

THIMPHU

*City Core
Action Plan*

THIMPHU City Core Action Plan

2023



RCUD

MoIT



Thimphu
Dzongkhag

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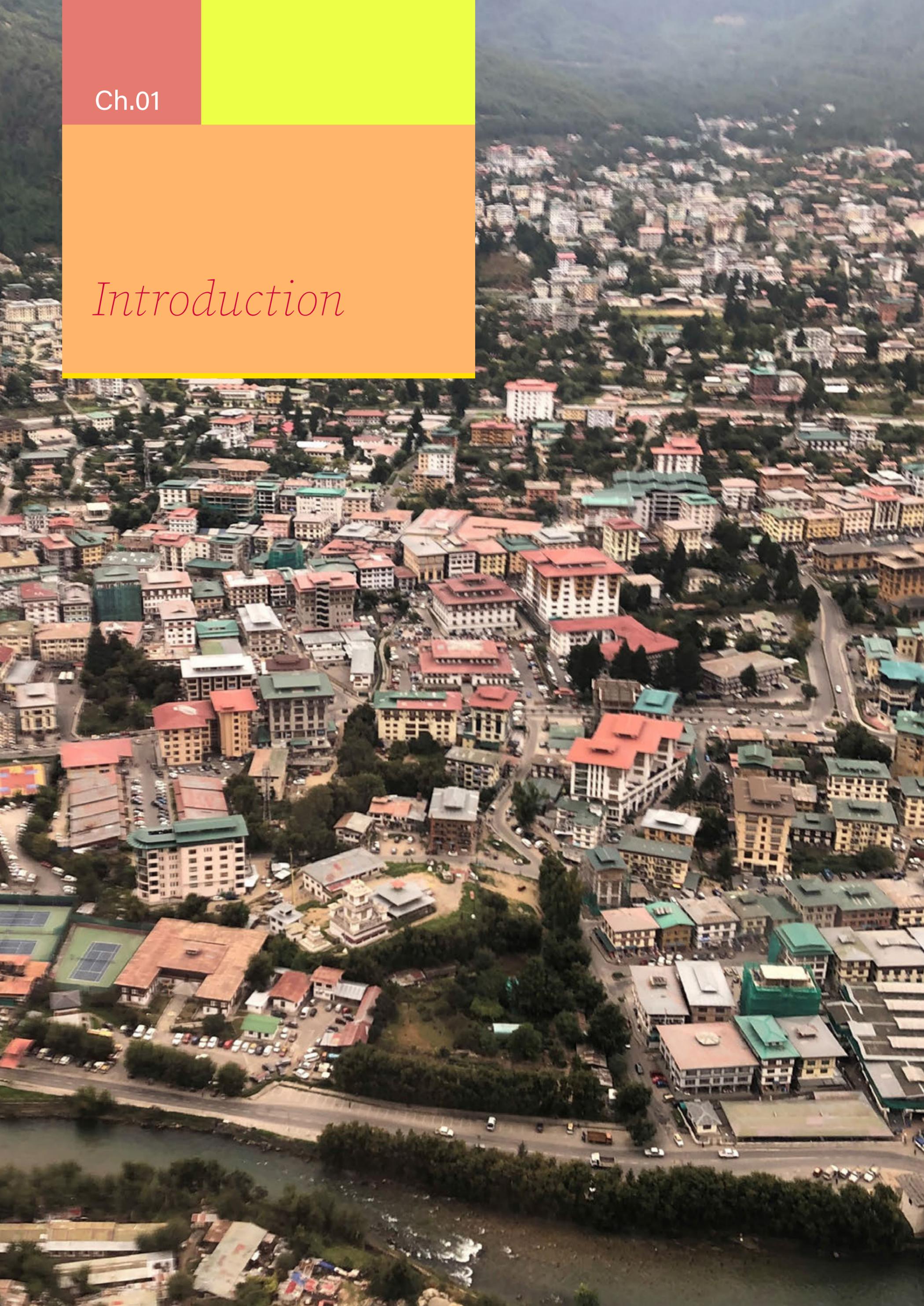
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Introduction



1.1 Introduction

1.1.1 Overview

Thimphu is at a turning point. After two decades of rapid growth and expansion, the City faces significant physical, social, and economic challenges. The Thimphu Structure Plan 2023 (TSP 2023) establishes a long-term vision and spatial framework for the City, to enhance the lives of its existing and future citizens, deliver world-class infrastructure and amenities, and protect important landscapes and heritage assets.

Thimphu's City Core is identified in TSP 2023 as a key place to accommodate 'good growth in the right places.' It is the heart of the capital, where the retail, leisure, culture, knowledge, employment and tourism economies converge and is the focus of daily life for its citizens.

The City Core Action Plan (CCAP), provides additional guidance to deliver future development in alignment with the principles and policies set out in TSP 2023. It establishes the future vision, aspirations, and opportunities for the City Core, and sets out an integrated spatial framework to guide future development and form a basis for dialogue with stakeholders, local communities, businesses and developers.

PURPOSE OF THIS DOCUMENT

The CCAP outlines a vision to transform the City Core and has been developed to inform a future Local Area Plan and other development controls. It has been developed in alignment with TSP 2023, with the goal of informing the strategic policies within TSP 2023, and providing additional detail to support the delivery of the vision as it applies to the City Core.

TSP 2023 is the statutory plan guiding decisions on development and regeneration activity within Thimphu to 2047 and articulates the vision for the city through a regenerative and distributive spatial framework. It sets out a balanced approach towards development and protection areas, and outlines how and where new homes, jobs, services, and infrastructure will be delivered, the natural, cultural and heritage assets that will be protected and the type of places that will be created.

The CCAP provides an overview of what the TSP 2023 vision and policies mean for the City Core, alongside a set of structuring principles, a spatial framework and more specific urban design guidelines for key areas and places. Together these elements will guide and support 'good growth in the right places' and the regeneration of the City Core.

WHO SHOULD USE THE CCAP?



Landowners or public institutions seeking approvals for their development need to demonstrate that proposals understand and comply with:

- The CCAP, its vision, spatial framework and guidance.
- Thimphu City Design Code (to be developed), including specific design requirements and guidance for area types defined by the Structure Plan, which cover typical development, public realm, open space and urban greening design typologies.
- Any other relevant Local Area Plans and/or Action Plans, including more specific neighbourhood level zoning on land use, movement hierarchy, utilities, streets and public realm, heritage conservation and landscape.



Relevant authorities must refer to the CCAP, any further relevant Local Area Plans and/or Action Plans, and the Thimphu City Design Code (to be developed) when assessing and permitting development proposals. Development must demonstrate that it contributes to forming the future vision of the City Core and aligns with the principles and guidelines within.



Public or private investors must refer to CCAP, the TSP 2023 and the Priority Masterplan Projects to understand the vision and the type of uses, design quality, and public realm transformation that are desirable.

1.1.2 The City Core Action Plan

The CCAP is focussed within and around the current City Core neighbourhood. This neighbourhood covers the primary elements of the existing City Core - Norzin Lam and Clock Tower Square, the National Stadium and Centenary Park, the Central Farmers Market (CFM) and the National Memorial Chorten.

Considering the opportunity for growth and intensification that could be accommodated within the City Core, as described in the TSP 2023, the full extent of the urban area covered by this CCAP is expanded beyond the existing City Core neighbourhood.

The CCAP area incorporates large areas to the south of the City Core Neighbourhood, within Changzamtog neighbourhood, including the existing Royal Bhutan Police compound (RBP), as well as areas to the west across Doebum Lam. The CCAP area extends beyond the eastern banks of the Wangchhu, including areas of Yangchenphug to the east, with the intention of drawing the important riparian landscape along the Wangchhu through the heart of a greater City Core.

The CCAP area covers significant numbers of the 'Strategic Sites', which were identified as part of the Thimphu-Paro Regional Strategy and so ensures that the greatest areas of change in the vicinity of the City Core are incorporated, with the aim of expanding and diversifying the activity to properly serve the potential future population within the city.

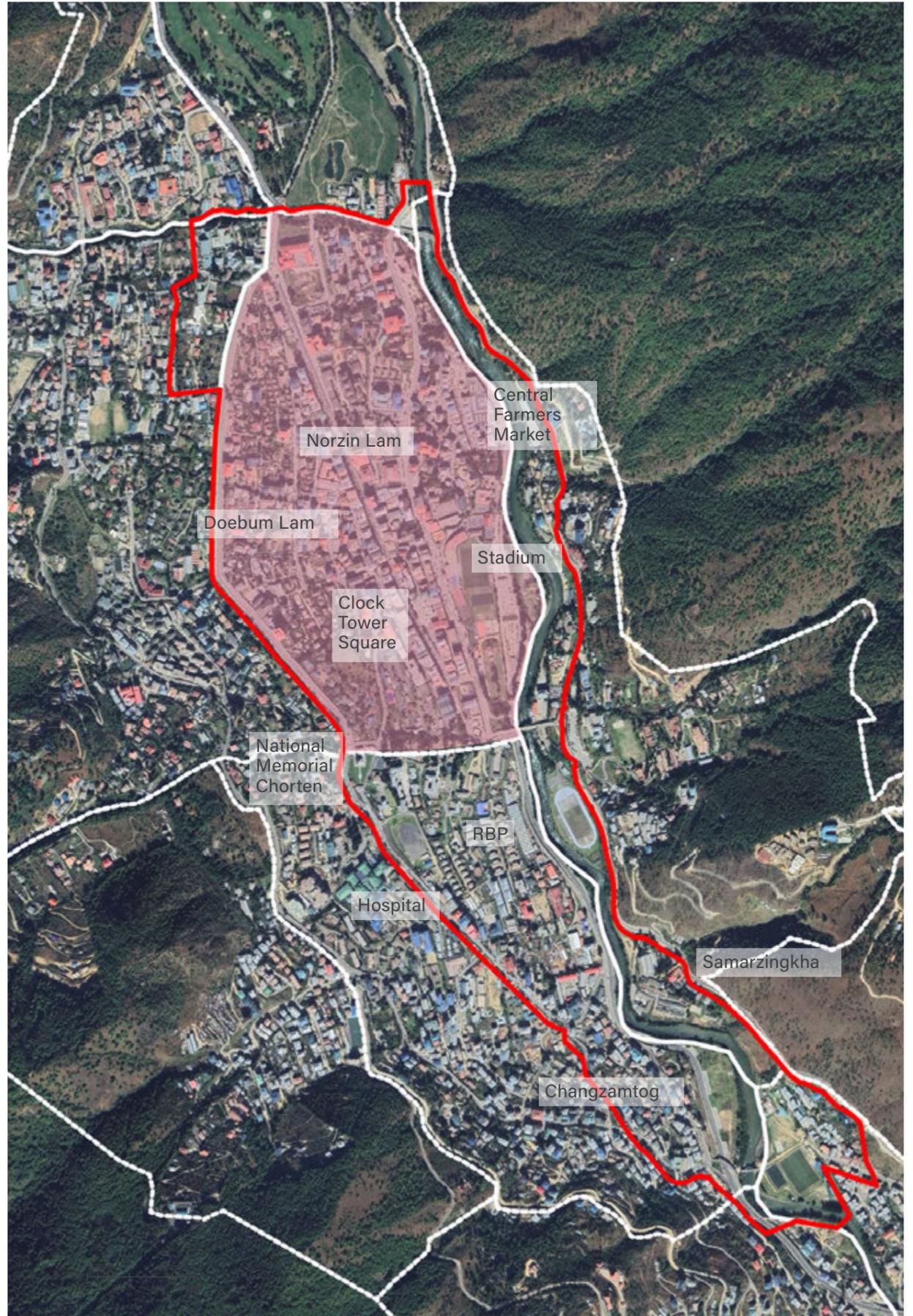


Figure 1.1 The area covered by the CCAP

1.1.3 Why a City Core Action Plan? And why now?

Thimphu is at a turning point after two decades of rapid growth. A new plan is needed to address key socio-economic challenges and provide a flexible framework to guide Thimphu's regeneration.

The Thimphu-Paro Regional Strategy has set a new vision for the city - one of regenerative and distributive principles and both this CCAP and the TSP 2023 have identified the City Core as a place for major transformation and intensification.

TSP 2023 has identified a series of challenges and opportunities that the city faces. Development in the City Core must respond to these challenges.

A DYNAMIC POPULATION

Uncertainty over Thimphu's population size in the short, medium and long term is a key demographic challenge.

Between 2000-2010, Bhutan's urban population growth rate was the highest among the eight South Asian countries, at 5.7 percent per year. Thimphu's population and urban footprint have also grown at a rapid pace over the past two decades through rural to urban migration.

The National Statistics Bureau (NSB) forecasts high urban population growth rates for Thimphu over the next two decades. However, these forecasts do not factor in recent national trends that may result in lower or even negative population growth rates.

The CCAP responds to this challenge by providing a flexible framework for change focussed on regenerating and transforming the existing City Core, while also demonstrating how 'good growth in the right places' and compact city principles can be incorporated in this location. In addition, it demonstrates how the City Core can be extended and intensified to ensure it continues to support the growing population of the city and provide the primary focus for a larger city.

As with the TSP 2023 demographic information underpinning the Plan is based on the Population and Housing Census 2017 (PHCB 2017) and the 2020 Household Survey undertaken during COVID-19 lockdowns. Updated information will be collected through the PHCB 2027 following the Plan adoption.

AN ECONOMY IN TRANSFORMATION

TSP 2023 has identified that un/under employment, high levels of youth unemployment, low participation rates for women and a large informal sector as some of the key economic challenges Thimphu is facing.

The educated and mobile youth enter the jobs market each year seeking meaningful, secure employment. Study and employment opportunities are driving youth emigration outside of Bhutan.

In short, there is a jobs deficit which must be addressed in the short term. A key area to explore in greater detail is to what extent informal jobs may be 'formalised'.

In Thimphu there is an opportunity to increase and consolidate the number of service sector based jobs, whilst specialising in key areas within the agriculture and industrial sectors - in particular the green building economy. There is a need to transform the mix of jobs by sector and build a diverse and balanced employment base.

The City Core has been identified by the TSP 2023 as having the potential to accommodate significant new floorspace for both employment and housing uses, which can be supported by the higher accessibility by public transport, as promoted by the TSP 2023 and the Low Emissions Transport Masterplan Priority Project. In addition, some areas of the City Core can begin their transformation from the beginning of the Plan Period, providing almost immediate growth capacity for jobs and homes.

For more information, please refer to the Thimphu Structure Plan, Part A: Chapter 1



Figure 1.2 Existing City Core

A CITY IN THE HIMALAYA

Thimphu has a unique natural setting, nestled in the Himalaya mountain range. The natural setting and geological history surrounding Thimphu means that it is prone to many different natural hazards.

Thimphu's location in a seismically active region, and its exposure to a variety of hydro-meteorological conditions make the city highly prone to intense and recurring natural hazards such as landslides, flooding, wildfires and ground related hazards. Further hydro-meteorological changes due to climate change are likely to further intensify the frequency and severity of hazard events within the region. A strategy to define 'Restricted Zones' within TSP 2023 aims to initiate the process of reducing the long-term impact of natural hazards, reduce human activities which can increase susceptibility to disasters, and protect people, livelihoods and critical services for communities.

The City Core has been identified as potentially one of the safer areas in the city in terms of geo-hazard, however critical parts of the City Core are located within the Flood Risk Zone. These areas include the National Stadium, Centenary Park and the Central Farmer's Market (CFM) building.

The CCAP has been developed in advance of more detailed assessment of the risks posed by geo-hazards and flood. It is essential that further assessments are carried out for susceptible areas and 'Critical Infrastructure' within the City Core and mitigations are identified and incorporated into proposals that will also align with the development strategies held within this CCAP.

PLANNING FOR THE FUTURE

Deficiencies in the provision of housing, affordable housing, energy and water infrastructure are just some of the most pressing needs of Thimphu's residents.

Thimphu's urban transformation needs to carefully balance future growth and development with the protection of a fragile ecology and environment.

Contemporary ways of building anchored in traditional crafts and contemporary ways of urban living reflecting traditional Bhutanese and Buddhist culture should shape Thimphu's future.

This should be achieved while also protecting Thimphu rich and diverse cultural and heritage assets and providing incentives for landowners to undertake heritage conservation.

The City Core is well placed to demonstrate and 'showcase' these principles so other parts of the city and other urban areas outside of Thimphu can understand the benefits they could provide for urban populations. A new and better Bhutanese way of living in the city can be developed and tested at the City Core.

A REGENERATIVE AND DISTRIBUTIVE THIMPHU

Working collaboratively with the Centre for Bhutan & GNH Studies (CBS) and the Doughnut Economics Action Lab (DEAL), the principles of GNH (Gross National Happiness) are adopted in TSP 2023. There are two key principles through which the TSP 2023 puts Doughnut Economics into practice:

- **Be distributive.** Share opportunity and value with all who co-create it.
- **Be regenerative.** Aim to work with and within the cycles of the living world.

These same principles underpin the CCAP vision, spatial framework and urban design guidelines.

Thimphu should flourish through the regeneration of existing underutilised urban areas in the short to medium term (next 10-20 years). In the longer term (+20 years), controlled growth should occur through Southern Extension, should grow pressures persist.

Thimphu's population growth needs to be supported by a regenerative economy. This should incentivise and structure current and future investment towards more inclusive and distributive practices. Thimphu should grow by ensuring residents have more equitable access to employment opportunities and community facilities.



Figure 1.3 Examples of Regenerative and Distributive principles, from TSP 2023

1.1.4 Planning Reform

TSP 2023 DEVELOPMENT CONTROL

TSP 2023 establishes a reformed framework for development management decisions and procedures based on international best practice policies, regulations and standards, as outlined in Figure 1.4.

The development control structure of TSP 2023 moves away from plot and precinct-level regulation to a more integrated and multi-layered spatial and policy framework approach.

This results in a plan that is more responsive to a sites features and local context. It provides a more flexible framework that can respond to changing demographic, economic, and community needs.

In order to enable this shift the following spatial plan and policy changes are proposed:

- **Introduce a Thimphu Regional Plan** to inform and guide decision making and planning enforcement for areas outside Thimphu Thromde. It is to be developed in due course.
- **Review the Thimphu Structure Plan** to establish an integrated overarching spatial structure supported by policies informing how development should be controlled to achieve desired outcomes.
- **Maintain the current role and content of Local Area Plans**, noting that existing LAPs will need to be reviewed in order to align with TSP 2023 policies and regulations.
- **Establish the Thimphu City Design Code** to provide supplementary spatial plot and public realm guidance to TSP 2023 proposals. The Thimphu City Design Code will replace the DCR 2016.

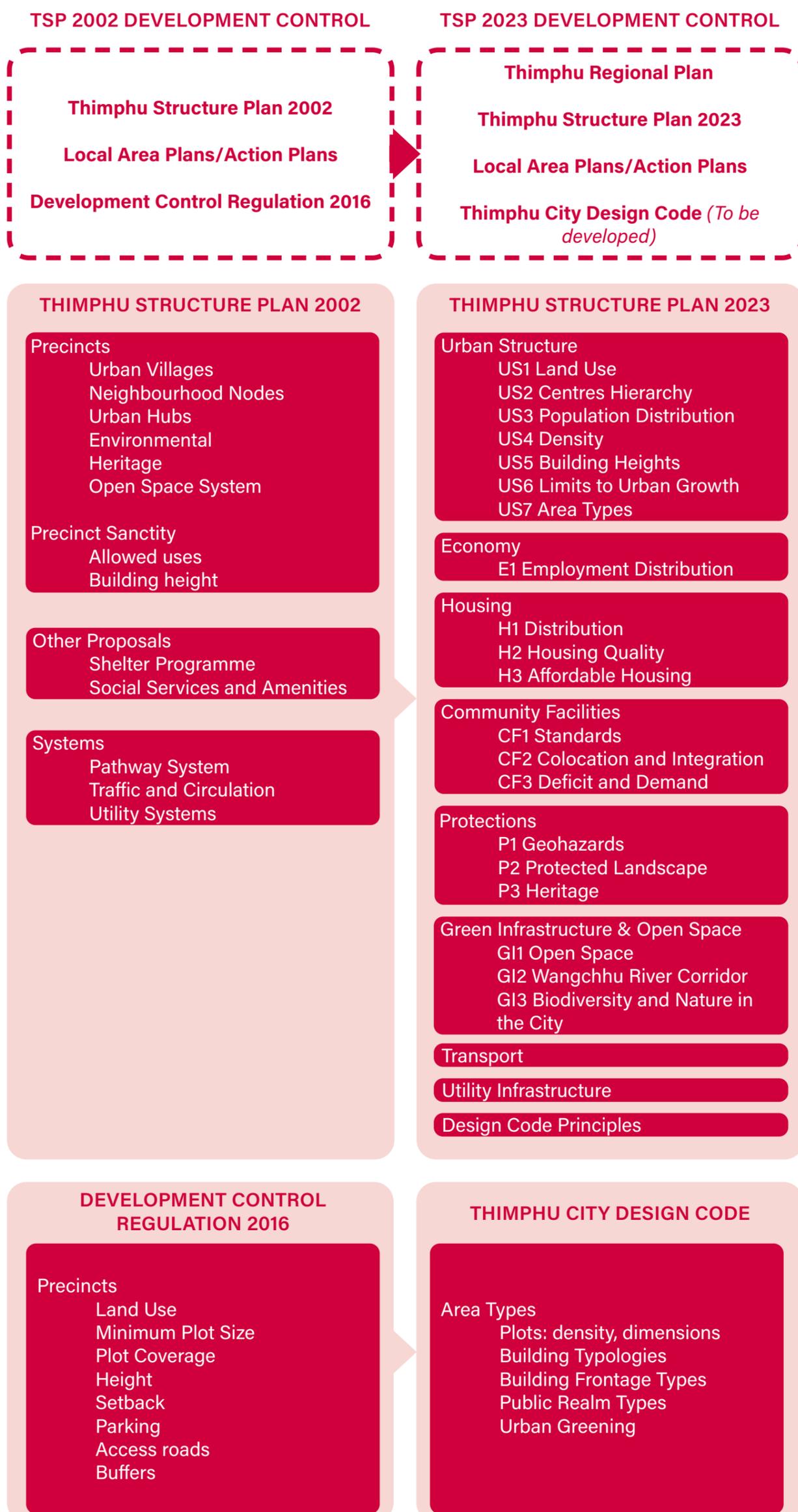


Figure 1.4 Thimphu development control reform

TSP 2023 KEY CONCEPTS

TSP 2023 promotes 'good growth in the right places' and enables transformation through three key concepts underpinning the spatial framework .

1/ Land Use

The TSP 2023 land use designations are different and more subtle than the predominantly mixed use TSP 2002 approach by distributing uses to suitable locations through criteria such as:

- Allocating areas for activity centres, community facilities and public open spaces across the city in line with population catchment sizes and needs.
- Proposing a variety of residential types suited to their local context.
- Locating activity centres and workplaces in accessible areas.
- Relocating industrial uses away from sensitive land uses.
- Restricting development in geohazard areas until further analysis and suitable mitigation solutions are proposed at LAP level.
- Establishing public open spaces, river corridors and forest areas where development is not permitted.

2/ Centres Hierarchy

The TSP 2023 hierarchy of centres provides a framework to allocate the right types and numbers of homes and jobs and the right types and sizes of community facilities in the right places.

The hierarchy of centres integrates mixed use activity areas, services and facilities with surrounding population catchments and specific needs based on size. They serve as a decision making tool for focusing investment and regeneration efforts in centres.

Larger city and sub-district centres contain specialist facilities and employment areas that can be easily accessed by a wider population. These are well connected to residential areas by public transport.

Smaller local and neighbourhood centres provide basic facilities serving daily needs within walking distance of homes.

3/ Area Types

Character refers to the physical and cultural aspects of a place that contribute to its unique identity. Enhancing character, or the distinct identity of neighbourhoods across Thimphu, promotes liveability by helping to improve civic pride and sense of community.

Area Types are defined by current and historic meaning, experiences, lifestyles, activities and location within a city's urban structure and natural setting. Thimphu's Area Types are informed by the five parts of the city and their areas of urban, suburban and open space within each part. The rural character of settlements in the wider Thimphu valley is to be retained.

To enhance character, development within an Area Type will be subject to a consistent set of guidelines for built form, streets, public realm, landscapes and heritage conservation.

Further design guidelines for the Area Types proposed in this plan will be provided in the Thimphu City Design Code (to be developed).

The CCAP:

Provides a finer grained approach to the clustering of uses within the highly specialised area of the City Core. It builds upon the existing uses and suggest additional activities that either complement or reinforce existing uses.

The CCAP introduces an greater working and living population within the City Core by identifying key areas of change where new uses can be accommodated and identifying locations where uses should be clustered to form living communities and concentrations of work places at public transport nodes.

The CCAP:

Covers a unique part of the city. The City Core is a highly complex and multi-layered place, and the CCAP builds on what is already present and seeks to add additional layers for a rich and varied urban place at the heart of the City.

Recognising that a new greater population will live in the City Core the CCAP provides locations where more local needs can be met easily as well as providing for the needs of the whole city, its residents, visitors and tourists.

The CCAP:

Provides a finer-grained description of character, described in this CCAP as a set of 'Character Areas'.

These are overlapping areas, without boundaries and smaller in size to the Area Types. The Character Areas seek to form richer urban experiences and strong identity. They respond to a very specific existing context and define unique characteristics at a local, urban scale.

Urban Design Guidelines seek to provide guidance on how these Character Areas could be developed.

1.2 Plan and Policy Context

1.2.1 Spatial Plans, Policy and Regulations

The CCAP is one of a series of operational plans that establish the strategic, spatial, policy, and design direction for the area up to 2047. It aligns with Bhutan's national plans, policies and initiatives.

Figure 1.5 identifies the hierarchy of spatial plans and policy documents relevant to this CCAP. The planning area of each tier of spatial plans are as follows:

- National Spatial Plan: the whole country.
- Regional Plan: a dzongkhag.
- Structure Plan: an urban area.
- Local Area Plan: determined by the Structure Plan, or by the planning authority.

SPATIAL PLANS

Comprehensive National Development Plan (CNDP) is the national level spatial plan providing overall direction for change across the country. A National Spatial Structure for Balanced Development and a National Land Use Plan is proposed. These inform the strategic role of Thimphu within a national context.

Thimphu Regional Plan is a recommendation for further planning to set out requirements for Thimphu Dzongkhag on landscape protections, rural settlements, and the location of key infrastructure, industrial and employment sites inappropriate for an urban setting. It is to be developed.

Thimphu Structure Plan 2023 (TSP 2023) is the city level spatial plan providing overall direction for the development and regeneration of Thimphu. It sets out how and where new homes, jobs, services and infrastructure will be delivered and the type of places and environments that will be created.

Local Area Plans (LAPs) provide further spatial planning guidance at the neighbourhood level. These are developed in line with the policies set out at Structure Plan level but provide more detail on the direction of development and regeneration. Two mechanisms support the LAP making process:

- **Public Planning Inquiry** chaired by the Royal Commission for Urban Development (RCUD) will then review the options presented and decide the most appropriate option, following a robust and transparent debate. This process will offer all interested parties an opportunity to fully participate in the planning process.
- **Land Dispute Settlement** process, based on the Land Dispute Settlement Guidelines 2018, will manage any disputes which may arise.

Thimphu City Core Action Plan (CCAP) (This document), provides further spatial planning and design guidance for the City Core area of Thimphu, defining policies, guidance and specific interventions to facilitate regeneration.

City Core Action Plan:

First of a series of Local Area Plans and/or Action Plans that will cover the whole of the city.

POLICY, REGULATION AND GUIDANCE

National Strategies and Thematic Policy are developed by various Government Ministries to guide national and local practices and projects. This includes but is not limited to the following:

- **Bhutan Draft Economic Roadmap** - sets out economic priorities for the whole country which informed the preparation of the Thimphu Paro Economic Development Strategy.
- **Bhutan Vision 2020** - sets out high level direction for the country including economic development which informed the preparation of the vision and objectives for Thimphu.
- **National Human Settlement Policy** - integrates with the comprehensive national development plan providing high level direction to planning processes.
- **National Health, Education and Housing Policy** - provides thematic national policy defining the approach to health care provision, education provision and housing, including both housing quality and affordable housing. This includes standards for delivery where appropriate.

Thimphu City Design Code (to be developed) will function as a set of illustrated design requirements that provide specific, detailed parameters for the physical development of a site or area. This includes built form, streets, public realm, heritage buffers and views, open spaces and utility infrastructure. The Design Code will also set out a series of requirements in relation to elements such as privacy, amenity, daylight and sunlight, with the aim of creating good environmental conditions and comfortable indoor and outdoor spaces. These requirements will create more variation in response to very specific contexts and conditions across the city. The existing Thimphu Thromde Development Control Regulations 2016 will remain in force until the new Thimphu City Design Code is published.

Management Plans are local level documents that protect and enhance historic assets, sites and places. They identify initiatives for the conservation and development of the built heritage assets and define guidelines for their management, conservation, maintenance and, where necessary, restoration.

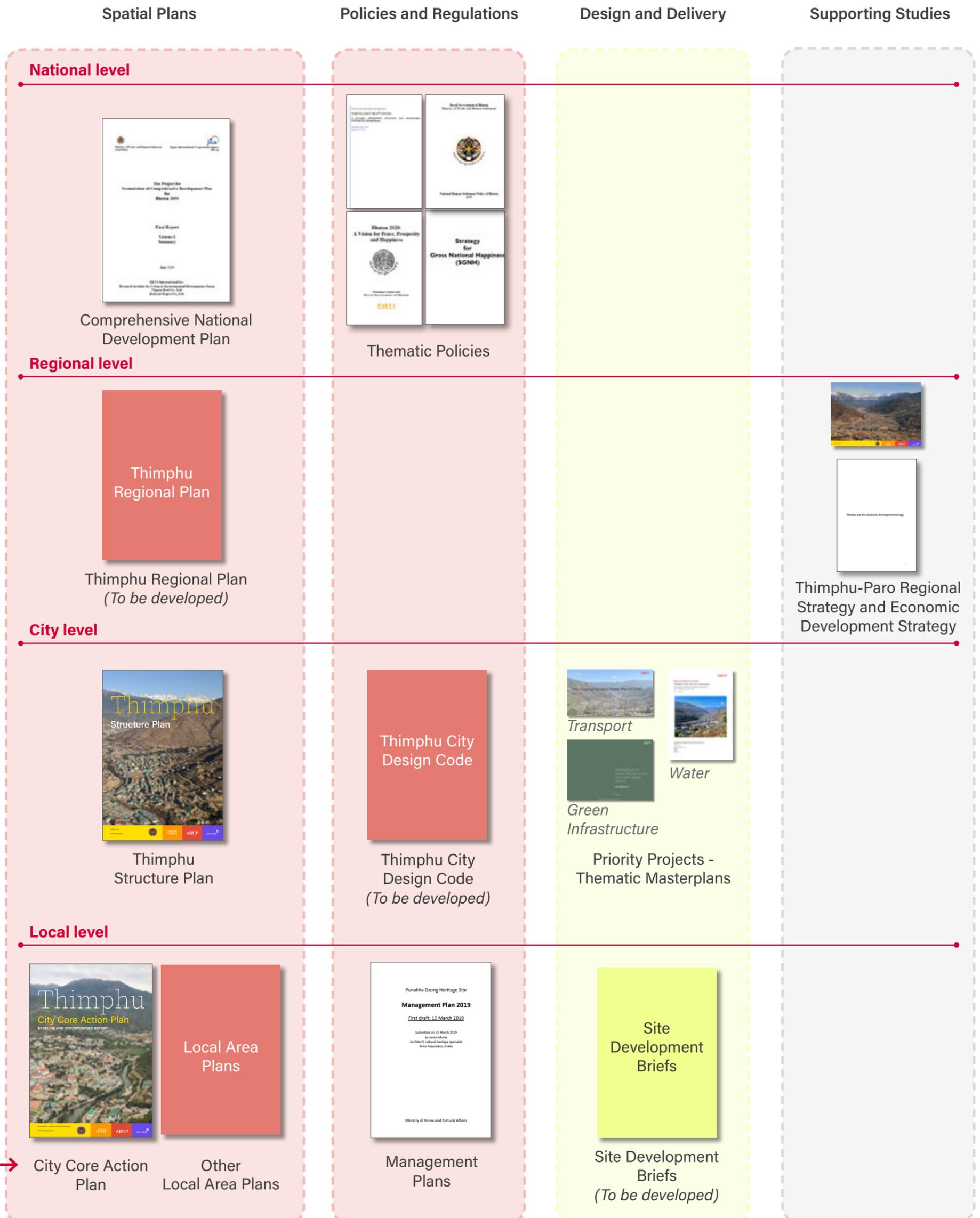


Figure 1.5 CCAP Planning Context

1.2.2 Design and Delivery

PRIORITY PROJECTS

Masterplans have been prepared for priority projects that cover city scale and align with both CCAP and TSP 2023 proposals. These have informed the CCAP proposals and define key actions for implementing improvements across three disciplines:

Low Emissions Transport Masterplan describes strategies to improve the quality of Thimphu’s transport services, supporting future growth in the city and transitioning to a low carbon transport system. The masterplan outlines eleven strategies to improve Thimphu’s transport system in support of improved urban spaces and healthy, vibrant neighbourhoods.

Water Services Masterplan examines the existing water supply, wastewater, and stormwater systems’ infrastructure and proposes capital improvement projects required to service existing and future development within Thimphu. The Masterplan identifies a list of recommended concept-level projects at a citywide scale.

Green Infrastructure Masterplan supports the development and enhancement of the open and green space systems in Thimphu - which include river and stream buffers, flood plains, heritage buffers, steep slopes, ecologically and geologically sensitive areas. The masterplan establishes a landscape design framework and identifies concept design proposals for the city.

SITE DEVELOPMENT BRIEFS

Site Development Briefs (SDB) will provide a further level of detail for specific, strategically important sites as identified through the LAP process. These will determine how best to deliver larger, more complex opportunity sites across Thimphu, considering ownership, pre-existing development and land uses, phasing, infrastructure requirements and cost, and demonstrate how to unlock and reconfigure major sites for regeneration in accordance with TSP 2023 and LAP policies and the Thimphu City Design Code (to be developed). The locations for SDBs will be identified through the development of LAPs.

Design and Delivery

City level



Low Emissions Transport Masterplan



Water Services Masterplan



Green Infrastructure Masterplan

Priority Projects - Thematic Masterplans

Local level



Site Development Briefs
(To be developed)

1.2.3 Supporting Studies

SUPPORTING STUDIES

The CCAP and TSP 2023 has been informed by the two key supporting studies.

Thimphu-Paro Regional Strategy covers the Thimphu-Paro Valley region and provides recommendations on how to direct and distribute population and economic growth across the two valleys, landscape and heritage protection, geohazard constraints, and supporting transport and utility infrastructure.

Thimphu-Paro Economic Development Strategy defines how the economy of the Thimphu Paro Region can flourish and prosper over the next 30 years and deliver clean and inclusive growth. This provides the direction for employment distribution policies and implementation model in TSP 2023.

Supporting Studies

Regional level



Thimphu-Paro Regional Strategy



Thimphu-Paro Economic Development Strategy

1.2.4 How to Use this Document

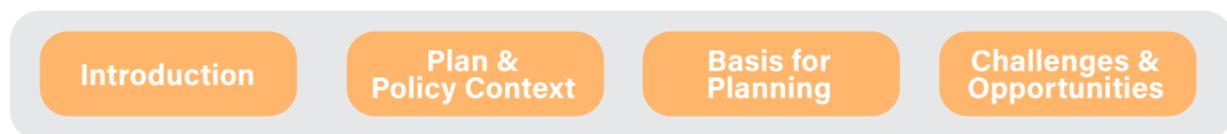
STRUCTURE OF THE DOCUMENT

The CCAP is a guide for proposals within the extended City Core and will inform a Local Area Plan that will support the local authority in the determination of planning applications. The CCAP is also an instrument for local communities to understand future growth in their area, and participate in the opportunities that will be enabled through urban transformation.

The document is structured into five Chapters, each providing a different level of guidance for the transformation of the City Core. Each chapter should be read in conjunction to form an understanding of the possibilities for transformation, the priorities and what 'good growth in the right places' looks like. This CCAP provides guidance rather than requirements, and should be always read in conjunction with TSP 2023 and the Thimphu City Design Code (to be developed).

The following provides an overview of the each Chapter of the document.

Chapter 1: Introduction



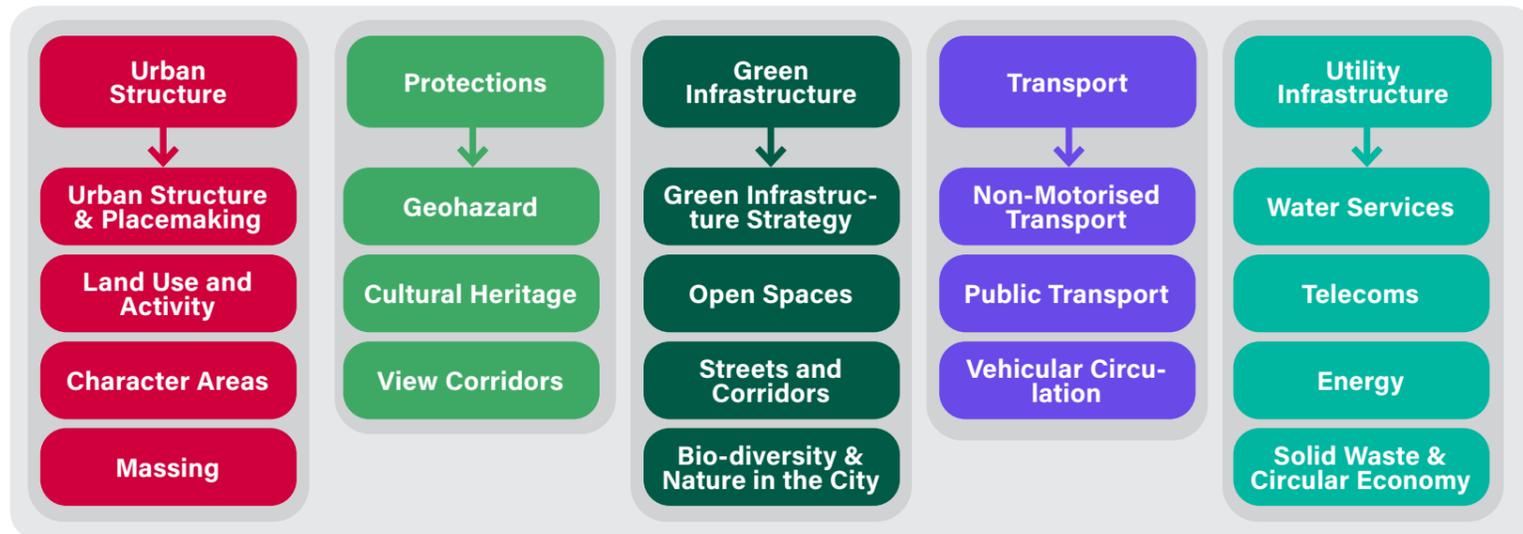
Provides an introduction to the CCAP and its role within the new Planning Framework, how it relates to the TSP 2023 and a summary of the key Challenges and Opportunities that the CCAP responds to.

Chapter 2: Vision and Structuring Principles



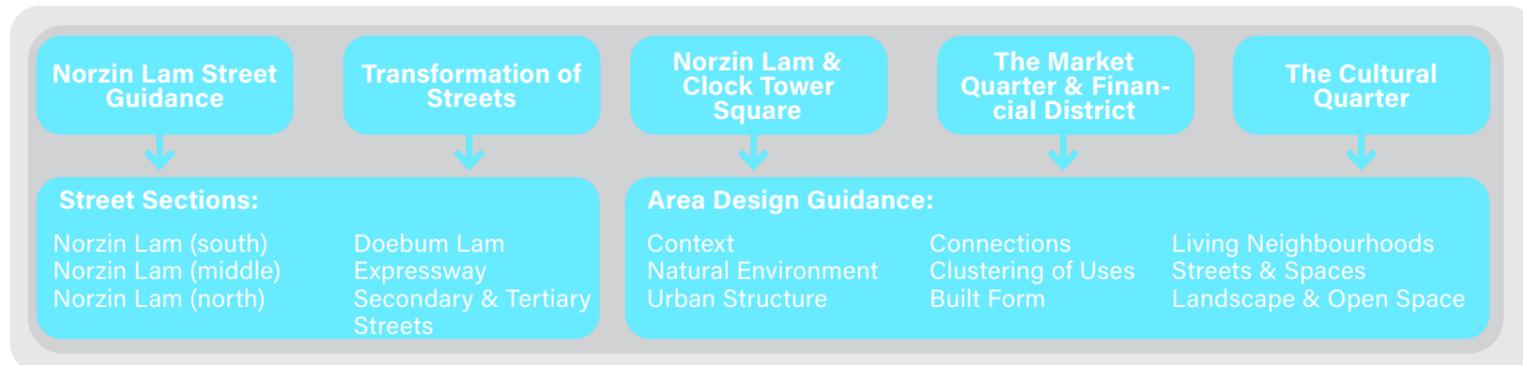
Provides a summary of how the TSP 2023 Vision for Thimphu manifests within the extended City Core and sets out a series of Structuring Principles which sets out the priority for change and transformation.

Chapter 3: Spatial Framework



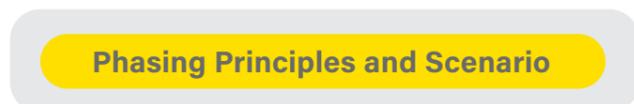
The Spatial Framework is formed of a series of 'Framework Layers' organised under the relevant 'Key Elements' also found in the TSP 2023. Read together these provide the strategic spatial interventions across the City Core.

Chapter 4: Urban Design Guidance



The Urban Design Guidance provides more specific guidance for three key Character Areas within the City Core as well as demonstrates the transformation of key streets. Guidance is organised using the Design Code Principles to ensure alignment with the City-wide Design Code.

Chapter 5: Phasing



The material within the Phasing section provides a high-level phasing scenario alongside key principles, demonstrating one way that development can come forward within the CCAP area

Figure 1.6 The Structure of the CCAP document

LAYOUT

Structuring Principles set the ambitions, priorities for change and key structural elements within the extended City Core.

Structuring Principle diagram

Written principles, descriptions and explanations

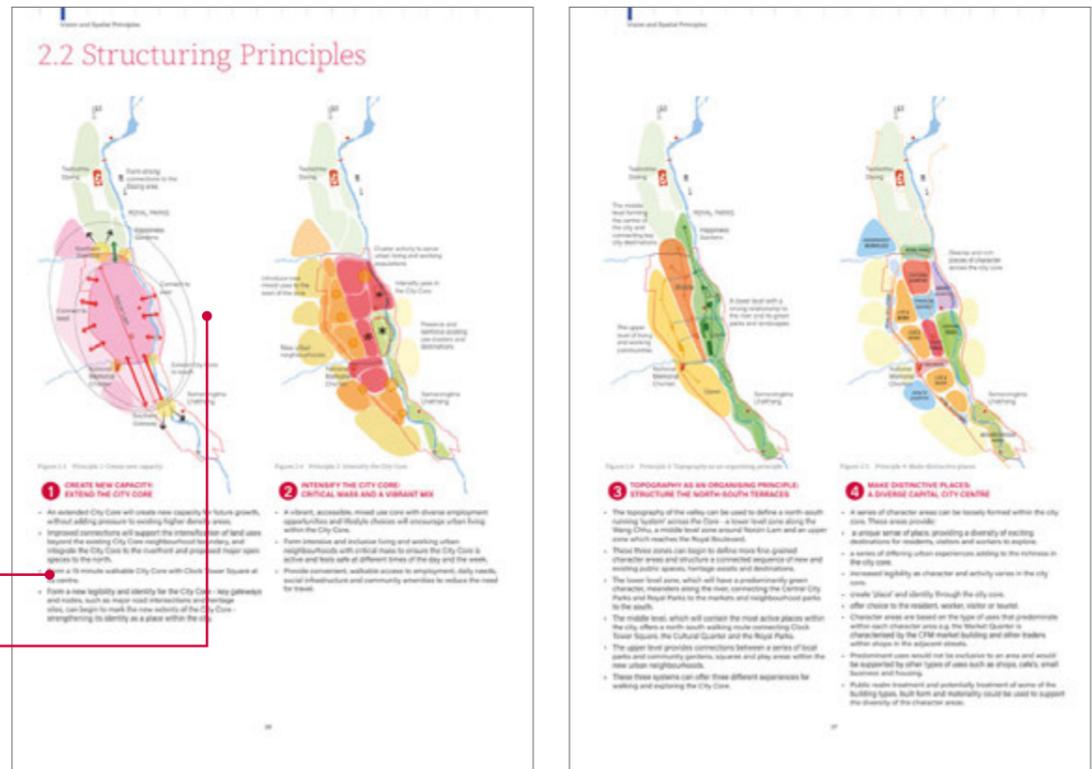


Figure 1.7 Pages from Vision & Structuring Principles chapter

The Spatial Framework is a series of 'Framework Layers' that provide mapping and a description of the key interventions proposed within the extended City Core.

Framework Layer/Theme

Written principles

Key interventions

Framework Layer diagram with key interventions mapped

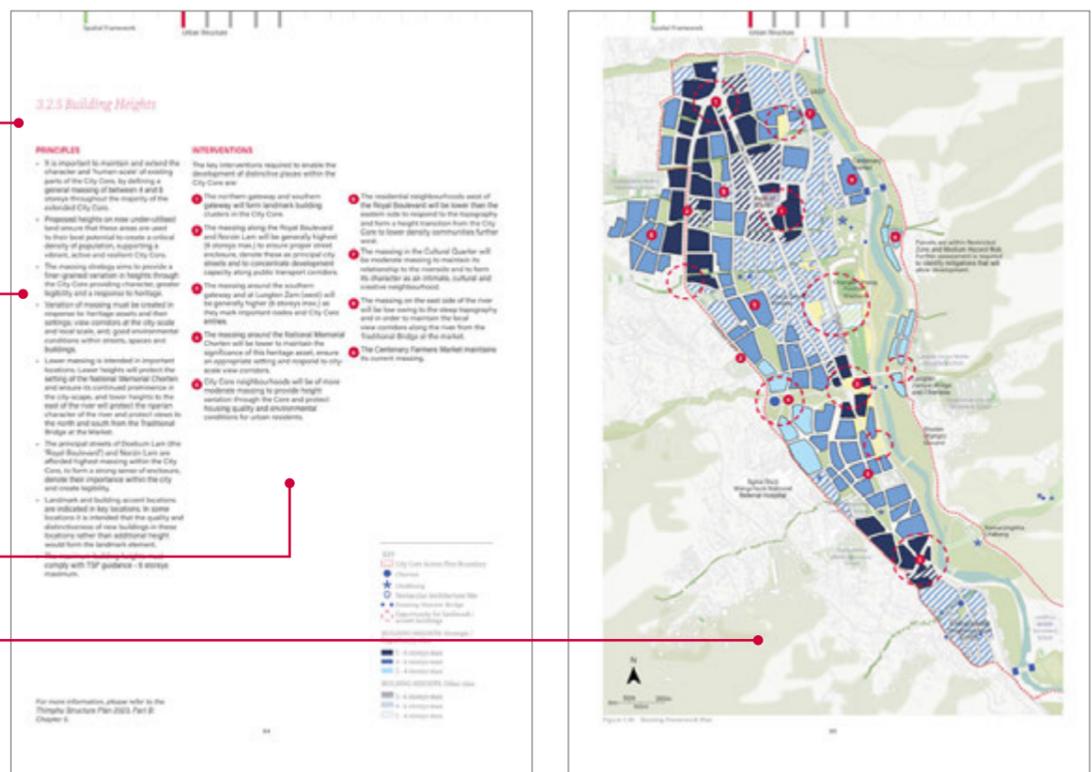


Figure 1.8 Pages from Spatial Framework chapter

The Urban Design Guidance chapter provides more specific guidance for three Character Areas within the City Core and a series of key streets. Guidance is held within the written guidelines and also within the diagrams and street sections - these should be read in conjunction.

Urban Design Guidelines

Urban Design Guidelines diagram



Figure 1.9 Pages from Urban Design Guidance chapter

1.3 Basis for Planning

1.2.5 TSP 2023 Proposals Relating to the City Core

OVERVIEW

TSP 2023 is the statutory plan guiding decisions on development and regeneration activity within Thimphu to 2047. It articulates the vision for the city and outlines how and where new homes, jobs, services and infrastructure will be delivered, the natural, cultural and heritage assets that will be protected and the type of places and environments that will be created.

TSP 2023 establishes a new land use distribution and centres hierarchy, and describes a strategy for regeneration and growth across the city. A series of places and area types are proposed that will support the creation of identity and a sense of place.

A series of protections designations are introduced to preserve the natural environment and cultural heritage held within the city.

The proposals for the City Core emerging from TSP 2023 are summarised below.

TSP 2023 - Part B Development Policies

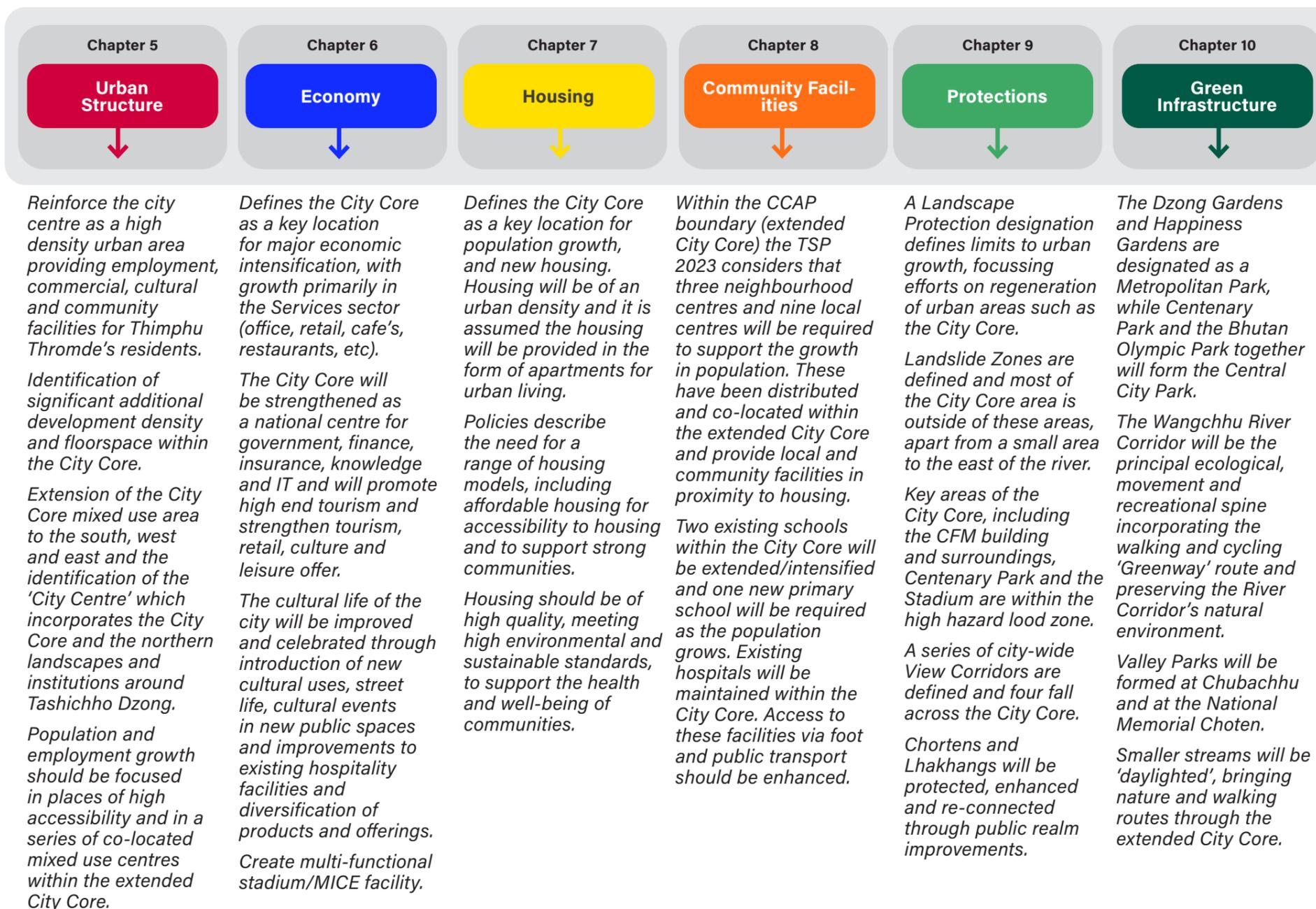


Figure 1.10 Policies relating to the City Core from the Thimphu Structure Plan 2023

Chapter 11
Transport

A rationalised and improved bus network which converges in the City Core provides improved accessibility, easy interchange and increased footfall.

Re-route through-traffic to the west of the City Core to reduce traffic congestion and allow the improvement of the public realm, including improvements at Norzin Lam and the transformation of Doebum Lam into the 'Royal Boulevard'.

A rationalised and extended movement and street hierarchy will support improved sustainable connectivity.

A rationalised car parking strategy will release space for new public realm and intensification.

Improve east-west walking routes and connections through the City Core, including new pedestrian bridges across the Wangchhu.

Chapter 12
Utility Infrastructure

A combined utilities corridor will be introduced along Doebum Lam to include water, power and telecoms cabling.

The existing water network should be upgraded to reduce water losses and to cater for fire-fighting.

Introduce Sustainable Urban Drainage systems within streets and spaces.

Integrate utilities within streets.

Introduce a series of waste hubs for collection of waste from residential and commercial uses.

Develop localised Energy 'Centres' utilising heat pumps and PVs, with potentially an early demonstration project within the City Core.

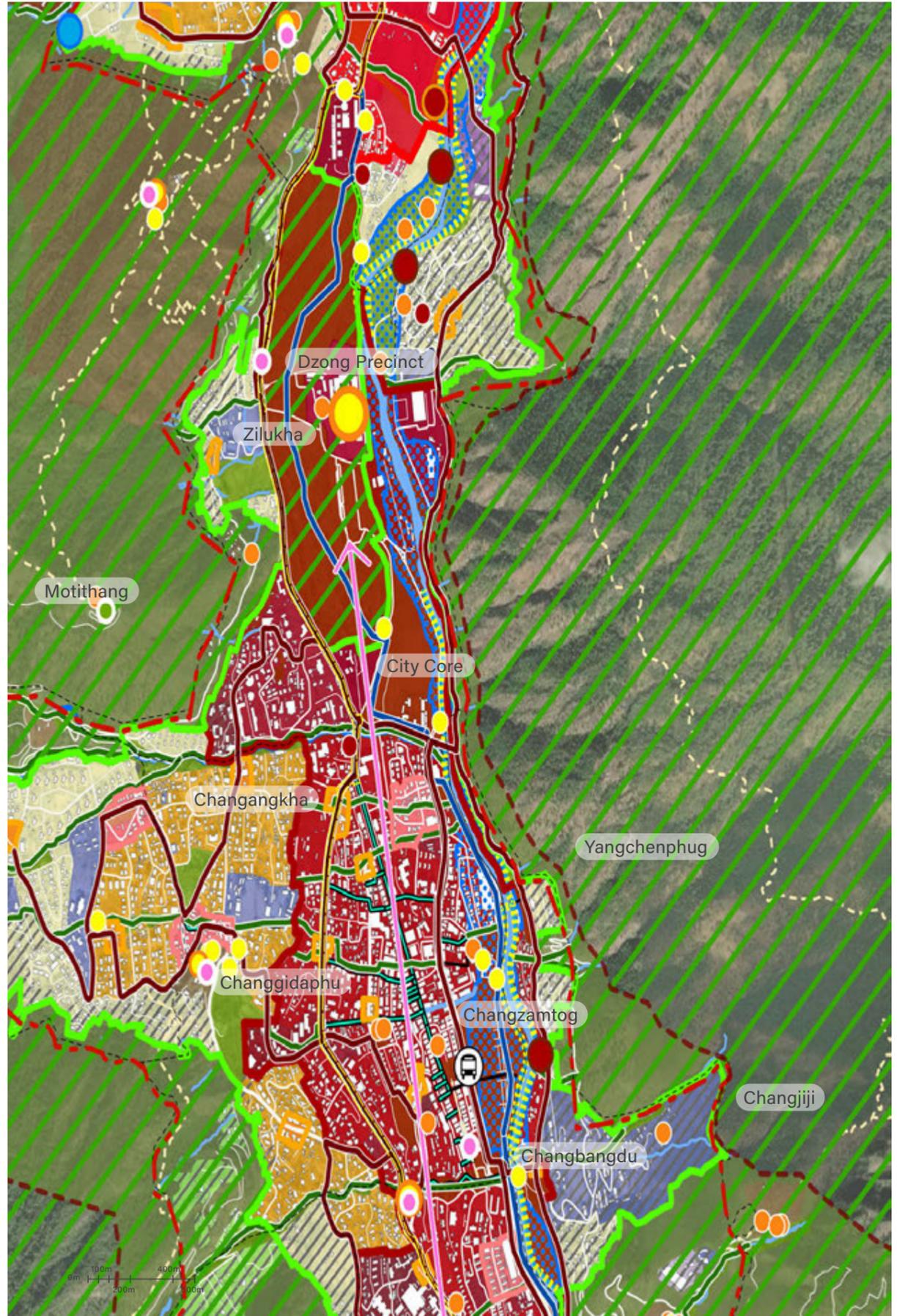


Figure 1.11 Central Sub-District Urban Structure - extract from Thimphu Structure Plan 2023

For more information, please refer to the Thimphu Structure Plan, Part A: Chapter 2 and Part B Development Policies

1.3.1 Growth in the City Core

GROWTH IDENTIFIED BY THE TSP 2023

TSP 2023 provides the locations for future growth on a neighbourhood by neighbourhood basis.

