner city and infill development, intensification will be promoted. This will help to accommodate the maximum population in the city. The vertical development will also encourage the intensification of the city.

4.2.7 Redevelopment

Redevelopment can be used to revitalize decaying or underutilized properties, improve the quality of life in communities, and stimulate economic growth. It can also refer to the rehabilitation or renovation of existing structures to bring them up to current standards. In particular, the redevelopment of existing dangerous and poorly-conditioned buildings are a priority, as it can improve the safety and livability of the community. Following the master plan's designated zones, there are 65 dangerous buildings and 967 buildings in poor condition that can be redeveloped according to the proposed land use at the neighborhood level. The TMA will have to declare these buildings as dangerous and inform the owners of these buildings to demolish the buildings. The reconstruction of these structures should adhere to the building bylaws of the TMA, and the use of local materials and natural resources should be encouraged to create a balanced and sustainable urban center.

4.2.8 Housing Location Strategy

The proposed housing strategy incorporates specific approaches for the development of new housing areas in the form of neighborhood units, up-gradation, and densification through the redevelopment of existing housing areas including unplanned settlements, and housing in the farm housing areas located in the agricultural areas preserved in the Khar Urban Centre. Looking at the possible distribution of housing types, the future requirement of housing provision will be dominated by small dwelling units. Because of the limited availability of land and increased requirement for housing, large-sized residential development shall be discouraged.

It is proposed to adopt a multi-pronged housing strategy for the provision of housing stock and delivery of serviced land, involving the private sector to a significant extent, government departments, etc. The overall responsibility for the provision of land and facilitation of adequate housing to meet the projected demand lies with the TMA/Local government in collaboration with Housing Department and other government agencies.

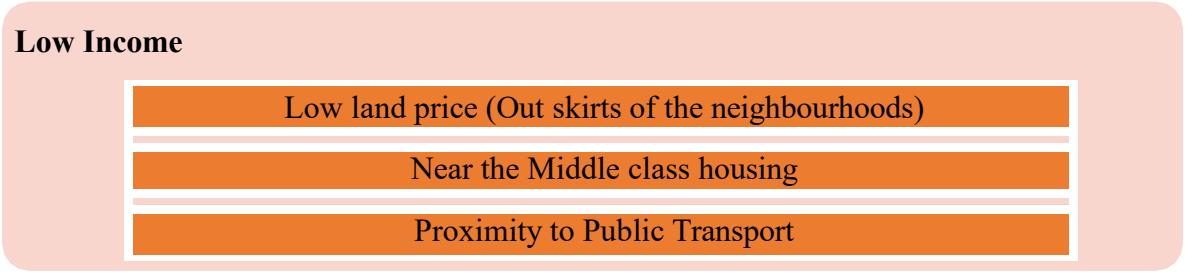
This Master Plan has been developed by keeping the following specific strategy for the residential; development.

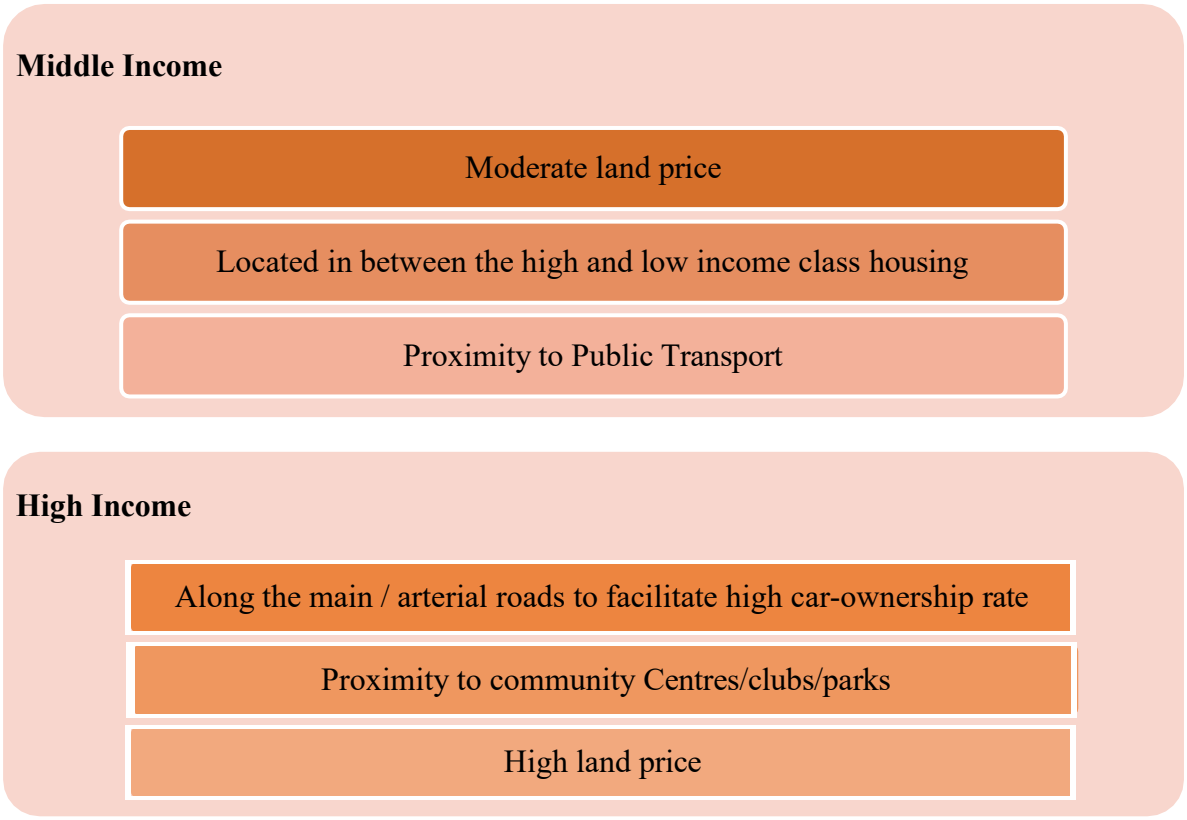
i) Determination of area requirement;

ii) Identification of suitable areas for housing development based on LSA and scenario development;

iii) Evolving the specific land use pattern and norms for new housing development in the form of neighborhood units;

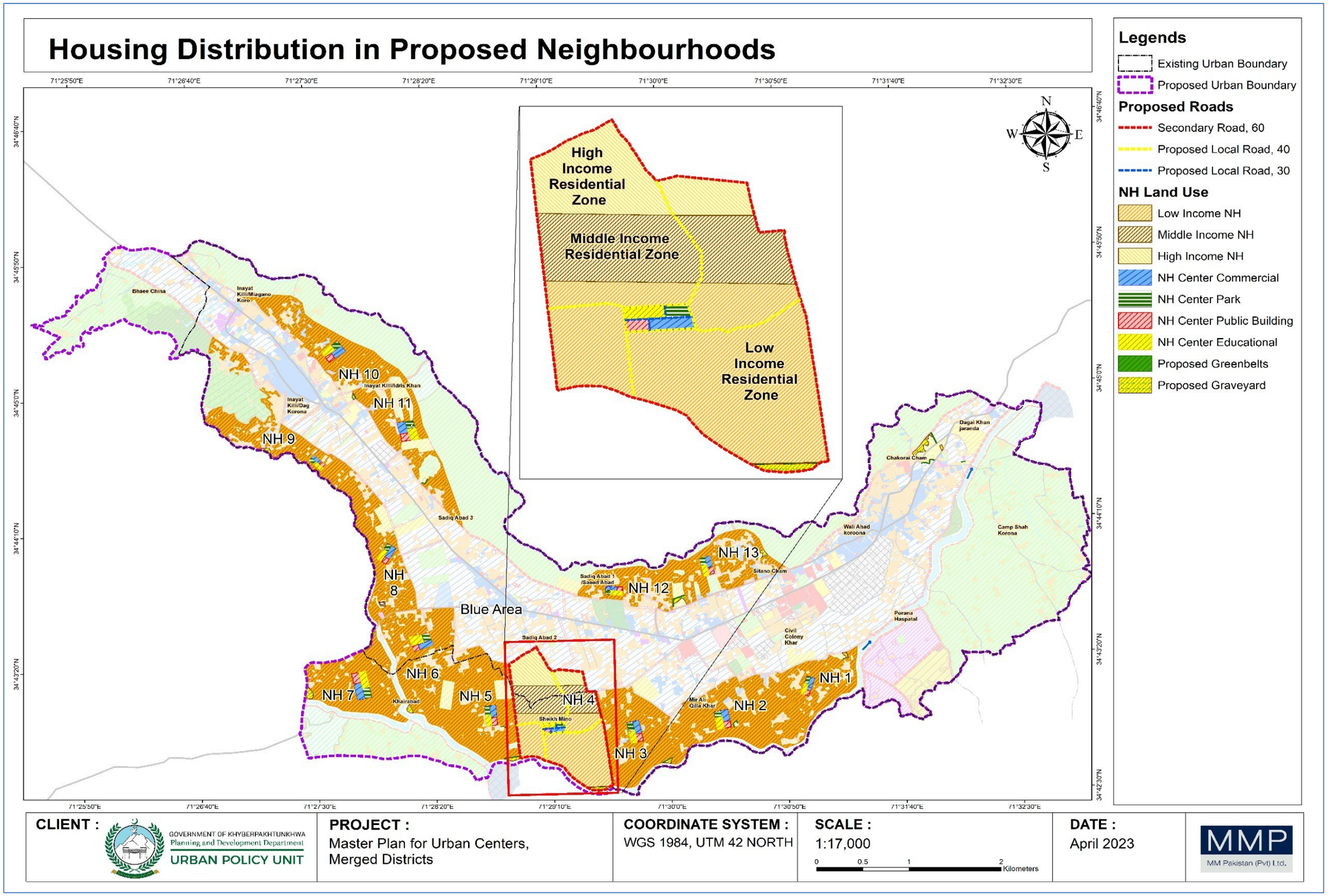
iv) Provision of integrated neighborhood units to accommodate all income groups using the gradual mixing technique as described below:



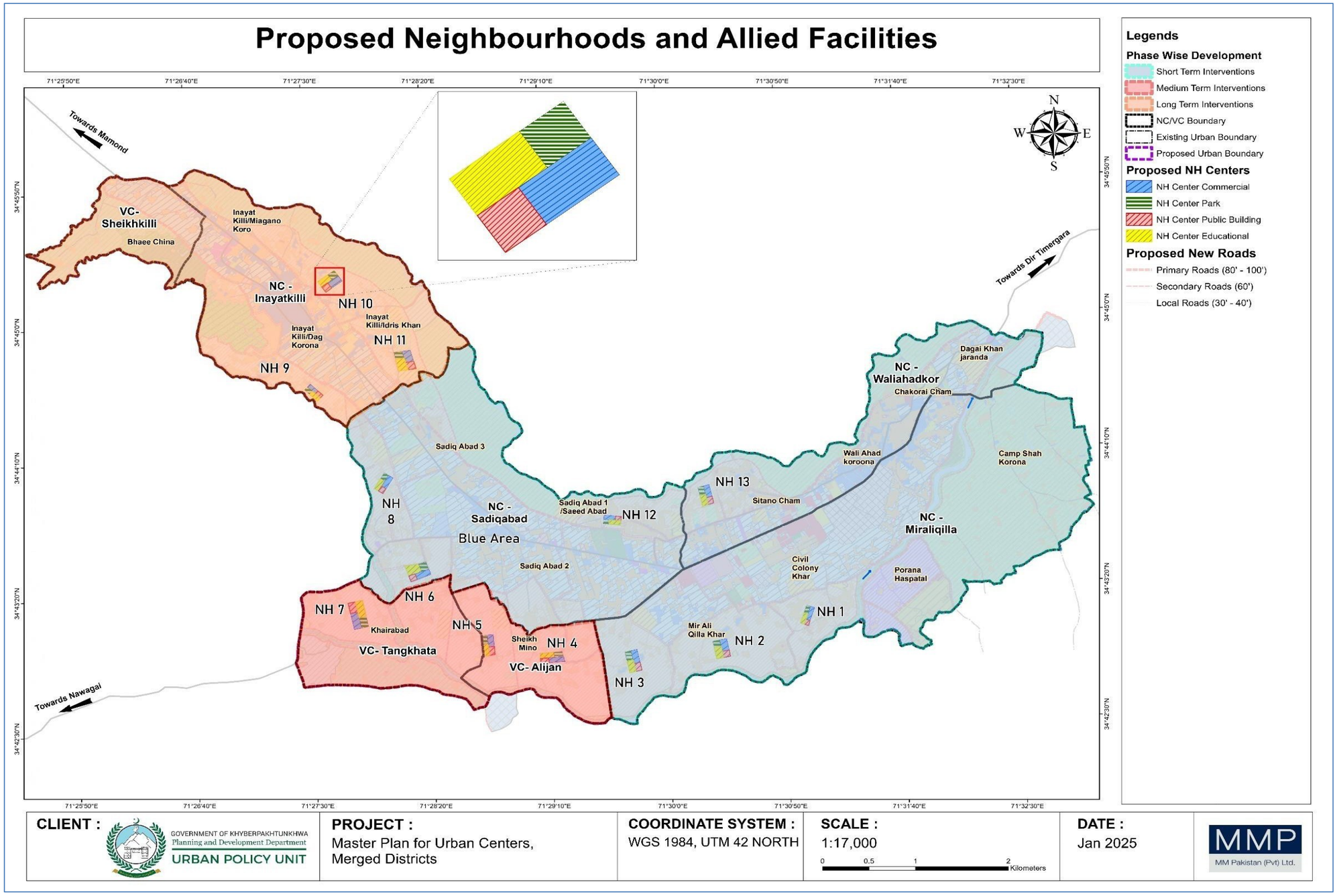


4.2.9 Housing Distribution in Neighbourhoods

The low, middle, and high-income housing distribution refers to the allocation of housing units/ plots based on the income level of individuals and families. The distribution of low, middle, and high-income housing can have a significant impact on the socioeconomic landscape of a community. By ensuring that all income levels are represented in a given area, communities can promote greater diversity and social cohesion. The allocation of these classes within the neighborhood is shown in the Map below.



Map 4-1: Housing Distribution in Proposed Neighborhood



Map 4-2: Proposed Neighborhood Centre & Allied Facilities

4.3 Existing and Proposed Neighborhoods Population

To address the future population needs within the proposed neighborhoods, a total of 13 new neighborhoods have been planned. Details of population distribution and accommodation are presented in **Table 4-8.**

Table 4-8: Existing and Future Population in Proposed Neighbourhood

Existing Population Within Neighborhoods				Proposed Population			
NHs	Land Use	Area	Existing Population	Land Use	Area	Future Population	Total Population
NH 1	Residential	24	2926	Residential	55	6591	9517
NH 2	Residential	30	4240	Residential	111	13362	17602
NH 3	Residential	18	2078	Residential	90	10860	12938
NH 4	Residential	42	3880	Residential	154	18443	22323
NH 5	Residential	16	1505	Residential	102	12232	13737
NH 6	Residential	36	3540	Residential	91	10947	14487
NH 7	Residential	11	1293	Residential	81	9750	11043
NH 8	Residential	24	2544	Residential	64	7620	10164
NH 9	Residential	50	4537	Residential	65	7808	12345
NH 10	Residential	28	3752	Residential	74	8829	12581
NH 11	Residential	19	2883	Residential	64	7704	10587
NH 12	Residential	34	4282	Residential	42	5096	9378
NH 13	Residential	36	4876	Residential	46	5520	10396
Grand Total		**368**	**42336**		**1040**	**124763**	**167099**

The population estimates are based on an average household size of 8.85. Currently, the existing neighborhoods house a population of 42,336. The new neighborhoods will accommodate an additional population of 124,763, bringing the total population within these neighborhoods to 167,099. However, the remaining future population of 92,463 will be adjusted outside the planned neighborhoods.

Of this remaining population, 80,590 resides in existing residential areas located within the designated "blue area" and farmhouses situated in preserved agricultural zones. These existing residential areas will undergo improvements through a dedicated Slum Improvement Action Plan, which includes street paving and the provision of essential infrastructure services.

The remaining future population of 11,873 will be housed in newly developed mixed-use and multistory walk-up apartment buildings within the blue area through infilling and densification.

To accommodate the future population within the proposed neighborhoods, 13 new neighborhoods have been planned. Detailed population distribution and accommodation are provided in **Table 4-8**. The population of existing and proposed neighborhoods was determined based on the average household size of 8.85. The existing population within the neighborhoods is 42,336, while the additional population of 124,763 will be accommodated within these neighborhoods. The overall population of these neighborhoods will be 167,099, while the remaining future population of 92,463 will be adjusted outside the planned neighborhoods. Out of this a population of 80,590 already lives within the existing residential areas located in the blue area and the existing farmhouses located in the preserved agriculture area of the city. These residential areas will be improved through Action Plan for Slum

Improvement. The improvement package will include the pavement of streets and the provision of infrastructure services in these areas. The remaining future population of 11,873 persons will be accommodated in the new mixed use and multistorey apartment buildings located in the blue area and the extension of farmhouses located in the preserved agricultural land.

The proposed land use plan for Khar Urban Centre includes a significant increase in population density in the planned neighborhoods. Currently, the existing net density of each neighborhood is 21 persons per acre. However, under the proposed plan, the average density will become 77 persons per acre.

These details are presented in **Table 4-9**, which provides a clear comparison of the existing and proposed densities for each neighborhood. It is important to note that this increase in density is being implemented to promote efficient land use and create sustainable, self-sufficient neighborhoods that can meet the needs of the growing population.

The table will be used in the planning and development of each neighborhood to ensure that the proposed density is achieved in a way that promotes livability, sustainability, and high quality of life for residents. By carefully managing the allocation of land use and infrastructure, the Khar Urban Centre can successfully accommodate a growing population without sacrificing the quality of life of its residents.

Table 4-9: Existing and Future Net Density of Proposed Neighbourhoods

Sr. No	Name	Area	Existing Population	Existing Density	Total Pop	Future Density
1	NH 1	116	2,925	25	9,517	82
2	NH 2	209	4,239	20	17,601	84
3	NH 3	163	2,077	13	12,937	79
4	NH 4	280	3,879	14	22,322	80
5	NH 5	187	1,505	8	13,737	74
6	NH 6	196	3,540	18	14,487	74
7	NH 7	148	1,293	9	11,043	75
8	NH 8	140	2,544	18	10,164	73
9	NH 9	160	4,536	28	12,344	77
10	NH 10	158	3,752	24	12,581	80
11	NH 11	155	2,883	19	10,587	68
12	NH 12	115	4,282	37	9,378	82
13	NH 13	129	4,875	38	10,395	81
Grand Total		2156	42,330	--	167,092	--

Source: Consultant Findings

4.4 Commercial

In Khar Urban Centre, there are two major commercial areas and two mini-commercial areas as given below:

i) Khar City's main Bazar

ii) Inayat Kalli Bazar

iii) Phatak Bazar (Mini Commercial Areas)

iv) Shande Morr Bazar (Mini Commercial Areas)

All these areas provide diversified types of commercial services to the community. However, all of these areas are developed and still developing in an ill-planned manner, which creates problems in Khar Urban Centre.

Commerce and trade are a major income and employment-generating sector, and a large proportion of the male population of all age groups directly or indirectly depends on small-scale commerce and trade. To provide commercial areas of planned and organized form, the need assessment is important for this sector as given below:

4.4.1 Existing Gap Analysis of Commercial Area

The current commercial area gap has been calculated as below:

- Urban Population (2022): 122920
- Commercial Area required (@0.5 acres/1000 persons)[7]= 61.46 acres
- The current area under commercial land use: = 286 acres
- Commercial area Surplus: 286-61.46=224.54 acres

It is clear from the above that there is too much commercialization converting land into commercial use creating problems of congestion. The area required by the end of the plan period would be 130 acres, while the current area is far more than the area required for the plan period.

4.4.2 Future Commercial Area Requirement

The below table shows the urban population and the corresponding commercial area required based on the NRM (National Reference Manual, 1985) Standard for two time periods, 2022 and 2040. The NRM, 1985 Standard determines that an urban area requires 0.5 acres of commercial area for every 1000 persons.

Therefore, according to the NRM, 1985 Standard, the urban population and commercial area requirements are as follows:

- In 2022, with an urban population of 122,920, the commercial area required is 61.46 acres.
- In 2040, with an urban population of 259,562, the commercial area required is 130 acres.
- The additional urban population between 2022 and 2040, which is 136,642, requires an additional 68.3 acres of commercial area.

Table 4-10: Commercial Area Required in Khar Urban Centre (2022-40)

Year/Period	Urban Population	Commercial Area Required @0.5 acres/1000 persons)[8]
2022	122,920	61.46 Acres
2040	259,562	130 Acres

[7] Source: Environment and Urban Affairs Division, Govt. of Pakistan, National Reference Manual on Planning and Infrastructure Standards, Page 307, Table 10.4 (adapted)
[8]Source: Environment and Urban Affairs Division, Govt. of Pakistan, National Reference Manual on Planning and Infrastructure Standards, Page 307, Table 10.4 (adapted).

Additional Urban Population 2022-2040	136,642	68.3 Acres

Consultant Calculation

The required area is less than the available area already used for commercial purposes.

However, a wholesale market is proposed near Sadiqabad Pattak. The market will include wholesale markets specializing in the bulk disposal of grains, fruits, vegetables, and meats. Furthermore, the market will feature large-scale warehousing and storage facilities.

The proposed wholesale market in Sadiqabad Pattak will cover an area of 10 acres. This market will consist of multiple wholesale markets, each catering to the bulk disposal of specific products such as grains, fruits, vegetables, and meats. The purpose of a wholesale market is to facilitate the trade of goods in large quantities, allowing retailers, restaurants, and other businesses to purchase these items in bulk.

In addition to the wholesale market areas, there will be the storage and management of inventory, ensuring a steady supply of products for wholesalers and easy access for buyers.

By incorporating wholesale markets and extensive storage capabilities, the proposed wholesale market in Sadiqabad Pattak aims to create a centralized hub for efficient trade, benefiting both suppliers and buyers in the region.

4.4.3 Proposed Blue Area of Khar Urban Centre

The proposed blue area of Khar Urban Centre will be an administrative, commercial, civic, and mixed-use zone. It also contains the existing commercial, administrative, civic and residential areas. The proposed blue area zone will cater to all kinds of clientele and attract city and local trade. This zone (Blue Area) is in a linear form and is separated from the rest of the city by provision of bypass roads on both sides. The major permissible uses within the blue area are given in the **Table 4-11** below;

Table 4-11: Major Permitted/ Permissible Land Use in Blue Area/CBD

Major Use	Land Use (Types)	Permitted/Permissible Uses
Blue Area	**Administrative**	DC Office
		AC Office
		TMA Office
		Local Government Office
		Judiciary Office
		Fire Brigade Office
		Rescue Office
		Police Office
		Post office
		Other Government Office
		Private Offices
	Civic	Community Centre
		Museum
		Clubs

Major Use	Land Use (Types)	Permitted/Permissible Uses
		Gyms
		Open spaces
		Mosques
		wedding Hall
		Other Civic Uses
	Commercial	Whole Sale Markets
		Retail Markets
		Ware Houses
		Hardware Markets
		Other Commercial Use
	Mixed Use Residential	Commercial + Offices + Residential + Parking

4.4.4 Land use of the Proposed Central Business District

The proposed Central Business District (CBD) is in the form of a Linear Blue Area to make the future Khar Urban Area as a Linear Dynapolis and has both existing and proposed land uses. The existing land use categories refer to the current state of land use in the area, while the proposed land use categories represent the intended land use changes that are planned for the future.

The existing land use categories include commercial, educational, graveyard, health, industrial, public buildings, recreational, religious buildings, residential, streets/roads, vacant land, and water bodies. The proposed land use categories include mixed-use, public building, recreational, educational, health (extension), and roads. These proposed land use categories indicate the intended changes in land use that are planned for the future. For instance, the proposed mixed-use land use category suggests that the area would be utilized for multiple purposes, such as commercial, residential, and recreational activities. **Table 4-12** provides a detailed breakdown of the current and proposed land uses in the Central Business District (CBD). The existing land use categories represent the current use of land in the area, while the proposed land use categories show the planned changes that are intended to occur in the future.

Table 4-12: CBD Existing and Proposed Land Use of Khar Urban Centre

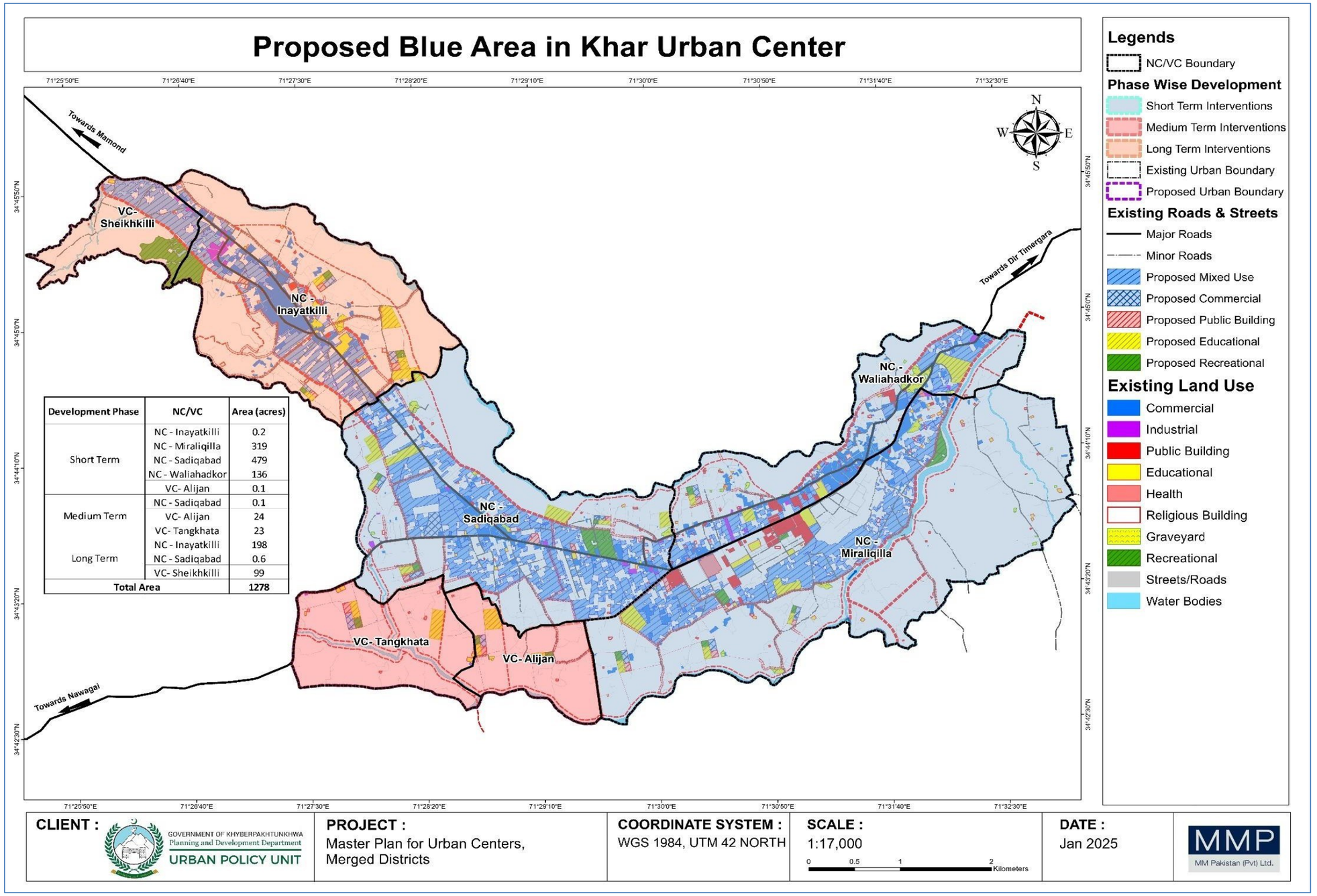
Land Use		Area (Acre)	%
Existing	Commercial	260	10.7%
	Educational	36	1.5%
	Graveyard	20	0.8%
	Health	15	0.6%
	Industrial	22	0.9%
	Public Buildings	60	2.5%
	Recreational	15	0.6%
	Religious Buildings	12	0.5%
	Residential	535	22.1%
	Streets/Roads	161	6.6%
	Vacant	2	0.06%
	Water Bodies	10	0.4%
Proposed	Proposed Mixed Use	1027	42.5%

Land Use		Area (Acre)	%
	Proposed commercial (Wholesale Market)	10	0.4%
	Proposed Public Building	7	0.3%
	Proposed Recreational	71	2.9%
	Proposed Educational	119	4.9%
	Proposed Health (Extension)	14	0.6%
	Proposed Roads	26	1.1%
Grand Total		**2420**	**100.0%**

4.4.5 Neighbourhoods Commercial Centers

The proposed neighborhood commercial areas in each neighborhood center aim to provide planned growth and easy convenience for shopping. The commercial areas consist of five key features, including a park in the center of the commercial center to balance out the congestion and production of CO2. Additionally, a parking area inside the center is provided, along with covered walkways for pedestrian movements. Showroom spaces should be made mandatory for showcasing goods and circulation space for customers along with godown spaces for shops provide added storage capacity. These features ensure a well-planned and convenient shopping experience for the community and visitors alike. The proposed neighborhoods are designed on the self-sufficient concept. This area is proposed based on the following criteria:

i) The commercial area is placed near the geographical center of the neighborhood.
ii) The commercial area is located on the vacant land available in (or near) the center of the neighborhood.
iii) The neighborhood center is located preferably at a walking distance from the neighborhood residential areas.



Map 4-3: Proposed Commercial (Blue Area)

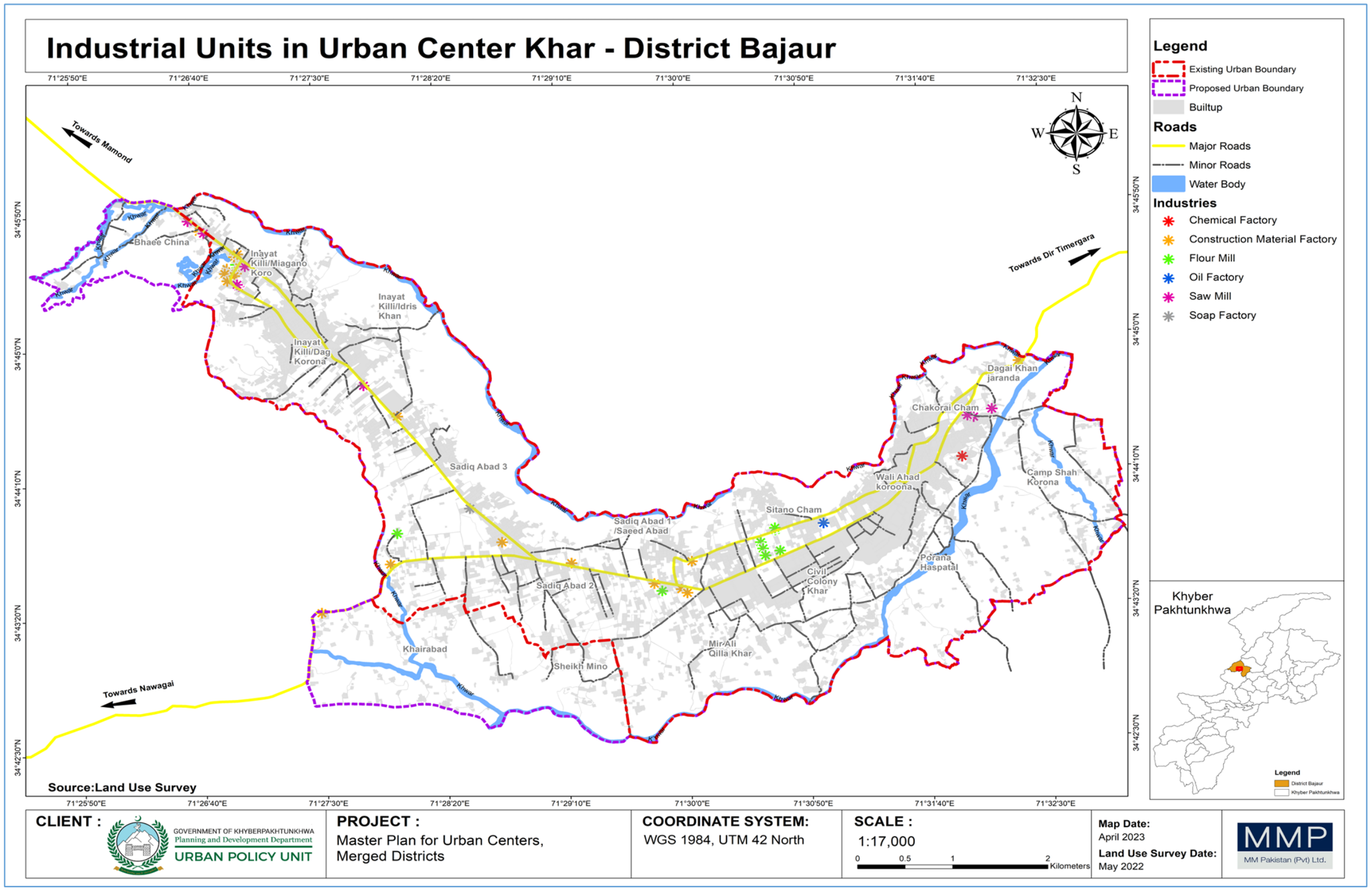
4.5 Industrial

In Khar Urban Centre, there are 46 different types of industries and factory units covering only 0.34% of the land, serving as a source of livelihood. A detailed survey was conducted for each unit of industry located in Khar Urban Centre, and the major types of industrial units that exist are woodworking/furniture, metal works (steel and iron related industry, making gates, doors, windows), cement industry-making construction materials (block maker, brick maker), marble factories, and mills.

The major types of industrial units that exist in Khar Urban Centre are;

- Woodworking / Furniture
- Metalworks (steel and iron related industry making Gates, Door, windows)
- Cement industry making construction Materials (Blocks Maker, Brick Maker)
- Marble Factories
- Mills

Unfortunately, the city has been developed haphazardly without any delineation of land use zones, leading to the industrial sector being developed within residential areas and city centers. This has resulted in serious issues such as congestion, traffic problems, environmental pollution, and social issues. Map 5-4 shows some of the important types of industries in the city



Map 4-4: Existing Industrial Units in Khar Urban Center

4.5.1 Current Industrial Area Gap

The current industrial area gap has been calculated as below:

- City Population (2022): 122920
- Industrial Labor Force (@ 2.7 % of total population): 3318
- Industrial area required (@50 workers per acre) = 67 Acres
- Current Industrial area in the city: = 24 Acres
- Industrial area deficiency: 67-24= 43 Acres

It is evident from the above analysis that there is a current shortage of 43 acres of industrial area. To fulfill the current deficiency, an additional 43 acres of industrial area is required. It is important to note that the current industrial area will be excluded from the required industrial areas in each period.

By 2025, the total industrial area required will be 52 acres, after excluding the current area. This requirement is expected to increase to 70 acres by 2030. In total, 118 acres industrial area will be required up to the plan period of 2040.

The table below shows a detailed standard base analysis for industrial requirements:

Table 4-13: Industrial Land Requirements for Master Plan Period 2022-40

Land use		Industries
Standards	Detailed	@ 2.7 % of Pop / 50 ppl per acre
	Population (%)	2.7%
	Area	0.02
	Existing Acre	24.00
	Existing Units.	46
	Existing %	0.34%
	Existing Demand (Acres)	67
Requirement	Gap 2022	43 (excluding current area)
	2025	52 (excluding current area)
	2030	70 (excluding current area)
	2035	91 (excluding current area)
	2040	118 (excluding current area)

4.5.2 Future Industrial Area Requirement

The industrial area requirement for Khar Urban Centre has been estimated based on the projected population for the plan period (2022-2040). The expected industrial workforce during this period has been calculated using a participation rate of 2.7% and the standard of 50 industrial workers per acre. The findings are summarized in the table below, indicating that a total of 118 acres of land will be needed for industrial purposes over the entire plan period (2022-2040).

It should be noted that this calculation takes into account the anticipated growth of the urban center and the corresponding demand for industrial facilities. Proper planning and allocation of land for industrial

purposes will not only facilitate economic growth but also help to mitigate issues such as traffic congestion, environmental pollution, and social problems associated with haphazard industrial development within residential and city center areas.

4.5.3 Proposed Industrial Estate

In order to provide better services, facilities, and industrial agglomeration the industrial site is selected based on the multiple criteria analysis. The assessment of economic and environmental aspects of the land and industrial facilities were considered. The proposed Industrial estate area in the Master Plan is 118 acres.

The land is allocated keeping the following points on focus.

- According to the development guidelines, industries should not be developed within 1000 meters of a residential zone. However, in the case of Khar Urban Centre, where residential development follows an uneven pattern, a buffer of at least 500 meters is prioritized for industrial development.
- The volumetric wastes produced by industries are discharged untreated into surrounding water bodies; thus, cleanliness of drinking water gets compromised by dangerous contaminants discharged by industry. Consequently, industrial development is deemed beneficial for the areas near the downstream.
- The industrial site is selected based on the wind direction. The leeward side is selected as the most suitable area to minimize pollution due to industrial development.
- Instead of allocating industries around other land uses, it has been determined that vacant/undeveloped land is optimal for industrial development. Thus, both the reserved agriculture and the viability of the local community could be maintained.

4.5.4 Khar Industrial Estate

In order to address the industrial area needs of the Khar Urban Centre and improve service facilities for local industries, the Master Plan has proposed the development of an industrial estate on the southeast side of the city. This estate will cover a total area of 119 acres and will provide a dedicated space for the clustering of industries in the city, allowing for the efficient utilization of resources and the promotion of economic growth. By providing a centralized location for industrial development, the proposed industrial estate will help to support the growth and success of local businesses and contribute to the overall development of the Khar Urban Centre.

The proposed Industrial Estate is a key component of the city's master plan and is intended to support the growth and development of the city's economy. Located on the outskirts of the city, the Industrial Estate will provide a dedicated area for industrial and manufacturing activities, as well as related support services.

The Industrial Estate will be equipped with a range of amenities and infrastructure to support the needs of businesses and workers, including roads and transportation links, utilities and services, and access to skilled labor and other resources. The layout and design of the Industrial Estate should be carefully planned to minimize the impact on the surrounding environment and to ensure the safety and well-being of workers.

The Industrial Estate will be an important hub for economic activity, providing a range of benefits for the city and its residents. These benefits may include the creation of new jobs, the expansion of existing businesses, the attraction of new investment to the city, and the stimulation of economic growth and development.

Overall, the proposed Industrial Estate is an integral part of the city's master plan and will be a key contributor to the city's future prosperity and success.

4.5.5 Guidelines for Industrial Allocation

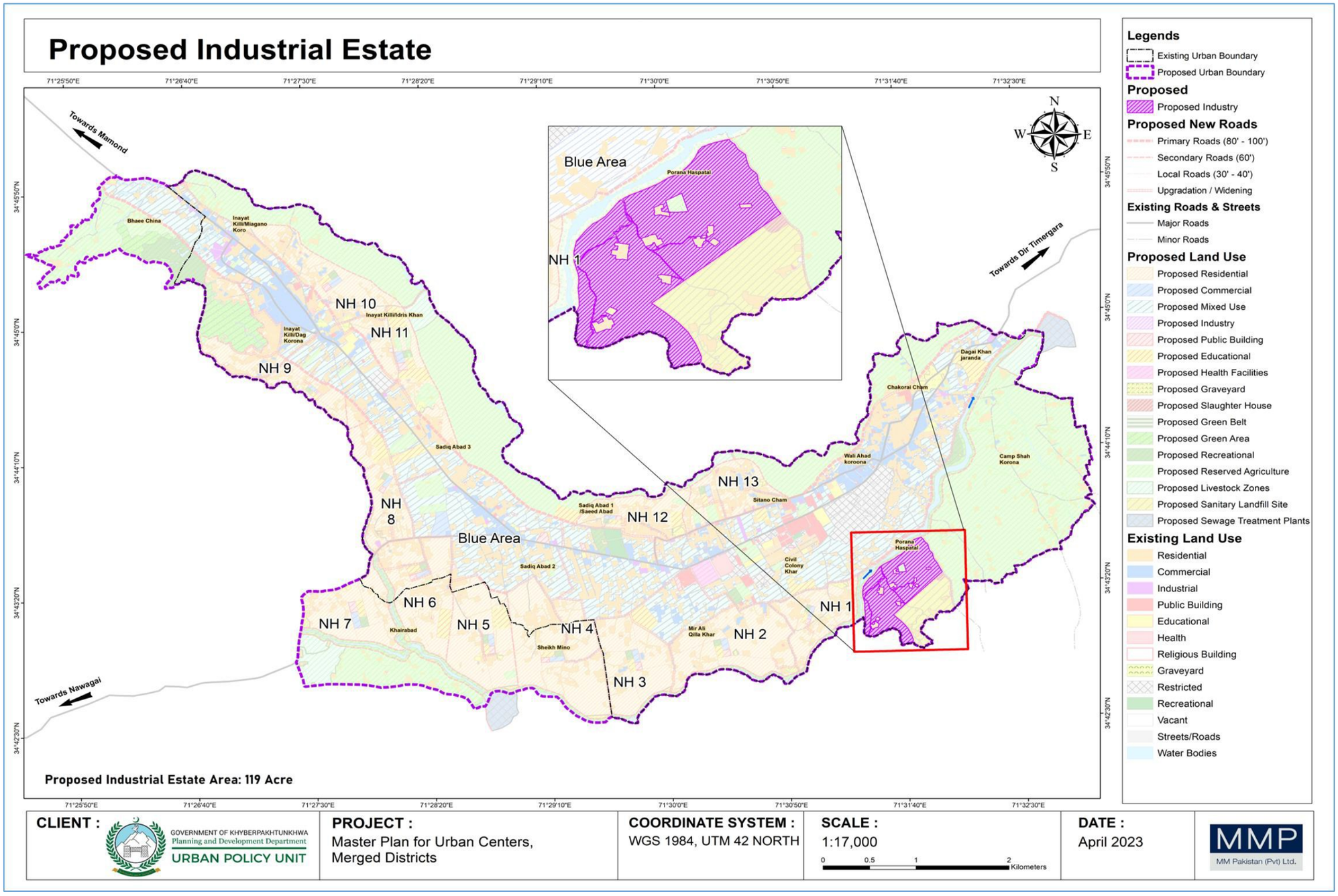
The multi-criteria analysis, as shown in chapter 3, used to determine suitable land parcels for industrial development. The selection was based on several key indicators, including:

i) The proposed Industrial estate is situated away from the city center to minimize the impact of industrial activities on the city and its residents.

ii) The selected area is mostly barren, which is ideal for industrial development, and it is also accessible from the city, making transportation of goods and materials more efficient.

iii) A leeward site was chosen to minimize the impact of air pollution from industrial activities on the city. This helps to ensure that the air quality in the city remains at an acceptable level, promoting a healthier environment for residents.

Overall, the use of the multi-Criteria analysis to select suitable land parcels for industrial development is a strategic approach that considers a range of factors to ensure that the site selected is suitable for its intended purpose while minimizing any negative impacts on the environment and the community



Map 4-5: Proposed Industrial Estate

4.6 Education

4.6.1 Existing Education facilities

Educational institutions' data is collected from both District Education Office and field surveys. District Education Office is responsible for maintaining educational records and statistics, while field surveys are conducted to collect additional information and to verify the accuracy of the data collected from the District Education Office.

The education institutions have been categorized based on the level of education they provide namely primary, middle, high, and higher secondary schools, colleges, polytechnic institutes, and religious institutes.

Table 4-14 shows that there are 15 primary schools for boys and 12 primary schools for girls in Khar Urban Centre. There are 5 middle schools for boys and only 1 middle school for girls. Similarly, there are 5 high schools for boys and 2 high schools for girls. There is one higher secondary school each for boys and girls, along with one college and one polytechnic institute, which provide education to both boys and girls.

Furthermore, there are 8 religious institutes in Khar Urban Centre, teaching religious education to male and female.

Table 4-14: Education facilities in Khar Urban Centre, 2022

Sr. No	Education institutions	Boys	Girls
1	Primary Schools	15	12
2	Middle Schools	5	1
3	High Schools	5	2
4	Higher Secondary Schools	1	1
5	College	1	1
6	Polytechnic Institute	1	--
7	Religious Institutes	8	4

Source: MMP Master Planning Survey of Khar Urban Centre 2022

According to the population projection and the standards outlined in the National Reference Manual (NRM) for the provision of education institutions, it has been revealed that the existing institutes in Khar Urban Centre are not meeting the required standards.

Currently, there is a significant deficit in the number of primary schools for both boys and girls. There are 15 schools in the city, where's 36 boys' primary schools are required, similarly, for girls, the required schools are 31 and only 12 are currently serving the population. The boys' and girls' middle schools are deficient 26 schools for boys and 06 for girls are required to serve the current population. The high schools are also in deficit 05 for boys and 08 numbers of schools for girls are required in 2022. The existing high secondary schools are 01 for boys and 01 for girls, while 03 more are required for boys and 01 for girls to serve the current population. There is a one-degree college for boys in the vicinity and only one girl college is available in Khar Urban Centre.

In the future requirements up to the plan period of 2040, the population projection shows demand for educational institutes is also determined through population projection and standards provided in NRM, 1985. The primary schools required up to 2040 for boys are 93 and for girls are 53. There are 60 middle schools for boys and 14 schools for girls that are required up to 2040. The future high schools demand boys are 17, and 20 for girls.

There is 09 higher secondary school for boys and 03 girls for higher secondary schools that will be required in 2040. It is estimated that 01 boy's degree college and 01 more girl's college will be required up to the planned period of 2040.

The following table shows the detail of existing deficiencies and future requirements in Khar Urban Centre.

Table 4-15: Primary Schools Requirement in Khar Urban Centre, 2022-2040

Year	Population	Boys			Girls		
		Primary School @2400 Pop	Deficiency	Area Req@ 1 acre	Primary School @4000 Pop	Deficiency	Area Req@ 1 acre
2022	122,920	51	36	36	31	19	19
2040	259,562	108	93	93	65	53	53

Source: MMP, Master Plan Analysis 2022

Table 4-16: Middle Schools Requirement in Khar Urban Centre, 2022-2040

Year	Population	Boys			Girls		
		Middle School @4000 Pop	Deficiency	Area Req@ 1.5 acre	Middle School @17000 Pop	Deficiency	Area Req@ 1.5 acre
2022	122,920	31	26	39	7	6	9
2040	259,562	65	60	90	15	14	21

Source: MMP, Master Plan Analysis 2022

Table 4-17: High Schools Requirement in Khar Urban Centre, 2022-2040

Year	Population	Boys			Girls		
		High School @ 12000 Pop	Current deficiency	Area Req@ 5 acre	High School @12000 Pop	Current deficiency	Area Req@ 5 acre
2022	122,920	10	5	25	10	8	40
2040	259,562	22	17	85	22	20	100

Source: MMP, Master Plan Analysis 2022

Table 4-18: Higher Secondary Schools Requirement in Khar Urban Centre, 2022-2040

Year	Population	Boys			Girls		
		HS School @30000 Pop	Current deficiency	Area Req@ 10 acre	HS School @70000 Pop	Current deficiency	Area Req@ 10 acre
2022	122920	4	3	30	2	1	10

Year	Population	Boys			Girls		
		HS School @30000 Pop	Current deficiency	Area Req@ 10 acre	HS School @70000 Pop	Current deficiency	Area Req@ 10 acre
2040	259562	9	8	80	4	3	30

Source: MMP, Master Plan Analysis 2022

Table 4-19: Colleges Requirement in Khar Urban Centre, 2022-2040

Year	Population	Boys			Girls		
		College @200000 Pop	Current deficiency	Area Req@ 15 acre	College @225000 Pop	Current deficiency	Area Req@ 15 acre
2022	122920	1	-	--	1	0	--
2040	259562	1	-	--	1	1	15

Source: MMP, Master Plan Analysis 2022

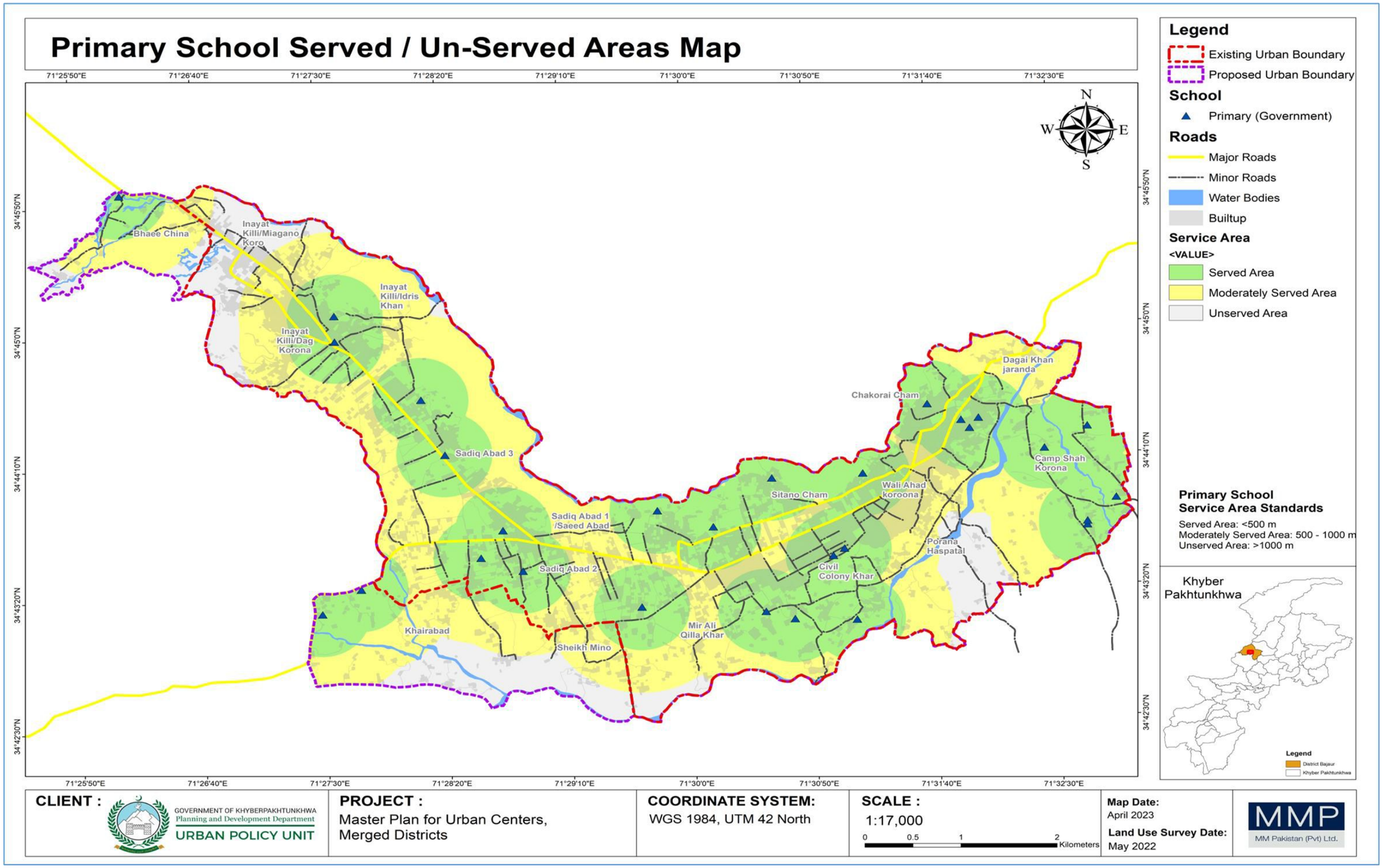
4.6.2 Education Policy Guidelines

In education policy in Khyber Pakhtunkhwa, area and school facilities provision is a critical aspect. The government of Khyber Pakhtunkhwa is committed to improving access to education for all children in the province, including those in remote and underserved areas. To achieve this goal, the government is working to provide adequate infrastructure and facilities in schools across the province.

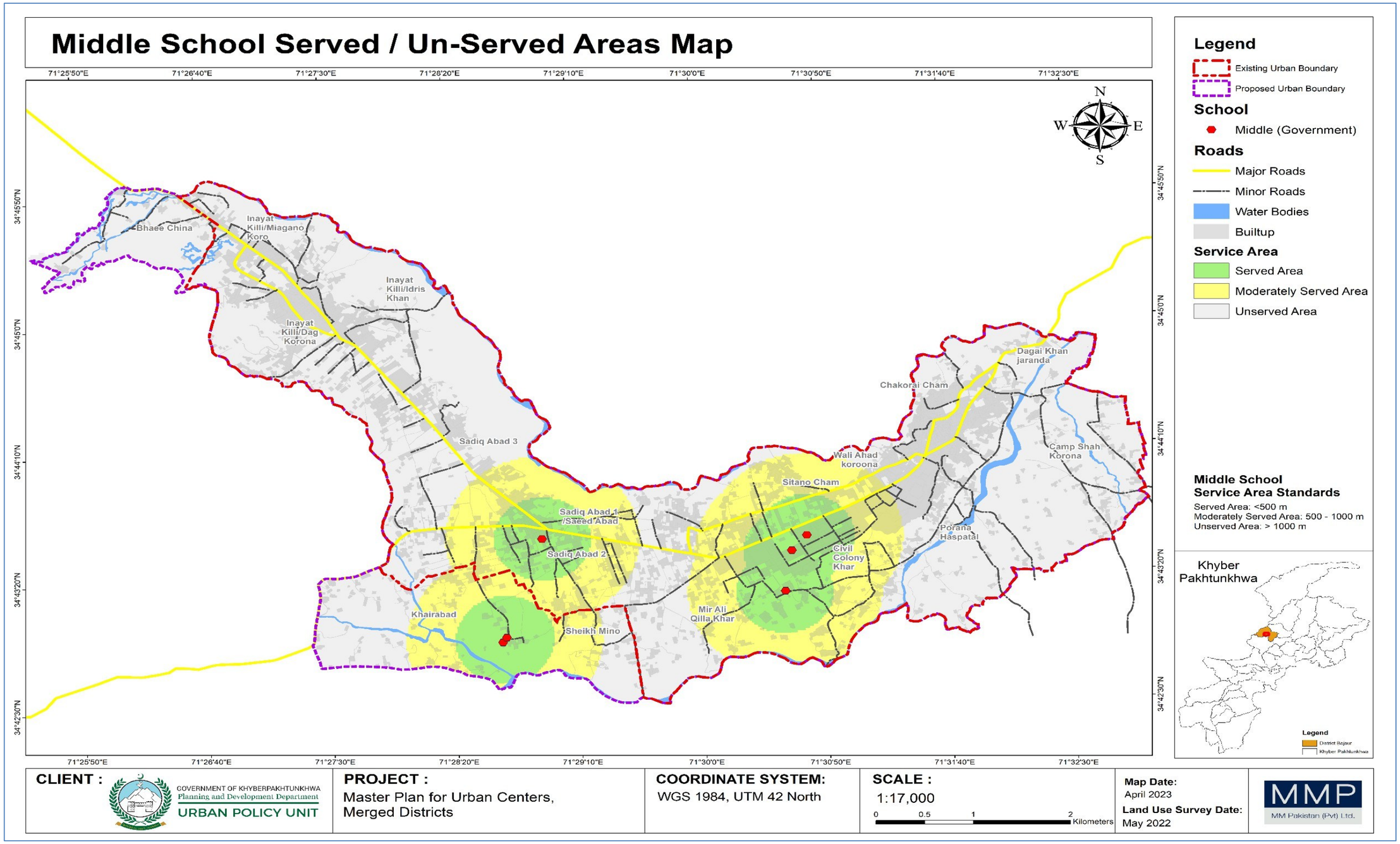
As per the Khyber Pakhtunkhwa education policy, the government is working to ensure that every child has access to a school within a reasonable distance from their home. The government aims to achieve this by increasing the number of schools in underserved areas and improving the quality of education in existing schools. The government is also working to provide adequate facilities in schools, including classrooms, libraries, laboratories, and playgrounds.