The future increase in the number of homes, jobs and population identified in TSP 2023 have informed the capacity for growth estimated within the extended City Core area. In summary:

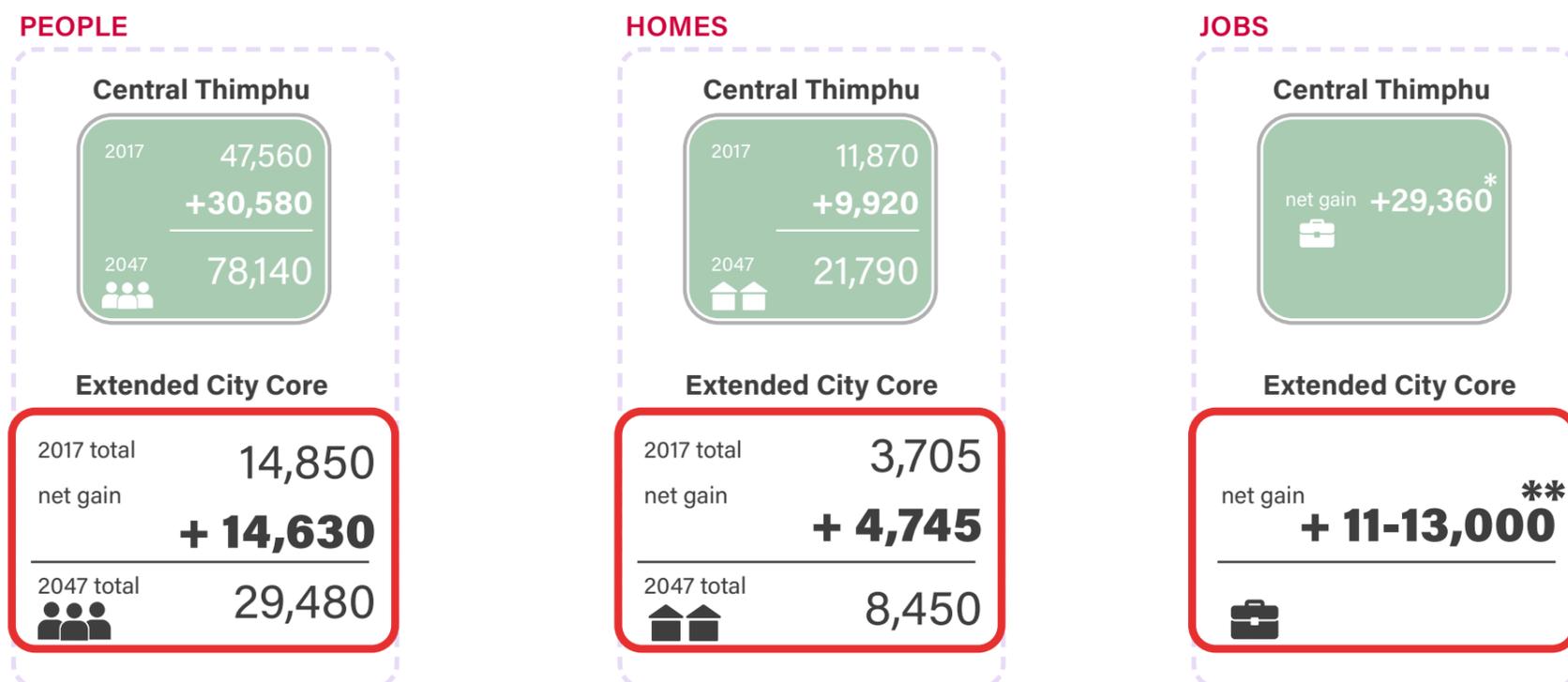
- New space for office, light industrial and other commercial uses could generate approximately 8,400 to 9,600 jobs.
- Of the total 12,000 new homes identified in the Central Thimphu sub-district, it is estimated that 6,500 - 7,500 could be delivered within the extended City Core.
- This would represent approximately 20,000 to 23,000 new residents in the City Core, considering an average of 3.08 persons per household.

TSP 2023 also identifies the community facilities necessary to accommodate a larger urban population, including:

- The extension or intensification of two existing schools and the provision of one new primary school within the City Core, as the residential population grows.
- Retention of the Indo Bhutan Friendship Hospital (in a consolidated site).
- Retention or reprovision of the equivalent of a Thromde Healthcare Centre as part of the regeneration of the RBP site.
- Other healthcare needs associated with population growth can be met via existing facilities including Jigme Dorji Wangchuck National Referral Hospital.



Figure 1.13 Central Thimphu Sub-District, CCAP Area and neighbourhood boundaries



*Accounts for spatial and non-spatial jobs.

**Estimate of spatial jobs only (based on sqm per FTE for office, distribution and retail areas).

Figure 1.12 Potential Growth at the City Core proposed by the TSP 2023

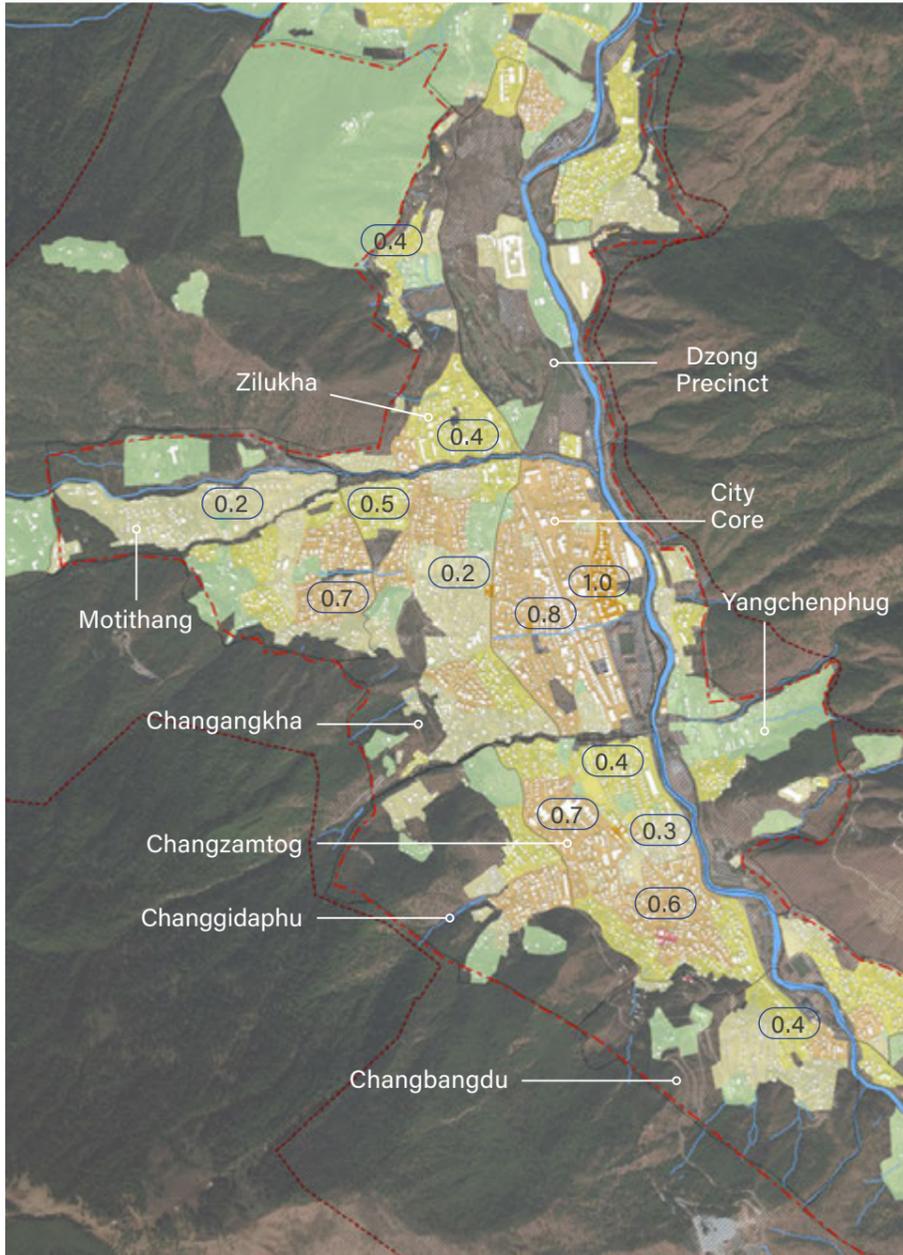


Figure 1.14 Existing density (Gross) in Central Thimphu

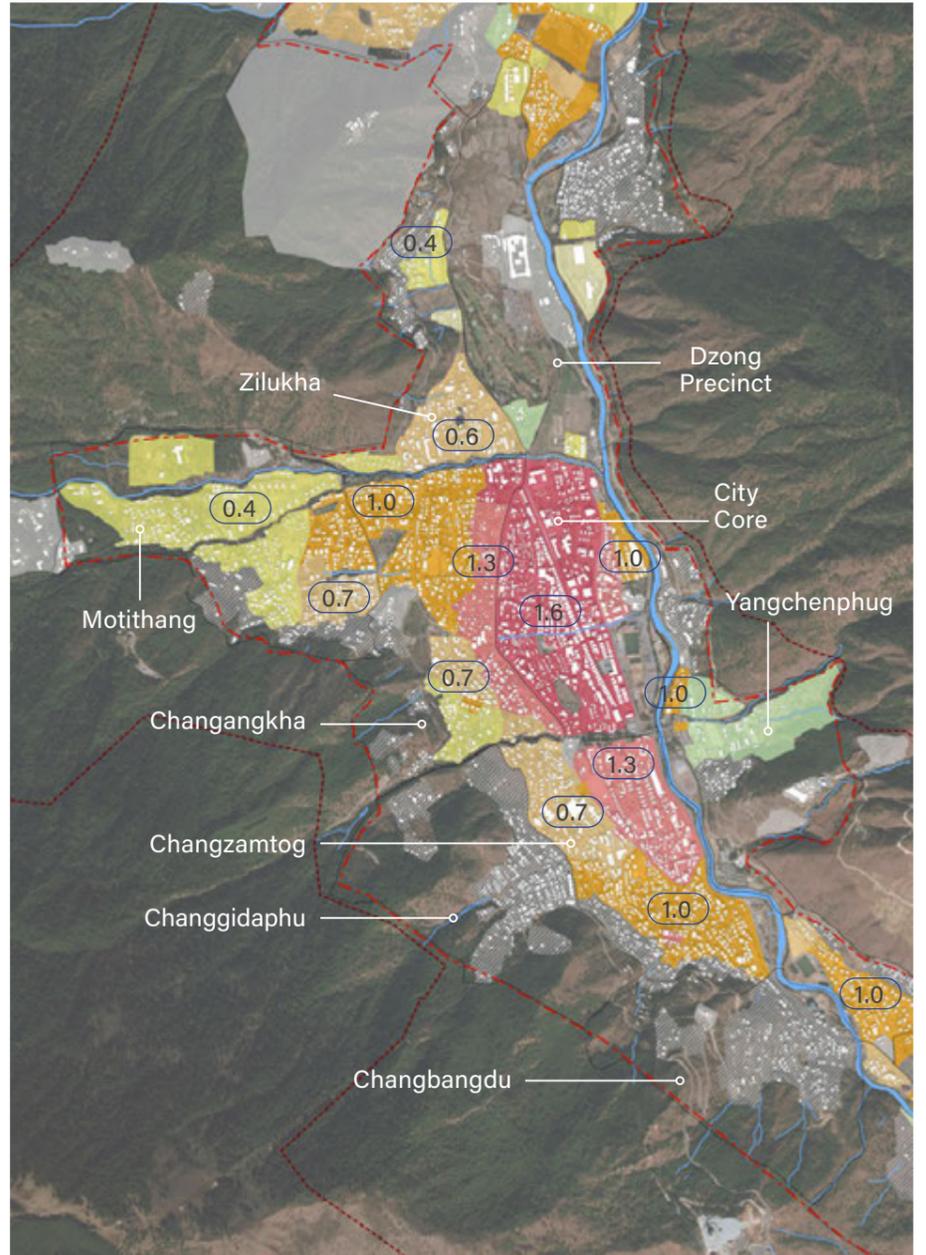


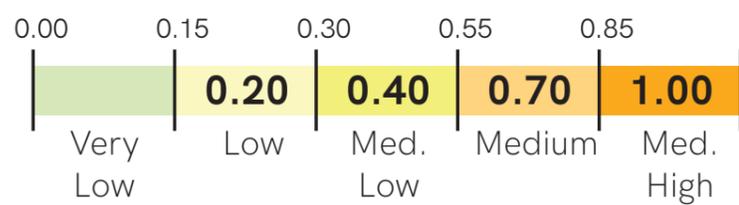
Figure 1.15 Density (Gross) projections in Central Thimphu

DENSITY CHANGE IN THE TSP 2023

TSP 2023 identifies the existing City Core neighbourhood and surrounding areas as an opportunity for transformation and intensification.

As it is already one of the more dense places in the city the differential change seems to be relatively modest. However, due to the opportunity to introduce a new density range across the city with the highest densities located within the extended City Core area, plus the amount of under-utilised land identified, the amount of additional capacity available is potentially significant.

Existing - Gross FAR ranges



Proposed - Gross FAR ranges



Figure 1.16 Existing and proposed density ranges in Thimphu

For more information, please refer to the *Thimphu Structure Plan 2023, Part A: Chapter 2 and Part B: Chapter 5.*

1.4 Challenges & Opportunities

1.4.1 Key Spatial Challenges

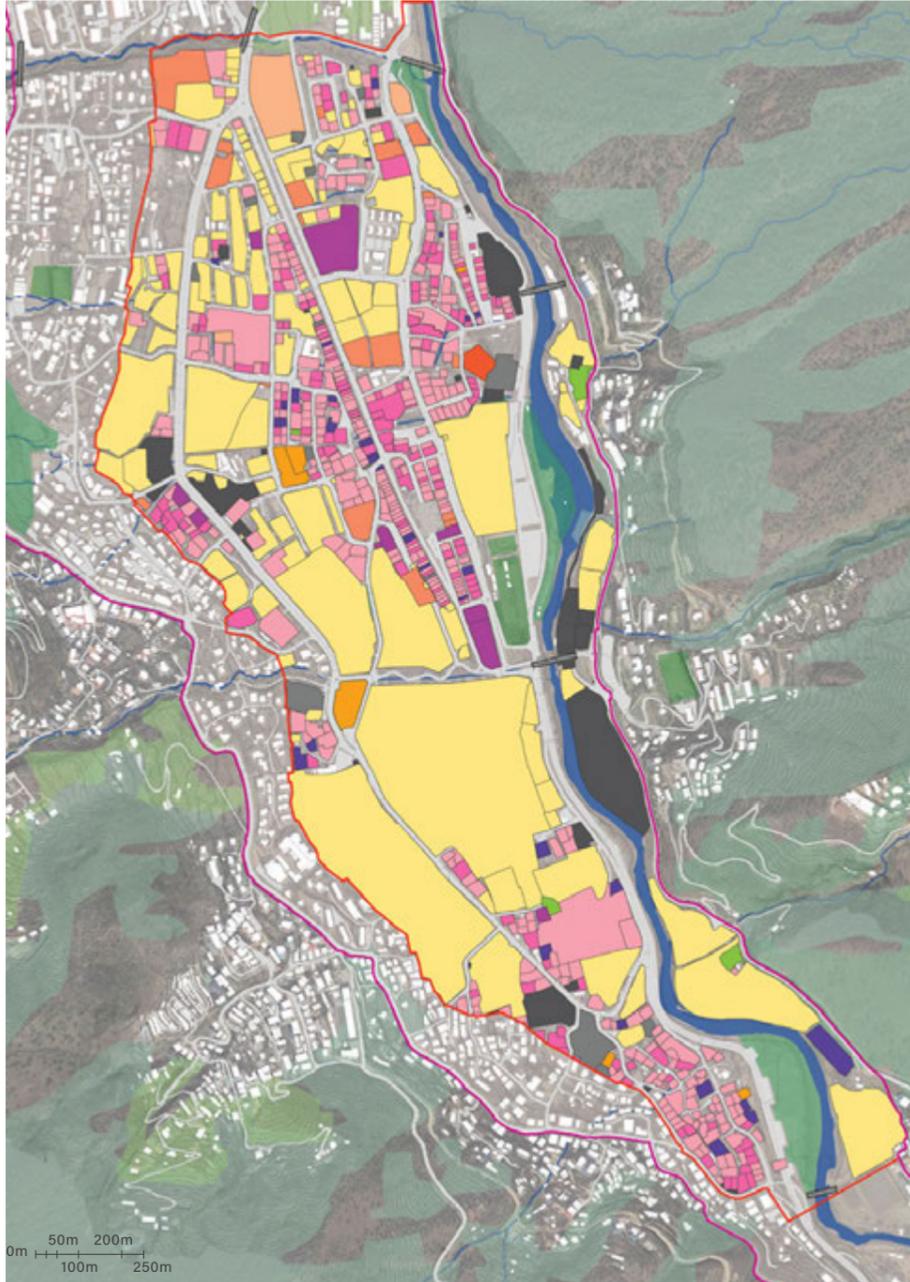


Figure 1.17 Land Ownership

IMPACT OF LAND OWNERSHIP

Land ownership in the core is a mix of public and private land. Generally, the public land holdings are significant and concentrated to the west and south of the City Core, while private land is highly fragmented and concentrated in the key commercial areas. The fragmented ownership pattern has an impact on:

- Forming a coherent and connected network of streets;
- Built form and provision of well-formed streets and spaces;
- On forming diverse character areas;
- The extent and the quality of the public realm.

A large area of public land is located to the south of the present-day City Core. This is occupied by the RBP compound. In addition, there is a significant portion of the City Core that falls under the ownership of government institutions. This provides a very significant opportunity to extend and regenerate the City Core.

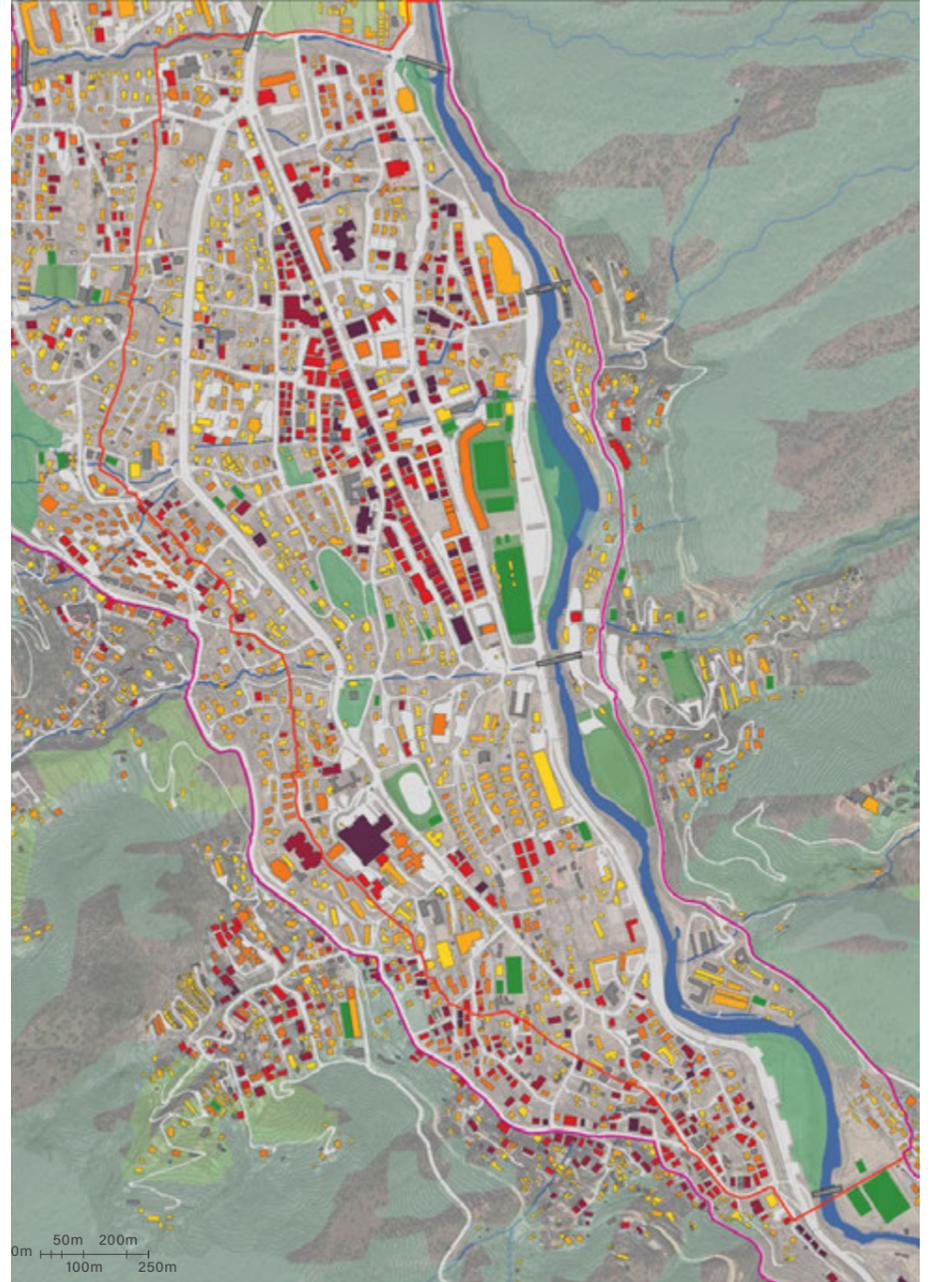


Figure 1.18 Existing building heights

UNDER-UTILISATION OF LAND

The land-ownership pattern has an impact on the utilisation of land. Private land holdings tend to be built to the maximum allowable density, while public lands are much less dense, characterised by low density housing with gardens, or government buildings surrounded with parking areas. The diagram on this page shows the massing and footprint of buildings within the City Core with observations as follows:

- Buildings at Norzin Lam and the market tend to be the tallest in the city at 4-6 storeys tall. They also occupy the maximum footprint allowable, leaving very narrow gaps between buildings.
- Areas to the west of Norzin Lam and to the south at RBP are of low height, generally 1 to 3 storeys, and buildings are set within large, open areas of space.

The areas to the west and south represent a huge underutilisation of scarce land within the City Core.

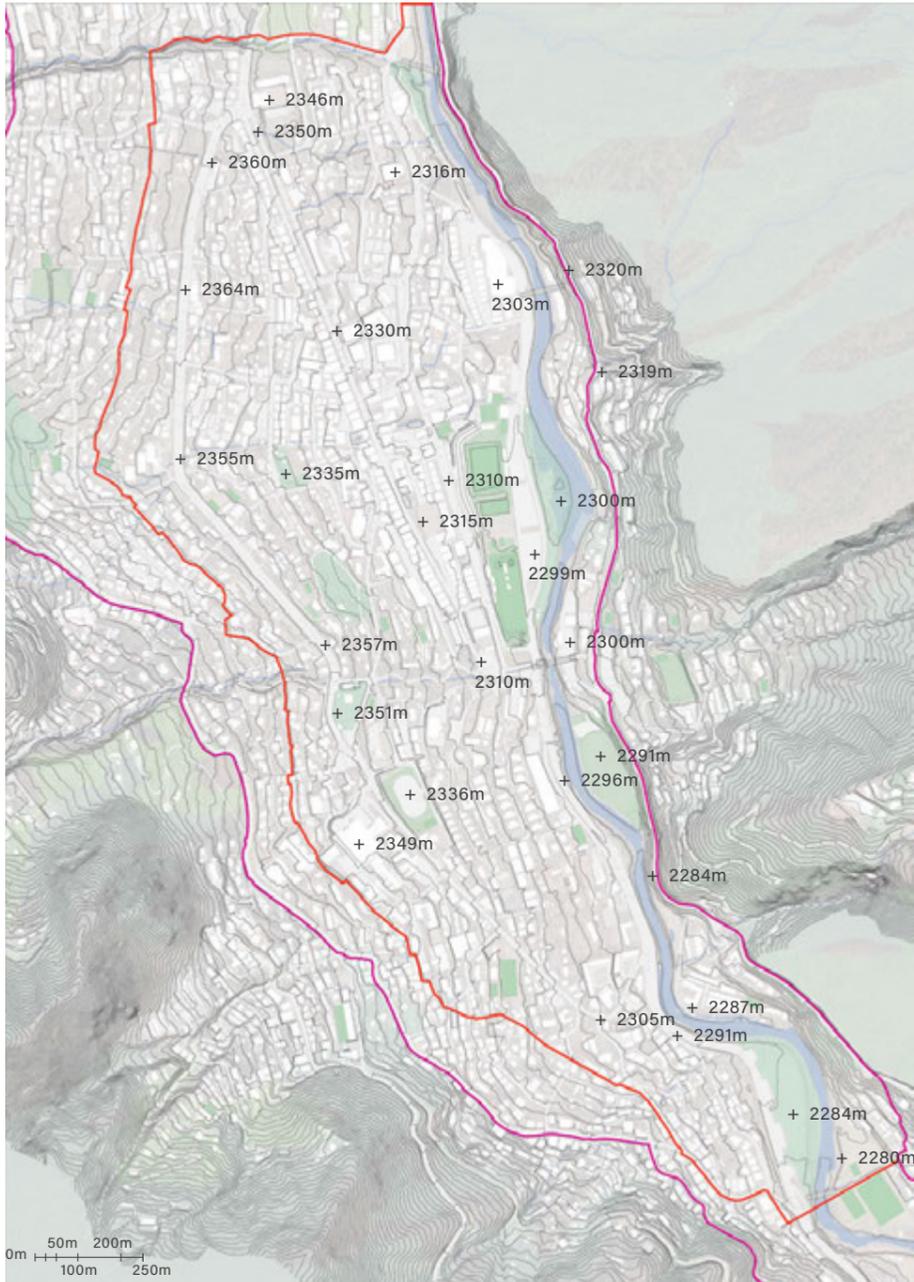


Figure 1.19 Topography

TOPOGRAPHY

The City Core is relatively flat in comparison to other areas of the city. However, there are still significant level changes. For example:

- There is a 60m level drop (E-W) from Doebum Lam to Centenary Park.
- The level difference between Doebum Lam and Norzin Lam is around 20m.
- There is a 40m level drop between the north and south ends of Norzin Lam.
- The eastern bank of the river is very steep, limiting development potential.
- The steepest level change within the City Core is at RBP with a drop of 60m between Doebum Lam and the riverside.

Improving pedestrian connectivity while working with fairly extreme level changes is a primary challenge. Ensuring strong east-west connectivity across the City Core will be vital in establishing more active, low-carbon modes of transport, increasing density, forming a coherent urban structure and strong, connected urban communities.

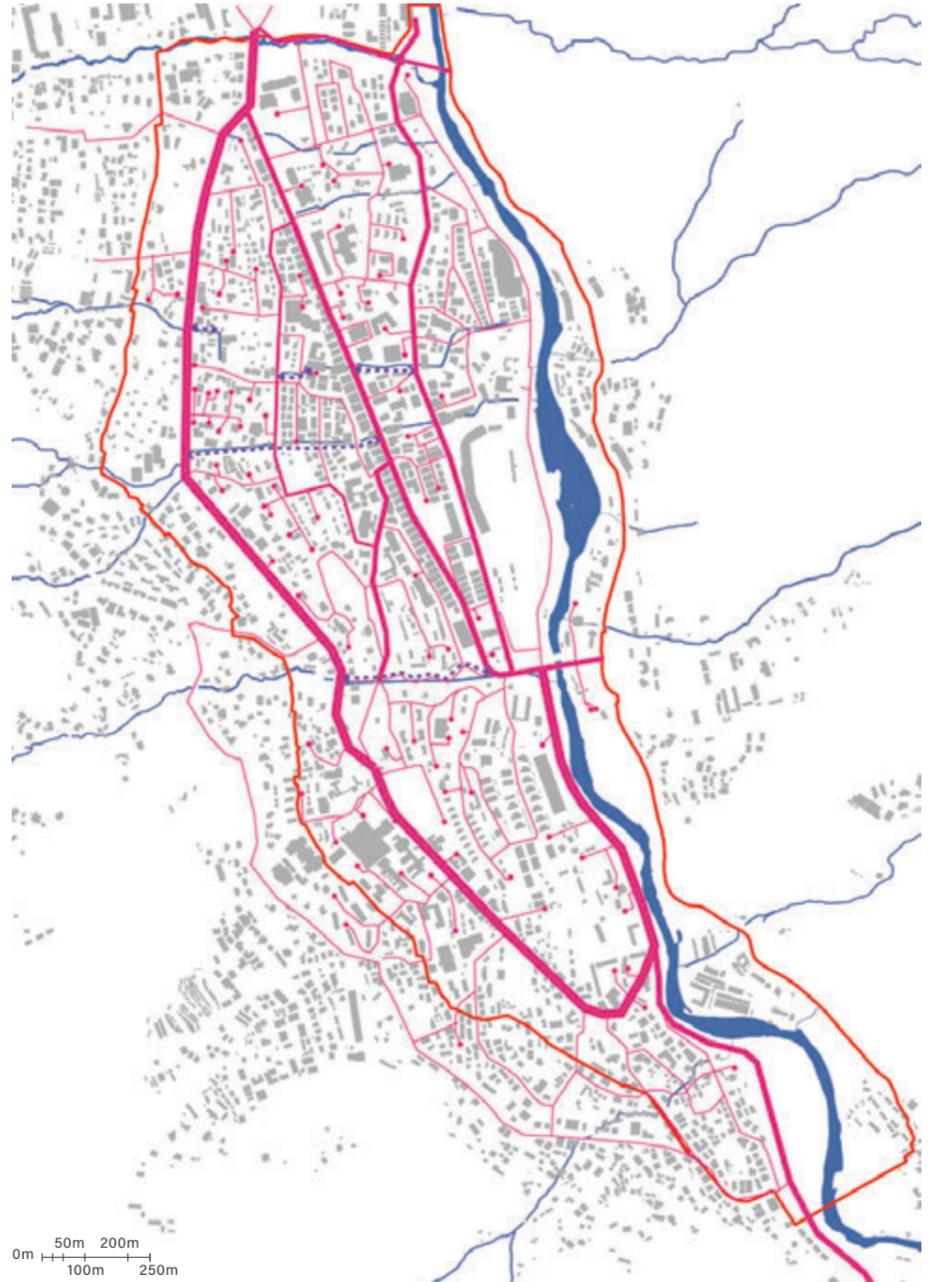


Figure 1.20 Existing street network

A FRAGMENTED STREET NETWORK

Generally, continuous connections are better formed on north-south running streets such as Doebum Lam, Norzin Lam and Chang Lam. This leads to these streets becoming the primary connections with high traffic volumes and congestion.

Generally, the secondary and tertiary streets do not form continuous connections and there is a high number of cul-de-sacs, especially to the west of Norzin Lam.

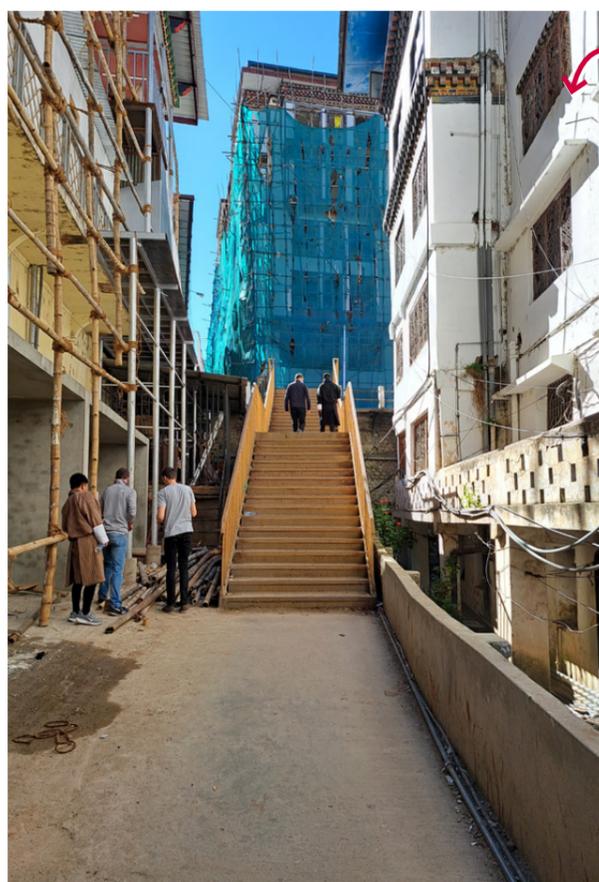
This results in a fragmented street network with a lack of continuous connections east-to-west.

For more information, please refer to the Appendix of this CCAP document.

1.4.2 Summary of the Challenges within the City Core

The City Core faces a number of challenges due to unconstrained and piecemeal urban growth. These challenges, however, indicate many opportunities for the area to deliver positive change.

URBAN STRUCTURE



CHALLENGES

- Steep topography along east-west routes curtails pedestrian movement through the city.
- Fragmented ownership leads to incoherent, piece-meal development lacking legibility.
- Under-utilised land in areas adjacent to Doebum Lam fails to deliver a coherent urban density or urban structure.
- Compromised settings of heritage sites, particularly the Zangdo Pelri Lhakhang.
- The proximity of buildings in dense urban areas, such as around Norzin Lam, produce living environments lacking privacy, daylight and access to amenities.

OPPORTUNITIES

- Opportunity to re-develop underutilised land in public ownership to bring a stronger urban structure, legibility, new urban communities and a greater population to support new activities.
- Opportunity for topography to structure the City Core into different, identifiable character areas and contribute a unique element to the identity of Thimphu.
- Opportunity to develop a new urban structure of pedestrian and cycle routes that traverse the City Core from east to west to connect communities and city destinations.
- Opportunity to improve the settings of historic features, lift their importance and ensure their continuity.

LAND USE



CHALLENGES

- There are places with high concentrations of active land use which form key destinations. However, these also attract very high levels of footfall and traffic congestion.
- Other areas have a very low density and lack activity.
- There is a good range of commercial uses, concentrated on Norzin Lam, but a lack cultural and leisure uses.
- Governmental and commercial office space is developed on a campus arrangement buildings surrounded by car parking.
- In low-density areas, there is a lack of overlooking, making some areas feel unsafe in the evenings.
- There is a low urban population, reducing the potential footfall and activity within the City Core and support for small businesses.

OPPORTUNITIES

- Opportunity to reduce the intensity of some uses and re-distribute to other areas of the city.
- Opportunity to introduce a greater mix of uses and to enable the forming of new destinations and a range of diverse character areas.
- Opportunity to reorganise government workplaces across the City Core to provide additional development opportunities.
- Opportunity to introduce new housing to form a greater urban population within the City Core.
- Opportunity to provide a demonstration of how people can live well in urban Bhutan.

GREEN INFRASTRUCTURE

CHALLENGES

OPPORTUNITIES



- Culverting and contamination of streams affect the health of a natural ecosystem and reduce urban amenity.
- Lack of publicly accessible open space, recreation and play throughout the City Core.
- Poor quality spaces between buildings and lack of communal areas and places to gather outside.
- Lack of greenery and green space within the public realm and streets.
- Riverside areas are susceptible to flooding including Centenary Park, the National Stadium and the Bhutan Olympic Ground.
- Local surface water flooding in streets and spaces.

- Opportunity to increase urban amenities by bringing nature into the streets and spaces and daylighting and naturalising urban streams and waterways.
- Opportunity to protect and build a range of connected ecosystems and habitats within and around the City Core.
- Opportunity to build resilience through the use of natural systems.
- Opportunity to provide a network of new spaces and a new public realm for people to gather, meet and dwell in, providing both interaction with nature, but also interactions between people that help build strong community bonds.
- Opportunity to use the introduction of green space to build a unique identity for the city.

TRANSPORT & MOVEMENT

CHALLENGES

OPPORTUNITIES



- The predominance of private vehicles and on-street parking impacts negatively the experience of streets and the ability to travel by other modes.
- Dead-end roads prevent through-movement and connectivity.
- Pedestrian footpaths are lacking or are uneven and poorly maintained.
- Expressway and Doebum Lam are barriers to east-west pedestrian movement.
- Lungten Zampa requires upgrading.
- High conflict between pedestrians and traffic at Lungten Zampa, National Memorial Chorten, junction of Doebum Lam and Norzin Lam (north), junction of Doebum Lam and Expressway and at the Changzamtog Flyover.

- Opportunity to rebalance the needs of pedestrians with the needs of vehicles and create a walkable, vibrant city.
- Opportunity to reduce emissions, air and noise pollution and create a safer more comfortable environment to live and work within.
- Opportunity to create a new network of streets, pathways and walking routes that can connect communities to city destinations and drive behavioural change.
- Opportunity to reduce traffic flows within the City Core and remove conflict points by implementing, at a city-scale, strategic interventions such as new public transport and junction improvements.

For more information, please refer to the Appendix of this CCAP document.

UTILITIES: WATER



CHALLENGES

- Several natural watercourses run west-east through the City Core, however, most of these are culverted.
- There are no notable Sustainable Drainage Systems (SuDS) which results in poor stormwater quality.
- Contamination of the river and its tributaries and streams degenerate natural and ecological systems.
- Significant water loss rates impact the reliability of water supply.
- Small diameter water mains at Wangchu Lam, Jangchub Lam and throughout Changzamtog don't meet fire-fighting demands. Fire hydrants are severely lacking throughout the network.
- Insufficient storage capacity to ensure the reliability and resilience of the water supply.

OPPORTUNITIES

- Opportunity to daylight streams and clean water to ensure health of natural and ecological systems.
- Opportunity for new developments to incorporate SuDS.
- Treat all wastewater prior to discharge, preserving the quality of rivers and streams.
- Create smart water networks.
- Reduce potable water demand, reduce water losses and increase water storage.
- Ensure local networks can deliver fire-fighting demand.
- Divert utilities outside of stormwater drains and stream corridors.

UTILITIES: TELECOMS



CHALLENGES

- Current internet access is primarily reliant on the mobile networks rather than the fixed network.
- Key challenges of fixed network services (provided by Bhutan Telecom) include access/wayleaves (particularly the last-mile implementation to lay cables in the ground), lack of installation records, loss of infrastructure due to natural hazards, poor separation and designation of infrastructure for different services.
- Key challenges for expanding the mobile network infrastructure (provided by BT and TashiCell) include available space for new mobile network sites, perceived negative impact of ground-based masts on visual landscape and concerns raised by citizens about electromagnetic emissions from mobile network sites.

OPPORTUNITIES

- Region-wide ducting infrastructure will enable rapid expansion of fixed telecommunications broadband services to accommodate growing market demand.
- Fixed connections to mobile network sites are largely via overhead cable lines, which are being replaced by underground infrastructure.

UTILITIES: ENERGY



CHALLENGES

- The City Core is densely populated with a diverse mix of buildings that consume a large share of electricity consumption.
- Most electricity is consumed for space heating, cooking, generating hot water, lighting, and lighting and space heating in public and commercial buildings.
- Many buildings are poorly insulated.
- Electric heating appliances puts strain on the grid during the dry season, when electricity production is insufficient at national level.
- Reliance on overhead distribution network faces risks from natural hazards, including flood damage.
- Bhutan suffers from a power deficit and relies on electricity imports from India to meet seasonal peak demand.
- A transition towards electric vehicles will increase electricity demand within the city centre.

OPPORTUNITIES

- Enforce new building standards that minimise energy demand and promote decentralized energy generation.
- Transition from direct electric heating to more efficient hydraulic systems.
- Bury infrastructure - and developing secondary or alternative corridors - will increase resilience to natural hazards.
- Diversify power generation and unlock flexibility through use of energy storage & demand-side management.

UTILITIES: WASTE



CHALLENGES

- Organic waste makes up a significant proportion of waste in the City Core.
- The recyclable fraction of the dry waste does not appear to be segregated at source and should be addressed.
- Collection by waste collection trucks is present, but it is not widespread. The trucks do not allow for waste segregation.
- Around 10 waste collection hubs (drop off centres) have been provided in Thimphu however there is only 1 no. hub within the City Core. More will be needed to facilitate waste segregation. The scale of these hubs may need to be altered for the City Core scale.

OPPORTUNITIES

- Transition to a circular economy and use the City Core as a demonstration for this transition across the city.
- Reduce waste through re-use as part of a circular economy, building on the history of Bhutan as an organic and self-sustaining society.
- Demonstrate and test a new system of segregation at source, waste drop-off hubs for both residents and commercial businesses.
- Organic waste provides an opportunity for diverting waste from landfill and using for composting and anaerobic digestion.

For more information, please refer to the Appendix of this CCAP document.

1.4.3 Summary of the Assets within the City Core

The City Core has many important assets which already makes it a special place in the city. There are opportunities to protect, enhance and bring these assets closer people’s daily lives.

URBAN DEVELOPMENT

ASSETS -----> OPPORTUNITIES



- Clock Tower Square and Norzin Lam are the principal public spaces in the City and are together one of the focal points both for special events as well as daily activity.
- A number of important city-scale views are found within the City Core: views to Wangditse Lhakang from along Norzin Lam, as well as more local views, such as views to forested mountainsides from Clock Tower Square and views to north and south along the river from the Traditional Bridge at the Market.
- Modest building heights across parts of the City Core bring a gentle and comfortable human scale.

- Opportunity to improve the public realm of Clock Tower Square and Norzin Lam to improve access and ease of use for all, while also creating two city public realm ‘icons’ that will define the identity of the city.
- Opportunity to maintain existing building heights across the City Core to ensure a comfortable human scale, good environmental conditions within streets, spaces and homes and visual connections between the City Core and its context are maintained.
- Opportunity to maintain the character of existing city-scale and local views, but also create new views to assets such as the National Memorial Chorten.

GREEN INFRASTRUCTURE

ASSETS -----> OPPORTUNITIES



- The Wangchhu and its riparian character and ecology runs through the heart of the City Core.
- Chubba Chhu and the ‘108 Steps’ space are more tranquil places offering proximity to nature and water and significant numbers of mature trees. These are identified as ‘Valley Parks’ within the TSP 2023 and will provide access to the mountainsides to the west of the city.
- The Happiness Gardens to the north of the City Core will form the first of the Royal Parks and pedestrian connections to the Tashichho Dzong.
- Well-established, mature willow trees mark the paths of open and culverted streams and provide moments of ecology and shade.

- Opportunity to improve public access to the riverside and draw its qualities (noise, cooling and ecology) into new public spaces.
- Opportunity to improve access to the Chubba Chhu and ‘108 Steps’ Valley Parks and maintain their natural and more tranquil qualities.
- Opportunity to improve walking connections between the City Core and the Happiness Gardens to ensure it becomes part of the City Core experience.
- Opportunity to retain existing mature trees to maintain ecologies, provide shade and contribute to identity.
- Opportunity to retain and build upon existing ecologies to bring nature and its qualities throughout the City Core.

LAND USE



ASSETS

- Buzz and activity in many places, including Norzin Lam, the Central Farmers Market (CFM) area and the Stadium and Centenary Park area.
- Two craft markets, Kaja Throm Market and the CFM building offer a diversity of places to shop and a range of affordability.
- A vibrant evening culture around Norzin Lam and especially at Chang Lam, opposite the Stadium.
- The Stadium and Centenary Park provide a city-wide and national-level sports and recreation destination.
- Significant cultural facilities are located within the City Core - the Textile Museum, the Centre for Performing Arts, VAST and the City Cinema.

OPPORTUNITIES

- Opportunity to build on existing activities within the City Core to provide a range of activities, a range of experiences and a range of facilities to support the cultural life of the City.
- Opportunity to cluster similar or supporting uses together to form different types of anchors and destinations within the City Core.
- Opportunity to connect a range of smaller destinations and activity clusters through a network of vibrant and safe walking streets and pathways.

HERITAGE



ASSETS

- A well-preserved traditional wooden bridge adjacent to the Central Farmers Market - and a vital pedestrian link across the river.
- The National Memorial Chorten is a national heritage asset, but also a cultural destination for the city.
- Close proximity to Tashichho Dzong, the proposed Happiness Gardens and the cultural landscapes north of Chubba Chhu.
- The historic Archery Ground showcases the national sport in the heart of the City Core.
- A series of locally important heritage assets are located in the City Core - the Zangdok Pelri Lhakhang, the city gates and other chortens marking important locations.

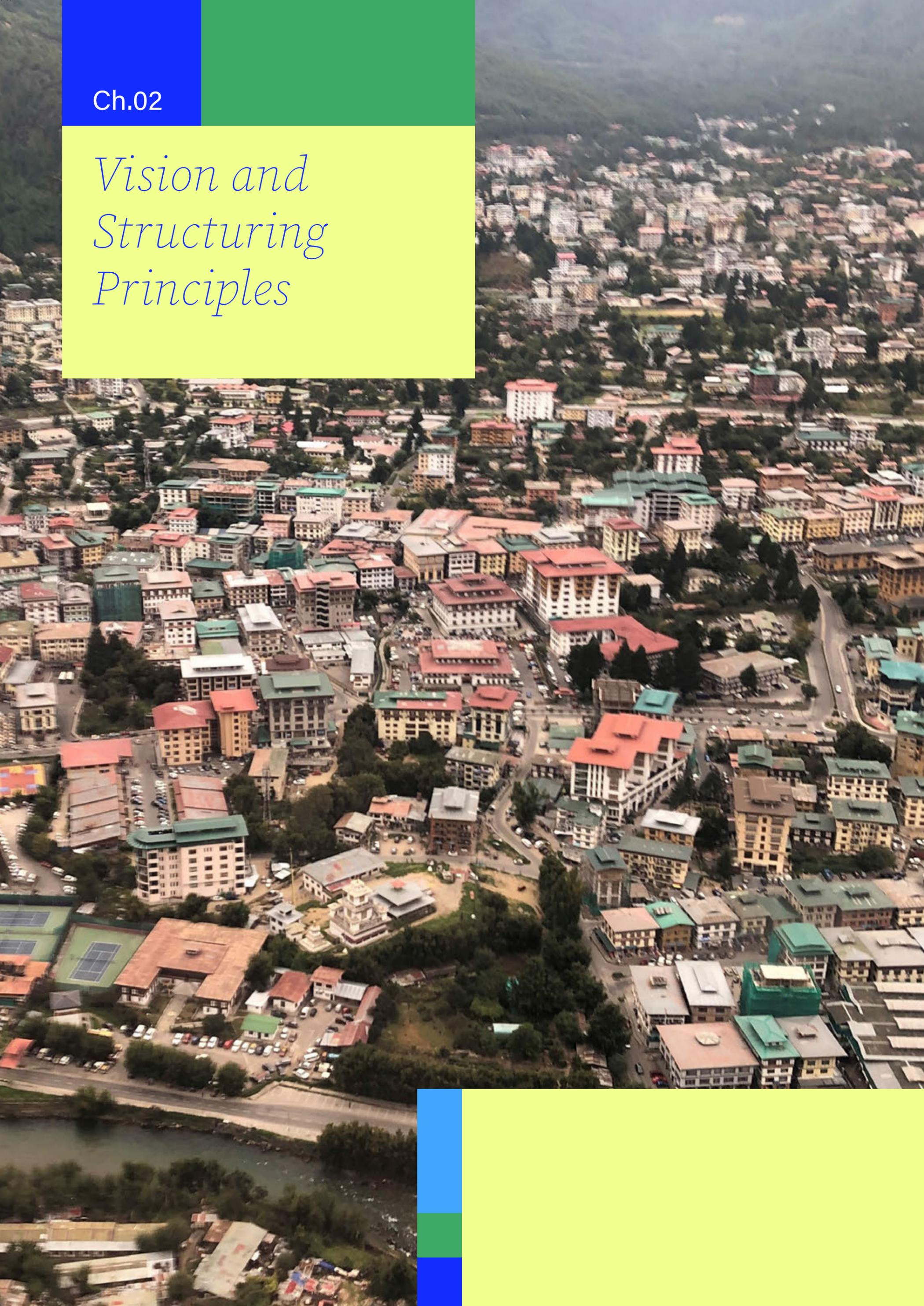
OPPORTUNITIES

- Opportunity to improve the settings of heritage assets through a new public realm and where possible through new, sensitive development.
- Opportunity to improve views to heritage assets, most importantly to the National Memorial Chorten.
- Opportunity to improve access to heritage assets, incorporating them within a new urban structure that integrates these assets into daily life.
- Opportunity to re-discover and celebrate the more hidden heritage elements and reform the relationships between them and their associations to the natural systems.

For more information, please refer to the Appendix of this CCAP document.

Ch.02

*Vision and
Structuring
Principles*



2.1 Vision for the City Core

2.1.1 Gross National Happiness within the Doughnut

WHAT IS GNH WITHIN THE DOUGHNUT?

The long-term vision for Thimphu is underpinned by the concept of Gross National Happiness within the Doughnut of social foundation and ecological ceiling ('GNH within the Doughnut'). The Doughnut Economics Action Lab (DEAL) has worked collaboratively with the Ministry of Infrastructure and Transport (MoIT) and the Centre of Bhutan Studies to develop the vision and potential performance framework.

The vision for the City Core is set out below and is organised under four vision principles developed for the city as a whole.

Social Foundation

Defining the social foundation can be explored by questioning:

- What would it mean for the people of Thimphu to thrive?
- What is Thimphu's impact on the well-being of people worldwide?

Thimphu's population growth ceiling is set within the socially just and ecologically safe space defined by the 'GNH within the Doughnut' Vision. In other words, population can only grow as long as everyone's social foundation needs can be met without depleting natural resources.

The CCAP explores the Social Foundation parameters through the following themes:

- Urban Structure;
- Protections;
- Green Infrastructure;
- Transport;
- Utility Infrastructure.

Ecological Ceiling

Defining the ecological ceiling can be explored by questioning:

- What would it mean for Thimphu to thrive within its natural habitat?
- What would it mean for Thimphu to respect the health of the whole planet?

The CCAP explores the Ecological Ceiling limits through the following themes:

- Green Infrastructure;
- Protections;
- Transport;
- Utility Infrastructure.

For more information, please refer to the *Thimphu Structure Plan, Part A: Chapter 3*

Create Opportunity

foster prosperity, support livelihoods and be governed with wisdom and compassion.

The City Core has the ingredients for an inspiring, active and thriving centre for the city and the country.

The vision is to intensify activities and make the City Core the heart of economic opportunity where entrepreneurship can thrive. Urban land within the City Core will be better utilised and regenerated, creating uniquely Bhutanese places where opportunity exists for all kinds of people to live, work, play and relax in close proximity. Existing activity will be reinforced and augmented to create diverse and fulfilling livelihoods embedded in strong economic ecosystems, ensuring economic resilience, adaptability and flexibility into the future.

Nurture Community

neighbourhoods that are diverse, equitable and friendly and support health and well-being at all life phases.

The communal life found in the villages is a cherished part of the Bhutanese culture.

The vision is to nurture new urban communities within the City Core and provide a template for living well in urban Bhutan. We want to ensure that connections between different people, different places and all possibilities are strongly formed. Resilient, inclusive, affordable, and accessible urban communities will be built within new Living Neighbourhoods. These urban places will demonstrate ways of living within neighbourhoods that are mixed, multi-generational and well-balanced, supporting increased liveability, conviviality and the health and well-being of the people.



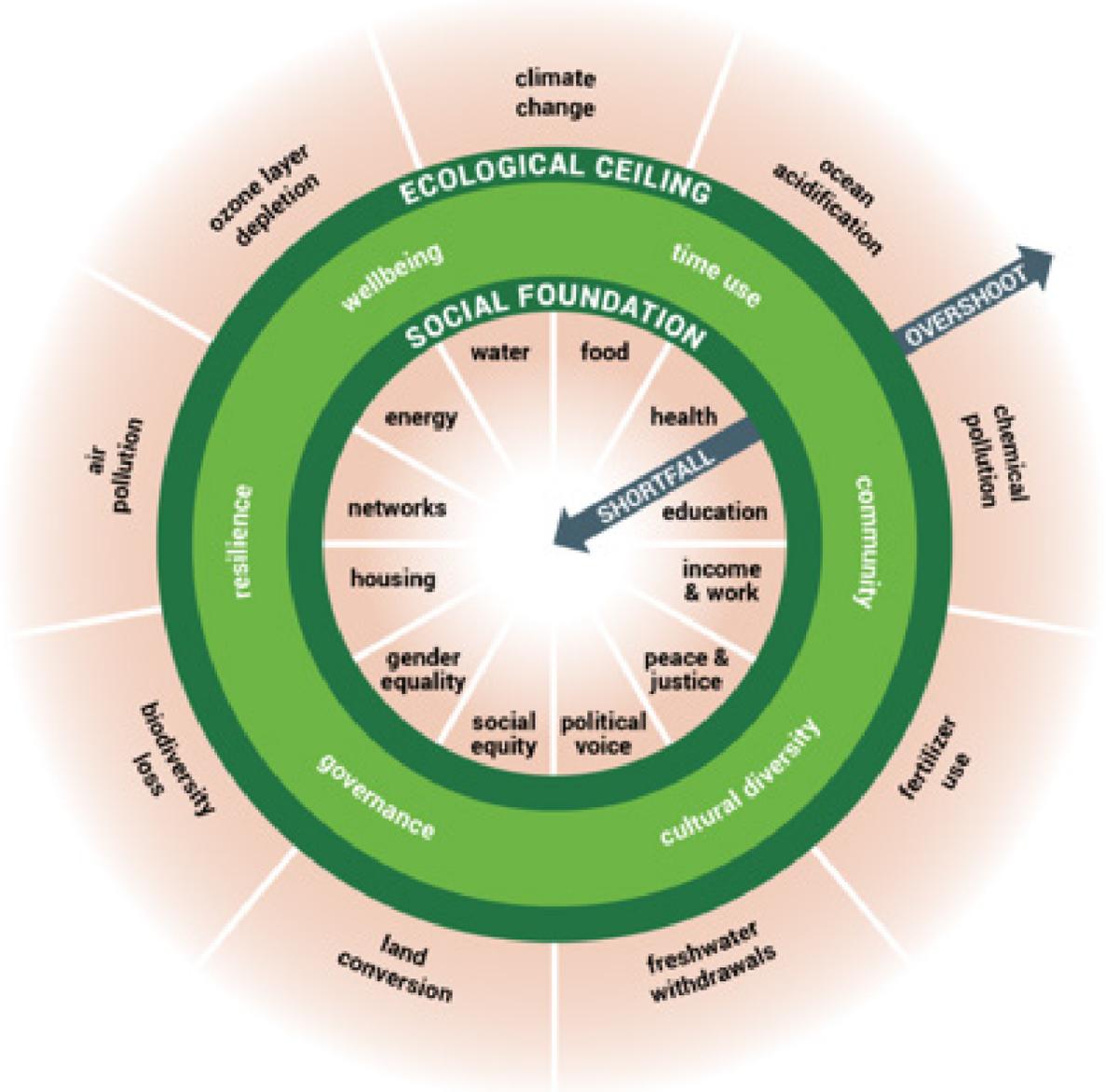
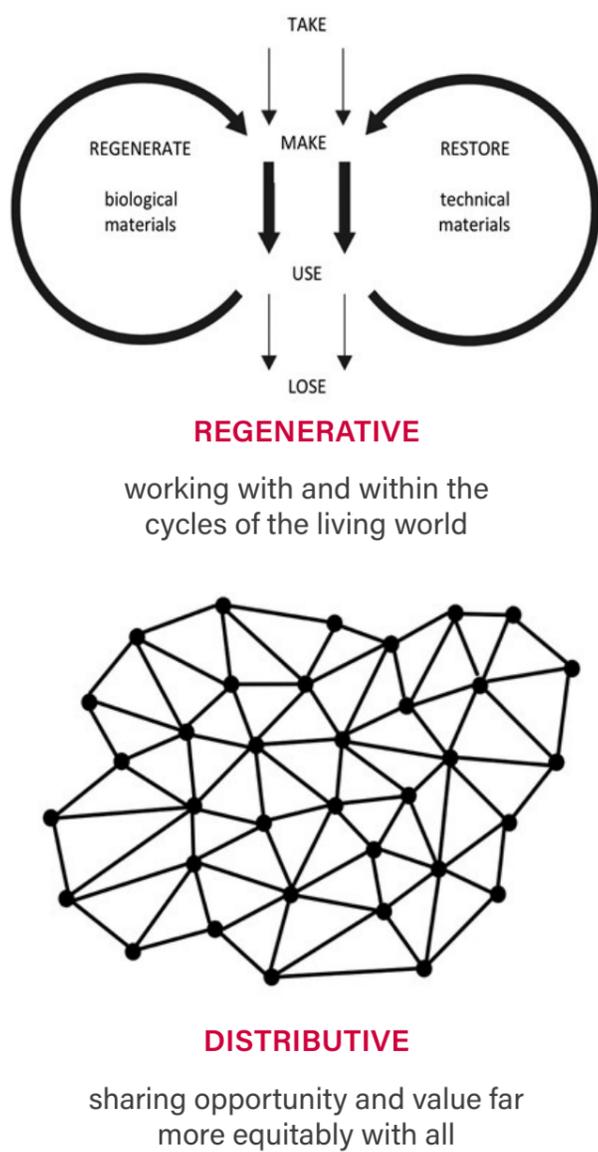


Figure 2.1 Doughnut Economy Model

Cultivate Balance balance between tradition and modernity, rural and urban and the natural environment, heritage and prosperity.

The car has taken over the public realm in the City Core, the inherent blue and green networks and the settings of nationally important and locally loved heritage have been degraded.

The vision, in this place where people, pedestrian activity, events and gatherings should dominate, is to re-prioritise the streets and spaces for people, revitalise public transport and create places for people to come together. The natural green and blue assets will be improved and stitched together to elevate their value and build a more sustainable future. Nature will be invited back into the City Core. City-scale uses will be set within this new green, pedestrian network to build social cohesion and enhance urban lives.



Inspire enrich spirituality and culture and function as a model for sustainable development.

Bhutan has a unique heritage and culture embedded in the principles of community, peace, happiness and sustainability. The Thimphu City Core is already home to several natural and cultural features and activities that make the city meaningful.

The vision is to protect and showcase these distinctive practices and features and make them an integral part of the daily experience of the City Core while contributing to the creation of legible, unique and characterful urban areas. The more intangible everyday culture of the city will be showcased within a new civic, public realm that encourages conviviality and shared responsibility and reflects on the unique Bhutanese way of life.



2.1.2 Its a Capital City!

WHAT MAKES A CAPITAL CITY?

As the capital city of Bhutan, Thimphu and its centre naturally holds a special position for the country. Part of developing a vision for the city core is understanding what makes capital cities different to other cities.