The government of Khyber Pakhtunkhwa is also committed to improving the quality of education in schools across the province. To achieve this goal, the government is working to enhance the skills and capacity of teachers through training and professional development programs. The government is also focusing on improving the curriculum and instructional materials used in schools. To support the education sector in Khyber Pakhtunkhwa, the government is increasing its budgetary allocation to education. The government is also working to attract private sector investment in education to complement its efforts.

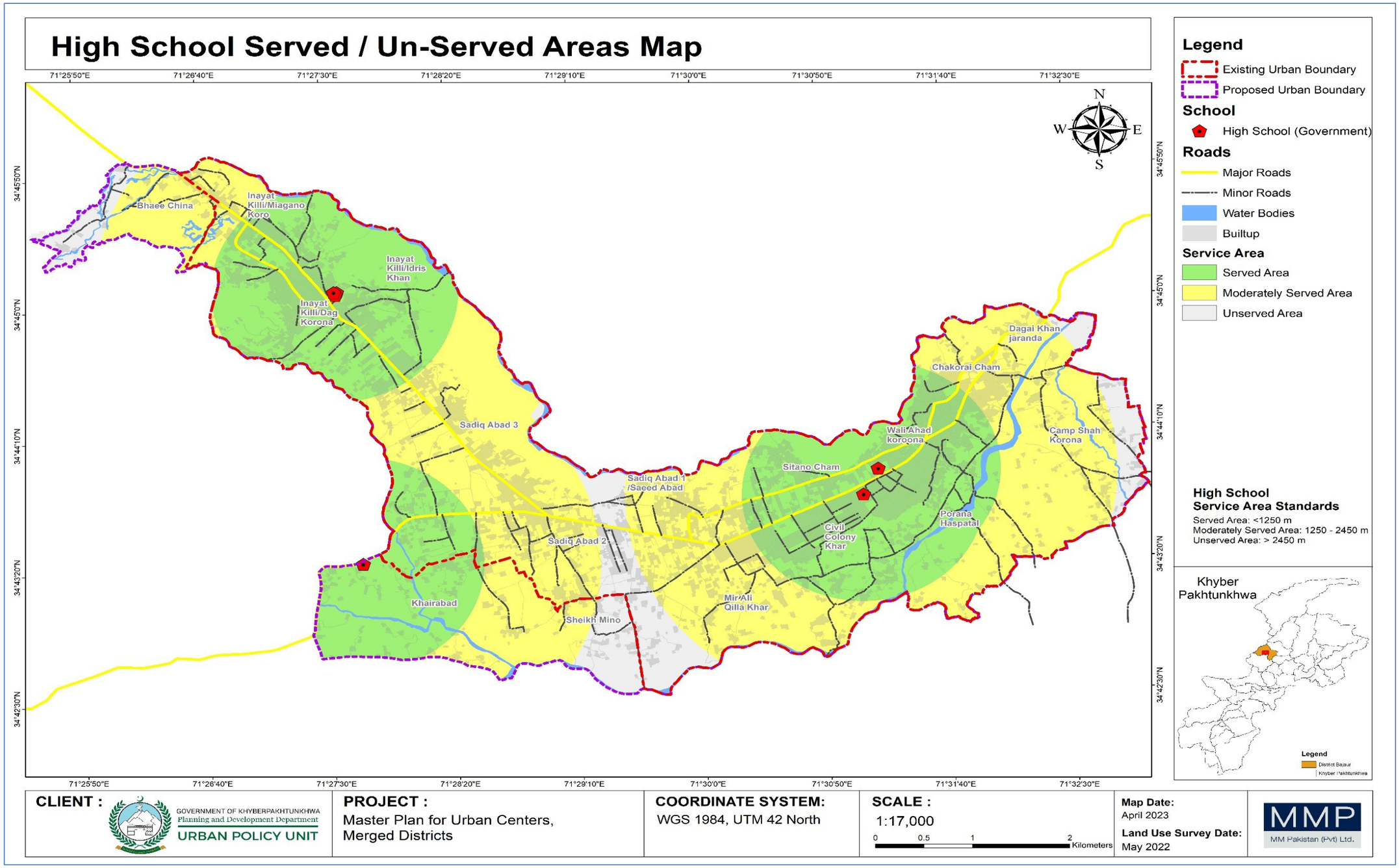
Overall, the area and school facilities provision are critical aspects of the education policy in Khyber Pakhtunkhwa. The government is committed to ensuring that all children in the province have access to quality education and is taking measures to achieve this goal.



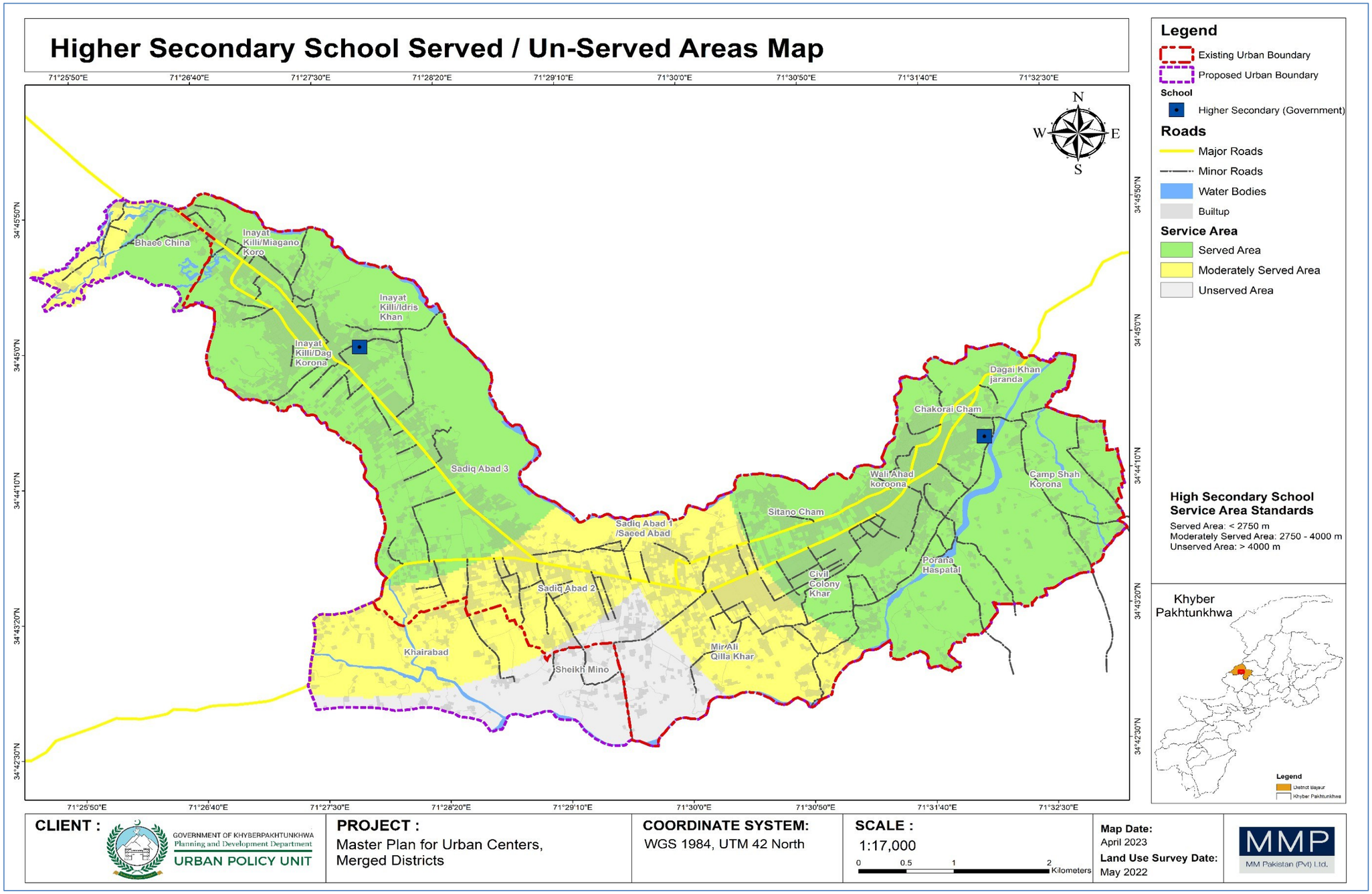
Map 4-6: Primary Schools Served/Unserved Areas



Map 4-7: Middle Schools Served/Unserved Areas



Map 4-8: High Schools Served/Unserved Areas



Map 4-9: Higher Secondary School Served/Unserved Areas

4.6.3 Proposed Education Facilities

The population-based analysis highlights a significant disparity in the current and required provisions of educational facilities. Furthermore, for the planning period of 2040, a considerable number of educational facilities will be required to cater to the future population. To address this, land has been allocated for primary and middle schools within the neighborhood centers. Thirteen (13) primary and middle schools are proposed, with seven for boys and six for girls in the neighbourhoods. High and higher secondary school facilities will be provided within the same building. The final master plan for Khar Urban Centre proposes five boys' and five girls' schools in the city, one college for boys, and one vocational training center for females. The private sector schools fulfil the remaining requirements of primary and high school education. Private education facilities will also be encouraged to make necessary arrangements for building facilities.

General Guidelines for Educational Institutes

The following are the general guidelines used for the allocation of educational institutes in the city:

- **Primary Schools and Middle Schools**
  - The Primary and Middle schools are proposed at the center of each neighborhood
  - Preferably at walking distance from the served neighborhood
  - The schools are near the neighborhood park
- **High and Higher Secondary Schools**
  - Ensured accessibility from the roads
  - Proximal to public transport
  - Allocated near green spaces
  - Each school will serve 2 to 4 neighborhoods
- **College & Vocational Training Centre**
  - Proximity to the Main Road
  - At the route of public Transport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GOVERNMENT OF KHYBERPAKHTUNKHWA


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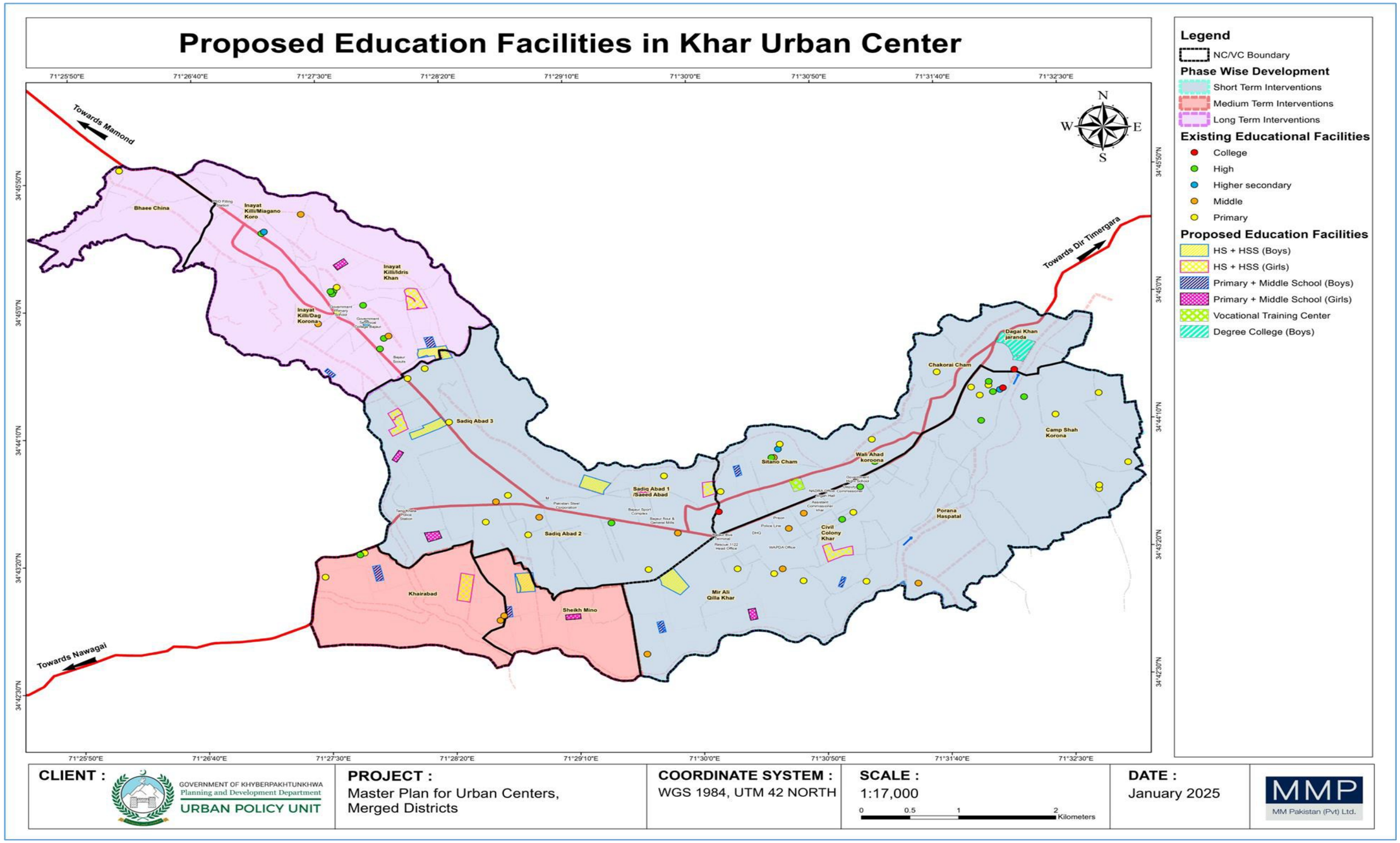
MM Pakistan (Pvt) Ltd.



Map 4-10: Proposed Educational Facilities in Khar Urban Centre

4.7 Health

Human health and safety are to be comprehensively protected and promoted in a society for the improved health and well-being of its inhabitants. In Khar Urban Centre, the health institutions are covering an area of 18 acres in Khar Urban Centre which is almost 0.3% of the total area of the city.

4.7.1 Existing Health facilities

Table 4-20: Current Health Facilities in Khar Urban Centre

Sr. No	Health facilities	Total number
1	Government Hospital (DHQ)	1
2	Government Dispensary/ MCH	5
3	Private Hospitals/Clinics	25

Source: MMP Master Planning Survey of Khar Urban Centre2022

4.7.2 Standards for Health Facilities

As per the long-term national goal identified in NRM, there should be 05 beds per 1000 population but owing to the scarcity of resources, NRM guides to a medium-term feasible target of 02 beds/per 1000 population. Master planning survey 2022 reveals that currently, almost 520 beds of facilities (including Government and private) are available in Khar Urban Centre corresponding with the NRM medium-term standard. Whereas the World Health Organization (WHO) standard for the provision of health care recommends 03 beds per 1000 people*9*.

Table 4-20: Number of Beds in Hospitals of Khar Urban Centre

Sr. No	Type of Hospital	Number of Beds
1	Government Hospital	403
2	Private Hospital	117
Total		**530**

Source: MMP Master Planning Survey of Khar Urban Centre 2022

4.7.3 Existing Beds in Hospitals

In Bajaur district, there is only one Type-A hospital located in the Khar Urban Centre. The bed strength of the hospital is 530, and it serves not only the population of Khar Urban Centre but also the entire district. The only District Head Quarter Hospital (DHQ) makes it difficult to serve the entire region. According to the NRM standard of 02 beds/1000, there are currently 246 beds required for Khar Urban Centre in 2022. The WHO standard is 03 beds per 1000 population. Using the same standards, there should be 369 beds available in the city. Based on the NRM standard, there will be 519 beds

[9] Pakistan's hospital bed density in 2010 was 0.6 beds per 1,000 people. http://data.worldbank.org/indicator/SH.MED.BEDS.ZS

200. E–Health Magazine " Low bed-to-population ratio",

requirement and WHO standard 779 beds are required in Khar Urban Centre. The detailed population and bed requirements are depicted in Table 4-21.

Table 4-21: Required No's of Beds in Hospitals of Khar Urban Centre

Year	Population	NRM[10]	WHO[11]
2022	122,920	246	369
2040	259,562	519	779

4.7.4 The Population-Doctor ratio in Khar Urban Centre

The ratio of doctors recommended for the population in developing countries like Pakistan by W.H.O. is 01 doctor for 1,000 populations. By following the WHO standard of 01 doctor per thousand populations the current and future requirement for the next 20 years is shown in Table 4-22.

Table 4-22: Population versus Doctors Ratio in Khar Urban Centre

Year	Population	Doctor required	Existing filled Posts	Required (2022-2040)
2022	122,920	123	73	50
2040	259,562	260	-	187
Doctors required for the Next 20 years			73	253

Source: Field survey and consultant estimation

4.7.5 Health Policy

The Khyber Pakhtunkhwa (KP) Health Policy aims to improve the health status of the people by providing access to quality healthcare services, ensuring equitable distribution of resources, and promoting a healthy lifestyle. The policy focuses on addressing the following key issues:

Strengthening the primary health care system: The policy aims to strengthen the primary health care system by improving infrastructure, ensuring the availability of essential medicines and equipment, and training and capacity building of health care providers.

Improving maternal and child health: The policy aims to reduce maternal and child mortality by increasing access to maternal and child health care services, promoting safe motherhood practices, and improving nutrition.

Addressing communicable diseases: The policy focuses on preventing and controlling communicable diseases such as tuberculosis, malaria, and hepatitis by strengthening disease surveillance systems, improving immunization coverage, and providing access to quality treatment.

Addressing non-communicable diseases: The policy aims to address non-communicable diseases such as diabetes, hypertension, and cancer by promoting healthy lifestyles, early detection, and treatment.

[10] National Reference Manual
[11] World Health Organization

Strengthening health governance: The policy focuses on strengthening health governance by improving regulatory mechanisms, enhancing accountability and transparency, and promoting community participation in decision-making.

To achieve these goals, the policy proposes several strategies such as increasing public investment in health, improving public-private partnerships, enhancing human resources for health, and ensuring the availability of essential medicines and technologies. Overall, the KP Health Policy seeks to improve the health and well-being of the people of Khyber Pakhtunkhwa by providing access to quality healthcare services and promoting healthy lifestyles.

4.7.6 Standard Provision of Health Facilities

The provision of adequate health facilities is essential for ensuring the well-being of a population. In Khyber Pakhtunkhwa, the government has made significant efforts to improve the healthcare system and increase access to health services. According to the KP Health Policy, there should be at least one basic health unit (BHU) for every 5,000 people in urban areas and every 3,000 people in rural areas. Similarly, there should be at least one Rural Health Centre (RHC) for every 25,000 people, and at least one Tehsil Headquarter Hospital (THQ) for every 500,000 people.

However, despite these targets, there is still a significant gap in the provision of health facilities in many areas of Khyber Pakhtunkhwa. According to a report by the Provincial Health Services Academy, more than 50% of the population of the province lacks access to basic health services.

To address these challenges, the government of Khyber Pakhtunkhwa has initiated various programs and policies to improve the healthcare system. One of the key initiatives is the establishment of new health facilities, particularly in rural areas.

In conclusion, while the government of Khyber Pakhtunkhwa has made significant efforts to improve the healthcare system, there is still a need to bridge the gap in the provision of health facilities, particularly in rural areas. It is essential to continue investing in the establishment of new health facilities to ensure the well-being of the population.

4.7.7 Proposed Health Facility

The current health facilities in the Khar Urban Centre are considered adequate to meet the health needs of its residents, as there is a District Head Quarter Hospital (DHQ) with 403 beds serving the population. However, for the planned period of the Master Plan, an additional 116 beds will be required, as per NRM standards. To cater to this demand, an extension to the existing DHQ hospital is proposed to facilitate the future population.

Furthermore, dispensaries are proposed for the provision of first aid facilities within the neighborhood centers. This will ensure that residents have access to basic medical care and first aid in their immediate vicinity.

4.7.8 General Guidelines for Health Facilities Allocation

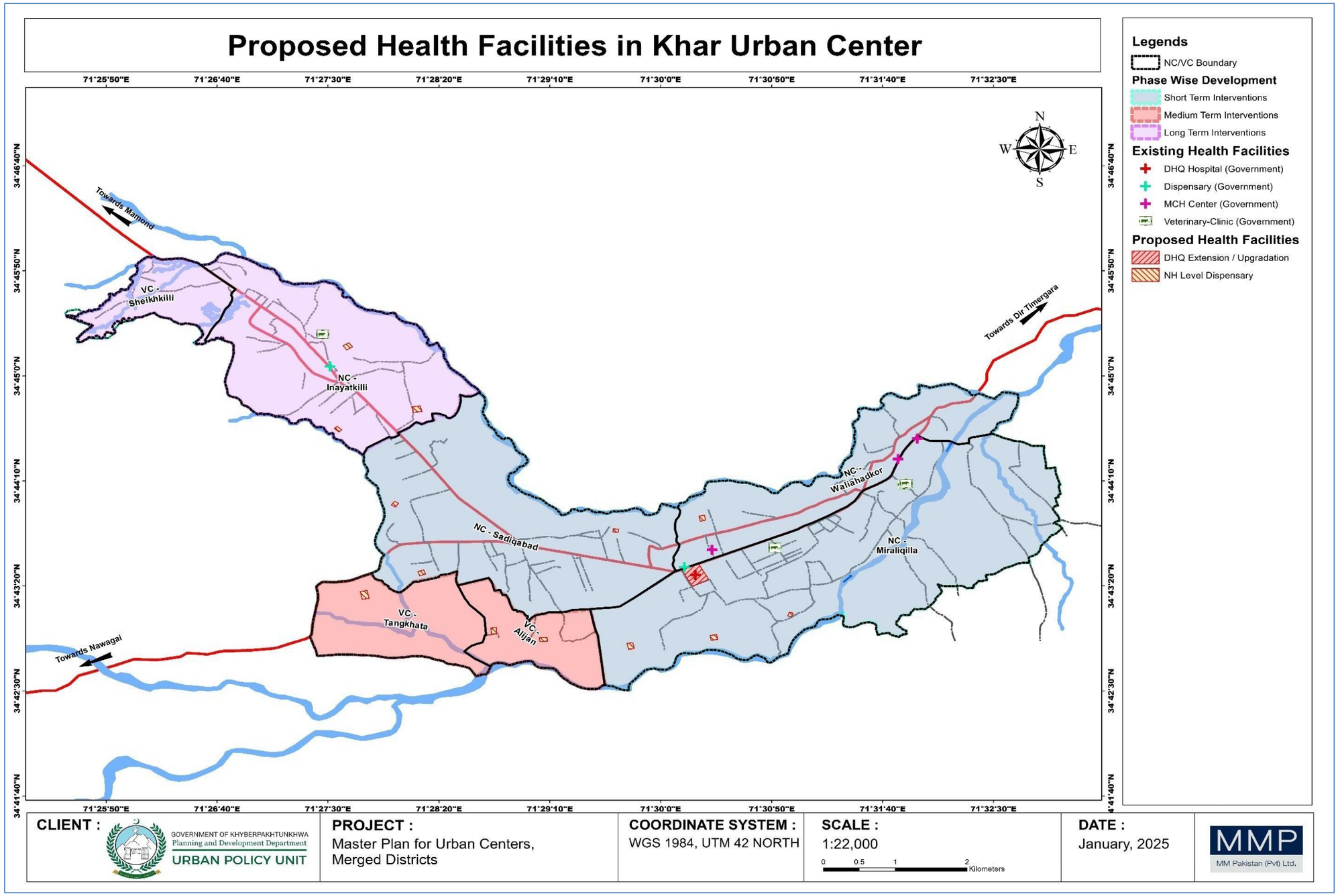
The following are the general guidelines used for the health facilities provided in the city:

- Health Dispensaries at NH Level

- At the center of each Neighborhood
- Preferably within the walking distance
- Adjacent to the neighborhood green spaces
- Extension of Existing DHQ

Table 4-23: Health Facilities Demand for Khar Urban Centre (2022-2040)

Category / Proposals		Dispensary	Hospital	Doctors	Beds
Standards	Detailed	(Pop / 5000) @ 0.2 Acre	(Pop / 80000) @ 5 Acre	(Pop / 1000)	(Pop / 500)
	Population	5000	80000	1000	500
	Area	0.20	5.00	0.00	0.00
Existing Acre		1.9	23.4	-	-
Existing Units		5	1	73	403
Existing Demand		25	2	123	246
Required	Gap 2022	20	1	50	-157
	Area	4.0	5.0	0.0	0.0
	2025	23	1	66	-125
	Area	4.6	5.0	0.0	0.0
	2030	29	1	98	-60
	Area	5.8	5.0	0.0	0.0
	2035	37	2	138	19
	Area	7.4	10.0	0.0	0.0
	2040	47	2	187	116
	Area	9.4	10.0	0.0	0.0sss



Map 4-11: Proposed Health Facilities in Khar Urban Centre

4.8 Proposed Public Buildings

Public buildings mean a building designed for public use and include post offices, police stations, town halls, libraries, and premises of social agencies such as hostels, local government offices, educational institutes, hospitals and clinics, mosques and fire stations, rescue centers, etc.

In Khar Urban Centre, most of the public buildings lie in the colony as an agglomeration. The entire district is controlled from this area; it can be called a secretariat for the Bajaur District.

The major centers i.e., Khar and Inayat Kali along the main road are proposed as a blue area in the city. The major land use within the blue area is commercial, administration, and mixed-use residential. The city-level public buildings will be accommodated within the blue area. While the neighborhoods level facilities are given in the center of each neighborhood.

4.8.1 Existing Pot Offices in Khar Urban Centre

There is one (1) post office and two (2) private courier services i.e. TCS and Leopard Courier located in Khar Urban Centre. In which only 3 to 4 persons work on average in the post office including the Post Master. The frequency of money orders is low as few are received in a month in the post office. Urgent Mail Service (UMS) is also provided in post offices.

Table 4-24: Existing Post Offices/Courier Services

Sr. No	Office Name	GPS coordinates	
1	Pakistan Post	LT 34.7354787	LG 71.526271
2	TCS Office	LT 34.7360621	LG 71.5239277
3	Leopard Courier	LT 34.7342588	LG 71.5184553

Source: MMP – Master Planning Survey of Khar, 2022

4.8.2 Future Provision of Post Offices/Services in Khar Urban Centre

According to the NRM 1985, there should be one post office per 30,000 populations. The population base analysis shows that there should be 4 post offices currently required, while there is only one post office in the city. There should be 8 post offices in the project area for the plan period 2040. In order to facilitate the current population and future population a post-Mall is proposed in Khar Main Road, and each neighborhood center, one letter box is proposed. The details regarding the current gap and future requirements are shown in the table below.

Table 4-25: Post Office Requirements/Demand in Khar Urban Centre (2022-2040)

Land Use		Public Buildings
Category / Proposals		Postal
Standards	**Detailed**	(Pop / 30000) @ 0.61 Acre
	Population	30000
	Area	0.61
	Existing Acre	0.30
	Existing Units	1
	Existing %	0.00%
	Existing Demand	4

Land Use		Public Buildings
Required	**Gap 2022**	3
	Area	1.8
	2040	8
	Area	4.9

4.8.3 Existing Safety & Security

Khar Urban Centre is the capital of District Bajaur. The Deputy Commissioner, District Administration, and District Police Officer, offices are situated in the center of the city. Therefore, the security situation is quite satisfactory in the city. The data collected from District Police Office, there are seven police stations currently exist within the city boundary. The District Head Quarter Office is situated in the city having an area of 2.29 Kanals.

Table 4-26: Police Facility in Khar Urban Centre

Sr. No.	Zone	Name	Area (Kanal)
1	Khar urban center	Police Head Quarter	2.29

Source: MMP – Master Planning Survey of Khar Urban Centre, 2022

4.8.4 Proposed Facilities of Security and Safety in the City

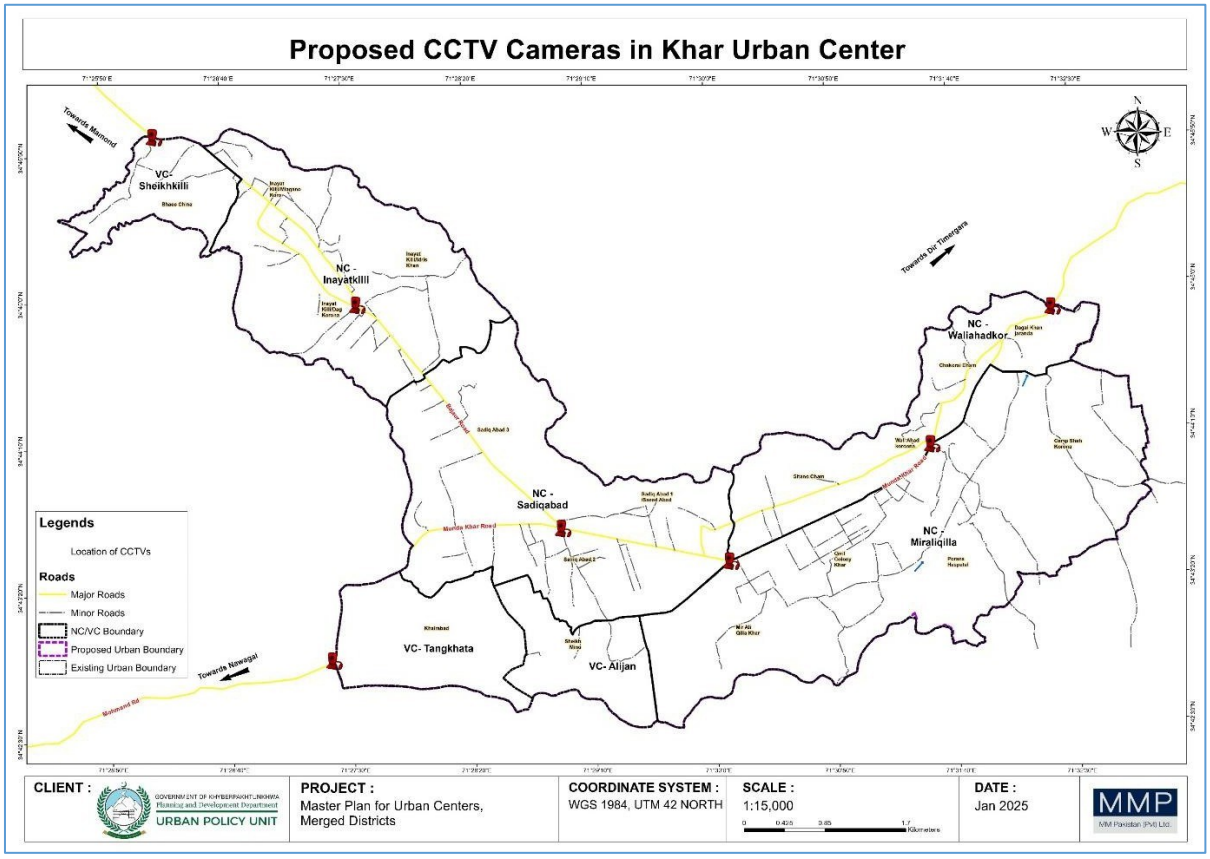
In order to make neighborhoods safe for their residents, one police chowki per neighborhood center is proposed, and a total of 13 police chowkis will be established in residential areas in the city.

Table 4-27: Police and Jail Requirements in Khar City

Category / Proposals		Policing	Jail
Standards	**Detailed**	(Pop / 50000) @ 2 Acre	One per District @ 35 Acre
	Population	50000	200000
	Area	2.00	35.00
Existing Acre		1.5	0.6
Existing Units		2	1
Existing %		0.02%	0.01%
Existing Demand		2	1
Required	**2040**	3	-
	Area Requirement	6.0	-

4.8.5 Proposed CCTV Cameras

CCTV cameras are proposed in Khar Urban Center at entry and exit points to monitor the movement of incoming and outgoing vehicles. CCTV cameras are also proposed at the main junctions of the city. These cameras needed to be connected to a surveillance center to monitor and respond to specific situations in real-time.



Map 4-12: Proposed CCTV Cameras in Khar Urban Center

The CCTV Cameras are intended to promote security and safe city initiative on the long-term. There are 7 CCTV cameras are proposed at the exit and entry point of the city.

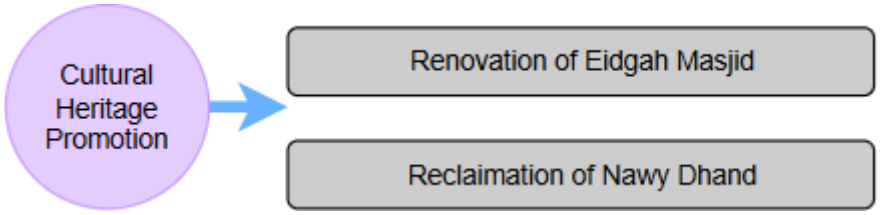
4.8.6 Judicial

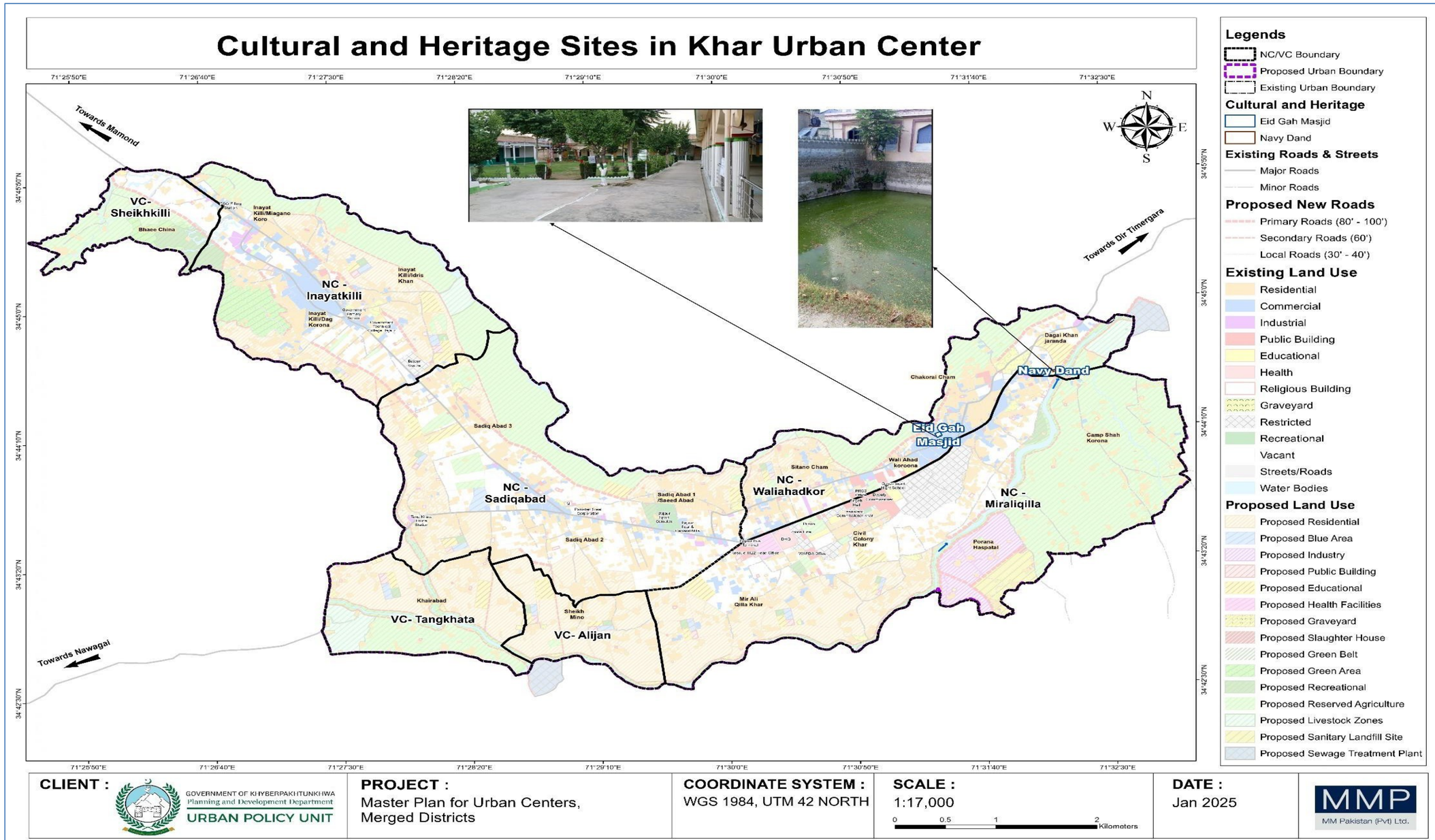
There is currently one judicial office in Khar Urban Centre. There is no such population-based standard for the provision of Judicial complexes or city courts in Pakistan. According to NRM 1985, there should be 0.4 acres of the area reserved for Judicial/court offices at the Tehsil level.

4.8.7 Historical/Social/Culture Heritage

The Aryans who moved from the Middle East are believed to be the origin of the Bajaur people. The inhabitants follow a distinctive Pakhtun culture, which is distinguished by warmth, courage, and devotion. Additionally, the tradition of the region dates back to ancient Bodha, as evidenced by the presence of monuments of the great Bodha. There are also signs of the renowned Gandhara Arts. Famous settlements like Gabary, Swai, Sikandaro, and Babar Shah have names that may be traced back to an earlier time and civilization.

The Khar subdivision lacks any notable cultural landmarks. However, the tribesmen's culture is Lungi. One of the well-known cultural customs is Hujra and Tang Takor. Among the historical sites are Gabber Chena, Seri-Sar, Sikandaro, Kohimore, and Navy Dhand, as well as Masjid Androon Khar and Eidgah Masjid.


Cultural Heritage Promotion
Renovation of Eidgah Masjid
Reclaimation of Nawy Dhand



Map 4-13: Cultural & Heritage Site in Khar Urban Centre

4.8.8 Culture and Heritage

4.8.8.1 Dress and Ornaments

People in the region dress in traditional Pakhtun attire, including Shalwar Kamees and headgear. Handcrafted Dir hats are popular among men, with notables sporting Pugri and Kula, although the tradition is diminishing. Women wear Shalwar Kamees and Chadder/veil, while shuttlecock Burqas are worn for Purdah (veil).

4.8.8.2 Dwellings

The majority of the dwellings are made of concrete blocks or mud. Houses are mostly one Kanal and above size known as Qila, with a joint family system. According to the Pakistan Bureau of Statistics, the average household size is 9.3 persons. A home usually has three to four rooms, as well as a veranda at the front. The joint family system mode of living is most common in the region. Hujra is commonplace in every house, which serves as a guest room and is used for social gatherings. It is an important part of Pakhtun culture, although it is, unfortunately, diminishing in present times, as individuals prefer to use personal guest rooms.

4.8.8.3 Religion

Islam is the major religion in the district. People are religious and every Islamic occasion is celebrated wholeheartedly.

4.8.8.4 Occupations

Due to lack of education, the people migrate to down districts in search of jobs or any other labor work. People are also engaged in government services and are a cherished source of lively hood for many. A very large community is involved in agricultural activities, small-scale business, and working on a daily wage basis. These all are also major providers of jobs and sources of employment in the region.

In this Master Plan, a keen interest has been taken to preserve and protect the rich culture and heritage of the people of Khar Urban Centre. The details of the proposed measures are discussed below.

4.8.9 Museum

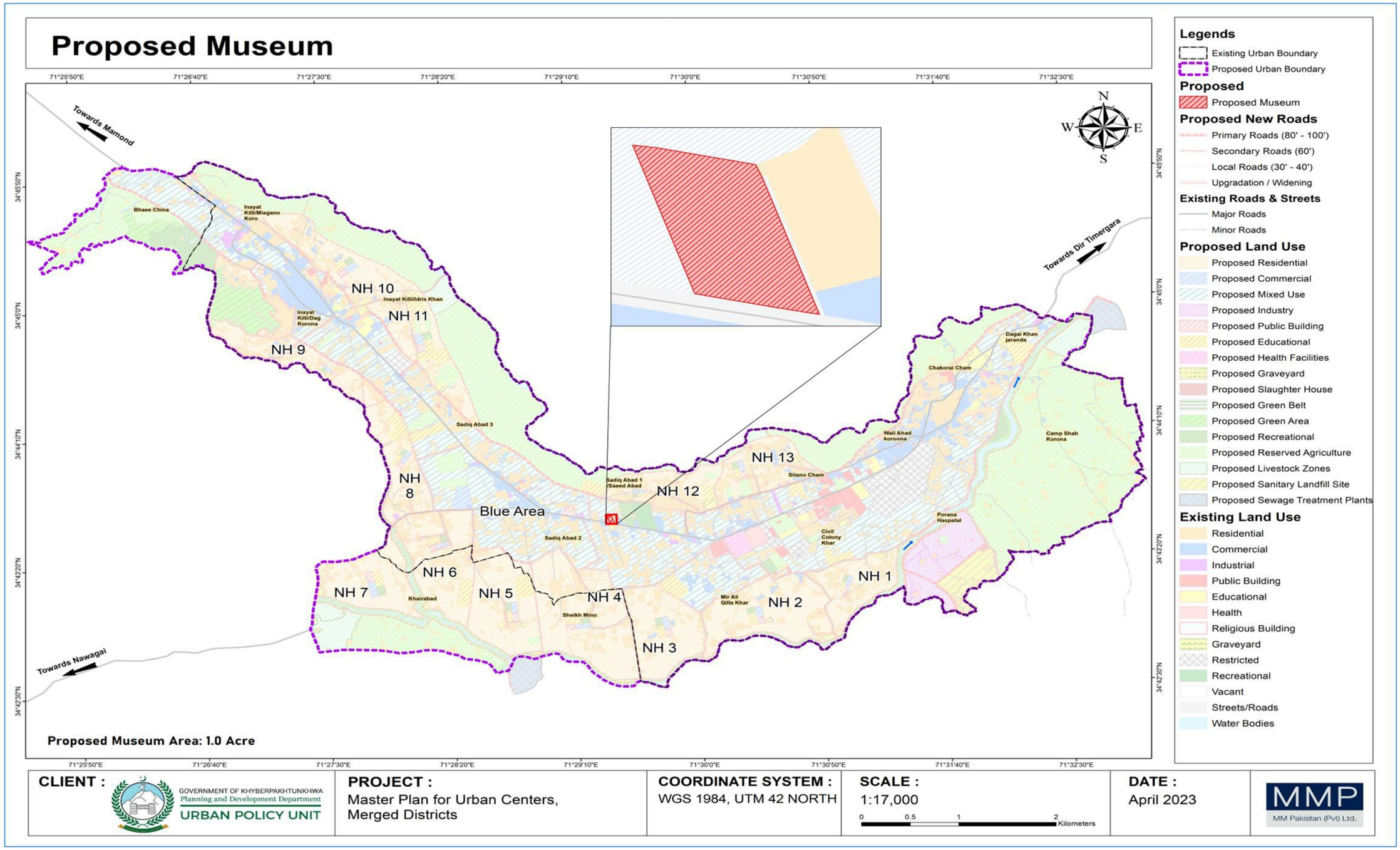
The importance of a museum building in Khar, Bajaur District, KP cannot be overstated. A museum building would serve as a cultural hub for the region, promoting the preservation and celebration of the area's rich history, traditions, and heritage. It would provide a space for locals and visitors alike to learn about the unique customs and way of life of the people of Bajaur District.

Moreover, the establishment of a museum building could have significant economic benefits for the area. Museums are often major tourist attractions, drawing visitors from around the world. The museum could bring in revenue for local businesses, such as restaurants and souvenir shops, and provide job opportunities for residents.

In short, a museum building would help to foster a sense of community pride and identity. By showcasing the history and cultural contributions of the region, the museum would create a sense of shared heritage and promote a greater appreciation for the area's cultural diversity. Overall, a museum

building in Khar Urban Centre would be a valuable investment in the community's cultural and economic development.

A museum is proposed in the Khar urban center, occupying an area of 1 acre near the Khar-Munda Main Road. The museum would be an ideal addition to the cultural and historical landscape of the area, showcasing the rich heritage of the region. The museum could feature exhibits that highlight the history and traditions of the local people, as well as artifacts and artwork from around the world. With its convenient location near a major road, the museum would be easily accessible to locals and tourists alike. The museum would be a valuable asset to the community, providing a space for learning, exploration, and appreciation of culture and history



Map 4-14: Proposed Museum

4.8.10 Slaughter House

A slaughterhouse is a facility where animals are slaughtered to provide food for human consumption. The slaughterhouse is proposed on an area of 1 acre in the southeast direction near the sanitary fill site having major access from the city center.

4.8.11 Mosque

According to the National Reference Manual of 1985, religion plays an important role in the social and cultural life of communities. In the case of Khar Urban Centre, it has been observed through a field survey that the people are religious and strong believers in one God. The predominant religion followed by the people is Islam, which is reflected in the fact that there are mosques on every street in the city.

4.8.12 Type of Mosques

There are different types of mosques based on serving the population. According to NRM, 1985 the standard of different types of mosques such as Mohalla, Jumma, and Markazi along with the area required.

Table 4-21: NRM Standard of Different Types of Mosques

Mosque	Population	Area	Area (acres)
Markazi Mosque	100,000	0.35-0.38	1
Jumma Mosque	25,000	0.18-0.2	0.5
Mohalla Mosque	5000-10,000	0.06-0.07	0.125

Source: NRM, 195

According to the field survey conducted in Khar Urban Centre, it has been observed that 45% of the mosques are Jamia Masjids, 19% are Madrasa Mosques, and 36% are Mohalla Mosques. While the city is already rich in terms of mosque provision, it is proposed to build one mosque per neighborhood to facilitate the future population. The location of these mosques will be at the neighborhood center, making them accessible to everyone living in the neighborhood.

Based on population standards, the details of each public building are shown in the table below.

Table 4-22: Public Building Gap and Demand Analysis of Khar Urban Centre

Land use		Public Buildings					
Category / Proposals		Postal	Fire Protection	Administrative Buildings	Judicial	Policing	Jail
Standards	**Detailed**	(Pop / 30000) @ 0.61 Acre	(Pop / 25000) @ 0.5 Acre	(Pop / 25000) @ 2.5 Acre	0.4 Acre per Tehsil	(Pop / 50000) @ 2 Acre	One per District @ 35 Acre
	Population	30000	25000	25000	50000	50000	200000
	Area	0.61	0.50	2.50	0.40	2.00	35.00
Existing Acre		0.30	0.10	48	0.2	1.5	0.6
Existing Units.		1	1	69	1	2	1
Existing %		0.00%	0.00%	0.69%	0.00%	0.02%	0.01%
Existing Demand		4	5	5	2	2	1
Required	**Gap 2022**	3	4	-64	1	0	0
	Area	1.8	2.0	-160.0	0.4	0.0	0.0
	2025	4	5	-63	2	1	0
	Area	2.4	2.5	-157.5	0.8	2.0	0.0

Land use		Public Buildings					
Category / Proposals		Postal	Fire Protection	Administrative Buildings	Judicial	Policing	Jail
	2030	5	6	-62	2	1	0
	Area	3.1	3.0	-155.0	0.8	2.0	0.0
	2035	6	7	-61	3	2	0
	Area	3.7	3.5	-152.5	1.2	4.0	0.0
	2040	8	9	-59	4	3	0
	Area	4.9	4.5	-147.5	1.6	6.0	0.0

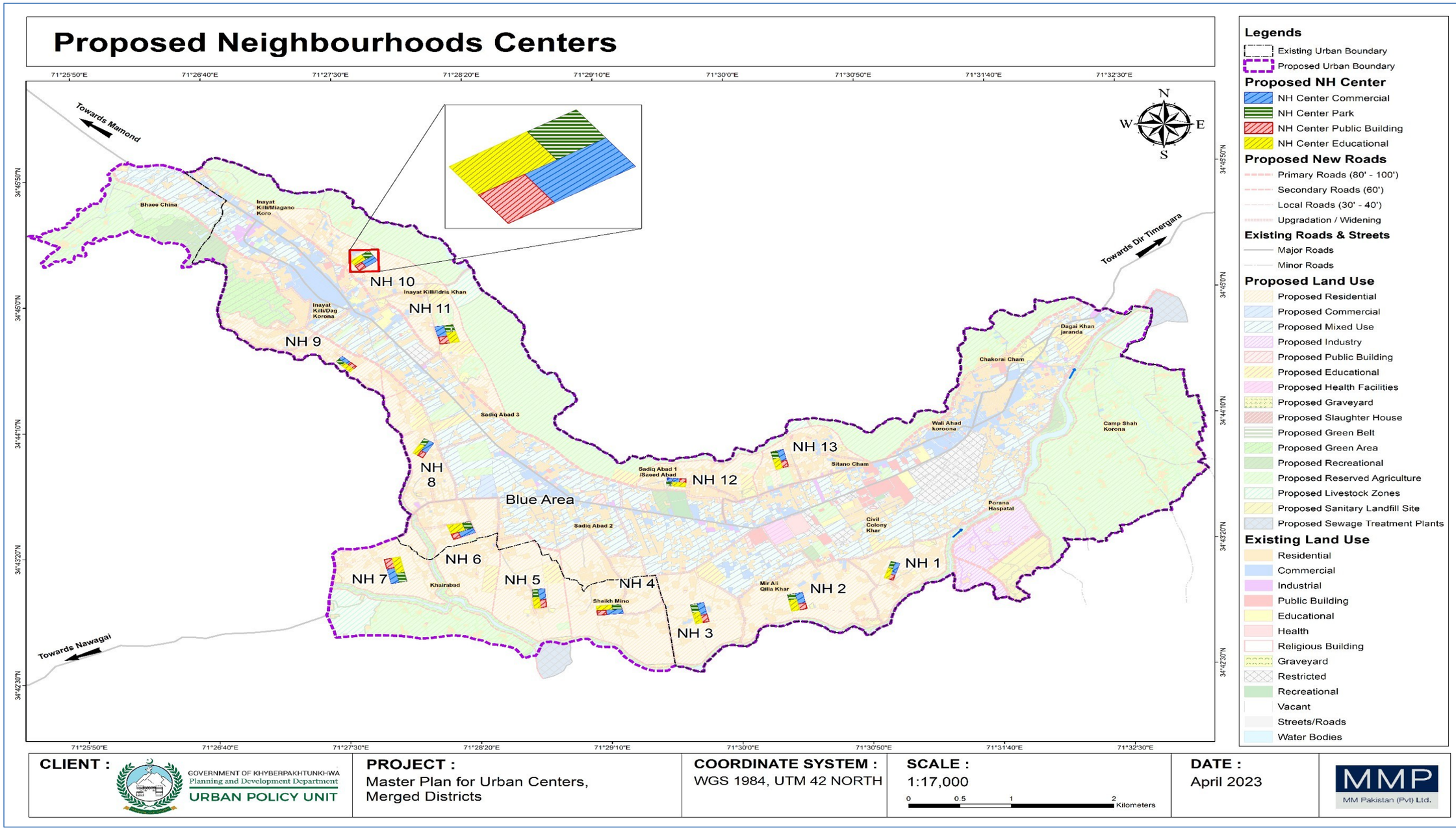
4.9 Proposed Public Buildings / Facilities in Neighborhoods Centre

The design of the neighborhoods in Khar Urban Centre is based on the principle of self-sufficiency. As such, the neighborhood centers have been planned to accommodate the maximum permissible facilities within their limits. Each neighborhood center will include essential services such as a post office, police check post, mosque, and dispensary, which are indicated in red color on the map. In addition, primary and middle schools have also been proposed in the neighborhood centers, which are shown in yellow color.

The areas highlighted in blue in the neighborhood center have been designated for commercial activities. These designated areas have also been indicated on the map using the color blue. The neighborhood centers will also include a mini-park and a tube well, along with a water filtration plant, all of which are proposed in the green area and shown in green color on the map. This comprehensive approach to neighborhood planning will ensure that the residents of Khar Urban Centre have easy access to all necessary facilities and services within their immediate vicinity.

Table 4-23: Neighbourhood-Level Public Facilities

Major Land Use	Land Use	Categories
NH Centre	Yellow	Primary School
		Middle School
	Green	NH Park
		Tube well + OHT
	Blue	Grocery Stores
		Local Markets
		Retail Shops
		Services Shops
	Red	Dispensary
		Post Office
		Police Check Post
		NH Mosque



Map 4-15: Proposed Neighborhood Centre

4.10 Transportation

4.10.1 Existing Road Network in Khar Urban Centre

Khar Urban Centre is developed mostly on a linear pattern along the Main Khar Road having important land uses/buildings such as Bajaur Scouts Headquarter, Khar Colony, and many other important offices and banks situated in Khar Urban Centre and other business centers and shops in Khar & Inayat Kali Road, therefore this road serves as a primary road of the city.

The total road length is 76 Km. The primary road is two-lane and has enough for two trucks to pass at a time in the opposite direction. Most of the residential areas have access from this primary road connected via thoroughfares/alleyways/streets or tracks, which are so narrow allow only motorcycles, cycles, and pedestrians to pass through them and depict the exact picture of narrow access streets/thoroughfares and unpaved streets in Khar Urban Centre.

Table 4-24: Road Network Hierarchy

Type	Name of Road	Total Length (KM)	Width (Feet)
Major Road	Munda Road, Khar	13.7	30
Minor Roads	Lt. Sajjad Khan Shaheed Bypass Road	4	26
	Inayat Kalay Road	1.6	24
	Ali Jan Qila Road	1	24
	Duray Mandal Road	2.6	24
	Sheikh Meeno Road	1.1	12
	Other Secondary Roads	12.6	12-24
Streets	Miscellaneous Roads & Streets	39.4	12
Total Length of Road		**76**	-

Source: MMP - Master-Planning Survey of Khar Urban Centre, 2022

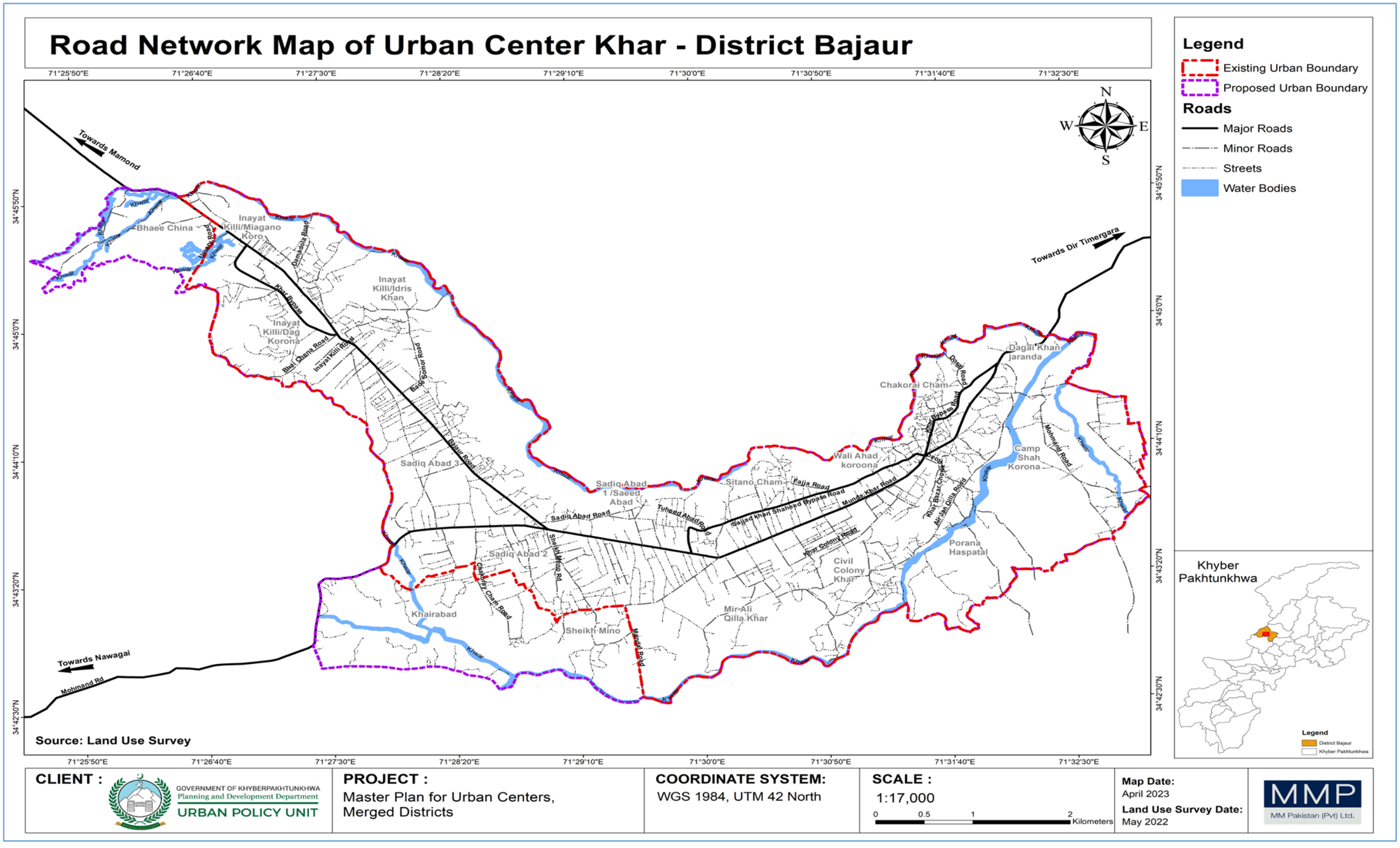
Existing roads as mentioned in the above table are not wide enough with limited right of ways varying between 12 feet to 24 feet resulting in severe traffic congestion and jams at various points during the peak hours of traffic. The major base of primary roads has the same width in the past when vehicular traffic was appreciably low as compared to the present one, whereas the traffic is high and it is still growing over time.