The 'Tangible':

Capital cities tend to have internationally and nationally important institutions located within them, such as:

- National government and governance.
- National and international institutions.
- World-class museums and galleries.
- Headquarters of national and international commerce.
- National Media.
- Universities, Centres of Excellence.

And the the 'Intangible':

These cities are important in the minds of a nation's citizens, reflecting their culture, heritage, history and pride. For those coming from the outside, capital cities and their centres showcase a country's cultural and national identity. They tend to host important more 'intangible' elements of a country such as:

- Collective history, tradition and remembrance;
- Symbolic, iconic elements;
- Royalty;
- National pride and identity;
- Ceremonial, a stage for national events;
- The showcase of the nation - diverse, open and welcoming;
- The theatre for national discussions, freedom of expression and change.

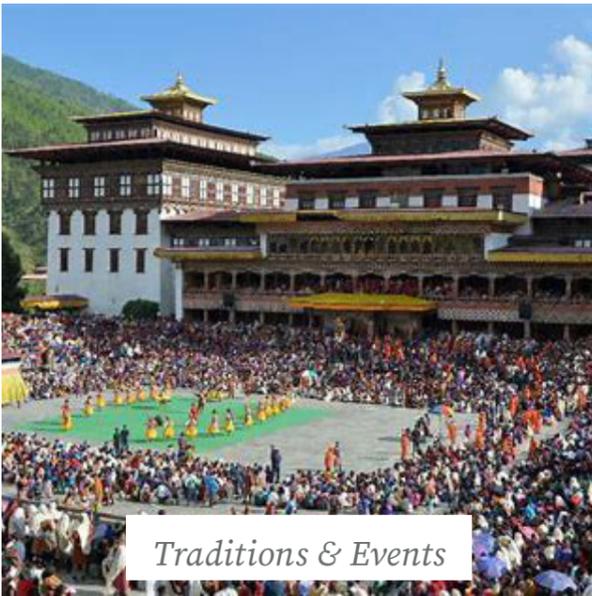
Vision Workshop

To understand more about the city and how it fulfils its role as the Capital of Bhutan a Visioning Workshop was held to listen to stakeholders and the client team (as citizens) about how they feel about their city.

A key question was asked:

What's missing in the City Core?:

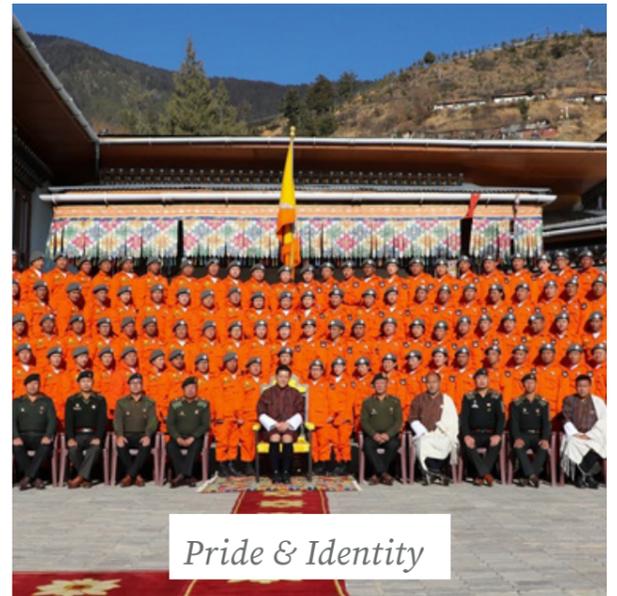
- a lack of green areas within the city that are safe and insufficient access to landscapes outside the City Core.
- a lack of good pedestrian connections, public realm and public transport accessibility.
- a lack of affordability of housing and liveability.
- not family friendly or inclusive enough.
- a lack of well-functioning infrastructure and utilities.



Traditions & Events



Galleries & Museums



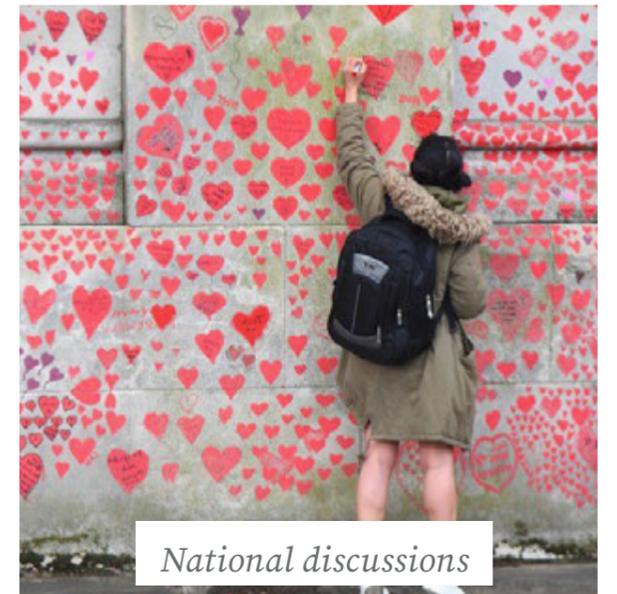
Pride & Identity



Centres of Excellence



National Sports



National discussions

CHARACTER - THE 'CAPITAL CITY CENTRE'

TSP 2023 has developed and defined a new spatial structure for the city which concentrates growth mainly into the existing urban areas. In response to the current visual homogeneity and continuous linear nature of the urban environment, the TSP 2023 then sets an ambition to establish 'Five Places within the City.'

Each place is characterised by distinct identities, informed by their specific contexts and emerging economies, population and activities. Landscape corridors of varying character will traverse the valley and strongly define the extent of each of the Five Places.

The CCAP area falls within one of the Five Places - 'Central Thimphu' - an area that incorporates the extended City Core as well as neighbourhoods such as a Motithang, Yangchenphug and Changzamtog.

In addition, a spatial element has been overlaid over the Five Places and defined as the 'Capital City Centre.' This element incorporates the commercial City Core area that this document is focussed on, as well as the landscapes, governmental institutions and national landmarks located to the north.

The 'Capital City Centre' will provide a national identity and contribute to the image of the country for the outside world. It will be Thimphu's primary centre for commerce, its engine for economic growth as well as the focus for shopping, street life and cultural and leisure activities. Importantly, it is also the governmental, legislative, religious and symbolic heart of Bhutan.

Within the 'Capital City Centre,' the role of the City Core is to act as a catalyst for growth and positive change, sharing its prosperity across the city, and establishing the 'Capital City Centre' as a vibrant, varied place for the Bhutanese and international visitors to come together and enjoy.

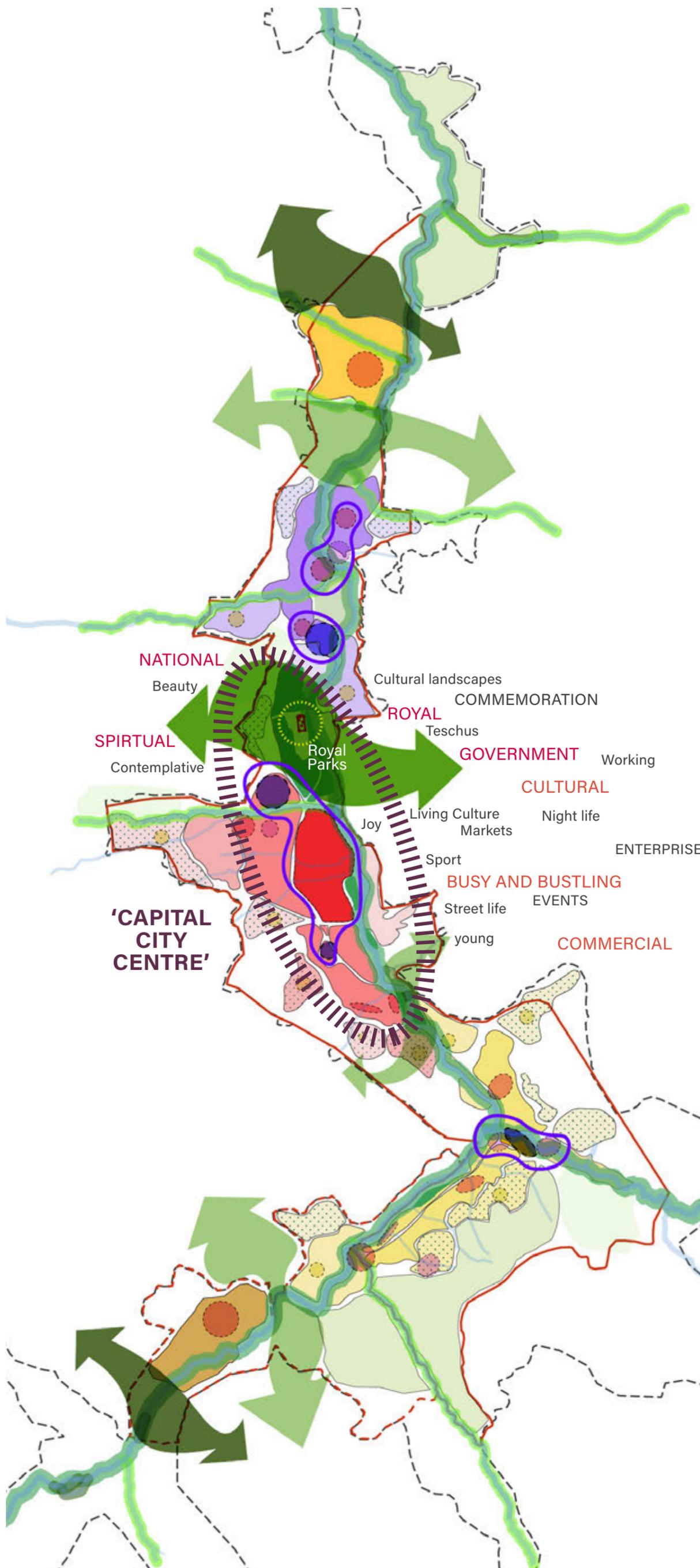


Figure 2.2 The 'Capital City Centre' - the heart of Bhutan

2.2 Structuring Principles

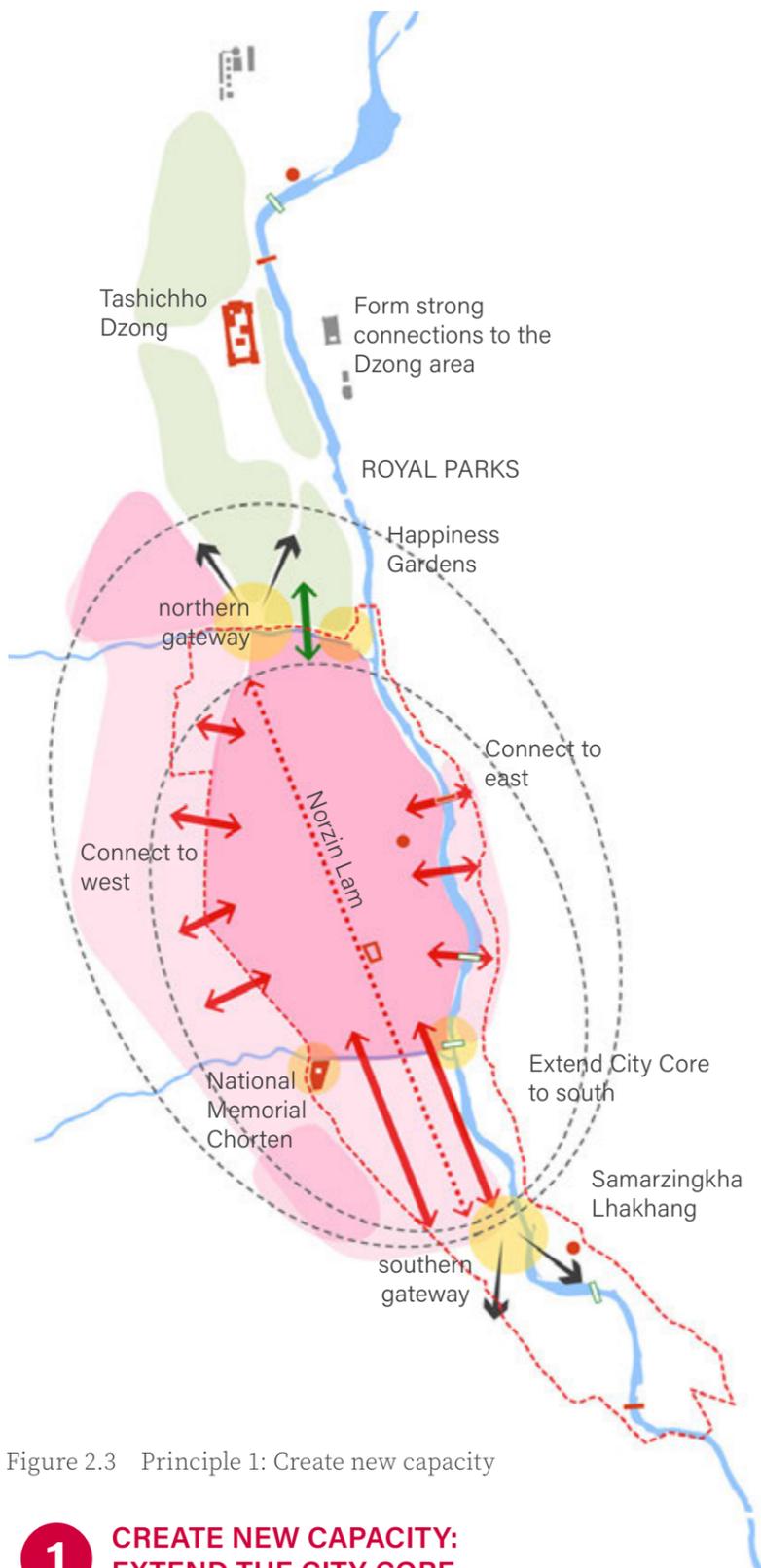


Figure 2.3 Principle 1: Create new capacity

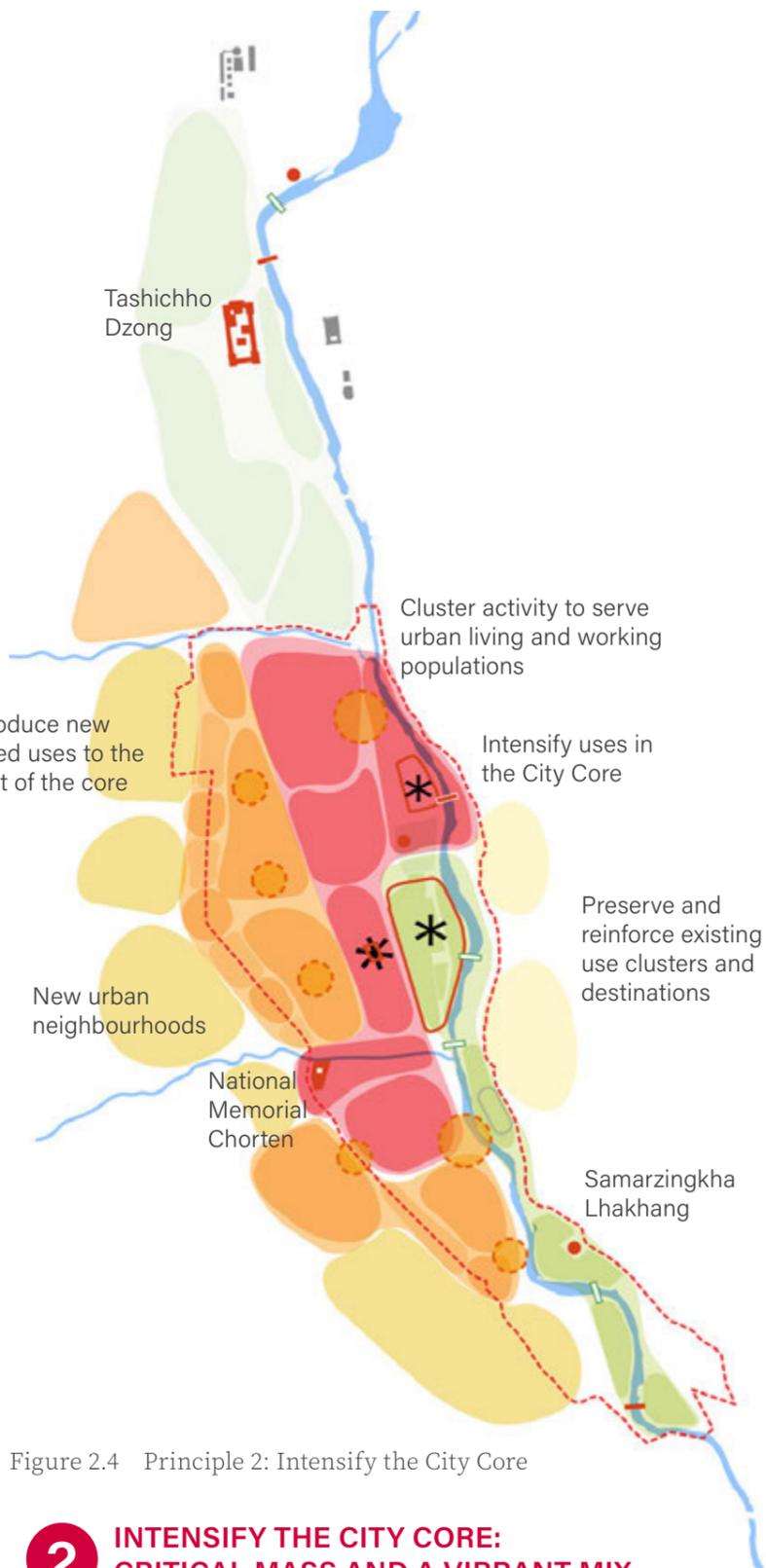


Figure 2.4 Principle 2: Intensify the City Core

1 CREATE NEW CAPACITY: EXTEND THE CITY CORE

- An extended City Core will create new capacity for future growth, without adding pressure to existing higher density areas.
- Improved connections will support the intensification of land uses and economic activity beyond the existing City Core neighbourhood boundary, and integrate the City Core to the river front and proposed major open spaces to the north.
- Form a 15 minute walkable City Core with Clock Tower Square at its centre.
- Form new legibility and identity for the City Core - key gateways and nodes, such as major road intersections and heritage sites, can begin to mark the new extents of the City Core - strengthening its identity as a place within the city.

2 INTENSIFY THE CITY CORE: CRITICAL MASS AND A VIBRANT MIX

- A vibrant, accessible, mixed use core with diverse employment opportunities and lifestyle choices will encourage urban living within the City Core.
- Form intensive and inclusive living and working urban neighbourhoods with critical mass to ensure the City Core is active and feels safe at different times of the day and the week.
- Provide convenient, walkable access to employment, daily needs, social infrastructure and community amenities to reduce the need for travel.
- Encourage additional economic activity, including small enterprise at the Market and creative industries at the proposed Cultural Quarter, supported by higher public transport accessibility and increased footfall.
- Introduce additional office clusters within the City Core, intermingled within the new living communities, to accommodate potential growth in services sector identified within the TSP 2023.

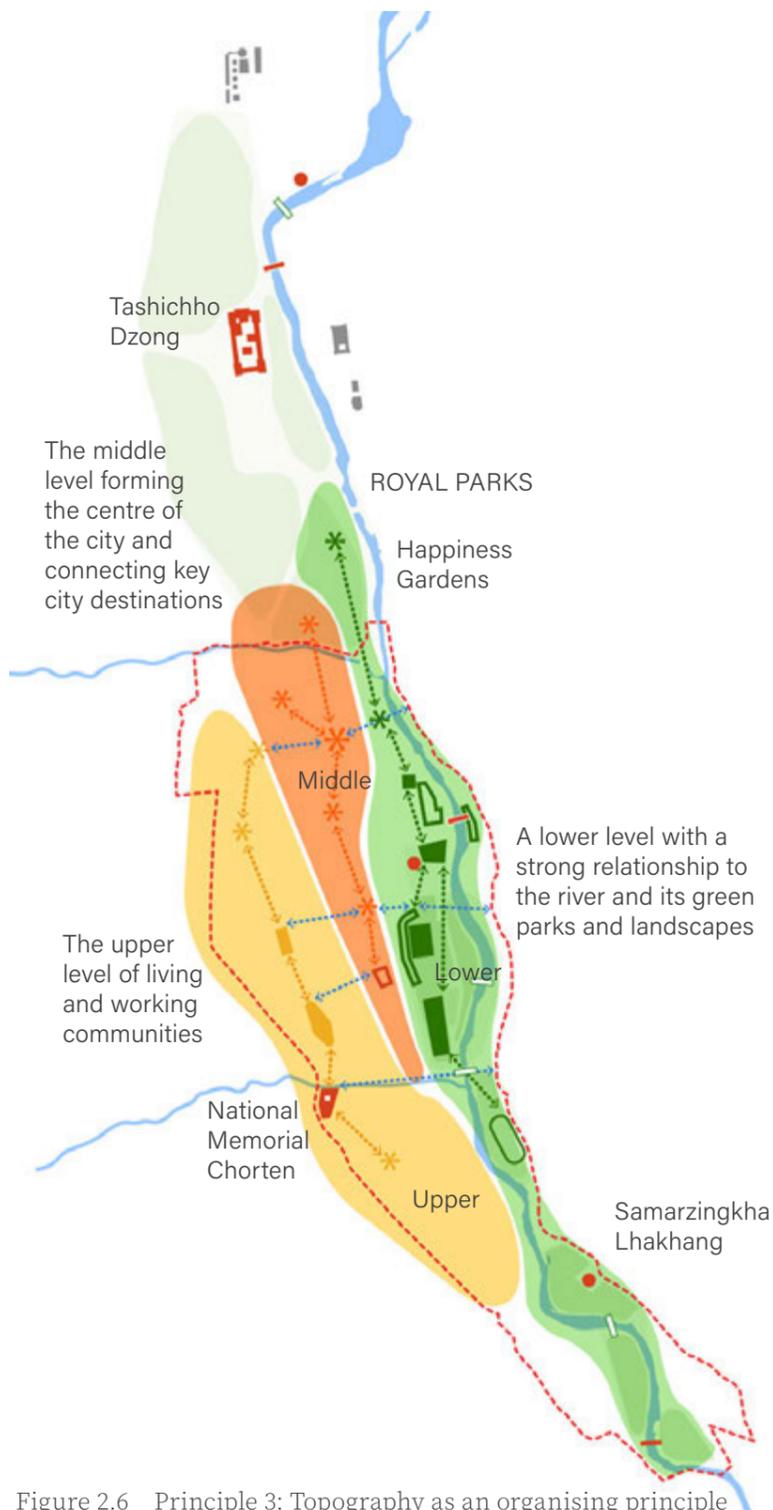


Figure 2.6 Principle 3: Topography as an organising principle

3 TOPOGRAPHY AS AN ORGANISING PRINCIPLE: STRUCTURE THE NORTH-SOUTH TERRACES

- The topography of the valley can be used to define a north-south running 'system' across the Core - a lower level zone along the Wangchhu, a middle level zone around Norzin Lam and an upper zone which reaches the Royal Boulevard.
- These three zones can begin to define more fine-grained character areas and structure a connected sequence of new and existing public spaces, heritage assets and destinations.
- The lower level zone, which will have a predominantly green character, meanders along the river, connecting the Central City Parks and Royal Parks to the markets and neighbourhood parks to the south.
- The middle level, which will contain the most active places within the city, offers a north-south walking route connecting Clock Tower Square, the Cultural Quarter and the Royal Parks.
- The upper level provides connections between a series of local parks and community gardens, squares and play areas within the new urban neighbourhoods.
- These three systems can offer three different experiences for walking and exploring the City Core.

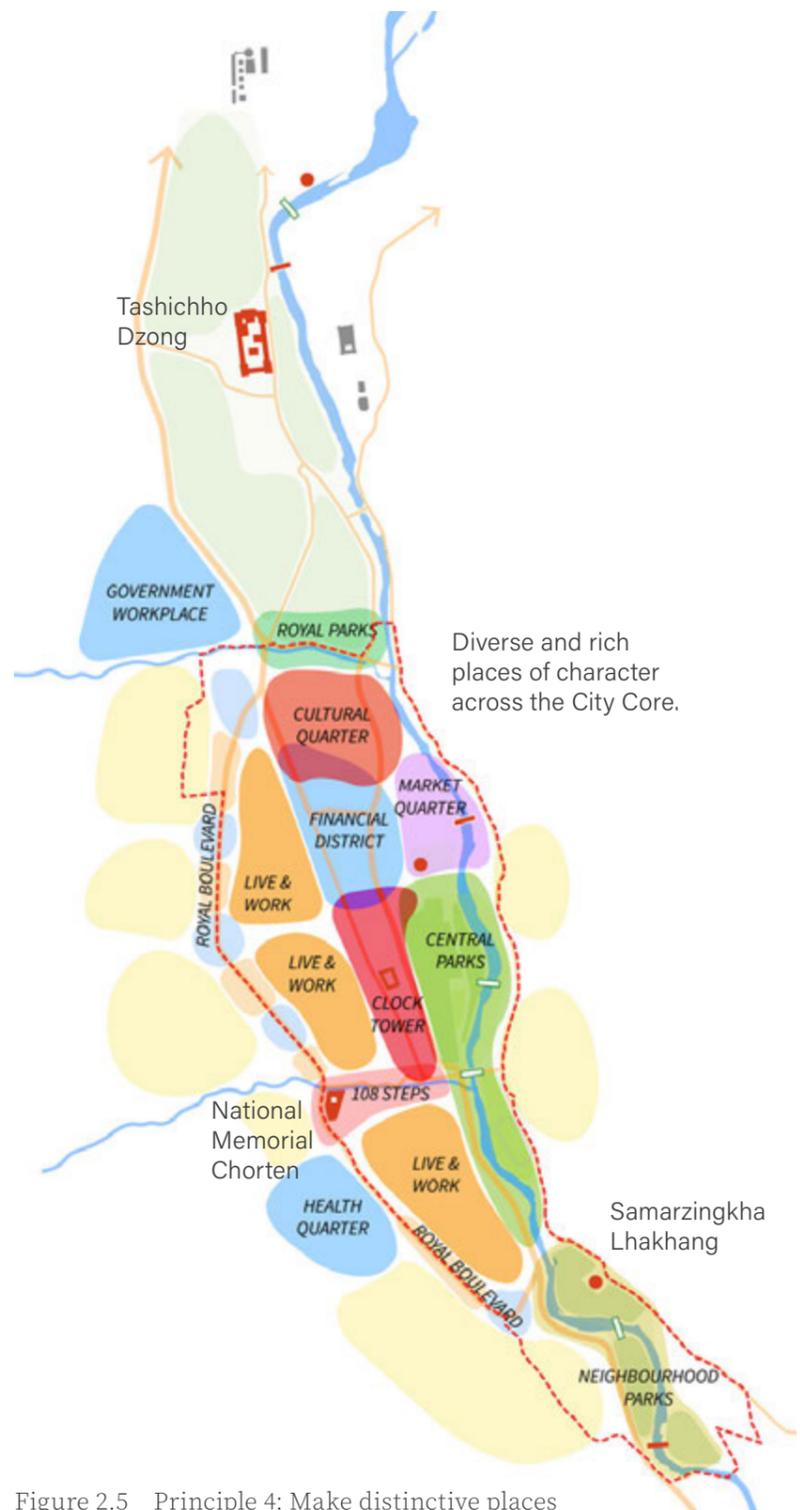


Figure 2.5 Principle 4: Make distinctive places

4 MAKE DISTINCTIVE PLACES: A DIVERSE CAPITAL CITY CENTRE

A series of character areas can be loosely formed within the City Core. These areas provide:

- a unique sense of place, providing a diversity of exciting destinations for residents, visitors and workers to explore.
- a series of differing urban experiences adding to the richness of the City Core.
- increased legibility as character and activity varies in the City Core.
- create 'place' and identity through the City Core, and offer choice to the resident, worker, visitor or tourist.
- Character areas are based on the type of uses that predominate e.g. the Market Quarter is characterised by the CFM building and other traders within the adjacent streets. For each, additional, related economic activity will be encouraged and supported to create thriving places and lives.
- Predominant uses would not be exclusive to an area and would be supported by other types of uses such as shops, cafés, small business and housing.
- Public realm treatment and potentially treatment of some of the building types, built form and materiality could be used to support the diversity of the character areas.

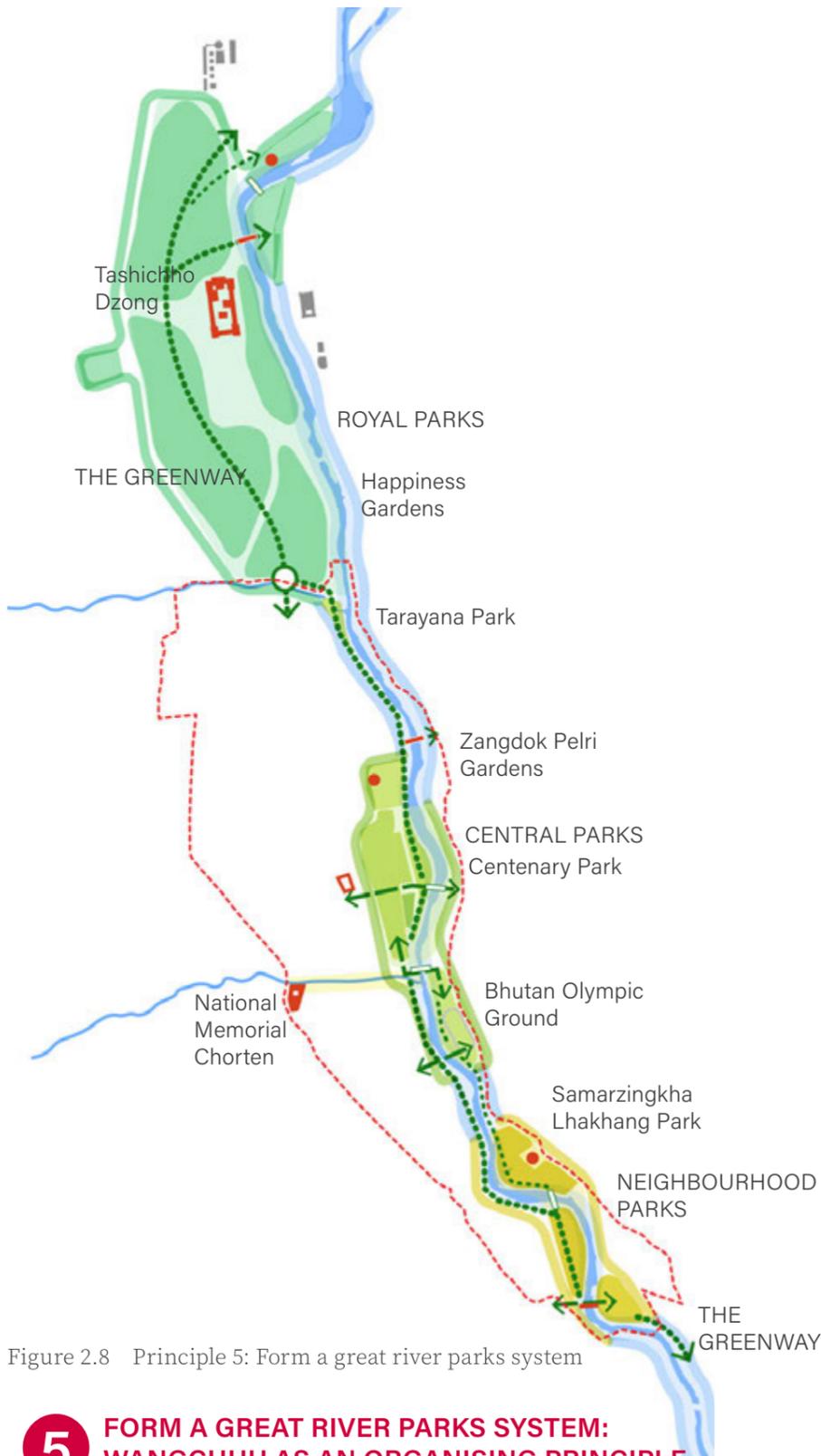


Figure 2.8 Principle 5: Form a great river parks system

5 FORM A GREAT RIVER PARKS SYSTEM: WANGCHHU AS AN ORGANISING PRINCIPLE

- The Wangchhu 'Greenway' organises a sequence of open spaces and heritage assets at three different scales: from the Royal Parks, (a future national asset) to the Central Parks (a resource for the city), to smaller and more local Neighbourhood Parks to the south.
- The Central Parks can be a city-wide asset with spaces for leisure, sports and recreation, contemplation, events, performance and pop up exhibitions. Zangdok Pelri Gardens and the Bhutan Olympic Ground are upgraded and integrated into the Central Parks.
- The 'River Parks' collectively define a protective buffer, restricting urban development within floodable areas and natural habitats.
- The Samarzingkha Lhakhang will have an improved setting, with a new landscape that connects to the 'Neighbourhood Parks' system at Changzamtog through new pedestrian bridges across the Wangchhu.



Figure 2.7 Principle 6: Enhance east-west walkable links

6 ENHANCE EAST-WEST WALKABLE LINKS: REVEAL AND REBALANCE NATURE

- 'Green Streams': revealing and celebrating waterways as part of a rich blue-green network. Culverted streams can be daylighted and restored to more natural conditions, retaining mature Willow trees.
- Heritage assets are integrated along the east-west 'Green Streams' making their presence an important part of the everyday experience.
- Forests and nature beyond the urban area can be linked to the City Core with connected ecological planting along east-west corridors.
- Improved and new walking routes, as well as new pedestrian bridges across the Wangchhu, create a connected and continuous public realm that stitches the east and west banks of the river and connect to routes and trails within the forest.
- Create uninterrupted walking and cycling routes that connect the upper neighbourhoods to the river.
- New local parks and small open spaces can be located adjacent to and associated with the east-west 'Green Streams', providing green spaces where communities can come together.
- Sustainable Urban Drainage Systems (SuDS) should form a key design feature, integrating green infrastructure and natural drainage solutions.

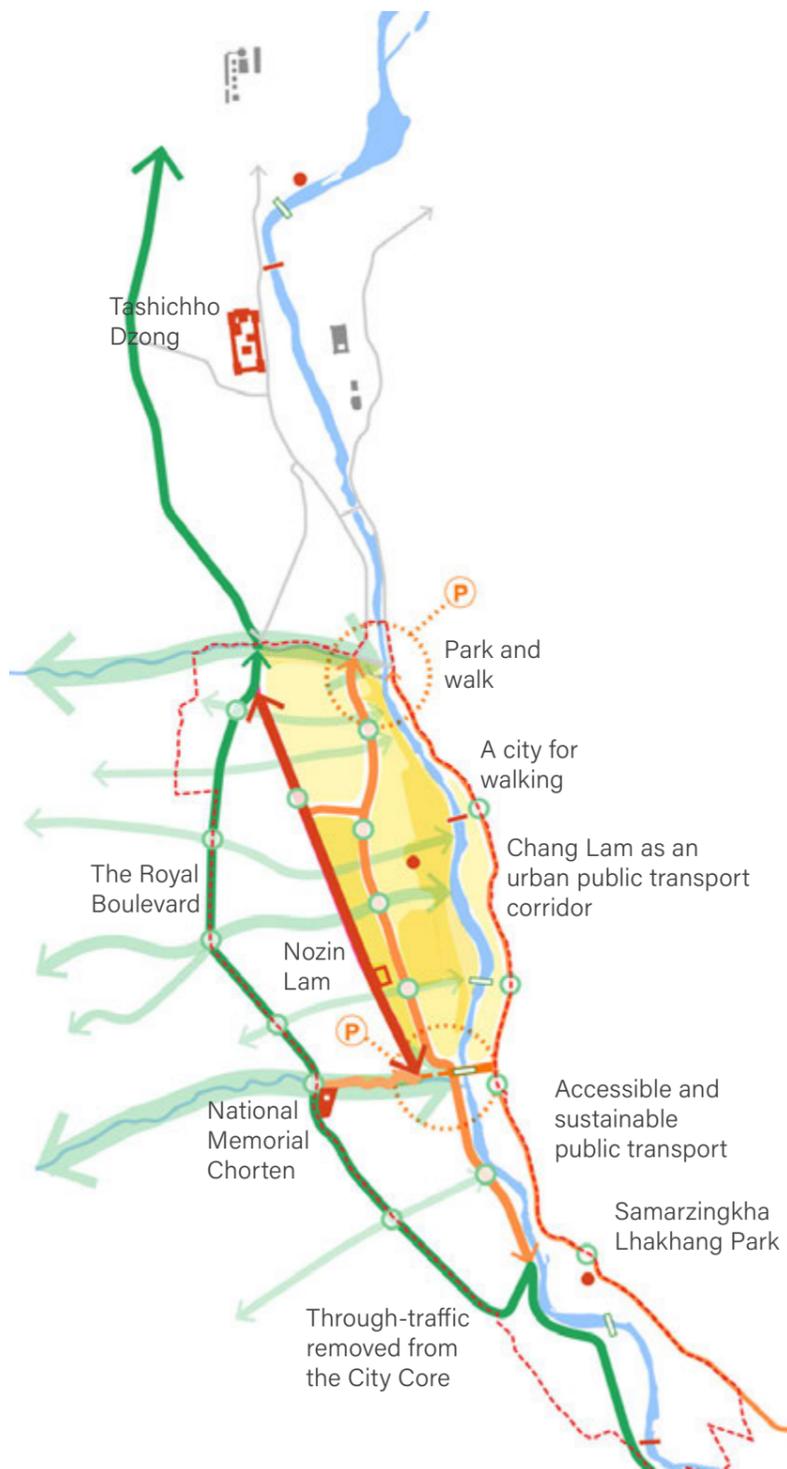


Figure 2.9 Principle 7: Make great streets and spaces for people

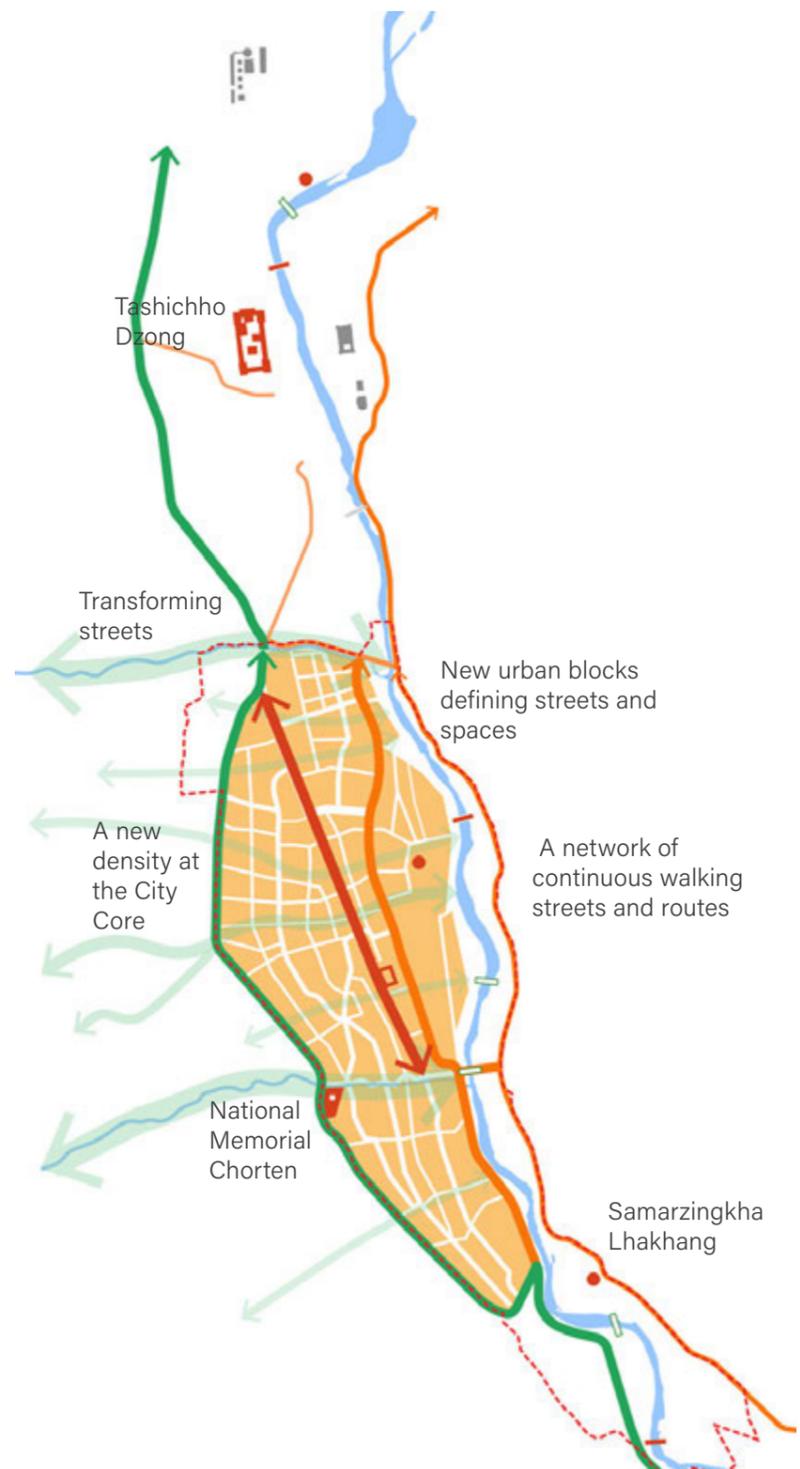


Figure 2.10 Principle 8: Optimise urban blocks to enable regeneration

7 MAKE GREAT STREETS AND SPACES FOR PEOPLE: CHANGE THE WAY WE MOVE

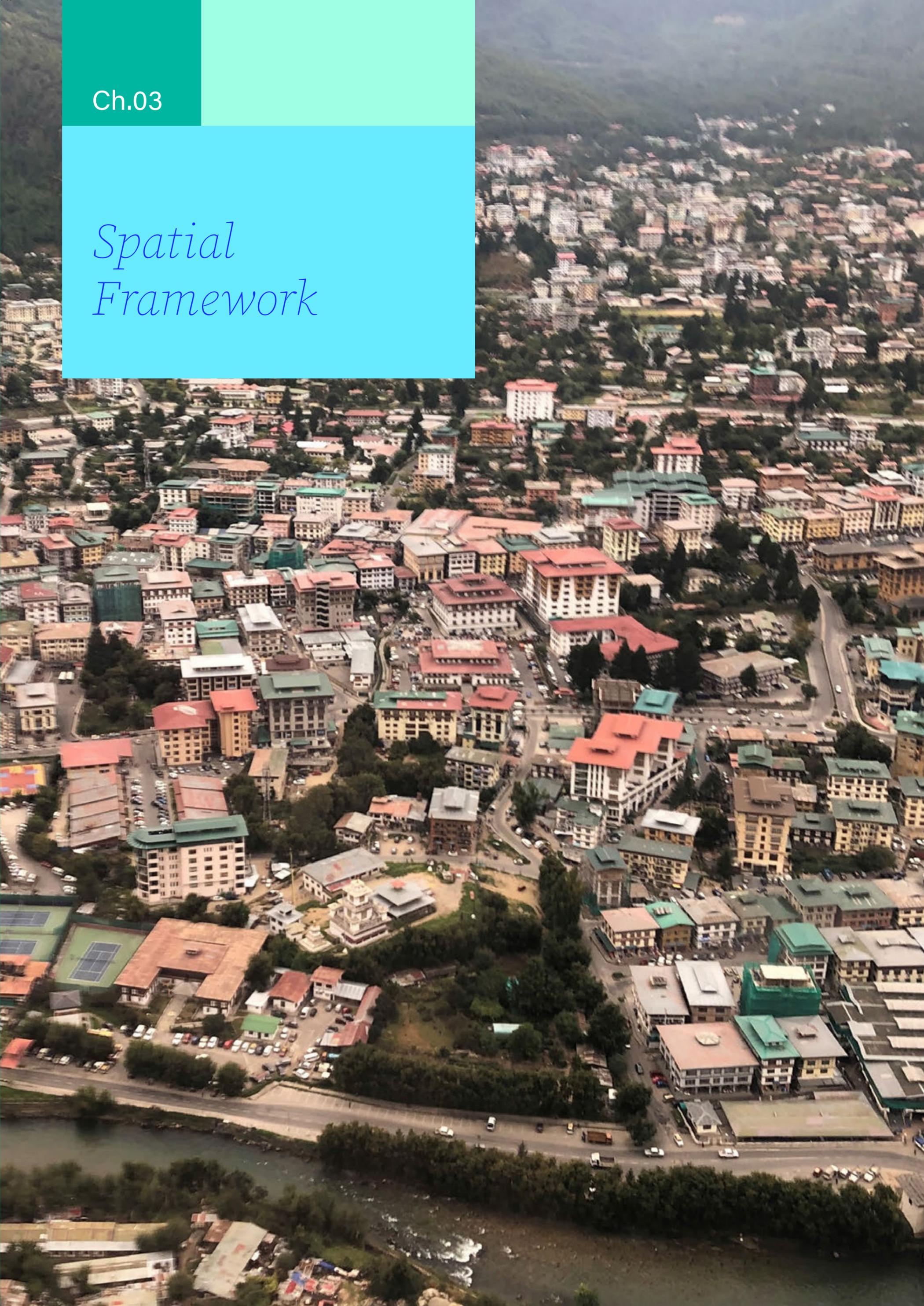
- Rebalance the public realm in favour of walking and cycling.
- Transform key north-south routes into three great urban streets, designed as public spaces as well as channels for movement.
- Transform Doebum Lam into the 'Royal Boulevard' - a great, green street that connects the whole city from north to south.
- Through-traffic will be encouraged away from the central City Core, taking the western route along the 'Royal Boulevard' or the eastern road, east of the river, so creating pedestrian priority areas and reducing traffic congestion in the heart of the city.
- Encourage public transport connections to the rest of the city and a 'park and walk' strategy with strategic locations for parking clusters and mobility hubs.
- New pedestrian crossings and bus stops are relocated along strong pedestrian desire lines to provide access to key destinations.

8 OPTIMISE URBAN BLOCKS TO ENABLE REGENERATION: A NEW WAY OF BUILDING

- Create a legible, finer-grain street network and an optimized urban block structure to bring new density of development to the City Core.
- Provide well-proportioned urban blocks to enable a new way of building, with development fronting streets and forming coherent edges and a definition between public and private realms.
- A finer-grain urban structure will improve the City Core's walkability and pedestrian experience, and reduce car dependency.
- Repair the street network, forming strong, continuous connections across the City Core that reduces congestion and improves accessibility and permeability.
- Introduce a new road hierarchy classification that brings clarity to users, differentiating between primary, secondary, tertiary and routes.

Ch.03

*Spatial
Framework*



3.1 Overview

3.1.1 Purpose and Content

THE SPATIAL FRAMEWORK

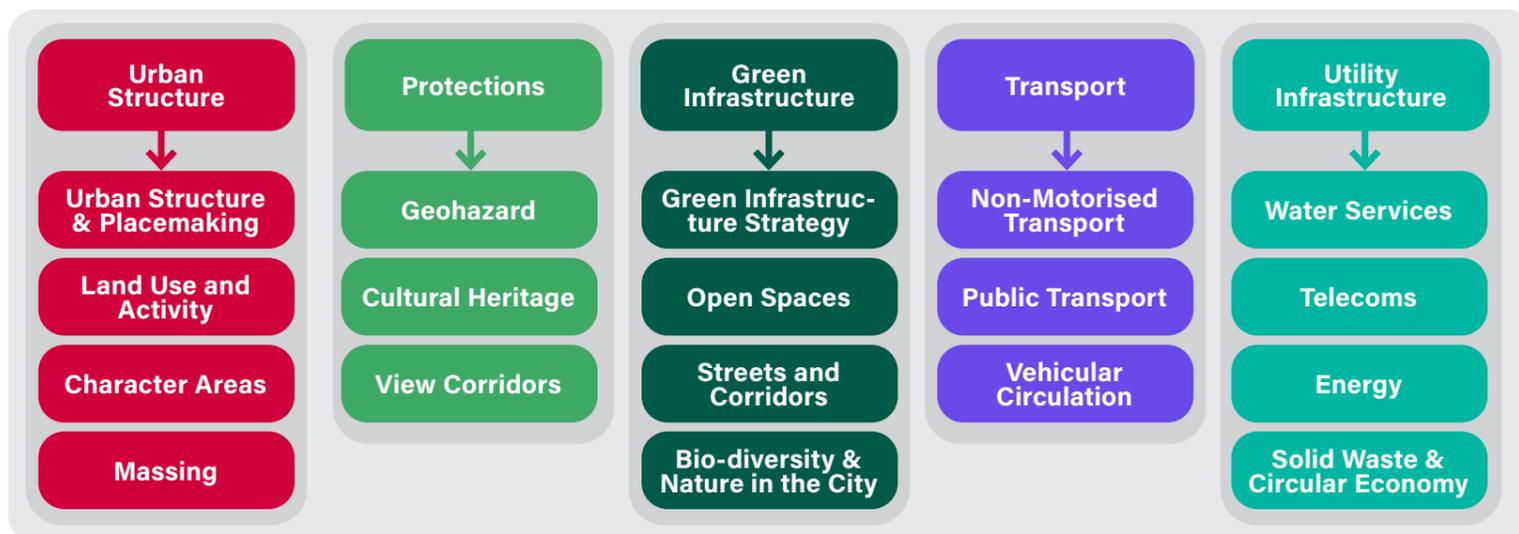
The following pages set out the strategic design considerations for the City Core area. Presented on the following pages are a series of plan diagrams or 'Framework Layers' that illustrate and describe the aspirations and interventions for Urban Structure, Protections, Green Infrastructure, Transport and Utilities within the City Core

Together these form the Spatial Framework for development within the key areas of change within the City Core, and this information provides the main components guiding its future growth.

The diagrams and the associated Objectives, Principles and Interventions should be used in combination to shape and guide development and inform design responses within the City Core.

The 'Framework Layers' are organised in a similar way to the TSP 2023, as outlined below.

Chapter 3: Spatial Framework



The Spatial Framework is formed of a series of 'Framework Layers' organised under the relevant 'Key Elements' of the Structure Plan. Read together these provide the strategic spatial interventions across the City Core.

Utility
Infrastructure

Transport

Green
Infrastructure

Protections

Urban
Structure



3.1.2 Defining 'Areas of Change'

STRATEGIC SITES

The Thimphu-Paro Regional Strategy (2022) identified Strategic Sites for re-development across the city. These sites are under public ownership and are greater than 0.5 hectares. The sites were assessed and rated according to a Red-Amber-Green (RAG) assessment of development potential, describing sites as:

- Red: unsuitable without major investment (potential long-term opportunity);
- Amber: suitable but with some constraints and/or investment requirements (potential medium-term opportunity);
- Green: suitable for development with limited constraints or immediate investment requirements (potential short-term opportunity).

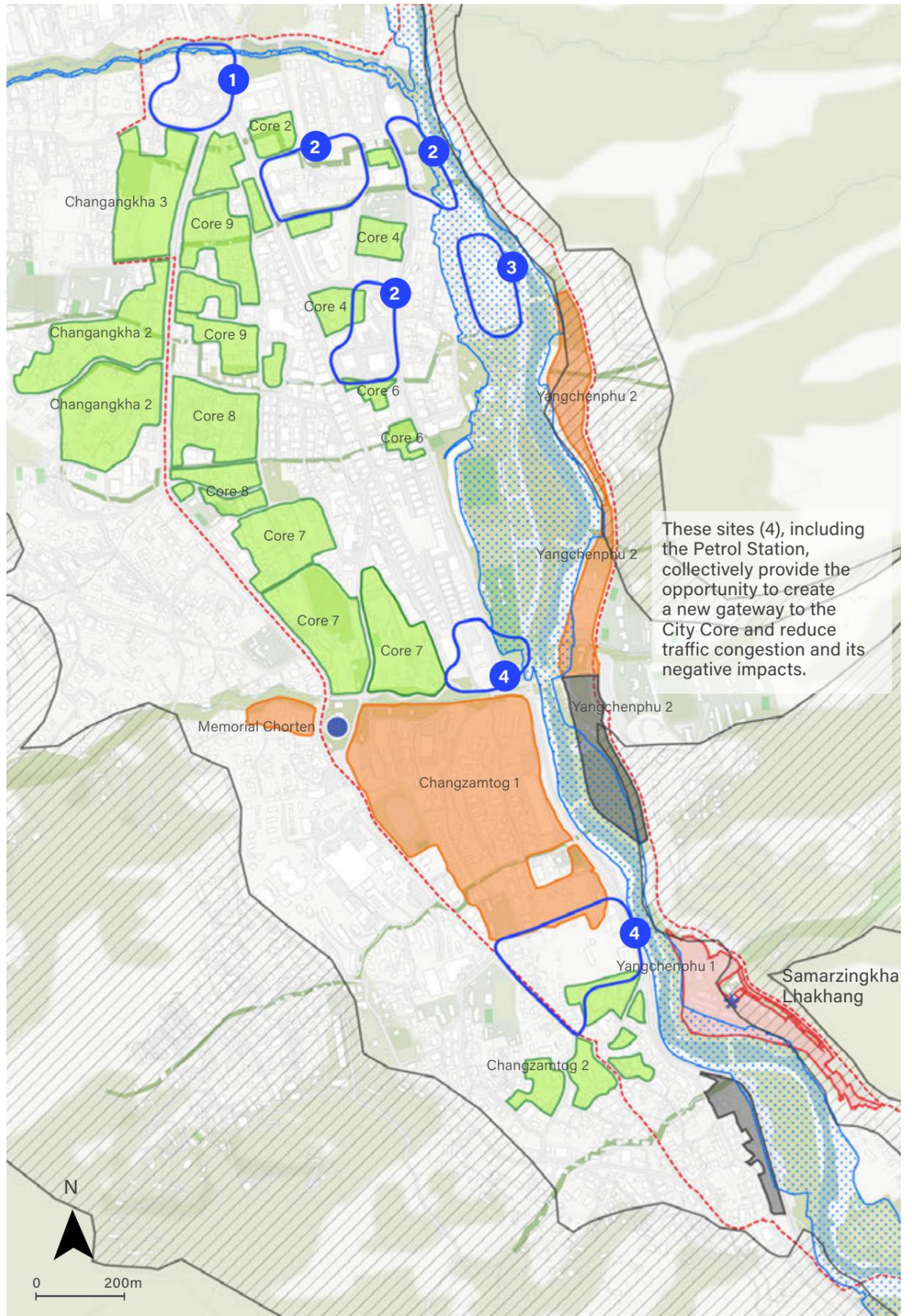
There is a concentration of 'Green' sites within the CCAP area which can unlock in the short term a significant amount of new homes and jobs. Other sites, such as the Royal Bhutan Police (RBP) compound and the Yangchenphug riverside sites, are classified as 'Amber' and can drive the extension of the City Core towards the south and to the east in a longer time frame.

At the Samarzingkha Lhakhang the Royal Bhutan Army (RBA) site provides an opportunity in the longer term to provide the Lhakhang with a more appropriate landscape setting, forming the new southern landscape 'gateway' to the City Core.

OTHER OPPORTUNITY SITES

Other sites with re-development potential that may not have met the broader criteria of the Regional Strategy selection have been identified. These are sites that could have been smaller than 0.5 hectares or under private ownership but are at critical locations. These can contribute significantly to the transformation of the City Core.

- 1 Sites under public ownership can form a northern gateway between the Royal Parks and the City Core and a transition to the adjacent employment cluster at Kawajangsa.
- 2 Sites under majority public ownership, not identified as Strategic Sites that can contribute to providing increased critical mass and additional activity in the northern part of the City Core.
- 3 Central Farmers Market (CFM) building and surrounding area can be improved to provide a better urban experience and reduced traffic congestion.
- 4 Sites under private ownership that can contribute to forming new, high-quality 'gateways' into the City Core with reduced pedestrian and transport conflicts and improved connectivity.



These sites (4), including the Petrol Station, collectively provide the opportunity to create a new gateway to the City Core and reduce traffic congestion and its negative impacts.

Figure 3.1 Strategic Sites and other development opportunity areas

| KEY | |
|---|-----------------------------------|
| | City Core Action Plan Boundary |
| | Strategic Site - RED |
| | Strategic Site - AMBER |
| | Strategic Site - GREEN |
| | Other opportunity sites |
| | Indicative High Hazard Flood Zone |
| | Indicative Landslide Hazard Zone |

3.1.3 Forming a new urban structure

URBAN BLOCK STRUCTURE

Part of the transformation of the wider city, incorporating the concept of 'Good Growth in the Right Places', is to form a more compact city consisting of a network of streets and spaces formed by a coherent urban block structure. This urban structure will provide a flexible framework for re-development over time.

An emerging block structure is drawn within the Strategic Sites and the other opportunity sites identified. This block structure is informed by the vision, aims and objectives of the City Core.

The urban blocks start to identify, with greater precision, the development areas that fall within strategic sites and other opportunity areas. And in turn, these blocks define a finer-grained street network that responds to the existing topography and ownership patterns.

Other areas within the City Core outside of the Strategic and Opportunity Sites are assumed to remain as existing in the short/medium term. However, future regeneration in these areas should conform to a new block structure, building heights and land use as defined in this document, as well as principles, guidance and requirements within the city-wide Design Code.

A new block structure to the west of Doebum Lam (and outside of the CCAP boundary) has been defined by additional typology and capacity testing studies and is included in the following spatial framework diagrams for completeness.

A few parcels to the east of the river fall outside of the flood zone but are within the Indicative Landslide Hazard Zone and classified indicatively as Medium Hazard Risk. However, these parcels remain shown in this spatial framework plans to demonstrate the extent of development opportunity here if the required assessments identifies mitigations that will allow development to take place.