As per the hierarchy followed, the foremost transit corridor (Trunk Road) is Bajaur Main Road, constructed by Frontier Works Organization (FWO), primarily connecting Khar to Swat and Timergara in the East and Peshawar & Mohmand in the South and Afghanistan at West.

Figure 4-1: Typical Irregular & unpaved Streets in Khar Urban Centre

Figure 4-2: Typical example of Main Road in Khar Urban Centre

Source: MMP - Master Planning Survey of Khar, 2022



Map 4-16: Existing Road Network of Khar Urban Centre

Khar Urban Centre is developed mostly on a linear pattern along the Main Khar Road. This road serves as a primary road having important land uses/buildings such as Bajaur Scouts Headquarters, Khar Colony, commercial sub-Centers, private offices, banks, etc.

The total road length is 76 Km. The primary road is two-lane and has enough for two trucks to pass at a time in the opposite direction. Most of the residential areas have access from this primary road connected via thoroughfares/alleyways/streets or tracks, which are so narrow allow only motorcycles, cycles, and pedestrians to pass through them and depict the exact picture of narrow access streets/thoroughfares and unpaved streets in Khar Urban Centre.

Existing Acreage and percentage of the existing road network are given below:

I. Existing Roads Area: 278 Acres
II. Existing Percentage: 4.0
III. Proposed Roads Area: 445.58 Acres
IV. Overall Percentage: 11.0

4.10.2 Existing Traffic Flow in Khar Urban Centre

4.10.2.1 Traffic Volume at Outer Cordon Points

The traffic volume survey was conducted at three entry points or cordon points in Khar Urban Centre on Monday, Wednesday, and Saturday to assess vehicular traffic. The main entry point for vehicles from Peshawar and other cities is Khar Main Road (Munda Road). The traffic flow was analyzed at three primary cordon points, which were selected to determine the number of vehicles entering and exiting the urban center. The number of entry and exit vehicles was calculated in terms of Passenger Car Units (PCUs) as per HCM 2000 guidelines. The three major cordon points are as follows:

- Nari Qila Cordon Point
- Khalozai Cordon Point
- Nawagai Cordon Point

During the survey, the total number of PCUs entering the Khar Urban Centre from these three points was found to be 31008.25, while the number of PCUs exiting the city from these three points was 29943 on Monday, Wednesday, and Saturday.

Table 4-26: Enter/Exit of PCUs to Khar Urban Centre

Entry-Exit	Cars, Jeep, Pajeros & Pickups	Motorcycle	Rickshaw & Qingchi	Coaches, Busses &Lories	Cycle	Trucks	Tracktors, trolly, Tankers (Oil & Water tankers)	Vans, Coasters & Wagons
Khar- Entry	**12,263**	**5,122**	**3,928.75**	**2,375**	**62**	**2,271**	**2,870**	**2,116.5**
Khalozai	4,760	1,824.5	265	50	3.5	618	1,624	28.5
Khar to Monda	1,859	844	856.25	182.5	52.5	219	147	459
Khar to Munda	1,664	850.5	925	230	1.5	126	98	393
Monda Road (Nai Qala)	1,794	970.5	921.25	115	3.5	165	80.5	534
Nawagai Road	1,593	471	697.5	1427.5	0.5	864	752.5	514.5
Nawagai Road	511	135.5	226.25	355	0.5	279	161	171
Salarzo Road	82	26	37.5	15	0	0	7	16.5
Khar-Exit	**12,964**	**4,415.5**	**3,827.5**	**1525**	**17**	**3,300**	**1,816.5**	**2,077.5**
Khalozai	5,236	1,875.5	522.5	25	2.5	1,566	1,123.5	25.5
Monda Road	3,864	1,468	2,157.5	590	6	417	364	1,014
Monda Road (Nai Qala)	1,837	680.5	902.5	192.5	8	297	199.5	705
Nawagai Road	1,468	293	192.5	592.5	0.5	792	94.5	261
Nawagai Road	559	98.5	52.5	125	0	228	35	72
Grand Total	**25,227**	**9,537.5**	**7,756.25**	**3900**	**79**	**5,571**	**4,686.5**	**4,194**

4.10.3 Road Layout Pattern for Future Development

There is no specific road layout pattern that is considered the "future" of development. However, there are several design principles and trends that are being incorporated into new road projects to improve safety, reduce congestion, and promote sustainable transportation. These include:

Complete streets: This approach prioritizes the needs of all road users, including pedestrians, bicyclists, and public transportation users, in addition to cars.

Smart transportation systems: These use technology, such as traffic sensors and connected vehicles, to improve traffic flow and reduce congestion.

Walkable and bikeable communities: This design principle emphasizes the importance of creating safe and convenient options for walking and biking to increase active transportation and reduce reliance on cars.

Green infrastructure: This refers to the incorporation of natural elements, such as trees and vegetation, into road design to improve air and water quality and reduce the heat island effect.

These principles are combined in different ways in different projects, depending on the context and the specific needs of a community.

The growth of a city's settlements depends greatly on the layout of its roads. Each household member relies more heavily on a car for everyday travel as the distance between the city's residential and commercial centers grows.

The response time needed for emergency response vehicles to arrive at a particular location is also lengthened by the route layouts. There are several types of road patterns used in cities; when a road is built in a pattern for good traffic management, such as a rectangular, radial, or hexagonal layout, which is referred to be a road pattern. There are various types of roads pattern used all over the world, such as;

a) Rectangular or Block Pattern
b) Radial Road Pattern
c) Grid Iron Pattern

The Grid Iron Pattern is suggested within the neighborhoods in Khar Urban Centre. The detail of the Grid Iron Pattern is given below;

4.10.3.1 Grid Pattern

A network of crossing parallel lines, whether actual or imagined, is referred to as a grid. When seen from above, this pattern is made up of streets that connect at right angles to create squares. A physical network that is not always constructed of straight or parallel lines can also be referred to as a grid.

A sort of city layout known as the grid plan, grid street plan, or gridiron plan has roadways that cross at right angles to one another. Regular grid systems often have greater infrastructure costs than those with discontinuous street layouts.

Frequent junctions and orthogonal geometry, two features of the grid layout that are fundamental, make pedestrian The geometry aids in orienting and the choice and directness of the path to desired destinations due to its many junctions.

- **Pros of Grid Pattern**
  - i) Grids are good for pedestrians because there are many different ways to travel from A to B.
  - ii) Grids are good for retail stores and restaurants because they offer a lot of corner lots.
  - iii) Navigating a grid is fairly straightforward.
- **Cons of Grid Pattern**
  - i) Grids are bad for drivers and bicyclists because they have a lot of intersections and therefore many potential conflict points.
  - ii) Grids can encourage people to use residential streets as shortcuts.
  - iii) Grids are a poor fit for cities with a lot of hills because they lead to unnecessarily steep streets.
  - iv) An inconsistent or incomplete grid can easily result in traffic chaos.

4.10.3.2 Proposed Roads and Layout Pattern

The intricately designed road pattern within the bustling Khar Urban Centre has been meticulously planned to seamlessly integrate with the natural contours of the local topography, while simultaneously enhancing the overall connectivity of the area. This ambitious road network has been conceptualized to incorporate three distinct levels of hierarchy, namely, neighborhood roads, intra-neighborhood roads, and secondary roads, with proposed widths of 30', 40', 60', and 120' respectively. The strategic implementation of this hierarchical system of road sizes and widths is intended to create a harmonious equilibrium in the distribution of vehicular traffic, while concurrently addressing the needs of the indigenous community.

The Main Bajaur Road is a vital component of this ambitious road network and serves as a major thoroughfare for the region, connecting the various neighborhoods and secondary roads. In light of the anticipated increase in demand and the necessity for the incorporation of essential utilities such as electricity, water, drainage, and service roads, the proposed widening of these roads to a width of 120 feet is essential to ensure more efficient and safe travel, thereby catalyzing the growth of the Khar Urban Centre.

In addition to the main roads, the industrial estate roads have been proposed to be widened to 100 and 80 feet to facilitate the transport of raw and finished materials to the industries and warehouses situated within the estate. This alteration is poised to elevate the efficiency of these operations and in turn, bolster the local economy.

The below attached table is providing the details of the short-, medium-, and long-term roads based on neighborhood and village councils in Khar Urban Center. The total length of proposed primary, secondary, and local roads is 13.28 km, 3.09 km, and 6.02 km respectively.

Table 4-27: Proposed Roads Category NC/VC Wise

Phase Wise Intervention	Neighborhood/ Village Council	Primary Road (km)	Secondary Road (km)	Proposed Local Road (km)
Short-Term	NC – Mir Ali Qilla	15.06	5.37	7.00
	NC – Sadiq Abad	12.99	3.88	6.79
	NC – Wali Ahad Korona	7.13	1.97	2.51
Medium-Term	VC – Ali Jan	2.03	1.51	4.43
	VC – Tangkhata	1.35	6.22	3.90
Long-Term	VC – Sheikh Killi	2.05		
	NC – Inayat Killi	13.28	3.09	6.02
Total Proposed Road Lengths		54.31	22.33	30.64

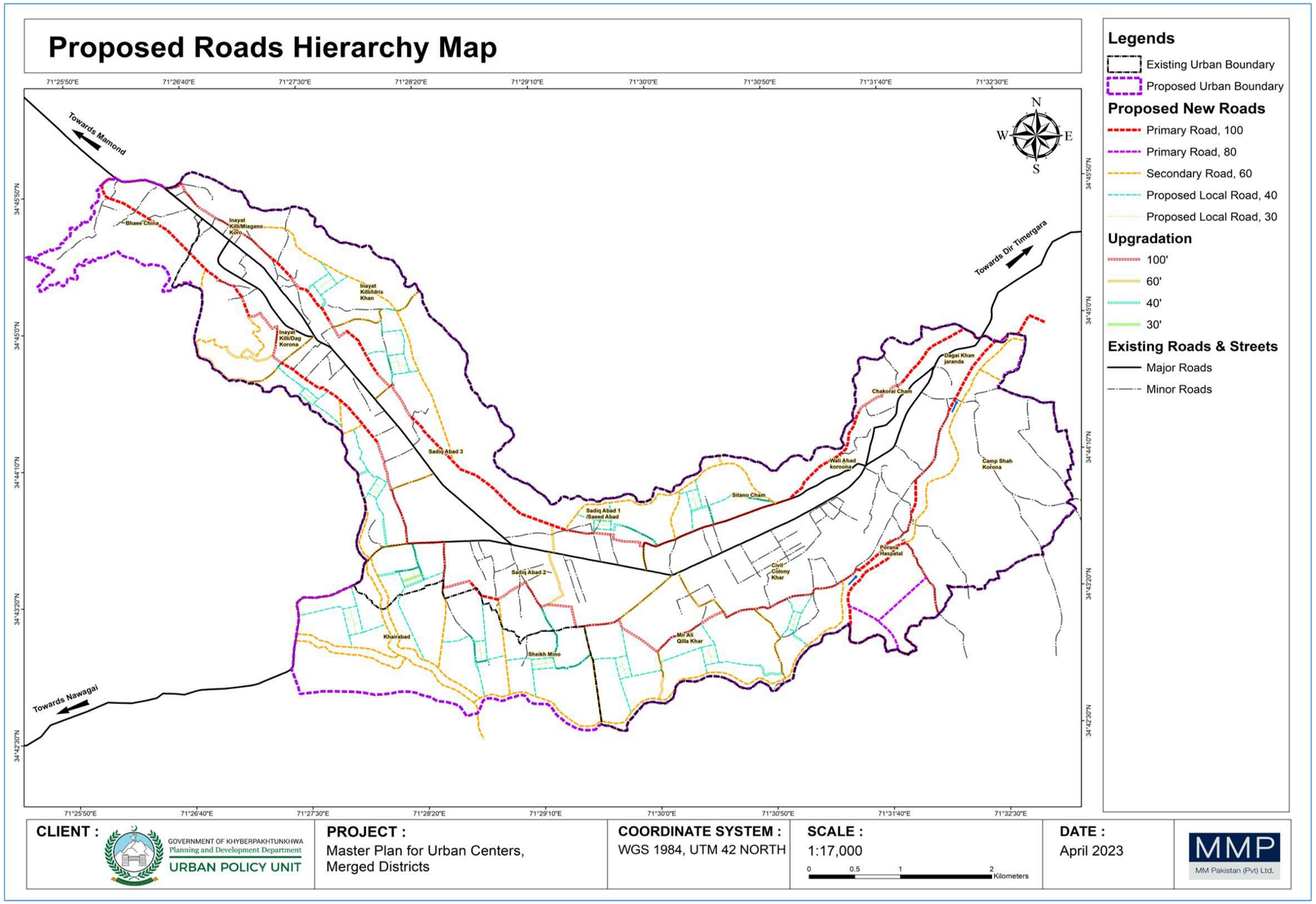
The proposed road network in Khar Urban Centre is strategically categorized based on width to serve varying purposes:

1. **Primary Roads** (80–100 feet): These wide roads form the backbone of the transportation system, accommodating high traffic volumes and ensuring city-wide connectivity.
2. **Industrial Estate Roads** (100, 80, 60 feet): Designed to support industrial activities, these roads provide access to industrial estates and facilitate heavy vehicle movement.
3. **Secondary Roads** (60 feet): These roads link neighborhoods to primary roads, ensuring efficient movement within the urban center.
4. **Local Roads** (30–40 feet): Narrower roads intended for neighborhood-level connectivity, promoting accessibility within residential areas.
5. **Water Body Buffer Roads** (60 feet): These roads are planned along water bodies, offering better access and protecting buffer zones.

This road categorization balances regional accessibility, industrial needs, and local connectivity, ensuring a comprehensive and well-integrated transportation system.

Table 4-27: ROW of Proposed Roads

Road Category	Width (ft)
Primary Roads	80’ - 100’
Industrial Estate Roads	100, 80, 60
Secondary Roads	60
Local Roads	30 & 40
Water Body Buffer Road	60
Primary Roads	80’ - 100’
Industrial Estate Roads	100, 80, 60



Map 4-17: Proposed Road Hierarchy

4.10.4 Parking Facility in Khar Urban Centre

An efficient parking system reflects well-organized enforcement of parking and traffic laws in any city. The main issue in Khar Urban Centre is the absence of a proper parking management system on the street, as well as there, being no off-street parking lots in Khar and Inayat Kali which are the Central Business Districts (CBDs). This On-street parking works at full capacity, especially during peak hours which causes traffic congestion and accidents.

The analysis of the Parking Survey reveals that there is no definite parking angle or pattern being followed for parking cars and other motor vehicles in front of shops and public buildings.

Some vehicles are parked at a 180-degree angle especially on the streets whereas, in the off-street parking system, others are parked at a 90-degree angle. While, motorcycles were parked at an angle of 60, 45, and 30 degrees as well, which are also parked in irregular patterns. There is no systematic parking lot available in Khar Urban Centre.

The majority of the car parking is on-street which has created a lot of traffic congestion issues.

4.10.5 Khar Parking Analysis

4.10.5.1 Khar Main Bazar Parking

- A Parking Survey was conducted for 12 Hours in Khar Main Bazar, where a total number of 573 cars and 1,120 Bikes were parked during the entire duration of the Survey.
- Parking Duration = Cars: 1.06 Hours per Car and 0.84 Hours per Bike.
- Length of Parking Area: 3.2 Km
- Space for one Car@ 90^0 =12 Feet or 3.3 meters, the space for Cars (@ 20 % less than the total length = 2,560 meters, 66% of the length available for car parking = 1,690 meters. The number of cars that can be parked on 1,690 meters is 512 cars.
- 33 % of the total length of 2,560 meters is 845 meters is available for parking of Bikes, which means a total of 845 bikes (@ 1-meter length per bike)
- No. of Cars parked during a peak hour = 70, No. of Bikes parked during a peak hour= 132

4.10.5.2 Inayat Kali Main Bazar Parking Survey

- Vehicles Parked during Peak Hours at Inayat Kali Bazar = Cars: 75, Motorbikes: 69
- Parking Duration = Cars: 1.06 Hours per Car and 0.84 Hours per Bike
- Length of Parking Area: 3.2 Km
- Space for one Car@ 90^0 =12 Feet or 3.3 meters, the space for Cars (@ 20 % less than the total length = 2,560 meters, 66% of the length available for car parking = 1,690 meters. The number of cars that can be parked on 1690 meters is 512 cars
- 33 % of the total length of 2,560 meters is 845 meters is available for parking of Bikes, which means a total of 845 bikes (@ 1-meter length per bike)

The above analysis indicates that the current curb parking space available at Khar Main Bazar and Inayat Kali Bazar is sufficient under the present system of car and bike parking at a 90-degree angle. However, the road width of just 30 feet (9 meters) causes slowing of traffic when someone parks or takes out their vehicle at a 90-degree angle.

To improve accessibility for residents to the city center, neighboring cities, and adjacent neighborhoods, a new road pattern has been designed and proposed. This planned road system will assist in shaping the city and provide residents with easy access to city facilities.

A truck Adda is proposed near Inayat Kali as trucks can hinder efficient traffic flow and cause blockages during loading and unloading activities in the daytime.

Additionally, a taxi stand and parking site are proposed near the Shade Morr Bus Terminal to minimize traffic blockages and improve the serviceability of the junction.

Overall, implementing these proposed road designs and additional facilities will greatly benefit the community by improving traffic flow and accessibility to city resources.

4.10.6 Proposed Transportations Facilities

To address the lack of formal transport facilities in the Khar Urban Centre and improve connectivity to other areas, it is recommended that the existing transport terminal be extended and equipped with basic facilities. This will provide a central location for the exchange of passengers and goods, while also addressing the need for a more organized and efficient transportation system in the area.

A truck adda is proposed near Inayat Kali on an area of 1.4 acres, which will facilitate the efficient movement of goods within and outside the city. In addition to the truck Adda, a taxi stands and parking area covering 1.9 acres will also be included in the terminal. These additional facilities will provide convenient and accessible transportation options for travelers and help to improve the overall efficiency of the terminal.

Looking towards the future, it may also be advisable to consider the implementation of a separate bus transport system to further improve connectivity and facilitate the efficient movement of people and goods within the city.

Overall, the establishment of this transport terminal with expanded facilities will be a significant benefit to the city, greatly improving connectivity and accessibility to other areas. It is a necessary step towards creating a more organized and efficient transportation system in the Khar Urban Centre.

4.10.7 Proposed On Street and Off-Street Parking

The Proposed Off-Street Parking Plan for Khar Urban Center outlines strategically placed parking areas across major localities to address traffic congestion and improve accessibility. The urban center is spread across a linear stretch, aligned with major roads such as NH-1 to NH-13, extending from Camp Shah Kas and Chitarkand in the east to Inzari and Dawae Qilla in the northwest, with connectivity towards Mamond and Nawagai.

Key settlements like Blue Area, Sarak Abad, Shahi Bagh, Shandai Mor, and Raghagan are focal points for proposed parking interventions. These areas serve as major residential, commercial, and

administrative hubs. The plan proposes new roads, upgrades, and designated off-street parking spaces near commercial strips and public facilities, particularly around Bazars, markets, and institutional zones.

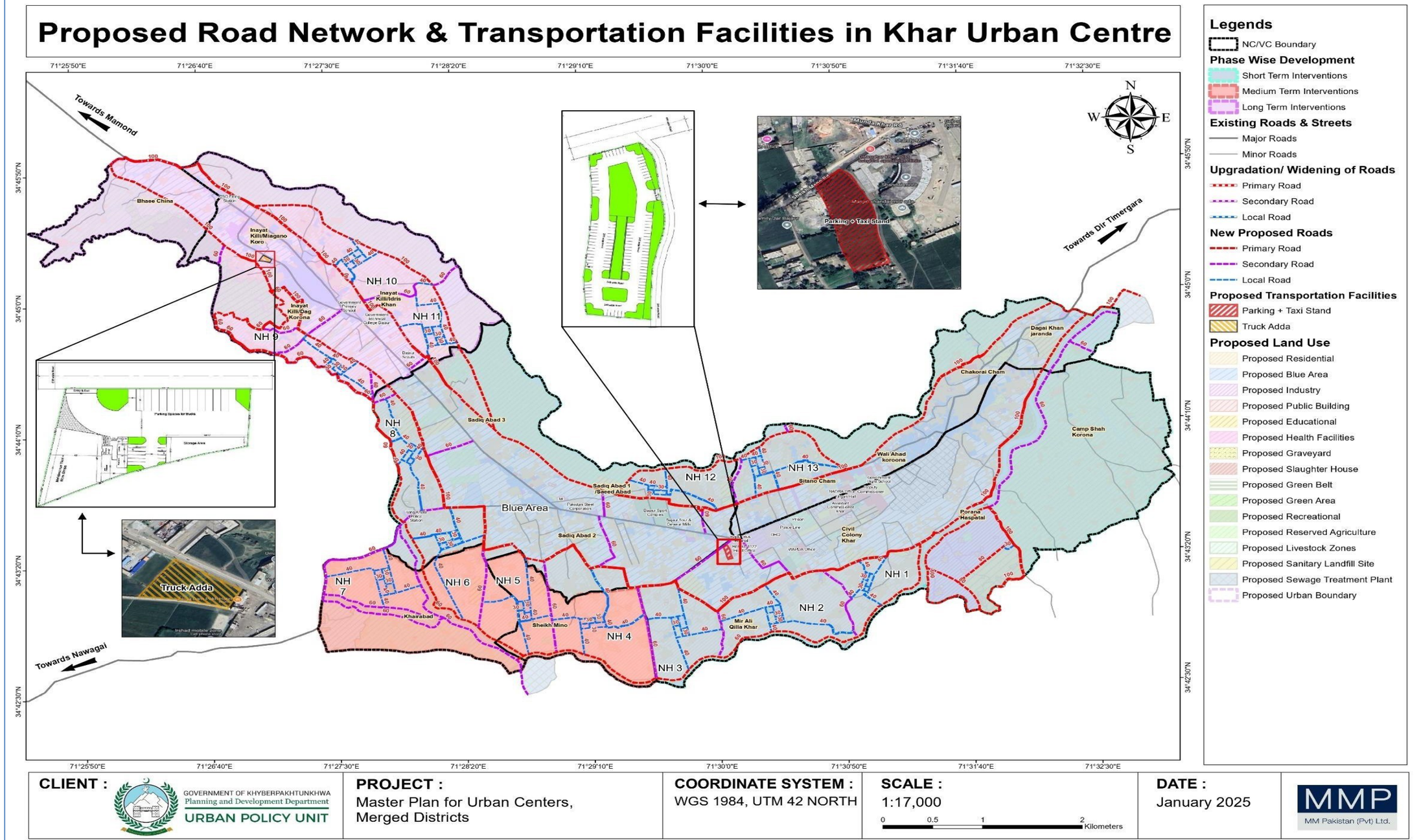
The proposed interventions are distributed to serve high-density neighborhoods and commercial zones, ensuring efficient traffic flow and enhanced urban mobility across Khar Urban Center.

The proposed on and off street are shown in the map 4-19 below:

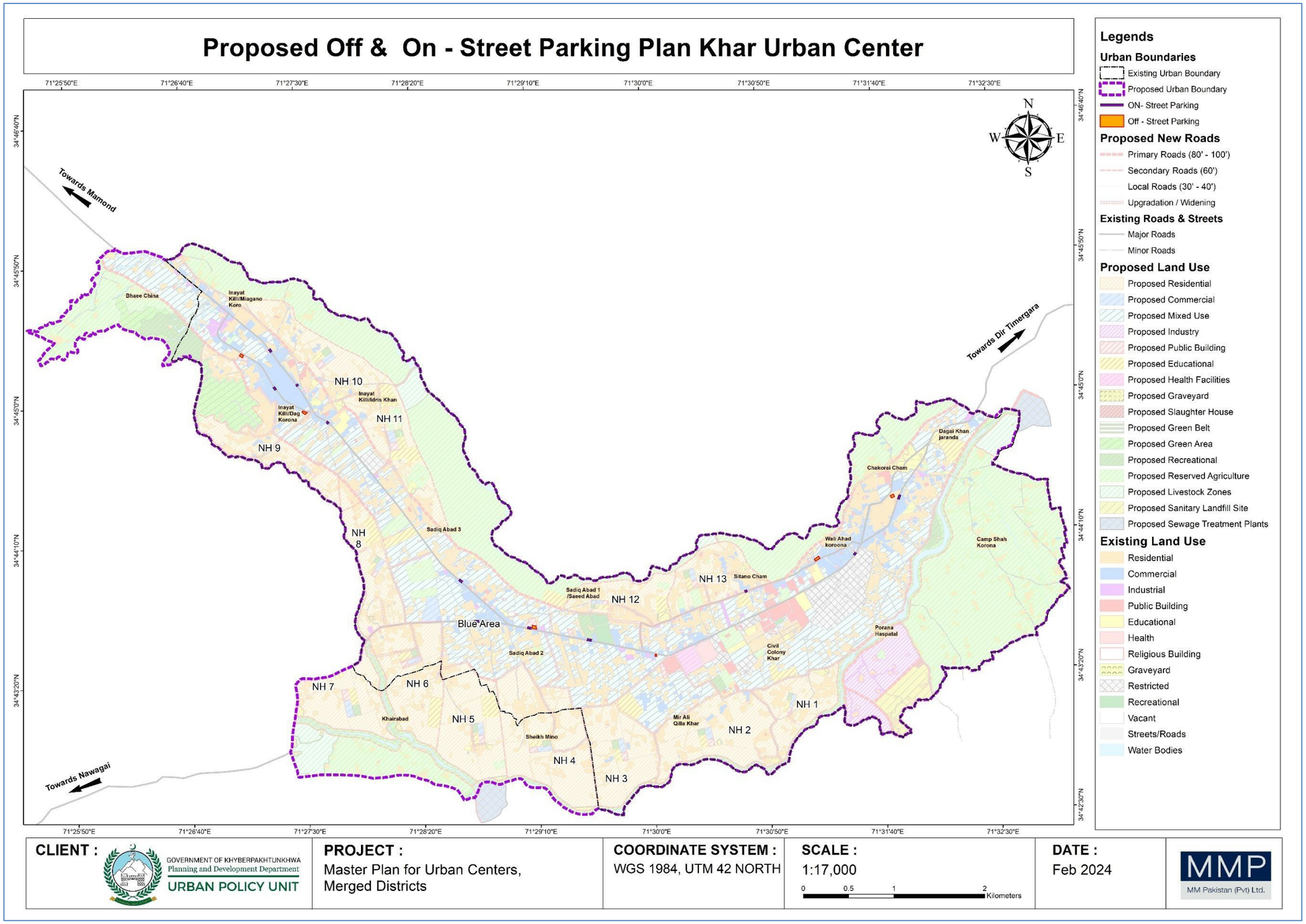
4.10.8 General Guidelines for Transportation Facilities

The following are the general guidelines used for the allocation of transportation facilities in the city:

- **Transport Terminal**
  - Located at the city entrance/exit
  - Near economic activities center
  - Connectivity with major roads
- **Taxi Stand and Parking**
  - Adjacent to the transport terminal
  - Connectivity with major roads
- **Truck Adda**
  - Near the Commercial center
  - Connectivity with major roads
  - Near the Workshop



Map 4-18: Proposed Road Network & Transportation Facilities



Map 4-19: Proposed On-Street and Off-Street Parking

4.11 Water Supply, Sanitation, and Solid Waste Management

Water supply, sanitation, and solid waste management are critical components of a healthy and sustainable urban environment. In Khar Urban Centre, these services are essential for maintaining public health and environmental sustainability.

4.11.1 Water Supply

The existing water supply schemes (WSS) in Khar Urban Center, District Bajaur, consist of multiple government and VDO-operated schemes serving various localities. These schemes primarily rely on solar-powered tube wells, with a few using electrical systems. Most of the schemes operate for 7 hours daily, with water discharges ranging between 2,500 to 5,000 GPH. Storage capacities vary, with some systems incorporating overhead reservoirs (OHR) and storage reservoirs (SR). While the majority of schemes are functional (F), a few, such as WSS Tauheed Abad Khar and WSS Janah Bus Terminal, are non-functional (NF), impacting water accessibility. The system plays a crucial role in providing potable water to thousands of residents, but some schemes require rehabilitation and maintenance to ensure uninterrupted supply across the urban center.

The field survey conducted in Khar Urban Centre reveals a significant gap in access to water supply schemes, with only 34 percent of the population having access to such facilities. This leaves a staggering 66 percent of the population unserved in terms of water supply. This situation calls for a proactive execution strategy that can bridge this gap and provide access to essential services to the unserved population.

The detailed analysis is depicted in the table below.

Table 4-25: Water Supply Served/Unserved Population

Population	Served Population	Unserved Population	Unserved Percentage
122920	41990	80930	66

Source: Consultant Calculation

The map below shows the existing water supply network, tube well, and overhead reservoirs.

4.11.1.1 Future Water Demand Estimation

Water consumption recorded in the developed world is more than 50 gallons/person/day, whereas the UN suggests that each person needs 20 to 50 liters of water a day to ensure their basic needs for drinking, cooking, and cleaning12. The water demand of Khar Urban Centre for 2022 has been estimated13 at 30 gallons. Per capita, future water demand is based on estimated per capita water demand and the estimated population for various future time horizons.

In many villages, settlements, and towns, water is delivered without a metered system, and field surveys have shown that a large percentage of the communities served experience water shortages. Therefore, actual water use is not a true reflection of water demand, and it is not possible to forecast future water

[12] UNESCO, World Water Assessment Program: World Water Development Report (2013).

[13] Draft Master Plan of Water Supply and Sanitation for District Bajaur.

demand based on historical records or extrapolation and trend analysis procedures. The population-based water demand is determined to estimate the current and future demand for water in the district.

According to the Khyber Pakhtunkhwa Drinking Water Policy 2015, each household should have access to at least 45 liters per capita of potable water or the round trip for fetching potable water should not exceed 30 minutes. Considering the local context, the water demand for Khar Urban Centre is considered to be 30 gallons per capita. The total water demand for the plan period (2040) has been calculated and provided in **Table 4-26**.

Table 4-26: Water Demand Projection in Khar Urban Centre

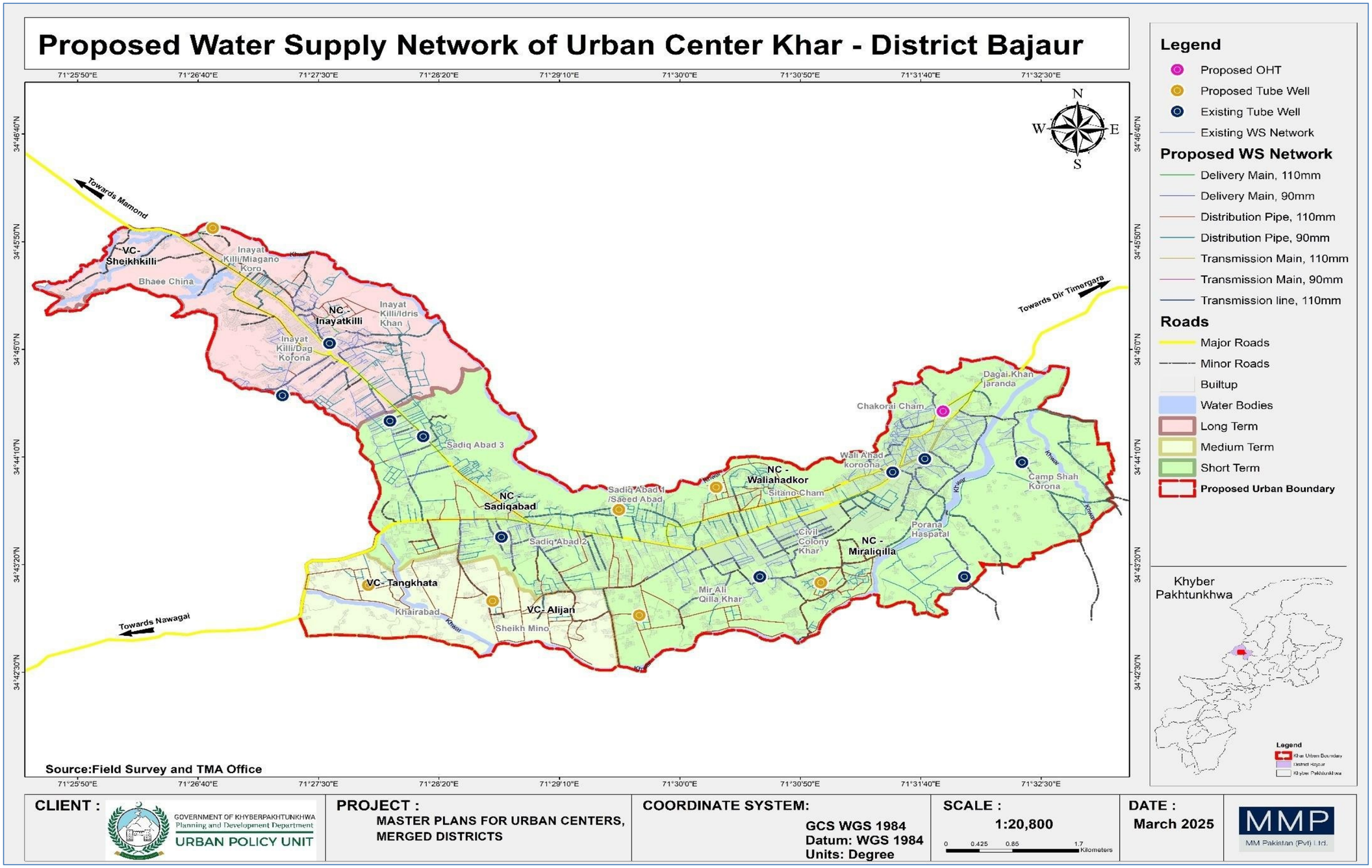
Year	Population	HH Size	Household	Water Demand @ 30 GPCD (MGD)
2022	122,920	8.85	13,889	3.7
2025	139,227	8.85	15,732	4.2
2030	171,354	8.85	19,362	5.1
2035	210,896	8.85	23,830	6.3
2040	259,561	8.85	29,329	7.8

To fulfill the water demand for the existing and future population, tube wells along with a filtration plant are proposed in each neighborhood center. The neighborhoods are designed to accommodate 5 to 10 thousand population, and one tube well per neighborhood is proposed to fulfill the water demand. Therefore, in each neighborhood center, one tube well and one overhead tank (OHT) will be constructed in the corner of the proposed park to store and distribute water.

The Proposed Water Supply Network for Khar Urban Center is designed to serve a growing urban population by implementing a phased distribution strategy. Based on existing and proposed schemes, the network aims to serve approximately 40,000–50,000 people across various neighborhoods.

- **Short-Term (Immediate Implementation):** The focus is on addressing urgent water needs by installing new tube wells, overhead tanks (OHTs), and primary pipelines (90mm and 110mm distribution pipes). These will ensure supply to high-density areas such as Khar, Inayat Killi, Sadiqabad, and Mirali Gilli, covering an estimated 15,000–20,000 people.
- **Medium-Term (5–10 Years):** The network will be expanded with additional transmission mains, upgraded distribution pipelines, and new storage facilities. This phase ensures a more even distribution, reducing reliance on existing sources and reaching outer settlements like Wali Ahad Kor, Chakorai Cham, and Tangkhata, benefiting an additional 15,000–20,000 residents.
- **Long-Term (Beyond 10 Years):** The network will be fully developed with additional tube wells, larger transmission lines (110mm), and increased storage capacity, covering the entire urban area, including peripheral settlements. This phase aims to provide sustainable and equitable distribution for over 40,000–50,000 residents, ensuring resilience against future demand.

The map below shows existing water supply reservoirs and network in Khar urban center.



Map 4-20: Proposed Water Supply Services Map Network Plan

4.11.2 Sewerage and Sanitation

Based on the water demand projections upto 2040 calculated above, projections of wastewater generation upto 2040 is estimated as under:

Table 4-27: Waste Water Generation of Khar Urban Centre

Year	Population	Water Demand @ 30 GPCD (MGD)	Waste Water Demand @ 70% of Water Demand (MGD)
2022	122,920	3.7	2.6
2025	139,227	4.2	2.9
2030	171,354	5.1	3.6
2035	210,896	6.3	4.4
2040	259,561	7.8	5.5

Khar Urban Centre is facing a significant issue of unplanned growth, leading to inadequate infrastructure development. Most of the streets are in poor condition and made up of Katcha, further deteriorating over time. There is a lack of proper sewerage and drainage systems in the area, causing significant health hazards to the local population.

The existing sewerage and drainage system in Khar Urban Centre comprises open drains, which are mostly broken and undersized. This lack of properly designed, concrete drains leads to the locals discharging their sewage water in Katcha drains or openly in the streets, causing unhygienic conditions. The situation is made worse in areas where the open drains are constructed, but the outfalls have not been developed, leading to the water discharging in temporary kitchen drains or open drains.

In response to the lack of proper infrastructure, people in Khar Urban Centre have dug soak pits and septic tanks in their houses for the disposal of sewage. However, these are not viable alternatives to a proper sewerage system as they pollute the groundwater, making it unfit for drinking and causing health issues for the local population.

To address the issue, the local government has constructed a network of roadside stormwater drains in the city. Although these are meant to collect stormwater, they are currently overloaded and cannot accommodate large volumes of water during the rainy season. This leads to severe flooding and disruption in the city. Moreover, the drains along the Khar-Ghalanai roads, Inner Khar Bazar, and Inayat Kali Bazar are open, filled with solid waste, and have not been regularly cleaned or de-silted. These open drains pose significant health hazards to the local population.

The lack of proper infrastructure for sewerage and drainage in Khar Urban Centre is a significant issue affecting the daily lives of its residents. This has resulted in the spread of diseases and contamination of water sources, posing severe health hazards to the local population. To address this issue, it is essential to develop a proper sewerage and drainage system to improve living conditions.

As per the NRM 1985 standard, there should be a sewage treatment plant of 0.92 acres per 8,000 of the population. Therefore, to recycle the city's sewage and make it usable for other purposes, such as agriculture, sewage treatment plants are proposed on outside of the skirts of the city with an area of 29.4 acres.

Table 4-28: Standard of Sewage Treatment Plant

Category / Proposal	NRM Standard	Year	Population	Area Required
Sewage Treatment Plant	0.92 acres per 8000 Population	2022	122,920	14.1
		2040	259,561	29.4

Two mega Sewage Treatment Plants (STPs) are proposed for the purpose to treat the wastewater produced/generated from commercial and residential areas. The site for the proposed STPs is based on the following criteria;

- The gravitational flow of Water
- Near the Natural Stream
- Away from Commercial and Residential

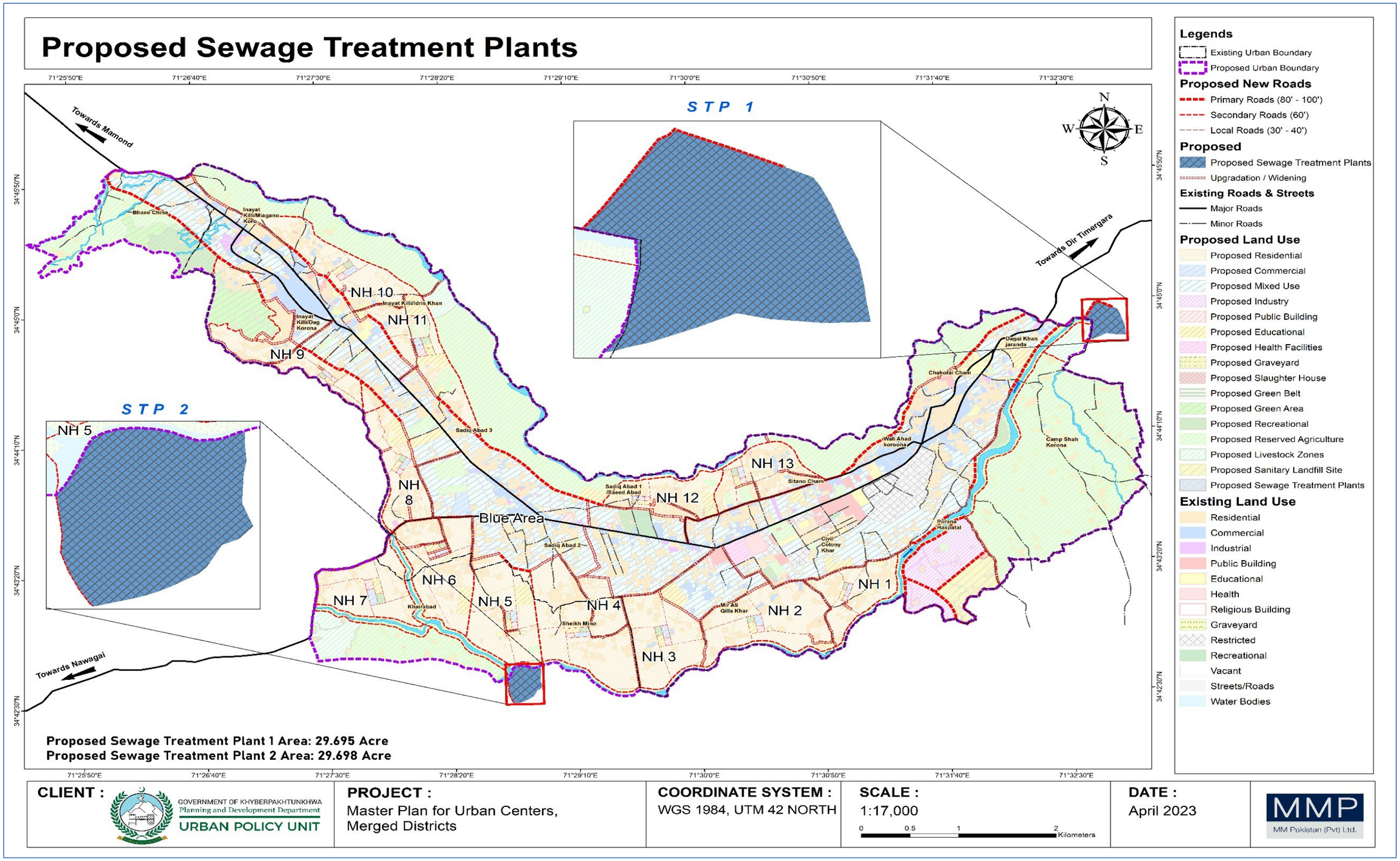
4.11.3 Solid Waste Management

Solid waste management is one of the most important responsibilities of the local government. The lack of proper techniques for solid waste management may lead to unhygienic conditions in the city. During the survey, it was found that door-to-door collection is non-functional in the majority of areas in Khar Urban Centre. The tehsil municipal administration (TMA) Khar is responsible for the collection, transportation, and disposal of solid waste in the city and is currently managing Khar Bazar and the surrounding areas for the collection of solid waste the city. Due to a shortage of manpower, especially skilled staff, essential equipment, and a lack of financial resources, the existing infrastructure is not coping with the demand and is not capable of handling the situation. The collection rate is approximately 30-40%, and the remaining 60% remains uncollected on the roads, streets, and residential areas that are usually burnt in the open air, creating air pollution and health hazards. The waste is collected through Wheelbarrows and Hand Carts as primary collection and tractors and dumper trucks as a secondary collection. Sweepers are also there to collect waste from roads. The TMA has provided a few dustbins in commercial areas of the city. There is only one authorized waste dumping site, and there is no proper arrangement to deal with the hazardous effluents generated by hospitals.

4.11.3.1 Solid Waste Generation and Projection

In Pakistan, Solid Waste Generation (per capita/year) ranges between 0.283 to 0.612 kg/capita/day and its growth rate is 2.4% per year14. By considering, the average minimum and maximum per capita waste generation the existing and future solid waste generation is calculated for Khar Urban Centre. The average solid waste of 0.58 kg/capita/day is generated.

[14] https://www.waste.ccacoalition.org/sites/default/files/files/lahore_city_profile.pdf



Map 4-21: Proposed Sewerage Treatment Plant

Table 4-29: Per Capita Solid Waste Generation

Year	Population	Waste generation rate (kg/capita/day)	Tons	Yearly generation (Tons)
2022	122,920	0.4	54	19,786
2040	259,562	0.48	137	50,138

4.11.3.2 Waste Storage

The local government provides waste bins or bags for storage at the source. The bins have a capacity of 4 tons and 40 kg and are placed in different locations throughout the city. The total capacity of the waste containers is 60.8 tons, which is considered adequate for the current population. The storage capacity of these bins is summarized in the following table:

Table 4-30: Existing Waste Bins in Khar Urban Centre

Location	Number of Bins	Total Capacity (tons)
Khar Bazar	8	32
Khar-I	8	32
Khar-II	3	12
Total	19	76

It is important to note that the capacity of the waste containers may need to be increased in the future to accommodate the growing population of Khar Urban Centre.

Table 4-31: Waste storage capacity

Type of container	Numbers	Waste carrying capacity
4 tons capacity	15	60
40 tons capacity	20	800

4.11.3.3 Waste Collection

According to TMA, 4275 tons of solid waste are collected per year from Khar Urban Centre, which generates approximately 49 tons of solid waste per day. Based on this data, it is evident that only 23 percent of the city's solid waste is collected by TMA, while the rest of the 67 percent is dumped in open spaces, natural drains, and on streets. During the survey conducted in 2022, it was observed that solid waste is manually collected. Table 5-34 shows the monthly solid waste collected from Khar Urban Centre in 2021, based on the data collected from the tehsil municipal administration.

Table 4-32: Monthly Wise Solid Waste Collection in 2021

Sr. No	Month	Solid waste Collected in Tons
1	January	360
2	February	340
3	March	340
4	April	340
5	May	370
6	June	380

Sr. No	Month	Solid waste Collected in Tons
7	July	370
8	August	345
9	September	385
10	October	340
11	November	345
12	December	360
Total		4275

Source: MMP Master Planning Survey of Khar Urban Centre 2022

According to the Tehsil Municipal Administration, Khar Urban Centre generated approximately 17,885 tons of solid waste in 2021, with an average monthly collection of 1,490 tons. However, the TMA only collected 3,750 tons of solid waste in the same year, which accounts for only 21% of the total waste generated. The remaining 79% of the waste was either burned, dumped in open spaces or natural drains, or left on the streets. The manual collection system used by the TMA is inadequate and inefficient in managing the solid waste generated by the growing population of Khar Urban Centre. There is an urgent need to improve the solid waste management infrastructure and establish a proper waste disposal system in the city.

Table 4-33: Proposed Sanitary Landfill Site Standard

Category / Proposals	NRM Standard	Year	Population	Area Required (Acres)
Sanitary Landfill	pop/10000 @ 0.1 Acre / Year	2022	122920	12
		2040	259561	47

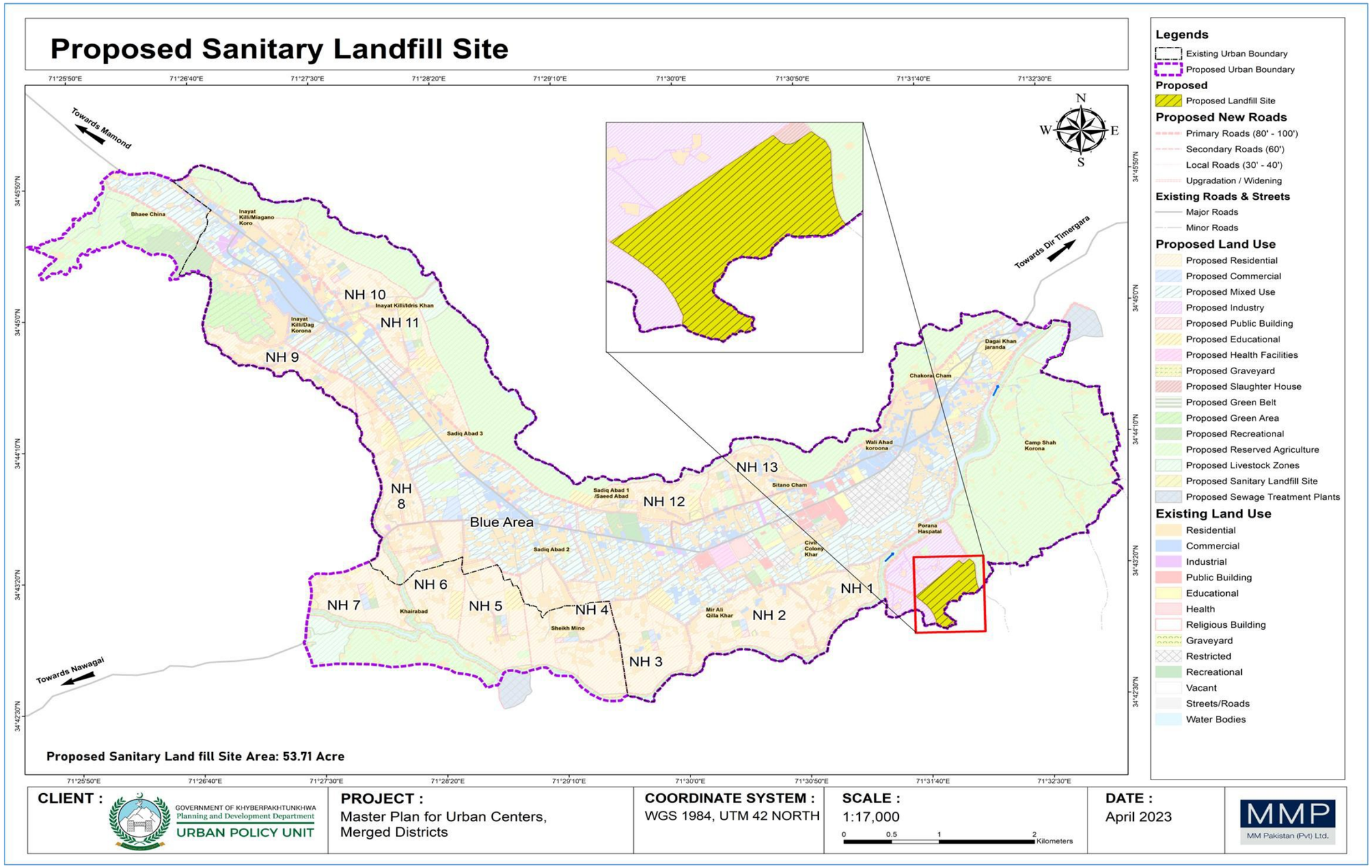
The solid waste site is proposed to safely dispose of the city's solid waste. This site is allocated away from the city on the leeward side away from the residential areas due to its bad odor. This site will be enough to accommodate the city's solid waste up to the planned period.

4.11.4 General Guidelines for Water Supply, Sanitation, and Solid Waste Management Land Allocation

The following are general guidelines used for the allocation of Tube Wells, Filtration Plants, Sewage Treatment Plant, and Sanitary Landfills in the city:

- **Tube well + Filtration Plant**
  - One in each Neighborhoods Centre
- **Sewage Treatment Plant**
  - At the exit point of wastewater discharge
  - Low elevation area
  - Outskirts of the city
  - Away from the residential areas
  - Proximity to the industrial estate
- **Sanitary Landfill Site**

- At the exit point of wastewater discharge
- Connectivity with major roads
- Preferably on Barren Land
- Away from the residential area



Map 4-22: Proposed Sanitary Landfill Site

4.12 Urban Design Elements in Khar Urban Center

Natural scenic beauty within and around the city. Due to increasing population and haphazard growth, the city lost its natural beauty and features of urban design. There are no bylaws/land use plans as these types of plans guide urban design aspects in the city. Khar Urban Center is developing not according to the principle of urban design.

Some of the urban design elements and their current condition are detailed below.

4.12.1 Urban Squares in Khar Urban Centre

The Urban square is the place where people gather in a city. The two important urban squares in Khar urban center are Khar Main Bazar and Inayat Kali Bazar, where a huge type of commercial activities takes place and people gather for some common purposes.

The city's primary function is to acculturate and humanization of its inhabitants and for these purposes, public spaces are essential tools in the city.

Urban public squares serve as more than simply functional areas; they also serve as symbols for their inhabitants. They are intriguing, lively, and busy locations. Most modern urban squares have historical significance for the neighborhood as well as for tourists and other visitors. Authorities should thus understand the importance of urban public squares for improving municipal image and community development.

4.12.2 Urban Design Elements

According to Kelvin Lynch, there are five basic urban design elements on which people create their mental images of the city i.e. paths, edges, districts, nodes, and landmarks. Khar urban center lacks these urban design elements.

- **Path**

Urban roads are evidently the backbone of urban public space. In Khar urban center, the roads, streets, and walkways are eroded, narrow, and non-metallic. The existing path layout is not systematic but expanded without any prior plans to keep the shape of the city attractive. There are no street patterns and poor connectivity without any markings and signage. Therefore, special attention is given to connectivity and linkages within the neighborhoods and central business district (CBD) in this Master Plan.

- **Edges**

Edges are the most attractive urban design elements in a city. This is the only element that facilitates both pedestrian and vehicular populations. According to field observation in Khar urban center, there is a lack of footpaths in the city. The edges are grabbed by the private land/property owners. The commercial activities on the roadsides also affect the footpaths which makes them less attractive for pedestrian movement. The Master Plan encourages pedestrian movement and provides most public facilities within a 5 to 10-minute walking distance.

- **Districts**

A district is characterized as several interconnected sectors that join together to form a city. These areas are similar to one another in terms of traits or qualities that define the identity of the city. Common practice usually involves certain unusual configurations of the districts or pathways. The classification of some of the areas having different land uses such as residential, educational, public amenities and green spaces, etc. There are informal settlements in the city that disturbed the overall vista of the city. Thirteen planned neighborhoods have been proposed with similar characteristics in order to achieve a homogeneous urban form.

- **Nodes**

Nodes can be defined as the strategic spots in a city into which an observer can enter, and which are the intensive foci to that site. Clearly can be viewed that the nodes for this area are more focused on the public amenities area such as Bazars and Sports complex. In Bazars, there is a variety of shops serving the people, rich in foods and hoteling, shops of cloths, everyday commodities shops, fruits, and milk shops. The colony in Khar urban center is also a node which is an attractive spot in the city.

- **Landmarks**

A landmark is a location or building or object which is an important sign for an area. The main landmark in this area is a Sports Complex, which attracts people to the city and presents a scenic view as a major landmark for this city.

4.12.3 Proposed Urban Design and Public Realm Principle

As discussed earlier there is no urban design concept/structure in Khar Urban Center. Some of the major elements and their proposed guidelines are discussed below.

4.12.3.1 Principles for Urban Structure

Urban structure general guidelines for arranging public open spaces, activity centers, public transportation nodes and corridors, residential neighborhoods, streets, walkways, blocks, and lots.

The general topography and land division pattern of an urban region make up the urban structure. It is the arrangement and scale of the streets, roads, and trails that make up the transportation network, as well as the pattern and scale of the blocks, lots, and public areas. Regardless of the size of a city, town, neighborhood, precinct, or huge development site, a place is defined more by the interactions between its many urban structure components than by any one of those components alone. Public transportation hubs and corridors, activity center locations and sorts, public areas, neighborhood facilities, and other elements of the urban organization are all included.

The block is the fundamental building block of urban construction. Blocks, which are defined by streets, are made up of lots or parcels of land that may be used for construction sites or other land uses. While lot layouts and land use might vary over time, roadway and block patterns often do not. For various building and land use kinds, lots can be combined or subdivided.