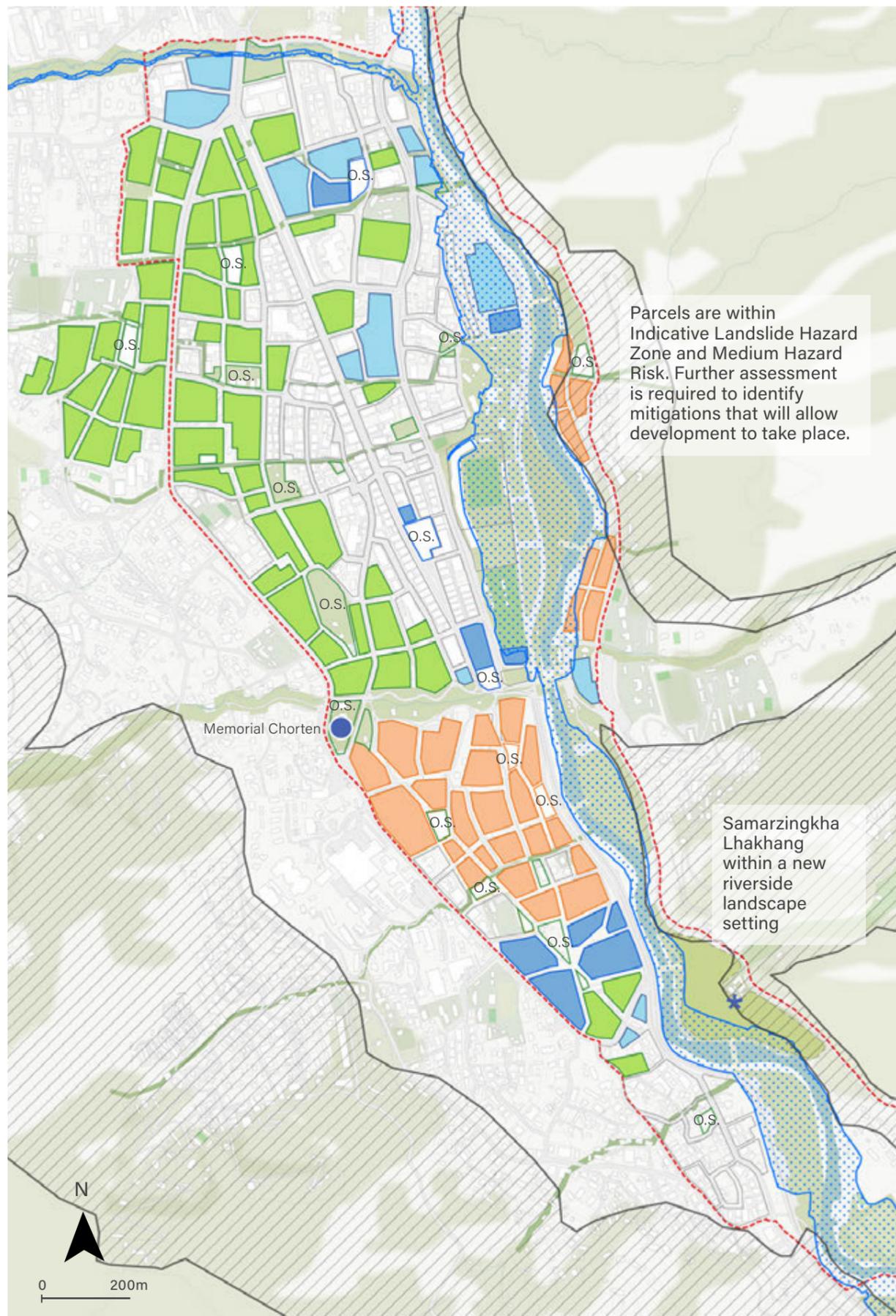


Figure 3.2 Indicative block structure

- KEY
- City Core Action Plan Boundary
 - Parcel within AMBER Strategic Site
 - Parcel within GREEN Strategic Site
 - Parcel within other opportunity site (publicly owned)
 - Parcel within other opportunity site (privately owned)
 - O.S. Parcel dedicated to open space
 - Indicative High Hazard Flood Zone
 - Indicative Landslide Hazard Zone

3.2 Urban Structure

3.2.1 Overarching Objectives

OBJECTIVES FOR URBAN STRUCTURE

The urban transformation of the City Core will:

- Expand the City Core and its activities to maintain its prominence and importance within a growing city.
- Form a strong relationship with the landscapes and institutions to the north of the commercial core to form a 'Capital City Centre' as the heart of the nation.
- Provide a framework within which new economic activity can develop by identifying locations for working clusters, a focus on existing and emerging enterprises and supporting existing economic activity.
- Introduce new living communities where people can live and work in close proximity, that enrich lives, enliven spaces and support the City Core activities. These new communities will provide a template for living well in urban Bhutan.
- Introduce a new range of housing types and ownership models, increasing the mix of housing available and attracting a variety of different kinds of people and family groups and fostering strong communities.
- Provide the City Core with a new urban structure, a new public realm and a series of character areas that enrich the urban experience.
- Form great streets and great spaces that help to form a new, stronger identity for the city as a whole.
- Integrate heritage elements well into the new urban structure, providing legibility and ensuring these assets are part of everyday life.
- Ensure integration of a new pedestrian public realm, a legible street network and upgraded parks and landscapes into a coherent urban structure.
- Ensure integration of critical transport strategies in support of the wider transformation of the city - and ensure that the needs of pedestrians are well balanced with the needs of motorised transport.



Figure 3.3 Precedent image: Gleis 21, Vienna (AUST)



Figure 3.4 Precedent image: Arbor Blocks, Seattle (USA)

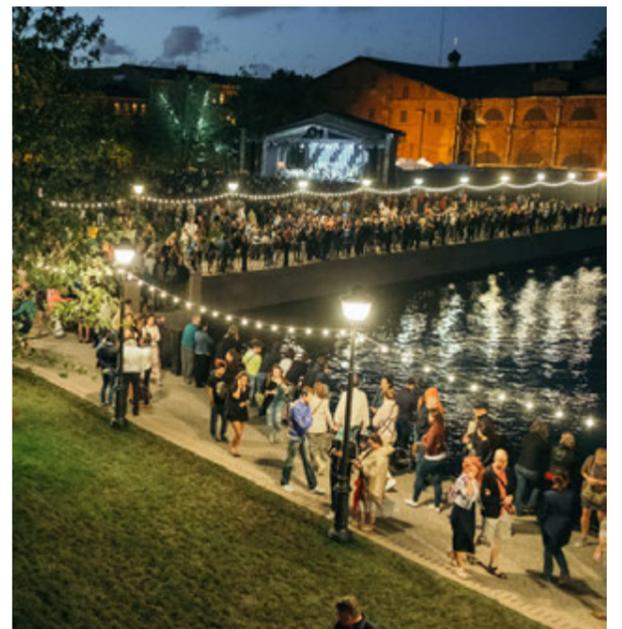


Figure 3.5 Precedent image: New Holland Island, St Petersburg (RUS)

OUTCOMES AND BENEFITS

The key outcomes and benefits of the transformation of the City Core are:

CREATING OPPORTUNITY

The framework provides an opportunity to introduce more workplaces for the city as a whole and provides this space in clusters in close association with new urban communities and public transport infrastructure. The framework aims to support new and emerging small businesses and provides an attractive and lively urban environment for residents, visitors and tourists.

NURTURING COMMUNITIES

The framework enables the clustering of residential uses, creating a platform for new communities to develop. There will be new opportunities for social interaction, community gathering and city-scale events within the new public realm and new community infrastructure can be created.

CULTIVATING BALANCE

The framework provides space for nature and open space to be brought through the city while also allowing growth through introducing a new higher density of development. It aims to re-balance the needs of pedestrians with the needs of vehicular transport, creating streets and spaces for people to enjoy.

INSPIRE

The framework provides space for participation in an urban culture through the introduction of a vibrant public realm and the potential for new cultural and recreational facilities. The formation of a Cultural Quarter provides a new destination in the city that can support, develop and showcase a living Bhutanese culture. The impact and scale of the change anticipated and the opportunity to demonstrate new ways of living, working, travelling and socialising will inspire communities at home and abroad.



Figure 3.6 Precedent images: Northwest Cambridge (UK)

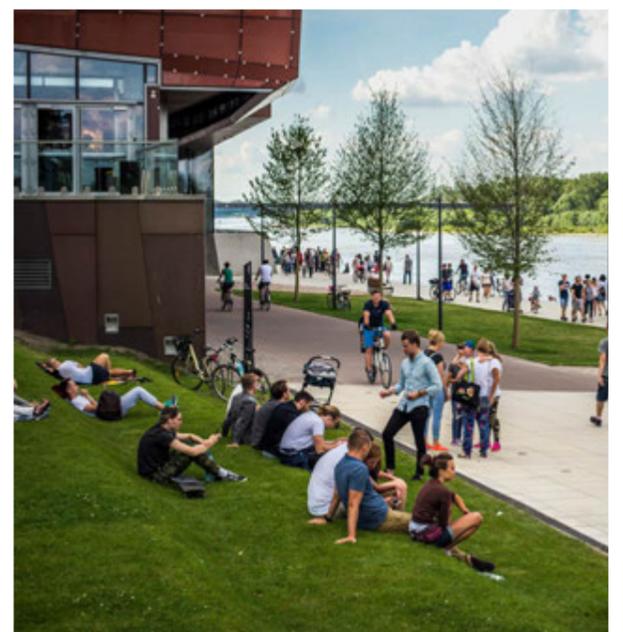


Figure 3.7 Precedent images: Vistula Boulevards, Warsaw (POL)

3.2.2 Urban Structure and Placemaking

PRINCIPLES

- The City Core is organised to form a coherent arrangement of urban blocks within which a legible street network is established.
- Gateways mark the northern and southern extents of the City Core - strengthening its identity as a key place in the city.
- Three 'Great Streets' run north-south through the City Core. Doebum Lam is transformed into the 'Royal Boulevard', Norzin Lam is the principal city street and Chang Lam is the new public transport corridor and arrival space.
- 'Green Streams' and 'Valley Parks' will be drawn through the City Core east to west, connecting western communities to the riverside.
- The River will no longer divide but will be drawn through the City Core with proposed development and riverside on both banks and new pedestrian bridges connecting the east and west.
- Heritage assets are retained and provided with enhanced buffers/settings. View corridors form new visual and physical connections throughout the city.
- Urban elements such as landmarks, gateways, public spaces and anchor buildings are located to bring activation, form legibility and terminate views.
- The proposed development will respond to special locations and elements with high-quality frontages, overlooking and activity.

INTERVENTIONS

The key interventions required to enable a coherent urban structure and a sense of place are:

- 1 Form northern and southern gateways by clustering urban landmarks, active uses and high-quality frontages. Gateways provide legibility and a sense of entering different parts of the city.
- 2 Extend Norzin Lam to the south of Lungten Zampa so that the vibrant heart of the City Core reaches the new riverside spaces.
- 3 Provide a public realm transformation and pedestrian priority to the southern part of Norzin Lam to create a vibrant, bustling activity cluster around the Clock Tower Square.
- 4 Improve the setting of the National Memorial Chorten with a new landscape, reduced traffic, strong pedestrian connections to the river and views of the river.
- 5 Form strong east-west pedestrian, ecological and visual connections to the river along smaller tributaries and streams - form the Green Streams and Valley Parks.
- 6 Form nodes along streets to create a sequence of spaces that add rhythm and interest for moving through the core. Nodes can mark junctions and transitions into important urban spaces. They should be addressed by positive frontages and can be spaces for activity. Clock Tower Square is the principal node and destination in the City Core.
- 7 Form well-defined edges that fully form routes between key destinations. Edges can be formed by different kinds of frontages that respond to their particular place. For example, residential frontages through 'living neighbourhoods' can feel quieter and establish privacy setbacks, while frontages along Norzin Lam can offer a higher degree of enclosure and activity.
- 8 Form new settings for heritage elements such as Zangdo Pelri and Sammarzingka Lhakhangs and the Traditional Bridge at the market. Consider rebuilding the lost Traditional Bridge at Lungten Zam.
- 9 Create new pedestrian bridges across the river to connect eastern communities, schools and public transport to the City Core.
- 10 Form from existing streets a new north-south street connecting Clock Tower Square to the Happiness Gardens.
- 11 Create a new route and view corridor from the Tree Chorten in Changzamtog to the Memorial Chorten, carving out key connections through a new neighbourhood at the RBP site.
- 12 Form a principal east-west connection between Clock Tower Square and Centenary Park.

KEY

-  City Core Action Plan Boundary
-  Chorten
-  Lhakhang
-  Vernacular Architecture Site
-  Existing Historic Bridge
-  Landmark
-  Node
-  Gateways and destinations
-  Norzin Lam frontage
-  Royal Boulevard frontage
-  Chang Lam frontage
-  Wangchhu and Green Stream frontage
-  Valley Park frontage
-  Living neighbourhood frontages
-  Khamtoe Lam
-  Royal boulevard
-  Link out of City Core
-  Local views

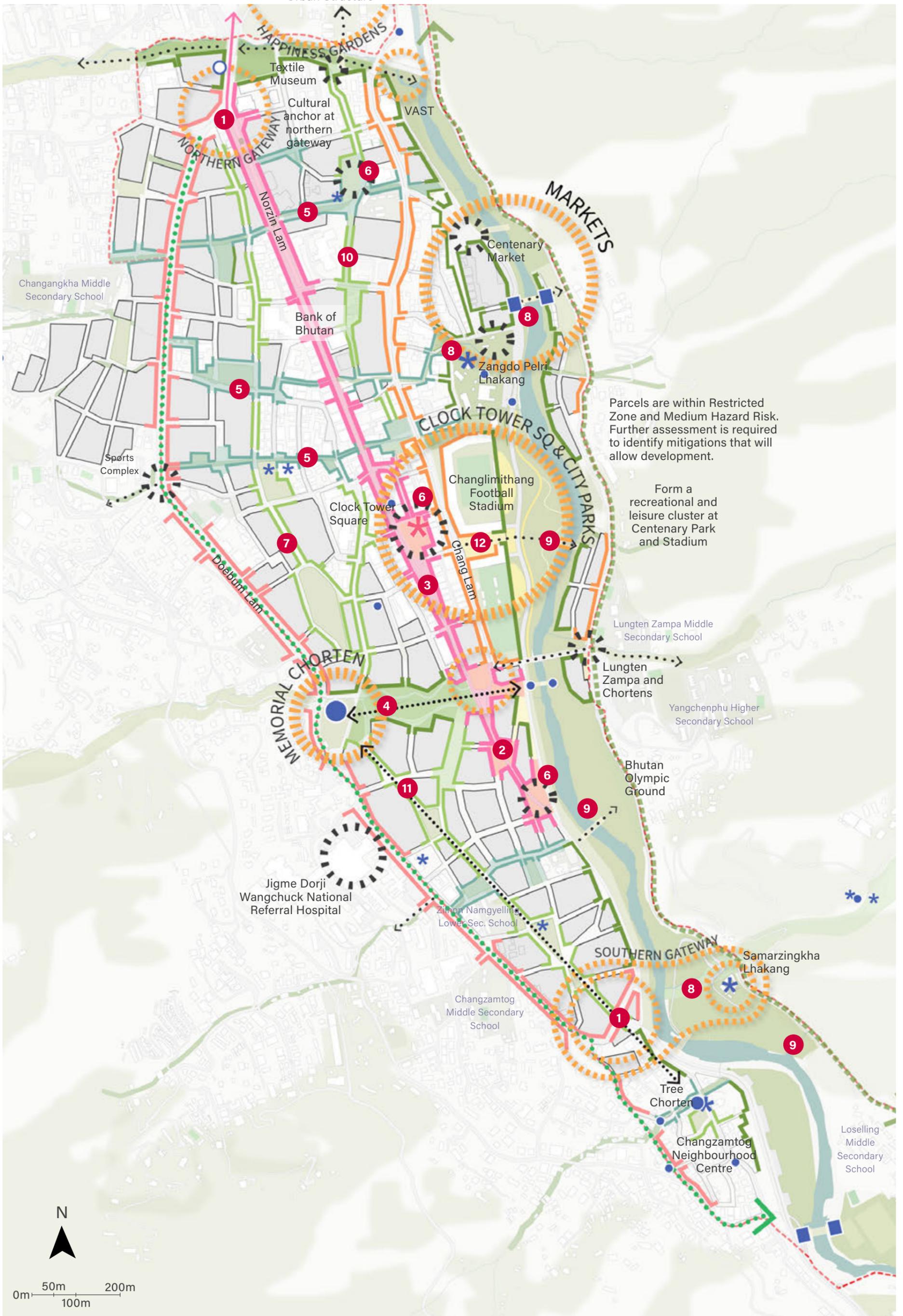


Figure 3.8 Urban structure framework plan

3.2.3 Land Use and Activity

PRINCIPLES

- The land use strategy builds on existing assets to create moments of intensity and activation balanced with quieter areas for living and working.
- The land use strategy introduces different character areas or places throughout the City Core that build on existing character and land use.
- City-scale destinations are located close to public transport corridors and walking routes.
- Workplaces are clustered at transport nodes to create a critical mass of activity at these locations.
- The land use strategy aims to introduce strong, urban communities and a greater number of residents within the City Core.
- Existing activities are retained and reinforced with additional, complementary mixed uses to form urban destinations for the city.
- Active ground floors (e.g. shops, cafés, services) are clustered to reinforce the locations for city scale and local services to support the new urban communities, These active frontages also form clusters of activity at transport nodes and to line principal pedestrian streets and spaces of the city.
- City Core activity is drawn into the Southern City Core, along the extension of Norzin Lam, to the new riverside spaces and forming two new nodes: at Lungten Zampa and where Norzin Lam meets the riverside.
- Urban blocks are denoted as either residential only, workplace only and flexible use to ensure workplace clusters are formed and distinctly residential neighbourhoods are created.
- Flexible-use parcels show locations where uses can be residential and mixed-use, workplace and mixed use or a mixture of residential, workplace and mixed use all in one parcel. This allows for flexibility for the future if additional demand in either residential or workplace is identified, while maintaining the identity of the workplace clusters and the integrity of the residential neighbourhoods.

INTERVENTIONS

The key interventions required to provide a varied, active and characterful City Core are:

- 1 Reinforce the vibrant, mixed use cluster around Clock Tower Square, Norzin Lam and Chang Lam. Extend Norzin Lam and its activity southwards to meet the riverside, providing amenities for southern neighbourhoods.
- 2 Build an important workplace cluster around the Bank of Bhutan and brand as a Financial District.
- 3 The National Referral Hospital forms an important employment cluster and city destination served by public transport. The RBP site opposite the hospital can accommodate future expansion of healthcare uses if this need is identified.
- 4 Form important workplace clusters associated with public transport along the Royal Boulevard in combination with new urban housing.
- 5 Form activity at accessible and prominent locations and allow for commercial, cultural and leisure clusters to be formed such as at the new Lungten Zampa Square and at the north of Norzin Lam.
- 6 Re-locate the Central Post Office and incorporate it into an urban block. The Central Post Office is located adjacent to public transport and activates the middle part of Norzin Lam.
- 7 Alternative locations for a new Town Hall are provided to the south of Lungten Zampa and along the extended Norzin Lam.
- 8 Form residential neighbourhoods in the west and south of the City Core with access to local parks, public transport, Green Streams and local centres.
- 9 Form a cluster of cultural and leisure uses in the north of the Core, building on existing uses and forming a Cultural Quarter as a character area. Provide a new pedestrian link between the Cultural Quarter and the Happiness Gardens to the north.
- 10 Form a cultural anchor at the north of Norzin Lam by introducing cultural uses or institutions next to the Textile Museum.
- 11 Move the Craft Market on Norzin Lam into the heart of the Cultural Quarter for additional street-based activity.
- 12 Reinforce the CFM building as an important city destination, cluster other retail and market uses around it and form stronger connections with other markets to form a Market Quarter.
- 14 Form a city-wide recreational and leisure destination at Centenary Park and the Bhutan Olympic Ground. Upgrade the Stadium, archery ground and tennis area, reorganising and incorporating these activities into the Central City Parks. Connect this recreational destination to the leisure destination of the sports hall and swimming pool on Doebum Lam, along Green Stream 3.
- 15 Intensify activities within two existing schools to provide capacity for new urban population in the City Core. Introduce a new primary school in the Southern City Core.

KEY

- City Core Action Plan Boundary
- Chorten
- Lhakhang
- Vernacular Architecture Site
- Existing Historic Bridge
- Landmark
- Events Space
- Neighbourhood Centre
- Local Centre
- Preferred Town Hall location (T1)
- Alternative Town Hall location (T2)
- Active ground floor frontage
- Active ground floor frontage (workplace framing Doebum Lam)

Land Use: Strategic / Opportunity sites

- Proposed Residential
- Proposed Workplace
- Flexible use
- Existing Education
- Proposed Cultural
- Market use
- Multi-level car park

Land Use: Other Sites

- Proposed Residential
- Proposed Workplace
- Flexible use
- Proposed Cultural

CENTRES & COMMUNITY FACILITIES

Due to the potential capacity for population growth in the City Core, the TSP 2023 identifies the need to co-locate the equivalent of two Sub-district centres. In addition, three Neighbourhood Centres, including one at Changzamtog (to the south) and nine Local Centres should be located within the CCAP boundary. The distribution of centres is shown in Figure 3.9.

The TSP 2023 sets out the typical facilities required within each type of centre. The following tables provide a description of the facilities that should be located within the Neighbourhood and Local Centres within the City Core, considers that some of these facilities already exist or are proposed as part of the CCAP Spatial Framework. For navigation of Table 3.1 and 3.2:

- Required: facility will be required at the proposed Local Centre location (although a closer review of the location should be carried out to verify).
- Provided: facility either exists, is likely to exist, or is proposed as part of this CCAP at the proposed Local Centre location.

Education

The City Core is well provided with existing schools distributed to both the west and east just outside the CCAP boundary. Within the boundary, there is one existing school to the north and two schools to the south.

The strategy to support growth as set out in TSP 2023 is to provide new schools where there is a deficit in other parts of the city and free up capacity in central schools for the new urban population at the City Core. As set out in the TSP 2023, this will require implementing a more formal process for allocating school places.

One large new primary school (4 Form Entry) will be required in later phases and a location is provided in the Southern City Core (see Figure 3.9). To ensure enough capacity, Thimphu Primary School and Jigme Losel School may need to be expanded or intensified.

The city centre is well provided by secondary schools. Future demand can be met through these existing facilities provided a more formalised allocations procedure is implemented which encourages students to enter the school nearest to where they live.

Walking routes along Green Streams connect the proposed urban neighbourhoods to existing schools in the west. New pedestrian bridges over the Wangchhu and a strong pedestrian connection at Lungten Zampa will connect communities to the eastern schools.

Health

The City Core is well served by the Jigme Dorji Wangchuck National Referral Hospital (JDWNRH) and existing, smaller health facilities within the City Core will be retained such as the Indo Bhutan Friendship Hospital.

Small health facilities that are required include the re-provision of the equivalent of a Thromde Health Clinic as part of the regeneration of the RBP site. This can be located on the ground floors of buildings under uses such as residential or workplace. It should also be located within a Neighbourhood Centre, where it can be accessible on foot or by public transport.

The population uplift will also place greater demand on JDWNRH. This could be supported by accessibility, public realm and signage and wayfinding improvements.

Table 3.1 Local Centres and Facilities in the CCAP boundary

| | Local Centre 1 | Local Centre 2 | Local Centre 3 | Local Centre 4 | Local Centre 5 | Local Centre 6 | Local Centre 7 | Local Centre 8 | Local Centre 9 |
|-----------------------------------|--|---|--|--|--|--|--|--|---|
| Neighbourhood | City Core | City Core | City Core | City Core | City Core | Changzamtog | Changzamtog | Changzamtog | Yangchenphug |
| Location | Doebum Lam (north) | Jangchub Lam (north) | Doebum Lam (north) | Jangchub Lam (south) | West of Clock Tower Square | Doebum Lam (south) | Doebum Lam (south) | Expressway | Khamtoe Lam |
| Community Service Centre | Required | Required | Required | Required | Required | Required | Required | Required | Required |
| Nursery | Required | Required | Required | Required | Required | Required | Required | Required | Required |
| Pocket Park | Provided (a park is proposed as part of CCAP, shared with LC2, also adjacent to Valley Park) | Provided (a park is proposed as part of CCAP, shared with LC1, also along a Green Stream) | Provided (a park is proposed as part of CCAP, also along a Green Stream) | Not required (Thai Pavilion Park), also along a Green Stream | Not required (adjacent to existing open space proposed as a public park) | Provided (adjacent to proposed local green spaces within Southern City Core) | Provided (adjacent to proposed local green spaces within Southern City Core) | Provided. (adjacent to major riverside spaces) | Provided. (adjacent to major riverside spaces) |
| Level 4 Mobility Hub | Provided (adjacent to proposed Doebum Lam bus stops) | Provided (adjacent to proposed Doebum Lam bus stops) | Provided (adjacent to proposed Doebum Lam bus stops) | Provided (adjacent to proposed Doebum Lam bus stops) | Provided (located on local bus route) | Provided (adjacent to proposed Doebum Lam bus stops) | Provided (adjacent to proposed Doebum Lam bus stops) | Provided (adjacent to proposed Expressway bus stops) | Provided (adjacent to proposed Khamtoe Lam bus stops) |
| Residential waste drop off centre | Required (located at ground floor of new buildings) | Required (located at ground floor of new buildings) | Required (located at ground floor of new buildings) | Required (located at ground floor of new buildings) | Required (located at ground floor of new buildings) | Required (located at ground floor of new buildings) | Required (located at ground floor of new buildings) | Required (located at ground floor of new buildings) | Required (located at ground floor of new buildings) |
| Local Shops, cafe, restaurant | Required (located at ground floor of new buildings) | Provided (these may already exist in LC location) | Required (located at ground floor of new buildings) | Provided (these may already exist in LC location) | Provided (these may already exist in LC location) | Required (located at ground floor of new buildings) | Required (located at ground floor of new buildings) | Required (located at ground floor of new buildings) | Required (located at ground floor of new buildings) |

For more information, please refer to the *Thimphu Structure Plan 2023, Part B: Chapter 8*.

Table 3.2 Neighbourhood Centres and Facilities in the CCAP boundary

| | Neighbourhood Centre 1 | Neighbourhood Centre 2 | Neighbourhood Centre 3 |
|--|---|--|---|
| Neighbourhood | City Core | Changzamtog | Changzamtog |
| Location | Northern City Core/ Cultural Quarter | Southern City Core | Changzamtog (south) |
| Thromde Health Clinic/ Hospital | Provided - met by Indo Bhutan Friendship Hospital | Provided - met via JDWNRH, Indo Bhutan Friendship Hospital and RBP Healthpost | Provided - met via JDWNRH and RBP Healthpost |
| Pre-primary and primary school | Provided - Jigme Losel Primary School intensified/ expanded | Provided - New 4FE school will be provided in Southern City Core | Provided - Thimphu Primary School intensified/expanded |
| Outdoor sports | Provided - Green Streams and Greenway provide access to City Parks | Provided - new bridge provides access to City Parks (Bhutan Olympic Ground) | Provided - Green Streams and Greenway provide access to City Parks |
| Chorten/ Lhakhang | Provided - existing Lhakhang at Cultural Square and Zangdo Pelri Lhakhang | Provided - Samarzingka accessed through new pedestrian bridges over river and public realm | Provided - Samarzingka accessed through new pedestrian bridges over river and public realm |
| Neighbourhood Park | Provided - Green Streams and Greenway provide access to City Parks | Provided - new bridge provides access to City Parks (Bhutan Olympic Ground) | Provided - Centre located alongside Changzamtog Park |
| Community Police station | Required - can be located at ground floor | Required - can be located at ground floor | Required - can be located at ground floor |
| Level 3 Mobility Hub | Provided - served by Mobility Hubs and bus stops across the City Core | | Provided - Level 3 mobility hub proposed at Centre |
| Comercial waste drop off centre | Required - can be located at ground floor | Required - can be located at ground floor | Required - can be located at ground floor |
| Light Manufacturing (inc car workshops) and distribution | Not required - not compatible in the Cultural Quarter | Required | Required |
| Local Shops, cafe, restaurant, market | Provided (these may already exist in LC location and located close to Centenary Market) | Required (located at ground floor of new buildings) | Provided (these may already exist in LC location and located close to Centenary Market, existing vegetable market to be retained) |
| Office | Provided (Financial District located to the south) | Provided (Proposed office, to include possible Town Hall located adjacent) | Required |

ACTIVITY IN THE CITY CORE

The City Core will be the active, accessible and thriving heart of the city. Activity and land use will be introduced that builds on the existing uses and form coherent clusters and places of varied character.

Clustering of activity starts to create destinations for the nation, for the city and at the local scale within the City Core. These differing clusters start to define variation in character area, building diversity, interest and a range of urban experiences. The converse is also important - areas of more tranquil character can be created as a counterpoint to provide choice of experience.

Building on the mapping of existing activity clustering provided in the baseline analysis, the diagrams on this page provide an indicative and only one point of view about how different activities can be clustered geographically, and how activity can ebb and flow throughout a day. This begins to provide a story of the daily life of the city.

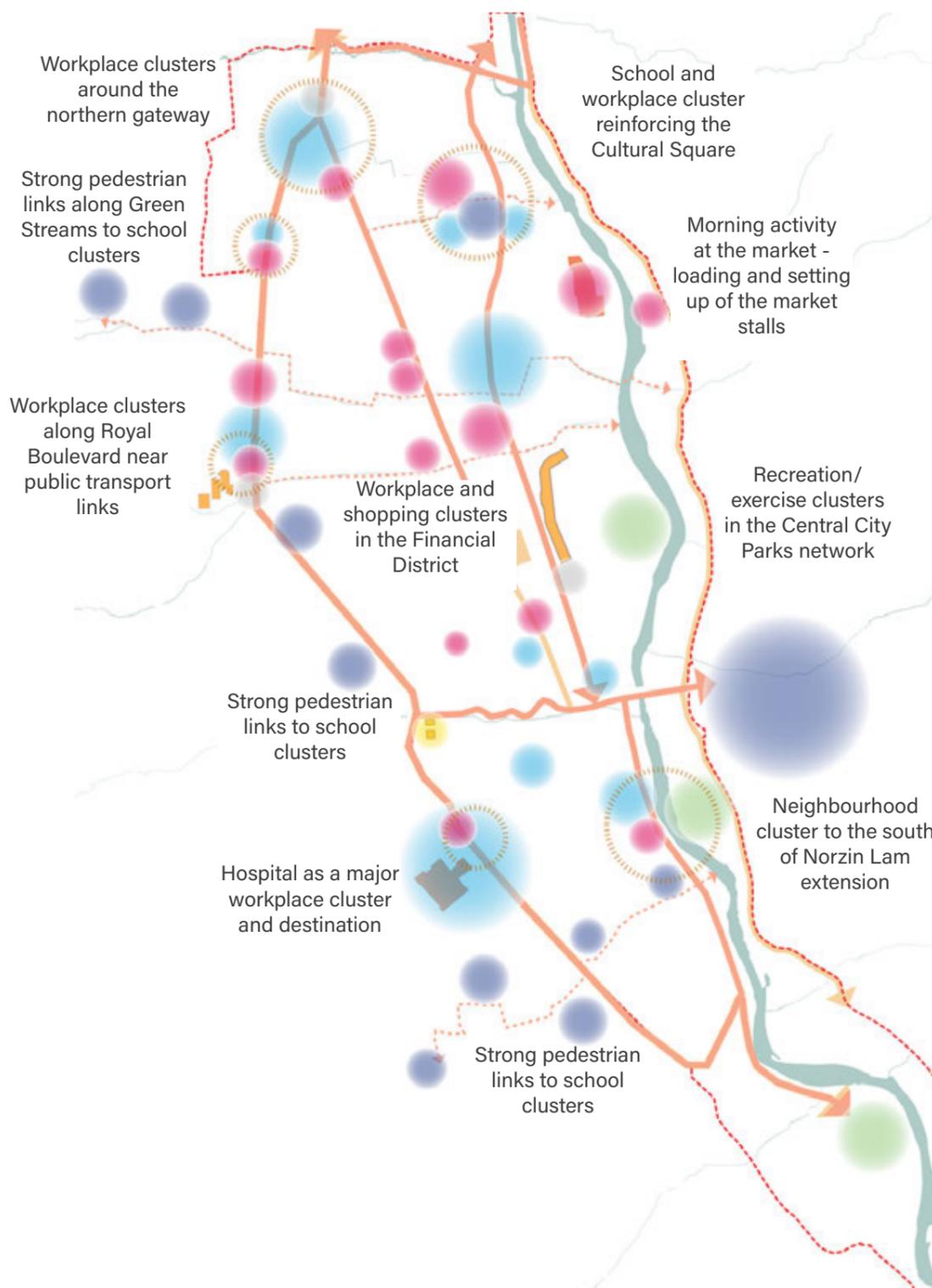


Figure 3.10 Weekday morning

MORNING

Thimphu City Core begins to open with early morning servicing to the Central Farmers Market and the shops along Norzin Lam setting up their wares and organising their stalls. People are out for their morning walks and exercise in the local parks and the riverside Central City Parks. Some start their day by circumambulating the National Memorial Chorten. Kids walk safely to school from their homes along the pedestrian only, naturalised 'Green Streams'. They make their way with the sounds of water and nature around them. The primary bus corridors of Doebum Lam and Chang Lam bring people from across the city to the workplace clusters along Royal Boulevard, at the northern gateway, the Financial District and the Hospital area. People stop for an early coffee and breakfast at a nearby bakery close to their work.

KEY

- City Core Action Plan Boundary
- Primary pedestrian connections
- - -> E-W pedestrian links
- Retail/shops cluster
- Workplace cluster
- School/education cluster
- Cultural cluster
- Sports and recreation cluster
- Entertainment/ evening use cluster
- Transport node
- Emerging centres

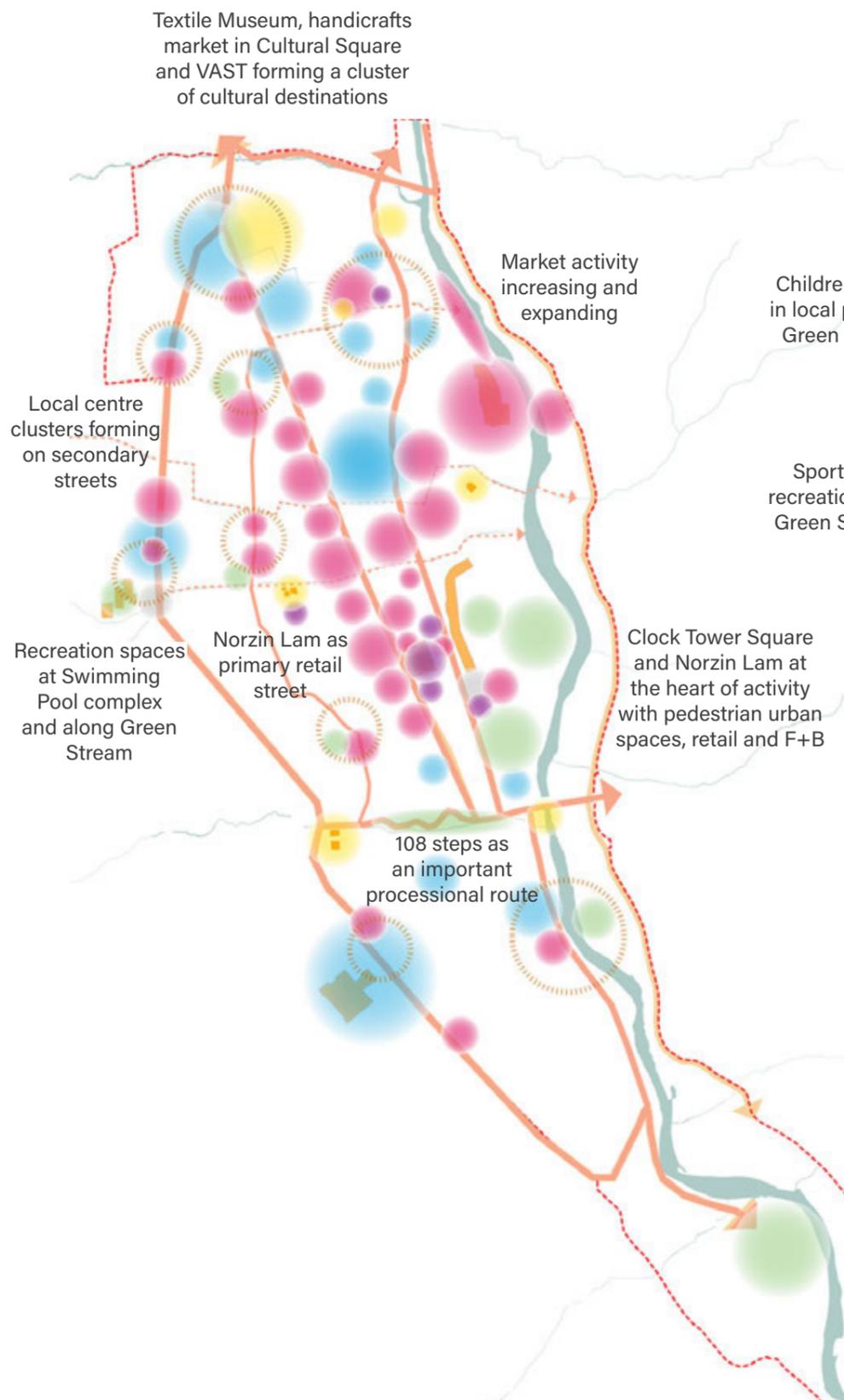


Figure 3.12 Weekday afternoon

AFTERNOON

Norzin Lam is in full swing with all the shops and restaurants open for business with spillover activities onto the street, Clock Tower Square and the Laneways. People are socialising and eating lunch at Clock Tower Square, Wogzin Square and at the Chang Lam plaza and Social Steps formed at the new Central Mobility Hub. The Textile Museum and workshops, studios and shops around Cultural Square are activated with afternoon shoppers and tourists. The Central Farmers Market activity is expanded with shoppers and people grabbing a quick bite to eat at the Food Hall. The secondary streets with neighbourhood shops in the local centres get busy with people picking up groceries and availing other services.

Sports and recreation clusters start getting activated with children playing in the parks and football matches in the stadium after school finishes. Important religious sites such as the National Memorial Chorten, Zangdo Pelri Lhakhang and Thai Pavilion offer a peaceful atmosphere for the elderly residents.

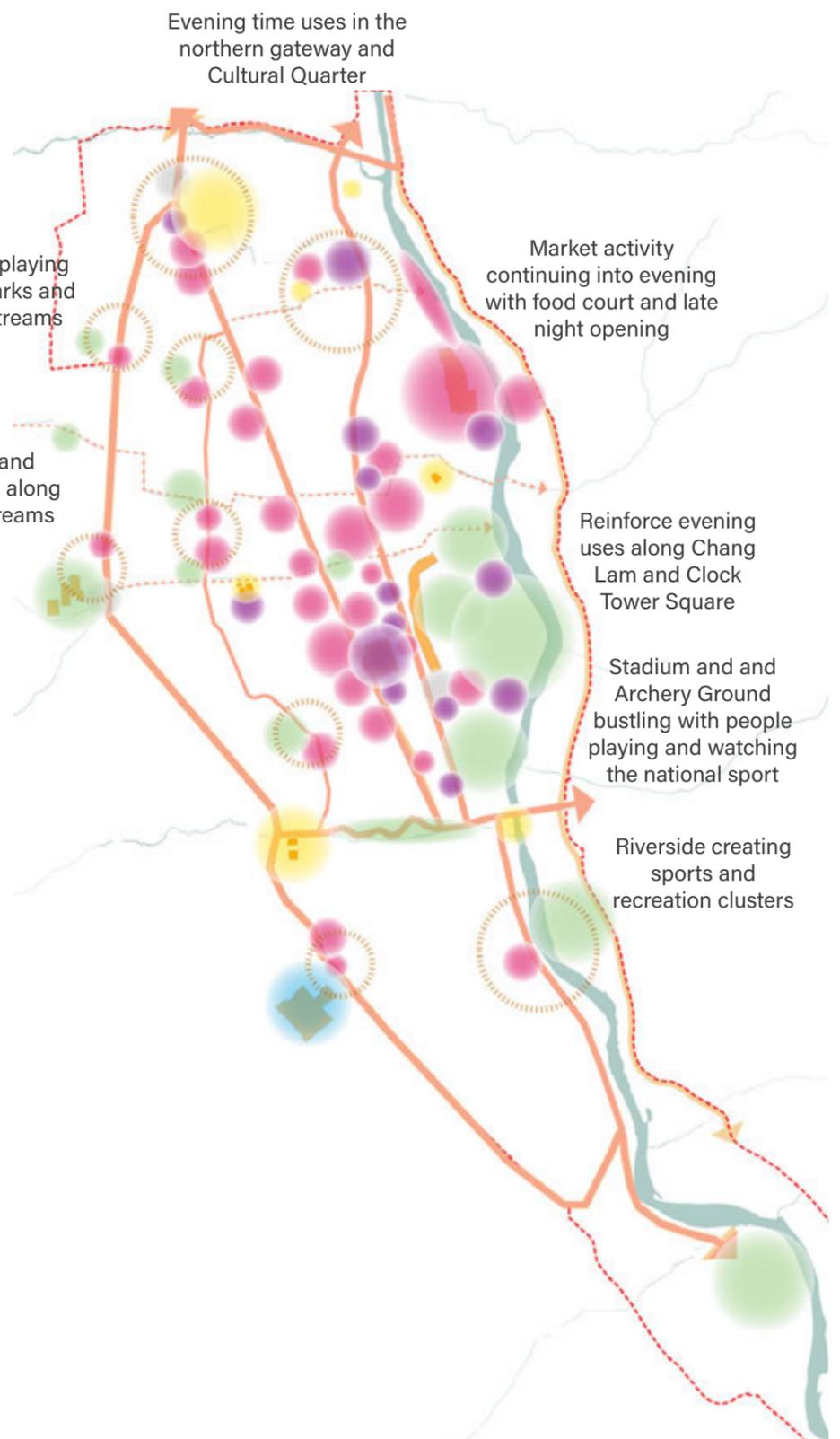


Figure 3.11 Weekday evening

EVENING

Events are happening in and around Clock Tower Square and the Stadium with performances and exhibitions set up throughout the year. People are dining at restaurants spilling onto Clock Tower Square and Chang Lam with a view of the forested hillsides. The Food Hall is serving food and people are at the CFM to pick up vegetables after work.

Sports pitches and parks are full of people enjoying the green open space after work. The Central City Parks offer a variety of sports and recreation activities for people of all age groups. Neighbourhood level recreation areas in Local Parks and along Green Streams also become activated. Chang Lam is full of restaurants, bars and clubs that create exciting evening destinations. The air is filled with the sounds of chatter and laughter as friends and strangers alike come out to enjoy the nightlife.

The City Core offers a variety of great streets and spaces for people to come together and experience Thimphu.

3.2.4 Character Areas within the City Core

PRINCIPLES

- Create a series of differing character areas within the City Core to provide a variety of experiences and a mixture of different use clusters and improved legibility.
- Create a sense of place for each character area and unique identity through the mix of uses, activity, unique urban spaces, types of streets and public realm treatment.
- Character areas may have a predominant or more visible use/activity profile, but will incorporate other uses. For example, the Financial District will have workplace spaces on upper floors but could have ground floor activity in the form of shops, cafés and restaurants; and the Cultural Quarter will have residential or workplaces on upper floors above cultural, entertainment and leisure uses.
- Various character areas will offer a choice of experience for residents, workers, visitors and tourists to enjoy.
- Character areas are built from the pattern of existing use, and reinforced by introducing various complementary uses. For example, the Cultural Quarter is built from the Textile Museum, the City Cinema and the VAST school located in the same part of the city.
- Promoting strong identities for different areas throughout the City Core supports existing industry and the creation of small business:- for example the Cultural Quarter should support and showcase the creative industries and the Market Quarter should support the creation of micro-business that can be instigated through low-cost space at new street-based markets.

INTERVENTIONS

The key interventions required to provide a varied, active and characterful City Core are:

- 1 Create a series of differing character areas through the City Core. Build character from the existing activity and uses and reinforce with new, complementary uses to create destinations.

CHARACTER AREAS

The character areas within the City Core are:

- **Cultural Quarter** showcases and celebrates Bhutanese culture, and supports new cultural and creative industries.
- **Market Quarter** is a hub for people to exchange and discover and a platform for local vendors and small businesses.
- **Clock Tower** concentrates shopping and commercial activities, with a pedestrianised zone that creates a safe destination for people to promenade, shop, dine and socialise.
- **Financial District** is a central workplace cluster with important institutions such as Bank of Bhutan.
- **Royal Boulevard** an urban boulevard with clusters of workplaces capitalising on renewed public transport connections.
- **Live & Work** Vibrant, mixed use, 'Living Neighbourhoods' where both people and small businesses thrive.

- **108 Steps** A Valley Park - reveals important heritage assets, while connecting the upper, western neighbourhoods to the riverside.
- **Central City Parks** Providing recreation, events and a place of reflection.
- **Neighbourhood Parks** Providing amenity for southern neighbourhoods.

Outside of the CCAP boundary but a key part of a vibrant 'Capital City Centre' are:

- **Government Workplace** A focal area for government offices (at Kawajangsa).
- **Health Quarter** Health-related services and education.
- **Royal Parks** A northern gateway and Valley Park that ensures strong connections between the City Core vibrancy and national institutions, open spaces and landscapes.

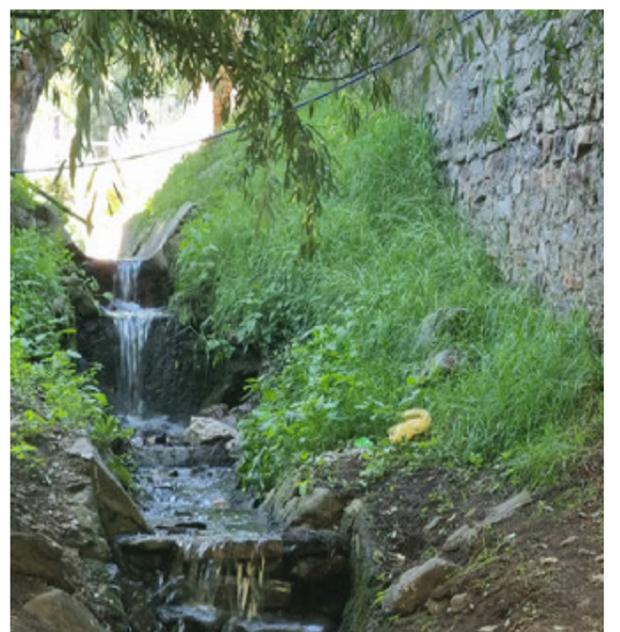


Figure 3.13 Existing characters in the City Core

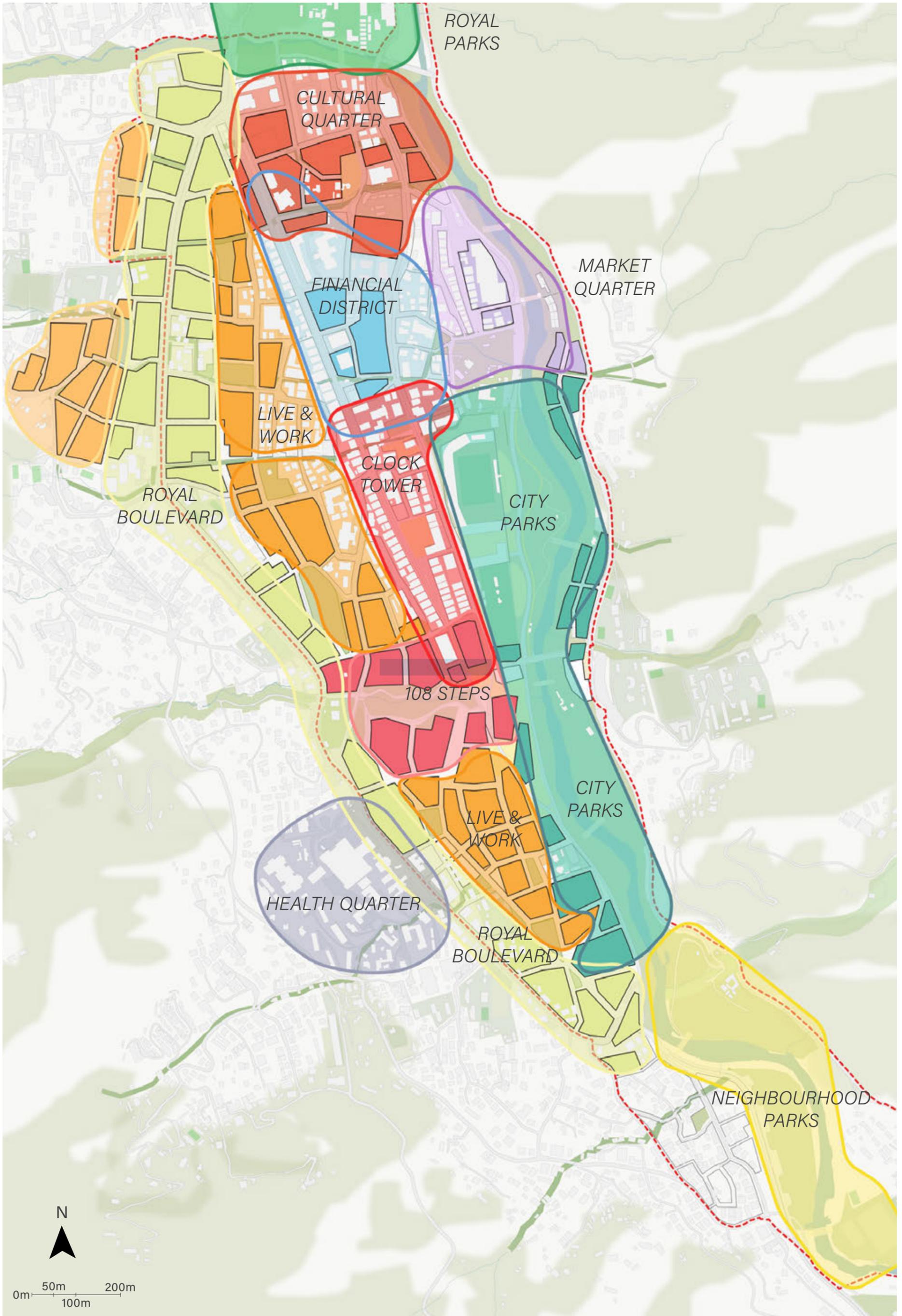


Figure 3.14 Character Areas

REINFORCING EXISTING USES, INCREASED FOOTFALL, AN EVENTS CALENDER

CLOCK TOWER AND NORZIN LAM

- Norzin Lam (south), centred north and south of Clock Tower Square, is a place of high intensity with shops, cafés, and bars. Norzin Lam (south) will become a pedestrianised zone that creates a safe destination for people to promenade, shop, dine and socialise.
- Clock Tower Square forms the heart of the city and is an important destination and gathering space. With space for a calendar of events all year round reinforced with active ground floor frontage, vibrant evening activities and nightlife, space for spill-out activities and high pedestrian footfalls, the Square will be the principal urban space of the City Core and a primary destination.



Figure 3.16 Existing- Norzin Lam



Figure 3.17 Existing- Clock Tower Square

REINFORCING EXISTING USES, ADDING STREET LIFE AND SUPPORTING USES

THE FINANCIAL DISTRICT

- A central commercial workplace cluster with important institutions such as the Bank of Bhutan and the Bhutan National Bank.
- It concentrates office uses, and provides spaces for established businesses and a range of spaces of various scales to meet the needs of emerging businesses as they organically grow and scale up.
- Restaurants and small shops support the local working population and create street life and a vibrant place to work in the City Core.



Figure 3.15 Existing- Bank of Bhutan

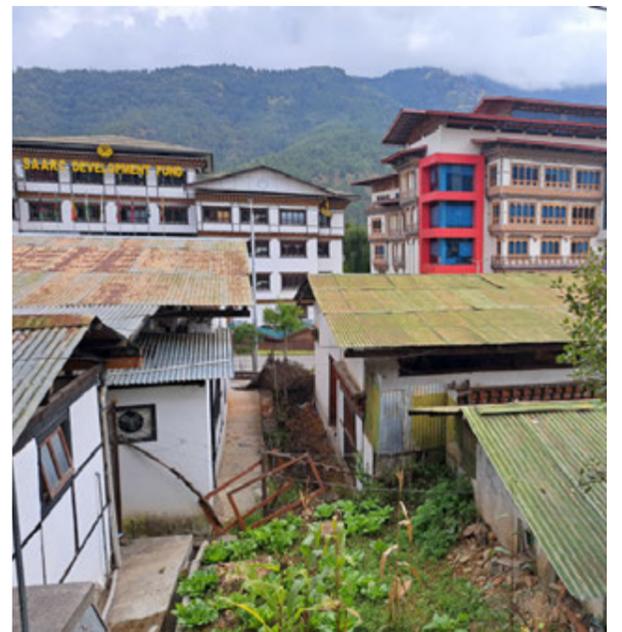


Figure 3.18 Opportunity areas in the Financial District

A CITY-SCALE DESTINATION, INCREASING FOOTFALL, ADDING STREET LIFE

THE MARKET QUARTER

- The Market Quarter brings together the existing CFM building, the wholesale markets, the handicrafts market on the eastern riverbank and a formalised, partly re-located Kaja Throm Market.
- It is a platform for local vendors and exhibitors, and a central place for people to exchange and discover.
- It is a place for food and festivities with local produce, street markets, food halls and a nighttime destination.



Figure 3.19 Kaja Throm



Figure 3.20 Existing Central Farmers Market

→ CELEBRATING BHUTANESE CIVIC LIFE, AN ICON AT THE CENTRE OF THE CITY



Figure 3.23 Active street frontages and spill-out



Figure 3.24 Night time activity anchor



Figure 3.25 Important event space

→ CREATING A MAJOR WORKPLACE CLUSTER IN THE HEART OF THE CITY

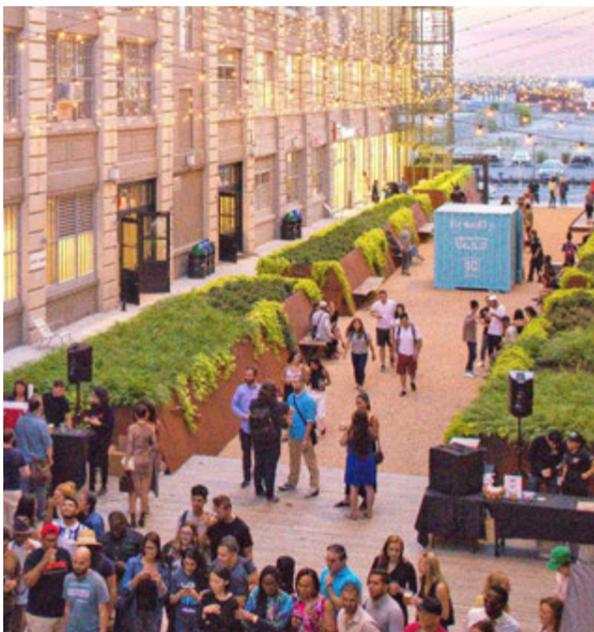


Figure 3.22 City centre working



Figure 3.26 Public realm around workspace clusters



Figure 3.27 Active public spaces and streets

→ CELEBRATING STREET LIFE, SUPPORTING SMALL BUSINESS, A PLACE OF PLACE OF EXCHANGE



Figure 3.21 Street market under a semi permanent timber structure



Figure 3.28 Street food markets and food halls



Figure 3.29 An evening destination

REINFORCING EXISTING USES, A NEW CULTURAL ANCHOR FOR THE CITY

THE CULTURAL QUARTER

- The Cultural Quarter builds on the Textile Museum, VAST, the City Cinema and the handicrafts market on Norzin Lam, to create a place which showcases Bhutanese culture and supports new cultural and creative industries.
- The Norzin Lam handicrafts market can be moved to a new Cultural Square to generate street activity and connect better with the Market Quarter at the riverside.
- A major cultural anchor could be created on Norzin Lam, combining the Textile Museum alongside, potentially, the Centre for Performing Arts relocated to draw activity north from Clock Tower Square.
- This area would support maker spaces, for cultural activities and events and vibrant and intimate streets that allow the showcasing of activities.



Figure 3.32 Existing- Textile Museum



Figure 3.33 Tshechu festival celebrations

CREATING A GREAT CITY STREET

THE ROYAL BOULEVARD

- The existing Doebum Lam will be transformed into a 'Royal Boulevard' with public transport, significant planting, mature street trees and generous space for pedestrians and other modes of movement in the future.
- New frontages along the Royal Boulevard provide enclosure and overlooking of the street as well as significant workplace clusters and active ground floor uses, capitalising on the renewed public transport connections.
- It already has significant workspace along its length such as the Hospital area. This can potentially become a health quarter of national significance with supporting education, services and key worker housing facilities.



Figure 3.31 Doebum Lam at the Hospital area



Figure 3.34 Doebum Lam - existing frontage and condition

NURTURING NEW URBAN COMMUNITIES, WALKABLE STREETS

LIVING NEIGHBOURHOODS

- Introduce compact and attractive neighbourhoods to the west and south of Norzin Lam and introduce new urban living and working communities that ensure the City Core feels safe and active throughout the day and the week.
- The communities are vibrant, mixed use areas where people and businesses thrive. Workplaces and social infrastructure are integrated ensuring access to daily needs and reducing the need for travel to other parts of the city.
- New, walkable street networks within these new urban communities also aid in connecting the upper neighbourhoods to the City Core.