4.12.3.2 Principles for Movement Network

The guiding concepts behind public roads, streets, and walkways' general design and layout. The network of streets, roads, and paths that supports on-road public transportation, private automobiles, emergency vehicles, bicycles, and pedestrians is known as the mobility network. The movement

network links locations and activities, enables people and goods to get where they are going and access private property.

The movement network land area serves a variety of purposes, including providing space for parking and utility infrastructure, as well as access to daylight and ventilation for nearby structures. A well-designed mobility network has high levels of legibility, convenience, amenity, and safety for users and offers the best walking and cycling access to places including activity centers, workplaces, schools, public transportation, and parks.

4.12.3.3 Principals for Public Spaces

Principles of urban design for parks, streets, plazas, and public open spaces. Parks, plazas, and street spaces are examples of public spaces—areas in the public domain that serve as gathering places for the general public.

Commonly found on publicly owned property, open to anyone, and controlled and maintained by councils or other public organizations. Certain privately owned properties allow for regulated public access and usage as a public area, such as a building forecourt, a walk-through, a retail center, or a shared open space. In existing urban areas, public spaces can be developed by reallocating land uses or as part of a land subdivision.

Public areas support a wide range of activities and give users entertainment and convenience. The location, size, dimensions, and interfaces with neighboring properties, as well as the pathways and configuration of activities inside the area, are crucial components of successful public spaces. Public places are also influenced by their surroundings in terms of how people utilize and see them. Direct linkages to the nearby pedestrian network are provided through a functional system of public areas, which also have paths.

4.12.3.4 Principles for Objects in the Public Realm

The arrangement and layout of small structures, utilities, and street furniture in the public sphere. The things in streets and public areas that are either for the general people's use and convenience or utilities infrastructure and services are considered to be in the public realm. Street furniture, service cabinets, trees, plants, obstacles, fences, lights, signage, and modest public constructions are examples of objects. seats, water fountains, mailboxes, payphone cabinets, kiosks, and public restrooms are examples of items that people may use; other items, including trees, lighting, barriers, and signs, improve the amenity and safety of an area. Although they are situated in the public realm, other items like service cabinets, power, and telecom poles are not directly used by the general public.

4.13 Parks and Playground

Khar Urban Centre is lacking in public parks and playgrounds, with only two recreational spaces available: Colony Park and the Sports Complex. However, these spaces do not meet the standards set by the NRM 1985 for providing adequate recreational opportunities for the residents. According to these standards, community-level playgrounds are necessary based on the population criteria.

Table 4-34: Parks and Playground in Khar Urban Centre

Sr. No	Name	Area (Acres)
1	Bajaur Sports Complex	13.32
2	Colony Park	1.21

Source: MMP – Master Planning Survey of Khar Urban Centre, 2022

4.13.1 NRM Standard of Active and Passive Recreation

According to the National Reference Manual, a city must sustain both types of active and passive recreation in the city. The standard of both types of recreation is given in the following **Table 4-35**.

Table 4-35: NRM Standard of Active and Passive Recreation

PASSIVE RECREATIONAL FACILITY				
Type	**Description**	**Allocation Criteria (pop)**	**Area (ha)**	**Area (Acres)**
City Park	Wide range of amusement facilities, fountains, lakes, landscaping, etc.	400,000	12 to 15	30
Community Park	selected amusement facilities fountains, lakes, landscaping, etc.	100,000	4 to 5	10
Neighborhood Park	wide range of child play fixtures, walking & jogging paths.	25,000	3.25 to 4	8
Mohalla Parks	Tot lots with slides, swings, and seesaws; other spaces with some turf	6,250	1.6 to 3.6	5

ACTIVE RECREATIONAL STANDARD				
Hierarchy	Population Criteria	Type	Size (ha)	Size (Acres)
City Stadium	300,000	Cricket	2	5
	200,000	football	1.4	3.45
		Hockey	1.15	2.8
Community Play Ground	100,000	combine playfield	2.14	5.28
Neighborhood Play Ground	25000	combine playfield	1.63	4

4.13.2 Proposed Parks and Playground in Khar Urban Centre

Khar Urban Centre is facing a shortage of public parks and playgrounds to meet the active and passive recreational needs of its residents. Currently, there are only two recreational areas available - the Colony Park and the Sports Complex, which fall short of the National Reference Manual (NRM) 1985 standards.

To determine the appropriate acreage for recreation purposes, the park standards suggest allocating 5 acres per 100,000 persons. Based on the 2022 estimated population of Khar Urban Centre, which is 122,920 individuals as per, Table 5-58, the total land area designated for outdoor recreation in the city is only 14.53 acres. This area is far below the NRM standard, indicating the need for more parks and playgrounds to be developed in the future. Moreover, the population of Khar Urban Centre is projected to increase by the year 2040, necessitating the establishment of more parks and playgrounds to meet the needs of the city. For the existing population, the appropriate level of parks and playgrounds, along with the required acreage, is detailed below.

It is recommended that the city continues to monitor population changes, community interests, and recreational trends to evaluate the future park and playground needs of Khar Urban Centre.

Table 4-36: Passive Recreation Facility Requirements (2022-2040)

Passive Recreation							
Year	Population	Community Park @100000	Area @12 (Acre)	Neighborhood Park @25000	Area @3 (Acre)	Mohallah Park @6250	Area@1 (Acre)
2022	122,920	1	15	5	15	20	20
2040	259,562	3	31	10	31	42	35

Table 4-37: Active Recreation Facility Requirements (2022-2040)

Active Recreation					
Year	Population	Community Playground @ 100000	Area @5 acres	Neighborhood Park @ 25000	Area @ 4 acres
2022	122,920	1	5	5	20
2040	259,562	3	10	10	45

4.13.3 Proposed Recreational facilities in Khar Urban Centre

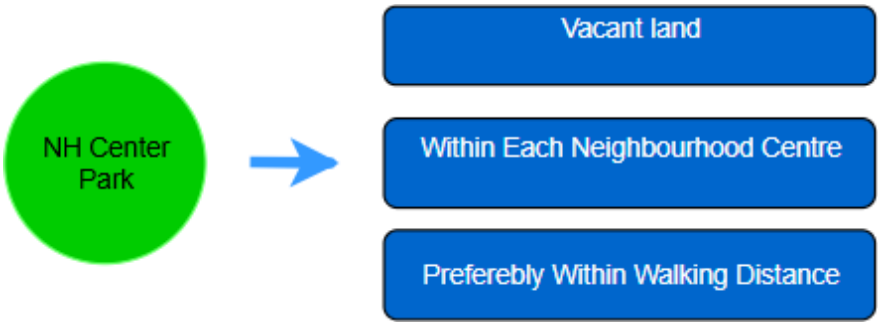
Based on the demand and needs for parks and playgrounds in the city, three town parks of an area covering 66.5 acres are proposed for the city. These parks are provided in a manner to facilitate the whole city population. The central park is proposed on the main road near Bajaur Sports Complex, the mega amusement park is proposed near the Inayat Kali bypass, and one mini park is proposed in the streaming front near Khar Urban Centre. For passive recreation, mini parks are proposed in every neighborhood center. The total area of the proposed neighborhoods parks is 18.2 acres.

For active recreation, there is a mega-sports complex situated near the Khar Urban Centre, while for the future need of the city, a community-level recreation facility on the area of 4.2 acres is proposed in the boundary of the blue area to facilitate the maximum neighborhood.

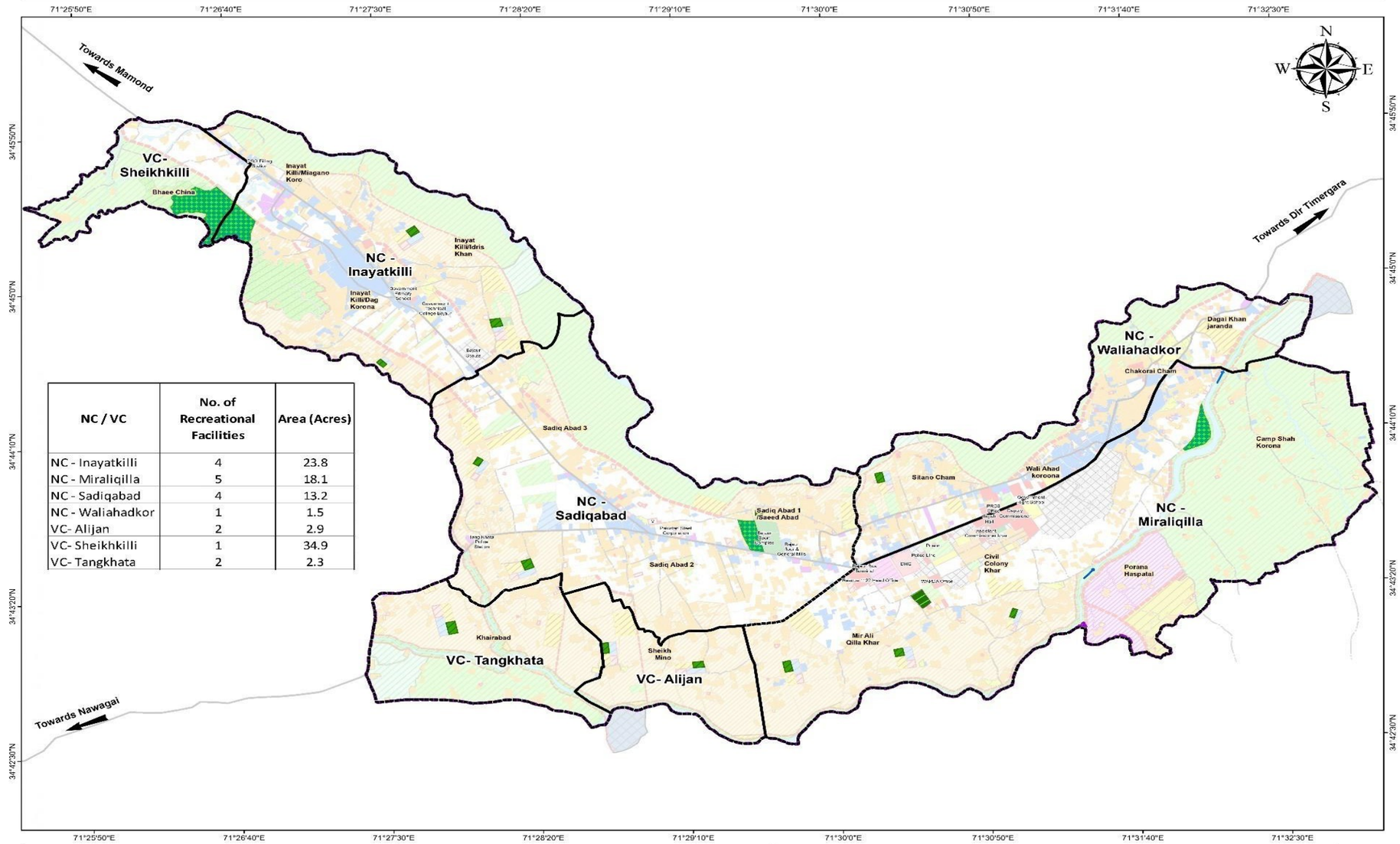
4.13.4 General Guidelines for Parks and Playgrounds Location

The following are the general guidelines used for the allocation of parks and playgrounds in the city:

- **City Central Park /Town Park**
- **Neighborhood-level parks and playgrounds**



Proposed Recreational Facilities



NC / VC	No. of Recreational Facilities	Area (Acres)
NC - Inayatkilli	4	23.8
NC - Miraliqilla	5	18.1
NC - Sadiqabad	4	13.2
NC - Waliahadkor	1	1.5
VC- Alijan	2	2.9
VC- Sheikhkilli	1	34.9
VC- Tangkhata	2	2.3

Legends

- NC/VC Boundary
- Proposed Urban Boundary
- Existing Urban Boundary

Proposed Recreational

- Sports Ground (Active Recreation)
- Town Parks (Passive Recreation)
- NH Parks (Passive Recreation)

Existing Roads & Streets

- Major Roads
- Minor Roads

CLIENT :	PROJECT :	COORDINATE SYSTEM :	SCALE :	DATE :
GOVERNMENT OF KHYBERPAKHTUNKHWA Planning and Development Department URBAN POLICY UNIT	Master Plan for Urban Centers, Merged Districts	WGS 1984, UTM 42 NORTH	1:17,000 (0, 0.5, 1, 2 Kilometers)	Jan 2025

MM Pakistan (Pvt) Ltd.

Map 4-23: Proposed Recreational Facilities

4.14 Proposed Reserved Agriculture, Livestock Zone, and Green Areas

The key consideration for the land suitability for agriculture, livestock, and forestation is necessary to protect agricultural land for food production of the city and forest for the environmental preservation of the city and natural habitat for flora and fauna. The following are the agricultural land use within a city;

- Crop production (e.g., wheat, corn)
- Livestock production (e.g., cattle, sheep)
- Dairy farming
- Poultry farming
- Aquaculture (e.g., fish farming)
- Forestry and timber production
- Horticulture (e.g., fruit and vegetable farming)

4.14.1 General Guidelines for Agriculture and Forest Allocation

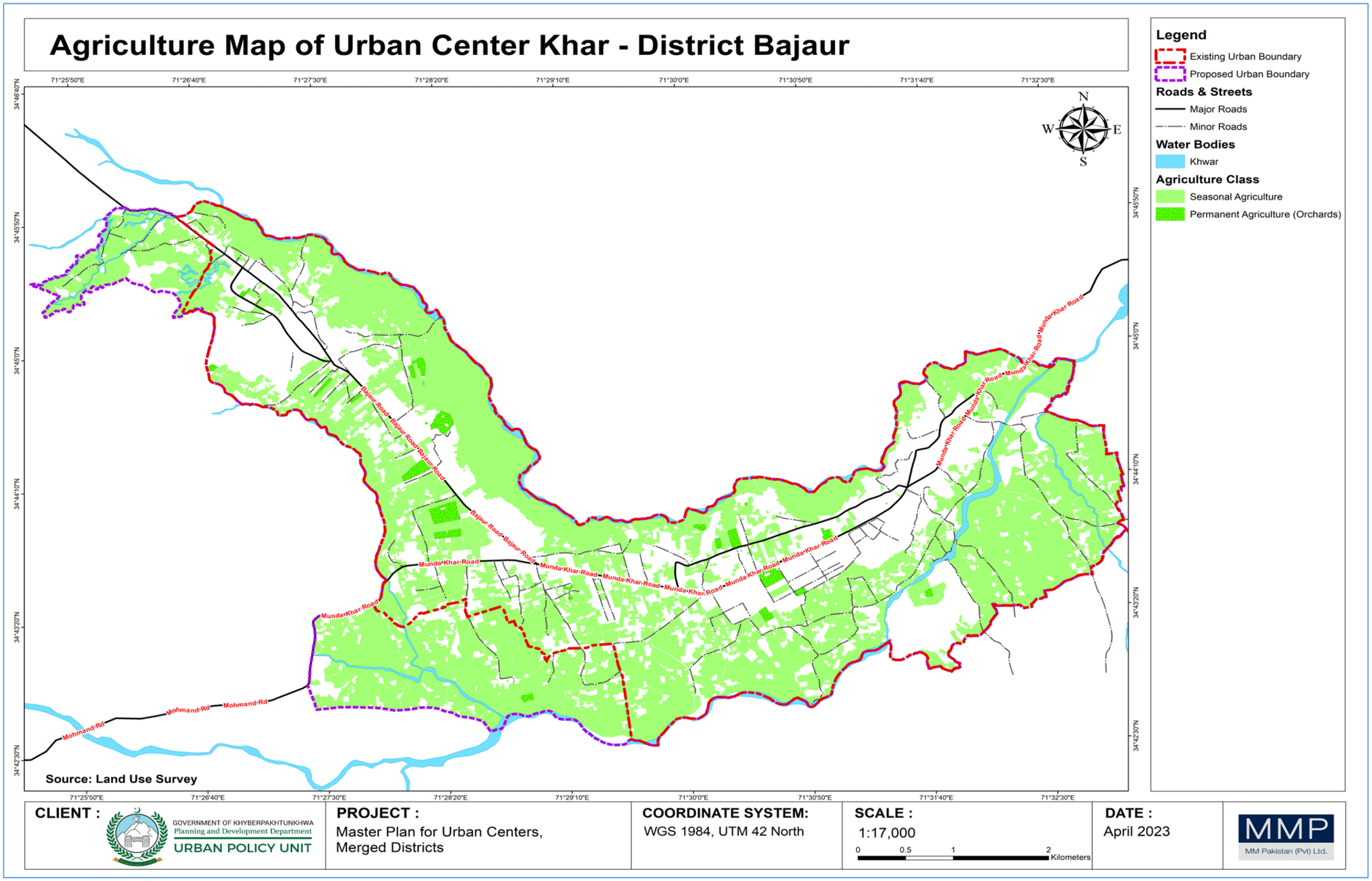
- **Proposed Reserved Agriculture**
  - Land with agricultural potential
  - Accessible from roads
  - Presence of water course/irrigation network
- **Managed Forest**
  - On Hilly areas of the city
- **Urban Forest**
  - Near water bodies and graveyards
  - Buffer to Built-up area

The following are the detailed allocation of agriculture, livestock, and forest areas based on the above criteria.

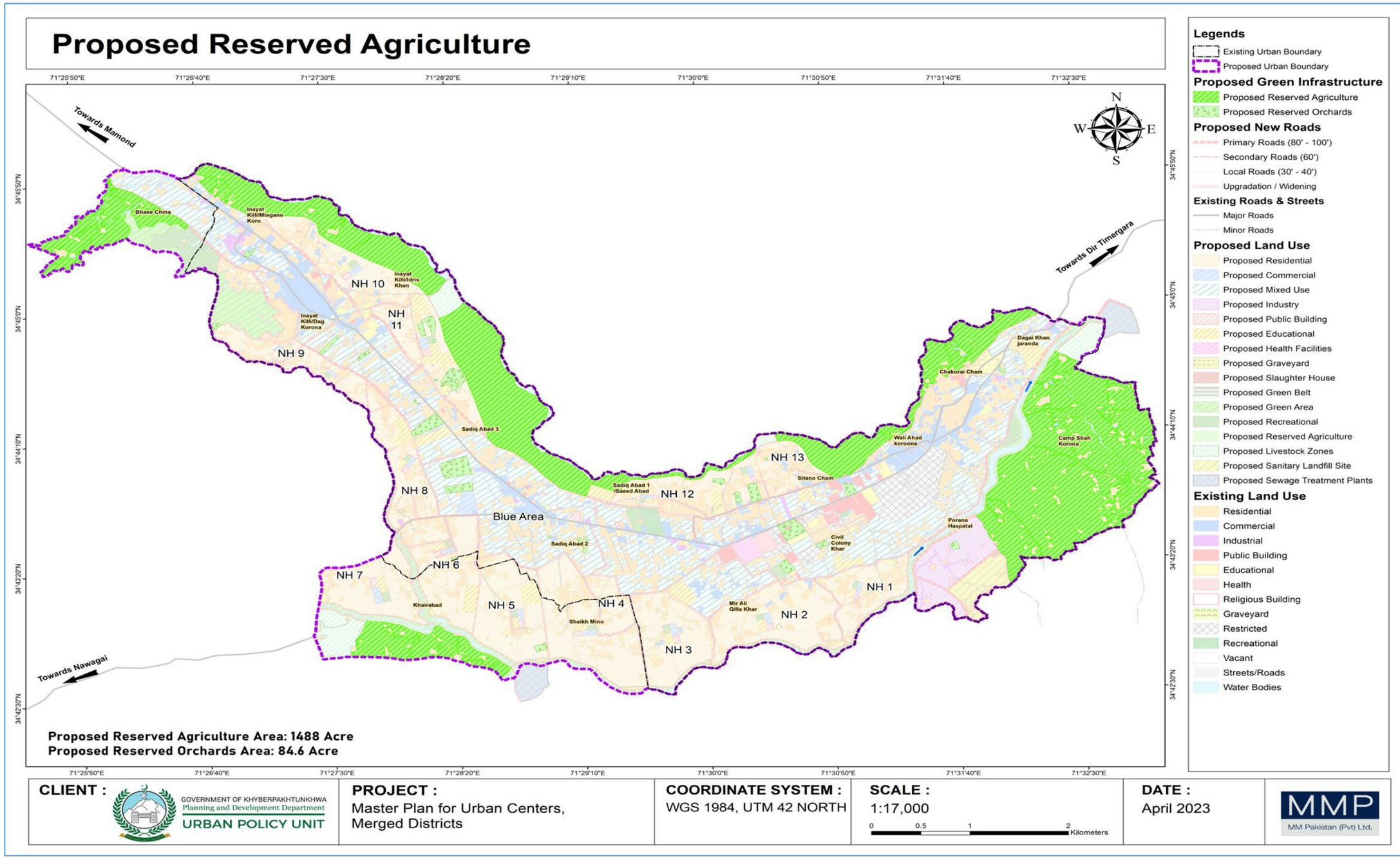
4.14.2 Agriculture

An area of approximately 1572.69 acres is dedicated to agricultural purposes in Khar Urban Centre. These prime agricultural lands play a crucial role in the city's food supply. However, there is currently no proper irrigation system in place. The city's area is divided into two categories: seasonal agriculture and permanent agriculture. Seasonal agriculture involves growing cash crops and vegetables on a seasonal basis, primarily along the city's boundaries, creating a green belt around it. Access roads are available to link these farms to the market. The preservation of these areas can restrict the city's expansion and discourage urban sprawl. On the other hand, permanent agriculture consists of fruit orchards that are protected from rapid development and cater to the city's fruit needs.

Map 4-23 shows the existing agriculture and Map 4-24 shows the proposed agriculture area within the Khar Urban Center.



Map 4-24: Existing Agriculture Land Use of Khar Urban Centre```



Map 4-25: Proposed Agriculture Reserved in Khar Urban Centre

4.14.3 Livestock Zones

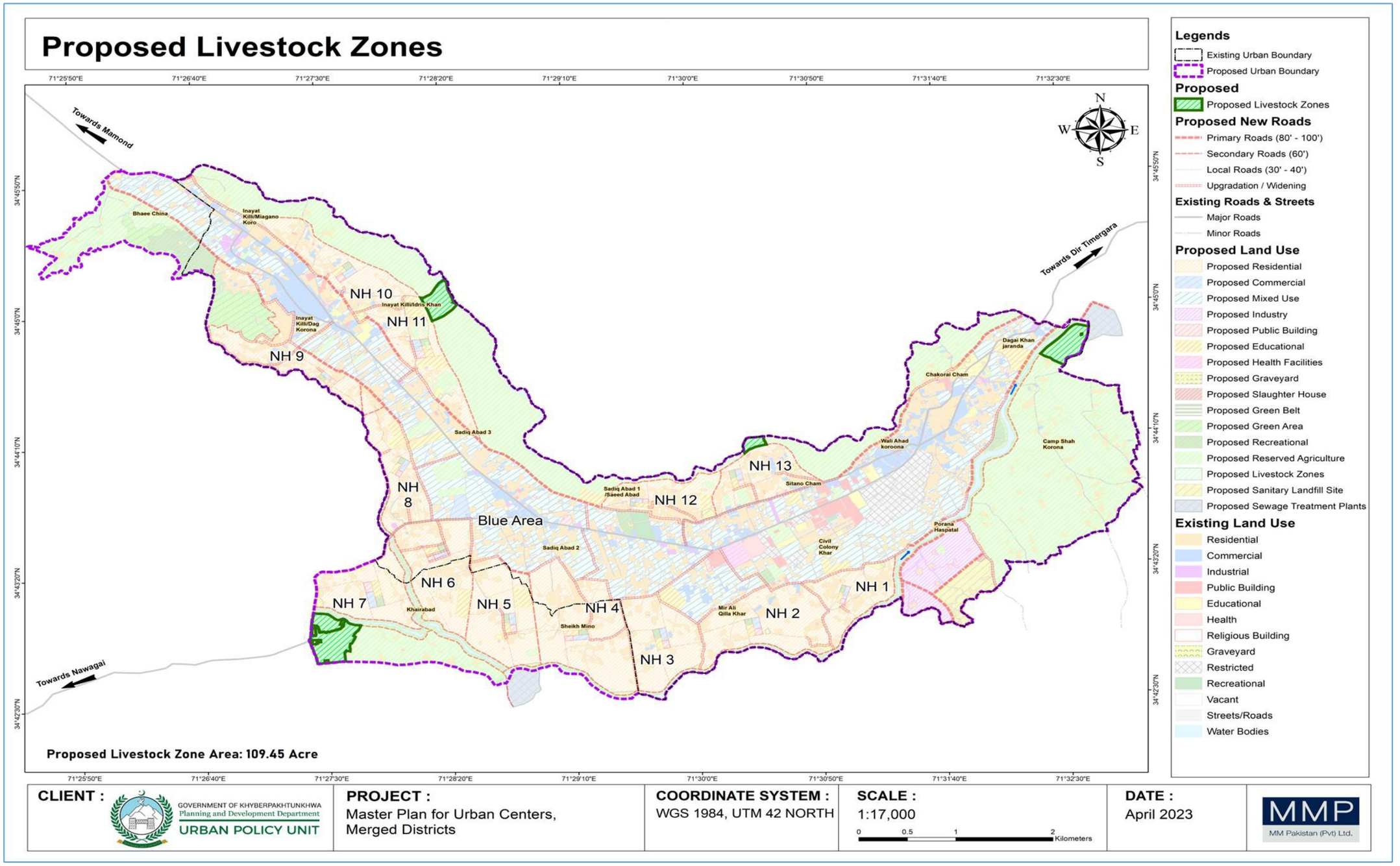
The Livestock zones proposed within the Khar Urban Centre are a crucial part of the city's plan for sustainable development. These zones are strategically located near agricultural areas in Inayat Kali, Khairabad, Sitano Cham, and Camp Shah Korona to ensure easy access and serve the population. The total area of the livestock zone is 109 acres, and it will contain mainly cattle farms that can accommodate cattle, buffaloes, sheep, and goats, with pasture and grazing lands around the farms. Additionally, there will be poultry farms and fish farms to fulfill the meat needs of the city.

To ensure the health and well-being of the animals in these zones, veterinary hospitals and clinics are also proposed. These clinics will be staffed with trained professionals and equipped with the necessary tools to handle any medical emergencies that may arise. By providing medical care for the animals, the city can prevent the spread of diseases and promote the sustainable production of meat and other animal products.

The livestock zones are designed to be sustainable and environmentally friendly. They will incorporate modern farming practices and use innovative technologies to minimize the impact of livestock farming on the environment. The zones will also prioritize the use of renewable energy sources, such as solar and wind power, to reduce the reliance on non-renewable resources.

The city recognizes the importance of these livestock zones for the growth and development of the agricultural sector. The future provision of the livestock zones will be near the agriculture areas/villages situated outside of the city boundary. This will help to create a mutually beneficial relationship between the city and the rural areas surrounding it. The livestock zones will provide a market for the farmers in the surrounding areas, while the city will benefit from a steady supply of fresh and locally sourced produce. The criteria developed for the proposed livestock zone are;

- Near existing livestock/dairy farms
- Adjacent to agricultural land/activity
- Veterinary services
- Presence of a water course
- Away from the city Centre
- The local market for supplies and trade



Map 4-26: Proposed Livestock Zones in Khar Urban Centre

4.14.4 Proposed Green Areas

There are several forest laws and ordinances that govern the management, conservation, and utilization of forests in the province. Some of the key forest laws and ordinances applicable in KP include:

- **Khyber Pakhtunkhwa Forest (Amendment) Act 2022**

This Act is the amend of the Khyber Pakhtunkhwa Forest Ordinance, 2002 (Khyber Pakhtunkhwa Ordinance No. XIX of 2002). This Schedule shall apply to merged districts for a period of ten years. The Khyber Pakhtunkhwa Forest (Amendment) Act, 2022 includes the following key points:

Ownership and Management: The ownership of forests, private forests, jointly managed communal forests, and socially managed forests will be vested with the concerned individuals or local communities. They will be managed collaboratively through a Joint Forest Management Mechanism or local traditional committees, along with the involvement of the Department as per the provisions of the Act.

Regulation and Management: The government may regulate and manage forests, private forests, jointly managed communal forests, socially managed forests, and wastelands owned by private individuals or jointly owned where the government has no proprietary rights.

Special Purposes: Forests will be managed and protected for specific purposes such as protection against natural calamities, conservation of soil and water resources, preservation of particular types of trees, maintenance of water supply, and protection of infrastructure.

Prohibited Acts: Various activities are prohibited in forests, including illegal cutting, land clearing for cultivation, irregular pasturing of cattle, setting fire or clearing vegetation, and other acts prohibited under local social systems or the Nagha System.

Ownership and Forest Produce: Forests and forest produce found in government-owned forests or lands in merged districts will be the property of the government unless otherwise stated. Owners of private forests, jointly managed communal forests, and socially managed forests may lawfully take forest produce subject to the provisions of the Act.

Forest Management Plan: Forest officers may create Forest Management Plans in accordance with the procedures outlined in the Act.

Non-bailable Offenses: Offenses under the Act, Nagha System, or local social systems are considered non-bailable.

Joint Management: The Divisional Forest Officer may assign management rights over forests, private forests, jointly managed communal forests, and socially managed forests to local traditional committees. The Forest Officer may also enter into agreements for joint management with community- based organizations or village-based organizations.

- **Khyber Pakhtunkhwa Forest Ordinance 2002**

This ordinance provides a legal framework for the management, protection, and development of forests in Khyber Pakhtunkhwa. It outlines the powers and functions of the forest department, procedures for granting permits and licenses, forest conservation measures, and penalties for illegal activities such as encroachment and timber smuggling.

- **Khyber Pakhtunkhwa Forest Act 2019**

This act was passed to repeal the previous forest ordinance of 2002 and update the legal framework for forest management in KP. It aims to strengthen forest governance, enhance community participation, promote sustainable forest management practices, and improve forest resource monitoring and assessment.

- **Khyber Pakhtunkhwa Forest (Amendment) Act 2014**

This amendment act introduced changes to the Forest Act of 2002, including provisions related to forest revenue sharing with local communities and the establishment of a Forest Development Fund for sustainable forest management.

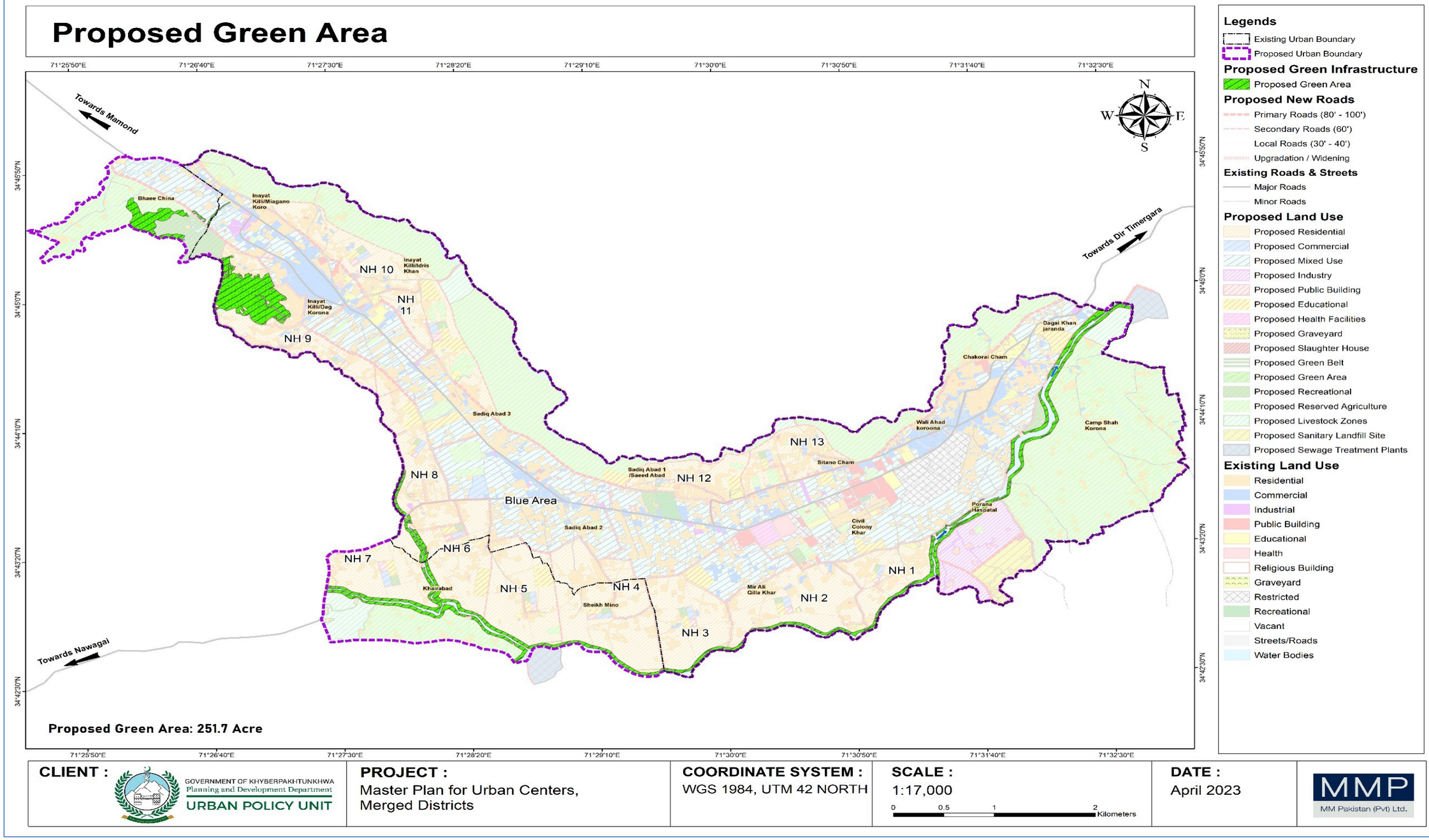
- **Khyber Pakhtunkhwa Forest Policy 2014**

Although not a law or ordinance, the Forest Policy provides guidance and strategic direction for forest management in KP. It outlines the vision, objectives, and strategies for sustainable forest management, biodiversity conservation, community participation, and the promotion of forest-based industries.

Urban green areas are an important aspect of sustainable urban planning as it helps to improve the quality of life for residents and promote environmental sustainability. The proposed urban greenery near the water bodies and green belts around Khar Urban Centre will provide several benefits to the community. Not only the urban green areas will help to improve water filtration and store water, but they will also help to reduce stormwater runoff and prevent soil erosion.

Moreover, urban green areas can provide habitat for wildlife and help preserve biodiversity, which is crucial in maintaining a healthy ecosystem. By creating new habitats and promoting the growth of native plants and trees, the urban green areas will help to support the local ecosystem and provide additional benefits such as improving air quality and reducing noise pollution. Therefore, an urban green area is proposed on 251.7 acres, which will include hilly areas and water bodies buffer. The proposed green areas are not suitable for any type of development. The tree plantation on the proposed sites will serve as a natural habitat for local wildlife and provide an additional area for residents to enjoy nature. Additionally, the green belt proposed around the graveyard will not only restrict its growth but also provide a beautiful and peaceful area for visitors.

In summary, the proposed green areas in Khar Urban Centre are an important step towards promoting sustainable urban planning and improving the quality of life for residents. By improving water filtration, reducing stormwater runoff, and preserving biodiversity, urban forests will provide numerous benefits for both the environment and the community.



Map 4-27: Proposed Green Areas & Urban Forestation in Khar Urban Centre

4.15 Disaster Risk Reduction Proposals

4.15.1 Nature of Natural and Manmade Hazards

4.15.1.1 Natural Hazards

Earthquake: As discussed above district Bajaur lies in Zone-3, therefore there is always a high risk to structures and buildings which may cause causalities of both human beings and animals. Further, it is revealed from the data obtained from the field about the housing units, most of the units lack structural stability and are vulnerable to seismic activity. For devising Disaster Risk Reduction (DRR), the structural strength of all buildings and infrastructures should be ensured in new plans.

Landslides/avalanches: The urban center of Khar is divided by steep slopes. Therefore, there is no landslides/avalanche disaster risk.

Flash Floods: Damages due to floods in 2022 have occurred in district Bajaur, however, the project area has not experienced any flood-related devastations.

4.15.1.2 Manmade Hazards

Wastewater: The industries discharge their wastewater into the adjacent nullas without prior treatment which, as per laboratory analysis of the samples, the COD and BOD exceed the NEQS.

4.15.2 PDMA Monson Contingency Plan, 2022

According to the Contingency Plan 2022, District Bajaur falls moderately vulnerable to natural disasters. The recent inventory conducted by the Emergency Operation Centre showed that natural disasters have caused damage to housing units, schools, and other public and private buildings in the district. Children and women are more vulnerable to injuries caused by natural disasters. Four (4) children have died and one (1) has been injured. These hazards have occurred in rural areas outside the urban area of Khar. However, in the future, there is the possibility of urban flooding in case of heavy rains and cloud outbursts. Since the urban area of Khar is located on higher ground, there is no possibility of river flooding in the urban area of Khar. Table 4-40 shows the loss of life and properties due to heavy rains, floods, GLOF, gusty winds, storms, snow melting, erosion, thunder lightning, thunderstorm, etc.

Table 4-38: Loss to Human life, and Livestock Due to Natural Disasters

Gender Wise Segregated Data from 15/07/2021 to 15/09/2021 (Flood/GLOF/Gusty Winds/Heavy Rain/Land Sliding/Rain/Snow Avalanche /Snow Melting/Soil Erosion/Thunder Lightning/Thunder Strom)								
Died				Injured				Cattle perished
Male	Female	Children	Total	Male	Female	Children	Total	1
0	0	4	4	1	1	1	3	

Table 4-39: Loss and Damage to Infrastructure

Loss of Infrastructure								
House			Schools			Others		
Fully	Partially	Total	Fully	Partially	Total	Fully	Partially	Total
0	1	1	0	0	0	0	1	1

Table above indicates that only one housing unit has been partially damaged in the rural hinterland of Khar. About the public property, one property has been partially damaged. There has been no loss of schools recorded because most of the schools are located in urban areas.

4.15.3 Emergency / Rescue Services in Khar Urban Centre

Rescue 1122 formally launched its services in Bajaur in 2019. The headquarters of Rescue 1122 is situated in Khar Urban Centre. Rescue 1122, responds to the following emergencies:

- Medical Emergency
- Road/Traffic Accidents
- Fire Incidents
- Disasters
- Water Emergency
- Health Referral
- Pandemic Diseases
- Recovery Emergency of Animals, Human Beings, and Vehicles

Services Procedure

- Calling Toll Free Number (1122) without dialing any code
- The average Response to the incident spot is 7 minutes
- Providing first Aid, in medical, Drowning, and Road's accidents and shifting to DHQ Hospital for further Treatment
- Evacuation of Drowning, through expert divers and specialized equipment in case of any kind of water and deep good emergencies
- Provide inter-district referral services through health ambulances

Emergency Rescue-1122 Existing Stations in Bajaur

- Station-11 at Khar Tehsil.
- Station-22 at Nawagai Tehsil.

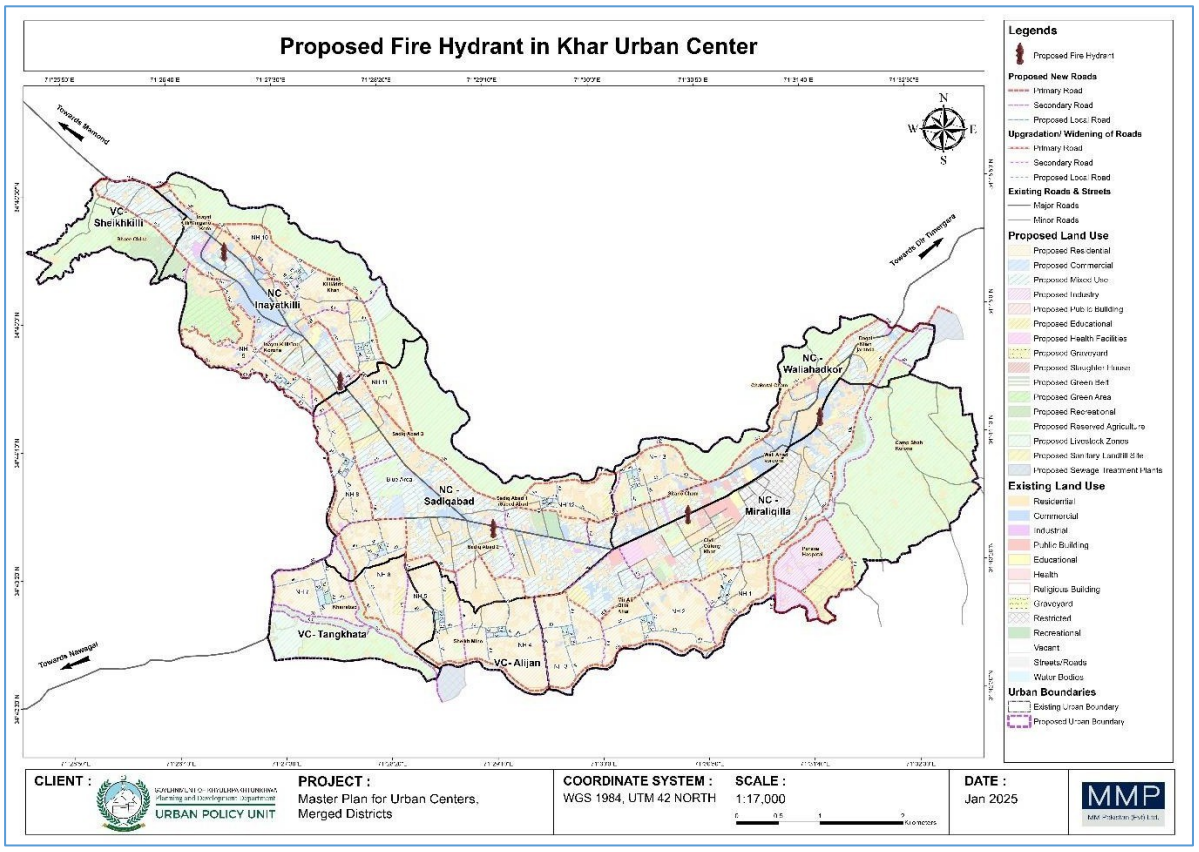
4.15.4 Proposed Disaster Risk Reduction Measures

4.15.4.1 Rescue-1122 Extension

According to the Rescue officials, the current area of the Rescue-1122 Station in Khar Urban Centre, which is only 0.13 acres, is inadequate for their needs. Therefore, an extension of the facility is proposed by utilizing the vacant land adjacent to the existing office, which measures 0.4 acres. This expansion will improve the provision of emergency services to the residents of Khar Urban Centre, ensuring that they have access to timely and efficient rescue services in the event of an emergency.

4.15.4.2 Fire Protection

There are currently no fire hydrants or extinguishers installed in the commercial centers of Khar Urban Centre, which poses a potential safety hazard. Following the NRM 1985, a fire protection system should be in place for a population of 25,000. Therefore, based on the population criteria, at least 5 fire hydrants/extinguishers should be installed in congested commercial and residential areas. To address this issue, the provision of fire protection equipment will be made compulsory in the Master Plan of Khar Urban Centre. Specifically, proposed fire protection hydrants will be installed in the Khar and Inayat Kali commercial areas, where there is a greater need for fire safety measures. By implementing these measures, the safety of residents and commercial areas can be significantly improved, and the risk of fire-related incidents can be minimized.



Map 4-28: Proposed Fire Hydrant

4.16 Graveyard

The graveyard is an essential component of any city as it provides a final resting place for the deceased members of the community. In Khar Urban Centre, the existing graveyard area is 35 acres, which is insufficient to meet the needs of the current and future population. According to the National Reference Manual (NRM) of 1985, the required area for a graveyard is high, making it challenging to provide the necessary space within the project area. To address this issue, an additional area of 14.69 acres is proposed in every neighborhood to accommodate the growing population's needs. The provision of a graveyard according to the devised standards will help maintain this facility and ensure that it remains available to the community for generations to come.

It is essential to note that the graveyard should be located in an area that is easily accessible to the residents and has the proper infrastructure, such as water supply and sanitation facilities. Moreover, the management of the graveyard should be carried out efficiently to ensure that it remains clean, well-maintained, and organized. The two recommendations for the sustainability of these graveyards are;

- Each grave should be numbered with a marker and the grave register filled in and preserved carefully.
- Graveyards should be properly landscaped and enclosed by a low boundary wall, and their future extension should conform, to duly laid out plans.
- In Khar Urban Centre, only those graveyards should continue to be operational and cover an area above 5 hectares.

Table 4-40: Graveyard Existing and Future Requirements

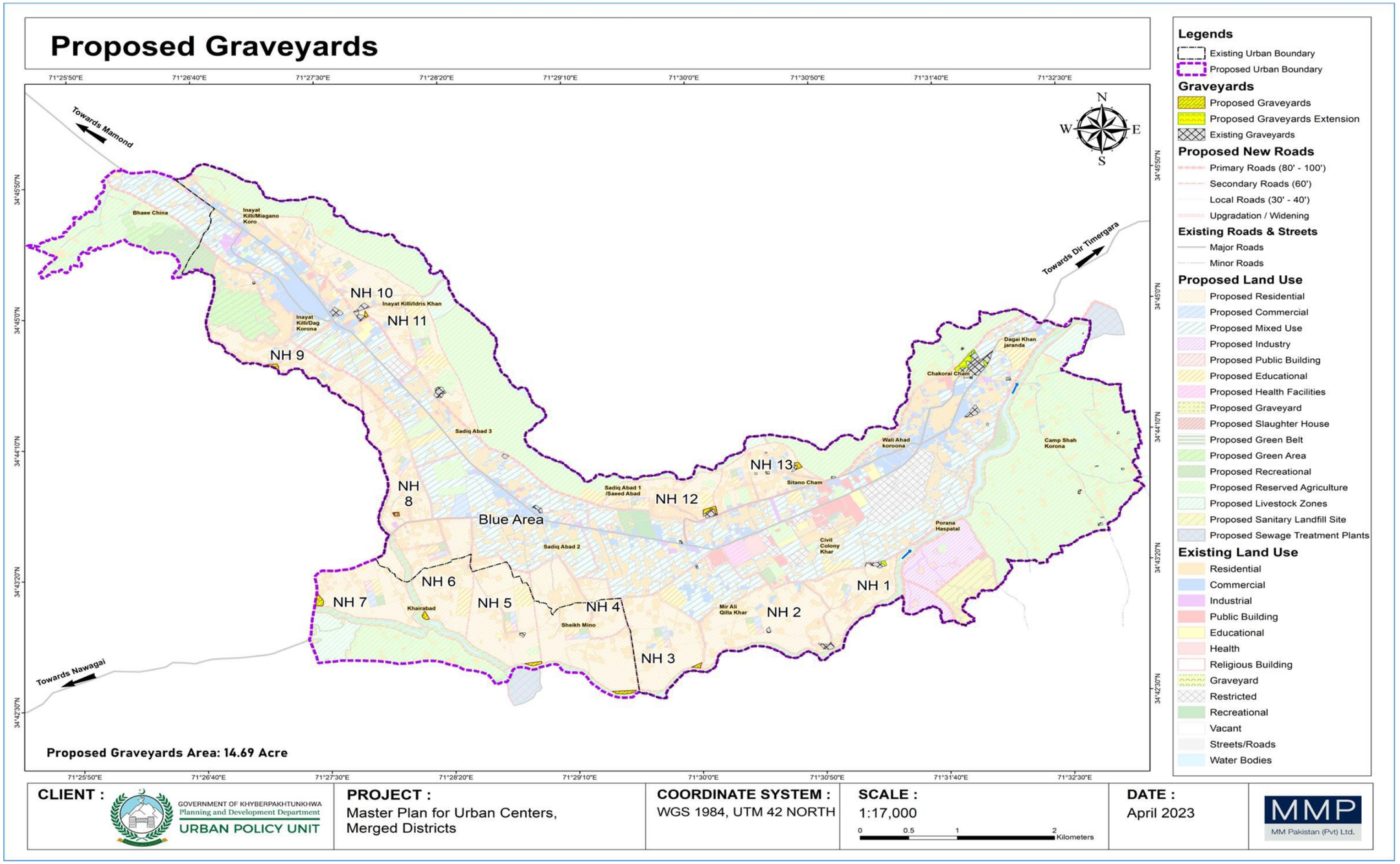
Land use		Graveyards
Standards	**Detailed**	(Pop / 1680) @ 1 Acre
	Population	1680
	Area	1.00
Existing Acre		35.20
Existing Units.		40
Existing %		0.50%
Existing Demand		73
Required	**Gap 2022**	38
	Area	0
	2025	48
	Area	0
	2030	67
	Area	0
	2035	90
	Area	0
	2040	119
	Area	0

Two major considerations have been taken into account for the provision of graveyard facilities in Khar Urban Centre, accessibility, and affordable land. The proposed graveyards have been chosen based on their proximity to neighborhoods and the availability of vacant land in their vicinity. This ensures that the sites will be easily accessible whenever required and will also remain on the periphery of the neighborhoods. Additionally, these graveyards can be divided according to the religious practices of the community. The locations of these graveyards are shown in the Map 5-27 below:

4.16.1 General Guidelines for Graveyard Allocation

The following are the general guidelines for the allocation of graveyards in the city:

- **Graveyards**
  - On the Outskirts of each neighborhood
  - Low land Price
  - Accessible from neighborhood roads



Map 4-29: Proposed Graveyard in Khar Urban Centre

5 Integration of Action Plans in the Final Master Plan

Action Plan for Land Management	Action Plan for Future Housing of All Income Group	Slum Identification and Up gradation
Action Plan for Health Facilities	Action Plan for Education Facilities	Action Plan for Quality of Life
Action Plan for WATSAN & Solid Waste Management (SWM)	Action Plan for Transportation, Traffic Management and Parking	Action Plan for Municipal Services
Action Plan for Disaster Risk Reduction	Action Plan for Economic Development	Action Plan for Tourism, Heritage & Conservation Development
Action Plan Environmental of Protection-Khar	Action Plan for Rural-Urban Fringe and Regional Development	Action Plan for Commercialization, Industrialization, and Investment Attraction
Action Plan for Safety & Security-Khar	Action Plan for Institutional Development Framework Implementing Master Plan	Action Plan for Behavior Change & Communication

5.1 Proposed Scenario Development

The Khar Urban Centre comprises four neighborhoods—Wali Ahad Korona, Mir Ali Qilla, Sadiq Abad-1, and Inayat Killi/Miagano Koro—spanning 5,820.97 acres. To accommodate future population growth, the project area also includes three adjacent Village Councils—Ali Jan Kaley, Tank Khatta, and Sheikh Kali—covering 1,158.08 acres. These areas are planned for phase-wise urbanization, with short, medium, and long-term sectoral action plans to guide sustainable development and create a livable urban center.

In the short-term phase, NCs Mir Ali Qilla, Wali Ahad Korona, and Sadiq Abad will be prioritized. Medium-term interventions will focus on NC Inayat Killi and VC Sheikh Kali, while the long-term phase will integrate VCs Ali Jan Kaley and Tank Khatta into the urban framework of Khar.

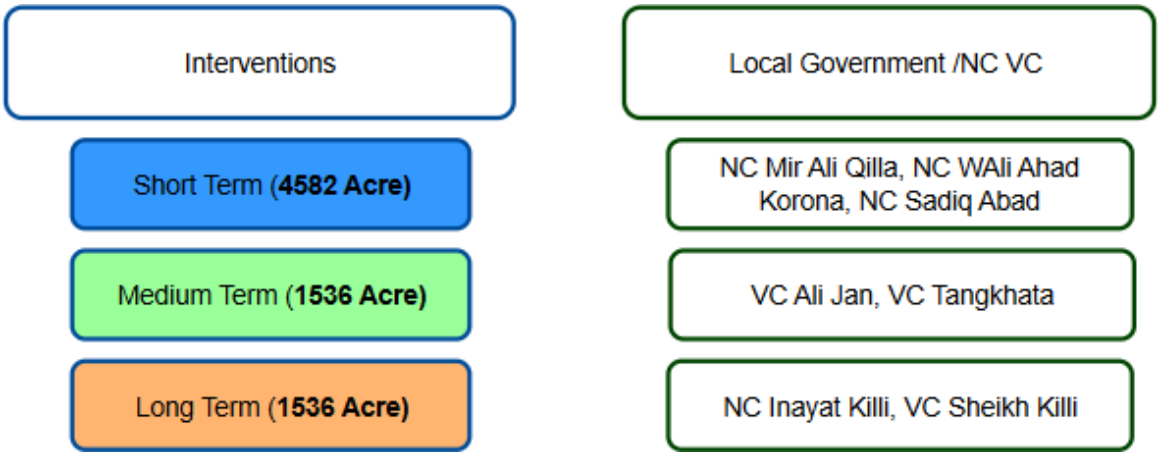
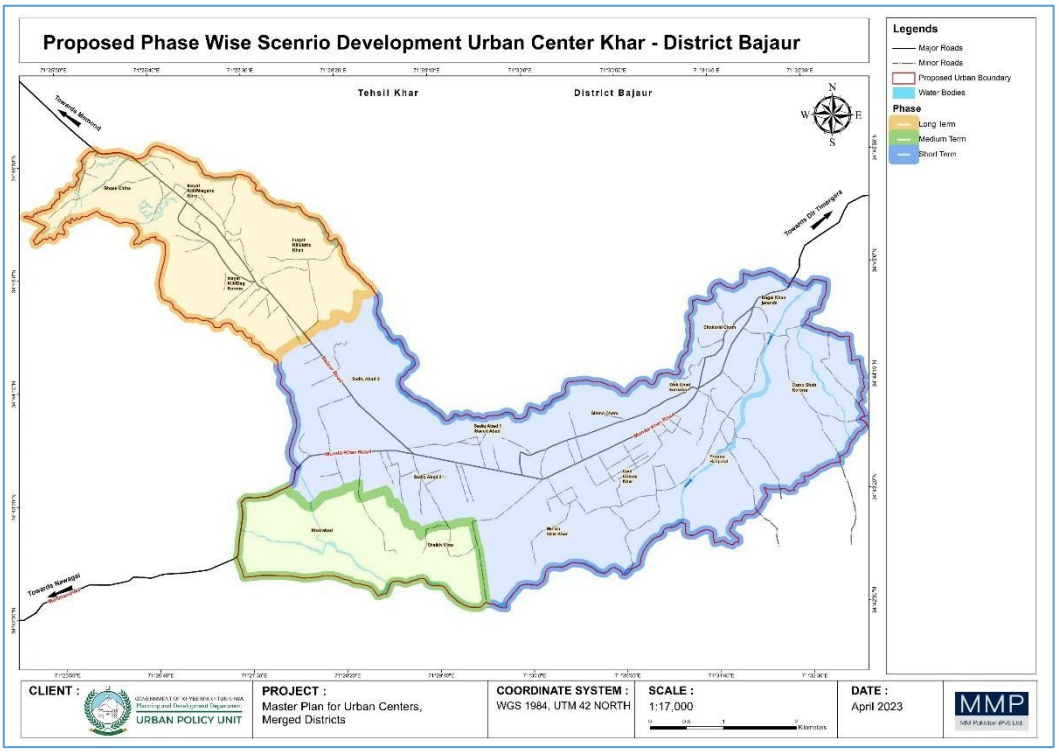


Figure 5-1: Proposed Phase-wise NC & VC Area



Map 5-1: Proposed Phase-wise Scenario Development

5.2 Zoning & Land Management

The infilling, intensification, and redevelopment zones are intended to be implemented in the initial stage of the master planning process by following the process of infilling, densification zones (where higher density have been proposed) and reconstruction of dilapidated housing units. Furthermore, the implementation of the proposed master plan will follow the prescribed land use and zoning regulations outlined in the section 5.17 provides a comprehensive set of regulations, specifying permissible, permitted, and prohibited land uses based on different zones. This detailed framework aims to ensure the compatibility and incompatibility of land uses and zoning across various zones, ensuring effective execution of the plan.

5.3 Proposed Residential Zones

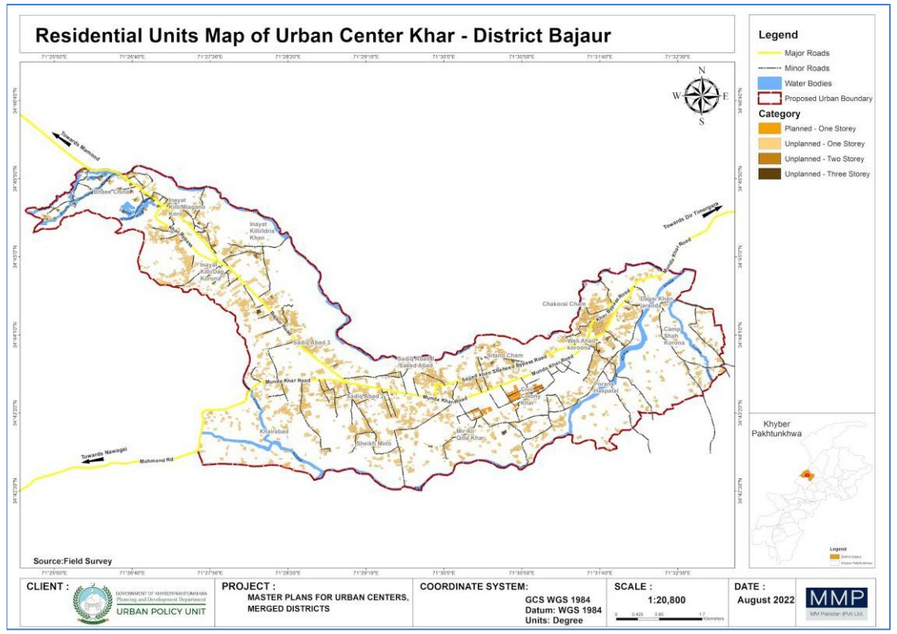
According to the land use analysis the following is the summary of residential sector:

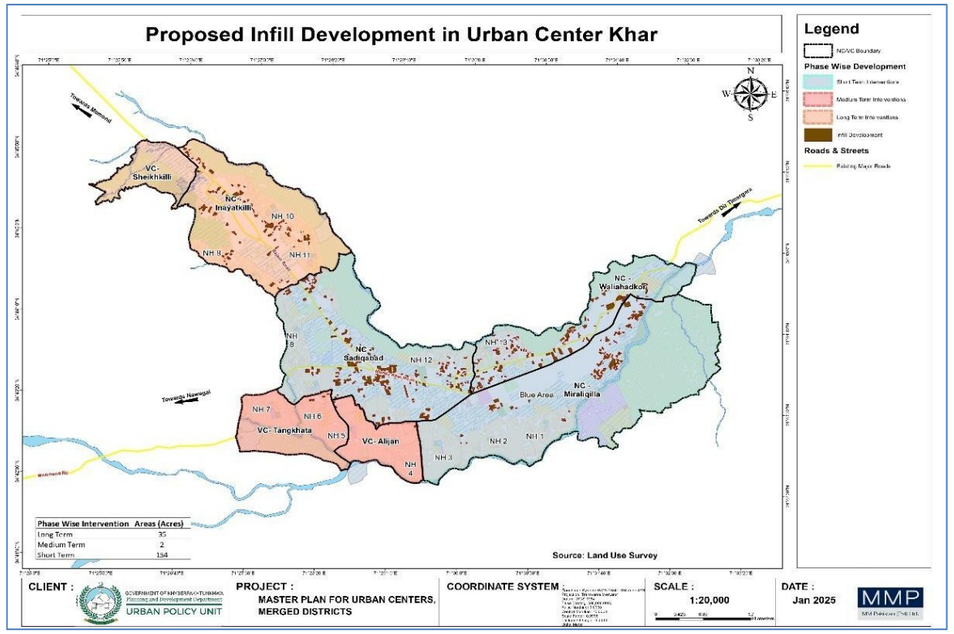
Residential	
Existing Area (Acre)	**1,020**
Existing Area (%)	**15 %**
Existing Household Size	**8.85**
NRM Standard	**26-48 %**
Proposed Area (Acre)	**1,457**
Proposed Area (%)	**21%**

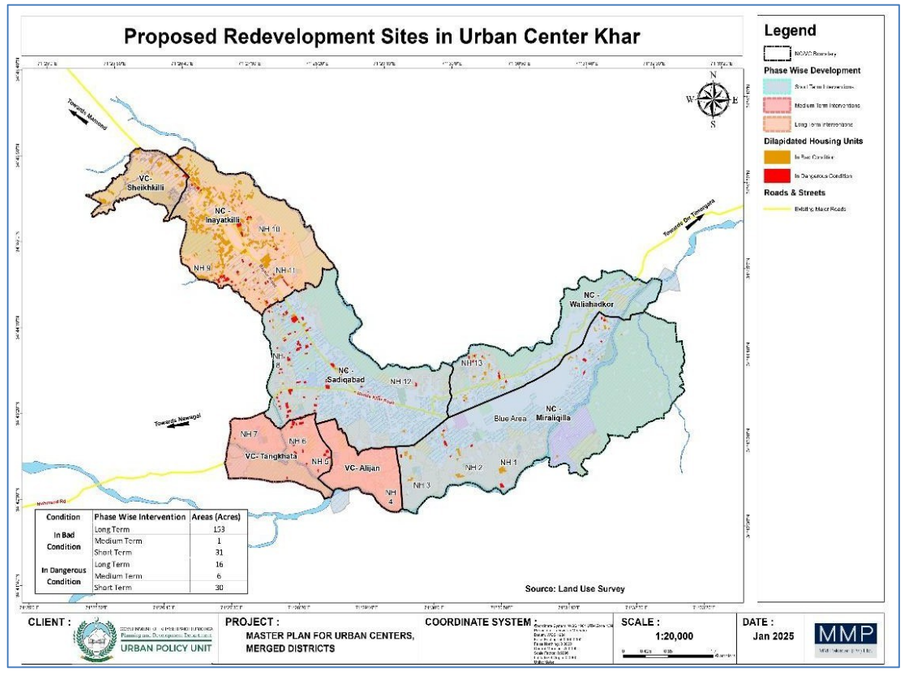
5.3.1 Infill, Redevelopment, and Proposed Site for Government Schemes (PHA)

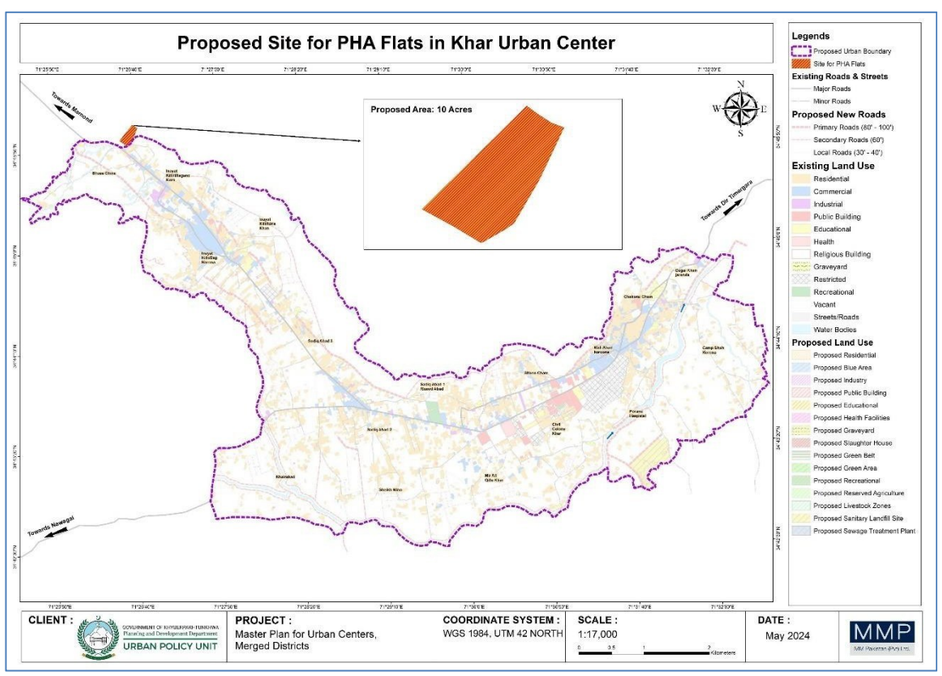
Infill development aims to make better use of existing urban spaces and increase density in areas, rather than expanding into greenfield sites. In the existing built-up areas, the vacant land parcels should be developed first according to the demand to promote the compact urban form. There are 191 acres of land available in the Khar Urban Center for infill development. In particular, the **redevelopment** of existing dangerous and poorly-conditioned buildings is a priority, as it can improve the safety and livability of the community. Following the master plan's designated zones, there are 205 dangerous buildings and 850 buildings in poor or bad condition that can be redeveloped according to the proposed land use at the neighborhood level.

The master plan proposes a 10-acre site in Khar urban center for future housing development by the **Provincial Housing Authority** (PHA). This site will serve as the initial phase of the project, with the potential for expansion based on project success and evolving requirements. The proposed site aims to address housing needs and support urban growth, providing a scalable solution for the community's future development.







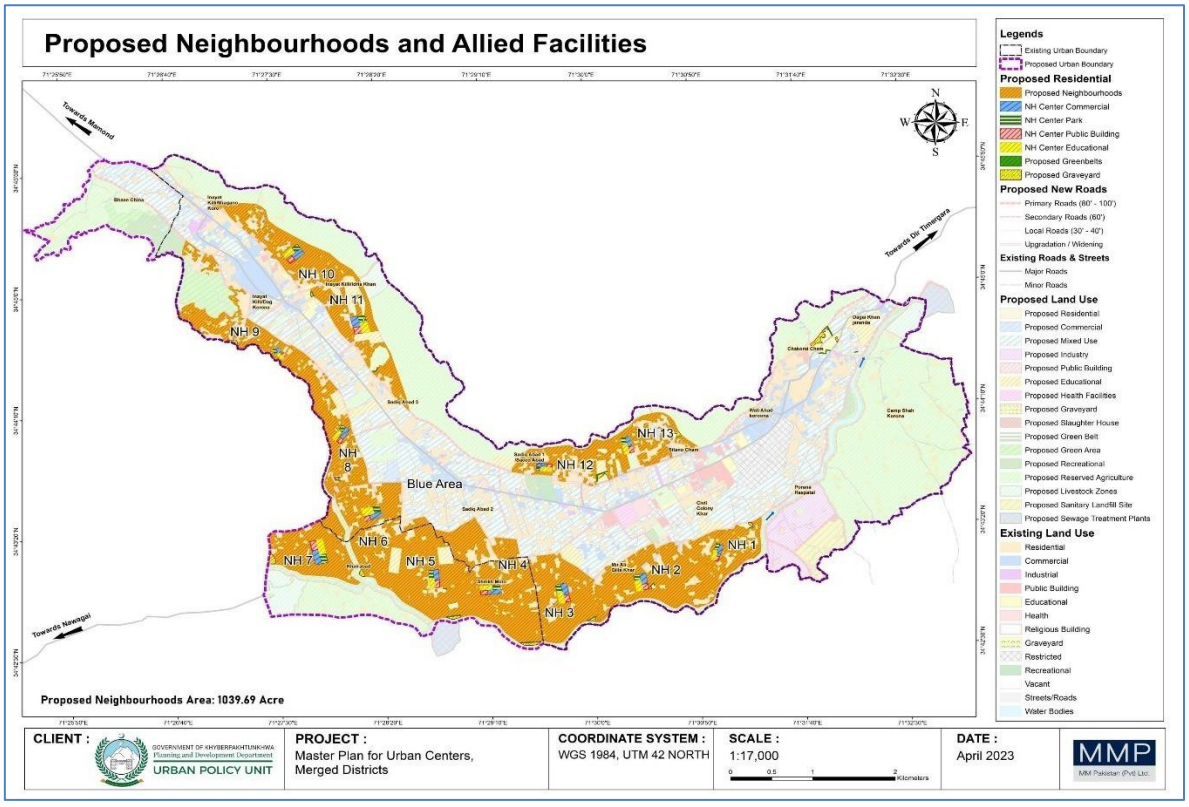


Map 5-2: Existing Residential & Proposed Redevelopment, Infilling, and PHA Sites

5.3.2 Housing Need Assessment and Future Demand

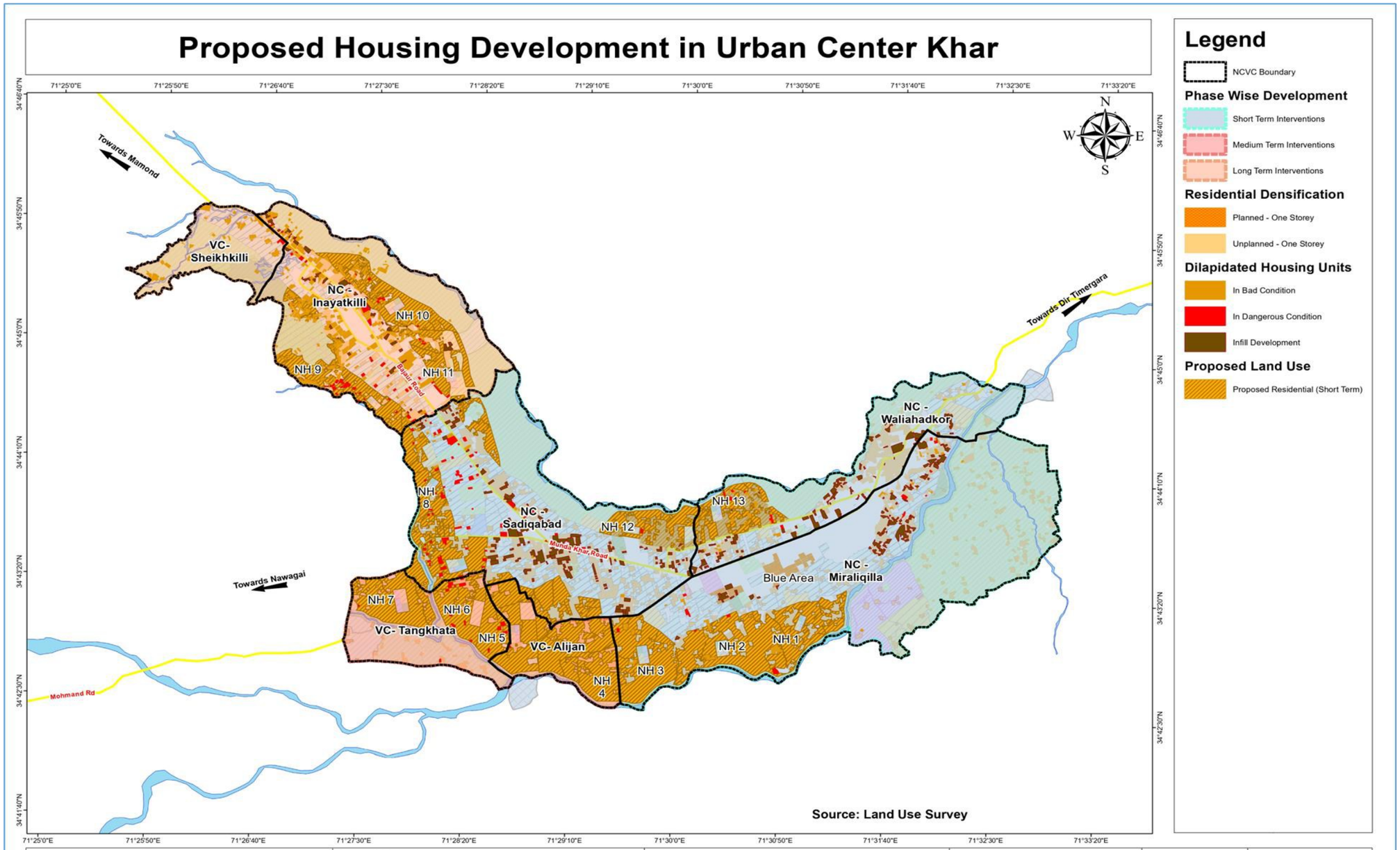
Year	Household Size	Population	Housing Units
2017	8.85	100,837	11,394
2022	8.85	122,920	13,889
2040	8.85	259,562	29,329

Goal: *Planned Housing for all income group*



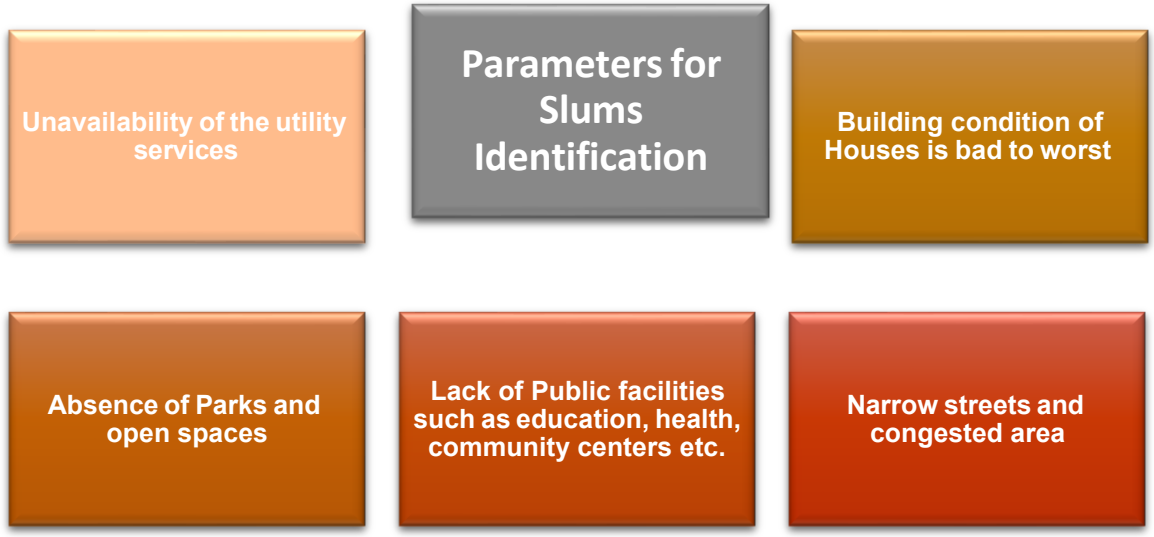
Map 5-3: Proposed Neighbourhood & Allied Facilities

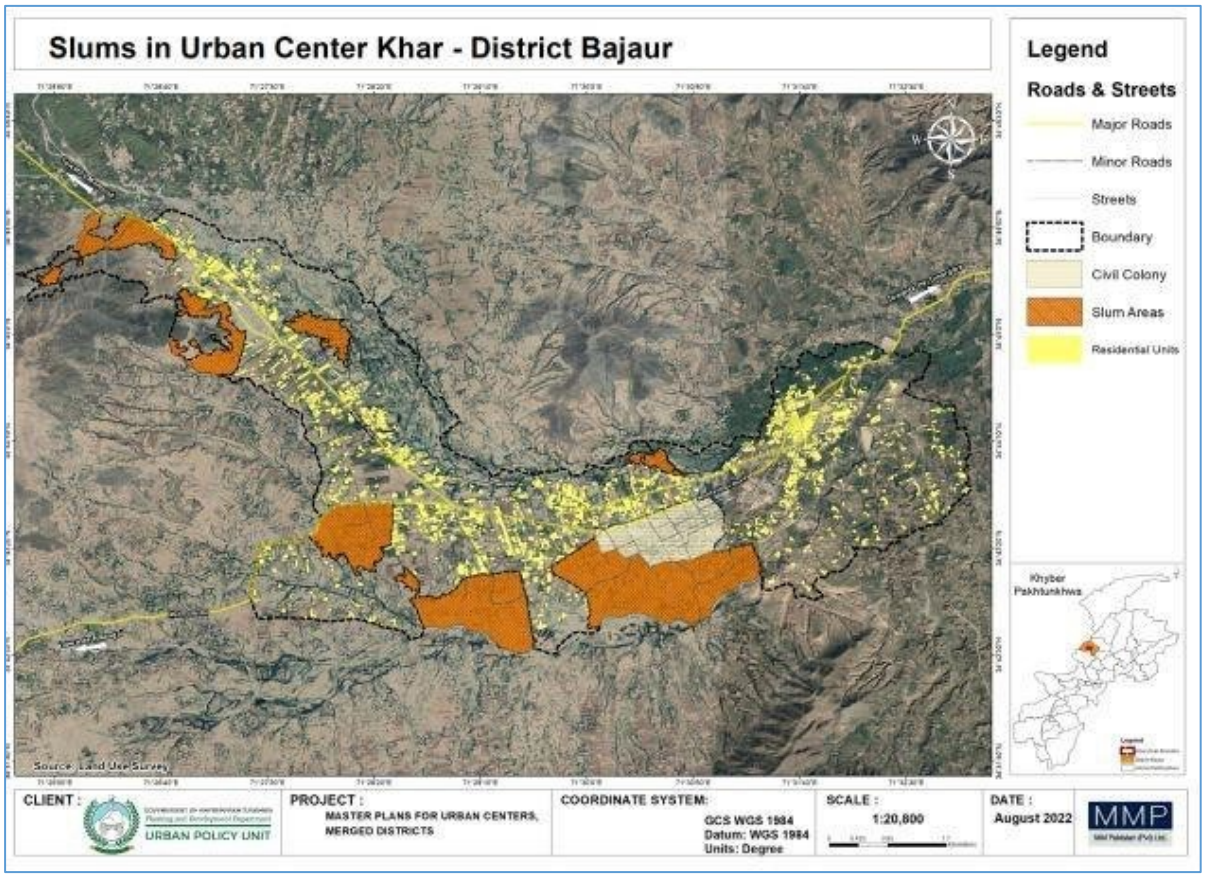
Phase-wise Interventions	Neighborhood/ Village Council	Proposed Residential Zone (acres)
Short-Term	NC – Mir Ali Qilla	366.81
	NC – Sadiq Abad	313.12
	NC – Wali Ahad Korona	61.28
Medium-Term	VC – Ali Jan	249.40
	VC – Tangkhata	217.33
Long-Term	VC – Sheikh Killi	-
	NC – Inayat Killi	249.38
Total Proposed Residential Zone		**1,457 acres**



Map 5-4: Proposed Housing Development in Khar Urban Centre

5.4 Slums Identification and Upgradation Plan



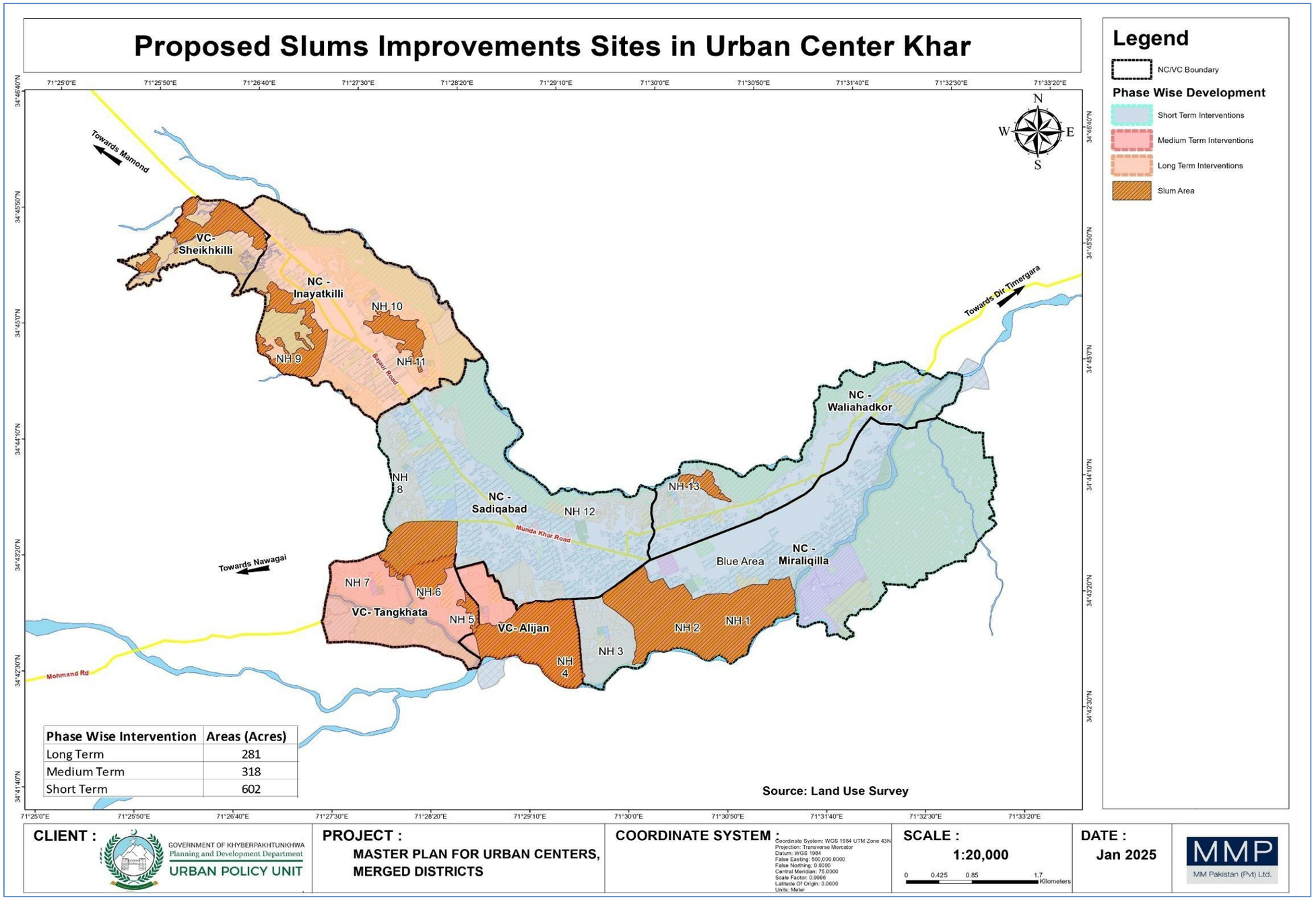


Map 5-6: Slum Areas in Khar Urban Centre

5.4.1 Proposed Actions for Slum Upgradation

According to these ***parameters***, Khar urban center has inadequate public facilities, and has a number of informal settlements in the city which is sprawling without any developmental plan. These settlements which have been identified in the below figure are usually the abode of the poor people who are living in very small and congested houses having, bad conditions of building and without any modern public utility services such as water supply, sewerage & drainage and solid waste management. The phase-wise interventions are as follows:

Phase-wise Interventions	***Slum Upgradation Plan***
Short-Term	*In the short term, the focus will be on upgrading the Miraali Qilla area and Sitano Cham, which have been identified as high-priority zones. These areas suffer from severely inadequate public facilities and poor living conditions. Immediate actions will include upgrading essential utilities such as water supply, sewerage, and drainage systems, and implementing solid waste management services. Additionally, temporary community centers and health clinics will be established to provide essential services, and public awareness campaigns on hygiene and sanitation will be launched. These interventions aim to quickly improve living conditions and infrastructure, setting a foundation for further development in these critical areas. The map shows short term interventions for slum upgradation can be found in action plan for further details.*
Medium-Term	*For the medium term, the focus will shift to upgrading the Sheikh Meno and Tangkhata areas, which also face significant infrastructural deficiencies and poor living conditions. Similar to the short-term plan, these areas will see enhancements in essential utilities such as water supply, sewerage, and drainage systems, and the implementation of solid waste management services. The construction of permanent parks, open spaces, schools, and healthcare facilities will also be prioritized. Additionally, affordable housing units will be developed to replace dilapidated structures, and transportation links will be improved to reduce travel expenses for residents. These upgrades aim to enhance public facilities and services, fostering a better quality of life for the inhabitants. The map shows short term interventions for slum upgradation can be found in action plan for further details.*
Long-Term	*In the long term, the focus will be on upgrading the areas north and south of Inayat Kali, Dag Korona, Miangano Korona, and Bhaee Chena. These regions will undergo comprehensive development to ensure sustainable improvement and integration into the urban fabric. Key actions will include the implementation of comprehensive urban planning to prevent future sprawl, the development of mixed-use areas combining residential, commercial, and recreational spaces, and the promotion of economic opportunities through skill development programs and local businesses. Additionally, continuous monitoring and maintenance programs for infrastructure and public services will be established. These efforts aim to ensure sustainable development and improve the quality of life for residents in these areas. The map shows short term interventions for slum upgradation can be found in action plan for further details.*



Map 5-7: Proposed Phase-wise Slum Improvement

5.5 Proposed Commercial Zone (Blue Area)

In Khar Urban Centre, there are two major commercial areas and two mini-commercial areas, as outlined below:

i) Khar City's main Bazar

ii) Inayat Kalli Bazar

iii) Phatak Bazar (Mini Commercial Areas)

iv) Shande Morr Bazar (Mini Commercial Areas)

5.5.1 Commercial Demand and Gap Analysis

The current commercial area gap has been calculated as below:

- Urban Population (2022): 122920
- Commercial Area required (@0.5 acres/1000 persons)[11]= 61.46 Acres
- The current area under commercial land use: = 286 Acres
- Commercial area Surplus: 286-61.46= 224.54 Acres

It is clear from the above that there is too much commercialization converting land into commercial use creating problems of congestion. The area required by the end of the plan period would be 130 acres, while the current area is far more than the area required for the plan period.

Table 5-1: Commercial Area Required in Khar Urban Centre (2022-40)

Year/Period	*Urban Population*	*Commercial Area Required @0.5 acres/1000 persons)*
2022	122920	61.46 Acres
2040	259562	130 Acres
Additional Urban Population 2022-2040	136642	68.3 Acres

Source: Consultant Calculation

5.5.2 Central Business District (CBD) Blue Area

The proposed Central Business District (CBD) is in the form of a Linear Blue Area to make the future Khar Urban Area as a Linear Dynapolis and has both existing and proposed land uses. The existing land use categories refer to the current state of land use in the area, while the proposed land use categories represent the intended land use changes that are planned for the future.

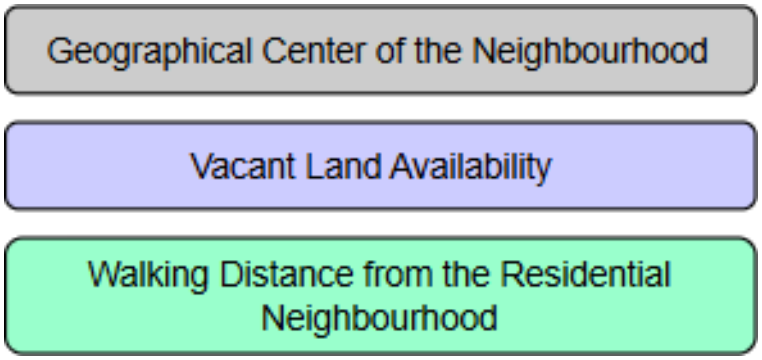
[15]Source: Environment and Urban Affairs Division, Govt. of Pakistan, National Reference Manual on Planning and Infrastructure Standards, Page 307, Table 10.4 (adapted).

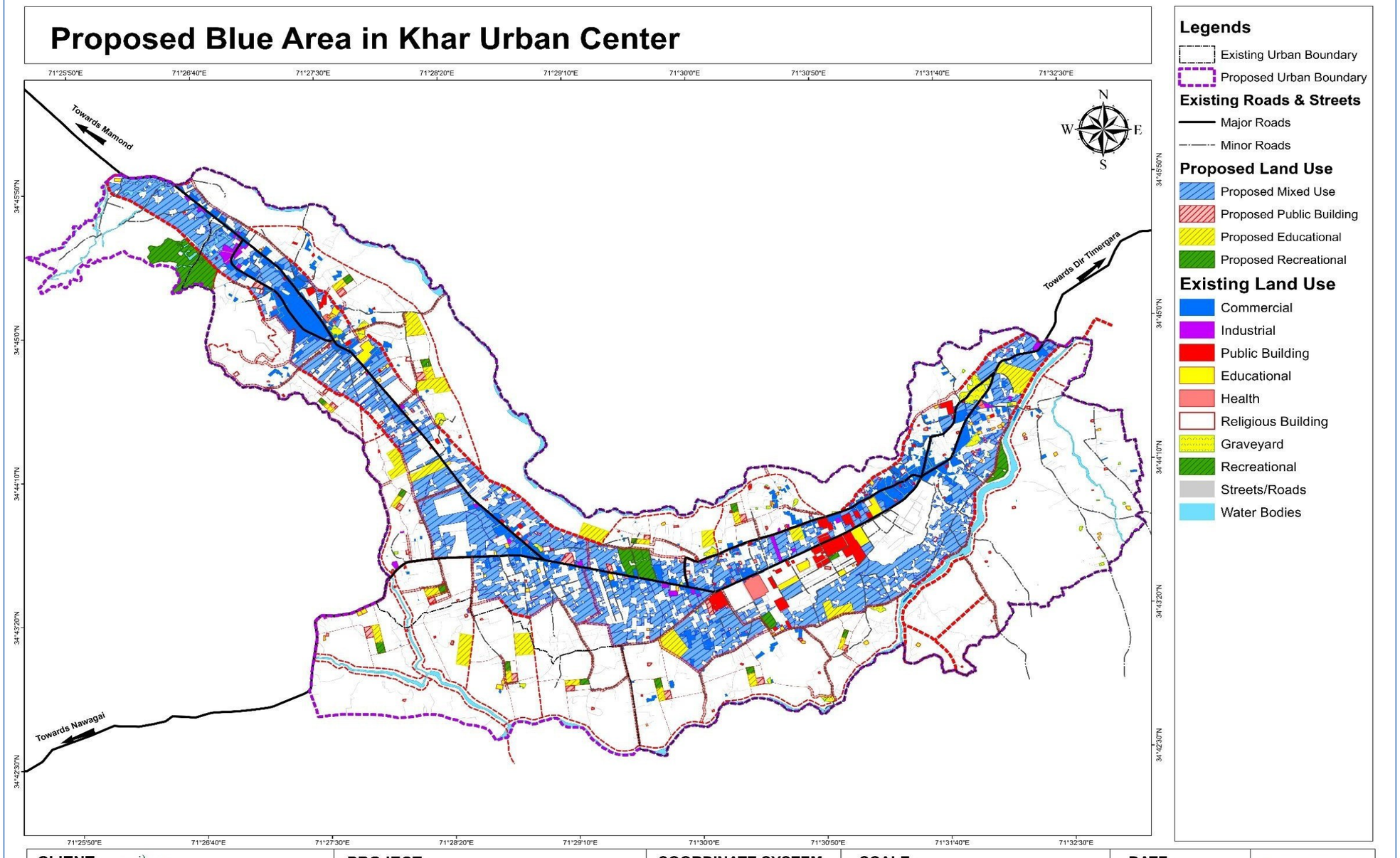
Existing & Proposed Land Uses in Blue Area

Existing	Commercial	260	10.7%
	Educational	36	1.5%
	Graveyard	20	0.8%
	Health	15	0.6%
	Industrial	22	0.9%
	Public Buildings	60	2.5%
	Recreational	15	0.6%
	Religious Buildings	12	0.5%
	Residential	535	22.1%
	Streets/Roads	161	6.6%
	Vacant	2	0.06%
	Water Bodies	10	0.4%
Proposed	Proposed Mixed Use	1027	42.5%
	Proposed commercial (Wholesale Market)	10	0.4%
	Proposed Public Building	7	0.3%
	Proposed Recreational	71	2.9%
	Proposed Educational	119	4.9%
	Proposed Health (Extension)	14	0.6%
	Proposed Roads	26	1.1%
	Grand Total	**2420**	**100.0%**

5.5.3 Neighbourhoods Commercial Centres

The proposed neighborhoods are designed on the self-sufficient concept. This area is proposed based on the following criteria:



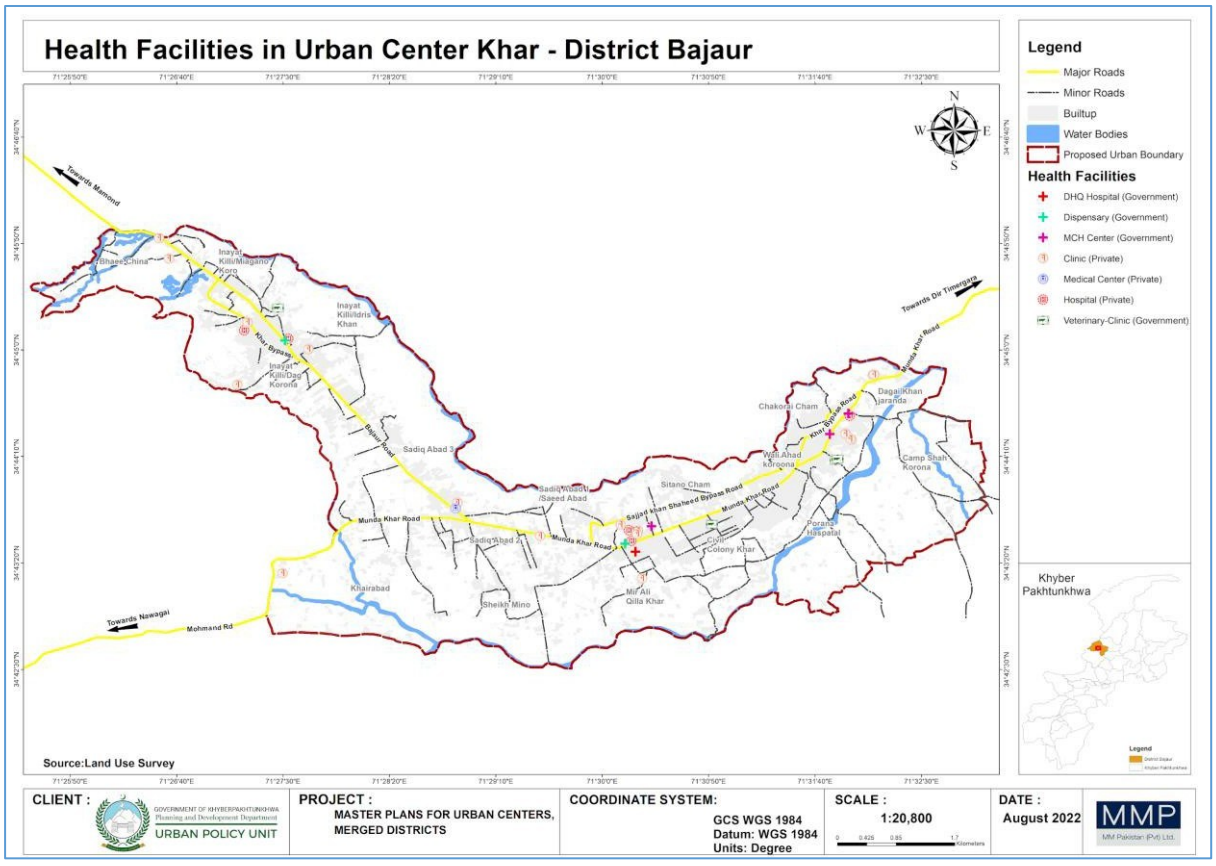


Map 5-8: Proposed Blue Area (Commercial Area)

5.6 Proposed Health Facilities

According to the land use analysis the following is the summary of Health sector:

Health	
Existing Area (Acre)	18
Existing Area (%)	0.3 %
Present beds available 2022	530
NRM Standard	05 beds per 1000 population
Proposed Area (Acre)	20
Proposed Area (%)	20%
Additional Number of beds (2022-2040)	519



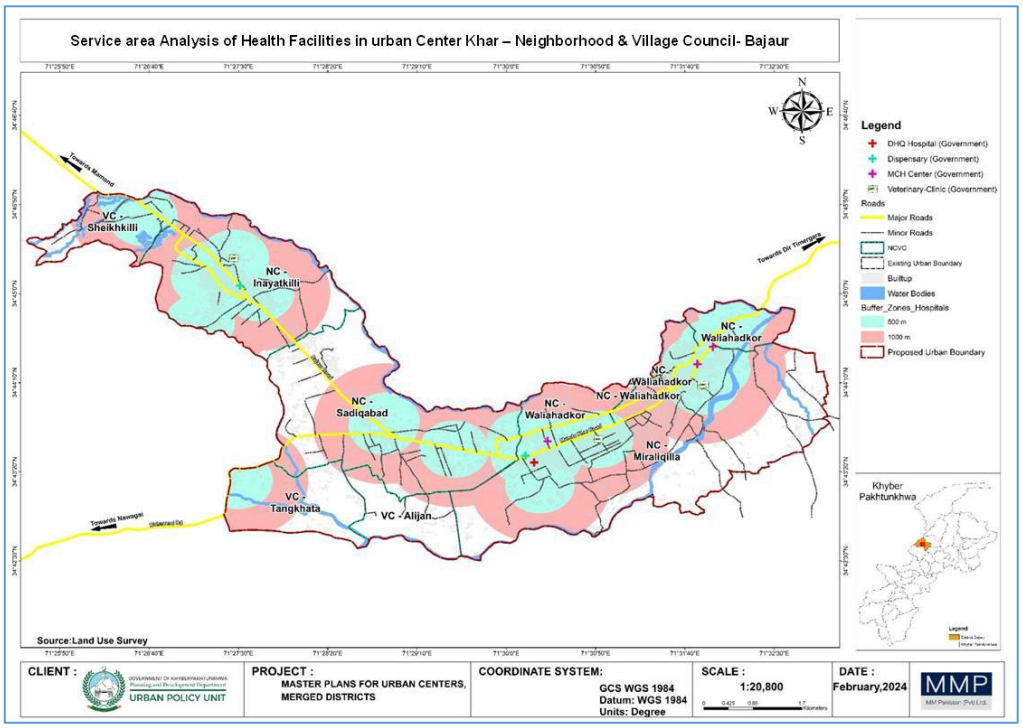
Map 5-9: Existing Health Facilities

The provision of adequate health facilities is essential for ensuring the well-being of a population. In Khyber Pakhtunkhwa, the government has made significant efforts to improve the healthcare system and increase access to health services. According to the KP Health Policy, there should be at least one basic health unit (BHU) for every 5,000 people in urban areas and every 3,000 people in rural areas. Similarly, there should be at least one Rural Health Centre (RHC) for every 25,000 people, and at least one Tehsil Headquarter Hospital (THQ) for every 500,000 people.

5.6.1 Demand Analysis of Health Facilities

The current health facilities in the Khar Urban Centre are considered adequate to meet the health needs of its residents, as there is a District Head Quarter Hospital (DHQ) with 403 beds serving the population. However, for the planned period of the Master Plan, an additional 116 beds will be required, as per NRM standards. To cater to this demand, an extension to the existing DHQ hospital is proposed to facilitate the future population. Furthermore, dispensaries are proposed for the provision of first aid facilities within the neighborhood centers. This will ensure that residents have access to basic medical care and first aid in their immediate vicinity.

The GIS-based analysis of health facilities shows they are concentrated in three locations, with major coverage in NC Waliahadkor and Miraliqilla, leaving parts of NC-Mirali Qilla underserved. Additional coverage is seen along Mohmand Road and in NC Inayat Killi, though boundary areas remain unserved. Private clinics serve Sheikhkilli and Tangkhata, but VC Alijaan lacks facilities



Map 5-10: Health Service Area in Khar Urban Centre

The Proposed health facilities are divided into immediate-, short-, medium- and long-term action plans.

5.6.2 Phase I- Immediate Plan

Phase I includes immediate term plans which can be implemented immediately in 1–2-year duration. The immediate plan proposes provision of adequate SWM, sewerage and sanitation facilities in DHQ, Infrastructure Improvement of MCH, and Overcome the deficiencies in terms of infrastructure and facilities in existing health centers. The details of intervention areas are marked on the map for more clarification in the Immediate Plan Map below.

5.6.3 Phase II-Short term

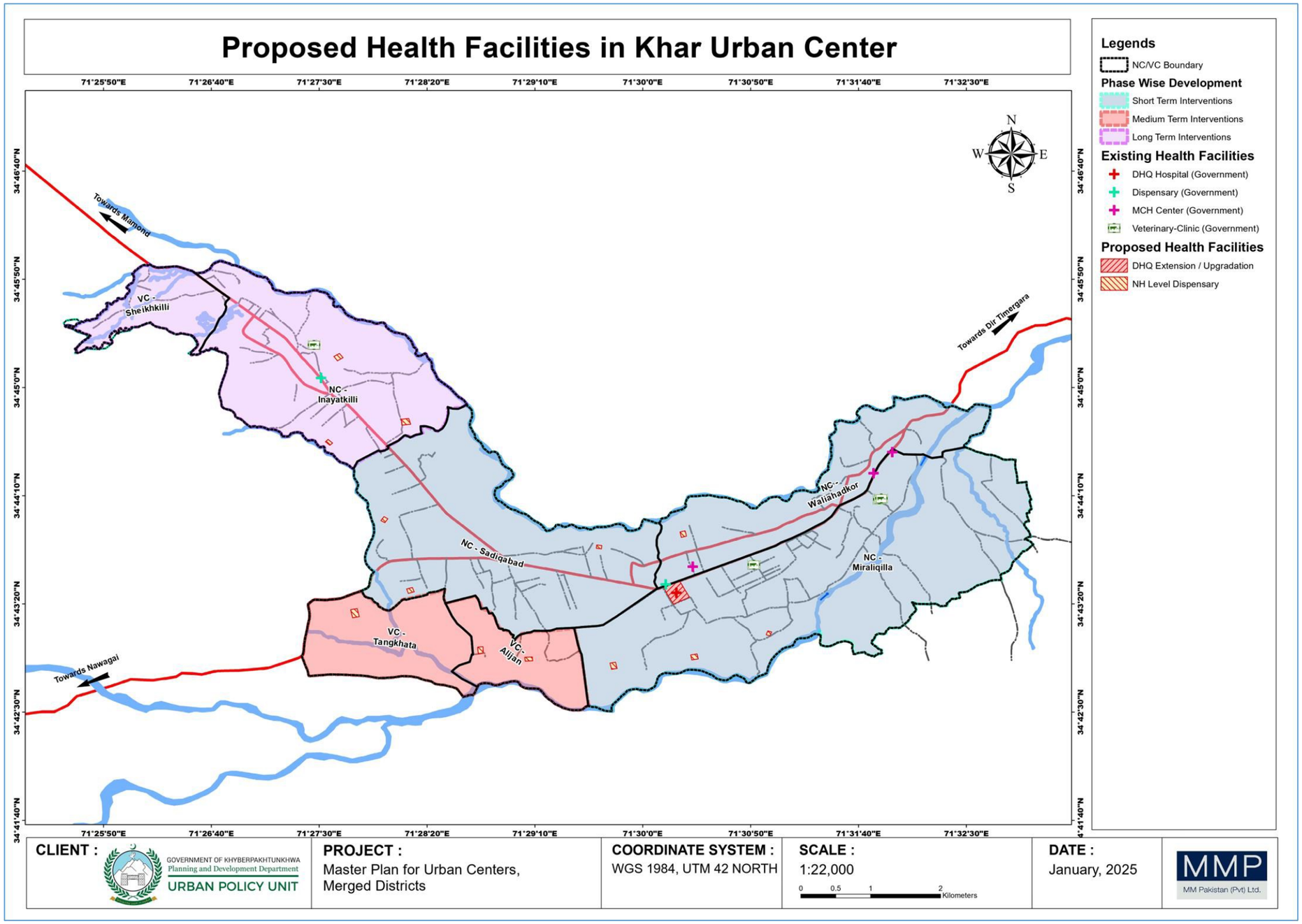
Phase II focuses on short-term plans to be implemented within the next five years, based on stakeholder collaboration. Key actions include land acquisition for DHQ expansion, health facility improvements, and hiring technical staff. The plan involves assessing existing health facilities, expanding the DHQ Hospital with 116 additional beds, and developing new health facilities in neighbourhoods 12 and 13. Map below provides further details on intervention areas.

5.6.4 Phase III- Medium Term

Phase III focuses on medium-term plans for the next five years, requiring legal approvals and funding allocation. It includes constructing new health facilities in neighborhoods 1, 2, 3, 10, and 11, and planning accessible ambulance routes. The scope of work extends until 2035, with intervention details provided in the Map.

5.6.5 Phase IV- Long Term

Phase IV focuses on long-term measures, including policy changes, infrastructure development, and completing large-scale projects by 2040. Key initiatives include constructing dispensaries in neighbourhoods 4 to 9 and establishing a monitoring and evaluation system. Intervention details are provided in the Long-Term Plan Map.



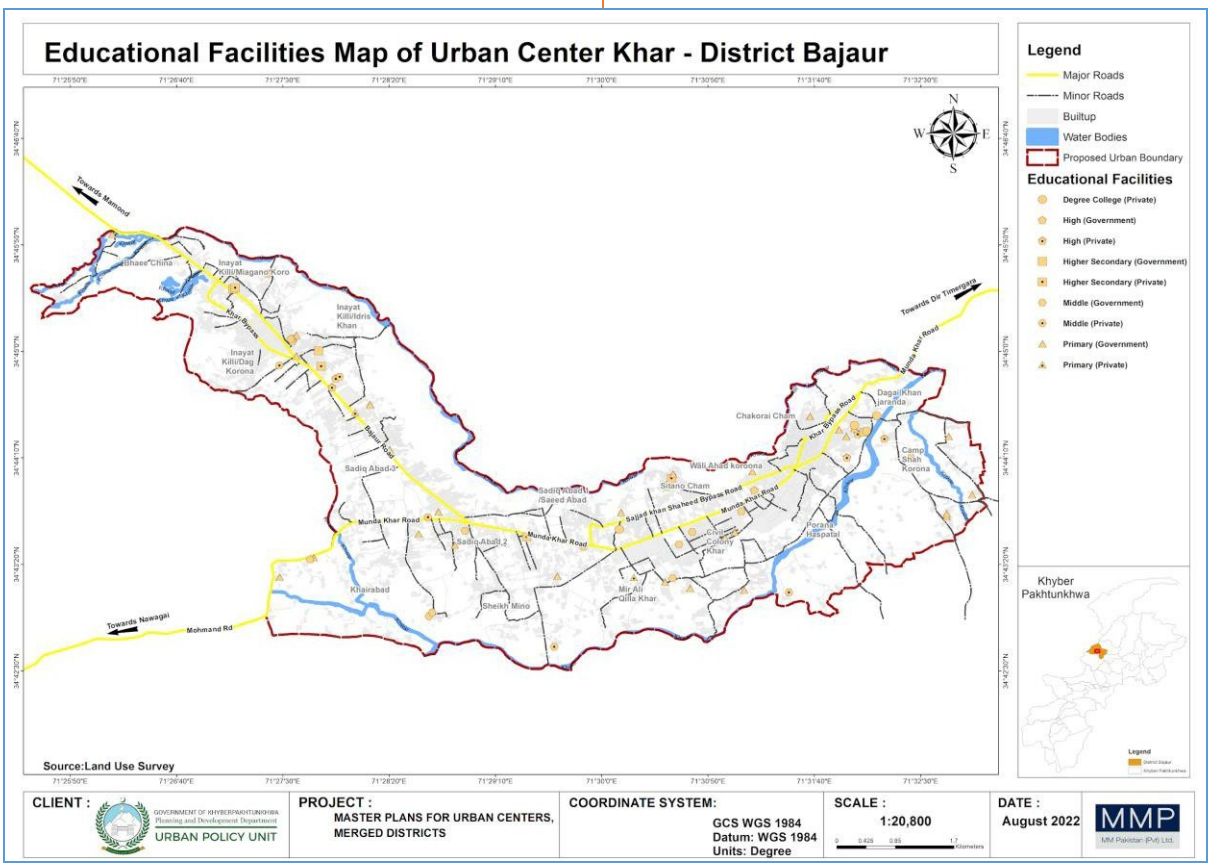
Map 5-11: Proposed Health Facilities in Khar Urban Centre

5.7 Proposed Educational Facilities

According to the land use analysis the following is the summary of Education sector.

Education

Existing Area (Acre)	37 Acers
Existing Area (%)	1%
Existing schools available 2020	60
Proposed Institutions	73
Proposed Area	446
Additional classrooms required 2022-2040	163

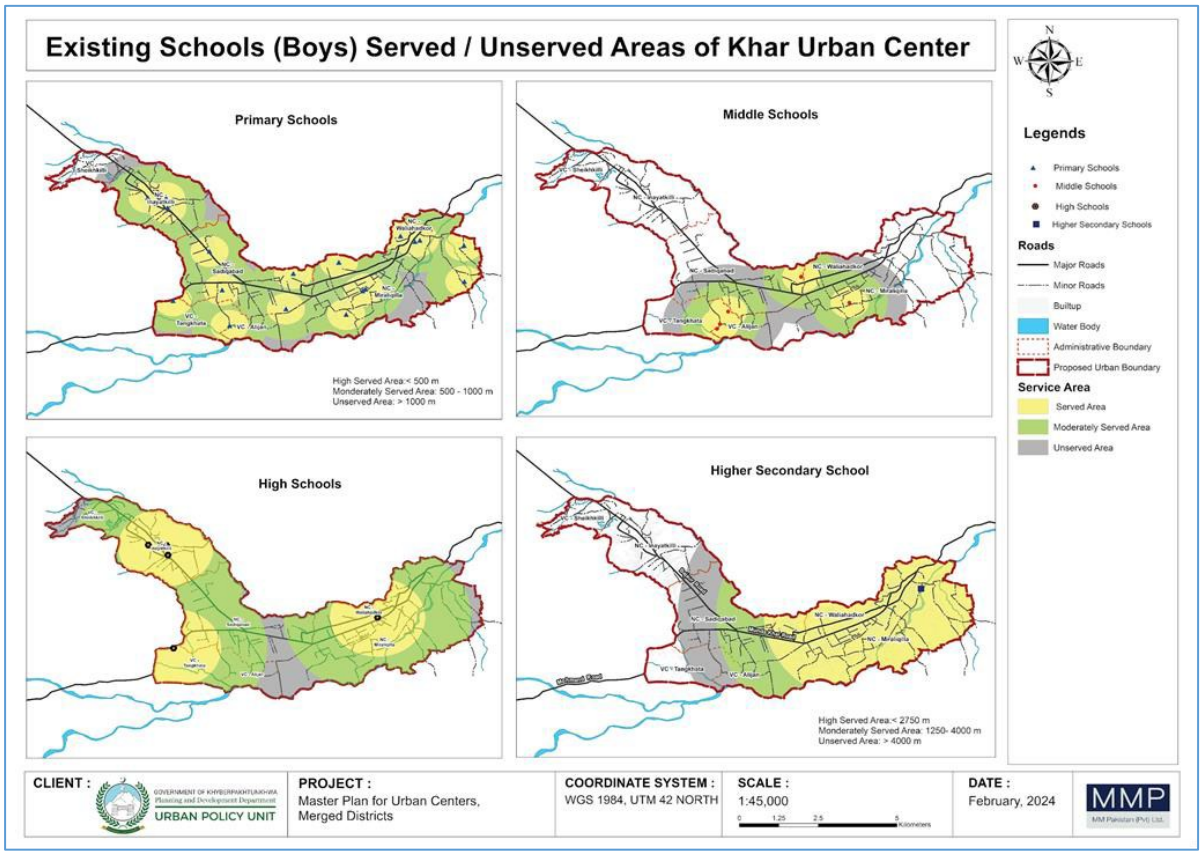


Map 5-12: Existing Education Facilities in Kahr Urban Centre

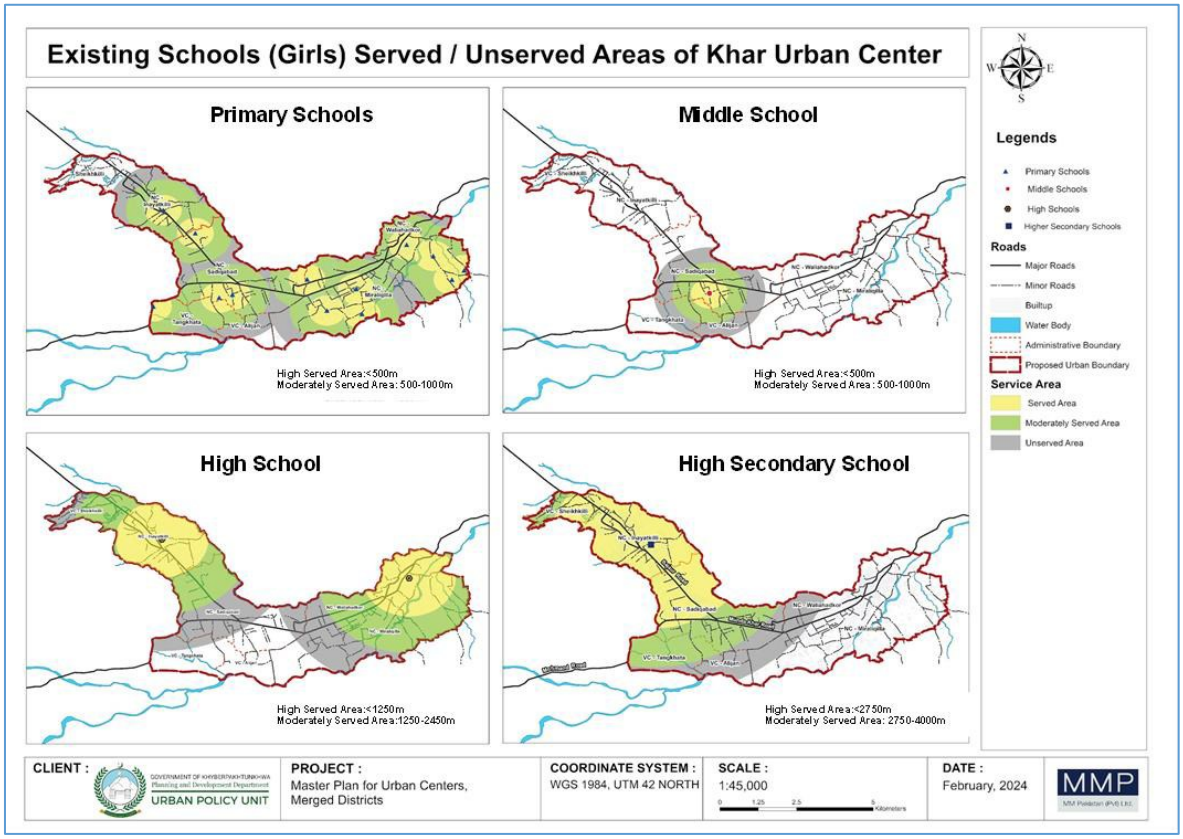
As per the Khyber Pakhtunkhwa education policy, the government is working to ensure that every child has access to a school within a reasonable distance from their home. The government aims to achieve this by increasing the number of schools in underserved areas and improving the quality of education in existing schools. The government is also working to provide adequate facilities in schools, including classrooms, libraries, laboratories, and playgrounds

According to the population projection and the standards outlined in the National Reference Manual (NRM) for the provision of education institutions, it has been revealed that the existing institutes in Khar Urban Centre are not meeting the required standards.