Figure 3.30 Existing housing offer



Figure 3.35 Active ground floors for community facilities and local needs

→ CELEBRATING BHUTANESE CULTURAL LIFE, SHOWCASING ARTS AND CRAFTS



Figure 3.40 VAST arts school



Figure 3.38 Active and intimate streets



Figure 3.39 Show-casing maker spaces, artists studios and workshops

→ AN URBAN GREENED STREET WITH PUBLIC TRANSPORT, LIVING AND WORKING



Figure 3.37 Public transport streets with planting and larger trees



Figure 3.42 Providing space for multiple modes of movement in the future

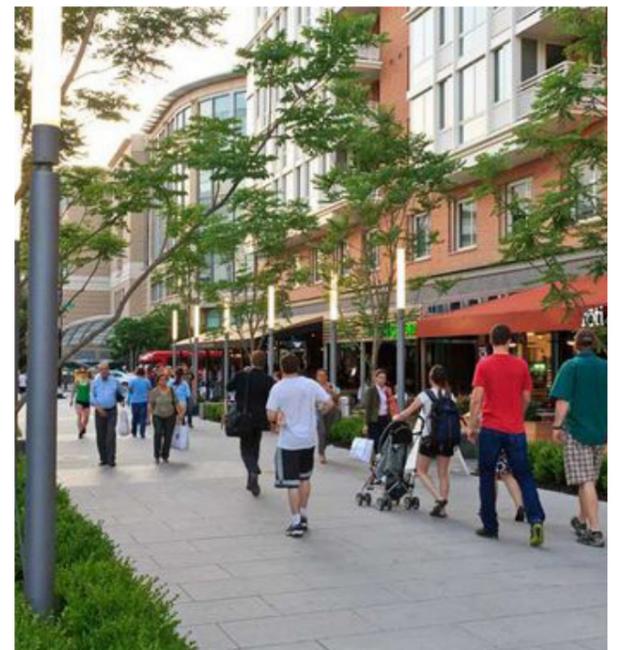


Figure 3.43 Active frontages and enclosure adjacent to a wider pedestrian footway

→ URBAN LIVING IN THE CITY CORE, LOCAL FACILITIES, MIXED AND BALANCED COMMUNITIES



Figure 3.36 Compact neighbourhoods with walkable streets



Figure 3.41 Green amenity spaces shared by residents only



Figure 3.44 A range of housing types for a balanced community

*REINFORCING EXISTING USES, OUTDOOR LIFE ALONG THE RIVER***THE CENTRAL CITY PARKS**

- Forming a central destination park focused to either side of the Wangchhu, with pedestrian bridges connecting both sides of the river.
- The primary space of a sequence of new riverside spaces, starting at Tarayana Park and ending at Changzamtog Park.
- The Central City Parks emphasize activity and gathering around sports, recreation, play as well as happiness and well-being recreation. The Park will also offer space for city-scale events.
- Some places within the park will be highly active, meant for connecting communities while other places will be quiet, meant for reflection and respite with shaded areas, trickling water and green walkways along the river.



Figure 3.47 Existing stadium area



Figure 3.48 Existing archery grounds

*NATIONAL HERITAGE ASSETS, OPEN SPACE, CONNECTIONS TO THE RIVER***108 STEPS VALLEY PARK**

- The 108 Steps Valley Park can become a pedestrian priority area that reveals and celebrates important heritage assets, natural systems and can connect upper residential neighbourhoods outside of the City Core to the new riverside spaces.
- A new setting can be provided for the National Memorial Chorten and other heritage assets at the river, improving the experience of visiting these elements.
- The land use and massing around this setting will recognise the importance of the Memorial Chorten.
- It forms an important processional east-west route and an opportunity to bring nature through the City Core.



Figure 3.45 National Memorial Chorten

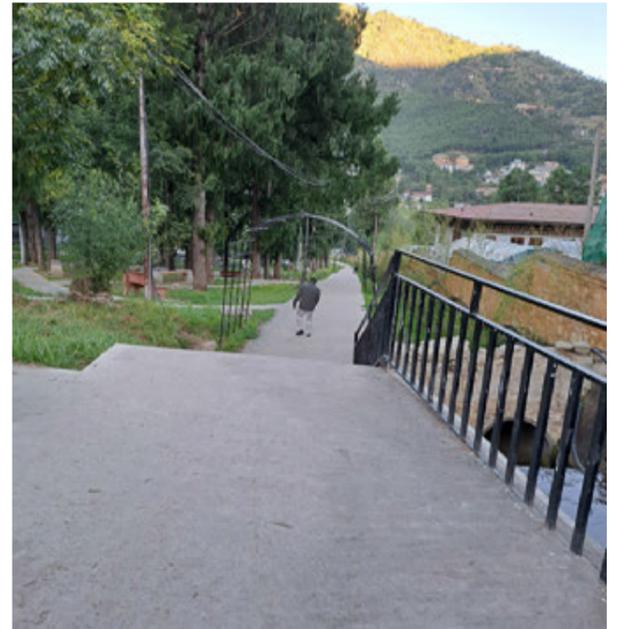


Figure 3.46 Existing condition - 108 steps

*CREATING ICONIC LANDSCAPE, FORMING THE CAPITAL CITY CENTRE***THE ROYAL PARKS**

- The Royal Parks are a series of spaces forming a natural setting for the Tashichho Dzong. These elements bring landscape and nature through the heart of the city while containing national governmental institutions.
- The beautiful cultural landscapes will be preserved, nurtured and opened up to the public.
- At the City Core a Royal Parks frontage can be formed as part of a 'northern gateway' that connects the city centre vibrancy to this major open space, forming the Capital City Centre.



Figure 3.49 The Happiness Gardens



Figure 3.50 Cultural landscapes around the Dzong

→ A PLACE FOR RECREATION AND SPORT, CITY-SCALE AND NATIONAL EVENTS AND QUIET CONTEMPLATION



Figure 3.54 The river at the heart of the spaces



Figure 3.55 Areas for picnicking



Figure 3.56 Areas for play

→ SHOWCASING HERITAGE AND REVEALING CONNECTION BETWEEN NATURAL SYSTEMS AND HERITAGE



Figure 3.51 Accessible walkways

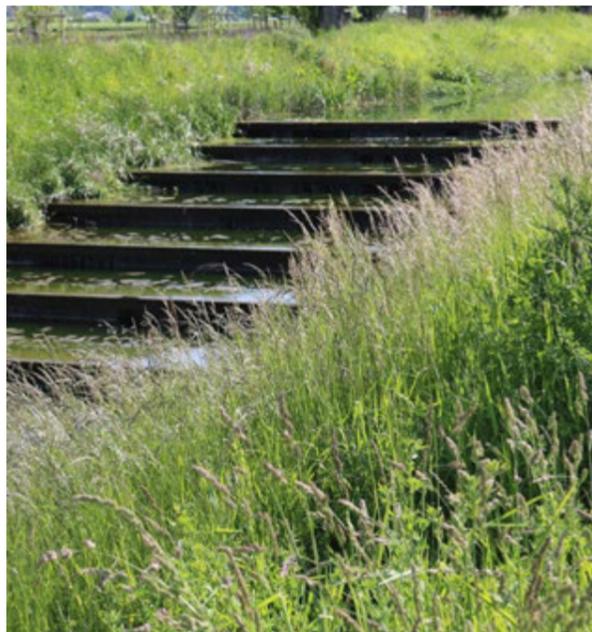


Figure 3.52 Landscaped steps



Figure 3.53 Walking, water and nature in the Valley Parks

→ CELEBRATING BHUTANESE HISTORY AND IDENTITY, BRINGING NATURAL LANDSCAPES INTO THE CITY



Figure 3.57 Forming frontage to the parks

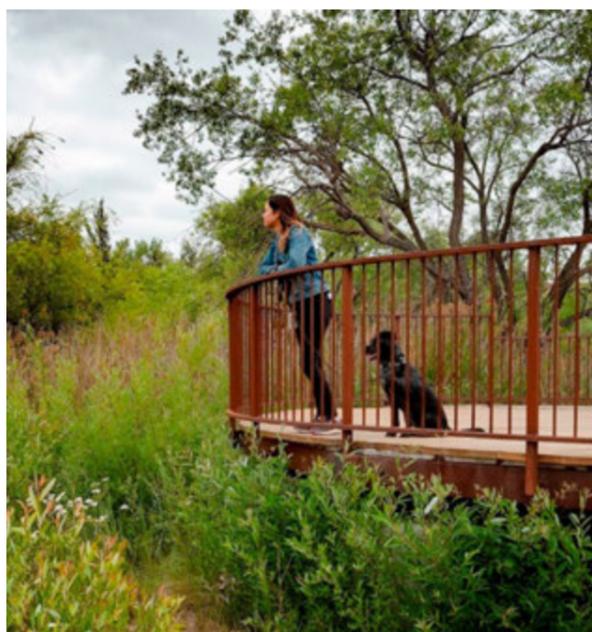


Figure 3.58 Spaces of quiet and introspection



Figure 3.59 Spaces for relaxation and engagement

3.2.5 Building Heights

PRINCIPLES

- It is important to maintain and extend the character and 'human-scale' of existing parts of the City Core, by defining a general massing of between 4 and 6 storeys throughout the majority of the extended City Core.
- Proposed heights on now under-utilised land ensure that these areas are used to their best potential to create a critical density of population, supporting a vibrant, active and resilient City Core.
- The massing strategy aims to provide a finer-grained variation in heights through the City Core providing character, greater legibility and a response to heritage.
- Variations in massing must be created in response to: heritage assets and their settings; view corridors at the city-scale and local scale, and; good environmental conditions within streets, spaces and buildings.
- Lower massing is intended in important locations. Lower heights will protect the setting of the National Memorial Chorten and ensure its continued prominence in the cityscape, and lower heights to the east of the river will protect the riparian character of the river and protect views to the north and south from the Traditional Bridge at the Market.
- The principal streets of Doebum Lam (the 'Royal Boulevard') and Norzin Lam are afforded the highest massing within the City Core, to form a strong sense of enclosure, denote their importance within the city and create legibility.
- Landmark and building accent locations are indicated in key locations. In some locations it is intended that the quality and distinctiveness of new buildings in these locations rather than additional height would form the landmark element.
- The maximum building heights must comply with TSP guidance - 6 storeys maximum.

INTERVENTIONS

The key interventions required to enable the development of distinctive places within the City Core are:

- The northern gateway and southern gateway will form landmark building clusters in the City Core.
- The massing along the Royal Boulevard and Norzin Lam will be generally highest (6 storeys maximum) to ensure proper street enclosure, denote these as principal city streets and concentrate development capacity along public transport corridors.
- The massing around the southern gateway and at Lungten Zam (west) will be generally higher (6 storeys maximum) as they mark important nodes and City Core entries.
- The massing around the National Memorial Chorten will be lower to maintain the significance of this heritage asset, ensure an appropriate setting and respond to city-scale view corridors.
- City Core neighbourhoods will be of more moderate massing to provide height variation through the Core and protect housing quality and environmental conditions for urban residents.
- The residential neighbourhoods west of the Royal Boulevard will be lower than the eastern side to respond to the topography and form a height transition from the City Core to lower density communities further west.
- The massing in the Cultural Quarter will be moderate massing to maintain its relationship to the riverside and to form its character as an intimate, cultural and creative neighbourhood.
- The massing on the east side of the river will be low owing to the steep topography and in order to maintain the local view corridors along the river from the Traditional Bridge at the market.
- The Central Farmers Market maintains its current massing.

KEY

- City Core Action Plan Boundary
- Chorten
- Lhakhang
- Vernacular Architecture Site
- Existing Historic Bridge
- Opportunity for landmark / accent buildings

Building Heights: Strategic / Opportunity Sites

- 5 - 6 storeys max
- 4 - 6 storeys max
- 2 - 4 storeys max

Building Heights: Other Sites

- 5 - 6 storeys max
- 4 - 6 storeys max
- 2 - 4 storeys max

For more information, please refer to the *Thimphu Structure Plan 2023, Part B: Chapter 5*.

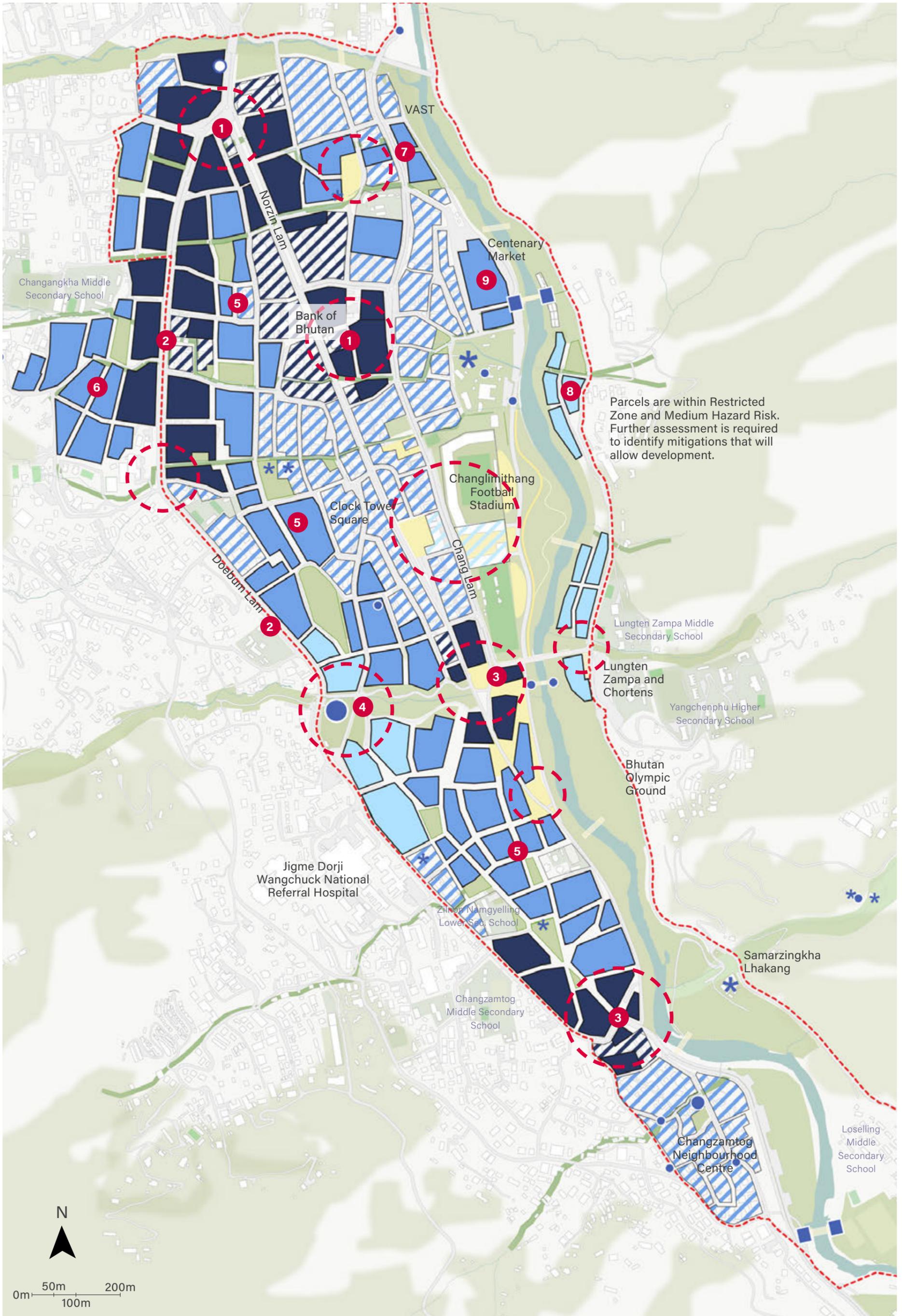


Figure 3.60 Building Heights Framework Plan

3.3 Protections

3.3.1 Overarching Objectives

OBJECTIVES FOR PROTECTIONS

The urban transformation of the City Core will:

- Seek to preserve and promote Bhutanese culture and heritage as a valued part of everyday life.
- Protect and preserve heritage assets of national significance and identify, protect and preserve assets of more local significance.
- Enhance the condition of heritage assets in the City Core where degraded and improve their buffer and the wider settings around them.
- Protect and nurture the intangible heritage within the City Core.
- Protect and enhance important city-scale views through the Thimphu valley between significant heritage assets and ensure appropriate development takes place within the foreground, middle-ground and background of these views.
- Enhance the resilience of the City Core area against natural hazards such as earthquakes, floods, wildfires and landslides and ensure the safety of the city's population and their livelihoods now and into the future.
- Ensure that mitigations are recommended against future higher intensity and more frequent natural events due to climate change.
- Celebrate the setting of the City Core - a lively, vibrant urban place set within forested mountainsides.
- Ensure compliance with the aims policies and principles of the TSP 2023.

For more information, please refer to the *Thimphu Structure Plan 2023, Part B: Chapter 9*



Figure 3.61 Heritage in the City Core

OUTCOMES AND BENEFITS

The key interventions required to ensure a resilient, culturally vibrant and resonant City Core are:

CREATING OPPORTUNITY

Improving and showcasing heritage will enhance the visitor experience in the city, supporting the leisure and tourism industries. A focus on heritage will build skills in traditional construction and restoration and support Bhutanese handicrafts. Ensuring the safety and continuity of livelihoods and businesses in the City Core is important to build a resilient economy over the long-term and reduce risk to the national economy.

NURTURING COMMUNITIES

Preserving cherished assets and revealing the cultural history of the city will strengthen national and local cohesion and build a strong identity and sense of pride for the benefit of present and future generations. Providing a sense that family and friends are secure in their neighbourhood will empower communities to think long-term and bring improvement to general health and happiness.

CULTIVATING BALANCE

Balancing preservation with progress will recognise Bhutan's unique heritage and culture while providing clarity about the right places for new enterprise and intensification. Preserving heritage has the potential to educate, illustrate lessons to learn from the past or provide further scientific investigation or analysis that will contribute to understanding Bhutan's history and culture while building the future life, culture and practices in the city.

INSPIRE

Preserving cultural assets, both tangible and intangible will inspire Bhutanese people and enable them to continue to strengthen and build their unique culture and identity. The things that make people unique will bring a strong sense of pride in themselves, their home and their city. Ensuring that confidence in the more intangible cultural practices continues into the future, creating spaces for activities to take place will mean that collective memories and new histories can be formed.



Figure 3.62 Heritage in the City Core

3.3.2 Geohazard and Flood

As set out in the TSP 2023, the majority of the City Core is located outside of Indicative Hazard Zones and so is not designated as restricted development, apart from a small area to the east of the Wangchhu. Within the CCAP area, there are localised areas of Medium Hazard, critically at the junction of Doebum Lam and the Expressway, as well as at the hospital area (the hospital itself is outside of the CCAP area).

Areas of the existing City Core are located within the Medium and High Flood Hazard areas. These include the CFM building and surrounding area, the National Stadium and Centenary Park. Although not considered 'Critical Infrastructure', they have an importance for the daily life of the city and its citizens. Existing road and pedestrian bridges and proposed pedestrian bridge locations are within Medium and High Flood Hazard areas.

The plan on the opposite page outlines Indicative Hazard Zones (for flood and landslide) as defined within the TSP 2023.

PRINCIPLES

- Any proposed development within the CCAP area must follow recommendations and policies within the TSP 2023.
- For all new development within the CCAP area, it is recommended that a site-specific ground investigation is conducted for all areas outside of Indicative Hazard Zones.
- Any proposed development within the Indicative Hazard Zone defined by the TSP 2023 must follow recommendations and policies within the TSP 2023.
- Critical Infrastructure should be located outside of Indicative Hazard Zones.
- Any proposed development within High Flood Hazard Zones will not be permitted.
- Any reconstruction of Critical Infrastructure within Medium and High Hazard Zones must comply with recommendations and policies within the TSP 2023.
- Any proposed development in Medium Hazard Flood Zones must carry out a Justification Test to establish safety as well as a Site Specific Hazard and Risk Assessment to identify risk management, mitigation measures and potential for increased risk elsewhere.
- Any new or redesigned public realm and open space within Medium and High Hazard Flood Zones must consider flood resilience and mitigations. These public spaces could also accommodate SuDs to help reduce flood risk and increase resilience in other areas.

INTERVENTIONS

The key interventions required to ensure safe and resilient City Core are:

- 1 The Stadium and CFM Market building are located within High Flood Hazard Zones. As they are considered socially and culturally important elements of the city and places where significant numbers of people will gather, proposals must follow recommendations in TSP 2023 for 'Enhanced Resilience.'
- 2 Any reconstruction of the road bridge at Lungten Zam (considered Critical Infrastructure) must first determine the full extent of the hazard and then identify and assess mitigation measures.
- 3 Proposed pedestrian bridges across the Wangchhu must first determine the full extent of the hazard which can then be used to inform a site-specific design with inclusion of mitigation measures where necessary.
- 4 New public realm designs for Centenary Park, for public spaces along the riverside and within the market area must consider flood resilience and mitigations. These public spaces could also accommodate SuDs to help reduce flood risk and increase resilience in other areas.
- 5 Development on the eastern bank of the river within the Restricted Development Zone must follow recommendations and policies within the TSP 2023. Further studies will be required to establish what kind of development will be permitted (not carried out as part of the CCAP).
- 6 The Hospital and the proposed new junction at Doebum Lam/Expressway would be considered 'critical infrastructure.' Further studies must be undertaken to fully understand hazards and to identify risk management/mitigation measures.
- 7 Consideration should be given to ensure protection from flood of historic bridges.

Please note that the outputs provided as part of this chapter have been developed alongside and align with the TSP 2023 and provides guidance only at a development plan scale. The outputs have not been developed to provide guidance on a site-specific scale. Due consideration is required of the developer to ensure site-specific hazards are addressed on a site-by-site basis.

Please see Part B: Chapter 9 for further information and Recommendations for Detailed Planning.

Appendices of the TSP 2023 provide a full Technical Note.

KEY

 City Core Action Plan Boundary

Modified Landslide Hazard Assessment

 Indicative Landslide Hazard Zone

Modified Landslide Hazard Assessment

 High Hazard

 Medium Hazard

 No Data

Indicative Flood Hazard Zone

 Indicative Medium Hazard Flood Zone (Wangchhu)

 Indicative High Hazard Flood Zone (Wangchhu)

 Indicative High Hazard Flood Zone (Major tributaries)

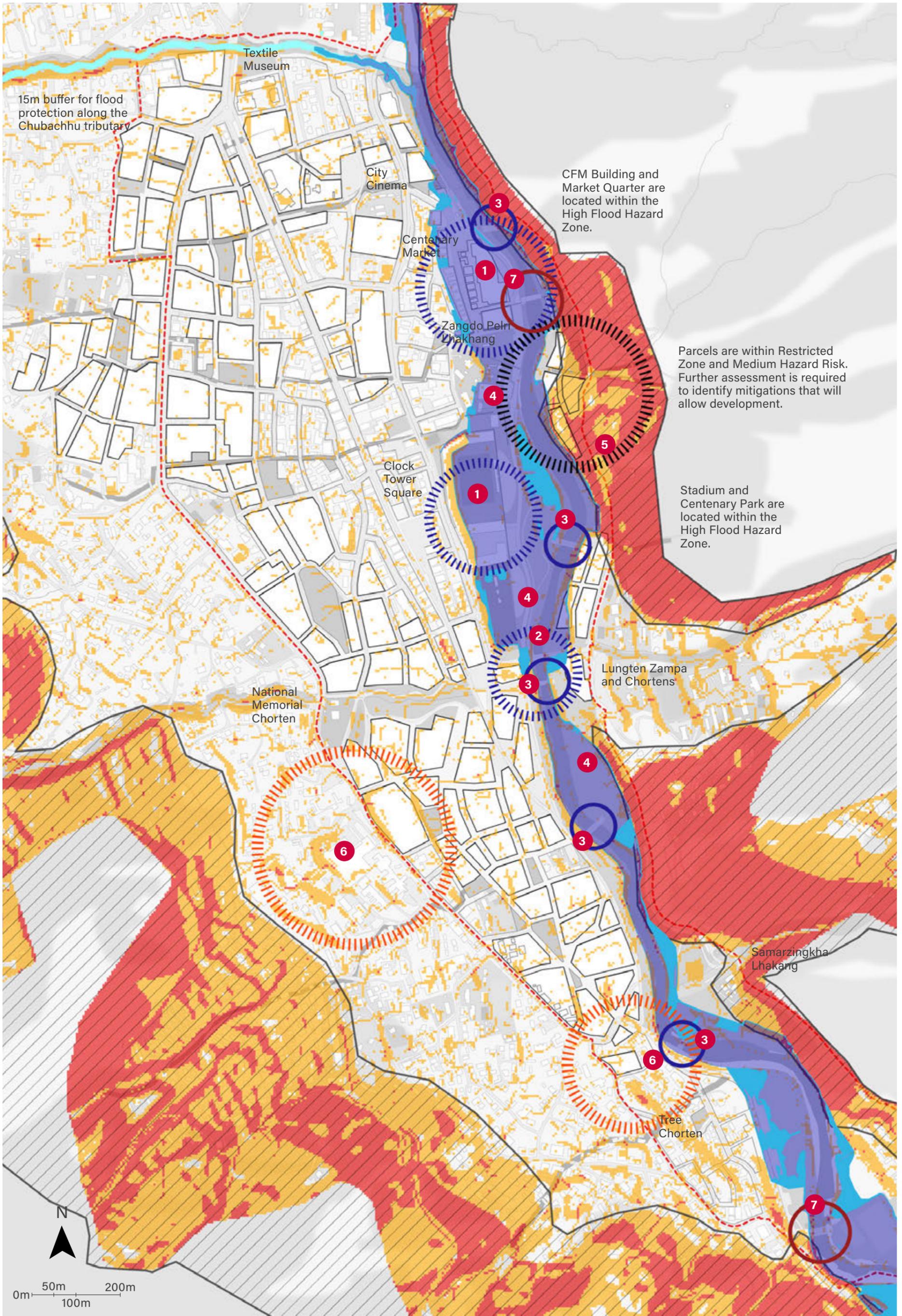


Figure 3.63 Geohazards and Flood Hazards at the City Core

3.3.3 Cultural Heritage

Within the CCAP area, there are numerous nationally and locally significant Heritage assets.

The National Memorial Chorten and Samarzingkha Lhakhang are considered nationally significant and categorised as Grade C.

The Locally significant Heritage assets include the Zangdo Pelri Lhakhang, the traditional bridges, the CFM market and at Changzamtog, plus a series of smaller Lhakhangs and Chortens throughout the City Core.

There are identified traditional vernacular buildings located at the northern end of Doebum Lam. These are considered significant and are provided protection within the TSP 2023. Other possibly valuable vernacular buildings are located within the CCAP area and some of these are indicated on the framework diagram. These may not be of great age but may demonstrate vernacular building practices and Bhutanese crafts and have some local cultural value. Further investigation is required to map and assess other vernacular-style buildings and their qualities and importance.

The City Core is a focus for the intangible heritage of the city. The unique daily life of the city is demonstrated within streets and spaces and events are located in specific spaces on holidays and national days. The new public realm and spaces indicated within this CCAP should enable intangible heritage and culture to be nurtured and showcased, alongside more contemporary Bhutanese lifestyles, leisure and entertainment.



Figure 3.64 Traditional Bridge at Changzamtog

PRINCIPLES

- Any proposed development within the Core Heritage Area of any nationally and locally significant Heritage assets must follow the recommendations and policies within the TSP 2023.
- Any proposed development within the Buffer Zone (or setting) of nationally and locally significant Heritage assets must follow the recommendations and policies within the TSP 2023.
- Development proposals within the core heritage area of a nationally significant heritage asset and its buffer zone are required to produce a heritage impact assessment (HIA).
- The conservation, activation and enhancement of nationally and locally significant heritage assets and their buffers should be promoted in accordance with national and international best practice.
- Decisions should seek to avoid impact on the heritage asset, its setting and the significance of both and require mitigation measures if necessary. Decisions should take an informed view on the balance between the impacts and the public benefit of the development proposal.
- New buffers/settings of greater extent can be formed around significant heritage assets - these spaces should be designed to the highest quality in accordance with Management Plans while allowing greater access and use by the public.
- Improve pedestrian access to gardens and spaces around heritage assets and introduce seating and lighting to enable longer dwell times and social gathering.
- Existing Chortens and Lhakhangs within the CCAP area should be embedded within the proposed green and blue network and connected along proposed walking routes.
- Intangible heritage and culture should be nurtured and showcased throughout the City Core and within the proposed Cultural Quarter.

INTERVENTIONS

The key interventions required to ensure the culture and heritage of the City Core is preserved and enhanced are:

- 1 Introduce new public gardens at both Samarzingkha and Zangdo Pelri Lhakhangs. Celebrate and describe Zangdo Pelri's importance to the history of Bhutan. Both gardens should form part of the Wangchhu Corridor landscapes.
- 2 Samarzingkha Gardens can create a new landscape 'gateway' in the south.
- 3 Provide improved pedestrian access to the National Memorial Chorten through reconfiguration of vehicular circulation (see Transport section) and an improved pedestrian route to the riverside.
- 4 Improve the public realm around the National Memorial Chorten, including enhancements to 108 Steps Valley Park and a stronger visual connection to the riverside. Spaces around the Chorten must be accessible and comfortable for older citizens and provide spaces and seating for social gathering.
- 5 Provide new, improved public realm settings for the locally significant heritage.
- 6 Preserve the historic bridges at the market and at Changzamtog and consider re-constructing the traditional bridge at Lungten Zam. Create a new public realm setting for the bridge at the market.
- 7 Preserve the intangible heritage found at Norzin Lam, Clock Tower Square, the National Stadium and Centenary Park. Promote a calendar of events in these spaces through that incorporates existing as well as new activities.
- 8 Promote intangible heritage including: traditional crafts such as weaving, carpentry, painting and silver-smithing as well as music and dance as part of the proposed Cultural Quarter.

KEY

- City Core Action Plan Boundary
- Heritage Setting (proposed improvements)
- Monument Setting (proposed improvements)
- National Monument (category C)
- Core Heritage Area (TSP 2023)
- Heritage Buffer Zone (TSP 2023)
- Chorten
- Lhakhang
- Vernacular Architecture Site (listed)
- Vernacular Architecture examples (further investigation required)
- Existing Historic Bridge
- Proposed new Buffer/setting in the form of Public Gardens

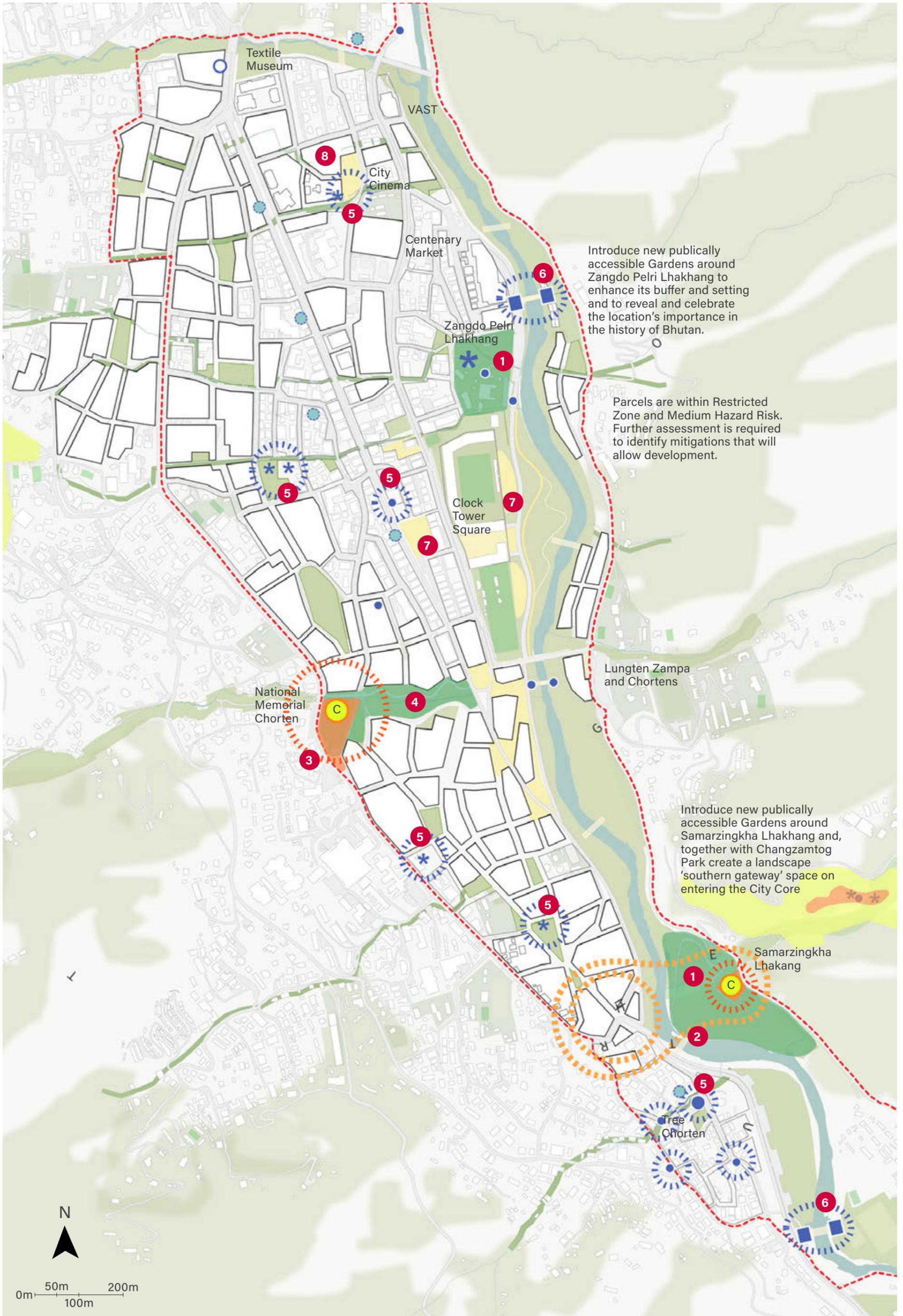


Figure 3.65 Geohazard Risk

3.3.4 View corridors and locally significant views

PRINCIPLES

- Within the CCAP area, any proposed development within a city-wide view corridor must follow the recommendations and policies within the TSP 2023 and prepare a visual impact assessment to determine its impacts on the view in which it sits. Four city-wide views have the greatest relevance for the City Core and they are listed on the framework diagram opposite.
- City wide view corridors within the CCAP area should be protected as defined in the TSP 2023.
- Important Local view corridors within the City Core are defined and their key features and aspects of foreground and background that contribute to the setting of the view are described on the following pages. Any proposed development within a Local view corridor must follow the recommendations and policies within the TSP 2023 and prepare a visual impact assessment to determine its impacts on the view in which it sits.
- Early development controls required to protect the setting of the view corridor (both city-wide and local) and any interventions that would improve the quality of the view in advance of any required Visual Impact Assessments have been defined within the Urban Structure and Design Guidelines of this document.
- Viewpoints within the City Core are defined, where new spaces and places for people to gather can be created, providing space and a new public realm for the leisure and recreation of residents and visitors.

INTERVENTIONS

The key interventions required to ensure the preservation and celebration of city-wide and local view corridors are:

- 1 Maintain lower development heights in the foreground and background of the National Memorial Chorten to preserve the city-wide view from Simtokha to the Chorten (further assessment is required).
- 2 Improve views along Norzin Lam to Wangditse Lhakhang by maintaining a consistent building height and building line along the street and introducing a new public realm, including trees.
- 3 Form a clear view corridor through proposed development within the Southern City Core to and from the southern gateway (and potentially as far as the 'Tree Chorten' at Changzamtog) and the National Memorial Chorten.
- 4 Preserve the existing view from Doebum Lam southwards towards the National Memorial Chorten. Introduce an improved public realm to provide a high-quality approach to the Chorten.
- 5 Form a stronger visual connection between the National Memorial Chorten and the Chortens at the riverside, including filtered views through groups of retained existing trees.
- 6 Preserve the existing view from within Clock Tower Square to the eastern, forested valley sides by maintaining the existing lower building heights for any future re-development to the east of the Square, including at Chang Lam.
- 7 Preserve the nature and character of existing views from the Traditional Bridge at the Market area along the river corridor to the north and to the south. Ensure that trees and planting are maintained along the river and ensure that any proposed development does not encroach significantly into these views.
- 8 Views from Lungten Zam along the river and over Centenary Park and the Bhutan Olympic Ground (the proposed Central City Parks) should be celebrated. The design of these public spaces and the frontages and roof-scapes of buildings within them or forming them should consider and respond to these views from the bridge.
- 9 Development frontages and roof-scape at the market area should consider and respond to overviews from Khamtoe Lam on the eastern side of the river.
- 10 Celebrate the view to Samarzingkha Lhakhang from the Expressway and form a new approach and southern gateway to the City Core.
- 11 Create a new public realm at key viewing locations:
 - At the National Memorial Chorten create a place to the south-east of the precinct where people can enjoy views over the city to Simtokha;
 - At Lungten Zam consider wider pavements to both sides of the bridge and/or places adjacent to the foot-way to allow people to pause and take in the view over the riverside, the proposed Central City Parks and longer views to Buddha Dordenma and Wangditse Lhakhang;
 - At the convergence of Norzin Lam and 108 Steps Valley Park create a place where views to both the National Memorial Chorten and Wangditse Lhakhang (along Norzin Lam) are revealed and celebrated;
 - Improve the public realm around the 'Tree Chorten' and allow space for viewing Wangditse Lhakhang and possibly the National Memorial Chorten.



Figure 3.66 The National Memorial Chorten

KEY

- City Core Action Plan Boundary
- Chorten
- Lhakhang
- Vernacular Architecture Site
- Existing Historic Bridge
- View point (proposed)
- Local/City Views
- Development sensitive to the setting of the National Memorial Chorten

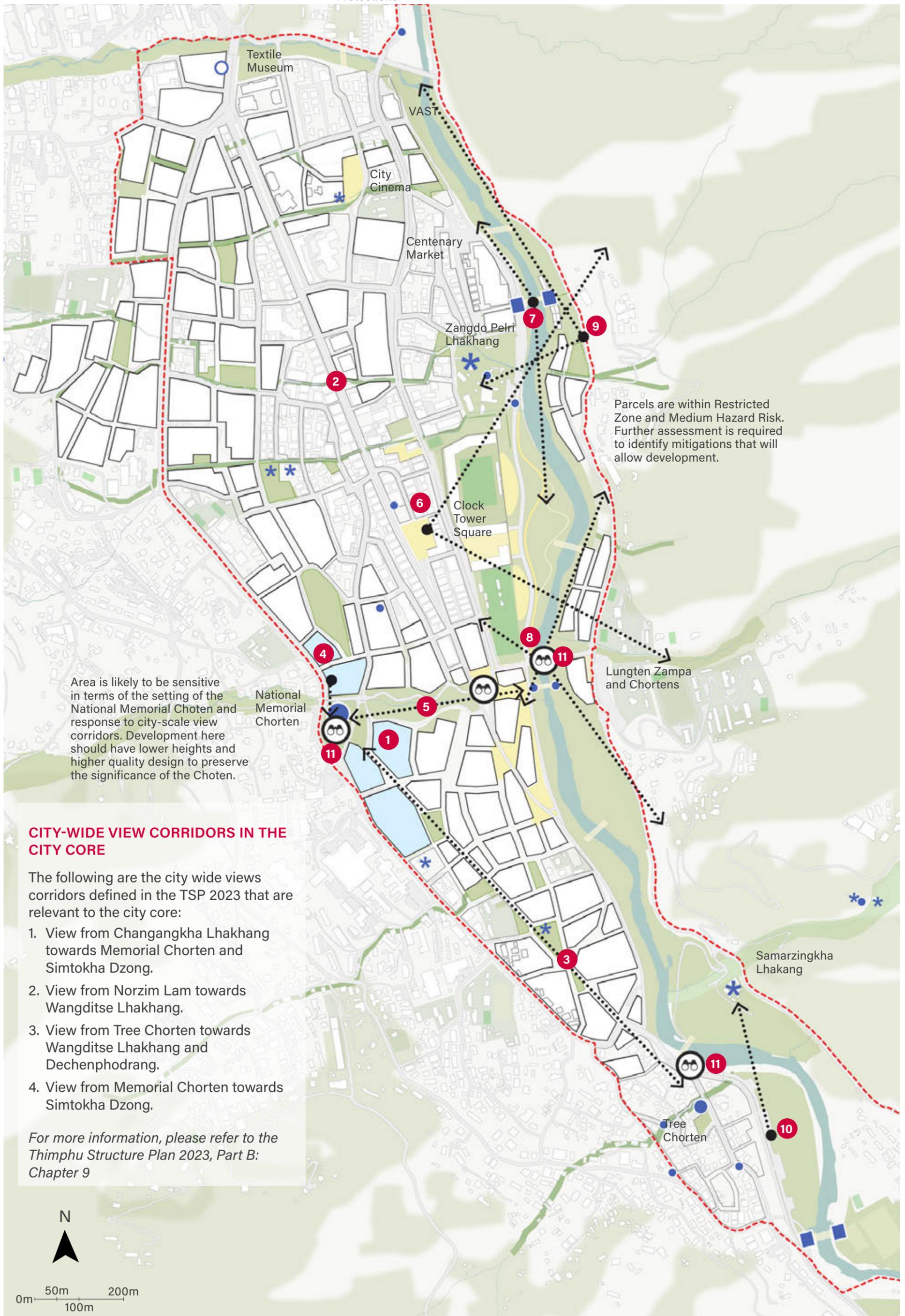


Figure 3.67 Locally significant views within the City Core.

PRESERVING AND IMPROVING LOCALLY SIGNIFICANT VIEWS

Doebum Lam (north) to the National Memorial Chorten

Foreground: Doebum Lam road corridor.

Middle-ground: Boundary treatment to the Memorial Chorten precinct and Memorial Chorten.

Background: Trees and mountainsides in distance form an appropriate backdrop to the Chorten.

Potential improvements:

- Improvements to public realm of Doebum Lam (as part of the transformation to the 'Royal Boulevard'), with careful placement of street trees/lighting columns so as not to obscure views to the Chorten.
- Maintain mature trees around the Chorten and ensure new development to the south of the Chorten does not obscure views to mountainsides.



Figure 3.68 Existing view from Doebum Lam (north) to National Memorial Chorten

Clock Tower Square to Eastern Mountainsides

Foreground: Clock Tower Square public realm and existing clock tower.

Middle-ground: A range of buildings facing onto the Square.

Background: Forested slopes of the valley and sky.

Potential improvements:

- Improvements to public realm of Clock Tower Square, including new surfaces, planting, trees and potentially a new clock tower.
- Maintain existing building and roof heights of development to east of Clock Tower Square. Ensure no encroachment into the view of development behind Clock Tower Square frontages (e.g. at Chang Lam).



Figure 3.69 View from Clock Tower Square to forested eastern mountainsides

Market Bridge along River corridor, north & south

Foreground: River.

Middle-ground: Mature trees and river banks.

Background: Mountainsides with forest cover and clear view to the Buddha Dordenma in the southern view.

Potential improvements:

- Improvements to the river bank (remove engineering solutions and naturalise).
- Ensure development does not significantly rise above the tree line (in the middle-ground of the southern view).
- Development should not significantly encroach on forested mountainsides (in the background of both views).



Figure 3.70 View from Market Bridge looking south to Buddha Dordenma



Figure 3.71 View from Market Bridge looking north

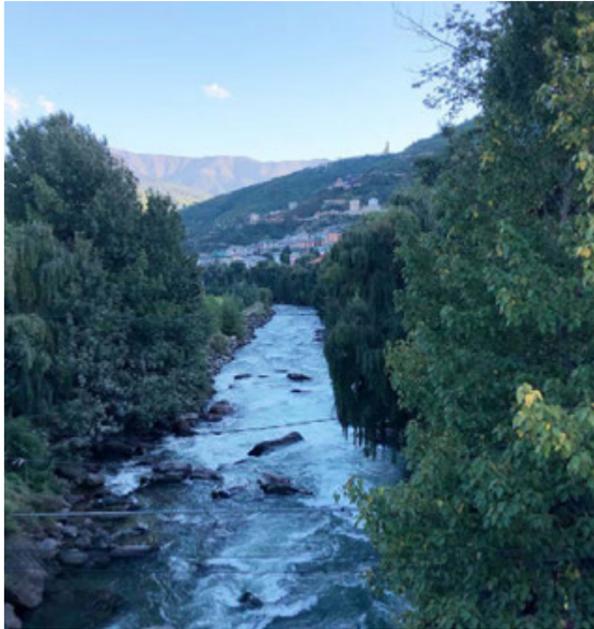


Figure 3.75 View from Lungten Zampa looking south towards the Buddha Dordenma

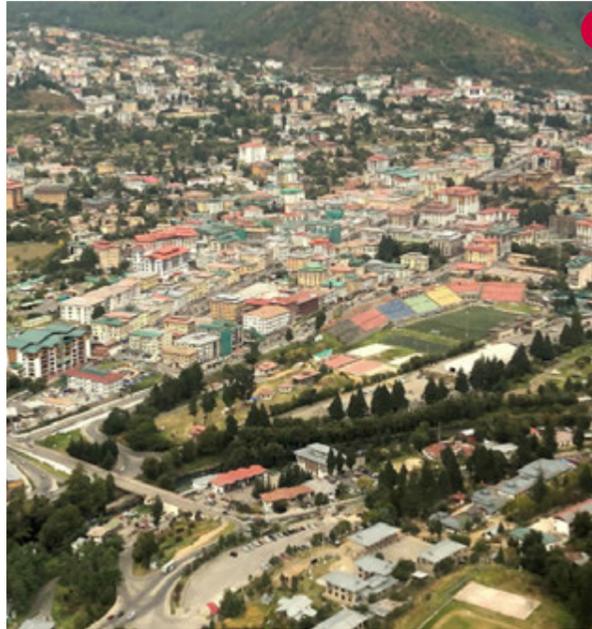


Figure 3.72 Aerial photo of the context of Lungten Zampa looking north

8 Overview from Lungten Zampa (north, south)

Foreground: River, river banks and Chortens (to south).

Middle-ground: Proposed Central City Parks (Centenary Park and Bhutan Olympic Ground).

Background: City Core urban area inc. Stadium, Chang Lam frontages and roof-scape (north view). Urban development, forested mountainsides and Buddha Dordenma (south view)

Potential improvements:

- Improvements to the river bank (remove engineering solutions and naturalise).
- New public realm within Central City Parks.
- Retain existing mature trees within new public realm.



Figure 3.73 View from Khamtoe Lam over Market area

9 Overview from Khamtoe Lam to Market Area

Foreground: trees and planting on eastern slopes.

Middle-ground: market building and City Core urban area.

Background: Forested mountain slopes.

Potential improvements:

- Consider roof-scape of market building and improve eastern frontage facing the riverside.
- Introduce new riverside public realm that may include street markets, high levels of activity and street trees.



Figure 3.74 View to Samarzingkha Lhakhang from Expressway

10 View to Samarzingkha Lhakhang from Expressway

Foreground: Expressway road corridor.

Middle-ground: RBA buildings.

Background: Lhakhang set within mature trees, with forested mountain slopes directly behind.

Potential improvements:

- Improvements to public realm of Expressway with careful placement of street trees/lighting columns so as not to obscure views to the Lhakhang.
- Consider the landscape treatment of the bank to the west (right of photo).
- Remove RBA buildings and form new parkland setting around the Lhakhang.

FORMING NEW LOCALLY SIGNIFICANT VIEWS

National Memorial Chorten to/from Tree Chorten/proposed southern gateway

Foreground: Expressway.

Middle-ground: Urban development at Changzamtog.

Background: Forested mountainsides with the National Memorial Chorten visible above the red roofs.

Potential improvements:

- Improvements to public realm of Expressway with careful placement of street trees/lighting columns so as not to obscure views to the Memorial Chorten.
- Explore forming a view corridor within any new development within the Southern City Core to open up clearer views to the National Memorial Chorten.

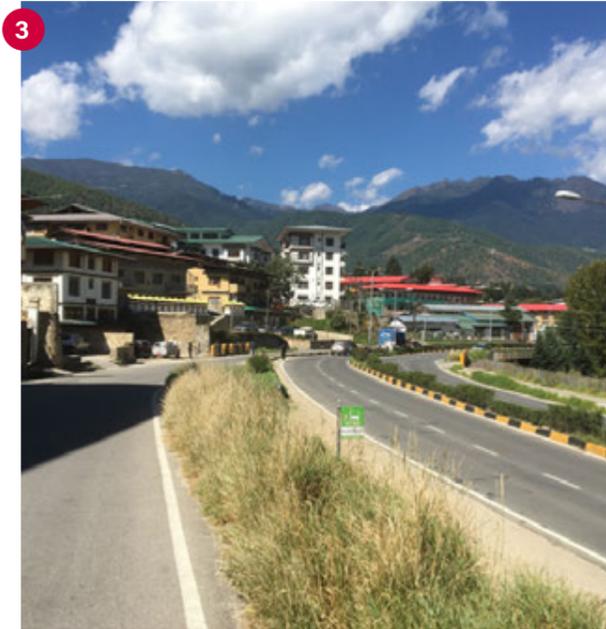


Figure 3.76 View to/from National Memorial Chorten to Tree Chorten/proposed southern gateway

National Memorial Chorten to/from Riverside

Foreground: '108 Steps' Valley Park public realm and channelised tributary stream.

Middle-ground: Mature trees and wall of RBP compound.

Background: Eastern valley slopes - the riverside is not visible.

Potential improvements:

- Extend Valley Park public realm to the south (right of photo) and form a new, clear view corridor between the riverside and the Chorten.
- Consider lifting the crown (removing lower branches) of the existing mature trees to provide more filtered views through the trees to the riverside.
- 'Daylight' the culverted stream as part of the Valley Park public realm improvements and provide a naturalised water feature within the space.

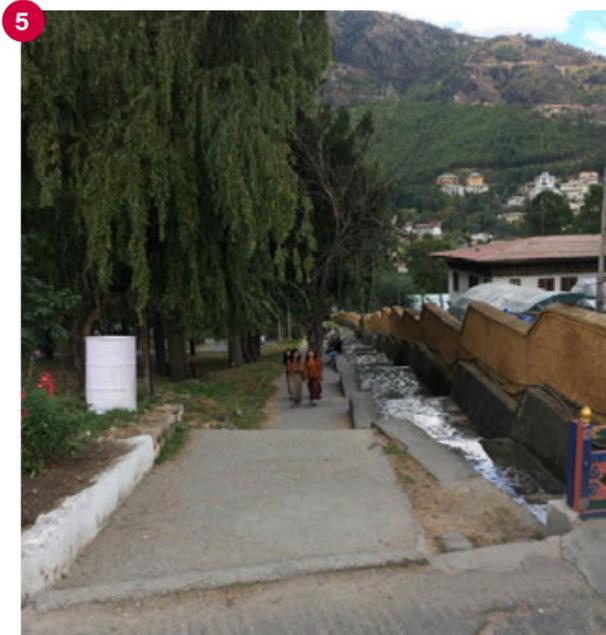


Figure 3.77 View to/from National Memorial Chorten to Riverside



3.4 Green Infrastructure

3.4.1 Overarching Objectives

OBJECTIVES

The following objectives have been identified to underpin the green infrastructure approach and support the vision of the project:

Protect existing landscapes, habitats and places of ecological and amenity value.

- Establish protective buffer through environmental designations along waterways and across areas of pristine forest;
- All new developments to deliver improvements to bio-diversity;
- Achieve an increase in biodiversity and habitat quality;
- Achieve an increase in the area of habitat to support species of interest, including pollinators;
- All new developments to incorporate sustainable drainage systems (SuDS);
- Increase volume and percentage of total runoff retained, and a reduction in peak runoff rate for a design storm;
- Reduce frequency of localised surface water flooding, and increase in flood storage capacity;
- Achieve an increase in carbon sequestration;
- Achieve a reduction in CO2 through encouraging alternative forms of transport (e.g. walking, cycling and public transport);
- Reduce localised surface and air temperatures;
- Re-purpose materials from on-site construction to save cost and material from waste disposal;
- Increase in the amount of air pollutants removed by vegetation as a result of increased planting.

Provide new open and green spaces for people and wildlife.

- Achieve a net increase in area of green infrastructure;
- All residents are to be within reasonable walking distance of high-quality green open space;
- Achieve an increase in site visitation and use;
- Improve the perceived quality of urban blue and green spaces;
- Achieve an increase in the level of service and perception of inclusivity and accessibility;
- Achieve an improvement in the level of satisfaction and well-being for those visiting and passing through the site;
- Achieve an improvement in the perception of aesthetic value;
- Reduce ambient noise level from traffic and improved perception of undesirable noise;
- Accessible play provision for children of different age groups;
- Draw from native plant communities to ensure resilience and deliver biodiversity benefits;
- Increased perception of safety and comfort;
- Achieve an increase in temporary jobs during design and construction, and permanent or seasonal jobs during use;
- Skills training and job opportunities for green and blue infrastructure.

Connect people and landscapes through Thimphu and beyond.

- Connected street tree planting along all primary pedestrian and cycle routes;
- SuDS along drainage corridors;
- Uninterrupted walking routes along east-west drainage corridors;
- Daylight existing culverted streams through urban areas, enhancing amenity and biodiversity benefits;
- Achieve an increase in walking, biking and those using public transport through improved connections and dedicated infrastructure;
- Achieve improved legibility across the town centre through intuitive wayfinding.



Figure 3.78 Precedent images

OUTCOMES AND BENEFITS

The key interventions required to enable the development of distinctive places within the City Core are explored over the next section of the report, with the aim of delivering the following outcomes:

CREATING OPPORTUNITY

Nature-based solutions and green infrastructure initiatives present a host of socio-economic benefits which make them a cost-effective solution to addressing multiple societal and economic challenges. It will provide opportunities for:

- People, in the form of jobs and recreational opportunities
- Visitors to experience the landscapes and culture of Bhutan
- Nature to permeate into the city

NURTURING COMMUNITIES

The public realm is a shared amenity between individuals and communities. Through lasting improvements, it will promote cohesion, provide economic opportunity, support health and well-being and contribute to a shared sense of civic pride.

CULTIVATING BALANCE

The green infrastructure strategy will restore harmony and balance between people and nature, be inclusive to all communities and user groups, and contribute to the future climate resilience of the City. It will aim to establish an appropriate balance between urban development, preservation of cultural heritage and safeguarding open, natural green space.

INSPIRE

A contemporary landscape design approach will look confidently to the future, inspiring new ways of utilising the public realm whilst being respectful of the past and celebrating traditional Bhutanese culture.

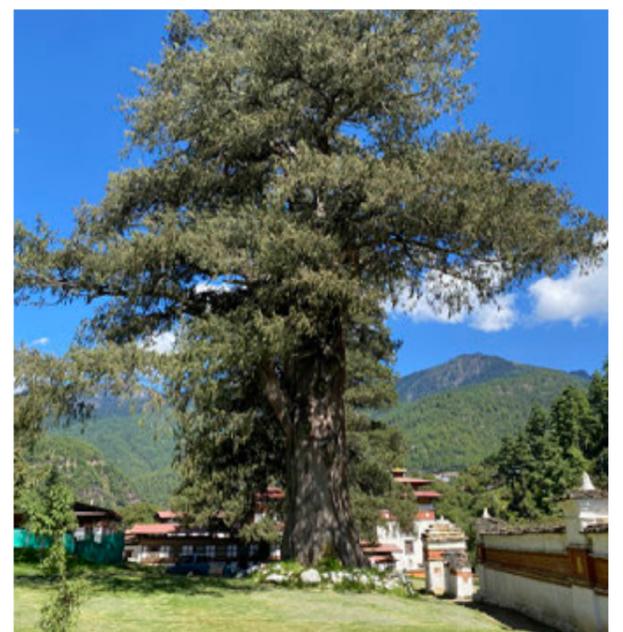


Figure 3.79 Precedent images

3.4.2 Overview

THEMES

Provision of new and enhanced public open spaces

The provision of new open and green spaces for public use and for nature. Proposals have been developed with the aim of providing:

- New open and green spaces for people and wildlife;
- Job opportunities for the citizens of Thimphu;
- Spaces for people to engage with nature;
- Places to grow food;
- Safe spaces for everyone;
- A natural legacy for the future population.

Connected green infrastructure

Connecting people and landscapes through Thimphu City Core and beyond. Proposals have been developed with the aim of connecting:

- People with each other;
- People and nature;
- People and heritage;
- Habitats and ecosystems.

Ecological and cultural landscape protections

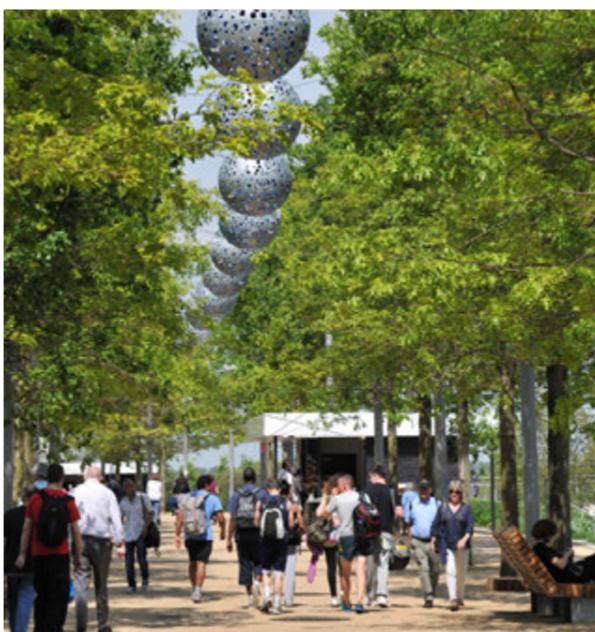
Environmental protections to preserve existing landscapes, habitats and places of ecological and cultural value. Proposals have been developed with the aim of:

- Protecting people from hazards and climate risks;
- Celebrating Bhutanese culture and identity;
- Supporting livelihoods, health and wellbeing;
- Preserving existing valuable habitats and biodiversity.

INTERVENTIONS

The key interventions required to enable the development of distinctive places within the City Core are:

- 1 Changlimithang River Park as a vibrant Central City Park at the heart of Thimphu, incorporating recreational spaces around the National Stadium, Centenary Park and The Bhutan Olympic Ground.
- 2 Improvements to Norzin Lam as a pedestrian priority green spine that supports active ground flood uses, dovetailing with an enhanced Clock Tower Square and structuring new routes down to the riverfront.
- 3 Upgrade the Thimphu Expressway and Doebum Lam to deliver a new Royal Boulevard that incorporates street trees and SuDS, dedicated cycle infrastructure, improved crossings and a coherent palette of materials.
- 4 Chubachhu and Memorial Chorten Valley Parks as ecological and movement corridors that connect people and nature to the City Core from upper neighbourhoods and the pristine landscapes beyond.
- 5 Themed Green Streams will integrate re-naturalised streams with uninterrupted walking routes that structure a wider network of pedestrian corridors and public spaces.
- 6 A hierarchy of green and open spaces will provide multifunctional climate resilience and health and wellbeing benefits.
- 7 The Wangchhu, its key tributaries, and landscapes of cultural value will be safeguarded and enhanced to promote the preservation of Thimphu's natural and cultural heritage.
- 8 A new gateway at Lungten Zam, with improved public realm and new pedestrian will anchor the eastern extent of '108 steps', connecting with the riverside Greenway.
- 9 A sequence of river parks and gardens will be connected via an uninterrupted walking and cycling Greenway along the banks of the Wangchhu.