The service area analysis of educational institutes was conducted using GIS, evaluating accessibility for boys and girls based on distance criteria. Maps were created for primary, middle, high, and higher secondary schools following National Reference Manual standards. For boys, primary schools adequately serve urban centers, but some areas remain unserved, while middle and high schools are concentrated centrally, leaving outer regions underserved. For girls, primary schools offer moderate coverage, but middle and high school facilities are limited, with several areas lacking access, particularly in the northeastern direction.



Map 5-13: Existing Boys Served/Unserved Areas of Educational Facilities



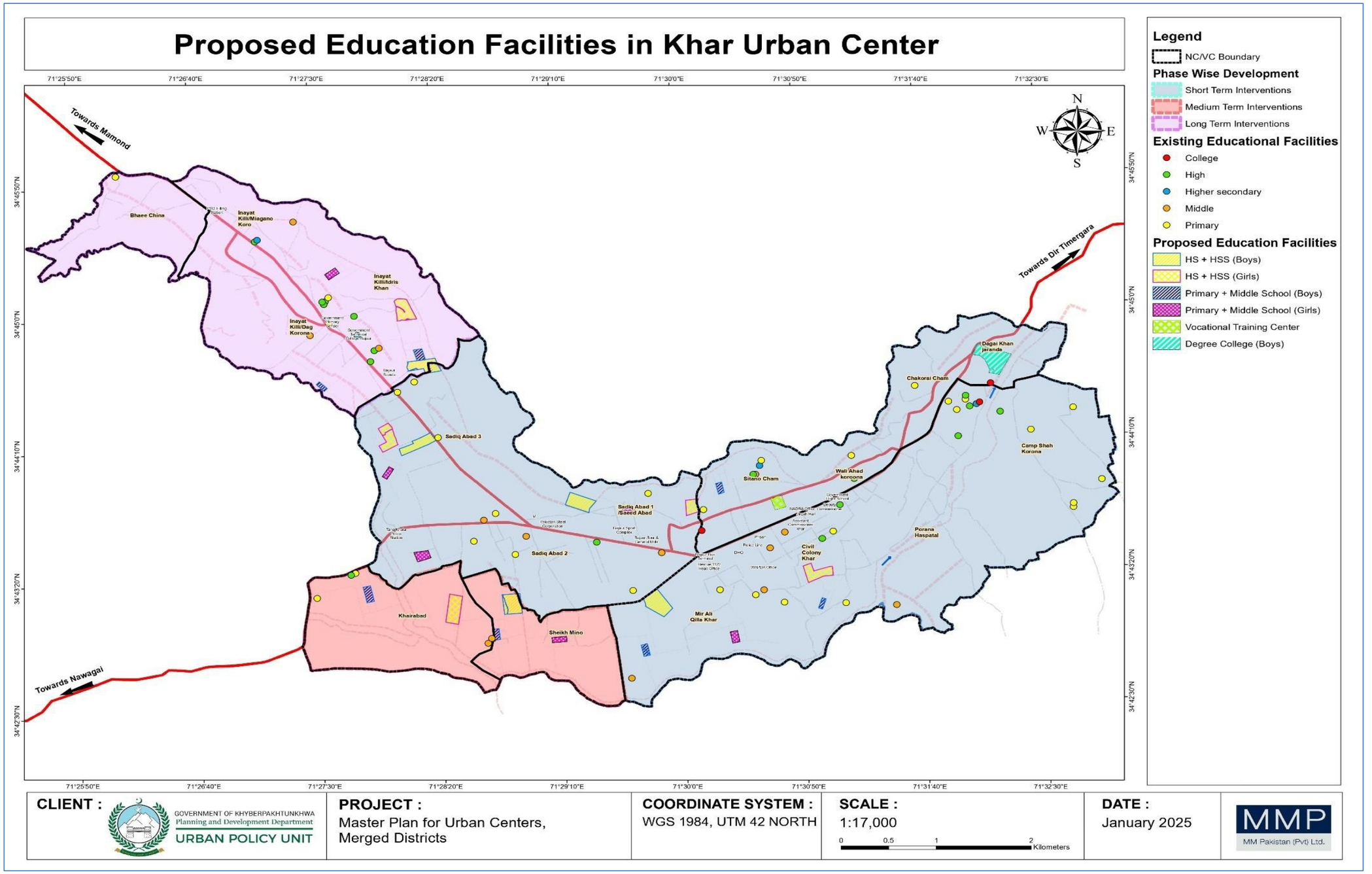
Map 5-14: Existing Girls Educational Facilities

5.7.1 Proposed Education Facilities

The population-based analysis reveals a gap between current and required educational facilities, with additional provisions needed by 2040. To address this, 13 new primary and middle schools are proposed, along with high schools and colleges in Khar Urban Centre. Private sector schools will help meet remaining demands, and their expansion will be encouraged.

5.7.2 Proposed Action Plan for Education Facilities

The educational facilities action plan is divided into short, medium, and long-term phases, each with dedicated maps illustrating the proposed developments. In the short term, immediate priorities include establishing primary and middle schools within neighborhood centers, specifically seven schools for boys and six for girls. The medium-term plan focuses on expanding high and higher secondary school facilities, integrating them into existing buildings to efficiently use space and resources. In the long term, the plan includes constructing five boys' and five girls' high schools, a boys' college, and a vocational training center for females. These phases aim to systematically address educational disparities and accommodate the future population's needs.



Map 5-15: Proposed Educational Facilities

5.8 Quality of Life

The quality of life of the people living in the Khar Urban Center was determined through a field survey. The quality of life in a city is based on the services and facilities available to the people. In Khar Urban Center, multiple indicators of the quality of life were taken to know about the satisfaction level of the resident of the city.

5.8.1 City-Level Satisfaction from Facilities

The satisfaction level of the residents from the existing facilities was determined through a household survey. The findings are shown graphically in Figure 4-9. The people were very deprived, and most of the people were not responded to the level of satisfaction with the existing facilities. They were of the view that if there is non-availability of the facilities how we can express our satisfaction for them. It means that better facilities can enhance the satisfaction level of the inhabitants.

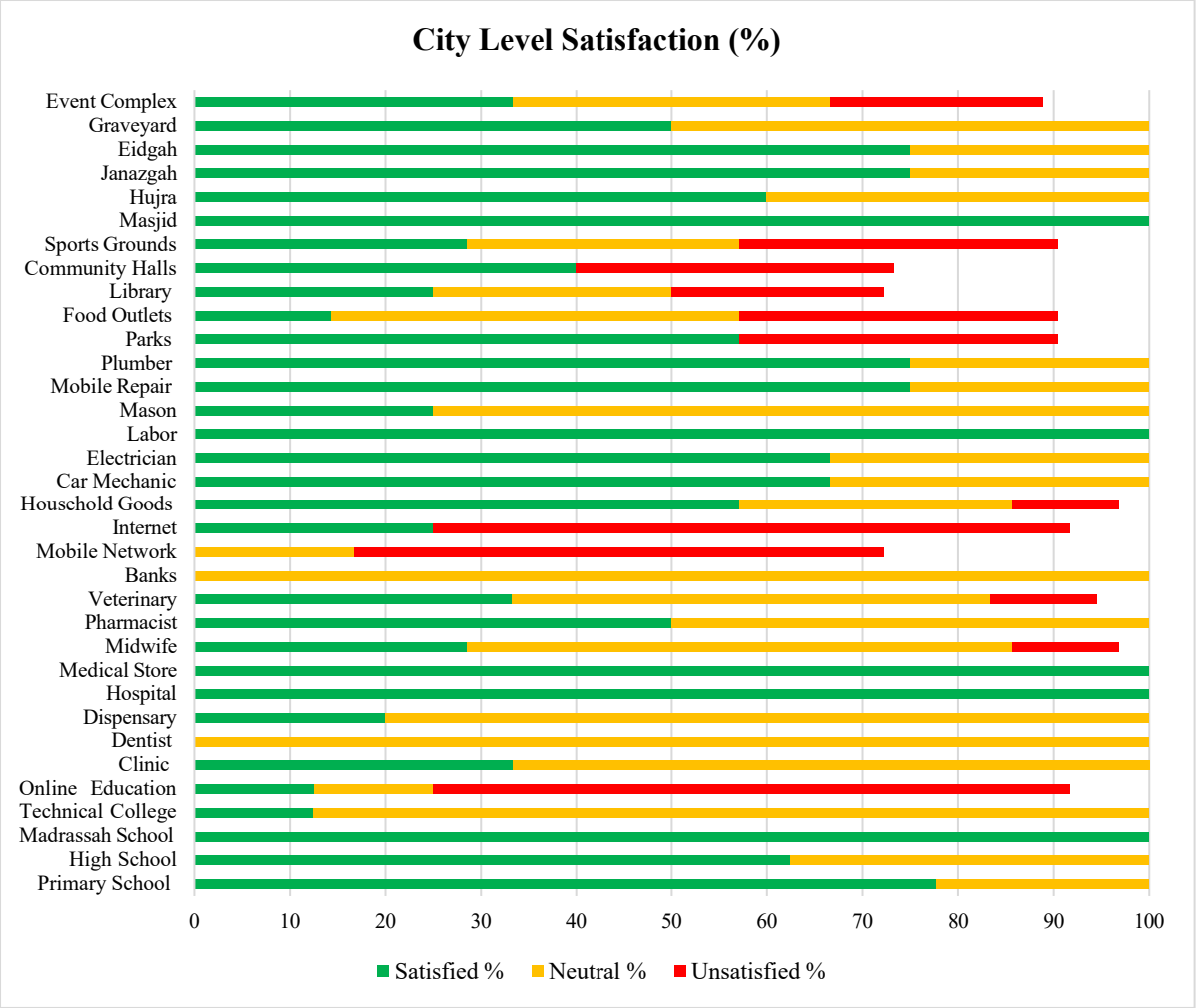


Figure 5-9: City-Level Satisfaction from Facilities

5.8.2 Proposed Provision for the Betterment of Quality of Life

The quality of life in a city can be influenced by a variety of factors, including access to basic needs like food, housing, and healthcare, as well as cultural amenities like museums, and parks. Other factors that can impact the quality of life in a city include safety, cleanliness, transportation options, job opportunities, and social services.

In general, cities that are safe, clean, and offer a range of amenities tend to have a higher quality of life. Additionally, cities that prioritize sustainability and environmental protection can offer a higher quality of life for residents and visitors alike.

To improve the quality of life in Khar Urban Centre, local governments investment in infrastructure, public transportation, and social programs that address issues like poverty and homelessness. Community involvement can also play an important role in improving quality of life by encouraging civic engagement and fostering a sense of community pride.

To enhance the quality of life of city residents, it is essential to ensure that all individuals have access to necessities such as food, shelter, and healthcare. To achieve this, neighborhood-level facilities have been proposed with the aim of equal access to all citizens regardless of their socioeconomic status.

Furthermore, it has been crucial to centralize major facilities within the city to ensure that they are easily accessible to all residents. This can include public transportation hubs, healthcare facilities, educational institutions, and cultural amenities such as museums and theaters. By providing these essential services in the heart of the city, individuals can access them easily and efficiently, leading to a higher quality of life. To further improve the standard of living for city residents, it is also important to prioritize sustainability and environmental protection. The proposals include green spaces and waste management. Prioritizing these initiatives can create a cleaner and more sustainable environment, which in turn can lead to healthier and happier communities.

Overall, by providing necessities, centralizing key facilities, and prioritizing sustainability, Khar Urban Centre can improve the quality of life for all residents. It is also important for local governments to prioritize these initiatives to create a more equitable and livable community for all citizens.

5.9 Quality of Life Improvement

The Master Plan outlines strategic interventions aimed at enhancing the overall quality of life, including inclusive housing for all income groups, slum upgrading, and the provision of essential health, education, and municipal services. A key initiative is the introduction of a comprehensive waste management system, incorporating waste segregation into organic and inorganic categories. Additionally, the plan envisions the development of a robust sewerage network designed to accommodate both existing and future population demands, ensuring sustainable urban growth for the planning period of 2024–2042.

The Master Plan of Khar urban center proposes the following quantitative and qualitative interventions to ensure sustainable urban development and improved service delivery:

Table 5-2: Periodic Interventions for Quality-of-Life Improvement

Sector	Action Plan	Implementing and Executing Agencies	Target Group	Time Period
Accessibility to Education and Health Facilities	➢ Rapid assessment of current accessibility features, identify immediate barriers and prioritize areas with the most urgent need of improvement.	Local Government /Municipal Authorities	Local Students and General Public	2022-2025
	➢ Expansion of the DHQ Hospital with 116 more beds and improvement in the accessibility of the neighborhood. ➢ Development of new educational and health facilities in NH 12 and 13.	Local Government /Municipal Authorities	Local Students and General Public	2022-2030
	➢ Development of new educational and health facilities in NH 1, 2, 3, 10, and 11. ➢ Planning of the new routes that are accessible and have the appropriate width for ambulance transportation in an emergency. ➢ Development of contingency plans for immediate response to unexpected barriers to accessibility.	Local Government /Municipal Authorities	Local Students and General Public	2022-2035
	➢ Development of new educational and health facilities in NH 4, 5, 6, 7, 8, and 9.	Local Government /Municipal Authorities	Local Students and General Public	2022-2040
Roads and Urban Mobility	➢ Provision of bicycle parking at the different intersections and in the parking lots. ➢ Provision of bus stops for the local transport on the main roads.	Local Government /Municipal Authorities	General Public and Visitors	2022-2025
	➢ Pavement of the priority roads and streets. ➢ Provision of footpath alongside the main roads and streets with addition of sitting spaces.	Local Government /Municipal Authorities	General Public, Visitors and Transporters	2022-2030
	➢ Widening of roads for the cycle tracks and central landscaping throughout the main roads and corridors. ➢ Provision of parallel parking to cater to the irregular parking along the roads in the widening process.	Local Government /Municipal Authorities	General Public, Visitors and Transporters	2022-2035
	➢ Development of major bus stands and bus stops with the development of local transport systems at the government level. ➢ Construction of new roads with the provision of green belts, footpaths, and street furniture. ➢ Provision of dedicated lanes for bicycles along with footpaths.	Local Government /Municipal Authorities	General Public, Visitors and Transporters	2022-2040

Sector	Action Plan	Implementing and Executing Agencies	Target Group	Time Period
Provision of Parks and Green Spaces	➢ Plantation provided along the road side, in the center median for the beautification purpose.	Local Government /Municipal Authorities/NGOs/Funding Agencies	General Public, Visitors, Business Industry	2022-2025
	➢ Rehabilitation of 2 existing parks of Khar. ➢ Development and extension of the available green spaces in the master plan and provide accessible green spaces in particular for women, children, older persons, and persons with disabilities.	Local Government /Municipal Authorities	General Public and Visitors	2022-2030
Provision of Parks and Green Spaces	➢ Provision of green spaces in the new infrastructural development. ➢ Development of urban forest and agriculture along the outskirts of the city and along the riverside and lakeside trails. ➢ Development of community and neighborhood parks.	Local Government /Municipal Authorities/Local Community	General Public and Visitors	2022-2035
	➢ Development of urban recreational areas like city parks. ➢ Development of green buildings with the environment friendly and self-sustainable material and using roofs as green spaces	Local Government /Municipal Authorities	General Public and Visitors	2022-2040
Provision of Libraries and Public Halls	➢ Upgradation of the existing libraries in educational institutes in terms of infrastructure and the facilities.	Local Government /Municipal Authorities/Private and Government Universities	Local Students	2022-2025
	➢ Sites can be designated for the public halls with the provision of parking, landscaping and access of the main roads.	Local Government /Municipal Authorities	Local Students/General Public/Visitors and Tourists	2022-2030
	➢ Development of new libraries in colleges and universities with the improved educational facilities. ➢ Development of the public libraries and public halls in the center of the town with access to the main roads.	Local Government /Municipal Authorities/Private and Government Universities	Local Students/General Public/Visitors and Tourists	2022-2035
	➢ Upgradation of public libraries and public halls using the sustainable materials and source of energy.	Local Government /Municipal Authorities	Local Students/General Public/Visitors and Tourists	2022-2040
Provision and Improvement of Civic Facilities	➢ The public toilets for males and females with the separate entrance and universal accessibility.	Local Government /Municipal Authorities	General Public and Tourist	2022-2025
	➢ Street furniture's to be placed along main roads.	Local Government /Municipal Authorities	General Public and Tourist	2022-2030

Sector	Action Plan	Implementing and Executing Agencies	Target Group	Time Period
	➢ Existing street lights and poles to be upgraded. ➢ On street parking to be planned with markings on the roads at certain angles. ➢ Ensuring accessibility for all by incorporating amenities like ramps and disability-friendly infrastructure.	Local Government /Municipal Authorities	General Public and Tourists	2022-2035
	➢ New street poles and lights to be placed on the roads and streets where the existing streets lights are not present. ➢ The public toilets for males and females with the separate entrance and universal accessibility needs to be provided at the bazars and on the main roads at certain distance. ➢ Street furniture's to be placed along all the roads and main streets where space is available and in the green areas along the roads.	Local Government /Municipal Authorities	General Public and Tourists	2022-2040
Strategies for Waste Reduction and Adaptation of Green Energy Initiatives	➢ Provision of dustbins at all transit stations, parking areas, and junctions. ➢ Implement measures to reduce plastic usage and promote reusable bags.	Local Government /Municipal Authorities	General Public, Visitors, and Tourists	2022-2025
	➢ Establish community-based recycling hubs to encourage residents to drop off recyclable materials conveniently. ➢ Retrofit street lighting with energy-efficient LED bulbs to reduce energy consumption and lower carbon footprint.	Local Government /Municipal Authorities	General Public, Visitors, and Tourists	2022-2030
	➢ Integrate renewable energy sources, such as solar panels on municipal buildings and public spaces. ➢ Implement techniques to reuse building materials in new development projects.	Local Government /Municipal Authorities	General Public, Visitors, and Tourists	2022-2035
	➢ Integrate green infrastructure, such as eco-friendly urban design, green roofs, and permeable pavements. ➢ Introduce advanced incineration technologies and centers to reduce landfill waste.	Local Government /Municipal Authorities	General Public	2022-2040

Sector	Action Plan	Implementing and Executing Agencies	Target Group	Time Period
Preservation of Cultural and Historical Sites	➢ Conduct a thorough inventory and condition assessment of urban cultural, and historical sites to identify immediate threats and maintenance needs, ensuring a comprehensive understanding of the preservation requirements.	Local Government /Municipal Authorities	General Public, Visitors, and Tourists	2022-2025
	➢ Develop a detailed preservation plan outlining specific actions for each site.	Local Government /Municipal Authorities	General Public, Visitors, and Tourists	2022-2030
	➢ Addressing infrastructure issues around heritage sites, such as improved signage, accessibility, and amenities, to enhance the visitor experience.	Local Government /Municipal Authorities	General Public, Visitors, and Tourists	2022-2035
	➢ Implementation of preservation plans, focusing on restoring and conserving the most critical elements of each site. ➢ Establishing a regular maintenance schedule for ongoing care of heritage sites.	Local Government /Municipal Authorities	General Public, Visitors, and Tourists	2022-2040

5.10 Proposed WATSAN & Municipal Services

5.10.1 Safe Drinking Water Provision Strategy for Khar Urban Centre

To achieve the target of safe drinking water supply and sanitation provision a comprehensive strategy has been designed for the plan period 2024-2042. The plan is as summarized below highlighting the existing situation, gap analysis and future action plan strategy equitable service delivery to the city by the next 18-20 years.

1. Existing Situation

- Population (2022): 122,920
- Current Water Demand: 1.8 MGD (6,813 m³/day)
- Storage Deficit: No dedicated fire reserve or peak-hour storage.
- Demand expected to increase to 3.9 MGD (14,172 m³/day) by 2040, requiring additional storage.

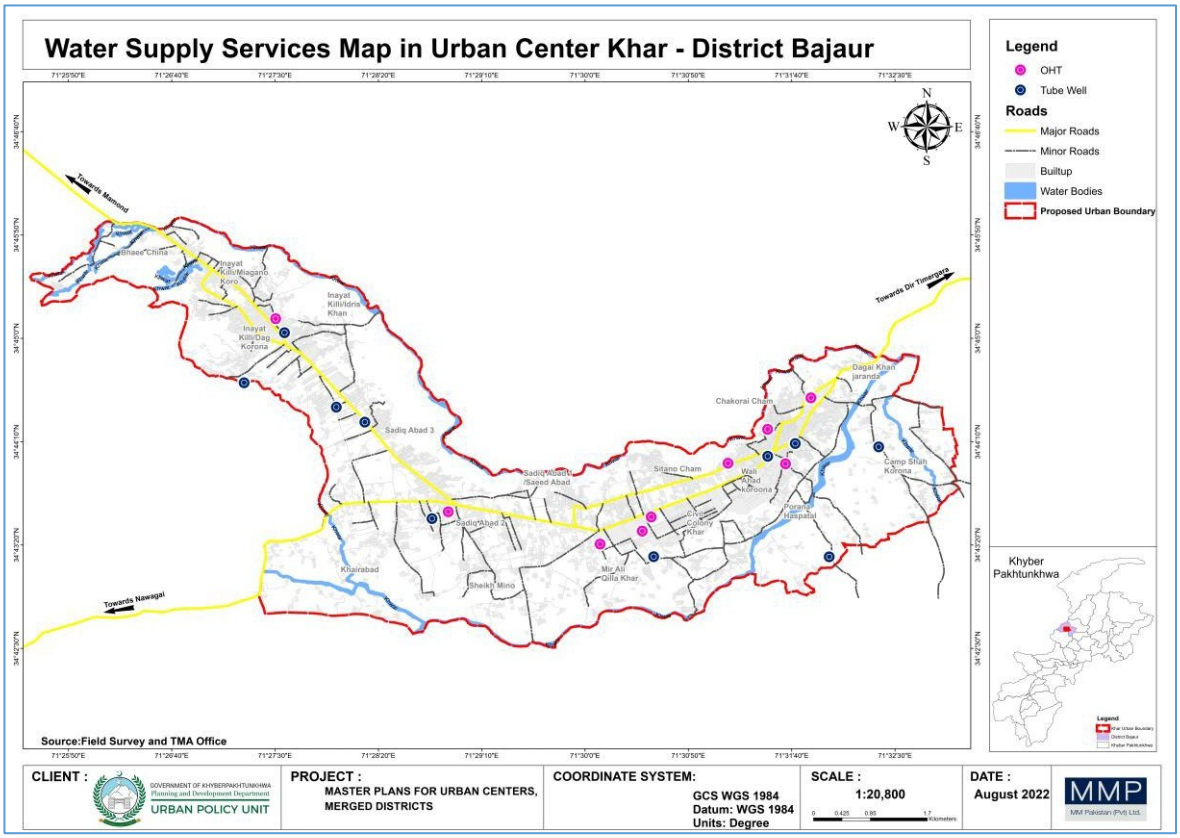
2. Gap Analysis

Projected Water Demand & Storage Needs

Year	Population	Water Demand (MGD)	Water Demand (m³/day)	Per Neighborhood (m³/day)	Required OHR Capacity (m³)
2025	139,227	2.1	7,949	611	1,100
2030	171,354	2.6	9,841	757	1,400
2035	210,896	3.2	12,112	932	1,700

2040	259,561	3.9	14,172	1,090	2,500

- Total Storage Required (2040): ~34,000 m³ across 13 proposed neighborhoods
- Fire Reserve (per neighborhood): 150 m³
- Peak-Hour Storage: 400 m³ per neighborhood



Map 5-16: Water Supply Served Areas in Khar Urban Centre

3. Future Plans

Short-Term (2025–2030)

In short term action plan, with the improvement of the existing and outdated reservoirs, new OHTs will be constructed in the Neighborhood Center 12 and 13 along with the supply lines. Already developed NC 12 and 13 will grow w.r.t infill development in future in short term plan. To meet the demand of these neighborhoods, OHTs will be constructed in these areas to fulfill the demand of water. The supply lines will be laid down along with the developed roads. Moreover, in the existing situation these neighborhoods are identified as the most critical sites as lacking the facilities of water supply so they are identified in the short-term plan for water supply with the constructing of new OHTs.

- ☑ Construction of 5 OHRs (1,100–1,400 m³ each) to cover priority areas.
- ☑ Upgradation of main supply lines to reduce losses and increase efficiency.

Medium-Term (2030–2035)

The OHTs will be constructed in the Neighborhood Centers 1,2,3,10, and 11 in medium term action plan, whereas, the water supply facilities are already existing to these neighborhoods to some extent which will be improved during short term plan. The location of newly constructed OHTs in medium term plan will be in the proposed park as shown in below map. Moreover, the new water supply lines will be laid down for providing the water facilities.

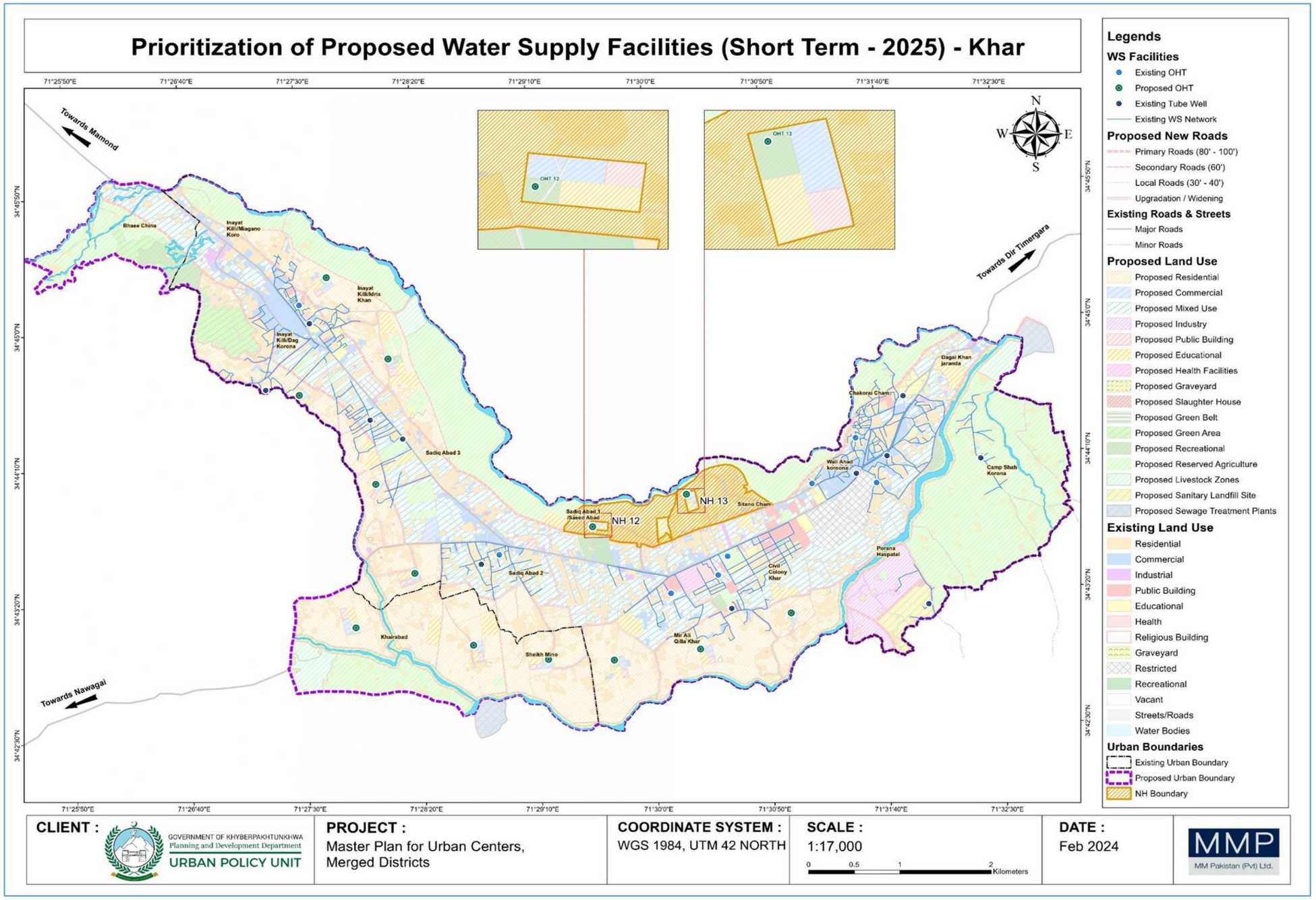
- Complete **8 more OHRs (1,700 m³ each)** for full coverage.
- Implement groundwater recharge and alternative sources.
- Expand storage to **80% of peak-hour demand** (target: **~2,000 m³ per OHR**).

Long-Term (2035–2040)

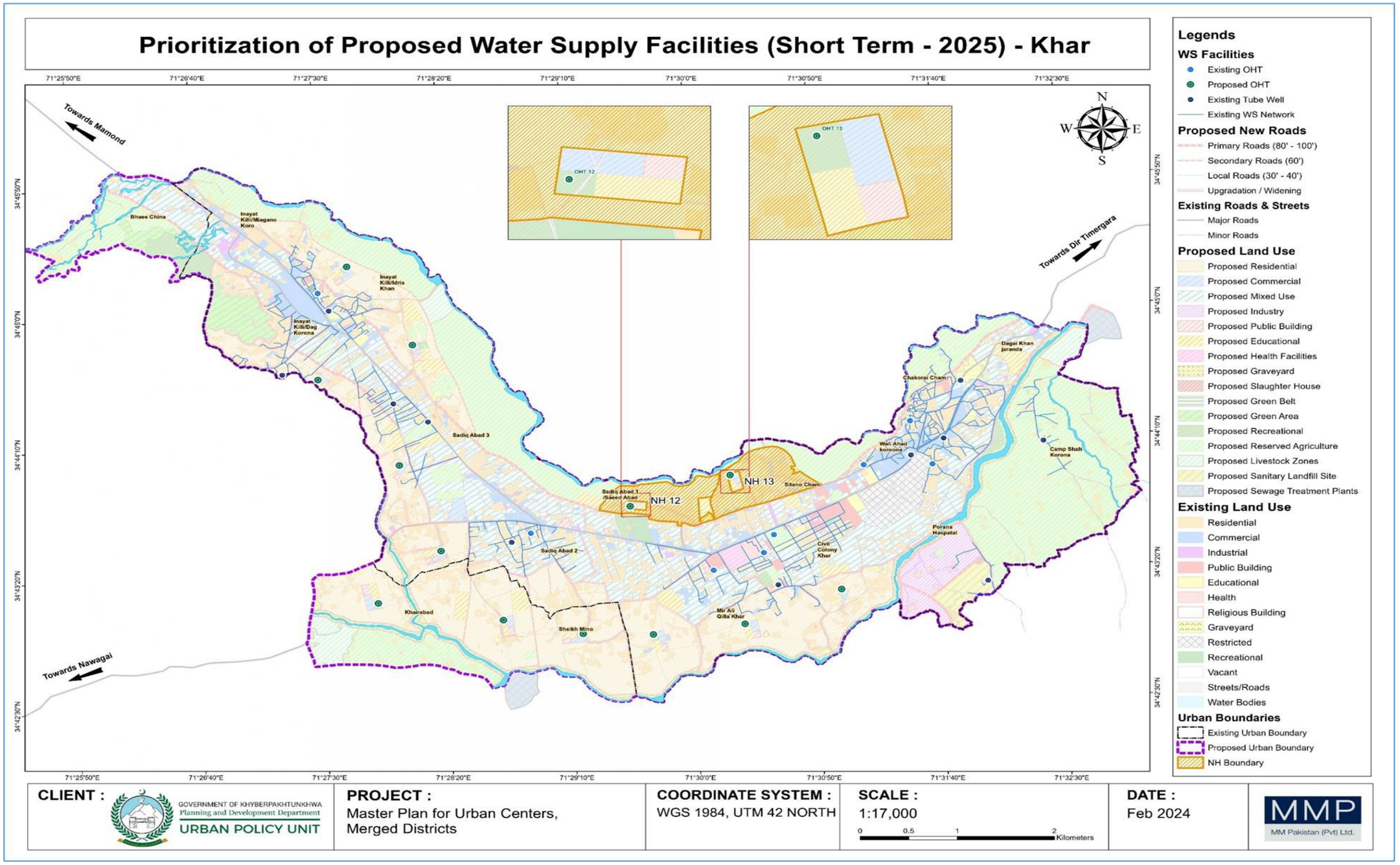
In long term plan, the construction of OHTs will be done in Neighborhood Center 4 to 9 which are the part of future proposal. These neighborhoods are envisioned for the long-term future development and the new OHTs will be constructed accordingly in these neighborhoods. The water facilities are located near Neighborhood Centers 8,9,10, and 11 as shown in above section Map 5-18 The NCs 3-5 are part of long-term plan for evolving them from Village Councils so these areas are part of long-term plan for water supply schemes.

- Ensure **100% safe drinking water access** with **2,500 m³ OHRs per neighborhood**.
- Develop **wastewater recycling** for non-potable uses.
- Strengthen **regional water resilience strategies** by constructing check dams and water reservoirs in the future.

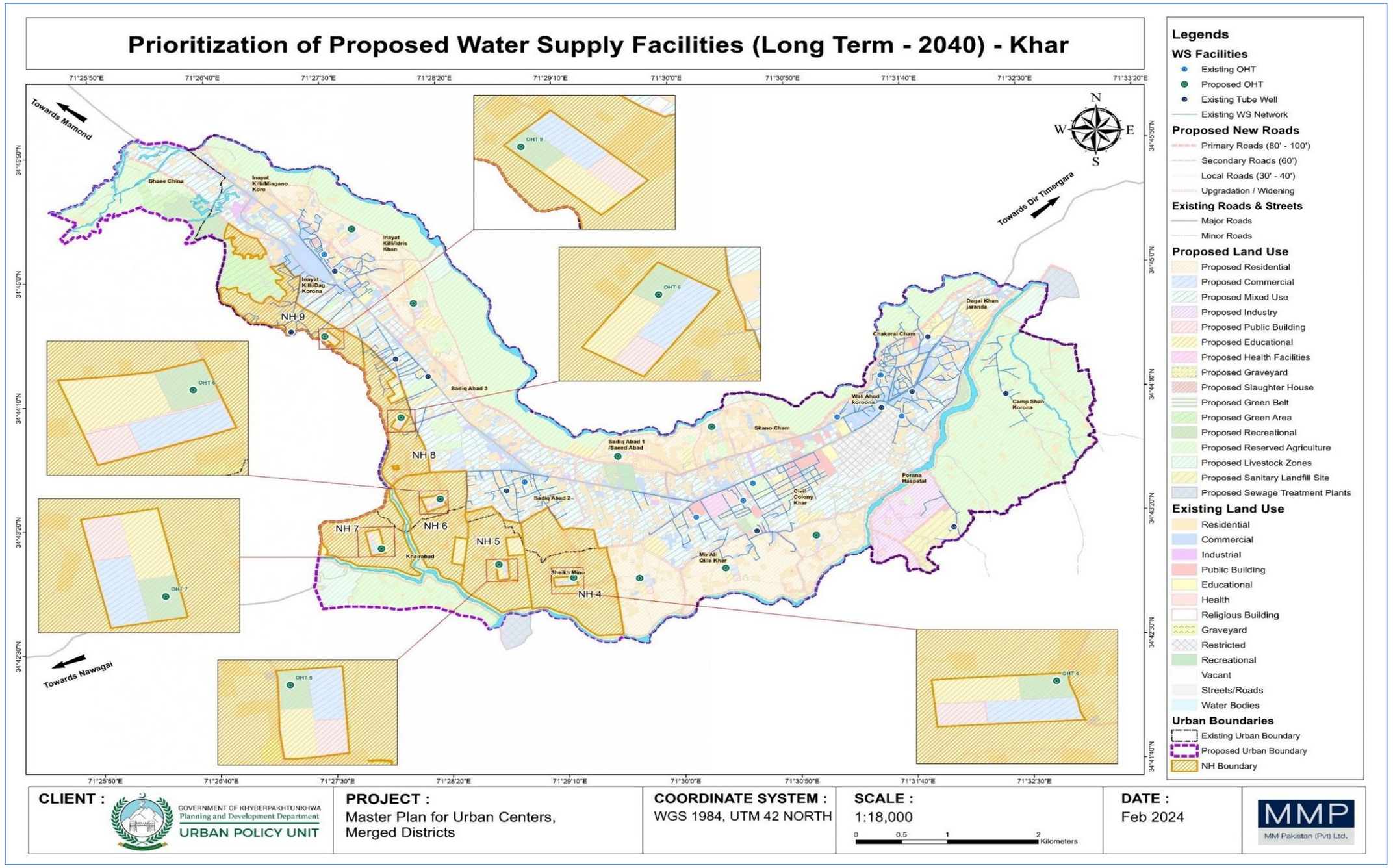
Long term plan includes construction of the remaining OHT in the Khar while maintaining the already constructed OHTs for water supply. Moreover, the maintenance of pipelines and water supply will be checked throughout the plan.



Map 5-17: Prioritization of Water Supply (Short Term)



Map 5-18: Prioritization of Water Supply (Medium Term)



Map 5-19: Prioritization of Water Supply (Long-Term)

5.10.2 Proposed OHT & Water Supply Network

The Proposed Water Supply Network Map of Urban Center Khar, District Bajaur illustrates the planned improvements in the water infrastructure to meet the growing demand for potable water. The map highlights the proposed tube wells (marked with blue circles) which are strategically located to enhance water availability across the urban center. These tube wells will supplement the existing water supply network, ensuring efficient distribution. Additionally, the proposed overhead tanks (OHTs) (marked with pink circles) will store and regulate water pressure for effective supply.

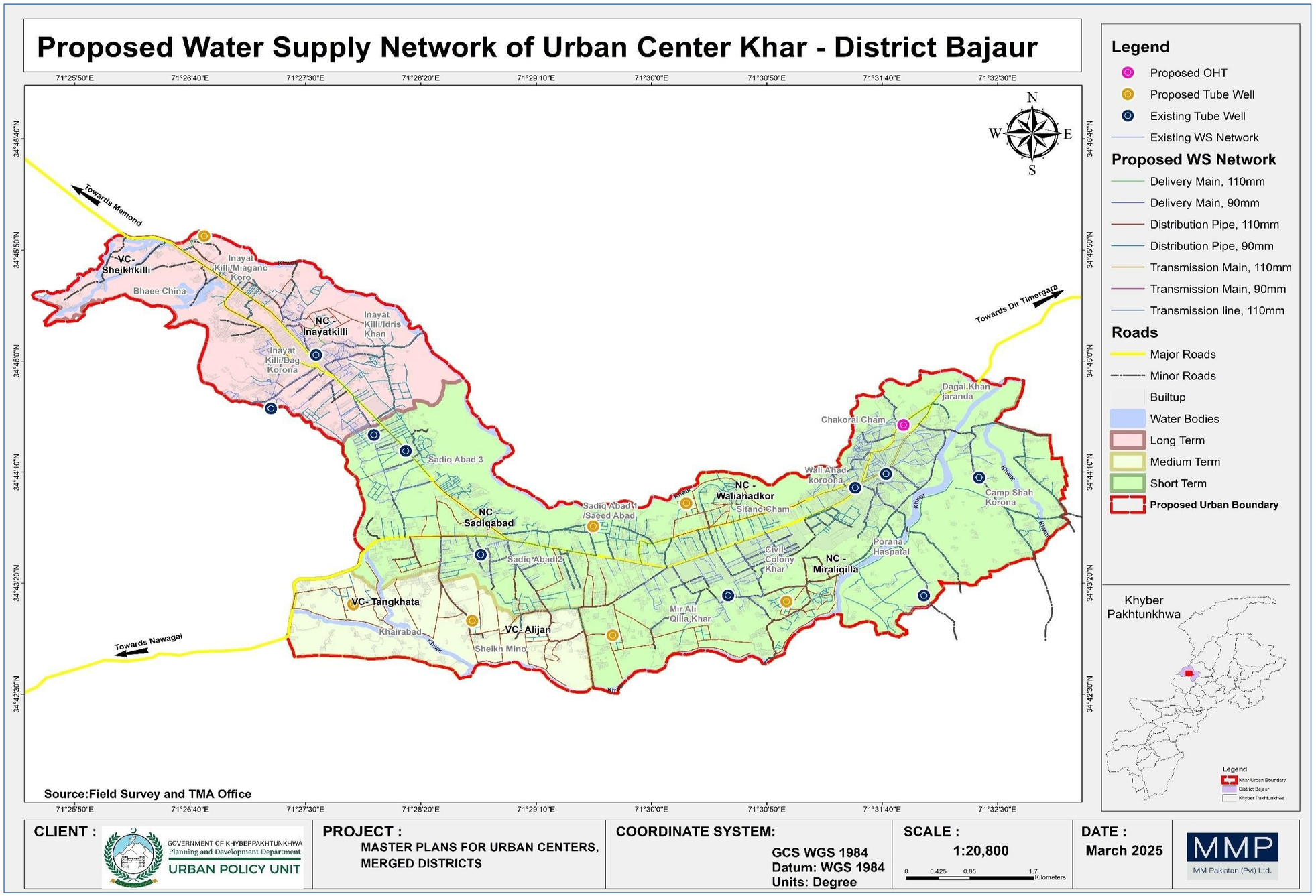
The proposed WS network is categorized into:

- Delivery mains (110mm and 90mm) for efficient water transportation.
- Distribution pipes (110mm and 90mm) to ensure equitable water access.
- Transmission mains and lines (ranging from 90mm to 110mm) to support bulk water transfer.

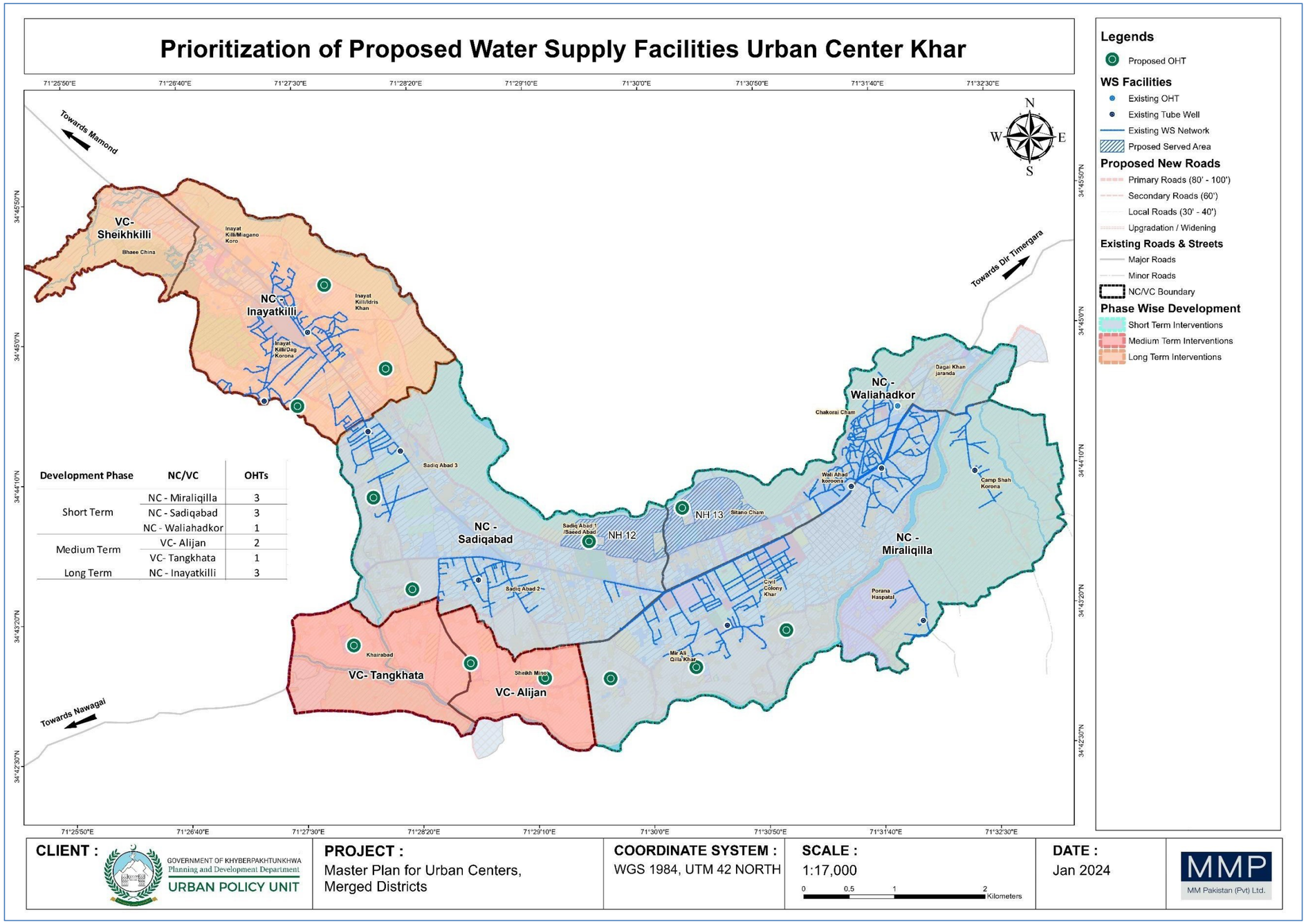
The urban boundary (marked in red) outlines the planned service area, ensuring that the proposed water infrastructure aligns with the city's expansion. The roads, including major and minor roads, are mapped to indicate accessibility for future maintenance and extensions. The zoning is divided into short-term, medium-term, and long-term planning phases to facilitate gradual implementation of the water supply infrastructure.

This proposal aims to enhance water availability, improve distribution efficiency, and cater to the projected population growth in Khar, ensuring a sustainable and resilient water supply system for the urban center.

The preliminary layout design is illustrated in Map 5-20. For detailed cost estimation of the water supply network, please refer to the respective Action Plan (Task-D).



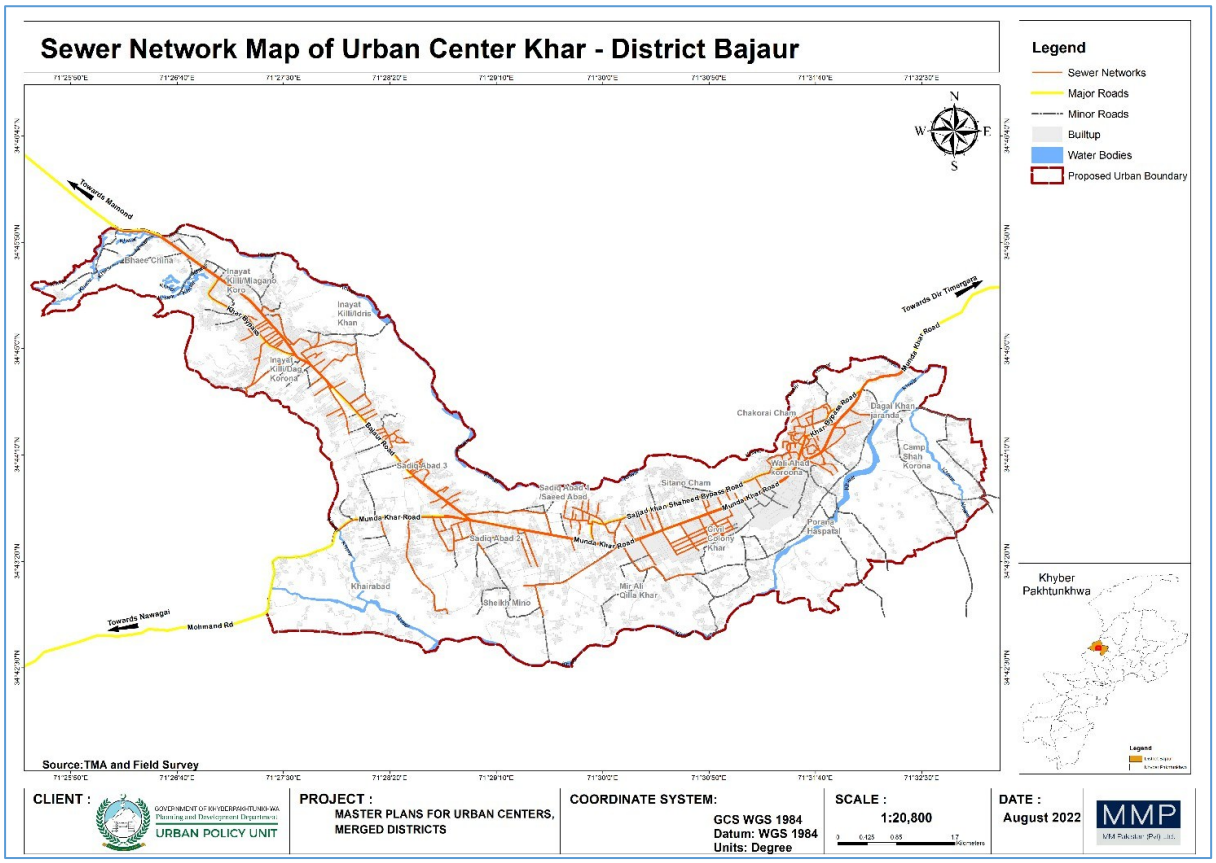
Map 5-20: Proposed Water Supply Network



Map 5-21: Prioritization of Proposed Water Supply Network & OHT

5.10.3 Sewerage Network Development Strategy for Khar Urban Centre

The existing sewerage system in Khar lacks adequate coverage, leading to environmental and public health concerns. To address these challenges, a phased strategy has been developed, including short, medium, and long-term plans. The strategy incorporates two Sewage Treatment Plants (STPs) located in the eastern and southern parts of the city, strategically positioned to handle wastewater efficiently. The primary sewerage network will collect household wastewater, while the secondary sewerage network will handle commercial and market effluents, both connecting to the trunk sewers for systematic disposal and treatment.



Map 5-22: Sewerage Network Map of Khar Urban Centre

The following phase-wise interventions are proposed to meet standard practice equitable sanitation to the residents in a sustainable way.

5.10.4 Short-Term Plan (2025) – Immediate Interventions

- **Rehabilitation & Maintenance:** Immediate repairs of critical sewer lines and open drains to prevent overflows.
- **STP Construction:** Begin construction of the eastern STP to treat wastewater efficiently.
- Sewerage system for Neighborhood Centers 1, 2, 3, 12, and 13, directing wastewater to the eastern STP as per the short-term priority map.