KEY

- City Core Action Plan Boundary
- Watercourse
- Heritage Landmarks
- Heritage Accents
- Heritage landscapes
- Green open spaces
- Urban spaces
- Clock Tower Square
- Norzin Lam
- Valley Park
- Riverside spaces
- Royal Boulevard
- Green Stream
- EW Pedestrian Routes
- Green streets

Figure 3.80 Precedent images

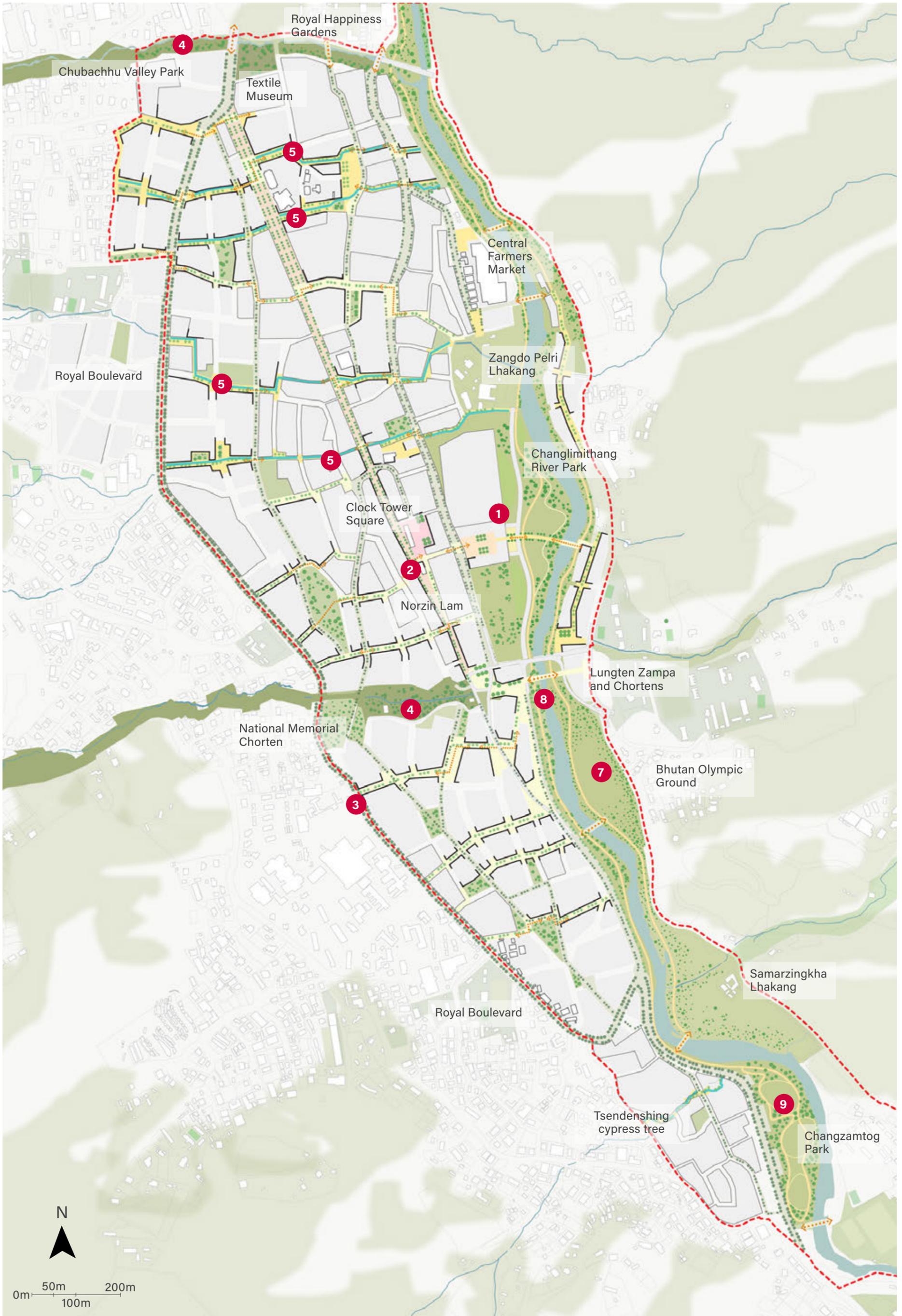


Figure 3.81 Green Infrastructure Framework Plan

3.4.3 Open Spaces

PRINCIPLES

Interventions have been developed based on the following principles:

- Deliver a hierarchy of multifunctional open spaces that provide public amenity for everyday use through the seasons.
- New and enhanced green open spaces should seek to support the health and wellbeing of Thimphu's communities and provide public amenity for people of different ages.
- Spaces that vary in scale and character are essential for providing climate change adaptation and mitigation, particularly in relation to improving air and water quality, mitigating urban heat island effect, reducing GHG emissions and serving as a vital refuge in the case of natural disasters.
- Ensure appropriate provision of play space and local parks at the neighbourhood scale.
- Ensure open spaces adhere to accessibility and inclusive design principles.
- Promote the consolidation of parking and 'hard' infrastructure to unlock space for the provision of small open spaces and pocket parks.
- Ensure appropriate management and maintenance of all open spaces.
- Ensure sensitively designed facilities associated with sport, recreation, heritage, religion and culture.
- Integrate new pocket parks and small open spaces adjacent to the enhanced 'Green Stream' walking and drainage corridors.

INTERVENTIONS

The key interventions required to enable the development of a hierarchy of open spaces within the City Core are:

- 1 Centenary Park and the Bhutan Olympic Ground will be extended and upgraded to form Changlimithang River Park.
- 2 Clock Tower Square will be improved as the principal urban space at the heart of the City Centre.
- 3 Lungten Zam Square will form a key gateway to Norzin Lam and the northern City Core.
- 4 Norzin Lam (north) incorporates a linear green corridor that permeates into the urban environment.
- 5 Samarzingkha Culture Park will provide a tranquil, contemplative space that celebrates Bhutanese cultural heritage.
- 6 Changzamtog Park will be a new riverside park for the Changzamtog community. Proposals advocate for an inclusive, safe and vibrant environment that promotes healthy living.
- 7 Tarayana Park will incorporate intimate garden spaces in a tranquil riverside setting.
- 8 A public realm around the Central Farmers Market (CFM) that integrates the market area into its urban context.
- 9 The landscape setting around Memorial Chorten forms part of the wider green infrastructure corridor that extends towards the river through 108 steps.
- 10 The Royal Happiness Gardens will be delivered as the first phase of Tashichho Dzong Gardens, where people will be able to visit and experience the historical, cultural and environmental heritage of Bhutan.
- 11 Thai Park is improved as a verdant, tranquil space for rest and relaxation.
- 12 The new Cultural Square anchors the Cultural Quarter, contributing to its unique identity and providing opportunity for flexible use.
- 13 A wider network of pocket parks and neighbourhood spaces will ensure accessible open space is distributed throughout the City Core.



KEY

- City Core Action Plan Boundary
- Watercourse
- City park
- Green open spaces
- Clock Tower Square
- Urban spaces

Figure 3.82 Precedent images

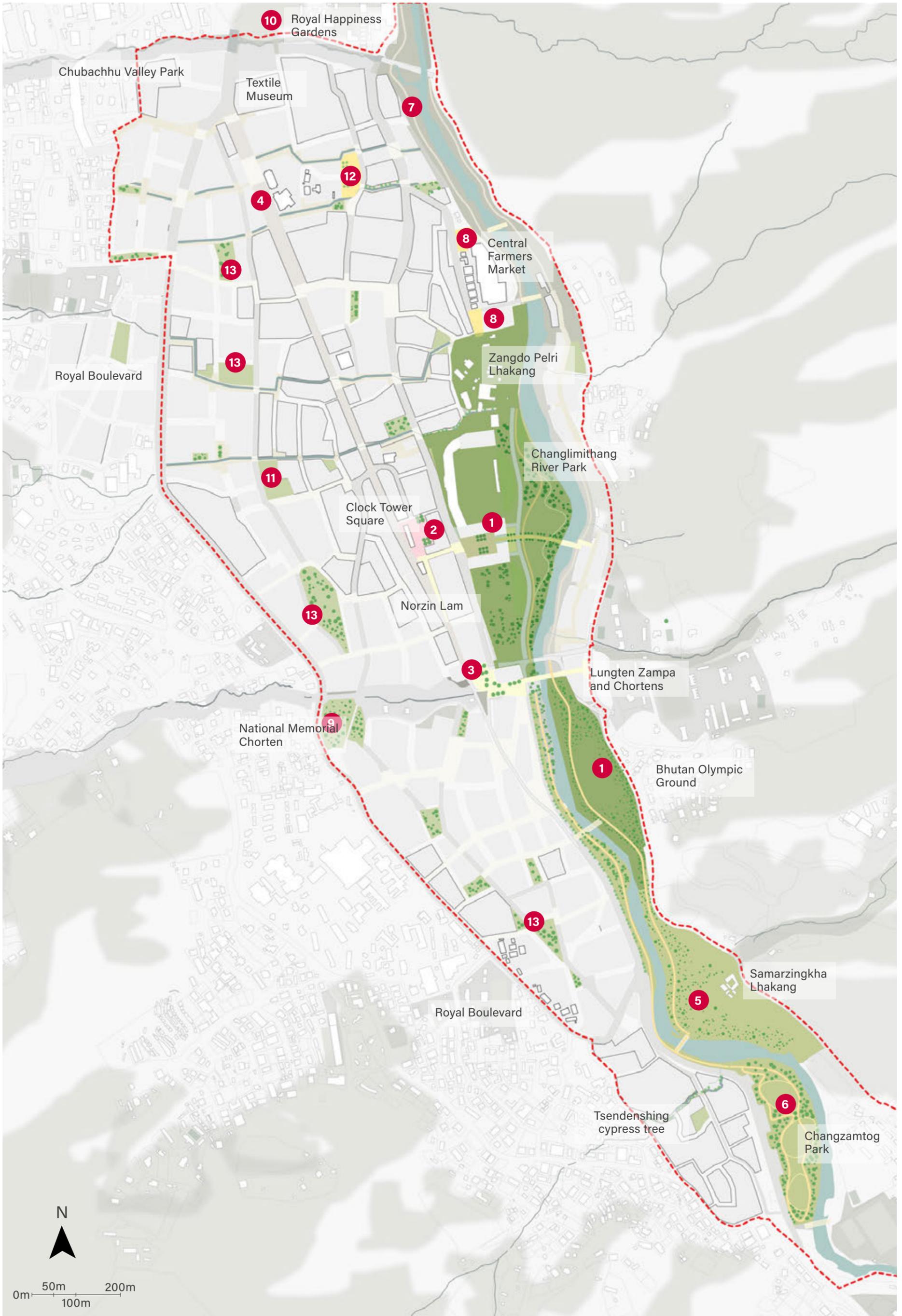


Figure 3.83 Open Space Plan

3.4.4 Streets and Corridors

PRINCIPLES

Interventions have been developed based on the following principles:

- Establish continuous areas of linear open space and streets that provide important connections through the urban centre, acting as a link between areas of open space, heritage assets, residential communities, protected landscapes and public amenities.
- Re-connect the green streams to provide uninterrupted, themed walking routes, opening up the channels in appropriate locations to integrate nature based solutions, improve public amenity and provide new aquatic habitats.
- Establish distinct planting zones to provide unique character to individual streets and corridors.
- Re-imagine the lost heritage bridge at Lungten Zam to improve pedestrian connectivity, forming part of a wider arrival landscape to the south of the City Centre.
- Streetscape improvements to integrate street tree planting, interconnected footways, removal of clutter and improved crossings.
- Interconnected river gardens along the Wangchhu Corridor will link with Northern and Southern Thimphu, providing pedestrian connectivity and a sequence of high-quality, multifunctional open spaces.
- East-west Valley Parks that connect with hillside neighbourhoods.
- Consider suitable locations for SuDS along drainage corridors and streets to maximise rainwater attenuation.

INTERVENTIONS

The key interventions required to establish a connected network of green infrastructure are:

- A new Valley Park will extend from Memorial Chorten down to the riverside, incorporating an open, naturalised stream, improved pedestrian connections and views towards the river.
- Chubachhu Valley Park will promote the protection of riparian habitats and incorporate opportunities for walking, cycling, play and recreation.
- The Cultural Green Stream will provide an uninterrupted walking route and incorporate a network of pocket parks, linking through the Cultural Quarter.
- The Spiritual Green Stream will promote the celebration of water as it flows towards the river and with the landscapes around Zangdo Pelri Lhakhang.
- The Recreational Green Stream will incorporate recreational and leisure uses, dovetailing with upgraded sports facilities around the National Stadium.
- Doebum Lam is transformed with an upgraded public realm, tree planting, improved crossings and the integration of SuDS to form the new 'Royal Boulevard'.
- Chang Lam forms the main transport corridor through the City Core, incorporating tree planting and improved active travel connections.
- Dondrup Lam Green Corridor will connect a network of public spaces across the west of the City Core.
- The Greenway is a walking and cycling route that provides uninterrupted access along the River and connects a series of garden and parkland spaces.
- A new pedestrianised link will connect Clock Tower Square to Chang Lam and Changlimithang River Park. The 'Social Steps' will address level changes and function as seating terraces during events.
- Norzin Lam is the principal 'Great Street' in the city, with improved planting and public realm.
- The Wangchhu Corridor extends to Northern and Southern Thimphu, promoting the preservation of the natural environment, improving flood resilience, and providing new public spaces for Thimphu.



KEY

- City Core Action Plan Boundary
- Watercourse
- Valley Park
- Royal Boulevard
- Green Stream
- EW Pedestrian Routes
- Green streets
- Greenway
- River Walk

Figure 3.84 Precedent images

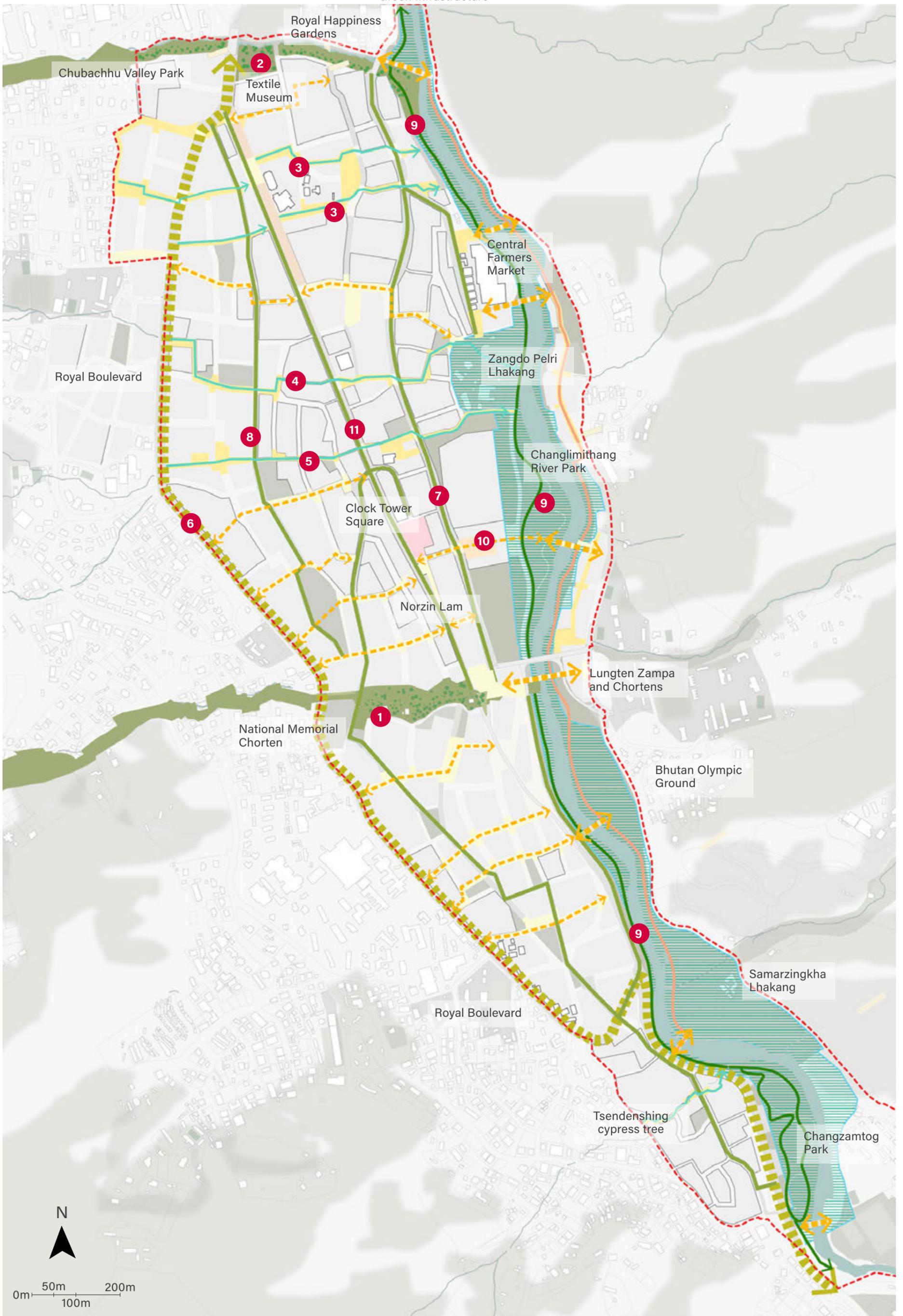


Figure 3.85 Streets and Corridors Plan

3.4.5 Biodiversity and Nature in the City

PRINCIPLES

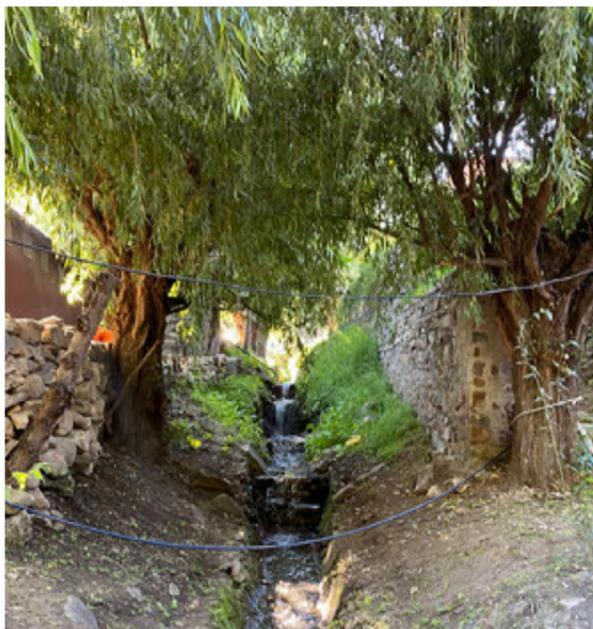
Interventions have been developed based on the following principles:

- Celebrate and cherish Thimphu's unique environmental setting by protecting valuable habitats.
- Establish a protective buffer along the Wangchhu, restricting urban development and promoting the preservation of the natural environment.
- Establish a protective buffer along key tributaries.
- Identify pockets of natural forest to preserve and connect through green infrastructure corridors, mitigating the risk of landslides in high hazard zones.
- Enhance the management of existing habitats, including through habitat restoration and avoiding habitat fragmentation.

INTERVENTIONS

The key interventions required to bring nature into the city and promote the protection of important habitats are:

- 1 The Riparian Corridor along the Wangchhu will act as a protective buffer, with the aim of restricting urban encroachment, preserving riparian habitats and mitigating flood risk.
- 2 Establishing a riparian buffer along Chubachhu, as a key tributary of the Wangchhu, will contribute to the future climate resilience of Thimphu.
- 3 Memorial Chorten Corridor will provide people with access to nature within the urban environment.
- 4 Retain mature trees of ecological and cultural value, including Tsendengshing cypress tree in Changzamtog.
- 5 Naturalise Green Streams in appropriate locations, introducing new aquatic habitats and tree planting alongside public amenity space.
- 6 Introduce planting throughout streets and spaces that maximise the use of native species, flowering plants and trees.
- 7 Introduce ecologically friendly management and maintenance practices.



KEY

- City Core Action Plan Boundary
- Ecological corridor
- Watercourse
- Riparian zone

Figure 3.86 Images of valuable habitats in Thimphu's City Core

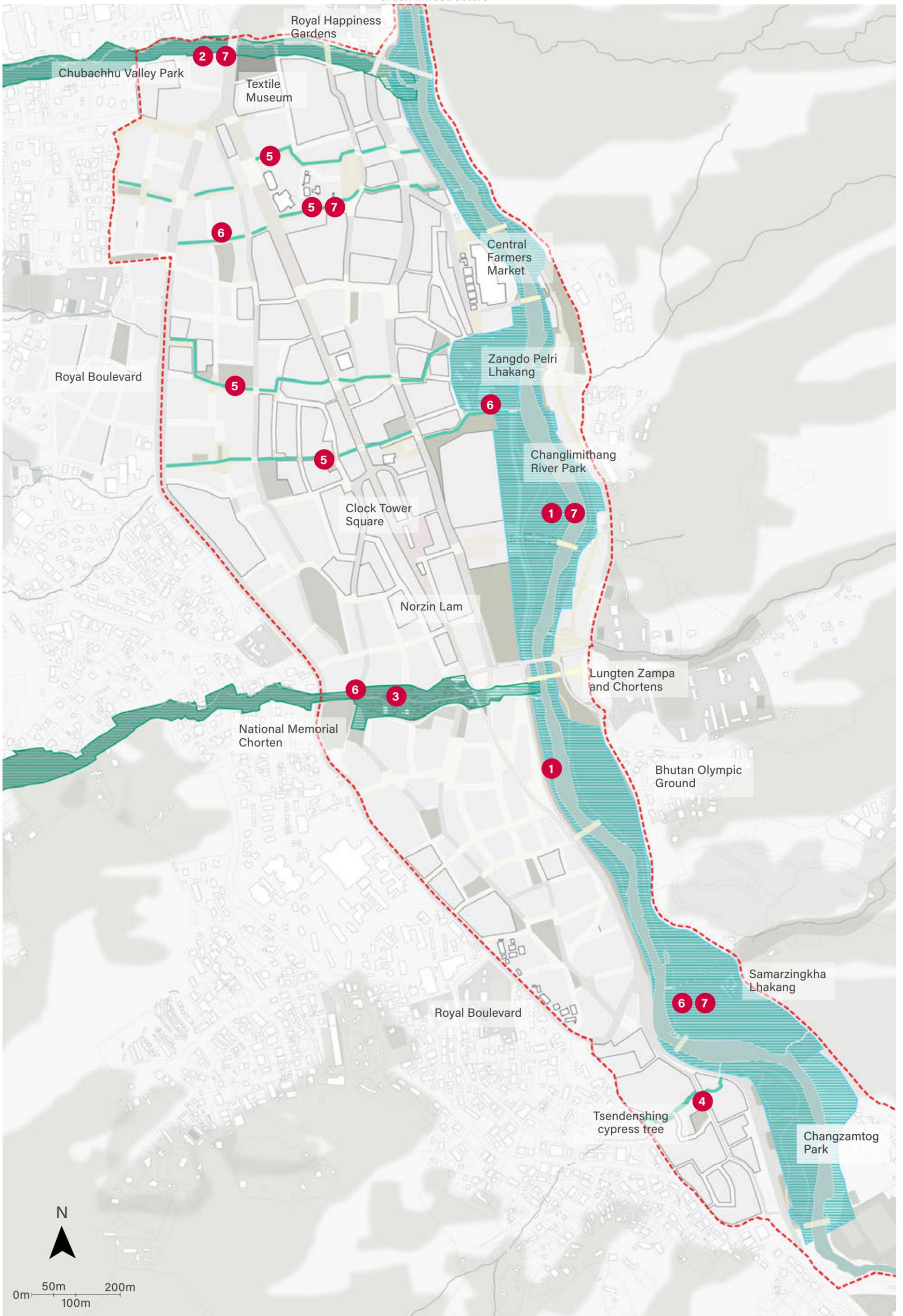


Figure 3.87 Ecological Landscapes Plan

3.5 Transport

3.5.1 Overarching Objectives

OBJECTIVES

The City Core's integrated, sustainable and coherent transport network will:

- Be a place to easily access by low emissions transport modes, and to walk between destinations and attractions while you are there.
- Reduce pedestrian and vehicle conflict.
- Encourage vehicular traffic away from the City Core.
- Incorporate key public transport corridors and support high-frequency services.
- Support efficient and safe movement of goods.
- Enhance the city as a vibrant and active place, with streets that people want to spend time in.
- Be monitored and improved on an ongoing basis, referring to a number of relevant metrics.



Figure 3.88 Precedent images

OUTCOMES AND BENEFITS

The key mobility interventions required to enable the development of distinctive places within the City Core are explored over the next section of the report, with the aim of delivering the following outcomes:

CREATING OPPORTUNITY

A balanced mobility offer, with a mix of transport alternatives available, will enhance inclusivity and access to employment, education and health for all cohorts of Thimphu's population.

NURTURING COMMUNITIES

The creation of new accessibility patterns, where local access on foot is improved, will unlock the potential of communities to develop.

CULTIVATING BALANCE

The infrastructure required to improve mobility networks will need to be sympathetic to the existing natural and heritage assets of Thimphu's City Core and environs. Sustainable mobility patterns will mitigate the negative impact that car travel can have on the natural environment.

INSPIRE

The creation of a safer, more accessible, less car-dominated City Core, will increase its attractiveness as a place to work, live, and visit. This will enhance the sense of pride that Thimphu citizens have for their capital city, which in turn will be reflected in a heightened sense of ownership and inspire more ambitious aspirations for the future.



Figure 3.89 Precedent images

3.5.2 Walking and Cycling (Non-motorised Transport)

PRINCIPLES

- Establish an interconnected pedestrian network as the key structuring element of future interventions to ensure enhanced walkability in the City Core.
- Enhance connectivity to the various attractors and key surrounding neighbourhood nodes by improving east-west connections, including consideration of additional or improved river crossings.
- Establish a strong north-south connection along Wangchhu for walking and cycling.
- Ensure the future continuity of the network, by identifying gaps and investigating solutions for the completion of links and river and road crossing points.
- Improve pedestrian mobility through better footpaths, including adequate kerb heights, ramps, fix uneven surfaces, appropriate width, and where possible, include shading elements. Improve the safety of pedestrian linkages with adequate street lighting and visibility features, and relocate pedestrian crossings along strong desire lines and improve the quality and safety of existing crossing facilities.
- Rationalise, upgrade, and provide urban furniture features along key routes and particularly at key public realm nodes.
- Enhance wayfinding and signage facilities to/from key locations including bus stops.
- Improve multi-modal integration by providing mobility hubs with bike sharing facilities at key transport nodes. Provide bicycle parking facilities at key nodes and at key destinations.

INTERVENTIONS

The key interventions required to improve the walkability in the City Core:

- Improvements to the walking network within the City Core.
- Improvements to the walking infrastructure within a 5-minute walk from public transport stops and stations in the city centre.
- Norzin Lam pedestrianisation and footpath improvements.
- Link between Memorial Chorten and Lungten Zampa - Enhance the walking conditions across the bridge as a connection to schools and bus stops.
- Walking and wheeling improvements to East-West Laneway connecting to Norzin Lam.
- Clock Tower pedestrian improvements
- Centenary Park pedestrian route and new bridge
- Explore the implementation of bike-sharing on the proposed Wangchhu greenway.
- Introduction of pedestrian amenities in the vicinity of public transport stops.
- Introduction of new safe crossings across major roads.
- Hierarchy of cycling infrastructure: Priority for greenway to be constructed first, followed by secondary and then tertiary cycling links.
- Greenway along Wangchhu: Enhanced and continuous walking and cycling paths along the Wangchhu. These may include new bike-sharing hubs along the route and extending the corridor towards the north and south of the city.
- Introduce ancillary infrastructure across the City Core, to encourage NMT use (bicycle parking, lighting, seating and other urban furniture, signage for walking, wheeling and cycling routes).
- Applying temporary vehicle restrictions on the streets outside schools in order to improve safety and air pollution.
- Introduction of Car Free Days within the City Core. This will require restricting vehicle access along selected streets and roads for a period of time.



Figure 3.90 Walking & cycling



Figure 3.91 Pedestrian footbridge in Bohinj (SI)

KEY

- City Core Action Plan Boundary
- Chorten
- Lhakang
- Vernacular Architecture Site
- Existing Historic Bridge
- Important destinations
- Major Pedestrian Crossing
- Pedestrian Crossing
- Primary Pedestrian Route
- Secondary Pedestrian Route
- Tertiary Pedestrian Route
- Primary Cycling Route / Greenway
- Secondary Cycling Route
- Tertiary Cycling Route
- Cycle Sharing Locations
- Pedestrian only areas
- Pedestrian Route to be established
- Potential Pedestrian bridge
- Active Travel Bridge
- River walk

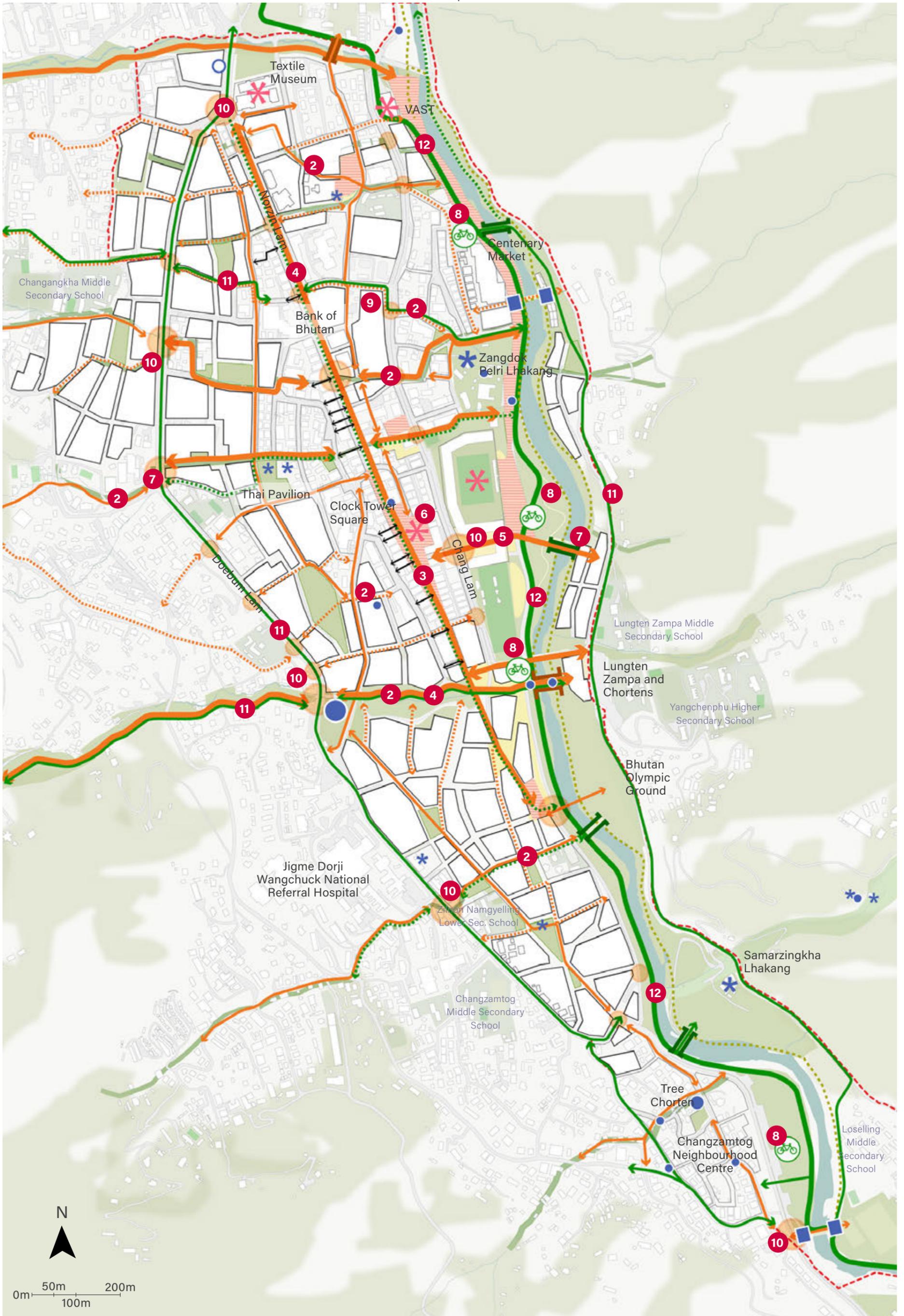


Figure 3.92 Non-motorised Transport Framework Plan

3.5.3 Public transport

PRINCIPLES

- Provide convenient and reliable bus service that meets current and future demand, both in terms of capacity and destinations served.
- Improve bus services through six high-frequency routes serving areas of economic activity, development and population growth.
- Ensure optimal pedestrian accessibility to bus stops, in order to enhance potential catchments. Locate bus stops to meet pedestrian desire lines and provide access to key destinations.
- Complement core bus routes with demand-responsive service in peripheral, low-density areas.
- Improve integration between the city bus and regional bus services for longer distance travel.
- Improve bus shelter and standardise platform infrastructure to create safe, legible and comfortable accessibility for all users. Enhance user journey experience by providing real-time passenger information at bus stops and a cross-platform mobile app.
- Provide clear bus network plans at bus stops and interchanges.

INTERVENTIONS

The key interventions required to improve the quality of public transport are:

- Relocation of the City and Regional bus stations from the City Core to a new combined terminus at Olakha, and introduce a series of Mobility Hubs with bus/active modes interchanges.
- Introduce ancillary infrastructure to improve the convenience, comfort and safety at bus stops.
- Improved road surface on bus route roads.
- Provision of night bus services.
- Deployment of information and communication technologies to provide real time information of traffic and public transport for users, advanced safety systems, etc.
- Better information at bus stops (provision of maps of routes at bus stops, timetables, real time information, etc.)
- High-quality footpaths towards all bus stops within 5 min walk.

| MOBILITY HUB COMPONENTS | LEVEL 1 (MAJOR HUBS) | LEVEL 2 (OTHER - CITY CORE) | LEVEL 3 (NEIGHBOURHOOD CENTRES) | LEVEL 4 (OTHER) |
|---|----------------------|-----------------------------|---------------------------------|-----------------|
| Bus shelter/stop | yes | yes | yes | yes |
| Waiting facilities | yes | yes | yes | yes |
| Drop-off/pick up areas | yes | yes | yes | yes |
| Walking catchment improvement | min. 10 mins walk | yes | yes | yes |
| Shared bikes | yes | yes | no | no |
| Cycle parking | min. 6 stands | yes | yes | yes |
| Car-sharing | min. 2 cars | yes | yes | no |
| Taxi ranks | yes | yes | yes | yes |
| EV Charging - for taxi's | yes | yes | no | no |
| EV Charging - for private vehicles | yes | no | no | no |
| Transport network map and bus schedules | yes | yes | yes | yes |
| Wayfinding | yes | yes | yes | yes |
| Real-time travel information | yes | yes | yes | no |
| Public wi-fi access points | yes | yes | yes | no |
| Ticketing kiosk | yes | yes | yes | no |
| Parcel and delivery lockers | no | no | yes | no |
| Loading bays | no | no | yes | no |
| Toilets | yes | yes | no | no |
| Changing rooms | yes | yes | no | no |
| Benches | yes | yes | yes | no |
| Planters and green pockets | yes | yes | yes | no |
| Parks and play grounds nearby | yes | no | yes | no |
| Lighting | yes | yes | yes | yes |

Note: most components within a mobility hub can be located together within streets and spaces.

KEY

- City Core Action Plan Boundary
- Chorten
- Lhaxhang
- Vernacular Architecture Site
- Existing Historic Bridge
- Level 1 Mobility Hub
- Level 2 Mobility Hub
- Level 3 Mobility Hub
- Level 4 Mobility Hub
- Bus Stops
- Bus charging location
- Taxi Rank
- Taxi Depot
- 500m walking radius
- Trunk Route - Dangrina to Olakha
- Trunk Route - Taba to Ngabiphu
- Local Route - Motithang to Ngabiphu
- Local Route - Motithang to Kabesa
- Local Route - Samteling to Changgidaphu

Figure 3.93 Potential components of different types (levels) of Mobility Hub (draft information)

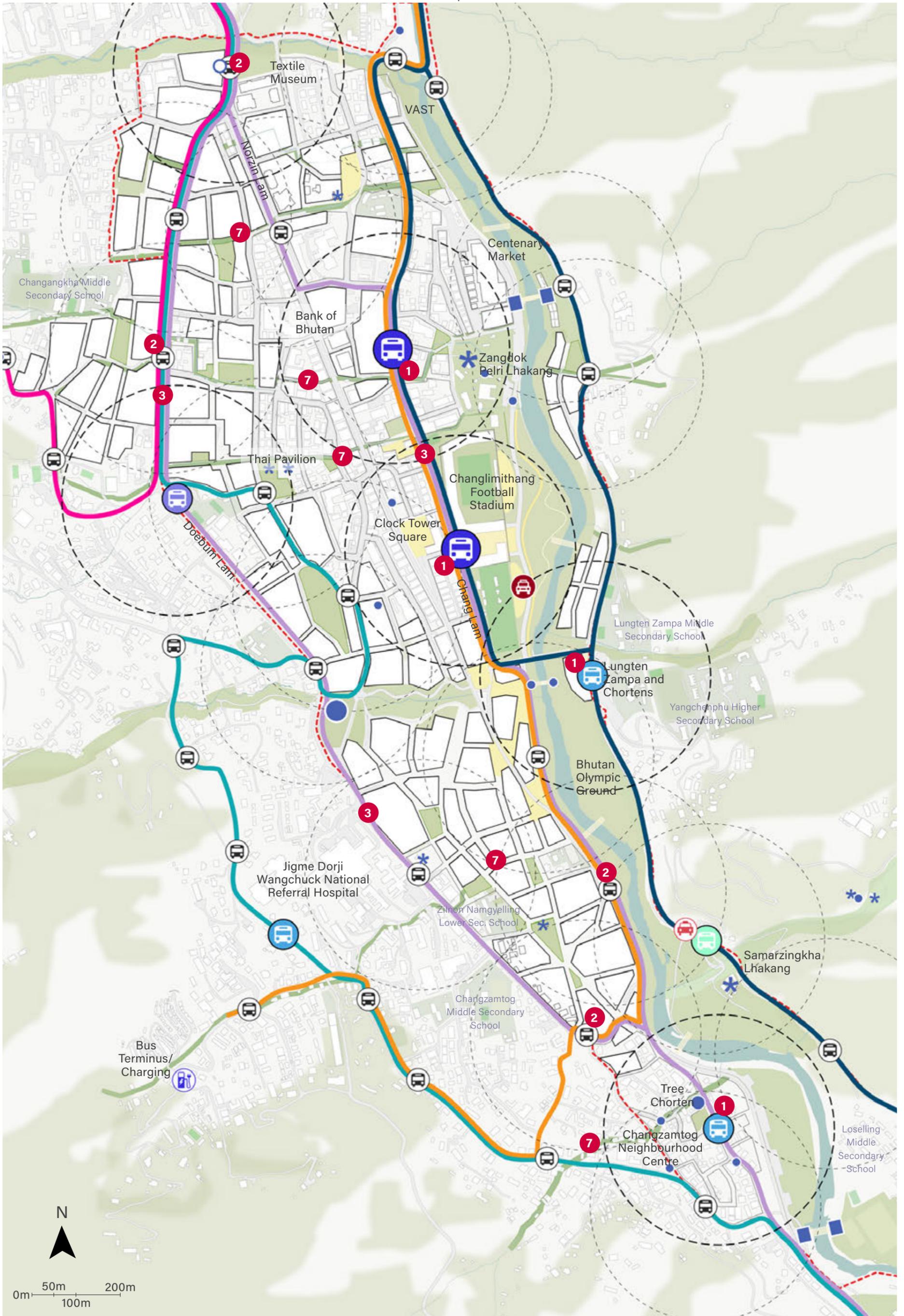


Figure 3.94 Public Transport Framework Plan

3.5.4 Vehicular Movement and Parking

PRINCIPLES

ROAD HIERARCHY

- Develop a new road hierarchy classification to bring clarity and reallocation of road space in line with sustainable and shared transport modes priority and integration.
- Identify and review pedestrianisation opportunities in the City Core (e.g. Norzin Lam).
- Provide alternative traffic routing to relieve City Core links from through-traffic.
- Provide new road connections and upgrades to connect to new development areas.
- Identify areas for traffic speed reduction and vehicle restrictions.
- Improve road infrastructure including signage facilities and road markings.
- Investigate improvements to key junctions, with a view to optimise vehicular circulation while prioritising sustainable modes.

INTERVENTIONS

The key interventions required to enable the development a clear and legible street network are:

VEHICLE CIRCULATION

- 1 Identification and review of opportunities for pedestrianisation in the City Core (e.g. Norzin Lam).

Conversion of the section of Norzin Lam from south of the Clock Tower to the policeman-kiosk roundabout with Chorten Lam into a pedestrian link, with occasional or time-bound vehicular access (deliveries, waste collection, emergency).

- 2 Conversion of the section of Norzin Lam between Jangchub Lam and Doebum Lam into a two-way street.

- 3 Provision of alternative traffic routing to relieve City Core links from through-traffic. The upgrade of the southern section of Doebum lam is essential to achieve this.

Change of the Doebum Lam section between the CSI Markets and the Memorial Chorten from single to dual-carriageway, to ensure capacity and potential for bus priority.

- 4 Improved existing road infrastructure including the implementation of adequate signage facilities and road markings.

- 5 Investigation of improvements to key junctions such as:

- Babesa Expressway junction with Doebum Lam (at CSI Markets) to prioritise car movements along the Doebum Lam-Expressway corridor and enable the downgrade of the northern section of the Expressway.
- Doebum Lam junction with the 108 Steps (at National Memorial Chorten).
- Doebum lam junction with Thori Lam (Chubachhu) into a signal-controlled layout, to improve pedestrian crossing facilities, better control the flow of traffic and allow for bus priority.
- Chang Lam junction with Dechen Zam to improve pedestrian crossings and regulate traffic flows.

- 6 Reconfiguration of the roads around the Memorial Chorten to enable two-way circulation along western side (Doebum Lam) and converting the eastern side into a cul-de-sac with car parking spaces.

- 7 Redesign of Jangchub Lam to enable it to act as a local distributor supporting access along the west side of Norzin Lam.

*See Low Emissions Transport Master Plan (LETMP, Sept 2023) for further detail on the vehicular circulation strategy.

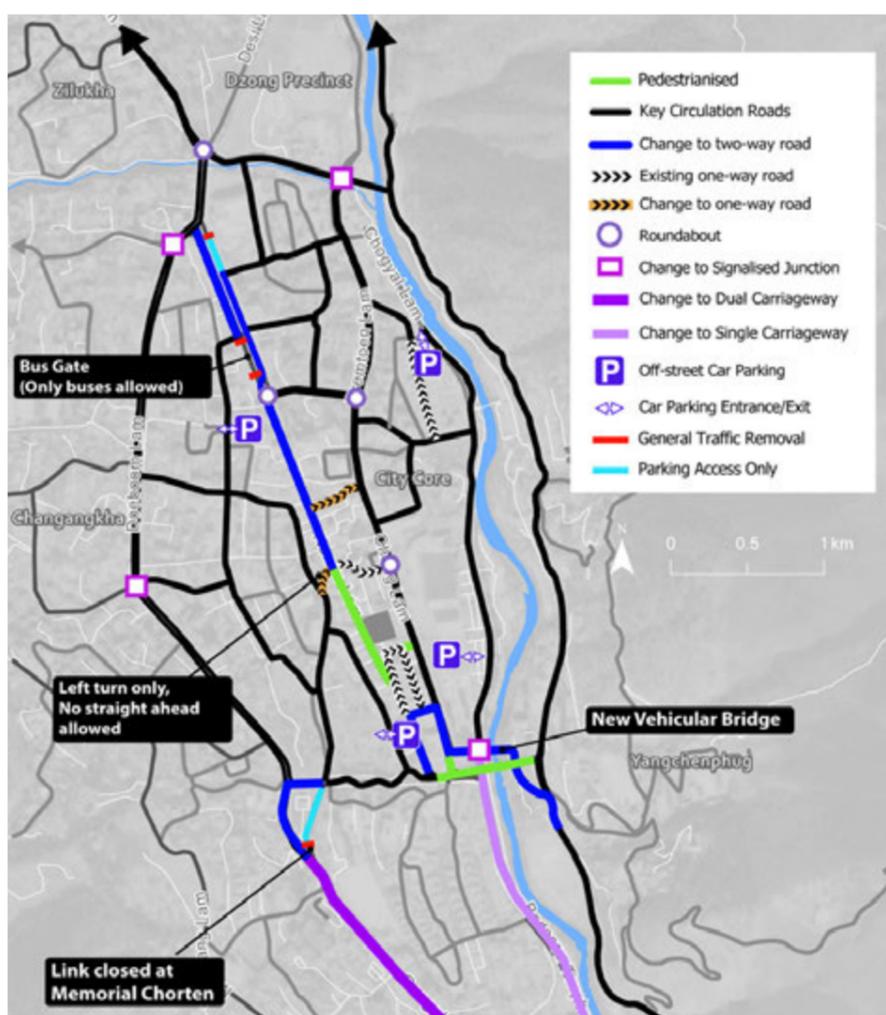


Figure 3.95 Circulation within the City Core (LETMP)

KEY

- City Core Action Plan Boundary
- Chorten
- Lhakhang
- Vernacular Architecture Site
- Existing Historic Bridge
- Primary vehicular route
- Secondary vehicular route
- Tertiary vehicular route
- Controlled service route
- Freight route
- Turnaround
- Potential new MLCP
- MLCP
- 500m walking circles
- Level 1 Mobility Hub
- Level 2 Mobility Hub
- Level 3 Mobility Hub
- Level 4 Mobility Hub
- Central Post Office
- Bus Gate

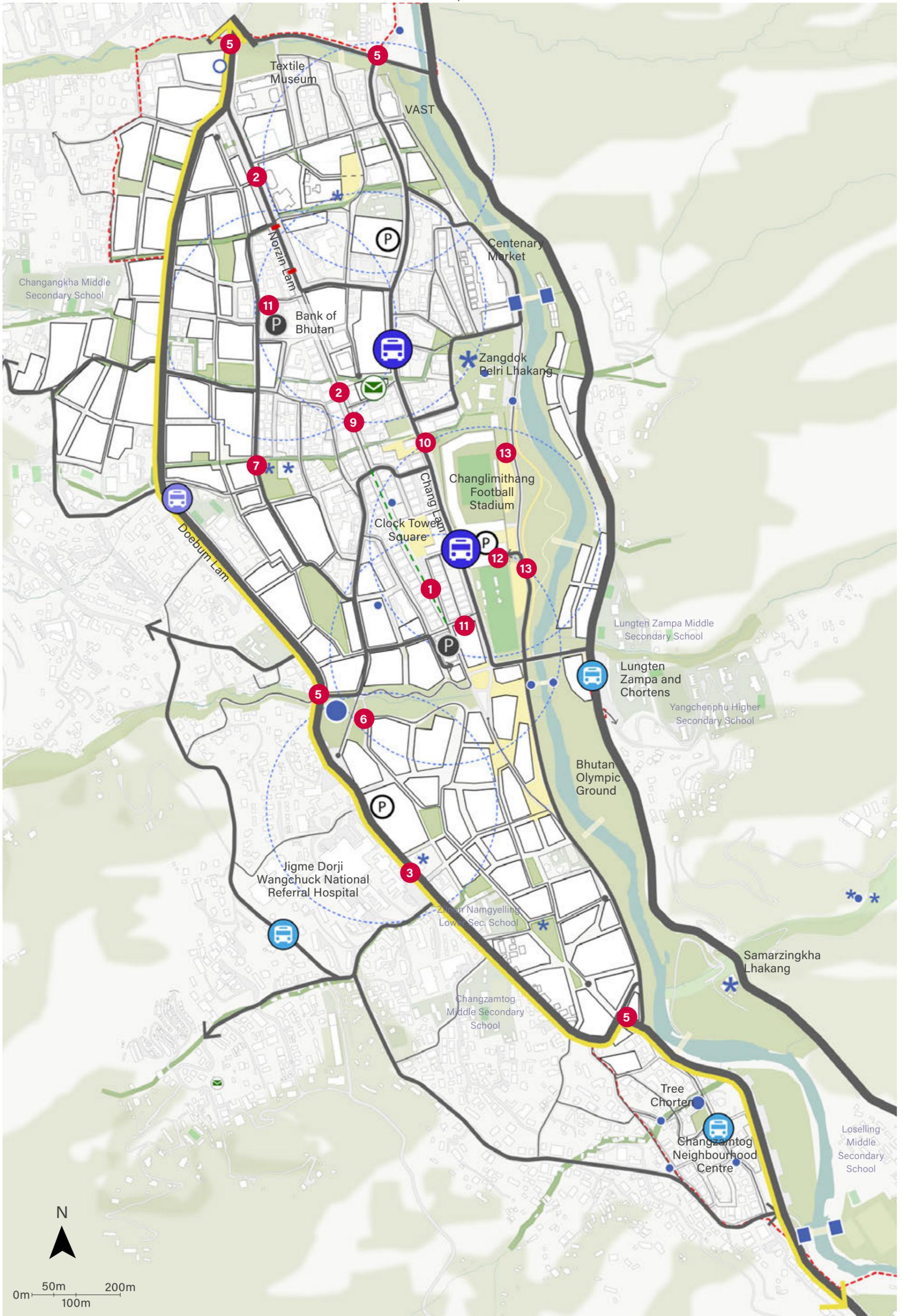


Figure 3.96 Vehicular Movement framework plan

PRINCIPLES

PARKING

- Rationalise on-street parking along non-pedestrianised sections of Norzin Lam.
- Introduce car parking charges that reflect short-, medium-, and long-term demand zones.
- Avail of underutilised car parking locations, i.e. Multi-level car parks (MLCPs) and National Stadium car park to absorb relocated spaces.
- Improve wayfinding and signage facilities to main car parking locations.
- Enforce measures to avoid illegal parking on footpaths and bus stops.
- Consider measures to limit employment-based car parking.

FREIGHT, DELIVERY & SERVICING

- Dedicate parking areas as commercial loading zones to improve delivery access to freight trip generating buildings or areas.
- Improve clarity of time-bound deliveries and clearly allocate kerb space for deliveries.
- Improve the quality of footpaths and create kerb cuts to improve access to buildings by handcarts.
- Incentivise cleaner or zero-emission goods vehicles in the City Core.
- Investigate the introduction of distribution hubs to reduce the number of heavy goods vehicles delivering to the City Core.
- Enhance opportunities for deliveries by (electric) 2-wheelers to reduce congestion and improve air quality.

INTERVENTIONS

CAR PARKING

- 8 Limited and formalised on-street parking across city centre.
- 9 Norzin Lam parking rationalisation including pedestrianisation of southern section, and conversion of herringbone parking into parallel parking along central and northern sections.
- 10 Chang Lam parking rationalisation including conversion of the street to a primarily bus corridor/station.
- 11 Improved design of existing MLCPs to eliminate problems with tight manoeuvring
- 12 New MLCP to the south of Changlimitang Stadium, associated with the proposed pedestrian walkway connecting the clock tower and the Centenary Park
- 13 Removal of existing at-grade Changlimitang Stadium parking.
- 14 Introduction of a short-term parking zone which allows for up to 1 hour of parking at a standard parking rate, but which increases significantly for every 30 additional minutes.
- 15 Increased parking enforcement.
- 16 Introduction of parking meters for on-street parking bays, providing parking tickets to be displayed in car windows which indicate the time of purchase in order to enforce time limits.
- 17 Reduce parking in existing employment sites across city centre.
- 18 Provision of public EV chargers.
- 19 Wayfinding measures to ensure that routes to MLCPs and other key off-street parking locations are clearly identified.

FREIGHT, DELIVERY & SERVICING

- 20 A new single freight logistics hub at Olakha with transfer of goods from heavy goods vehicles to smaller and/or low emission delivery vehicles to enter the City Core.
- 21 Relocation of industrial facilities, including sawmills to locations outside the city centre.
- 22 Implementation of dedicated loading zones in commercial locations.
- 23 Ban of HGVs in the city centre during peak times to alleviate traffic congestion and kerbside use.



Figure 3.99 Green streets for walking and cycling



Figure 3.97 Existing bus services in Thimphu



Figure 3.98 Intelligent public transport systems - information and communication technologies



Figure 3.101 Low Carbon Mobility

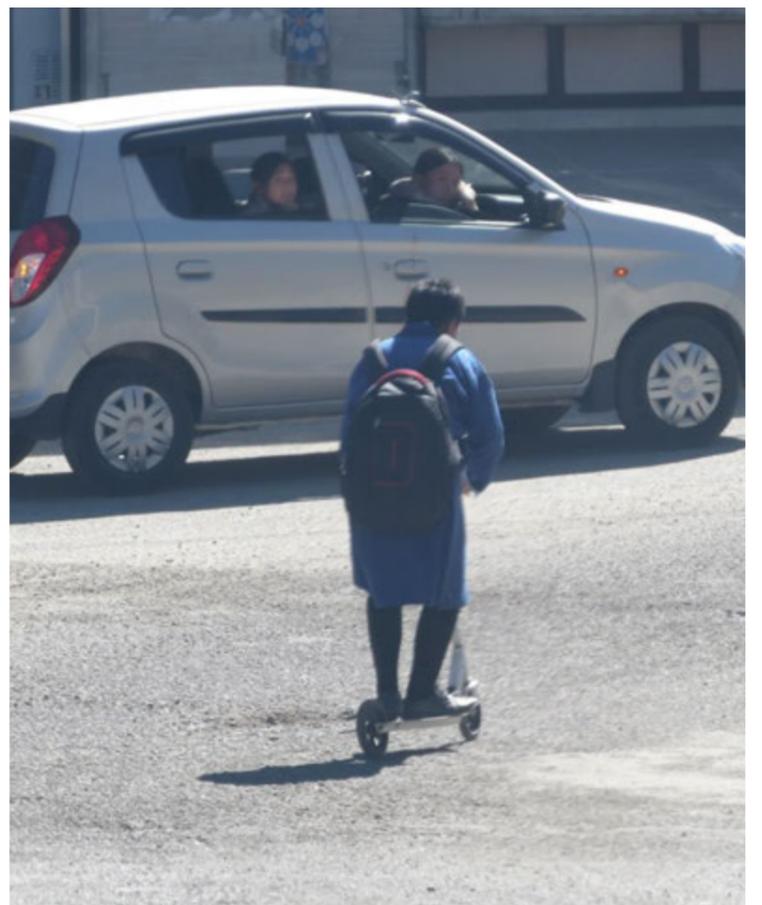


Figure 3.100 Alternative modes of transport (NMT)

3.6 Water Services

3.5.5 Overarching Objectives

OBJECTIVES

Water services provision in the City Core will be dependent on the resilience of a city-wide network that serves all of Thimphu. Many of the key objectives related to water are therefore the same as those articulated as part of the Thimphu Structure Plan (TSP), which refer to the greater Thimphu area. These include the following:

- All residents within Thimphu are served by a 24/7, high-quality, safe and reliable water supply.
- Fair and efficient supply of water to all consumers within Thimphu (including domestic, non-domestic and commercial customers).
- Promote sustainable use of water to minimise the effect on the environment.
- The water supply infrastructure can deliver necessary flows and pressures throughout the city for firefighting purposes.
- The water supply network will be sensitive to the natural environment.
- The water supply system will be operated economically and efficiently.
- The water supply system will be resilient to shocks and stresses including climate change.
- Wastewater in Thimphu will be managed in a manner that both protects the environment and minimises the risk to public health.
- Wastewater services shall be provided to international standards for all residents, businesses, schools and healthcare facilities in Thimphu and allow for the growth of the city in accordance with the provisions of the TSP.
- All wastewater is treated prior to discharge to the environment.
- The wastewater system will be operated economically and efficiently.
- Improve the water quality of stormwater run-off.
- Reduce stormwater run-off rates.
- Enhance amenity and biodiversity benefits of stormwater infrastructure.
- Improve the water quality of natural watercourses.
- Re-naturalise existing culverted streams.

OUTCOMES AND BENEFITS

CREATING OPPORTUNITY

Water systems which support sustainable growth within the city in accordance with the provisions of the TSP.

NURTURING COMMUNITIES

Safe and reliable water supply, wastewater and stormwater networks which enhance and protect the public health.

CULTIVATING BALANCE

Managing non-revenue water losses and water demand to ensure adequate water for living while protecting natural water resources.

INSPIRE

Public understanding of the water systems and how residents can contribute to sustainable management of water in Thimphu.

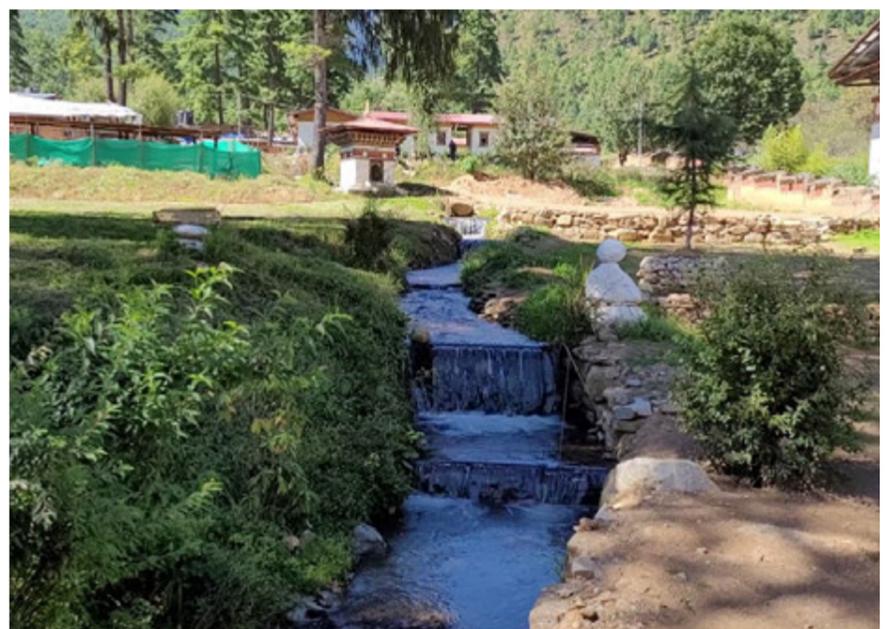


Figure 3.102 Natural streams in Thimphu

PRINCIPLES

The overarching strategy should ensure a safe, equitable, reliable and resilient network which protects natural watercourses.

- Customers will be served by a high-quality, safe and reliable water supply with multiple barriers against contamination.
- Water supply to all consumers in the City Core (including domestic, non-domestic and commercial customers) will be fair and efficient.
- Water will be used in a sustainable manner, to minimise any negative effects on the environment.
- Wastewater in Thimphu will be managed in a manner that both protects the environment and minimises the risk to public health.
- Wastewater collection and treatment systems will be provided to meet environmental quality standards and accommodate growth in the City Core.
- Stormwater runoff from urban areas will not negatively affect the quality of urban watercourses.
- Sustainable drainage systems (SuDS) shall be incorporated into all new developments and redevelopments which mimic natural, predevelopment flow regimes as much as possible.
- Stormwater capture and reuse should be promoted to reduce the demand for potable water.
- Stormwater systems should reduce the risk of flooding, both at the local level and within the wider catchment.
- Stormwater systems should improve visual amenity and support the development of green infrastructure and urban landscapes.
- Utilities should be diverted out of existing stormwater drains / culverts.

STRATEGIC INTERVENTIONS

Water Reliability and Resiliency

Improving the reliability and resiliency of the water network is essential to ensuring a safe and equitable system. While there is enough water available in the catchment to serve Thimphu, significant leakage, increasing consumption and inadequate storage all contribute to water shortages and inequitable supply.

Measures such as non-revenue water reduction, demand management and improved water storage to maintain a consistent supply of water to each property are all necessary to ensure a reliable and resilient system. Once a reliable water system exists, this can then be used for firefighting purposes.

River Water Quality

Thimphu's rivers and streams are a priceless resource, several of which have experienced significant deterioration as a result of human activity. The primary contributors to this are the discharge of greywater to the stormwater network, and untreated surface runoff from hardstanding areas. These activities increase the level of pollutants – Organic material, Phosphorus, Ammonia, Suspended Solids and heavy metals – in the water. These pollutants have a negative impact on the environment, depleting aquatic ecosystems and can be toxic to human health.

It is essential that all wastewater is treated prior to discharge. This should primarily be achieved by collecting wastewater in public sewers and treating the wastewater at the downstream wastewater treatment plant. In certain instances, it may not be feasible to connect to the sewer, in which case individual septic tanks and percolation areas can provide the necessary treatment.

Integration of green infrastructure and sustainable, natural drainage solutions (e.g., permeable paving, swales, bio-retention pits, wetlands) into the stormwater drainage network ensures that contaminated runoff is collected and treated before it enters natural waterbodies. SuDS also contribute to wider amenity and biodiversity benefits.



Figure 3.103 Bioretention area

3.6.1 Water Supply

PRINCIPLES

- Reduce water losses throughout the network from >50% to <15%.
- Demand management initiatives to reduce average water consumption from 135litres per capita per day (lpcd) to 100lpcd through behavioural changes, plumbing standards and pressure regulation.
- Potable water quality achieves 2014 EU Drinking Water Standards and 2016 Bhutan Drinking Water Quality Regulations.
- Increase water storage provided by reservoirs from <12 hours to >48 hours to prevent loss of supply during planned and unplanned interruptions.
- Provide fire hydrants to enable the Fire Department to abstract water from the network to address a fire at any location throughout the city.
- Upgrade undersized water mains to deliver the required water flow rate for firefighting.
- Create Smart water networks through the installation of SCADA systems and flow and pressure monitoring.

INTERVENTIONS

The following key interventions will improve the quality of water supply services in the City Core:

- 1 Install a series of (7) flow and (19) pressure monitors in the CCAP extents and additional throughout the network to accurately monitor the performance of the water supply system, assist with leakage reduction and inform future design considerations.
- 2 Repair or replace leaking trunk mains, distribution mains, household connections, reservoirs, valves and meters throughout the network.
- 3 Upgrade storage reservoir capacity (Bhutan Chamber of Commerce and Industry (BCCI) Tank, Swimming Pool Tanks, Royal Insurance Corporation of Bhutan Limited (RICBL) Tank, and Hospital Tanks).
- 4 Install (-7) Pressure Reducing Valves (PRVs) in the CCAP extents and additional throughout the network to reduce excessive network pressures.
- 5 Develop Building Standards which require low-flow taps, toilets, and showers for all new developments.
- 6 Replace water mains on Wangchu Lam and Changdelo / Changzamtog to a minimum 100mm diameter for firefighting.
- 7 Install hydrants at 45m-90m intervals throughout the network.

KEY

- City Core Action Plan Boundary
- Combined Utility Corridor
- Storage Reservoir
- Proposed Pipe
- Raw Water Main
- Water Trunk Supply Main
- Water Trunk Distribution Main



Figure 3.104 Existing water storage reservoirs

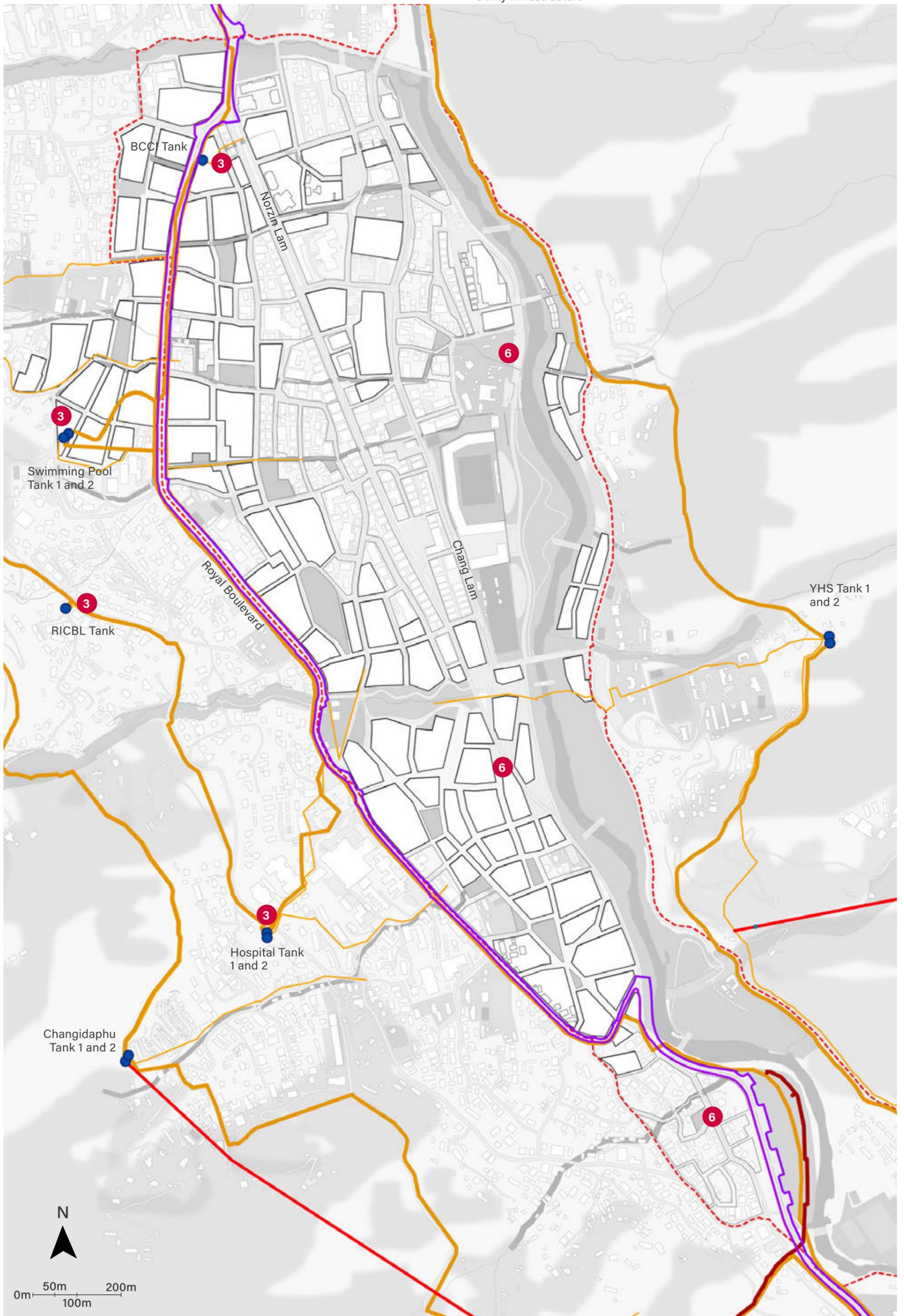


Figure 3.105 Water Supply Framework Plan

3.6.2 Waste Water

PRINCIPLES

- Separation of stormwater from the wastewater system to increase the effective capacity of the existing sewers and Wastewater Treatment Plants (WWTPs).
- All properties to discharge greywater to the public wastewater sewers. In many areas greywater is being discharged to the stormwater network and being discharged untreated to the Wangchhu.
- Further reduction of wastewater flows through demand management (as per Water Supply strategy) and greywater recycling.
- Upgrade undersized wastewater mains to cater for current and future demand to prevent overflow of raw sewage onto public streets and protect public health.
- Rationalise the number of WWTPs serving Thimphu through reconfiguration of the trunk wastewater network and associated upgrades at strategic WWTPs.
- Solid waste management is needed to reduce the dumping or flushing of inappropriate materials into the wastewater network.

INTERVENTIONS

The following key interventions will improve the quality of wastewater services in the City Core:

- 1 Install a series of flow meters throughout the network to accurately monitor the performance of the wastewater system.
- 2 Disconnect all downpipes and stormwater outlets from the wastewater network.
- 3 Connect all properties on septic tanks within the City Core to the public wastewater network.
- 4 Upgrade trunk wastewater main from Bhutan Craft Market to Kaja Throm and along Wangchhu Lam to Changzamtog Park.
- 5 Connect the wastewater network served by Lungten Zampa WWTP into the network discharging to Babesa WWTP through a new wastewater pump station at Lungten Zampa WWTP and rising main across Lungten Zampa.
- 6 Decommission Lungten Zampa WWTP.

KEY

- City Core Action Plan Boundary
- Combined Utility Corridor
- Existing waste water treatment plant (WWTP)
- Existing sewer trunk mains
- Proposed waste water pump station
- Proposed Sewer Line
- Proposed Sewer Upgrade



Figure 3.107 Existing water treatment plants

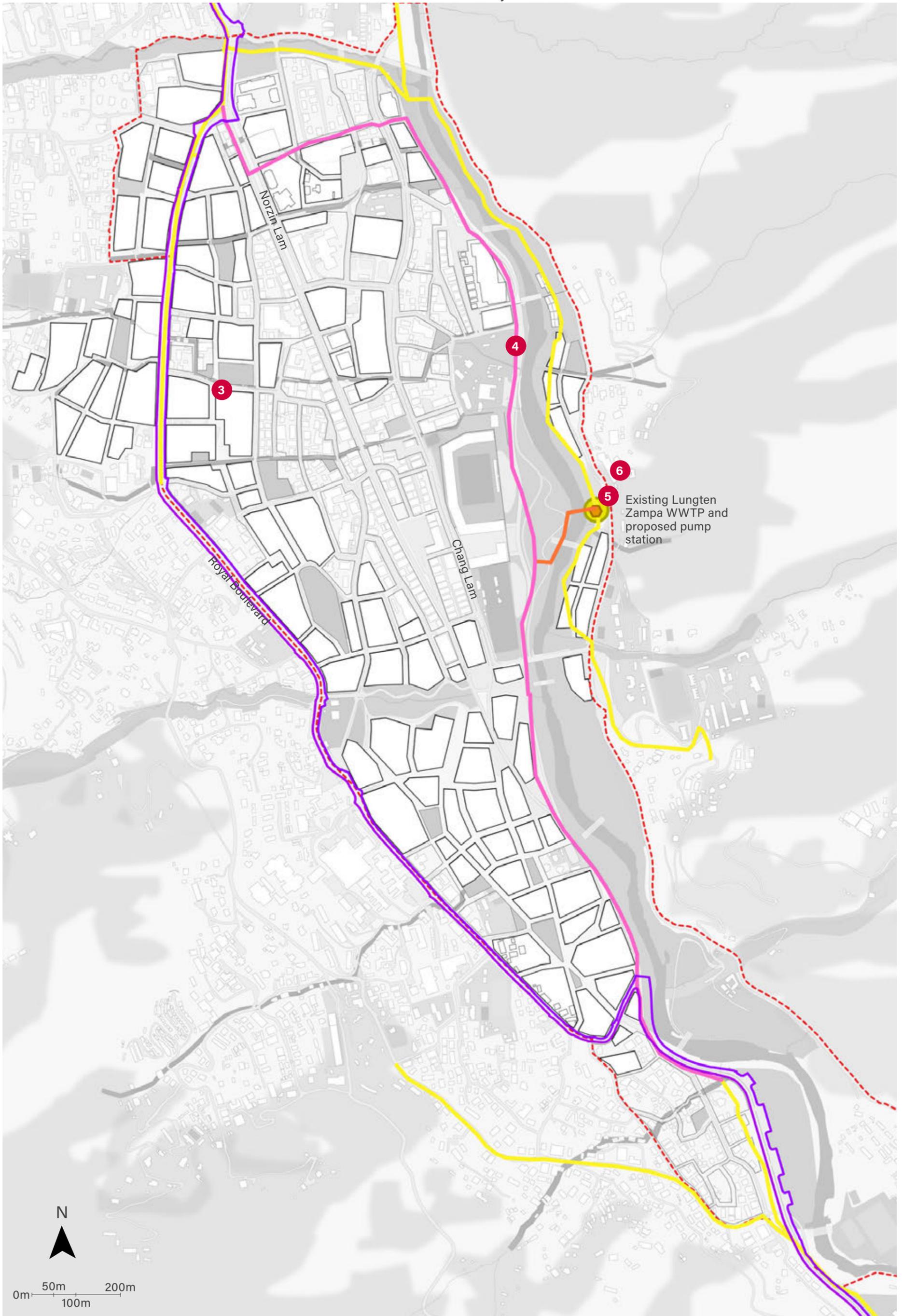


Figure 3.108 Waste Water Supply Framework Plan

3.6.3 Stormwater

THEMES

- SuDS / Low Impact Development (LID) should form a key design element of any redevelopment, in particular areas involving redevelopment of the public urban realm, open spaces and rejuvenation sites. These measures should create treatment trains where stormwater is both treated and attenuated prior to discharging to the public stormwater drains.
- Existing utilities are to be diverted outside of stormwater drains and culverts to protect both the utilities themselves and reduce the risk of blockage and subsequent flooding caused by the utilities.
- Solid waste management is needed to reduce the dumping of litter into stormwater drains.
- Existing culverted streams running through the City Core should be opened and restored to more natural conditions (daylighting) in conjunction with Transport and Green Infrastructure strategies, improving the east-west pedestrian routes and connectivity through the city.

INTERVENTIONS

The following key interventions will improve stormwater quality in the City Core:

- 1 Implement SuDS throughout the city, including:
 - rainwater harvesting and permeable paving for individual buildings
 - swales, tree pits and/or bio-retention areas along roads
 - ponds/wetlands in larger open spaces and parks
- 2 Daylighting Changangkha Stream along 108 steps (Memorial Chorten Valley Park).
- 3 Daylighting the stream from Bhutan Ecological Park to Zangdo Pelri Lhakhang (Recreational Green Stream).
- 4 Daylighting the stream from Changangkha Lhakhang to Centenary Market (Spiritual Green Stream).
- 5 Daylighting the stream from BCCI to Kaja Throm (Cultural Green Stream).
- 6 Community awareness programmes and monitoring of hotspot areas to reduce dumping.
- 7 Diversion and undergrounding of existing utilities laid in stormwater drains throughout the City Core.

KEY

- City Core Action Plan Boundary
- Combined Utility Corridor
- Primary stormwater drains
- Proposed stream daylighting



Figure 3.109 Examples of different types of SuDs

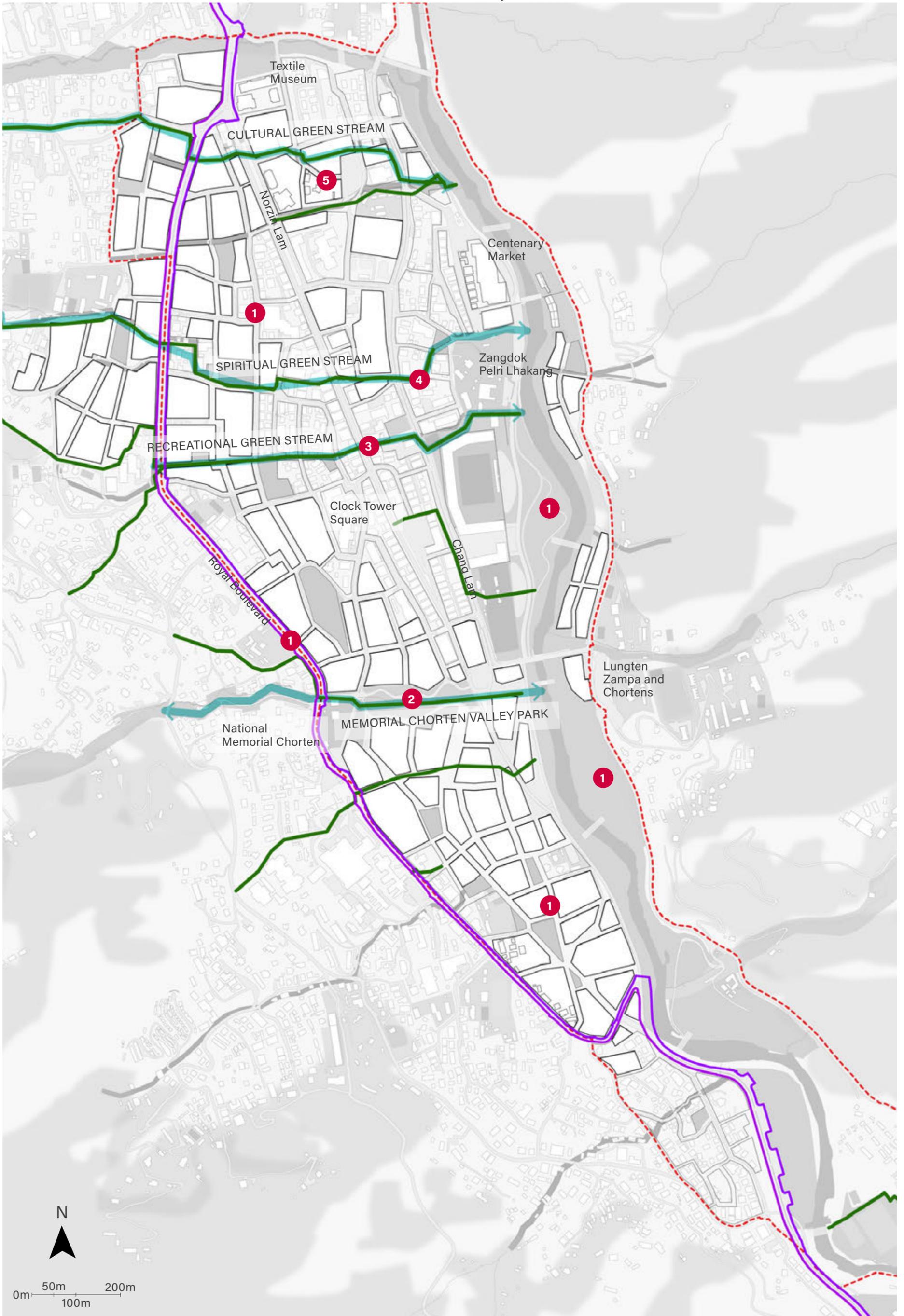


Figure 3.110 Storm Water Supply Framework Plan

3.7 Energy

3.6.4 Overarching Objectives

OBJECTIVES - ENERGY

- Enforce new building standards that minimise energy demand and promote decentralized energy generation.
- Transition from direct electric heating to more efficient hydraulic systems (e.g., radiators, fan coils unit) supplied by heat pumps.
- Energy retrofit policies for existing buildings.
- Influence behavioural usage of electricity through demand-side-management measures.
- Diversify power generation through the development of solar power plants.
- Develop micro power generation at the point of consumption (e.g. rooftop integrated PV).
- Improve the resilience of the electricity distribution network to natural hazards.
- Promote the development of 'energy hubs' to utilise synergies and unburden the main electricity network.
- Unlock flexibility through the use of energy storage & demand-side management.

OUTCOMES AND BENEFITS

The following are the outcomes and benefits of the interventions for energy:

CREATING OPPORTUNITY

Create opportunities through the diversification of the energy supply strategy which will create direct and indirect jobs in the energy efficiency and power sectors.

NURTURING COMMUNITIES

Neighbourhoods that are diverse and connected by resilient infrastructure and which use synergies between different sectors and building types (energy communities).

CULTIVATING BALANCE

Balance new and existing developments by creating uniform energy performance standards and designing new buildings to 'support' existing ones through energy generation and sharing.

INSPIRE

Inspire and empower communities to develop in a sustainable and resilient way.



Figure 3.111 CFM rooftop solar plant.

STRATEGIC PRINCIPLES

The City Core is densely populated with a cluster of commercial, residential and public buildings that consume a large share of electricity for space-heating, cooking, lighting and domestic hot water. Moreover, electric heating appliances put a strain on the grid during the dry season, when electricity production is insufficient at the national level.

With the population of Central Thimphu expected to double by 2050, a transformation and consolidation of the energy infrastructure is necessary. This can be achieved through energy demand reduction and management strategies and through energy resilience measures aimed at increasing the robustness of the existing network and at diversifying the energy supply.

Proposals have the aim of:

- Guaranteeing the security of energy supply through generation at the point of consumption.
- Addressing the unbalanced seasonal energy supply/demand.
- Reducing electricity consumption.
- Improving energy network resilience.

STRATEGIC INTERVENTIONS

Energy Demand Reduction and Management

The building sector alone was responsible for 42% of the total national-level energy consumption in 2014 (Department of Renewable Energy, 2019). Successful management of energy demand is therefore a key element towards improving energy services. On one hand, enforcing standards for new buildings and retrofitting existing buildings will reduce the demand and increase energy efficiency. On the other hand, demand-side management strategies and influencing user behaviour will shift the demand from “peak consumption times” to “off-peak” times, thus unburdening the electricity network and facilitating the integration of decentralised energies.

Energy Resilience

Energy resilience can be achieved at a city scale by diversifying the electricity generation mix and developing more robust transmission networks. At the district and neighbourhood levels, energy resilience can be increased by implementing ‘energy clusters’ that unlock synergies and flexibilities by promoting decentralised energy generation, distribution, and storage as well as using synergies between different industries and utilities.

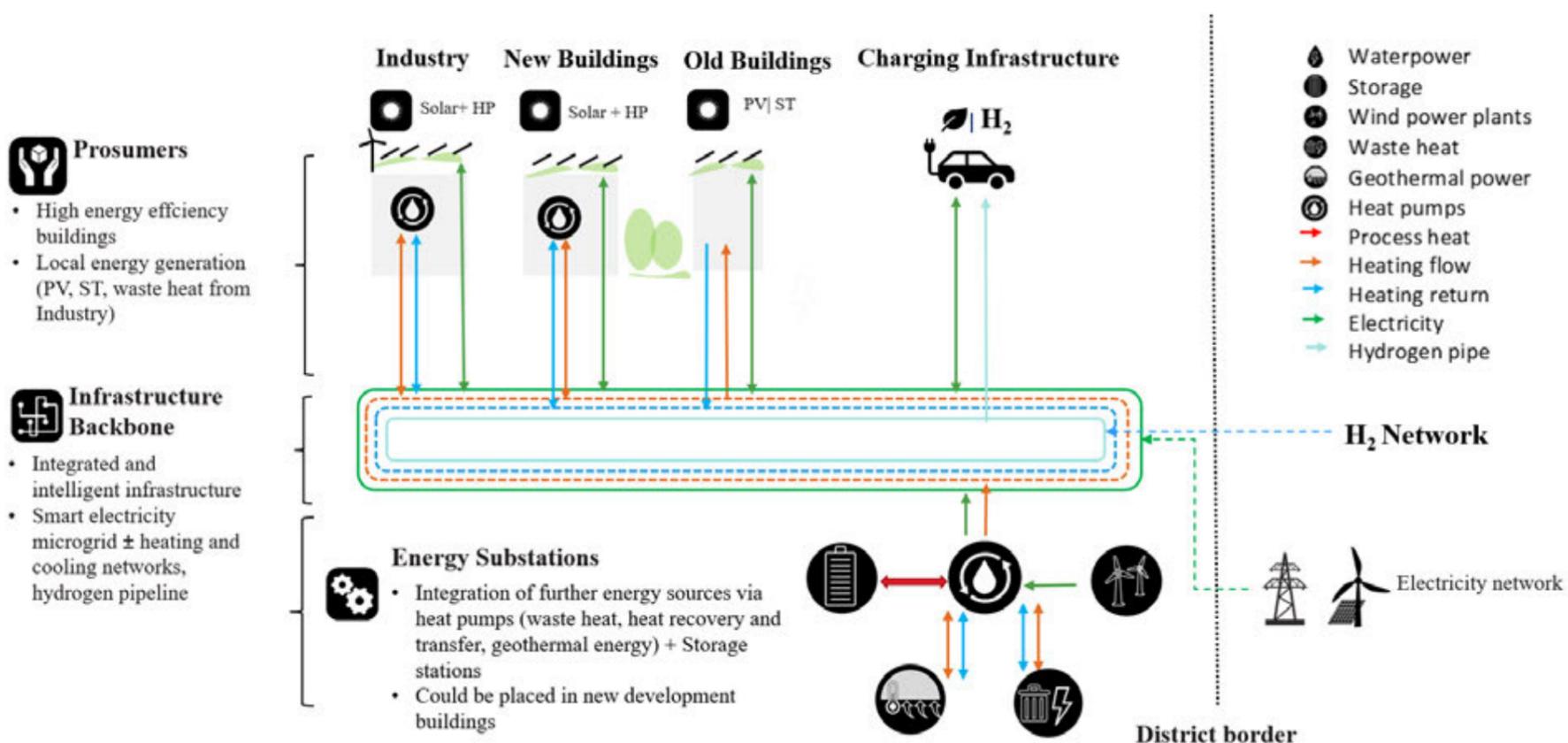


Figure 3.112 An ‘Energy Centre’ functioning scheme

3.7.1 Energy demand reduction and management

PRINCIPLES

- Introduce guidelines and standards for energy efficient design of new buildings to reduce the increase in energy demand due to new developments and to minimise the operational cost of buildings.
- Create incentives and subsidies for the retrofitting of existing buildings to increase their energy efficiency and suitability for decentralised energy generation as well as phase out gas consumption.
- Unlock flexibilities and reduce the burden on the electricity network through the implementation of demand-side-management strategies and education campaigns to influence user behaviour.
- Monitor and rate the energy performance of buildings through smart-meter rollout programmes and mandatory energy consumption reporting.

INTERVENTIONS

New Building Design Guidelines & Standards

Enforce new building design standards to ensure a high level of energy performance for new developments. As outlined in the 'SDG7 Roadmap to Bhutan' and in the 'Bhutan Green Building Guidelines 2013' these should prioritise optimising solar gains of new buildings through passive design strategies, improving the thermal performance of the building envelope and introducing energy efficient HVAC systems. Additionally, new buildings developments should, where possible, face south to enable solar rooftop installation and the load of the solar systems should be considered during structural design. The deployment of heat-pumps for space heating and domestic hot water should also be mandated to vastly reduce the peak consumption loads as well as create flexibilities for the electricity grids. We recommend revising the 'Green Building Guidelines' to introduce these provisions as well as benchmarks for thermal resistance of the envelope, specific energy consumption and efficiency of the HVAC systems.

Regulatory Framework and Subsidies for Energy Retrofitting

Introduce grants/incentives with low interest for the energy retrofitting of existing buildings. Prioritise 'low-hanging fruit' such as retrofitting windows and exchanging inefficient appliances (lighting, cooking stoves, refrigerators) as these will vastly reduce energy demand and have lower payback periods. Further incentives for the insulation of the facade and integration of rooftop renewable energy generation (Solar PV) should also be integrated.

Subsidies for heating system upgrades

Due to load growth, developmental activities, and population increase, retrofitting of obsolete equipment should have the highest level of urgency. High electricity consumption in space heating/cooling, cooking, and 'others' indicates that implementing systems energy efficiency measures could significantly reduce overall electricity consumption. Deploying heat pumps with thermal storage for space heating and domestic hot water will vastly reduce the electricity demand of these consumption areas as well as unburden the electricity grid and facilitate demand-side-management (e.g. due to the thermal storage). Furthermore, by using the same system for heating and cooling, the efficiency and pay-back period of the heat pumps can be further increased.

Energy Performance Audits & Rating System

Introduce a program for mandatory Energy Performance Reporting or Energy Audits for commercial and industrial buildings and businesses to track energy efficiency and identify potential energy efficiency measures. Medium and large companies should perform energy audits and report the findings to the Government every 5-7 years. The auditing process and reporting should be carried out in conformity with the existing guidelines.

Furthermore, to create a market pull for energy efficient buildings, a rating system for ranking existing and new building's energy performance could be introduced. A similar system as in India (Star Rating Programme) could be adopted, ranking the specific energy consumption of buildings (kWh/m²) on a scale of 1-5 with 5 being the most efficient buildings.

Peak electricity demand tariffs

Introduce appropriate 'peak electricity demand' tariffs to improve behavioural electricity usage. The tariffs should help to balance electricity demand during the entire 24-hour peaks and troughs.

Education & Outreach Campaigns

Another way to influence behavioural change is through energy consumption educational campaigns. Depending on the message, tone, and exposure, the resulting impact on behaviour can vary. Therefore, an experienced team to design and supervise the educating campaigns is advised.

Subsidies and incentives for energy-efficient appliances and demand-side-management implementation

Transition to more energy-efficient systems (e.g., hydraulic systems such as radiators, fan coil units, etc) can significantly reduce energy demand in existing building stock. Moreover, installing new appliances allow the integration of smart meters, enabling demand-side management implementation.

3.7.2 Energy resilience

PRINCIPLES

- Increase the robustness of the electricity distribution network by transitioning to underground distribution lines that are located in a shared 'utilities' corridor to facilitate accessibility.
- Diversify power generation and minimise winter deficit of power through the development of large-scale solar and wind plants outside of the city and small-scale decentralised generation on building rooftops (for solar) and industrial areas (for wind).
- Introduce electric vehicle charging stations in key areas of the City Core and develop strategies to utilise them for unburdening the electricity network.
- Introduce a hydrogen network to supply hydrogen-based transport and the fuel demand for industry processes with 'green' energy generated from surplus renewables.
- Increase energy independence and unburden the electricity network through the creation of energy communities/ clusters that promote decentralised energy generation, distribution and storage at the neighbourhood scale.

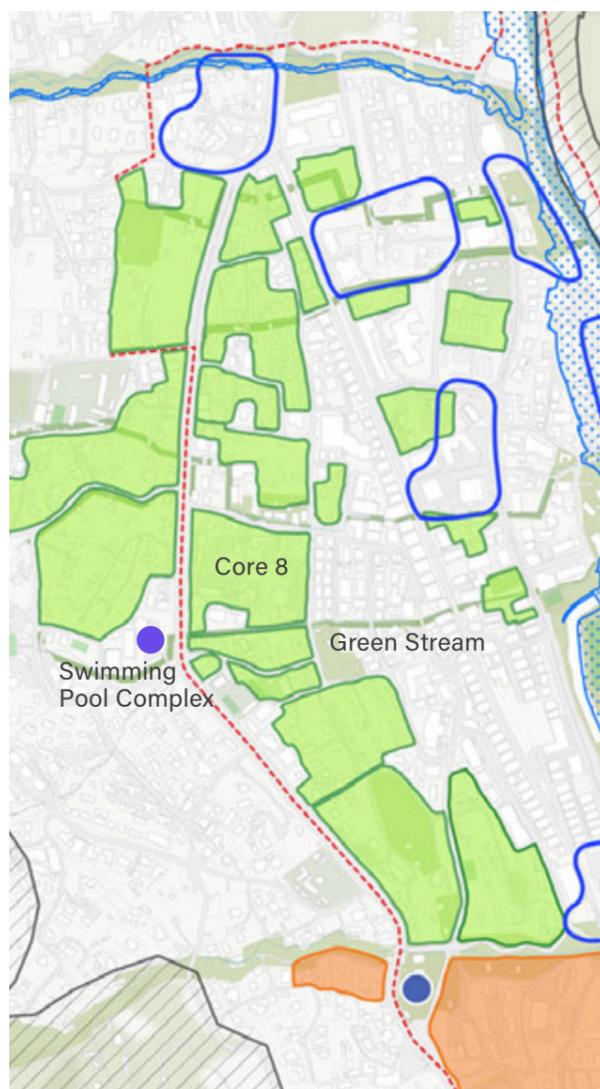


Figure 3.113 Strategic Sites in the western core

INTERVENTIONS

Transition to underground distribution networks

Convert the overhead electricity distribution lines to the underground infrastructures, as already outlined in the 'Distribution System Masterplan (2020-2030)'. Electricity distribution lines can be located alongside water and telecoms lines. Underground distribution network connections between dwellings and primary infrastructure route.

Integration of electric systems into a shared underground utility corridor will also help to reduce the need for infrastructural works. Moreover, the proposed utility corridor can easily serve the City Core due to its positioning. More information is provided in the Telecoms section of this chapter.

Rollout of rooftop PV plants in the City Core

As reported by the Department of Energy (Ministry of Energy and Natural Resources) in the meeting with Arup held on the 10th of May 2023, there are already several small-scale PV plants in Thimphu. Public agencies should roll-out the installation of rooftop solar plants on all the feasible government buildings and institutional car parks across the city. As a next step, the integration of PV plants on the rooftops of residential and private commercial developments is recommended as this will offset the increased energy demand and be decentralized generation at the point of consumption. To mitigate the negative effects of grid 'feed-in', incentives should be created to promote the integration of new developments with rooftop PV into the energy clusters described below.

Rollout of electric vehicle charging stations

Electric and Hydrogen Vehicle charging stations should be deployed in the City Core. The EV charging stations could be connected to the proposed energy clusters to increase the potential of 'peak-shaving' and of demand-side management. Peak electricity demand tariffs would incentivise users to charge their cars at times of excess renewable energy generation (e.g. from PV) and the connection to energy clusters would ensure charging with locally generated electricity and thus unburdening the main grid. Moreover, the use of green hydrogen should be investigated for further grid optimisation and renewable energy storage.

Pilot projects for "energy centres"

It is important to promote the creation of 'energy clusters/communities' in key areas of the City Core to demonstrate decentralized energy integration and unburden the electricity distribution network. Energy clusters are based on the idea of optimising the demand-consumption ratio by connecting buildings with different uses and energy generation potentials through small-scale & smart energy networks to promote "prosumer" behaviour and load-shifting.

In addition to facilitating decentralised energy generation, energy clusters avoid overloading the city grid, allowing gradual and low-cost processes of efficiency and electrification. See Appendices for a description and illustration of the energy clusters principle as well as its overarching benefits. (See Appendices - CH08)

The roll-out of pilot projects across Thimphu and the City Core is recommended as a first step. The pilot projects will take place in City Core Strategic Sites, exploiting opportunities due to the heterogeneous building stock and synergies between different sectors.

We have explored the Core 8 Strategic Site as the first case study. The site is located west of Norzin Lam, adjacent to Doebum Lam and close to the Swimming Pool Complex. The southern edge of the site has a proposed 'Green Stream' running along it and an existing pedestrian pathway. The site is primarily government owned with a commercial strip on the western edge that has a fragmented mix of private ownerships. The regeneration of the site could offer a proper functional mix, and the Green Stream promotes the possibility of using a combination of different energy sources.

3.8 Telecoms

3.7.3 Overarching Objectives

OBJECTIVES

A resilient and equitable network will be created in the Thimphu City Core by:

Prioritising telecommunications as a basic service for all citizens.

Key steps include:

- Providing region-wide ducting infrastructure to enable rapid expansion of fixed telecommunications broadband services.
- Providing secondary and tertiary ducting infrastructure to enable smart city interventions, e.g. mobility hubs.
- Providing guidelines to facilitate the expansion of mobile networks.
- Providing public education campaigns to address public safety concerns associated with the installation of mobile network sites.

Replacing overhead lines with underground infrastructure to minimise disruption due to damage.

Safe use of underground infrastructure will be achieved by:

- Separation and designation of infrastructure for a variety of services including telecommunications and electrical cabling.
- Documentation of infrastructure data in a shared electronic database.
- Coordination of access chamber location and configuration requirements with service providers.
- Clear labelling of the telecommunications infrastructure, including an indication of service type on access chamber covers.

OUTCOMES AND BENEFITS

The following are the outcomes and benefits of the interventions for telecoms:

CREATING OPPORTUNITY

Digital infrastructure to enable smart city interventions and to support increasing uptake of digital lifestyles, creating economic, social and environmental opportunities and efficiencies.

NURTURING COMMUNITIES

Digital infrastructure to enable connectivity within and across communities, as well as facilitating equitable access to information and resources.

CULTIVATING BALANCE

Digital infrastructure to enable sensing technologies and data capture, e.g. environmental data, which could be used to drive improved air quality, enhanced biodiversity and improved disaster prevention and control.

INSPIRE

Digital infrastructure as an enabler for value added industries and equitable citizen participation in the society and economy.



Figure 3.114 Duct installations and London Olympic Park

STRATEGIC PRINCIPLES

Shared infrastructure for efficiency and maximising usage

All service providers are encouraged to follow the existing infrastructure sharing regulation and to share infrastructure as far as practicable. This will be facilitated by the provision of shared ducting infrastructure by the Authority, involving consultation with service providers.

Resilient infrastructure

Infrastructure provision should be resilient through appropriate redundancy and separation. Construction methods should also consider local conditions to minimise service disruptions and facilitate faster service recovery in the event of any damage/failure/(natural) disaster. This also includes consideration of geohazards and other environmental hazards for infrastructure design, installation and maintenance.

Consideration for operation and ongoing maintenance

Provision of accessible inspection chambers and utility tunnels along the ducting infrastructure to facilitate maintenance activities. Electronic asset database to facilitate data gathering and sharing across stakeholders.

Respecting local government requirements and enhancing stakeholder engagement

Existing guidelines relating to the installation of infrastructure (including heritage and cultural requirements) should be reviewed and clarified/quantified where appropriate so that private stakeholders, e.g. service providers, are able to assess their proposals against them. The leasing arrangement of Authority-provided ducting infrastructure should be produced and agreed with service providers. In addition, the process and requirements for approval of mobile network sites should be updated and clearly communicated with the service providers to enhance collaboration between public and private stakeholders. Other policies, e.g. making Fibre-to-the-Home/Building infrastructure provision a mandatory requirement for new buildings, should be reviewed and updated. Public education campaigns can also support addressing public safety concerns associated with mobile network sites.

STRATEGIC INTERVENTIONS

The strategic interventions comprise of two categories: The **policy-based interventions** (e.g. update to the mobile network site approval process and making Fibre-to-the-Home infrastructure provision a mandatory requirement for new buildings) and the **physical infrastructure-based interventions** (e.g. the utility corridor) should be considered holistically.

For example, the utility corridor and the associated secondary/tertiary routing should facilitate connectivity required by the policy and prioritise installations to meet growing demand. Updates to the process and the content required for mobile network site approvals could also influence the future mix of how internet services are being delivered, e.g. via mobile network or fixed fibre broadband infrastructure.

Active engagement between public and private stakeholders, a transparent approval process and clear communication of policies, requirements and outcomes are key to the successful implementation of strategic interventions.

On the physical infrastructure-based intervention, the extension of the utility corridor across the City Core will be based on the requirements from Fibre-to-the-Home/Building for new buildings, mobile service provision (e.g. fixed connections for mobile network masts) and smart city interventions (e.g. mobility hubs).

PRINCIPLES

Resilient telecommunication services

Resilient telecommunication services comprise two parts:

- The resilience of telecommunication infrastructure through physically separated, redundant fibre backbone routing, and the diversity in how telecommunication services are being delivered, i.e. through a more balanced mix of fixed network and mobile network.
- Resilience against (accidental) damage, potential flooding, landslide, earthquake and other environmental hazardous events.

Predicted telecommunication demand

Interventions should help meet anticipated increases in demand on the telecommunication networks.

- The demand for digital communication is increasing and is predicted to grow significantly in the City Core.
- Realising the smart city vision, e.g. remote monitoring of water level, smart waste management and car parking management, will also increase demand for telecommunication infrastructure and services.
- Fibre-to-the-Home/Building is envisaged as part of the Structure Plan making telecommunication infrastructure provision a mandatory requirement for new buildings.

INTERVENTIONS

Shared Utility Corridor with Secondary and Tertiary Route Extensions

Two redundant and physically separated Utility Corridor routes (while having interconnection points between the two routes) will serve as the connectivity backbone for the City Core.

The proposed routes align with existing water and telecom services infrastructure, and with planned telecom routes. The planned telecom routes have been identified during stakeholder engagement as part of the production of this plan. However, further coordination is required by the Authority and the service providers after the submission of this plan to review other potential viable routes to address the comment about the separation distance between the current proposed primary utility corridor routes, as well as identifying the appropriate interconnection points between the two routes, which might not be within the City Core.

The infrastructure will be built by the Authority and shared across different services, e.g. telecoms, power and water. Note that the water services will not be utilising this corridor until about 25 years later as part of their long-term planning. Therefore, the utility corridor will not be constructed with ducting/piping allocated to water services on 'Day-1' of the implementation phase.

Service providers will enter into a long-term lease with the Authority for the use of the ducting infrastructure and for the installation of cabling. The principles of resilient infrastructure as identified in the previous section apply to the routing.

Clear labelling and separation of services

Ducting infrastructure should be clearly documented both in an electronic database and on-site to ensure safe access and maintenance during operation, facilitate planning for future works and monitoring/tracking of assets and conditions.

There should also be separation of services in ducts or sub-ducts as part of standardised partitioning to minimise interference and accidental damage.

Inspection chambers

Inspection chambers/utility tunnels will be built by the Authority to facilitate maintenance activities. Appropriate placement frequency and chamber configuration(s) will be coordinated between the Authority and the service providers.

Updating and communicating local government requirements

Existing guidelines relating to the installation of infrastructure (including heritage and cultural requirements) should be reviewed and clarified/quantified where appropriate so that private stakeholders, e.g. service providers, are able to assess their proposals against them.

The process and requirements for mobile network site approvals should be updated and clearly communicated with the service providers, so that it is clear what information and in what format are needed to be submitted and the acceptance criteria the information will be evaluated against. Initial suggestions on the potential content to be included in the approval process have been shared with the Authority in the file note (Ref. TSP-Telecoms-FN001), which is appended to this document (See Appendices - CH09).

It has been determined that the Authority is best placed to coordinate and enforce wayleaves and access requirements across different public and private stakeholders. The process and the policies involved should be updated and communicated in order to facilitate open and transparent communication and collaboration between stakeholders. The leasing arrangement of Authority-provided ducting infrastructure should be produced and agreed with the service providers.

Other policies, e.g. making Fibre-to-the-Home/Building infrastructure provision a mandatory requirement for new buildings, should be reviewed and updated.

Public education campaigns can also support addressing public safety concerns associated with the installation of mobile network sites.

Phasing

The routes will be extended and prioritised based on service demand in the City Core, new building requirements, mobile service provision (e.g. fixed connections for mobile network sites) and smart city interventions (e.g. mobility hubs).

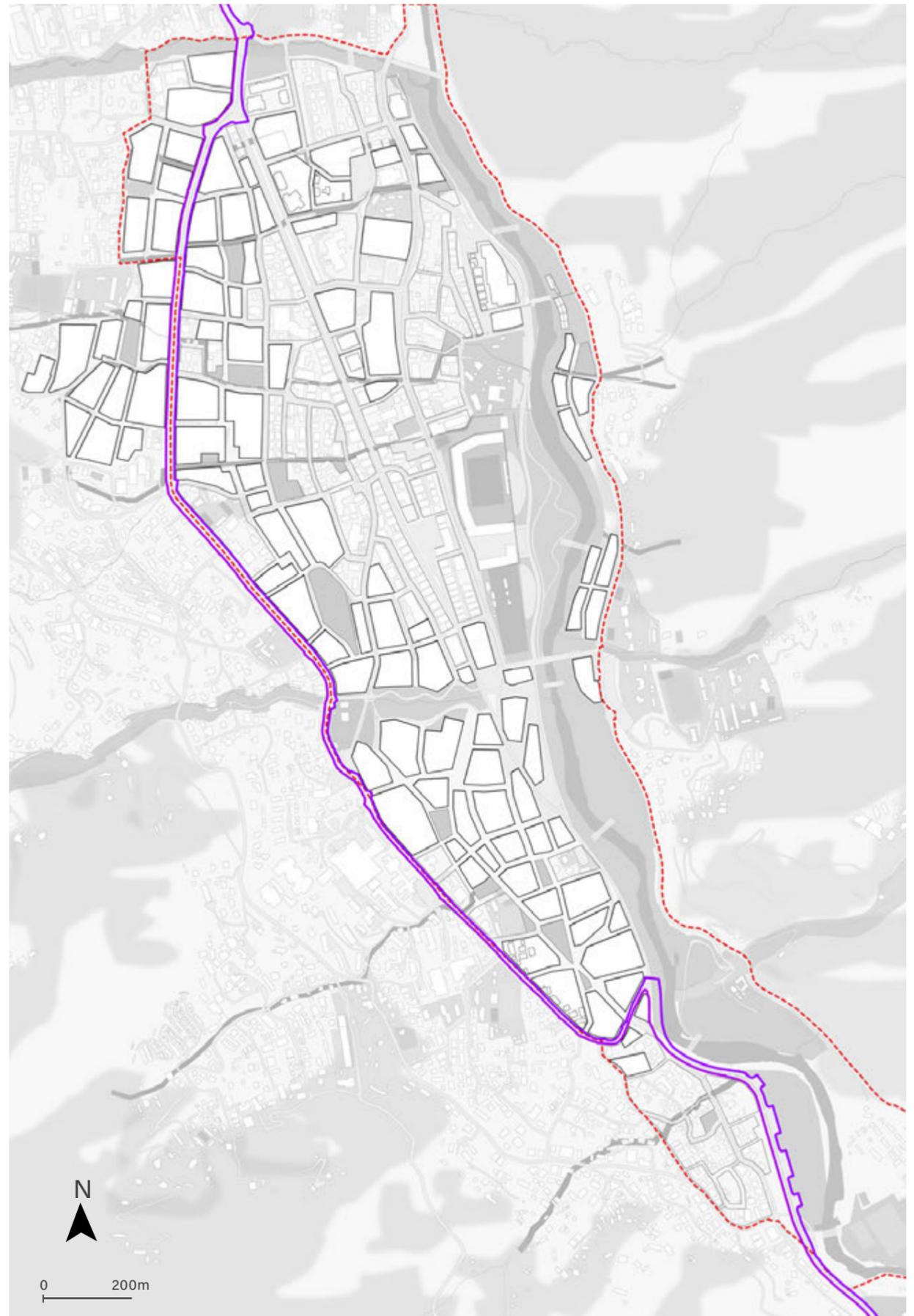


Figure 3.115 Proposed shared utility corridor

3.9 Solid Waste & Circular Economy

3.8.1 Overarching Objectives

OBJECTIVES

The overarching objectives for solid waste and circular economy in the CCAP are that the interventions presented contribute to waste reduction and facilitate Bhutan's transition to a circular economy.

The linear "take- make-waste" approach of modern societies is unsustainable. The strategies set out here are designed to create platforms that will support the transition from a linear to a circular approach to products and materials and build on the history of Bhutan as an organic and self-sustaining society.

A circular approach aims to:

- Eliminate waste and pollution, including carbon emissions;
- Keep products and assets in use at their highest value for as long as possible; and
- Regenerate nature.

OUTCOMES AND BENEFITS

The following are the outcomes and benefits of the interventions for waste and circular economy:

CREATING OPPORTUNITY

Create employment and business opportunities - through the circular economy with a demand for skills that will repair, refurbish, and resell products and materials and provide a platform for innovators and entrepreneurs to identify new business opportunities to serve communities sustainably.

NURTURING COMMUNITIES

Foster a sharing culture - Resources, tools and skills are shared amongst the community and move away from a consumer mentality. Move from a society of buyers to borrowers.

CULTIVATING BALANCE

Reduce waste generation - by diverting recyclable and organic materials from landfill and retaining the value of these resources for society.

INSPIRE

Transition to a circular economy - one that designs out waste; maximises the reuse of materials, products and assets.

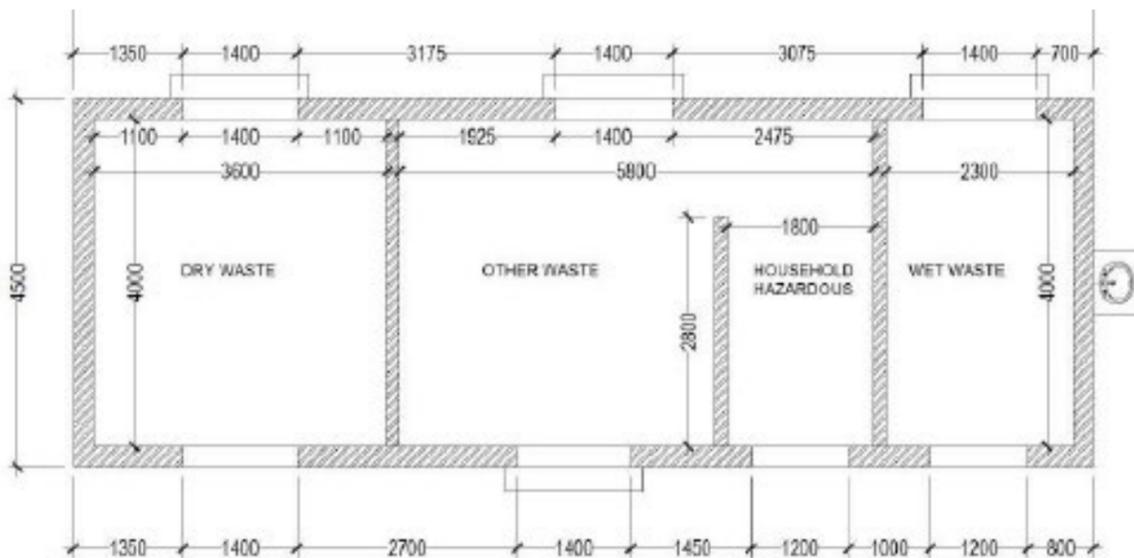


Figure 3.116 Thimphu's waste drop-off centres: floor plan and elevation

STRATEGIC PRINCIPLES

The two key themes for the City Core area are:

- Reduce waste, and;
- Facilitate the transition to the circular economy.

STRATEGIC INTERVENTIONS

The two main strategic interventions for Thimphu's City Core are to reduce waste by driving total waste and resource segregation and establish waste drop-off hubs to serve residents in local centres, commercial businesses and the City Core market area.

Waste segregation is one of the foundation interventions that underpins Bhutan's strategic goal of achieving "Zero Waste Bhutan by 2030" (NWMS 2019). It will reduce waste generation and the dependency on landfilling. Diversion of valuable resources such as recyclables and organic waste provides the basis for value streams for secondary material markets and feedstock for composting.

Prescribing dedicated waste drop-off hubs for residential, commercial and markets ensure all sectors have access to waste management facilities that reflect the nature of waste generated.

It is envisaged that waste drop-off hubs in local centres will transition to local circular economy hubs as kerb-side waste collection services improve and reduce the dependency on drop-off centres. Circular economy hubs will provide opportunities for residents to avail of repair services and the opportunity to resell or rent consumer goods rather than having to buy them.



Figure 3.117 Precedent images: waste drop-off/recycling centres

3.9.1 Waste Segregation

PRINCIPLES

- Waste segregation is the foundation intervention that underpins waste reduction by diverting valuable resources such as recyclable and organic materials from the waste stream and is key to facilitating downstream value capture through reuse, recycling and recovery.
- Segregation provides opportunities to create a product stream for recyclable and organic materials as commodities. Waste segregation is the basis for schemes such as deposit return schemes that could be implemented in the long-term and have seen success in other countries.
- Waste of electrical and electronic equipment (WEEE or e-waste) is increasing. Smaller e-waste items (e.g., mobile phones, batteries, laptops) may be accepted at residential drop-off hubs for example. However, larger bulky items such as household appliances (e.g., washing machines, air conditioners, etc.) will need specific locations designed to manage potential pollution risks such as leaks of hazardous material and may need to be taken to specialised areas outside the City Core.
- Waste segregation could divert approximately 90% and 85% of Thimphu's current municipal and commercial waste streams respectively from landfill. As a result, the demand for landfill could be significantly reduced over time. This is based on assuming total segregation of materials as per waste composition analysis carried out under the National Waste Inventory Survey (NWIS) 2019.
- Reducing the long-term need for landfills will reduce land-take and management costs and avoid the negative environmental landfill legacy issues associated including uncontrolled methane generation, leachate and risks to surface and groundwaters.

INTERVENTIONS

- Establish waste segregation across all waste collection services (including at drop-off hubs) to ensure materials with market value are diverted from landfilling. The landfilling or incineration of recyclable or organic waste represents value loss. Diverting such materials aligns with circular economy principles by keeping materials in their highest value for as long as possible.
- All waste collection services to provide segregation of waste, recyclables and organic/food waste.
- Kerb-side waste collection services may be limited to two segregated fractions and should prioritise the segregation of non-recyclable waste, mixed recyclables (paper, plastic and metals) and organic/food waste.
- Glass should be excluded from mixed recyclables, and it cannot be easily separated from mixed fractions when broken or damaged. It also presents a health and safety risk when down-stream manual sorting is employed.
- Establish segregation of emerging and increasing waste streams such as waste electrical electronic equipment (WEEE) or e-waste which is unsuitable for landfills due to the potentially hazardous components.



Figure 3.120 A 'Library of Things'



Figure 3.118 Segregated recycling bins for waste drop-off



Figure 3.119 Waste drop off: Segregated recycling



Figure 3.122 Segregated Recycling: example of bulk containers for temporary storage of waste and recyclables



Figure 3.121 Thimphu's waste recycling

3.9.2 Waste Drop off hubs

PRINCIPLES

Waste drop-off hubs have already been established in some areas of Thimphu and are needed to support the ongoing improvement in kerb-side waste collection services under the 2019 National Waste Management Strategy (NWMS 2019). Current kerb-side waste collection schedules are not accessible to all in the City Core in terms of their coverage, frequency and requirement for users to be present at the time of collection. The current waste drop-off hubs will continue to be needed to support improvements in kerb-side collection and facilitate waste segregation.

Waste Drop-off Hubs for Local Centres

- Provide local residents in the City Core with accessible waste and recycling facilities that are convenient, maintained and serviced.
- With the proposed improvement in kerb-side waste collection services under the NWMS 2019, dependency on drop-off hubs will reduce and they can be re-purposed into local circular economy hubs.
- Provide drop-off points for non-bulky WEEE and hazardous waste. Bulky WEEE items will need to be sent to larger facilities outside the City Core which are fit for purpose.

Waste Drop-off Hubs for the Commercial City Core

- Commercial premises in neighbourhoods will have dedicated waste drop-off hubs to support and supplement kerb-side waste collection.
- Provide segregation of non-recyclable waste, recyclables and organic waste.
- Provide drop-off points for WEEE (non-bulky) and hazardous waste.

Waste Drop-off Hubs for Thimphu Central Farmers Market

- Provide dedicated waste management facilities at the market to encourage segregated and responsible disposal of market waste.
- Ensure the predominantly organic fraction of waste is diverted from landfill.
- Provide opportunities for circular bio-economy businesses linked to organic market waste to benefit from the segregation of organic and food waste. Where this is composted, it might beneficially be returned to farmers and food producers.
- Maintain the market as a viable and attractive place for residents to shop and tourists to experience Bhutanese food culture.

INTERVENTIONS

Waste Drop-off Hubs for Local Centres

- Residential drop-off hubs shall be only for local residents and should not be used for commercial waste which would overwhelm capacity. Dedicated waste-drop off hubs for commercial centres and the market are assigned as part of this CCAP.
- Drop-off hubs should remain accessible outside normal working hours to allow those who cannot avail of kerb-side collection services to drop-off their waste, recyclables and organic waste at time that is convenient to them.
- Drop-off hubs should be future proofed to allow them to be re-purposed as local circular economy hubs where residents could get items repaired, sell/buy second hand items or rent/borrow consumer goods. For example, the initiative of 'Library of Things' hubs that are growing in the UK.

Waste Drop-off Hubs for the Commercial City Core

- Opening hours should align with local businesses to minimise waste being left on the street, blocking access, drains or being disturbed by street dogs.

Waste Drop-off Hubs for Thimphu Centenary Market

- Waste drop-off area for vendors and market management only.
- Particular provision for organic waste segregation.
- Designated areas within or adjacent to the market and screened from market visitors.