5.10.5 Medium-Term Plan (2030) – Expansion & Regulation

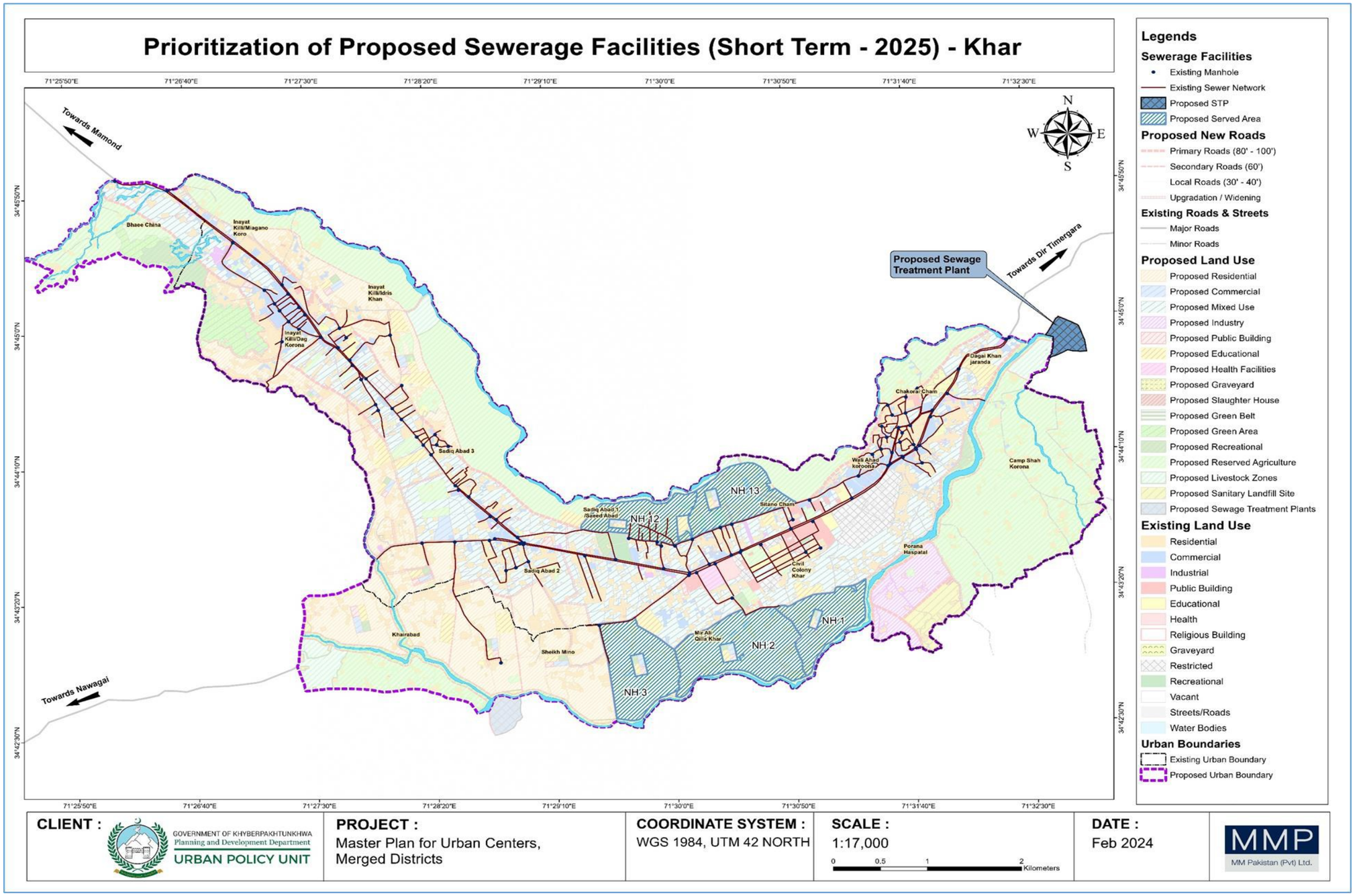
- **Network Expansion:** Extend sewer lines to unserved areas, ensuring full urban coverage.
- **Drainage Upgrade:** Convert open drains into covered or underground sewer **lines** to reduce contamination.
- **STP Construction:** Develop the southern STP for handling wastewater from additional zones.
- **Regulatory Enforcement:** Implement strict penalties for illegal dumping and encroachment on drainage systems.
- **Neighborhood Focus:** Connect Neighborhood Centers 4–11 to the sewerage network, routing them toward the southern STP, as identified in the medium-term priority map**.**

5.10.6 Long-Term Plan (2040) – Sustainability & Resilience

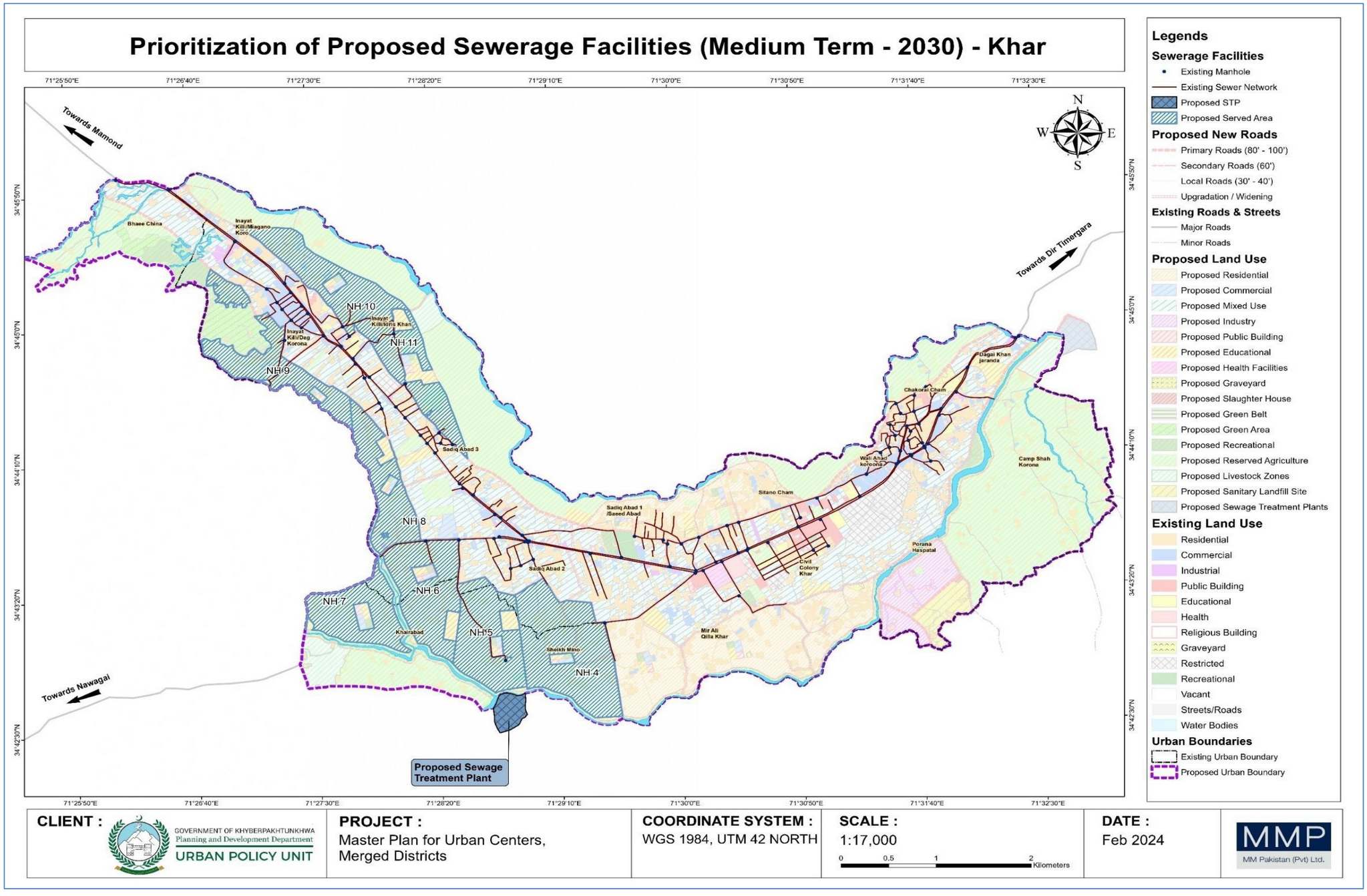
- **Urban Drainage Management:** Integrate sewerage with stormwater strategies to mitigate flooding.
- **Institutional Strengthening:** Train municipal staff on advanced sewerage system management.
- **Innovative Solutions:** Explore decentralized wastewater treatment, recycling, and **reuse initiatives** for sustainability.
- **Monitoring & Maintenance:** Establish a real-time monitoring system for efficient operation.

By following this three-phase strategy, Khar will significantly improve wastewater management, enhance public health, and support sustainable urban growth. The spatial prioritization from the sewerage network maps ensures that the interventions align with the most critical areas first, enabling an efficient and systematic approach toward urban sanitation.

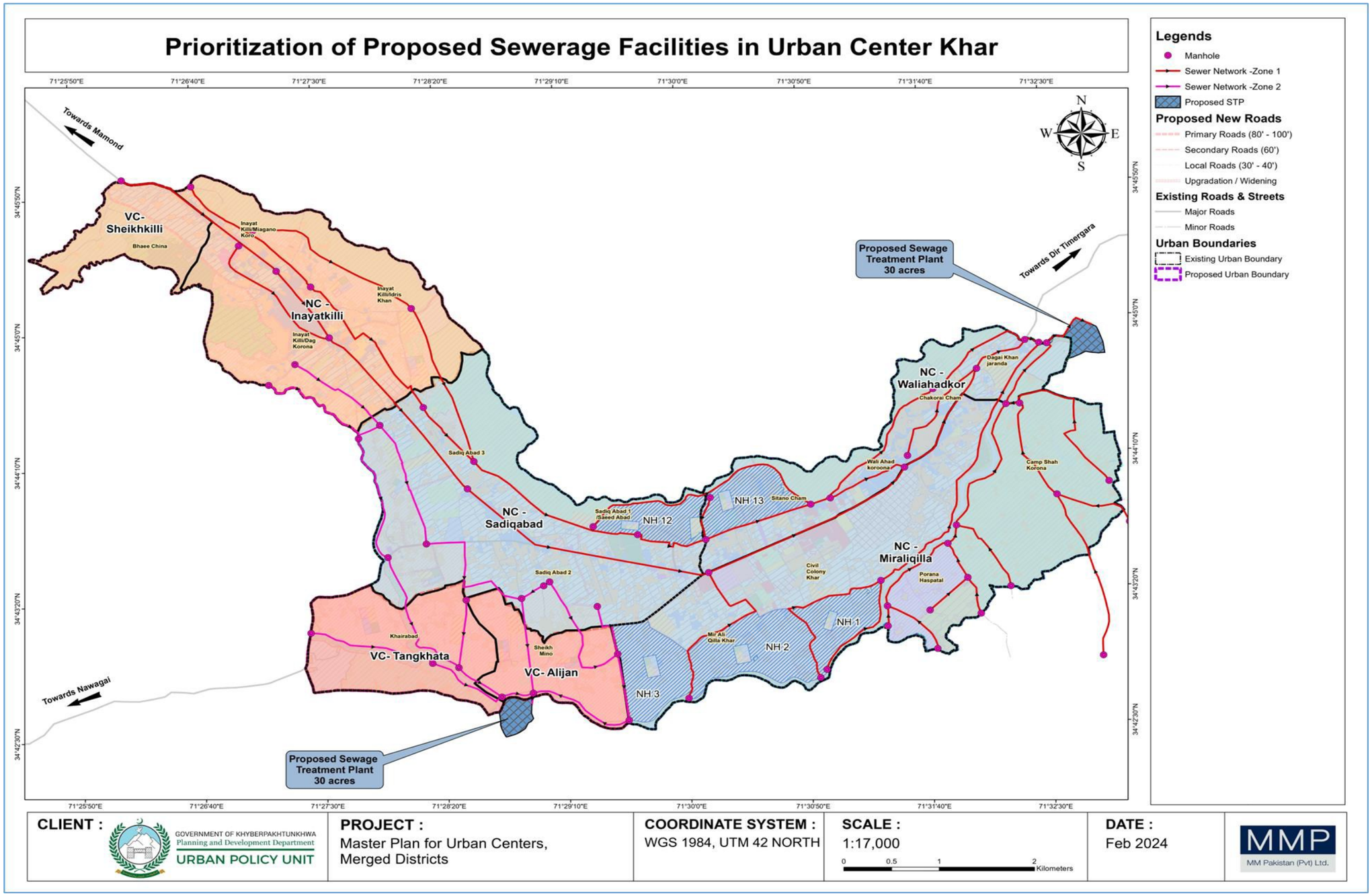
The preliminary layout design is illustrated in Map 5-24 showing prioritization of sewerage network. For detailed cost estimation of the sewerage network, please refer to the respective Action Plan (Task-D).



Map 5-23: Prioritization of STP (short-term)



Map 5-24: Prioritization of STP (medium-term)



Map 5-25: Phase-wise- Prioritization and Layout of Sewerage Network

5.11 Solid Waste Management for Khar Urban Centre

5.11.1 Current Situation

Khar is facing significant challenges with waste management. Based on a survey, only 30-40**%** of the waste is collected, leaving **60%** of the waste uncollected and scattered across public spaces and streets. This uncollected waste is not only unsightly but also a major health risk, especially when burned openly, contributing to **air** pollution.

The Municipal Committee (MC) Khar is responsible for waste collection and disposal. However, manpower shortages, lack of essential equipment, and financial constraints have severely limited the effectiveness of the current system. The city has only one authorized waste dumping site, which is not well-equipped to manage the increasing volume of waste safely.

5.11.2 Gap Analysis

- **Inadequate Collection System**: The current door-to-door collection is non-functional in most areas. The existing collection methods rely on manual labor with wheelbarrows and hand carts, which are slow and inefficient.
- **Waste Disposal**: The only waste disposal site is about 5 kilometers from the city center and lacks essential infrastructure**,** such as a boundary wall**,** stormwater drainage, and **liners** to prevent contamination of water resources.
- **Limited Equipment and Capacity**: The MC's equipment includes only 15 large-sized containers (4 tons)**,** 20 small-sized containers (40 kg)**,** and a few vehicles, which are insufficient to cover the growing waste volume. The current system has the capacity to collect a very small portion of the waste generated.
- **Waste Generation Rate**: In 2022, Khar generated 49 tons of waste annually. Projections estimate this will grow to 124 tons by 2040 due to population growth and increased waste production.

5.11.3 3 R's Proposed Waste Management Process

The 3 R's concept will be used to combat the waste in Khar Urban Centre. Material reduction, reuse and recycling (commonly referred to as the three R's of waste management) are different strategies of reducing the amount of waste produced by manufacturing processes, which ultimately goes to landfill. These three strategies also commonly form the center of what is referred to as the 'waste management hierarchy' – a list placing various methods of waste reduction in order of most to least desirable. This is a generally accepted hierarchy, often incorporated into and influential upon waste management legislation. The exact wording of the hierarchy varies, but the broad structure remains the same.

1. **The hierarchy of waste**

Reduce, Reuse, Recycle, also referred to as the 3 R's of recycling, are created to establish a hierarchy of waste management practices for individuals and businesses. The 3 R's philosophy has been adopted for the urban center to attain the vision of a safe and clean urban center.

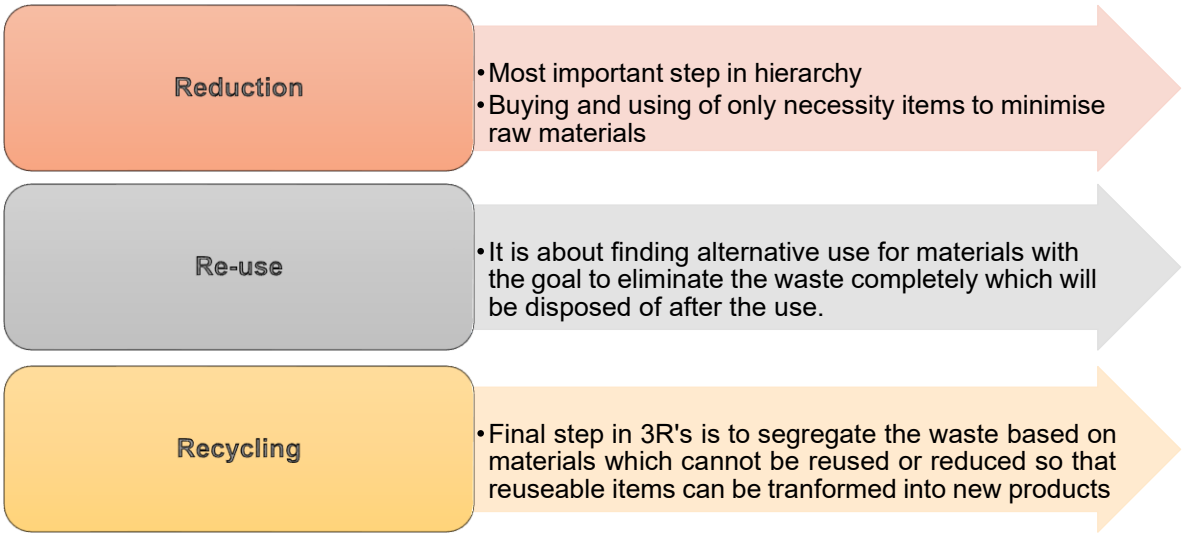


Figure 5-2: 3R's of Waste Management

The ultimate goal of the 3R's is to minimize the amount of waste sent to landfills, in order to create a safer and healthier environment. While historically the waste hierarchy has been centrally focused on the 3 R's, the following additional steps can be considered as the booster to areas of 3R's: Moreover, following approaches can be used for the waste management:

5.11.4 Proposed Strategy for Solid Waste Management (SWM)

5.11.4.1 Short-Term Plan (0-2 Years)

1. **Improve Waste Collection Efficiency**:

- Currently, only 30-40% of the waste is being collected. To improve this, we propose reviving door-to-door waste collection, especially in areas where it is not functional. The use of small vehicles like Qingqi or Suzuki vans will ensure timely collection, particularly in narrow streets and residential areas.
- The current collection rate of 30-40% indicates a significant gap. By improving collection methods, we can capture more of the 60% uncollected waste and significantly reduce pollution and health hazards.

2. **Public Awareness Campaigns**:

- Launch an awareness campaign to encourage households to separate organic and inorganic waste. This will facilitate easier recycling and composting processes, which can reduce the amount of waste sent to the landfill.
- The lack of waste segregation is contributing to higher waste volumes at disposal sites. Educating the public on simple sorting practices can reduce waste by up to 30-40% at the source.

3. **Staff Training**:

- Provide training workshops for waste management staff to improve operational efficiency. This includes educating them on best practices for waste segregation and health safety.
- The shortage of trained staff, especially daily wage workers, is a significant barrier. Proper training can improve productivity and safety for workers handling hazardous waste.

4. **Organize Community Cleanup Campaigns**:

- Engage local communities in regular cleanup efforts in public spaces, streets, and markets. This can help tackle visible waste problems and encourage responsible waste disposal.
- Street litter and open waste burning are direct consequences of uncollected waste. Community-driven initiatives can supplement municipal efforts in the short term.

5.11.4.2 Medium-Term Plan (2-10 Years)

1. **Increase the Number of Waste Collection Points**:

- Install additional waste collection bins in key commercial and residential areas, especially where businesses are concentrated. This will make waste disposal more convenient and accessible.
- Data Insight: Currently, the MC has limited waste bins in commercial areas. Expanding this infrastructure will reduce the burden on streets and public spaces and improve waste collection coverage.

2. **Upgrade Waste Collection Vehicles and Equipment**:

- Purchase more compaction vehicles and dustbins to improve waste collection. Modernizing the fleet will help improve efficiency and reduce the cost of transportation over time.
- The current fleet, which includes only 1 water bowser and 1 bucket vehicle, is insufficient for Khar's growing waste. An upgraded fleet will enable more waste to be collected without delays.

3. **Strengthen Regulations and Enforcement**:

- Implement stricter rules for littering and illegal dumping, with penalties to encourage residents and businesses to manage waste more responsibly.

- The 60% of waste that remains uncollected is often the result of improper disposal practices. Effective enforcement of waste management rules can reduce this significantly.
- **Promote Recycling and** Composting:
- Establish recycling centers for inorganic waste and composting facilities for organic waste. Organic waste, which includes food scraps and cow dung, accounts for a significant portion of total waste.
- By recycling and composting, up to 50% of waste can be diverted from landfills. This is a cost-effective and sustainable approach, especially given the projected 124 tons of waste by 2040.

5.11.4.3 Long-Term Plan (11-20Years)

1. **Waste-to-Energy Initiatives**:

- Invest in waste-to-energy (WTE) facilities that can convert waste into usable energy, thus reducing landfill use and generating electricity or heat for the city.
- By 2040, Khar will generate 124 tons of waste per year. Turning this waste into energy can reduce landfill dependency while producing valuable resources.

2. **Develop a, Sustainable Landfill**:

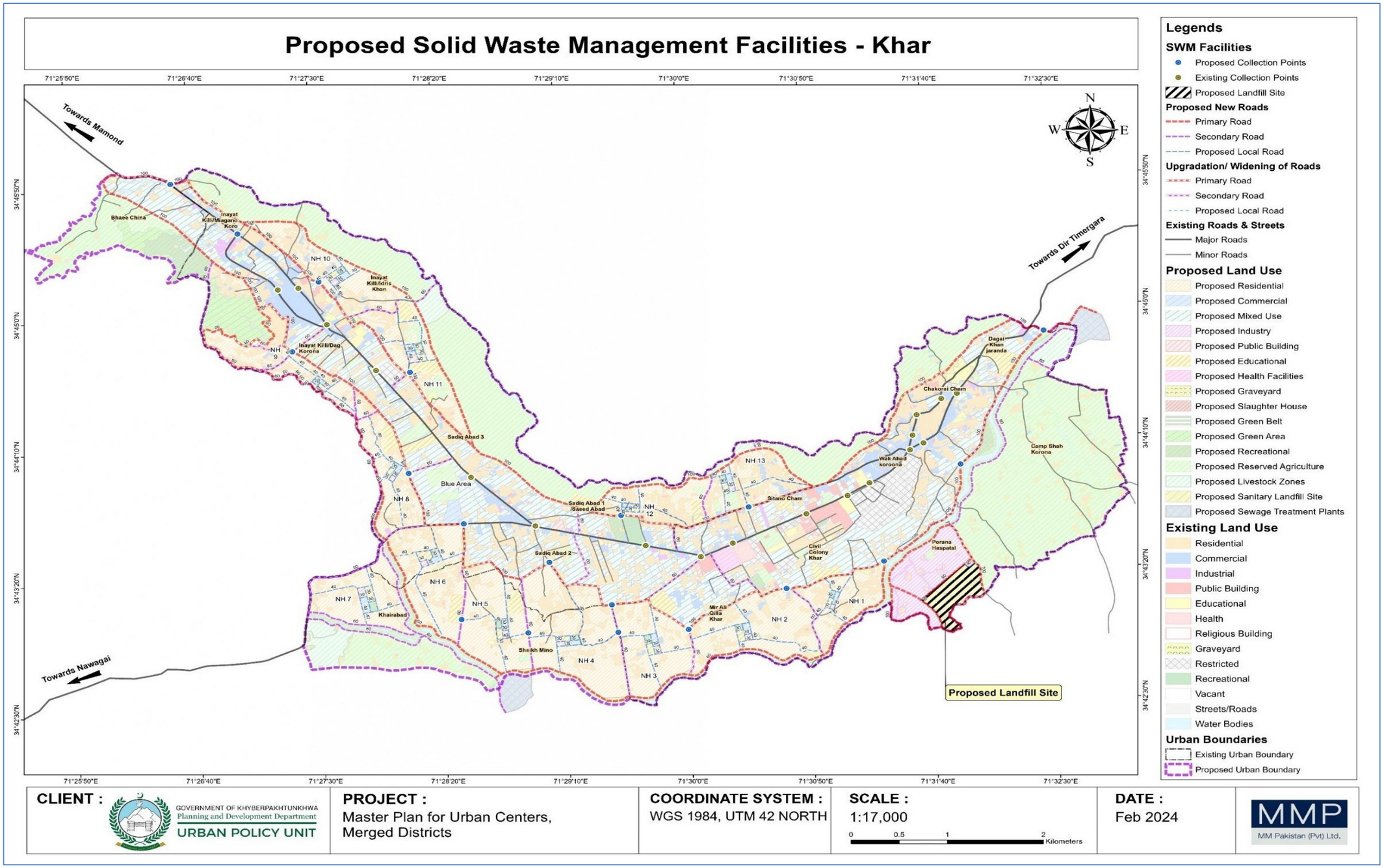
- Build a new landfill with necessary environmental protections, such as a **liner** system and stormwater management. This will ensure that waste disposal does not harm the environment.
- The current dumpsite lacks essential infrastructure, and proper waste containment systems are crucial to prevent groundwater contamination, particularly as waste generation increases.

3. **Collaboration with Industry**:

- Foster partnerships with local industries to promote sustainable practices, such as the use of eco-friendly packaging and improved waste management in production processes.
- Industrial waste makes up a significant portion of the waste stream. Encouraging industries to reduce waste at the source can significantly lower the burden on municipal systems.

4. **Revenue Generation through Recycling**:

- Create a revenue model by selling recycled materials (plastics, metals) and compost to local businesses or farms. This will help generate funds to support waste management operations.
- The sale of compost and recyclables can offset operational costs and reduce the financial burden on the city's waste management budget.



Map 5-26: Proposed Solid Waste Management

5.12 Proposed Road Network & Transportation Facilities

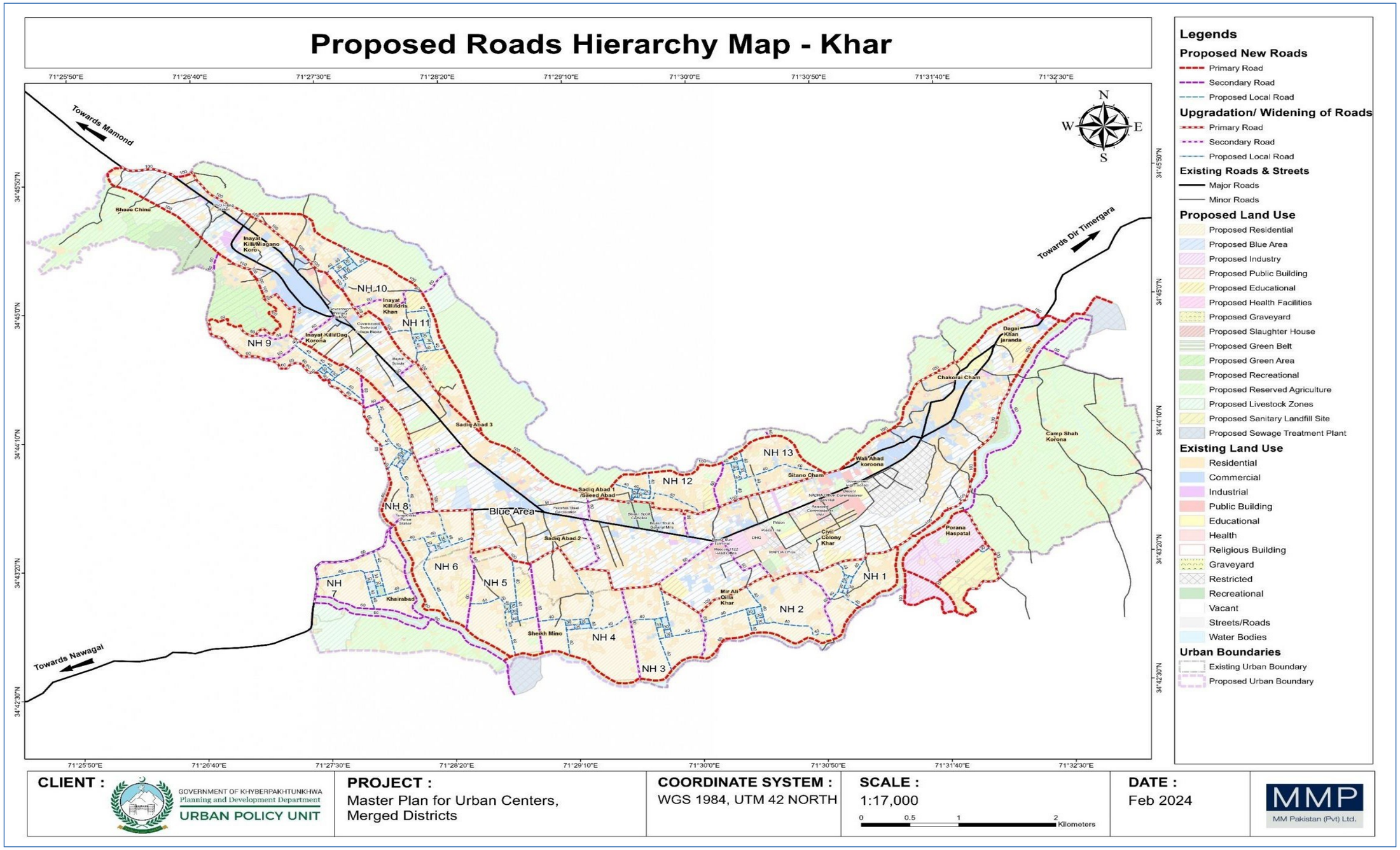
The transportation network of the Khar Urban Center has been analyzed based on the primary and secondary data sources which has revealed that the existing transportation infrastructure of the Khar Urban Center is insufficient and faces several issues like congestion and pollution due to unavailability of sufficient transportation facilities like public transport, pedestrian footpath, and traffic control system. Private vehicles and informal modes of transportation including rickshaws and vans are operating in irregular pattern creating hinderance in smooth mobility, further, the situation is aggravated due to non-availability of organized bus stops and terminals.

In transportation sector, proposals are made to improve the transportation situation of Khar. Both proposals are discussed below comprehensively. Two types of proposals have been given for roads along with the proposal of bus stand, truck stand, and parking stand:

- Road widening/upgradation of existing Roads
- Development of new Roads

Moreover, to improve the transportation facilities in Khar Urban Center proposals related to public transportation including bus and truck stand, taxi stand and parking area have also been made.

1. Provision of Public Transportation in the following identified areas in the future:
    - Main Khar Bazar
    - Khar Colony
    - Phatak
    - Inayat Kaley
2. Extension of Existing Transport Terminal
3. Truck Adda (1.4 acres) near Inayat kali
4. Taxi stands and parking area (1.9 acres) near the Shande Morr Bus Terminal



Map 5-27: Proposed Road Hierarchy of Khar Urban Centre

5.12.1 Proposed Road Network

The below attached table is providing the details of the short-, medium-, and long-term roads based on neighborhood and village councils in Khar Urban Center. The total length of proposed primary, secondary, and local roads is 13.28km, 3.09km, and 6.02km respectively.

Table 5-3: NC/VC Wise Proposed Roads in Khar Urban Centre

Phase Wise Intervention	Neighborhood/ Village Council	Primary Road (km)	Secondary Road (km)	Proposed Local Road (km)
Short-Term	NC – Mir Ali Qilla	15.06	5.37	7.00
	NC – Sadiq Abad	12.99	3.88	6.79
	NC – Wali Ahad Korona	7.13	1.97	2.51
Medium-Term	VC – Ali Jan	2.03	1.51	4.43
	VC – Tangkhata	1.35	6.22	3.90
Long-Term	VC – Sheikh Killi	2.05		
	NC – Inayat Killi	13.28	3.09	6.02
Total Proposed Road Lengths		**54.31**	**22.33**	**30.64**

The proposed road network in Khar Urban Centre is strategically categorized based on width to serve varying purposes:

1. **Primary Roads** (80–100 feet): These wide roads form the backbone of the transportation system, accommodating high traffic volumes and ensuring city-wide connectivity.

2. **Industrial Estate Roads** (100, 80, 60 feet): Designed to support industrial activities, these roads provide access to industrial estates and facilitate heavy vehicle movement.

3. **Secondary Roads** (60 feet): These roads link neighborhoods to primary roads, ensuring efficient movement within the urban center.

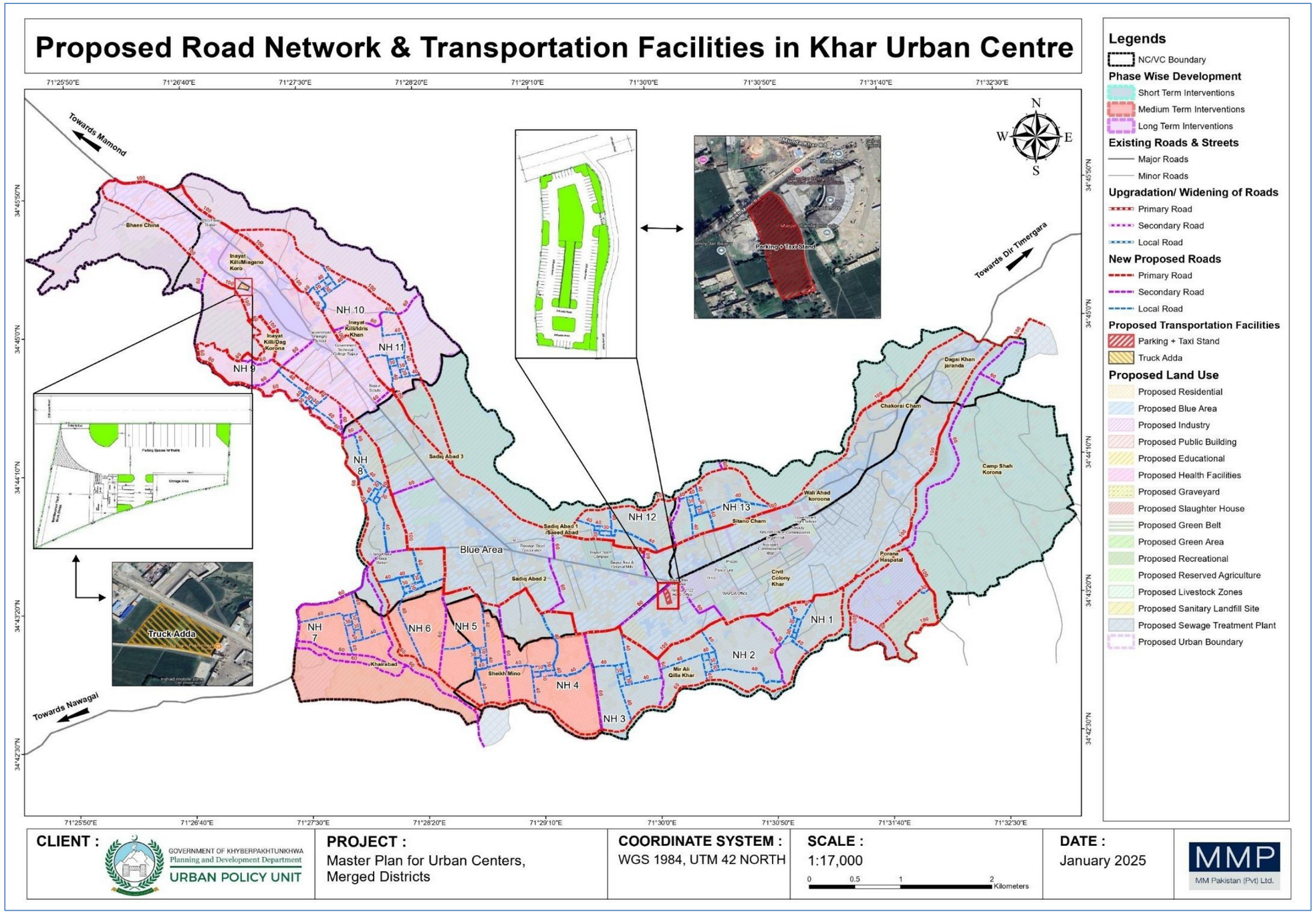
4. **Local Roads** (30–40 feet): Narrower roads intended for neighborhood-level connectivity, promoting accessibility within residential areas.

5. **Water Body Buffer Roads** (60 feet): These roads are planned along water bodies, offering better access and protecting buffer zones.

This road categorization balances regional accessibility, industrial needs, and local connectivity, ensuring a comprehensive and well-integrated transportation system.

Table 5-4: Proposed Right of Ways of Road Network in Khar Urban Center

Road Category	**Width (ft)**
Primary Roads	80' - 100'
Industrial Estate Roads	100, 80, 60
Secondary Roads	60
Local Roads	30 & 40
Water Body Buffer Road	60
Primary Roads	80' - 100'
Industrial Estate Roads	100, 80, 60



Map 5-28: Proposed Road Hierarchy & Transportation Facilit

5.13 Disaster Risk Reduction & Emergency Planning

The Disaster Risk Reduction (DRR) proposals for Khar Urban Center aim to strengthen the community's resilience to various hazards while improving safety, health, and environmental sustainability. These proposals focus on proactive measures and collaborations between key departments to mitigate risks and ensure a rapid and effective response in emergencies.

5.13.1.1 Disaster Risk Reduction (DRR) Proposals for Khar Urban Center

1. **Reconstruction and Rehabilitation of Unsafe Buildings**

- Address 65 dangerous and 967 poorly maintained buildings in Khar. This involves assessing building integrity, enforcing safety codes, and rehabilitating or demolishing unsafe structures to reduce health and safety risks.

2. **Installation of Sewage Treatment Plants**

- Install two sewage treatment plants on the east and southern sides of Khar to improve wastewater management, prevent contamination, and reduce health risks associated with waterborne diseases, especially during floods or heavy rainfall.

3. **Mitigating Risks from Mining Operations**

- Modernize mining equipment and introduce safety measures to reduce environmental and health hazards in Bajaur's mining zones. This includes regular health monitoring for miners and ensuring safer working conditions.

4. **Expansion of Rescue-1122 Station**

- Expand the Rescue-1122 station in Khar Urban Center by acquiring an additional 0.4-acre plot, increasing response capacity to handle emergencies more effectively with more equipment and personnel.

5. **Provision of Fire Hydrants**

- Installation of fire hydrants in high-risk commercial areas of Khar to improve fire safety and preparedness in densely populated regions.

6. **Establishment of Early Warning System (EWS)**

- Set up a community-based Early Warning System using local networks and volunteers to monitor and relay disaster warnings (like floods or landslides) via text messages, loudspeakers, or social media.

7. **Drought and Famine Mitigation**

- Establish local seed banks at the neighborhood and village council levels to preserve drought-resistant seed varieties, ensuring food security during droughts or famines.

5.14 Environmental Protection & Sustainability

Summary of Environmental Quality Results
Environmental testing samples of air water, and soil conducted in Khar Urban Center yielded the following results:

5.14.1 Air Quality:

- The levels of Nitrogen Oxides (NO, NO2, and NOx) were well within the National Environmental Quality Standards (NEQS).
- Sulfur Dioxide (SO2) was also compliant with NEQS limits.
- Carbon Monoxide (CO) levels across all monitoring sites were within permissible limits.
- Particulate Matter (PM10, PM2.5, and SPM) at all sites complied with NEQS standards.
- Lead Airborne Particles and Ozone levels were also well below NEQS limits.

5.14.2 Noise Levels:

- Hourly noise monitoring at ten locations showed that all sites complied with commercial noise standards during both day and night.

This indicates that, overall, Khar's air and noise quality meet national standards, showcasing positive environmental conditions but also highlighting the need for continuous monitoring to ensure sustainability.

5.14.3 Drinking Water and Waste Water Sample

- Samples were collected from the pre-designated / selected sites for analysis of the drinking and wastewater. As stated earlier, the sample sites were selected carefully and in due consultation with the client.
- A total of six samples were collected one each from the whole project area. Drinking water samples were collected from the main drinking water sources of Khar urban center, while the wastewater sample was collected from the final discharge points.
- As discussed in the methodology section, High density sterilized methods are used for the sampling and preservation of drinking and wastewater. The following standard methods were used for the analysis

Water quality data as generated after laboratory testing of drinking water and wastewater sample revealed that except for the COD and BOD, all other parameters tested, are in compliance with the National Environmental Quality Standards (NEQS) for liquid effluents and drinking water respectively.

The COD is 310 mg/l in Inayat Kali and 280 mg/l in Khar Bazar, while the NEQS is 150 for the same. Similarly, the BOD is 154.5 mg/l in Inayat Kali and 142.5 mg/l in Khar Bazar, which is in excess of the NEQS, i-e, 80 mg/l.

5.14.3.1 Proposals for Environmental Protection and Sustainability

Based on these findings, the following proposals have been made to enhance sustainability and protect Khar's environment:

1. **Sustainable Urban Development**:
   The city will adopt the **Linear Dynapolis model**, which promotes walkability and reduces dependence on vehicles, helping to minimize carbon emissions and traffic congestion.
2. **Efficient Land Use**:
   The Master Plan allocates 30.6% of land for agriculture and reserves space for livestock and poultry farming, ensuring food security and preserving green spaces while balancing urbanization.
3. **Compact and Accessible Neighborhoods**:
   Self-sufficient neighborhoods will be developed to enhance the quality of life. Essential services like schools, healthcare, parks, and transportation will be accessible within walking distance, reducing the need for long commutes and lowering environmental impact.
4. **Monitoring Population Growth and Resource Use**:
   The Master Plan will align infrastructure development with projected population growth, ensuring responsible resource use and preventing environmental degradation due to overburdening.
5. **Proposed Green Zones and Neighborhood Parks:** The Master Plan includes designated green zones and 13 neighborhood parks, enhancing biodiversity, air quality, and providing recreational spaces for residents.

The Master Plan for Khar Urban Center prioritizes environmental sustainability by promoting walkable neighborhoods that reduce reliance on vehicles, thus cutting down carbon emissions and traffic congestion. It also emphasizes efficient water and sanitation systems, improving public health and reducing environmental contamination. Disaster Risk Reduction (DRR) measures are integrated to enhance resilience against natural hazards, ensuring community safety. The plan also focuses on safety and security, with well-designed infrastructure and emergency response systems. By reserving protected agricultural zones, the plan supports food security and the preservation of green spaces, while recreational areas like parks contribute to the quality of life. These initiatives collectively foster a sustainable, resilient, and livable urban environment, balancing development with environmental protection.

5.14.3.2 Contribution to Sustainable Development Goals

The proposals for Khar's Master Plan contribute to several United Nations Sustainable Development Goals (SDGs):

1. **Sustainable Urban Development**:
   - **SDG 11 (Sustainable Cities and Communities)**: Promotes walkability, reduces vehicle dependence, cuts emissions, improves air quality, and decreases traffic congestion.
2. **Efficient Land Use**:
   - **SDG 2 (Zero Hunger)**: Zones reserved for agriculture and livestock farming to support food security and a resilient food supply.
   - **SDG 15 (Life on Land)**: Preserved green spaces and balances urban development to protect terrestrial ecosystems.
3. **Compact and Accessible Neighborhoods**:
   - **SDG 11 (Sustainable Cities and Communities)**: self-sufficient neighborhoods with easy access to services, promoting equitable urban living.
   - **SDG 3 (Good Health and Well-Being)**: Accessible healthcare and recreational facilities improve public health and encourage physical activity.
4. **Monitoring Population Growth and Resource Use**:
   - **SDG 12 (Responsible Consumption and Production)**: Aligns infrastructure with population growth to promote responsible resource use and prevent over-exploitation.
   - **SDG 13 (Climate Action)**: Ensures sustainable development by avoiding environmental overburdening.

5. **Green Zones and Neighborhood Parks**:
    - **SDG 13 (Climate Action)**: Contributes to climate resilience through carbon sequestration and enhanced biodiversity.
    - **SDG 15 (Life on Land)**: Supports biodiversity and ecosystem services.
    - **SDG 11 (Sustainable Cities and Communities)**: Improves livability and fosters a sense of community.

Additional contributions:

- **SDG 6 (Clean Water and Sanitation)**: Efficient water and sanitation systems improve public health and reduce environmental contamination.
- **SDG 11 (Sustainable Cities and Communities)**: Disaster Risk Reduction measures enhance resilience and safety against natural hazards.

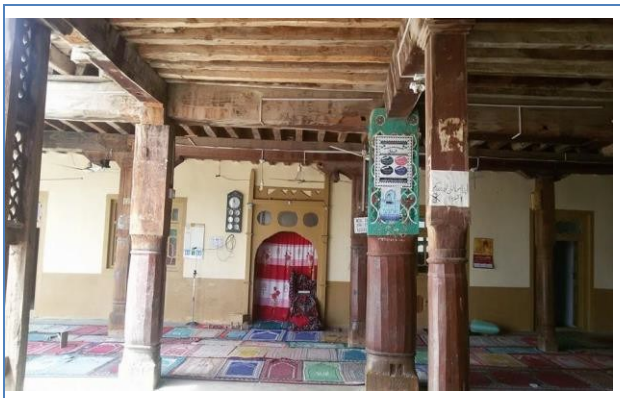
These proposals collectively foster sustainability, resilience, and a high quality of life in Khar.

5.15 Tourism & Heritage Development

Bajaur holds a unique significance due to its geopolitical location, bordering Afghanistan's Kunar province. This strategic position has not only shaped the district's historical narrative but also positioned it as a pivotal point for both Pakistan and the wider region. The administrative structure is an embodiment of the governance system that has evolved over time in this area. The district's headquarters in Khar in the coming years as a hub of commerce and administration will play a vital role in shaping the community's identity and direction.

Bajaur's cultural identity is largely intertwined with its inhabitants comprising of different tribes. Within this overarching identity, several sub-tribes like Utman Khel, Khel, Tarkalanri, Mamund (Kakazai, Wur, and Salarzai), and a small Safi population contribute to the intricate mosaic of local cultures. The distribution of these tribes across different parts of Bajaur, such as the Utman Khel in the southeast, Mamund in the southwest, and Tarkani in the north, highlights the nuanced geographic dispersion of cultural practices. Pashto language, spoken in varying dialects across the district, encapsulates the linguistic diversity that has evolved over generations. This linguistic variance reflects not only geographical distinctions but also the unique historical interactions and influences that have shaped communication patterns.

In the face of development, it is of paramount importance to safeguard this cultural heritage. The predominantly agrarian economy of the merged districts, including Bajaur, underscores the strong connection between the community and its natural surroundings. The practices rooted in agriculture and livestock, which have been sustained over time, are emblematic of a lifestyle deeply embedded in the local culture.



Inhabitant of Bajaur. C. 1835. Illustrations by Imam Bakhsh Lahori for the memoirs of General Claude-Auguste Court (French general of Ranjit Singh).

Table 5-5: Proposed Phase-Wise Development of Tangible, Intangible Heritage, and Tourism

Sr. No.	Proposed Actions	Proposed Actors	Time Period	Tentative Cost (in million PKRs)
1	Documentation and Inventorying Heritage in KPK: tangible, intangible, natural, living, and documentary in Bajaur District	• Directorate of Archaeology and Museums Government of Khyber Pakhtunkhwa	5 years	10-50
2	Establishing a monitoring and enforcement system	• Directorate of Archaeology and Museums Government of Khyber Pakhtunkhwa • District Administration	Continuous	2-8/year
3	Developing and Promoting Heritage Tourism Renovation of Eidgah Masjid	• Tourism Corporation of Khyber Pakhtunkhwa • Directorate of Archaeology and Museums Government of Khyber Pakhtunkhwa • District Administration	5 Years	10-50
4	Developing a Small-Scale History and Heritage Museum or an Interpretation Centre, Khar Renovation of Navy Dand Site	• Directorate of Archaeology and Museums Government of Khyber Pakhtunkhwa • Local Communities	5-10 Years	50-100
5	Bajaur Heritage Festival	• District Administration • Local Communities • Private Partners (CSR)	Annual	10-25/Year

Sr. No.	Proposed Actions	Proposed Actors	Time Period	Tentative Cost (in million PKRs)
6	Tribal/Pashtun Film Festival	• District Administration • Local Communities • Private Partners (CSR)	Annual	10-25/Year
7	Bajaur Literary Festival	• District Administration • Local Communities • Private Partners (CSR)	Annual	10-25/Year
8	Capacity Gap Analysis of the Tourism Department and Development of Tourism Policy (It shall be carried out by an expert, third party, in consultation with the department)	• Tourism Corporation of Khyber Pakhtunkhwa	1 year	10/one time
9	Further Archaeological Explorations in Bajaur	• Directorate of Archaeology and Museums Government of Khyber Pakhtunkhwa	5 years	25/Year
10	Developing Tourist Police	• KPK Ministry of Interior • Tourism Corporation of Khyber Pakhtunkhwa	5-10 years	10-25/Year

5.16 Commercialization, Investment Attraction and Economic Development

The economic development and investment attraction strategy for Khar Urban Centre, as outlined in the Master Plan, focuses on creating a balanced and sustainable growth environment. Key proposals include the establishment of an industrial estate to foster local business growth, alongside a designated central blue area aimed at commercial expansion. The plan also emphasizes the promotion of agriculture and livestock through targeted action plans, encouraging regional prosperity. Furthermore, tourism and regional development initiatives are integral, with suggestions for mining, livestock farming, and the improvement of connectivity through new road infrastructure. These comprehensive proposals aim to stimulate both local and regional economic growth, positioning Khar Urban Centre as a hub for diverse sectors.

Figure 5-3: Economic Development Strategies

5.17 Rural-Urban Fringe & Regional Development

The fringe exists in the agricultural hinterland, where land use is changing, and is characterized in relation to the metropolis. The Rural-Urban Fringe and Regional Development action plan aim to boost the development of the Khar urban center, taking into account settlement distribution in the district and broader regional context. The goal of this action plan is to demonstrate how integrating landscape and environmental resources into the planning system can generate economic, social, and environmental benefits.

The following key interventions have been proposed for rural-urban fringe & regional development.

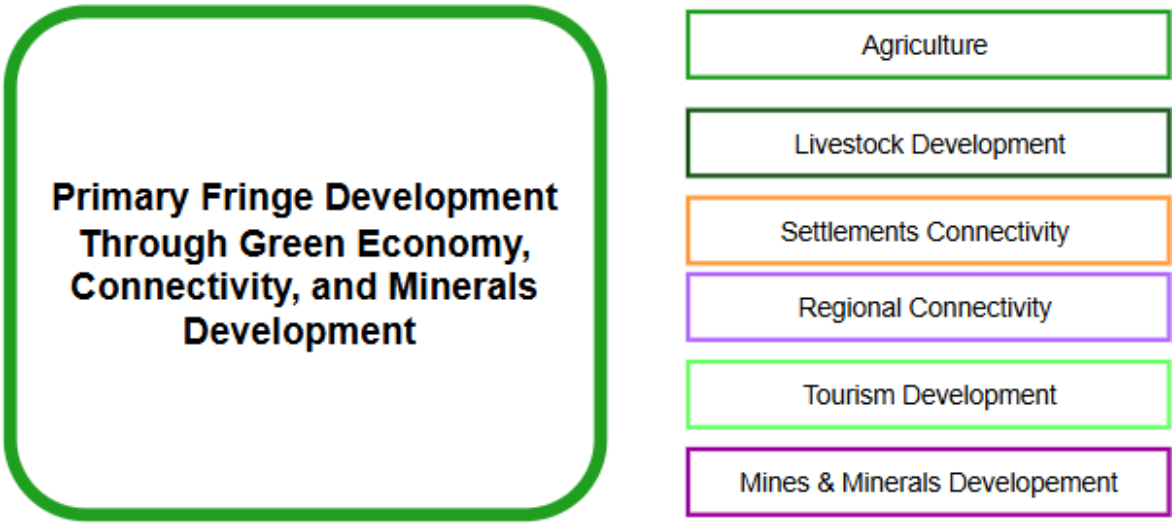
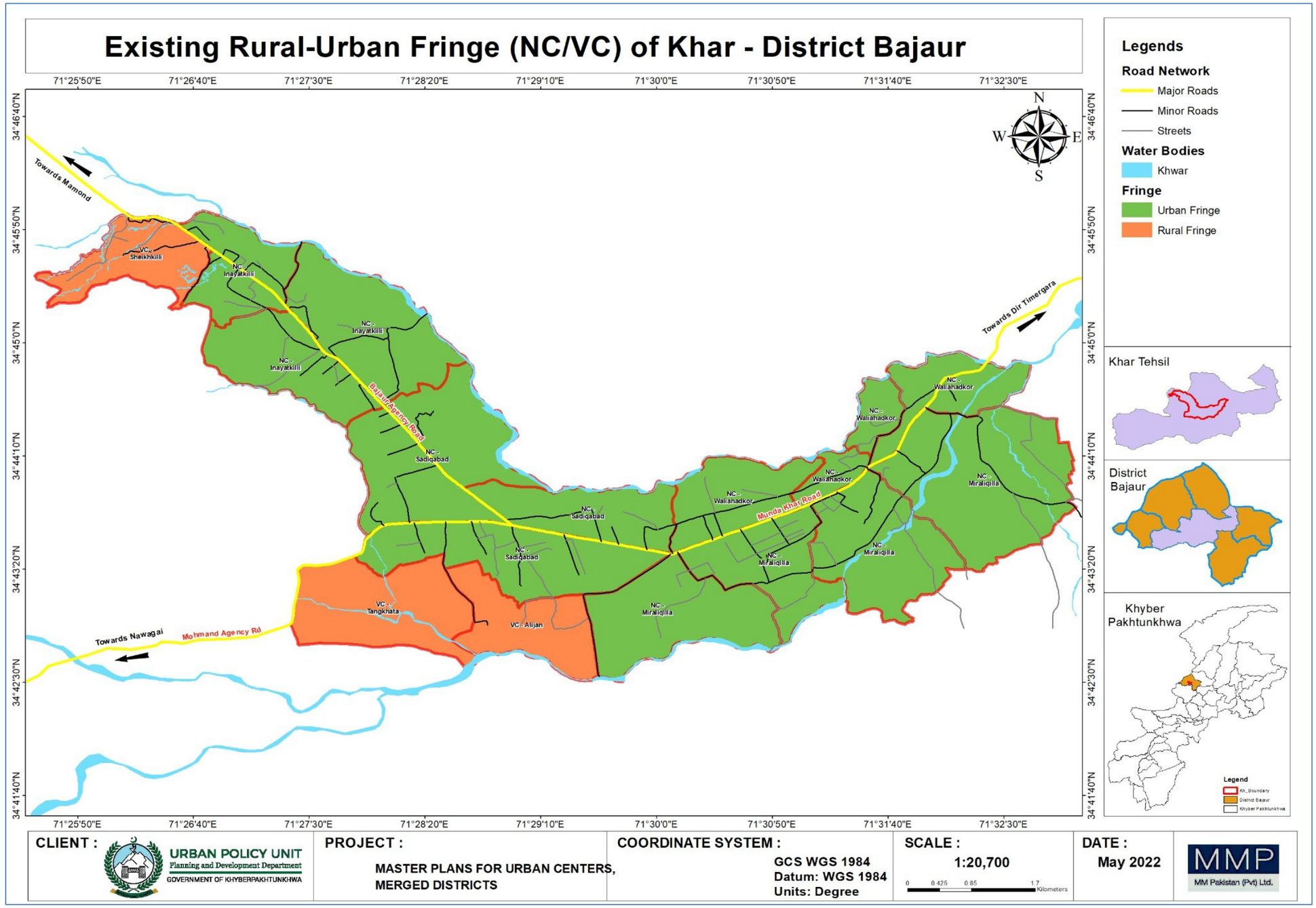


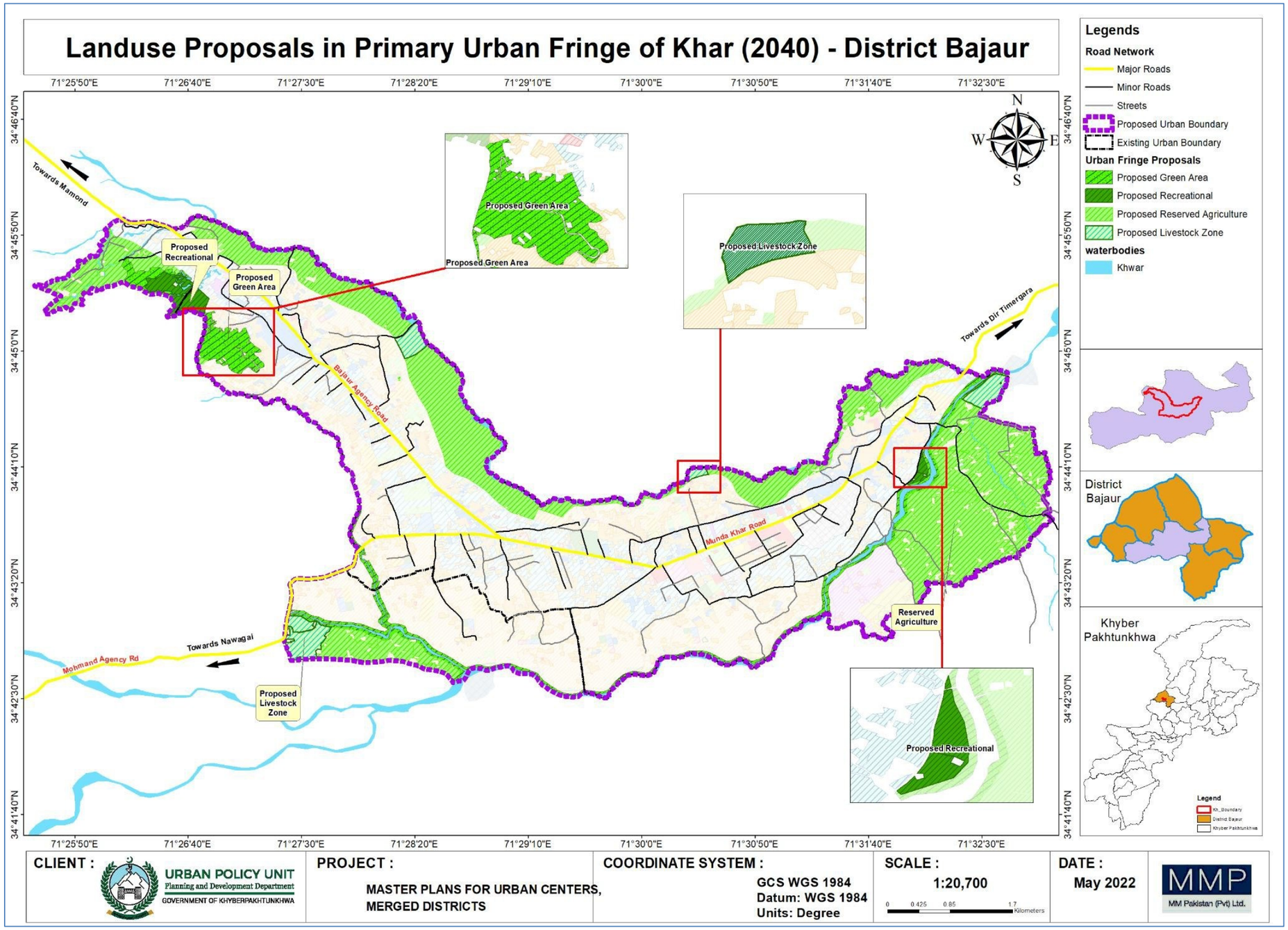
Figure 5-4: Fringe Development through Green Economy & Sustainable Approaches

Khar Urban Centre serves as the administrative headquarter of Bajaur District. Khar Urban Centre is situated in a semi-arid region. Khar Urban Centre has a diverse economy with potential in several sectors such as mining, agriculture, and tourism. The city is divided into four distinct neighborhoods, namely Wali Ahad Korona, Mir Ali Qilla, Sadiq Abad-1, and Inayat Killi/Miagano Koro. Additionally, three neighboring Village Councils, Ali Jan Kalai, Tank Khatta, and Sheikh Kali, exists as indicated in below:

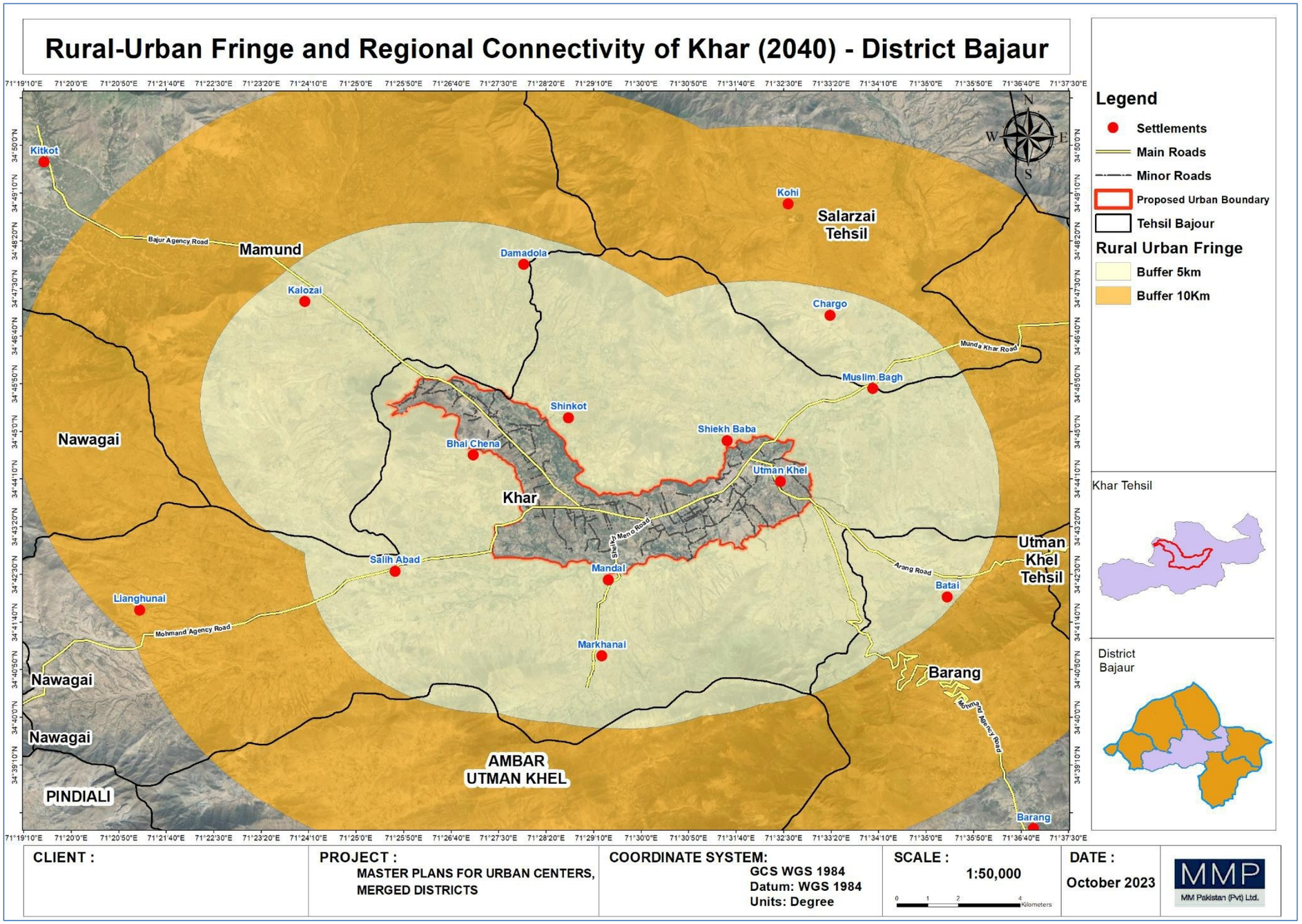
The following key factors have been considered to improve rural-urban fringe development in plan period 2022-2040.



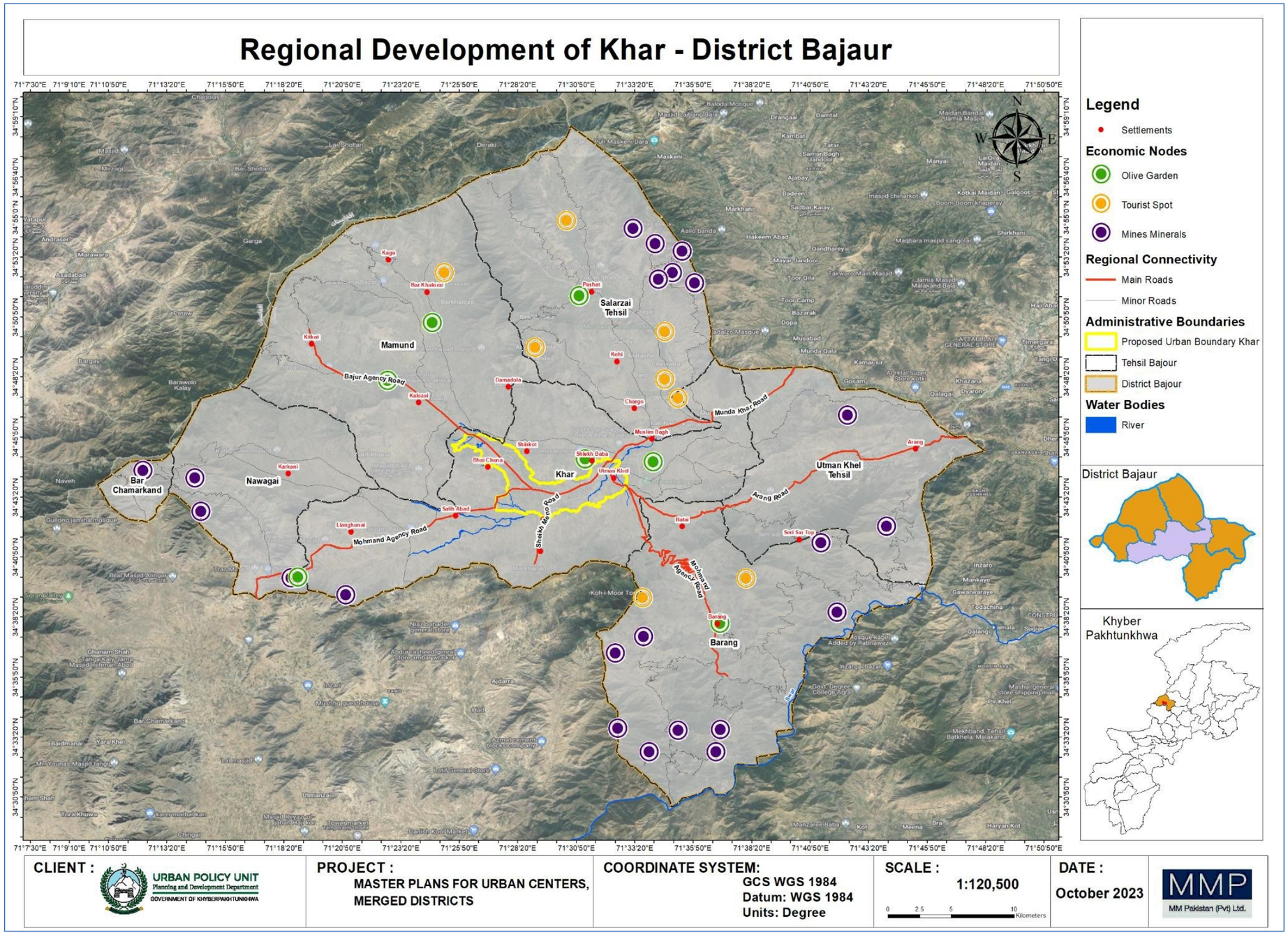
Map 5-29: Existing Rural-Urban Fringe of Khar Urban Centre (NCs & VCs)



Map 5-30: Proposed Rural-Urban Fringe Development



Map 5-31: Proposed Fringes Development & Regional Connectivity



Map 5-32: Regional Development

5.18 Master Plan Implementation Framework

The implementation framework for the Khar Master Plan is a strategic blueprint translating visionary aspirations into actionable reality. In the short term (2023-2025), the focus is on establishing decentralized governance and initiating networked urban projects. Local leaders and municipalities play pivotal roles, adapting to new structures while engaging communities through awareness campaigns. The medium term (2025-2030) sees a scaling-up phase, refining governance frameworks, expanding projects, and embedding community involvement in decision-making. Technological integration becomes more pronounced, enhancing communication and project coordination. The long term (2030-2040) envisions fully integrated decentralized governance, institutionalized networked urban initiatives, and advanced technological adoption. Community empowerment becomes sustainable, with excellence recognized through awards. The synthesis of strategies ensures that decentralized governance, collaborative partnerships, technological integration, and community involvement form an interconnected fabric, driving Khar towards a resilient, inclusive, and tech-driven urban future. This isn't just a procedural guideline; it's a commitment to forging a city that reflects the dreams and needs of its residents, one intentional step at a time.

The implementation framework for the Khar Master Plan aligns seamlessly with the legal underpinnings of the Khyber Pakhtunkhwa (KP) Urban Policy and the Land Use & Building Control Act of 2021. These documents serve as the backbone, providing the legal framework for the proposed organogram that will govern the plan's execution. The organogram, intricately designed, reflects the mandates laid out in the KP Urban Policy and the Act, ensuring a harmonious integration of legal guidelines into the implementation structure. As we embark on this transformative journey, the proposed organogram stands as a testament to our commitment to compliance, governance, and the lawful realization of Khar's urban aspirations. This marriage of visionary planning and legal diligence ensures that every step we take is not just progressive but firmly anchored within the legal parameters set forth by the regional authorities.

5.18.1 Legal Backing of the Master Plan

The preparation of the master plan document will provide a guideline for future development of Khar urban center up to 2040. This document will work as a blueprint for shaping the urban development of the center. The approval of the plan from the public and line department this will be notified by the KP cabinet and it should be legally adopted by the TMA Khar. This will become legal document and anyone violating the plan may be get penalties under the KP Land Use & Building Control Act 2021. The implementation of Master Plan should be made mandatory for all local planning authorities such as Municipal Committee, Khar and the local administration.

5.18.2 Building & Development Control

Detailed building control and development scheme approval byelaws has been prepared in the Land Use & Building Control Act which can be used as a regulatory framework for the building and development control. The TMA should appoint qualified town planners and architects it building and development control section which should receive and applications regarding the development and approve panning permissions according to byelaws and land use and building control act in the proposed master plans. One window operation should be implemented for the ex-FATA urban headquarters like the same also has been practice for the rest of the urban areas and districts. All the approved building plans and development approved documents should be digitally recorded and available for the general public along with the proposed master plan maps for respective urban areas.

The private housing schemes should also be approved with compliance with district land use plan and master plan. The Provincial Land Use & Building Control Authority (PLU & BCA) came under the Land use & Building Control Act 2021 should established Local Enforcement Unit (LEU) at district level for such approvals and a source of revenue generation for the efficient functioning of the authority.

5.18.3 Public Participation and Community Empowerment

A community organization should be initiated by Municipal Committee of Khar to encourage self-help and matching-grants projects through it. Self-help and participatory projects should be introduced to improve the existing areas and to develop new low-income housing schemes. The organization of communities to develop self-help projects will empower them and thus they will be able to get their problems and issues resolved in future. Community based organizations (CBOs) may take up the form of Citizen Community Boards (as proposed in the Devolution Plan for various provinces of Pakistan). Some NGO's may also take up the task of organizing communities and developing self-help housing projects, micro-credit schemes, ladies shopping centers (Meena Bazars), women vocational centers, ladies sewing and embroidery centers and handicrafts center. These projects will empower women and go a long way in empowering women and eradicating poverty in the urban center.

5.18.4 Financing of the Plan Provision

New innovative ways of financing projects such as BOT should be tried in the building of roads, bridges and multistory flats. Private sector may be encouraged to participate in the development of educational and health institutions. Financing arrangements suggested for all proposals in the Master Plan should be followed in letter and spirit. Self-financing projects should be encouraged and incremental development housing projects (such as Khuda-ki-Basti projects) to make the low-income housing projects affordable for the target groups.

5.18.5 Coordination among Line Departments

Proper liaison and coordination should be maintained by the Technical Staff such as Engineers, District Town Planner & District Architect in the Municipal Committee of Khar with various line departments and horizontal and vertical linkages should be established to implement the Master Plan in a coordinated manner. Copies of approved Master Plans should be available with all concerned departments and they should be mandated to follow the Master Plan for all future development projects.

5.18.6 Monitoring and Evaluation of the Plan

There should be a provision of interim evaluation of the Master Plans after every phase. A system of monitoring of the plans should be developed to note down the progress of the implementation of the Master Plan. An evaluation and research cell should be created in the Municipal Committee of Khar to monitor and evaluate the Master Plan regularly.

5.18.7 Continuity in the Planning Process

The Master Planning should be envisaged as a continuous process. It means that a new Master Plan should be prepared after the expiry of the planning period i.e. 20 years and the Master Plan should be revised after every 5 years. The preparation of local plans and area development schemes should continue on a regular basis according to a phase wise Programme. A GIS cell should be established to monitor the activities and plans with proposed master plan and maintain the database. A dashboard

can also be created to make sure all the line departments have access to these data and get help from the GIS cell wherever necessary. An already GIS cell has been created in every DC office at district level which can also be utilized for such purpose.

5.18.8 Phasing and Programming of the Master Plan

The Master Plan for Khar will provide guidelines for the future development of the town during the next 20 years i.e., up to 2035. The proposed development projects will be spread over the following three phases of five year each:

Phase I (Short-Term)

Phase II (Medium Term)

Phase III (Long-Term)

5.18.9 Institutional Framework for Implementation of the Plan

The existing Tehsil Municipal Committee (TMA) in Khar has a very scanty technical staff. There is no Town Planner or Architect working in the municipality. At present the Municipal Committee of Khar is headed by an Administrator under whom there is a Tehsil Officer Regulations, Tehsil Office Infrastructure (TOI) while Tehsil Municipal Officer (TMO) has an additional charge and currently dealing with Khar and Khar urban center. An Accountant and some supporting staff such as clerks, personal assistants also work in the municipality office. The current functions of the Municipal Committee include approval of building plans, maintenance of land record, street lighting, solid waste management, street upgrading, and maintenance of drainage system in the town. However, the building approval and such activities are not enforced till now but TMA has plan to create awareness amongst the pubic regarding building plan approval. A small portion of the city has a sewerage system particularly in civil colony There is a need to create a establish Local Enforcement Unit in the District which should be made responsible for the development of detailed local plans and enforce the building bye-laws in future development.

As the Khar is a small urban center and a limited number of technical staff can manage and enforce the prior building and development control in the future. For the building and development control and maintenance of the planned areas. Qualified Town Planners, Architects and Engineers should be employed to prepare and implement the provisions of the Master Plan. The following implementation framework in the figure 4 below has been proposed for the Municipal Committee Khar:

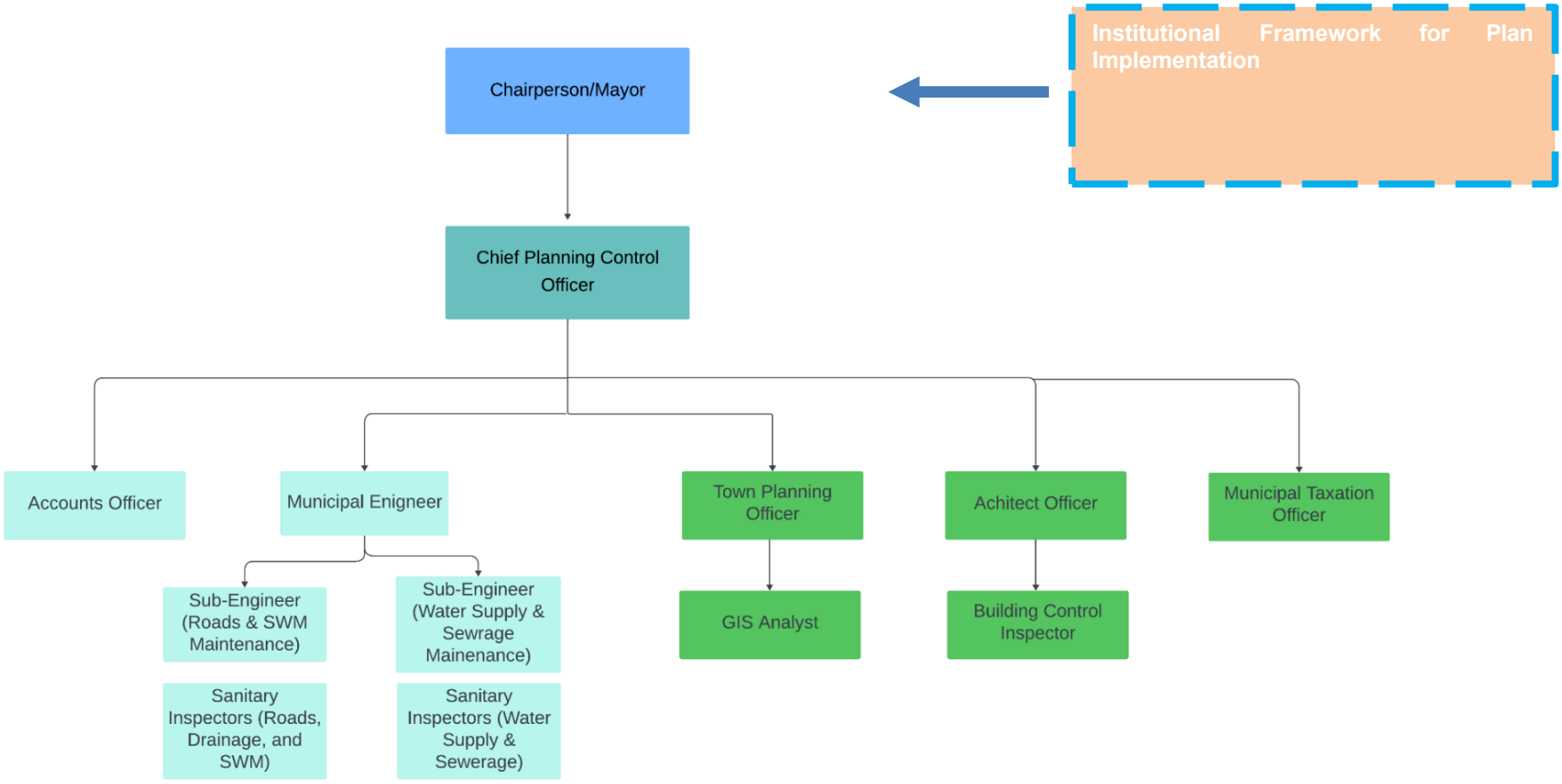


Figure 5-5: Implementation Framework

5.19 Zoning Plan and Regulations

The Zoning Plan and Regulations for Khar Urban Center establish a robust framework for guiding the city's planned growth and sustainable development. These regulations are essential for promoting the efficient use of land, ensuring equitable access to resources, and fostering an organized and harmonious urban environment. By defining permissible land uses and specifying development controls for each zone, the plan provides a clear roadmap for managing urban expansion and integrating it with the city's strategic objectives. This approach not only addresses the current needs of the community but also anticipates future demands, creating a resilient urban center capable of adapting to social, economic, and environmental changes.

The zoning plan divides the urban center into distinct zones, such as residential, commercial, industrial, institutional, and recreational, each designed to serve specific purposes while minimizing land-use conflicts. Each zone has tailored regulations that define allowable activities, building densities, setback requirements, and infrastructure needs, ensuring that development is functional, efficient, and sustainable. For instance, residential zones focus on providing safe, accessible, and affordable housing options for diverse income groups, while commercial zones are strategically located to enhance economic activity and provide investment opportunities. Similarly, industrial zones are planned to promote economic growth while mitigating environmental impacts, and recreational zones prioritize green spaces and public amenities to enhance the quality of life.

The regulations also integrate sector-specific guidelines and standards derived from the National Reference Manual and relevant policies in areas such as health, housing, transportation, environmental management, and economic development. These guidelines ensure that urban development aligns with broader policy objectives, such as reducing urban sprawl, enhancing connectivity, protecting natural resources, and fostering social inclusion. For example, transportation guidelines focus on developing a well-connected network of roads, public transit, and pedestrian pathways, while environmental regulations prioritize the preservation of natural habitats, waste management, and the use of renewable energy.

Moreover, the zoning plan emphasizes public welfare by ensuring compliance with safety standards and building codes while fostering equitable access to critical resources like healthcare, education, and employment opportunities. By incorporating public-private partnerships and encouraging local investments, the plan facilitates the development of self-sustaining neighborhoods and economic hubs that contribute to the city's long-term resilience and growth.

In conclusion, the Zoning Plan and Regulations for Khar Urban Center serve as a vital instrument for shaping the city's future. By balancing the demands of urbanization with sustainability and inclusivity, the plan aims to create a well-organized, livable, and economically vibrant urban center. It provides a comprehensive vision for a city that supports the needs of its residents today while laying the foundation for future generations to thrive.

5.19.1 Land Use & Zoning Regulations

S

- “Accessory building” means a building which is subordinate to the principal building, and is incidental to the use of the principal building on the same lot.
- “Actual land use" means the existing land use both in the planned areas and non-planned areas
  within the local area of a local government.
- "Agricultural area" means the land, outside the peri-urban area, which is predominantly used for the cultivation of crops and includes cropland, pastureland, orchards, nurseries, poultry farms, fish farms and dairy farms and the areas earmarked in the district land use plan or master plan;
- "Agro-based industry" means an industry for pickles, spices, honey, rice mill, flour mill, sugar mill, citrus processing and polishing unit, fruits or vegetable pulping and juicing units, cotton and ginning mill, distillery unit, jute mill, dairy, poultry, meat, bamboo and timber products manufacturing units, fodder or poultry feed manufacturing unit;
- “Appellate Tribunal” means the appellate forum, to be established under sub-section (1) of section 41 of this Act;
- "Approved scheme" means a scheme approved by the Government, a local government or any other public authority;
- “Authority” means the Provincial Land-Use and Building Control Authority, established under section 6 of the Khyber Pakhtunkhwa Act no.XXXII of 2021;
- "Betterment fee" means the fee levied by a local government under the Act.
- "building" means any structure for a shop, house, hut, out-house, shed, stable or enclosure built of any material and used for any purpose, and also includes a well, wall, verandah, platform, plinth, ramp, staircase and steps.
- "Building byelaws" mean the building byelaws of a local government.
- "Building line" means the line under or beyond which the outer face of a building may not be projected in the direction of an existing or proposed road except the compound wall.
- "Built up area" means an area established in a non-planned area.
- “Chairperson” means the Chairperson of the Council;
- "Commercial area" means an area designated for commercial use as per approved scheme or master plan or is being used as such in the non-planned area.
- "Commercial corridor" means a road or a segment of a road, with not less than sixty feet right of way and specified depth of area, which has been designated as commercial by a competent authority.
- "Commercial uses" means the use of land or buildings for the purpose of retail merchandising, provision of services and small-scale processing;
- "Competent authority" means the concerned local government to approve land use plan, classification, reclassification, development and redevelopment in a local area.

- " Condominium complex " means a multi-storey mixed-use building having residential apartments with maximum 20% floor area for commercial use, offices, recreational area, place of worship, gym and play area;
- “convener” means the convener of the District Land-Use Planning and Management Committee;
- "conversion" means the change of existing land use to any other land use as per classification under the rules;
- “Cottage industry" means an industry which is carried on wholly or primarily with the help of the members of the family as a whole time or part time occupation.
- “Council” means the Provincial Land-Use and Building Control Council, constituted under section 3 of the Khyber Pakhtunkhwa Act no. XXXII of 2021;
- "department" means the Local Government and Community Development Department;
- "Educational institution" includes a school, college, university, research or training center, academy or Information Technology center, library or a madrassa recognized as such by any law for the time being in force;
- "Environmentally sensitive area" means an area that has been designated as such under Regulation 22 of the Pakistan Environmental Protection Agency (Review of Initial Environmental Examination and Environmental Impact Assessment) Regulations 2000;
- "Existing planned areas" means areas developed under approved land use classifications in an approved scheme;
- "Form" means the forms appended to the rules;
- "Government" - means ' the Government of the Khyber Pakhtunkhwa;
- "Hazardous use means a use that poses threat to public health or the environment and is more explicitly stated to include substances that are explosive, flammable, toxic, infectious, and other such uses as deemed fit by the Authority;
- "Healthcare institution includes a hospital, health center, dispensary,' clinic, polyclinic, clinical laboratory, medical training -center, nursing home, dental center, homeopathic or acupuncture center, recognized as such by any Law for the time being in force;
- "Historically significant area" means an area designated under any law for the time being in force as historically, architecturally • or archeologically significant area;
- “Institutional use" means land use which is predominantly connected with education, health, public or private office, hotel, theatre or auditorium, including public assembly institutions in terms of building and zoning bye-laws of the local government;
- "Intercity service area" means an area designated by the competent authority as service area along the main connecting roads.
- "Land use plan" means a plan for optimum use of land, in any region, to serve as a guide in zoning to meet the needs of the community and approved by the competent forum;
- "Local government" means a Galiyat Development Authority constituted under the Act:
- “Master plan" means the traditional method for presenting a set of land usage, allocation and control measures in the form of a map or in graphical form and is supported by written

statement of goals and objectives, strategy, financial implications and policies for planning and development for an area and includes a structure plan, an outline development plan, a spatial plan, peri-urban structure plan and a metropolitan plan approved by the competent forum;

- “member” means a member of the Council;
- "non-conforming use" means the land use that does not conform to the permitted or permissible land use but it is existing at site;
- “non-hazardous use" means all other uses except hazardous uses;
- "non-planned area" means an area of the local government other than the planned area;
- "Notified area" means an area in which special restrictions regarding its development or redevelopment have been imposed under any law for the time being in force;
- "Open space" includes park, golf course and theme park;
- "Other restricted area" means an area in which the Federal Government, the Government, a local government or any other public body has imposed certain building or area development restrictions;
- “Peri urban area” means an area that spans the landscape between contiguous urban development and rural countryside with low population density and is predominantly being used for agricultural activity and is likely to be urbanized in the next twenty years as demarcated in district land use plan or master plan;
- "Planned area" means an area of the local government with defined land uses as per approved schemes or master plan or Outline Development Plan;
- "Planning Officer" means head of planning wing of the local government;
- “prescribed” means prescribed by rules and regulations;
- "Project area" means an area selected by the competent authority to prepare a land use reclassification scheme;
- "Proposed land use" means the land use other than the land use explicitly indicated in the land use plan for future development of the local area;
- “province” means the Province of Khyber Pakhtunkhwa;
- "Public sector institutional area" means an area reserved for the Federal Government, the Government, a local government or any other public body;
- "redevelopment" means renewal, reconstruction or upgradation of infrastructure and buildings in an area;
- “regulation” means regulations made under this Act;
- "Residential area" means an area which is designated for residential use in accordance with an approved scheme or master plan or is being used as residential in non-planned areas;
- "Residential use" means land use which is predominantly connected with housing;
- "Restricted area" means an area in which the Federal Government, the Government, a local government or any other public body has imposed certain building or area development restrictions;

- "Ribbon development" means existing unplanned and horizontal development along the roads of a local area of the local government;
- "Right of way (ROW)" means the width of road or street between two opposite properties;
- “rules” mean rules made under the Khyber Pakhtunkhwa Act no. XXXII of 2021;
- "Set back area" means an area to be surrendered for road widening;
- "Site development zone" means an area within the planned or non-planned area of a local government with proposed land uses and notified by the competent authority for the future development of the local area;
- “sub-type” means a sub-type, as laid down in land use regulations made under section 52 of the Khyber Pakhtunkhwa Act no. XXXII of 2021;
- “Unauthorized land use” means land use otherwise than in accordance with a land use permission or without a land use permission where required;
- “Urban design” means the relationship between different buildings, buildings and streets, squares, parks and waterways and other spaces, which make up the public domain, the nature and quality of the public domain itself, the relationship of one part of a village, town or city with other parts and the patterns of movement and activity which are thereby established in short, the complex relationships between all the elements of built and un built space; and
- “Valuation table" means a valuation table notified under the Stamp Act 1899 (II of 1899).

A word or term, used but not defined in the rules, shall have the same meaning as assigned to it in the Act.

Land use classes:

A local government shall, within six months from the commencement of the rules, classify its local area into the following land use classes indicating actual land use in both planned area and non-planned area:

A. Residential Area
B. Commercial Area (Institutional Area)
C. Industrial Area
D. Agricultural Area
E. Notified Area (Including Forest Area)

The land use in each land use class shall be as under:

- **Permitted use:** The land use, which is allowed in each land use class under the rules.
- **Permissible use:** The planning and design committee subject to the payment of the fee may allow the land use that are not permitted.
- **Prohibited use:** The land use, which is neither permitted nor permissible.

Zoning and Land Use Regulatory

Table 5-6: Zoning and Land use Regulations

Land use	Permitted use	Permissible use	Prohibited use
Residential Area (Neighborhood)	• Detached house • Semi-detached house • Town house; • Residential apartment building; • neighborhood level park and playground; • .place of worship or prayer • Old age home or orphanage • Place of burial or graveyard • Horticultural nursery • Urban farm • Urban forest; and • Non-commercial renewable energy installation.	• Place of worship or prayer or mosque; • Daycare center or preschool; • Primary and junior school; • Secondary school and higher secondary school; • Dispensary with two bed which may include indoor pharmacy; • Hospital; • Library; • Indoor sports facilities; • Community center • Post office, fire station, rescue and emergency services office; • hostel; • Guest house having not more than ten rooms;	• Land uses that are neither permitted nor permissible.
Commercial Area (Blue Area)	• Residential apartment; • Multi storey building; • Condominium complex; • Commercial plaza; • Shopping mall, departmental store; • Business facility; • Private office; • Government or semi-government office; • Court or tribunal; • Mixed use building; • Shops and group of shops; • Coaching center or academy for educational purpose and extra-curricular activities such martial-arts, school or health club; • Cultural institution such as park, memorial and monument; • Hotel or Motel; • Car showroom; • Boutique or garment outlets or beauty parlor;	• Technical and vocational institution • Theater, auditorium, concert hall or exhibition hall or cultural institution • Seasonal commercial fare site • Stadium, amusement park & play land • Petrol pump or gas or LPG or LNG station • Loading and unloading requirements of all uses; • Weighbridge; • Service industry without nuisance; • Second hand goods market • Private hospital; • Television or other studio; • Auto workshop, service garage and service station; • Wholesale market; • Storage place, cold storage and warehouse; • Printing press; • Coal, wood or timber yard;	• Land uses that are neither permitted nor permissible.

- Hospital;
- Clinic or polyclinic;
- Marriage, banquet hall, marquee;
- Athletic club, gymnasium, fitness center or indoor facility;
- Day-care center or pre-school
- Research and development centers or library;
- Primary and junior school;
- Secondary and higher secondary school;
- Educational and research institution (College);
- Educational and research institution (University);
- Electric vehicle charging station
- Bakery or confectionary;
- Hostel or guest house or lodging house;
- Courier service or logistic office;
- Private telephone exchange or cable operation or mobile franchise offices;
- Restaurant;
- Social welfare institution such as community center, art gallery and museum
- Parking plaza or parking site;
- Taxi or rickshaw stand and bus halt;
- Police station, post office and fire station, rescue and emergency services offices; and
- Place of worship or prayer.
- Base trans receiver station or communication tower; and
- Renewable energy installations or projects

Industrial Area	• Cottage, light and medium industry, heavy or large industry; • Vertical green industry; • Construction equipment; • Warehouse, storage or distribution center; • Building material store; • Cold storage and ice factory; • Petrochemicals, petroleum and gas products storage or gowdown; • Industrial Park or estate; • Police station, Fire station and post office • Automatic Teller Machine (ATM); • Industrial research institute; • Treatment or recycling plant • Grid station • Power plant; • Loading and unloading place • Weighbridge • Industrial units except for which special permission is required under any law, rules or policy • Industrial -products display center, fair price shop and showroom; and • Renewable energy installations or projects • Ancillary office or place for industry • Auto workshop, service garage and service station • Essential residential, commercial or educational facility for laborers or employees • Base trans-receiver station or communication tower	• Petrol pump, gas station, LPG or LNG storage or filling station • Essential residential, commercial, health and educational facility for workers or employees • Oil Depot • Restaurant • Hospital • Auto workshop, service garage and service station • Incineration plant • Storing, packing, pursing, cleaning, preparing, and manufacturing of blasting powder, ammunition, fireworks, gun powder, Sulphur, mercury, gases, nitro-compounds, phosphorous, dynamite • Storing explosives, petrol, oil, lubricants, and other inflammable materials including coal, chemicals, liquids or otherwise cleaning dying, preparing and manufacturing of cloth or yarn in indigo or other color • Storing, processing, cleaning, crushing, melting, preparing or manufacturing and dealing in bombs, tallow, offal, fat blood, soap, raw or dry hide or skin, washing or dying wool or hair • Casting of heavy metals, electro plating, welding, marble cutting and polishing, manufacturing of cement or pipes, burning or grinding of lime stone, metal or use of any other obnoxious or hazardous material • Effluent treatment or recycling plant;	• Land uses that are neither permitted nor permissible.

	• Loading and unloading place • Construction equipment's • Parking lot; • Water purification plant; • Green or urban forest area • Vocational and technical training institute • Medium or heavy industry including manufacturing, production, processing, cleaning, servicing and repair of materials, goods or products	• Industrial units for which special permission is required under any law, rules or policy; and • place of worship	
Mixed Used	• Educational and research institution (college); • Educational and research institution (university); • Secondary and higher secondary schools; • Library; • Language centre; • Religious institution; • Park, memorial, monument or play ground; • Government or semi-government office; • Social welfare institution such as community centre, art gallery, • Museum and auditorium; • Local and zonal municipal office; • Police station, fire station or post office; • Hospital; • Veterinary hospital; • Clinical laboratory; • Shelter home; • Pannahgahh; • Convention centre; • Private office; • Day-care centre or pre-school;	• Hotel or Motel • Guest house • Restaurant • Athletic club, gymnasium, fitness centre or indoor sport facility • Banks or Automated Teller Machine (ATM) • Cinema • Petrol pump, gas station, LPG or LNG storage or filling station • Departmental store • Taxi or bus stand • Amusement Park or Play land • Hostel • Research and development centres • Residential apartment • Marriage, banquet hall or Marquees • Area Development Project	• Land uses that are neither permitted nor permissible.

	• Old-age home or orphanage; and • Urban forest area.		
Open Space and Recreational Zone	• Bird sanctuary; • botanical garden; • Park, memorial, monument or play ground; • Forest; • Orchard; • Picnic hut; • Plant nursery; • Place of worship; • Joy land or play land; • Farm; • Recreational club or resort; • Shooting range; • Swimming pool; • Library; and • Zoological garden.	-	-
Agricultural & Livestock Zone	• Crop; • Orchard; • Pasture land; • Livestock rearing such as dairy, poultry or fish farm; • Forest; • Nursery or a green house, horticulture; • Tube well; • Existing rural settlement or village; • House within and contiguous to rural settlement; • Farm house within the boundaries of farm • Place of worship or prayer; • Place of burial or cremation • Agricultural machinery workshop • Basic health unit; • Public or private recreational park • Corner shop • Warehouse	• Agricultural machinery workshop • Brick kiln, milk chilling and Pasteurization; • Animal husbandry clinic; • Country club; • Community facility or public utility • Bus terminal or truck stand • Fruit and vegetation market • Grain market; • Cattle market; • Rice mills and flour mills; • Recreational club or resort or country club; • Shooting range; • Swimming pool; • Library; • Cold storage; • Zoological garden • Agricultural or livestock research institute; • Park, memorial, monument, playground, gymnasium or sports complex; • Picnic Hut • Oil depot; • Power plant; • Water filtration plant;	• Land uses that are neither permitted nor permissible.

	• Waste treatment plant or dumping sites in deserted areas • Basic health unit • Clinic or hospital; • Veterinary dispensary or hospital; • Incineration plant in deserted areas • Bird sanctuary • Botanical or zoological garden • Factory outlet or products marketing center; • Zoo or Wildlife Park; • Base trans-receiver station or communication tower • Petrol pump or gas station or LPG or LNG storage and filling station.

5.19.2 Land Use of Notified Area

A local government may declare a historically significant area, environmentally sensitive area (Forest Area), public sector institutional area, other restricted area or an intercity service area as notified area after clearance from District Planning and Design Committee.

A local government shall ensure that the following land use provisions under permitted, permissible and prohibited uses are strictly followed as per land use plan in following notified area.

1. **Historically Significant Area**

   a. **Permitted use**: A local government shall ensure that land use permitted in a historically significant area is in accordance with any special or general law and the conditions provided in the notification governing the historically significant area.

   b. **Permissible use:** A local government, subject to rule, may grant any of the permissible uses in a historically significant area which is in accordance with any special or general law and the conditions provided in the notification governing the historically significant area.

   c. **Prohibited use:** A local government shall not allow a person to use a property in a historically significant area for a purpose which is neither permitted nor permissible.

2. **Environmentally sensitive area**

   a. **Permitted use:** A local government shall ensure that permitted land use in an environmentally sensitive area is in accordance with special or general law and any special conditions applicable in the environmentally sensitive area.

b. **Permissible use:** A local government may, subject to rule, grant any of the permissible use in an environmentally sensitive area subject to any special or general law.

c. **Prohibited use:** A local government shall ensure that no person is allowed to use a property in an environmentally sensitive area for a purpose which is neither permitted nor permissible.

3. Public Sector Institutional Area

a. **Permitted use:** A competent authority shall ensure that permitted land use in a public sector institutional area is in accordance with any special general law.

b. **Permissible use:** a competent authority may grant permission for any of the following uses:

i. Public office including a Federal Government, Government, local government office or an office of any other public body
ii. Official residence;
iii. Public sector educational institution;
iv. Public sector religious institution or place of worship;
v. Public sector mess or club;
vi. Public sector healthcare institution;
vii. Diplomatic premises;
viii. Jail or prison;
ix. Public sector television station or studio and
x. Any ancillary use

c. **Prohibited use:** A local government shall not allow a person to use a property in a public sector institutional area for a purpose which is neither permitted nor permissible.

4. Other Restricted Area:

a. **Permitted use:** local government shall ensure that land use permitted in any other restricted area is in accordance with any special or general law and the conditions provided in the notification governing the restricted area.

b. **Permissible use:** A local government, subject to rule 11, may grant any of the permissible uses in any other restricted area is in accordance with any special or general law and the conditions provided in the notification governing the restricted area.

c. **Prohibited use:** A local government shall not allow a person to use a property in any other restricted area for a purpose which is neither permitted nor permissible.

5. Intercity service area:

a. **Permitted use:** The competent authority may grant permission for any of the following uses;

i. Commercial Use
ii. Residential Use and
iii. Ancillary Use

b. **Permissible Use:** The competent authority may grant permission for any of the following uses;

i. petrol pump or gas station or LPG or LNG storage and filling station
ii. train, bus or truck terminal;
iii. and unloading place;
iv. service station or workshop; and
v. weighbridge

C. **Prohibited use:** The competent authority shall not allow a person to use a property in an intercity service area for a purpose which is neither permitted nor permissible.

5.20 Existing and Proposed Land Use for Khar Urban Centre 2024-42

The proposed land use assessment for the Linear Dynapolis model in the Khar Urban Centre is based on population projections and standards for the provision of necessary infrastructure for the city. The model is applied to guide the city's existing and future development as planned growth. The layout of the city is designed based on the concept of self-sufficient neighborhoods, where the provision is made to provide basic facilities such as schools, healthcare, transportation, and parks within proximity to the residents. This approach aims to improve the quality of life for residents by making essential services and amenities easily accessible. The model also promotes sustainable urban development by creating compact and efficient neighborhoods that reduce the need for transportation and conserve natural resources.

The proposed facilities and land requirement is shown in the table below.

Table 5-7: Proposed Land Use of Khar Urban Centre

Sr. No	Land Use		Area (Acre)
1	Proposed	Proposed Residential	1039.69
2		Proposed Mixed-Use	976.99
3		Proposed Commercial	39.93
4		Proposed Industry	119.09
5		Proposed Public Building	24.65
6		Proposed Educational	148.23
7		Proposed Health Facilities	13.65
8		Proposed Graveyard	14.69
9		Proposed Slaughter House	1.41
10		Proposed Green Belt	2.53
11		Proposed Green Area	251.71
12		Propose d Recreational	88.80
13		Proposed Reserved Agriculture	1572.69
14		Proposed Livestock Zone	109.45
15		Proposed SWM	53.71
16		Proposed Roads	417.65
Proposed Land Use Total Area			**4875**
1	Existing	Residential	1020
2		Commercial	293
3		Industrial	24
4		Public Building	62
5		Educational	44
6		Health	16
7		Religious Building	20
8		Graveyard	35

9		Recreational	15
10		Streets/Roads	292
11		Restricted	123
12		Water Bodies	164
		Existing Land Use Total Area	2106
		Grand Total	6981
		Proposed STP-1 (Outside Project Boundary)	30
		Proposed STP-2 (Outside Project Boundary)	30

According to the 1985 National Reference Manual (NRM) standards, cities should allocate a specific percentage of their total area for different purposes based on their population. For Khar Urban Centre, with a projected population of 259,562 by 2040, the residential area should be between 26% to 48%, while the commercial area should be between 0.5% to 2%. The industrial area should account for 3% to 8% of the total city area, and recreational facilities should be between 1% to 7%. The graveyard area should be allocated between 0.5% to 4%, and the institutional area should be between 2% to 10%. The table below provides a comparison of land use between the NRM standards and the current situation in Khar Urban Centre. This standard allocation of land for different purposes can help ensure the sustainable development of the city, catering to the needs of its growing population while also preserving its natural and cultural resources.

Table 5-8: Comparison of Khar Land Use Plan with NRM Standard

NRM Comparison				
Proposed Land Uses	**Area (Acre)**	**Percentage**	**NRM Standards**	
Residential	2,059	29%	Residential	26-48%
Commercial	1,309	19%	Commercial	0.5-2%
Industrial	143	2%	Industrial	3-8%
Public Buildings	107	5%	Institutional	2-10%
Civic Services	55			
Educational	193			
Health	29			
Restricted Area	123	2%	-	-
Recreational	103	1%	Recreational	1-7%
Graveyard	50	1%	Graveyard	0.5-4%
Transportation	709	10%	Transportation	12-29%
Built-Up Area	4,881	70%	-	-
Agriculture	1,573	30%	Agriculture	3-17%
Livestock	109			
Water Bodies	164			
Green Belts	3			
Green Area	252			
Non-Built-Up Area	2,100	30%	-	-
Total Area	**6,981**	**100%**	**-**	**-**

5.20.1 Proposed Land Uses in Khar Urban Centre

The proposed Master Plan for Khar Urban Centre includes a comprehensive land use plan which identifies the major land use categories and their respective areas. The plan aims to reserve 30.6% of the total area for agriculture, while 2.2% of the area is reserved for livestock, poultry farms, and fish farms. The present Khar Main Bazar and Inayat Kali commercial area are proposed to be located in the Blue Area, which will cover 21.4% of the total area.

The proposed residential area of Khar Urban Centre has been divided into 13 different neighborhoods, each designated as NH (Neighborhood) followed by a number from 1 to 13. The proposed residential area under various neighborhoods is 880.3 acres, which is 18.1% of the total city area. NH 4 has the highest residential area of 153.7 acres, followed by NH 2 with 111.4 acres, and NH 5 with 101.9 acres. The lowest size of the residential area has been proposed for NH 12 i.e. 42.5 acres.

The proposed residential areas have been designed to provide comfortable living spaces for the city's current and future population. The NH areas are located strategically to ensure ease of access to commercial, educational, health, and recreational facilities. The plan also proposes a mix of housing types, including single-family homes, apartments, and townhouses, to cater to the needs of different income groups and lifestyles.

The proposed residential areas are expected to enhance the quality of life for Khar Urban Centre residents by providing them with safe, comfortable, and sustainable housing options.

Furthermore, the plan includes provisions for various educational institutions such as degree colleges for boys, high schools for boys and girls, and vocational training facilities for girls. The proposed land use plan reserves 0.6% of the total area for commercial activities in NH Blue, while the recreational facilities will cover 1.4% of the total area, with parks and playgrounds.

The plan proposes to extend the existing graveyard area by 0.1% and allocate an additional 0.2% of land for graveyards in each neighborhood. The plan also identifies areas for urban forestation, managed forest, and green belts, which will cover 3% and 2.1% of the total area, respectively.

The plan includes provisions for public buildings and facilities such as parking and taxi stands, post offices, sewage treatment plants, slaughterhouses, solid waste management sites, and truck adds. The proposed plan reserves 9.2% of the total area for primary, secondary, and tertiary roads.

Overall, the proposed Master Plan for Khar Urban Centre covers a total area of 4,875 acres and is designed to allocate land use categories based on the NRM 1985 standards. The plan aims to maintain a balance between residential, commercial, recreational, and other land use categories while taking into account the needs of the current and future population of the city.

The details of the proposed land use in Khar Urban Centre have been shown in the table below;

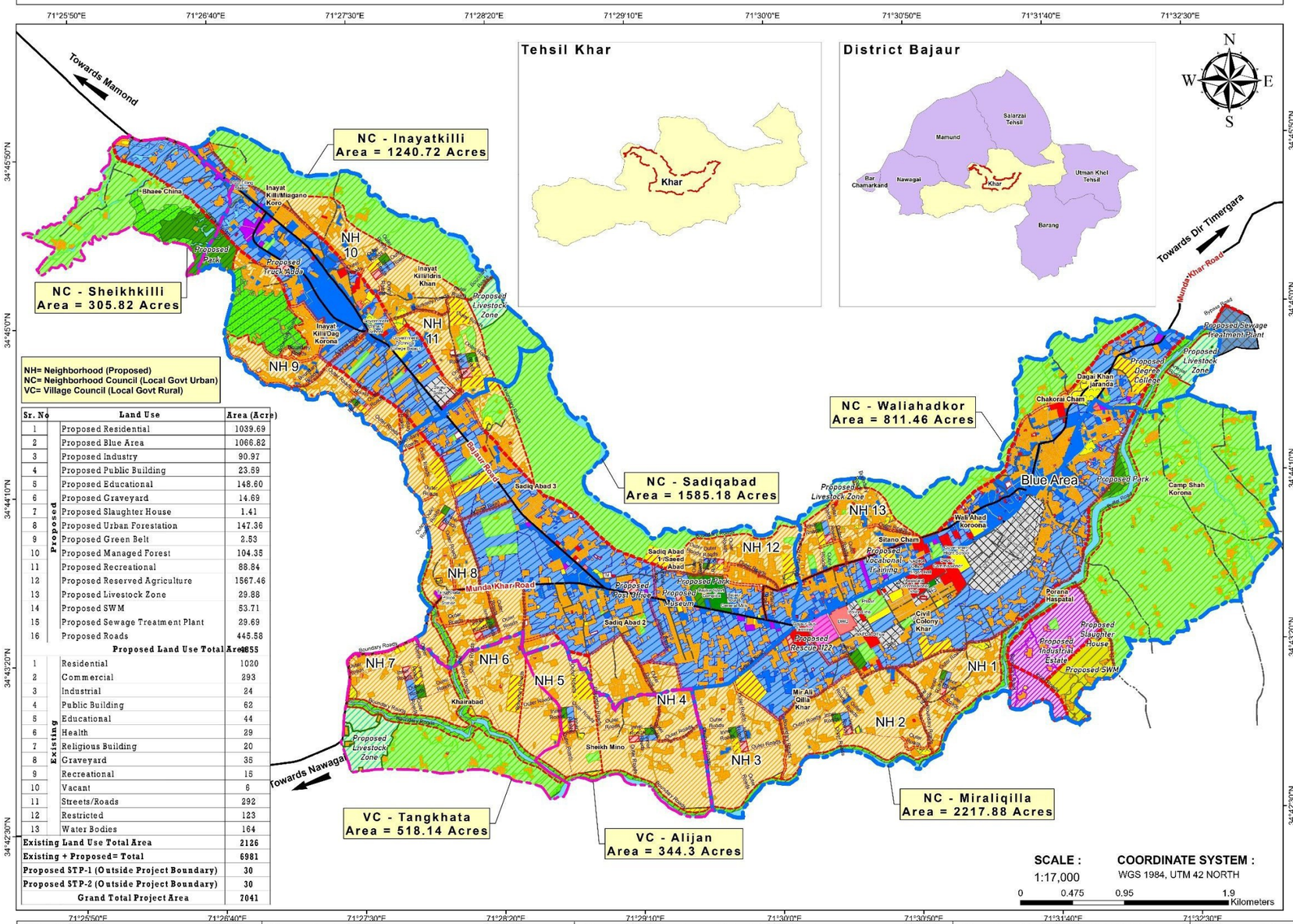
Table 5-9: Details of Proposed Land Uses of Khar Urban Centre

Sr. No	Major Land use	Proposed Class	Category	Area	Percentage
1	Agriculture	Reserved Agriculture	Urban Agriculture	1,488	30.5
		Permanent Agriculture	Orchards	85	1.7
		Livestock Zones	Livestock, Poultry farm, Fish farm	109	2.2

Sr. No	Major Land use	Proposed Class	Category	Area	Percentage
2	Central Business District	Blue Area	Administrative, civic, and commercial uses	987	20.3
3	Commercial	NH Blue	Retail Shops	30	0.6
4	Educational	Degree College	Boys	17	0.4
		HS + HSS	Boys	53	1.1
			Girls	45	0.9
		NH Yellow	--	30	0.6
		Vocational Training	Girls	4	0.1
5	Health	Hospital	Extension	14	0.3
6	Graveyard	--	Extension	4	0.1
			Proposed	11	0.2
7	Industry	Industrial Estate	--	119	2.4
8	Proposed Green Area	Urban Forest	--	252	5.2
	Proposed Green Belt	Green Belt	Buffer	3	0.1
9	Public Building/Facility	NH Red	Public Buildings	17	0.3
		Transportation	Parking + Taxi Stand	2	0.0
		Post Offices	Pakistan Post	3	0.1
		Rescue 1122	Extension	0	0.0
		Museum	Proposed	1	0.0
		Slaughter House	Proposed	2	0.0
		SWM	Dumping Site	54	1.1
		Bus Terminal	Extension	0	0.0
		Truck Adda	Proposed	1	0.0
10	Recreation	Passive Recreation	Parks	67	1.4
		Active Recreation	Playgrounds	4	0.1
11	Recreational	NH Green		18	0.4
12	Residential	NH 1		55	1.1
		NH 2		111	2.3
		NH 3		91	1.9
		NH 4		154	3.2
		NH 5		102	2.1
		NH 6		91	1.9
		NH 7		81	1.7
		NH 8		64	1.3
		NH 9		65	1.3
		NH 10		74	1.5
		NH 11		64	1.3
		NH 12		43	0.9
		NH 13		46	0.9
13	Proposed Road	Primary, Secondary, and tertiary Roads		418	8.6
Grand Total				**4,875**	**100.0**
14	Sanitation	Sewage Treatment Plant-1		30	--
		Sewage Treatment Plant-2		30	--

The population projection is used to determine land requirements, but the existing facilities in the Khar Urban Center should also be taken into consideration to determine what additional facilities are needed for the current and projected population. The details of existing and proposed land uses have been shown in Map 6-30.

Proposed Master Plan of Khar Urban Center - District Bajaur (2024-42)



NH= Neighborhood (Proposed)
NC= Neighborhood Council (Local Govt Urban)
VC= Village Council (Local Govt Rural)

Sr. No		Land Use	Area (Acre)
1	Proposed	Proposed Residential	1039.69
2		Proposed Blue Area	1066.82
3		Proposed Industry	90.97
4		Proposed Public Building	23.89
5		Proposed Educational	148.60
6		Proposed Graveyard	14.69
7		Proposed Slaughter House	1.41
8		Proposed Urban Forestation	147.36
9		Proposed Green Belt	2.53
10		Proposed Managed Forest	104.35
11		Proposed Recreational	88.84
12		Proposed Reserved Agriculture	1567.46
13		Proposed Livestock Zone	29.88
14		Proposed SWM	53.71
15		Proposed Sewage Treatment Plant	29.69
16		Proposed Roads	445.58
		Proposed Land Use Total Area	**4855**
1	Existing	Residential	1020
2		Commercial	293
3		Industrial	24
4		Public Building	62
5		Educational	44
6		Health	29
7		Religious Building	20
8		Graveyard	35
9		Recreational	15
10		Vacant	6
11		Streets/Roads	292
12		Restricted	123
13		Water Bodies	164
Existing Land Use Total Area			**2126**
Existing + Proposed= Total			**6981**
Proposed STP-1 (Outside Project Boundary)			**30**
Proposed STP-2 (Outside Project Boundary)			**30**
Grand Total Project Area			**7041**

Legends

- NC Boundary
- VC Boundary

Proposed New Roads

- Primary Roads (80' - 100')
- Secondary Roads (60')
- Local Roads (30' - 40')
- Upgradation / Widening

Existing Roads & Streets

- Major Roads
- Minor Roads

Proposed Land Use

- Proposed Residential
- Proposed Blue Area
- Proposed Industry
- Proposed Public Building
- Proposed Educational
- Proposed Health Facilities
- Proposed Graveyard
- Proposed Slaughter House
- Proposed Green Belt
- Proposed Green Area
- Proposed Recreational
- Proposed Reserved Agriculture
- Proposed Livestock Zones
- Proposed Sanitary Landfill Site
- Proposed Sewage Treatment Plant

Existing Land Use

- Residential
- Commercial
- Industrial
- Public Building
- Educational
- Health
- Religious Building
- Graveyard
- Restricted
- Recreational
- Streets/Roads
- Water Bodies

SCALE : 1:17,000

COORDINATE SYSTEM : WGS 1984, UTM 42 NORTH

0 0.475 0.95 1.9 Kilometers

Client :	Consultant:	Name and Signature of the Team Leader		Director, Planning (LU & BCA)	Approved By:
GOVERNMENT OF KHYBERPAKHTUNKHWA Planning and Development Department URBAN POLICY UNIT	MMP MM Pakistan (Pvt) Ltd.	NAME : DR. SHABIH UL HASSAN ZAIDI	SIGNATURE:		Landuse & Building Control Council, KPK Dated: June 03, 2024

Map 5-33: Final Master Plan of Khar Urban Centre (2024-2042)

5.21 Conclusion

The Khar master plan is a comprehensive document that outlines a vision for the city's future development by 2040. It is based on an analysis of the city's strengths, weaknesses, opportunities, and threats, and aims to promote economic growth, improve quality of life, and protect the environment.

One of the main goals of the Khar master plan is to support the expansion of commercial and residential areas in the city, to meet the needs of its growing population, and support economic development. The plan proposes the development of 13 self-sufficient neighborhoods and a linear Dynapolis model for commercial development, as well as the expansion of green infrastructure with a focus on preserving natural resources and promoting environmental sustainability. This includes initiatives such as the expansion of managed forest areas, the planting of trees and other vegetation in urban areas, and the preservation of agricultural land. These initiatives will help protect the city's natural environment, improve air quality, reduce greenhouse gas emissions, and promote water conservation.

In addition to supporting the growth of commercial, industrial and residential areas, the Khar master plan also calls for the upgrading and expansion of existing infrastructure and amenities, including roads, public transportation, schools, hospitals, and other facilities, to meet the needs of the city's residents. This will involve the development of a range of initiatives designed to improve the quality of life for city residents, including the creation of new parks and recreational areas, the improvement of public spaces, and the development of cultural and community centers. The details of these public spaces and facilities will be covered in the Action Plans being prepared as Task-D of the Master Plan.

To ensure that the Khar master plan is successful in achieving its goals, it will be necessary to establish a robust implementation strategy that involves all relevant stakeholders. This may include the establishment of a dedicated planning authority or other coordinating body, the development of partnerships with private sector organizations and community groups, and the engagement of the local community in the planning and decision-making process. By adopting a proactive and collaborative approach, it is hoped that the Khar master plan will be able to effectively address the challenges and opportunities facing the city, and contribute to its long-term prosperity and success.

2024