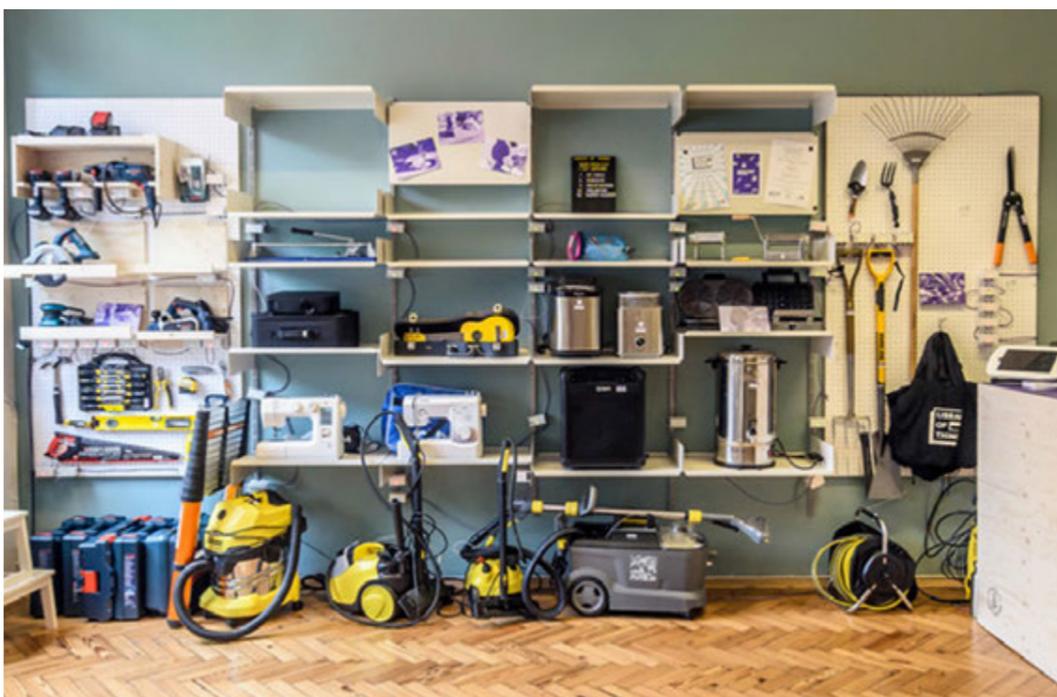


Figure 3.123 An example of a 'Library of Things'

KEY

- ▭ City Core Action Plan Boundary
- Potential residential waste hubs
- Potential commercial waste hubs
- Centres

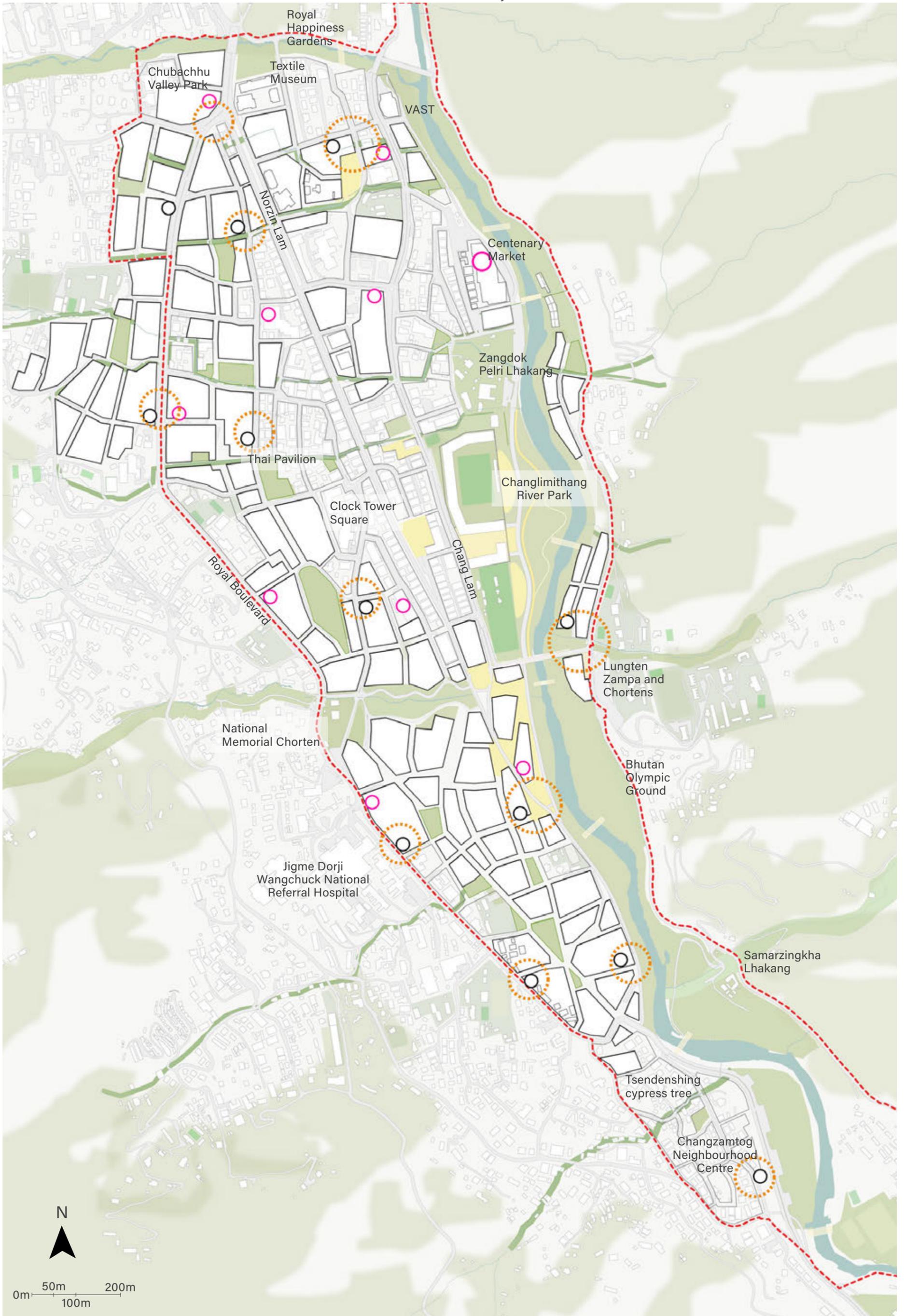
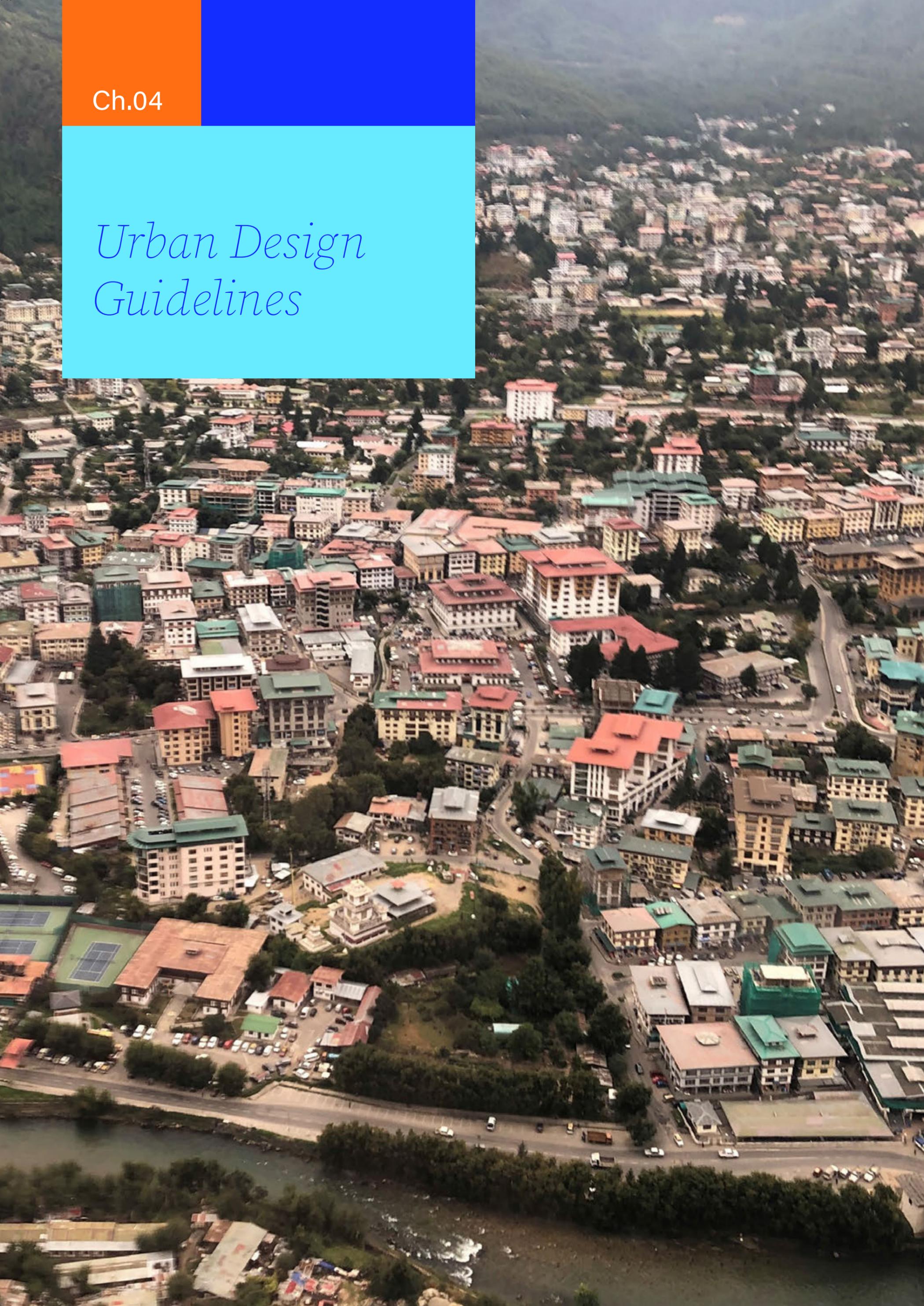


Figure 3.124 Waste Framework Plan

Ch.04

Urban Design Guidelines



4.1 Overview

4.1.1 Purpose and Content

THE URBAN DESIGN GUIDELINES

The following pages provide guidelines for the design of development, open spaces and movement interventions within key parts of the City Core. Four Character Areas have been selected as a focus for this more detailed guidance as either places of significant change (Cultural Quarter) or areas that have particular importance for the city (e.g. Clock Tower Square and Norzin Lam).

The Urban Design Guidelines provide a set of recommendations and principles for design that are intended to articulate and guide interventions towards the future vision of the extended City Core. Held within this set of guidelines are the aspirations, ideas and reasons for doing things, sometimes in a new way.

The Guidelines are held within the written statements, the plan diagrams and the street sections and all these elements should be read in conjunction.

There are focussed guidelines for some of the key Character Areas as well as a section dedicated to the transformation of selected streets. These explore how the street design principles held within the TSP 2023 can be applied to existing streets within the City Core to transform streets, form a legible hierarchy and introduce a range of characters and urban experiences.

The areas and Character Areas that the Urban Design Guidelines focus on are:

- 1 Norzin Lam street guidance
- 2 Clock Tower Square and Norzin Lam
- 3 Market Quarter and Financial Quarter
- 4 Cultural Quarter

There are potentially a number of special projects within the City Core, including:

- 1 Pilot Neighbourhood Project (with first Energy Centres pilot project)
- 2 National Stadium Regeneration- including the integration of proposed east-west link between Centenary Park and Chang Lam, proposed 'Social Steps' and MLCP.
- 3 Regeneration of the area around the Central Farmers Market (potentially including the re-purposing of part of the CFM building) - integrating existing street markets into the public realm.
- 4 Central River Parks - including the proposed Zangdo Pelri Lhaxhang Gardens, the re-provision of Tennis courts to provide a 'Green Stream', re-organisation and consolidation of surface car parking, a proposed pedestrian bridge over the Wangchhu and the Greenway.

These projects, in addition to the Southern City Core will potentially be subject to Site Development Briefs and further more detailed study.

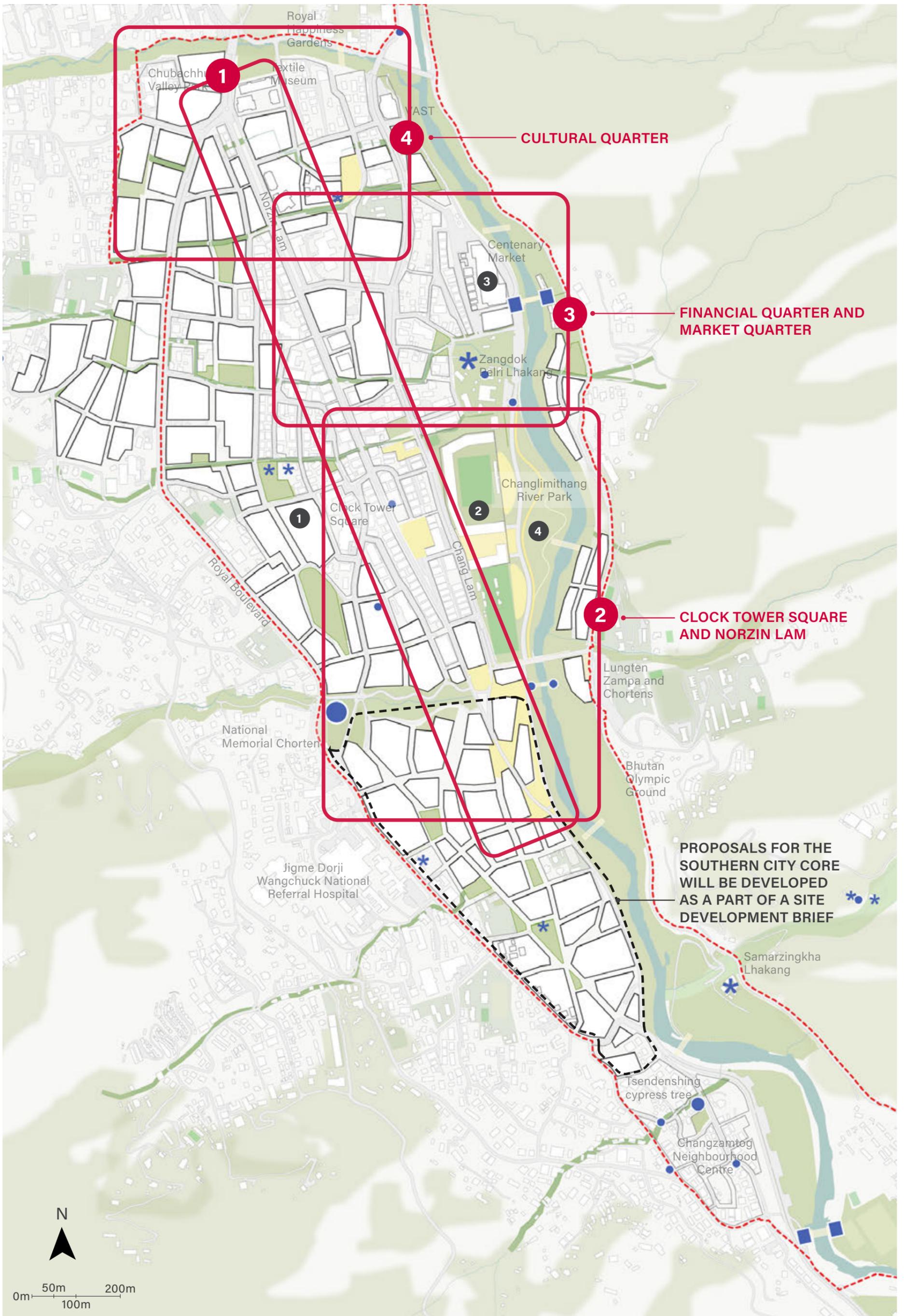


Figure 4.1 Urban Design Guidelines areas

4.2 Norzin Lam

4.1.2 Norzin Lam street design guidance

CHARACTER

The northern part of Norzin Lam is a distinctive part of the street. The corridor width and level change allow for the creation of a linear, green public realm. The changing character of the street responds to the varying existing conditions overlaid with the different proposed functions here.

↑ Norzin Lam (northern section)

The middle section of Norzin Lam is a highly enclosed space with active frontages and colonnades to both sides at the ground floor. Buildings have a consistent frontage line and height along both sides of the street to frame views to Wangditse Lhakhang. There are high levels of footfall and pedestrian activity, so the majority of the street-scape is pedestrian space with new planting and street trees providing shade for pedestrians. Street furniture should be introduced within the planting areas to allow people to pause, meet and socialise.

↑ Norzin Lam (middle section)

Together with Clock Tower Square this southern part of Norzin Lam becomes the city's principal urban space and signifies the centre of the city. Norzin Lam will become mainly pedestrian-only, encouraging high levels of footfall and spill-out into the public realm from active ground floor frontages (such as cafe tables, seating and wares from shops). The regenerated Laneways are an extension of the street offering a very different spatial experience. High levels of planting and street trees are located within the space to provide shade.

↑ Norzin Lam (southern section)

Norzin Lam extension serves to form a strong pedestrian connection between the urban heart of the city (Norzin Lam and Clock Tower Square) and the principal natural corridor through the city (the Wangchhu Corridor). Extending the street allows City Core activity to extend southwards, towards riverside frontages. The extension should be recognisably part of the same street and retain a similar character in terms of enclosure, frontage line, building heights, colonnades and active frontage.

↑ Norzin Lam (extension)

Development frontage and public realm treatment to form a northern gateway

Crafts market is moved to Cultural Quarter

Maintain active ground floor frontages (shops, cafés, restaurants and bars) to west side of street.

The width of the street provides the opportunity to create a unique part of the street. Creating variance along the street will bring legibility and allow the street to respond to varying conditions, requirements and character areas alongside it.

Existing road corridor narrows at the junction with Samten Lam.

Western frontage line must remain consistent along whole length of street, eastern frontage line can vary.

Introduce active frontages and colonnade to east side of street where new development is introduced.

Maintain active ground floor frontages (shops, cafés, restaurants and bars) to both sides of street within the middle part of the street.

Maintain colonnade to west side of street.

Policeman kiosk indicates a change in character along the street.

Norzin Lam becomes a pedestrian priority space alongside Clock Tower Square - the buzzing, heart of the city, full of activity and high levels of footfall.

Public realm treatment of Norzin Lam relates to the public realm treatment of Clock Tower Square - together these spaces form the principal urban space in the city.

Buildings form strong enclosure and definition to Norzin Lam and Clock Tower Square.

Laneways are regenerated to improve access to Norzin Lam and provide additional activity and public realm.

City Gate indicates a change in character along the street.

A new urban, shared space terminates and draws together both Norzin Lam, Chang Lam and Lungten Zam. It also provides a termination to the 108 Steps landscape and pedestrian access down to the riverside spaces.

New extension to Norzin Lam brings footfall and activity to the riverside and new riverside spaces.

Introduce active frontages and colonnade to both sides of street.

Street terminates at River Square - a new urban space overlooking the riverside and the Central City Park (Bhutan Olympic Ground).

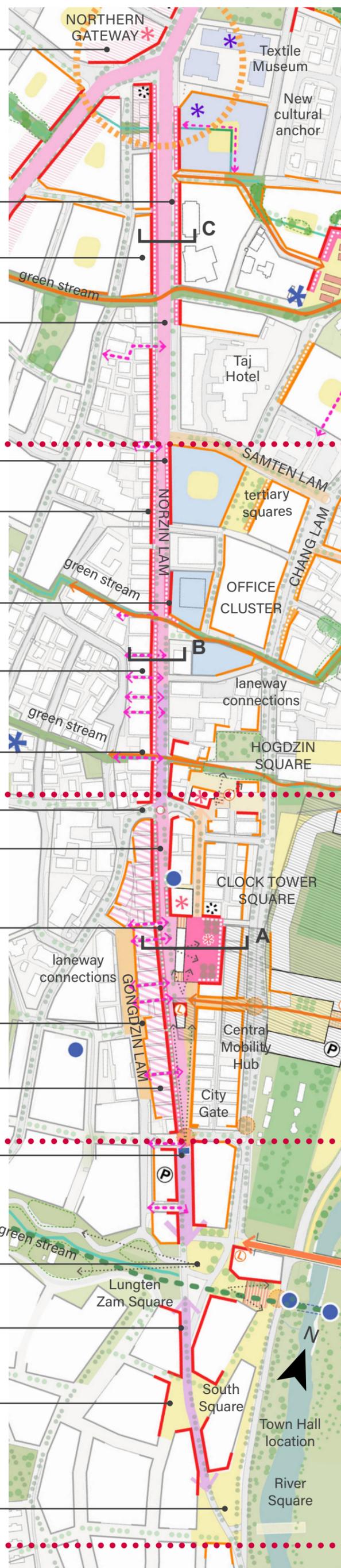


Figure 4.2 Built form and Public Realm Guidelines

CIRCULATION

Function: the street corridor accommodates pedestrian footways, landscape and tree planting, two-way traffic, including public transport route, on the upper level, on-street parking and access and landscape planting within a shared surface public realm on the lower level. Bus gates allow bus priority.

Norzin Lam (northern section)

Function: street corridor accommodates pedestrian footways, landscape and tree planting, slow speed two-way traffic, on-street parallel parking within a shared surface public realm. Parking is included to allow access to shops and is interspersed with planting and street trees. Traffic speeds are slow and the roadway is as narrow as possible to allow ease of pedestrian crossing the street at any point.

Norzin Lam (middle section)

Function: street corridor becomes a pedestrian priority zone and functions as public, urban space alongside Clock Tower Square. Corridor must accommodate a one-way (from south to north) access for servicing of shops with occasional spaces for loading. Access must accommodate emergency vehicles. Service access will be restricted to mornings and evenings only. Alternative servicing can be provided from tertiary streets to east and west of Norzin Lam throughout the day.

Norzin Lam (southern section)

Function: Norzin Lam extension should primarily form a pedestrian link between Clock Tower Square to the riverside. Potentially buses could use this link if gradients allow, to bring greater accessibility to this part of the street. Vehicular access from the south provided only to new development at southern city core, without extending into Lungten Zam Square. Functionally this street should be similar to the Norzin Lam middle section (see above).

Norzin Lam (extension)

Junction improvements to provide bus priority, integration of mobility hubs/bus stops and improved pedestrian crossing of Doebum Lam. Signal controlled.

Two-way traffic on the western side of Norzin Lam, to accommodate buses.

On street parking interspersed with landscape planting and associated access only roadway to east of street.

Pedestrian crossing (and staircase at level change) where the Green Stream walking route meets Norzin Lam. Bus stop located to serve shops and cultural uses - located at intersection of Green Stream walking route.

Bus gates forming a bus only section of the street to reduce general traffic using the street.

Improved pedestrian crossing at main junctions.

Two-way slow speed traffic within a shared surface public realm.

Pedestrian crossings where the Green Stream walking routes meet Norzin Lam.

Continuous walking routes along Green Streams connect western communities to Norzin Lam and riverside.

Junction re-configuration to provide strong pedestrian crossings and to accommodate changes in circulation.

Pedestrian priority, shared surface street.

3.7m one-way access-way is provided for servicing and emergency vehicles.

Additional servicing can be provided from adjacent tertiary streets.

High public transport accessibility is provided by the Central Mobility Hub and bus interchange on Chang Lam via the east-west pedestrian connection to Centenary Park.

Loading areas must be located on street only to the north and south of Clock Tower Square.

Two-way street provides access to areas to the south and west.

Reconfiguration of junction at eastern side of Lungten Zam to reduce congestion and prioritise pedestrian movement.

Strong east-west pedestrian connection across the Wangchhu is provided - either by re-purposing the existing bridge or providing a new crossing.

Norzin Lam extension provides strong pedestrian connection between Clock Tower Square and the riverside spaces. This new link could provide an alternative route for bus routes from the south.

Expressway is downgraded to form a two-lane, two-way street and ample areas of green, public realm which form part of the riverside spaces.

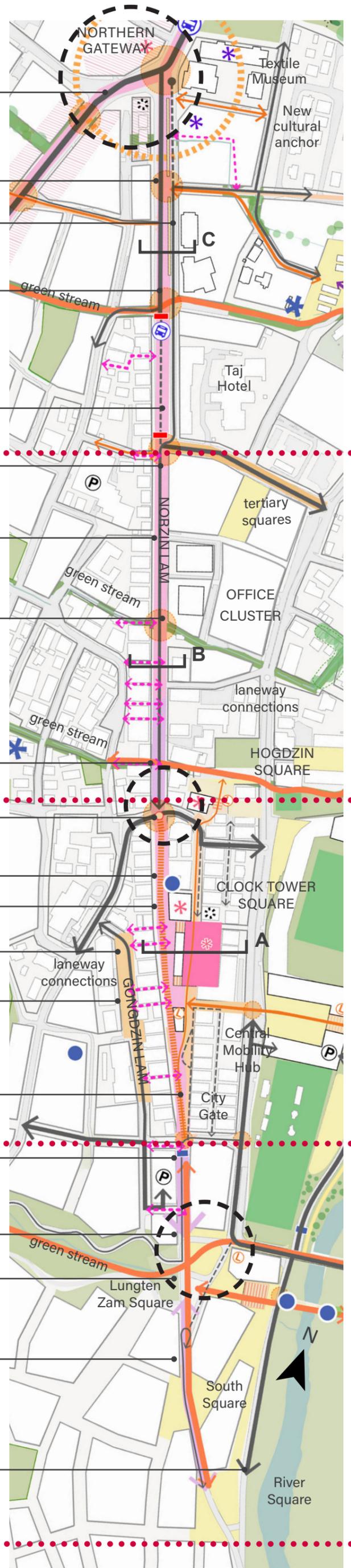


Figure 4.3 Connections, Access and Circulation Guidelines

4.2.1 Norzin Lam Street Sections

NORZIN LAM AT CLOCK TOWER SQUARE

- Norzin Lam forms part of the principal urban space within the city and is an area of very high footfall and activity.
- This is the primary shopping area in the city with shops lining both sides of the street. Retail activity will spill out onto the street, providing additional activity and interest.
- There is a high degree of enclosure and definition of space with buildings maintaining a height of 5 storeys along its length and stepping with the slopes. This enclosure contrasts with the more open space of Clock Tower Square.
- High levels of greenery will be introduced to bring nature right into the heart of the city and to provide pedestrians with shade and respite on sunny days.



Figure 4.5 Coal Drops Yard, in London, a public square with activities at different levels.



Figure 4.4 Pedestrianised Royal Mile, in Edinburgh, is a shared space that is a destination for tourists and locals.

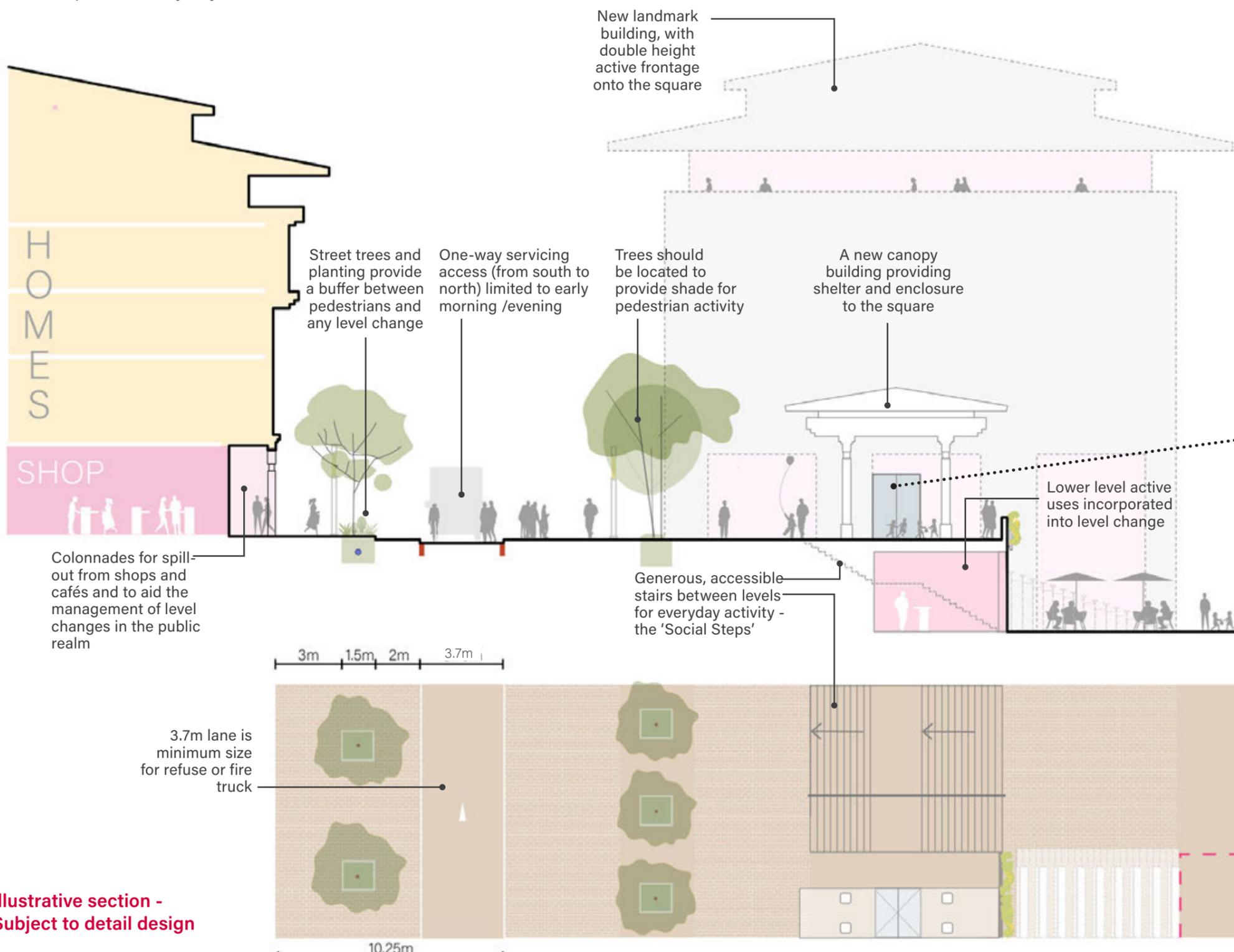


Figure 4.6 Street Section A - Norzin Lam at Clock Tower Square



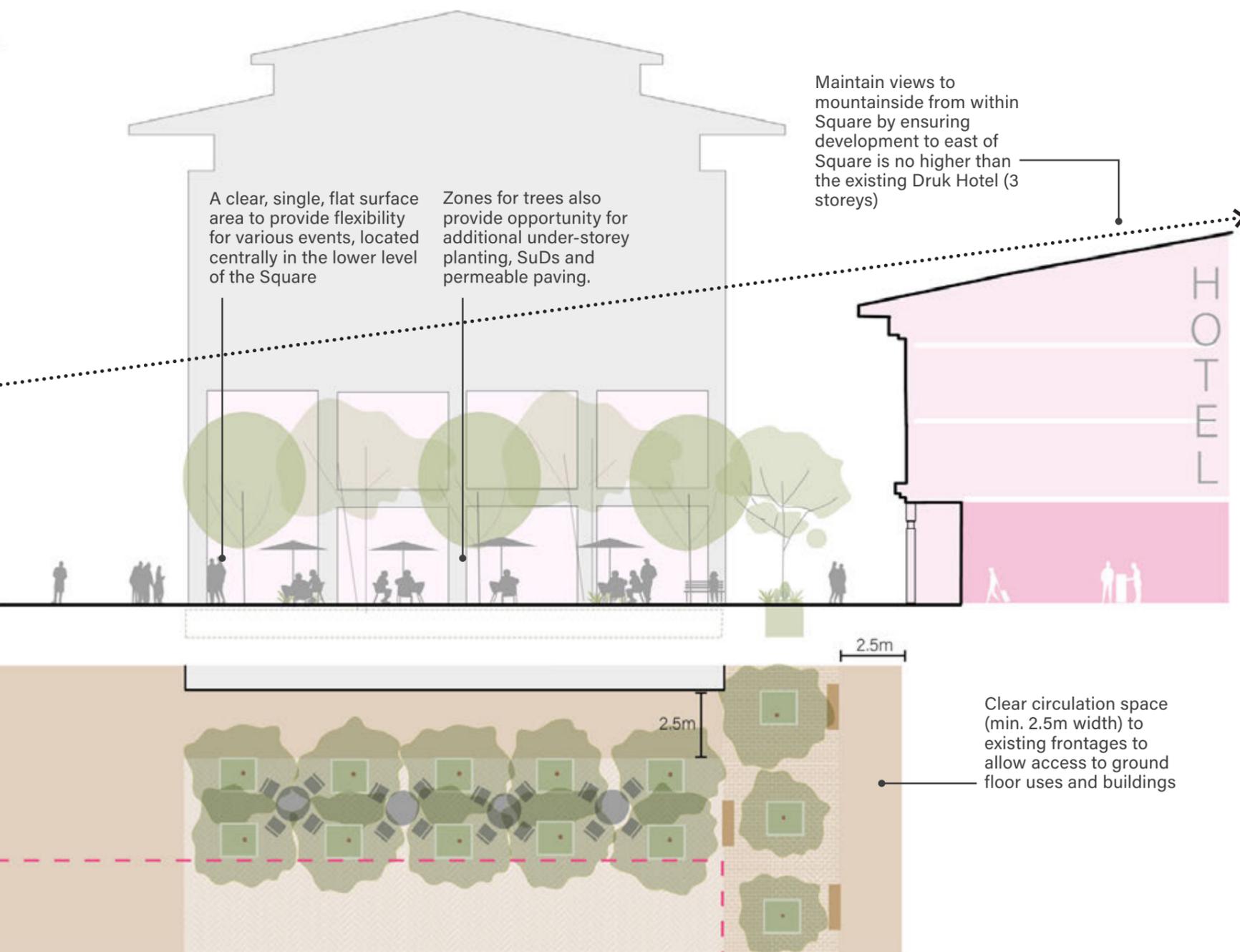
Figure 4.7 Pavilion in the Tashichho Dzong helping frame and enclose public spaces, while providing shade and shelter during events.



Figure 4.9 Slovenska Boulevard, Ljubljana (SI). A shared surface prioritises pedestrians, while allowing occasional access for vehicles.



Figure 4.8 Lincoln Centre Bosque, NYC (USA). Trees provide shade and shelter for pedestrian activity and increase dwell time within the public realm.



More detail on Clock Tower Square can be found on p 146-149

NORZIN LAM MID-SECTION

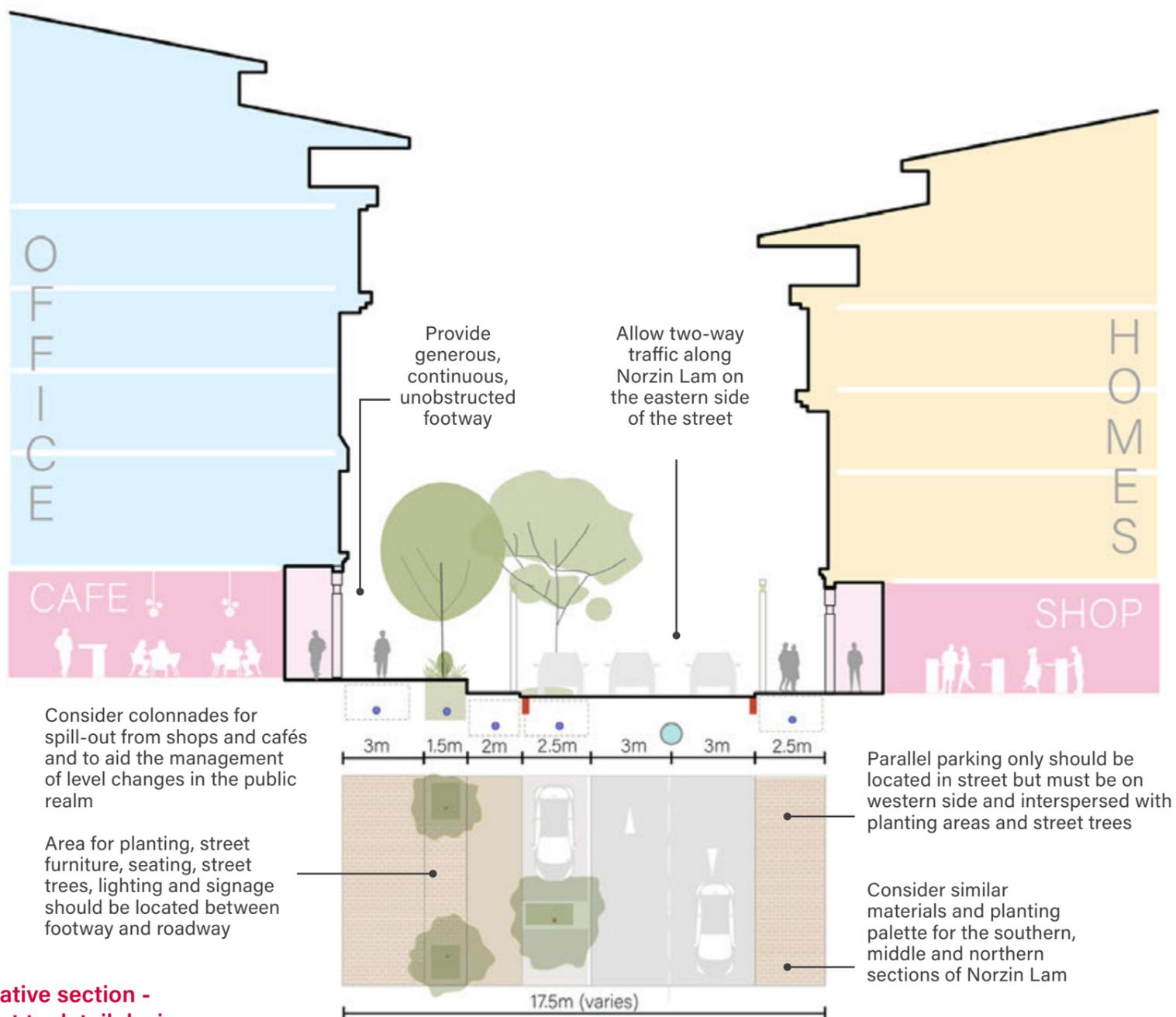
- This part of the street continues to be the primary shopping street of the city and is an area of very high footfall and activity with both sides of the street lined with shops. Retail activity will spill out into the street, providing additional activity and interest.
- Spill-out from active uses should be encouraged while maintaining a clear pedestrian footpath to both sides of the street.
- This is a balanced street with high levels of pedestrian activity mixed with low levels of vehicular movement (two-way and slow-speed) and parking to support the retail.
- Street trees and planting will be introduced to provide shade for pedestrian footways and to reduce the impact of car parking on the public realm.



Figure 4.10 Noosa (AUS). Parking integrated into a shopping street with trees and planting interspersed.



Figure 4.11 Hackney, London (UK). Allow spill out from shops and cafés while providing clear pedestrian walkways.



Illustrative section - Subject to detail design

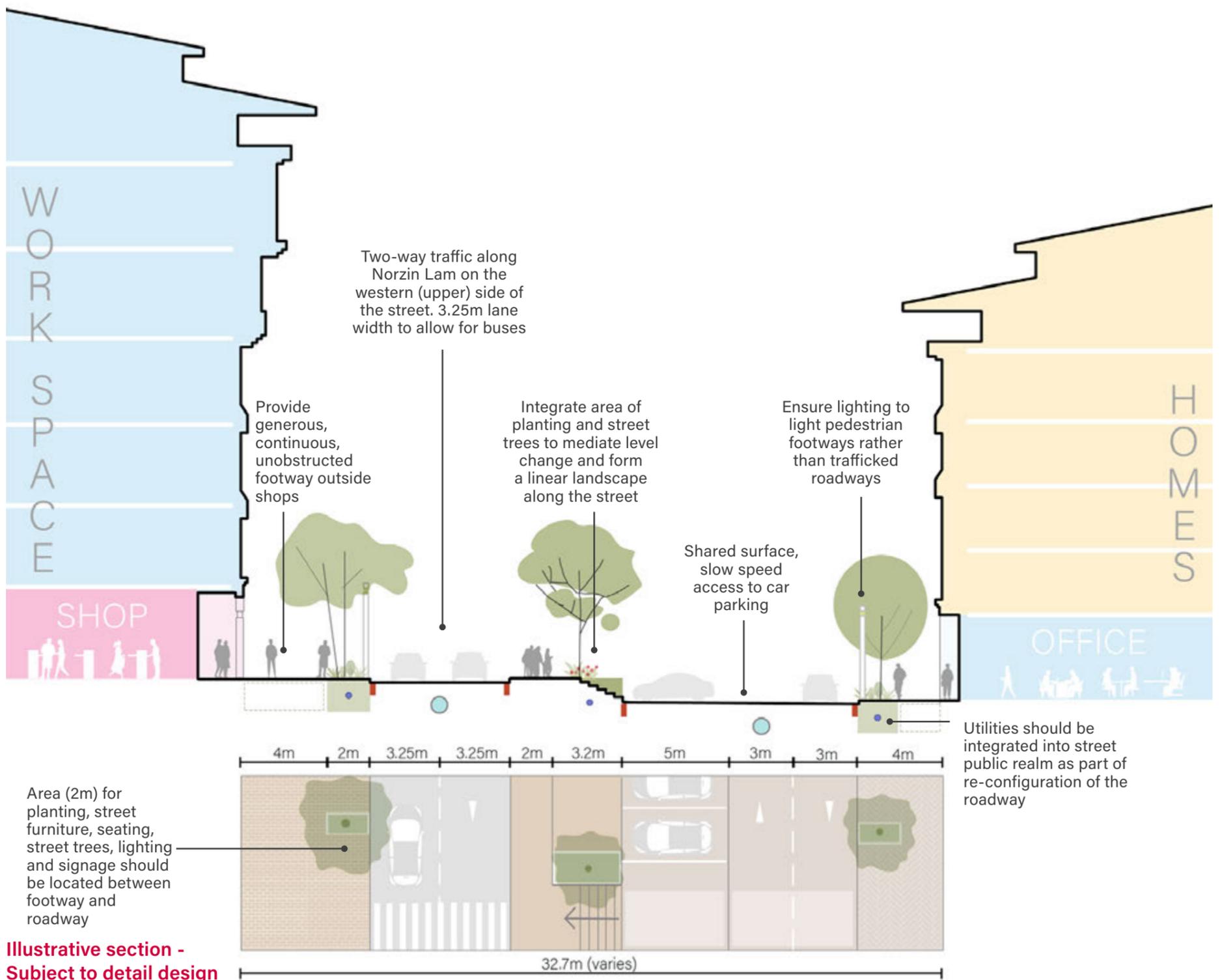
Figure 4.12 Street Section B - Norzin Lam Mid-Section (north of policeman's hut)

NORZIN LAM (NORTHERN SECTION)

- The street becomes wider and this allows for a change in character. Ground floor activity is varied with retail, workplace and cultural uses.
- Buildings can be taller (up to 6 storeys) as they reach the northern gateway.
- Two-way traffic and bus priority (via 'bus gates' that only allow buses through). Bus stops support activity.
- The street is split into two levels with the lower level accommodating access to adjacent uses and on-street car parking.
- Street width allows for a linear landscape to be formed, interspersed with car parking.



Figure 4.14 Portland, Oregon (USA). Continuous tree planting providing enclosure and shade along a wider street corridor.



Illustrative section - Subject to detail design

Figure 4.13 Street Section C - Norzin Lam North

4.3 Transformation of streets

4.3.1 Transformation of Doebum Lam & Expressway

ROYAL BOULEVARD (DOEBUM LAM)

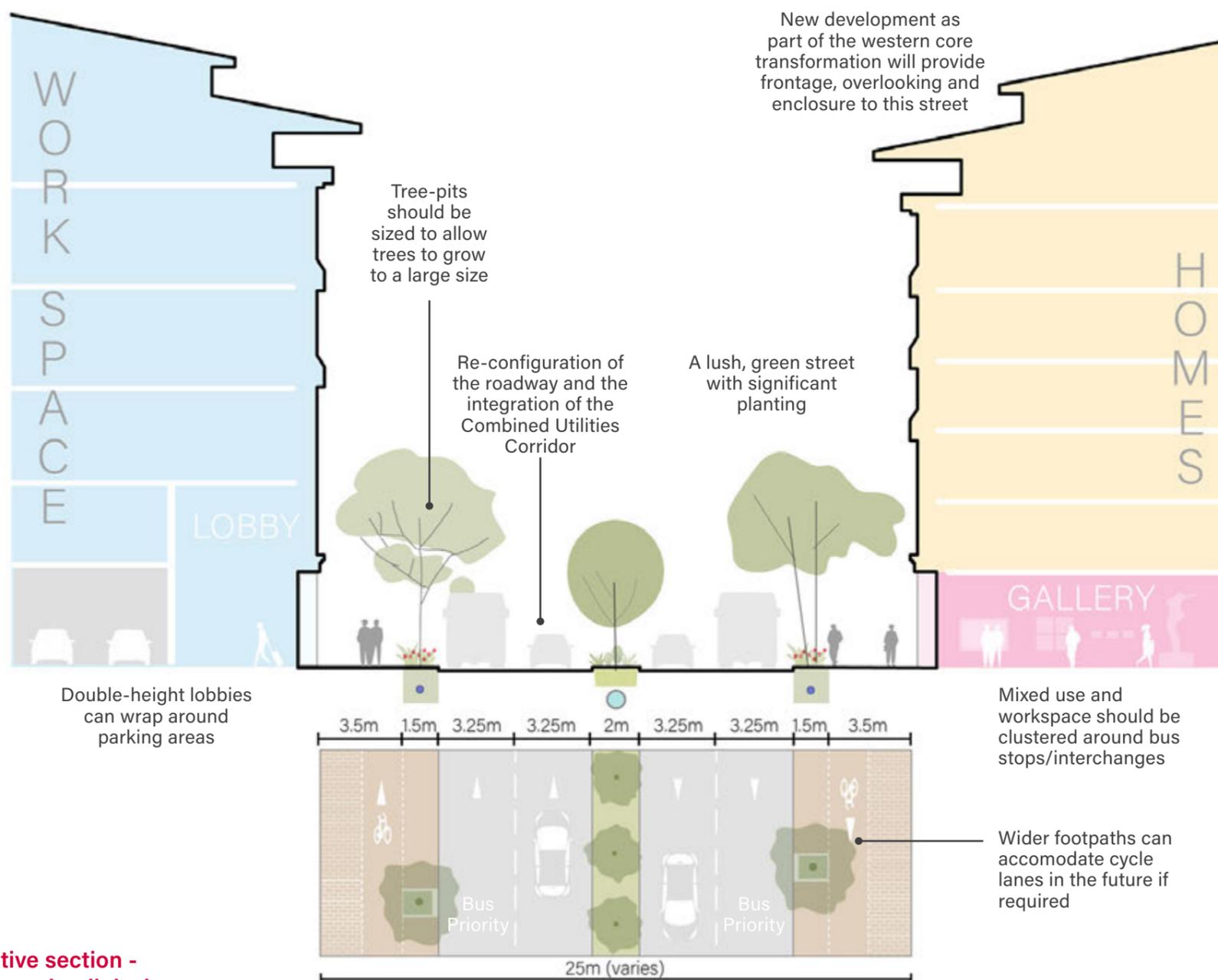
Doebum Lam will continue to be a primary corridor for vehicular and public transport through the City Core however, its character will be transformed to provide a distinctive urban, green street. More comfort for pedestrians and safer access to renewed public transport connections will be provided.

Key design considerations:

- Minimum 3.25m vehicle lanes/bus priority lanes.
- Minimum 2m footpaths.
- Minimum 2.7m bus shelter zones.
- A landscaped median providing a distinct character for the Royal Boulevard.
- Larger trees providing shading and comfort, and separation between vehicular movement and pedestrian activity.
- Incorporation of SuDS within landscape area (eg. rain gardens, bio-swales, etc).



Figure 4.16 Precedent image: Passeig de Sant Joan, in Barcelona (Spain)



Illustrative section - Subject to detail design

Figure 4.15 Street Section - Doebum Lam transformed into the 'Royal Boulevard'

EXPRESSWAY, SOUTH OF LUNGTEN ZAMPA

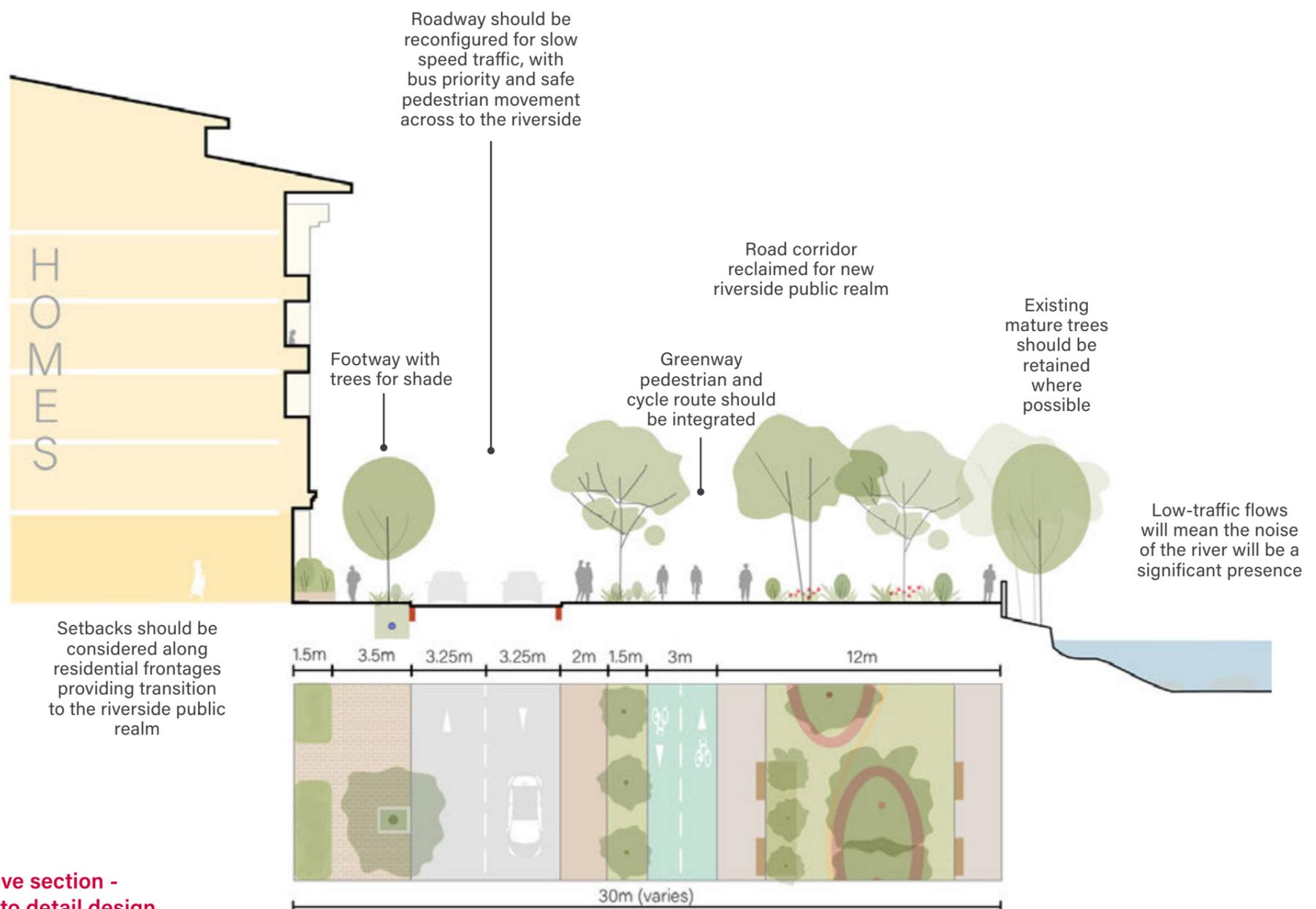
The proposal to re-route traffic and downgrade the northern section of the Doebum Lam-Babesa Expressway will reduce vehicle use and create new riverside spaces integrating the proposed Greenway. The Expressway will be downgraded from a four-lane to a two-lane roadway and this transformation should be planned and designed in alignment with the River Parks system and Greenway, creating coherent and connected landscapes along the Wangchhu.

Key design considerations:

- Minimum 3.25m vehicle lanes.
- Minimum 2m footpaths.
- Minimum 1.5m cycle lane (each way).
- Trees providing shading and comfort, and separation between vehicular movement and pedestrian activity.
- Incorporation of SuDS within landscape area (eg. rain-gardens, bio-swales, etc).



Figure 4.17 Precedent image: Madrid Rio (ES)



Illustrative section - Subject to detail design

Figure 4.18 Street Section E - The Expressway transformed

4.3.2 Transformation of Secondary & Tertiary Streets

SECONDARY STREET: CHANG LAM AT CENTRAL MOBILITY HUB

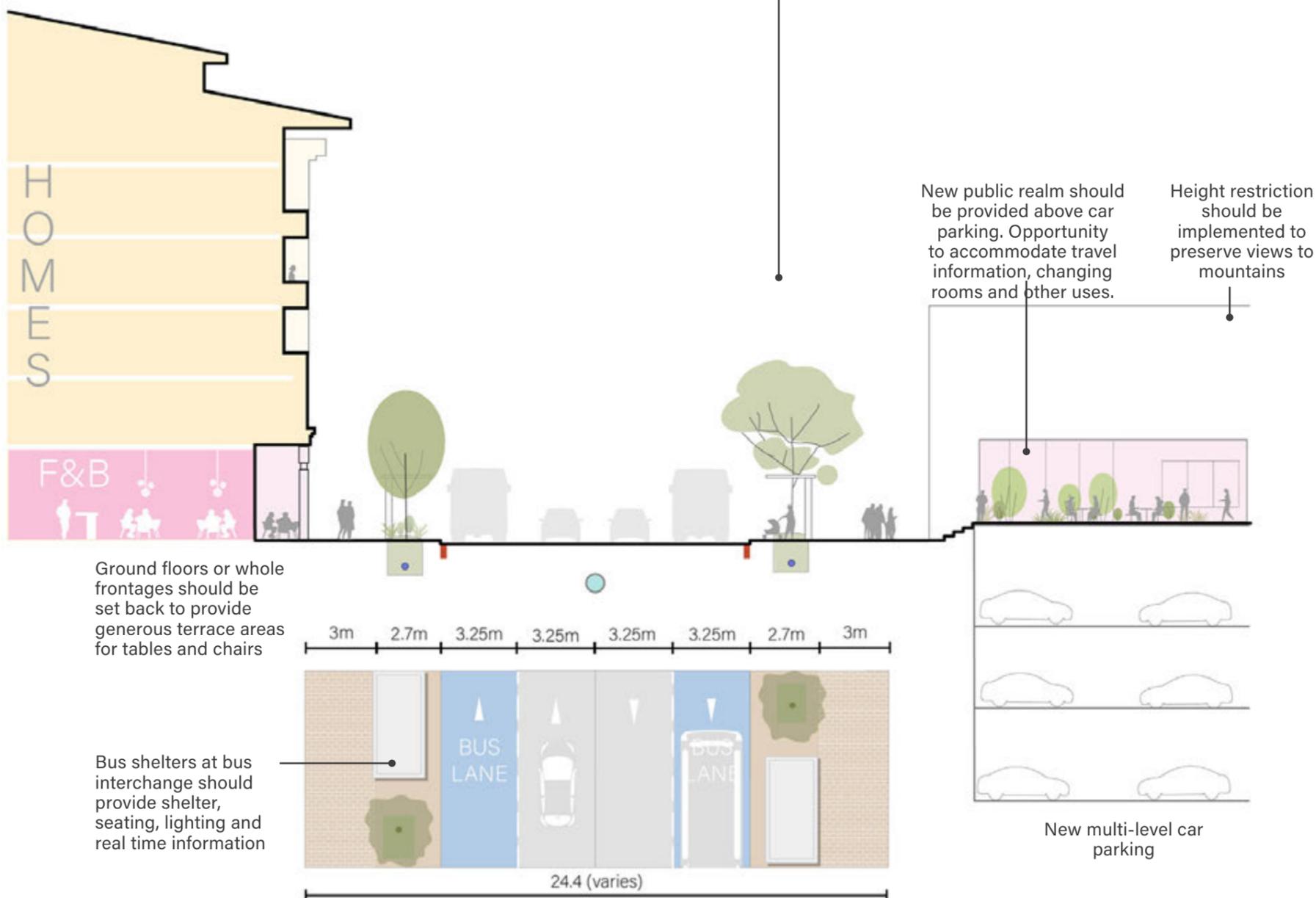
Chang Lam will become the main bus corridor within the City Core. The transformation of Chang Lam should reflect the implementation of a bus priority route by removing or reconfiguring existing on-street car parking. This will allow greater space for bus priority lanes and pedestrian access. The street at the south accommodates the Central Mobility hub which allows interchange between different bus routes, public transport information and other facilities.

Key design considerations:

- Bus priority lanes should be 3.25m minimum
- Generous footpaths to accommodate high levels of pedestrian activity.
- Minimum 2.7m bus shelter zones.
- Trees providing shading and comfort, and separation between vehicular movement and pedestrian activity.



Figure 4.20 Precedent image: Malop Street Green Spine (AUS)



Illustrative - Subject to detail design

Figure 4.19 Street Section - Chang Lam at south of Stadium

SECONDARY STREET: RESIDENTIAL STREET (JANGCHUB LAM)

Jangchub Lam will become a key 'secondary street' providing access to residential areas in the western City Core. It will also concentrate a significant amount of ground floor mixed uses at local centres. The transformation of Jangchub Lam should support the ambition to make the City Core a great place to live, balancing activity with comfort and privacy for residents. On-street parking should be allowed on one side or alternating sides, providing more space for continuous footpaths and landscape.

Key design considerations:

- Minimum 3m vehicle lanes.
- Minimum 2m continuous footpath.
- Trees and landscaping should be provided to create interest and slow-traffic.
- Setbacks should be considered where necessary for spill-out activities or privacy.

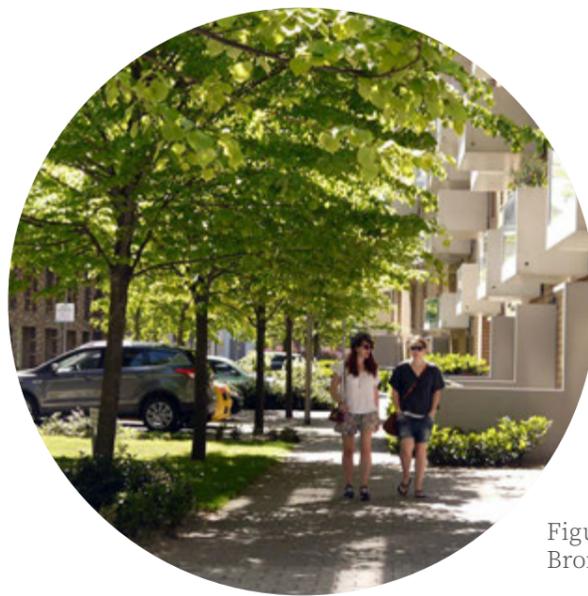
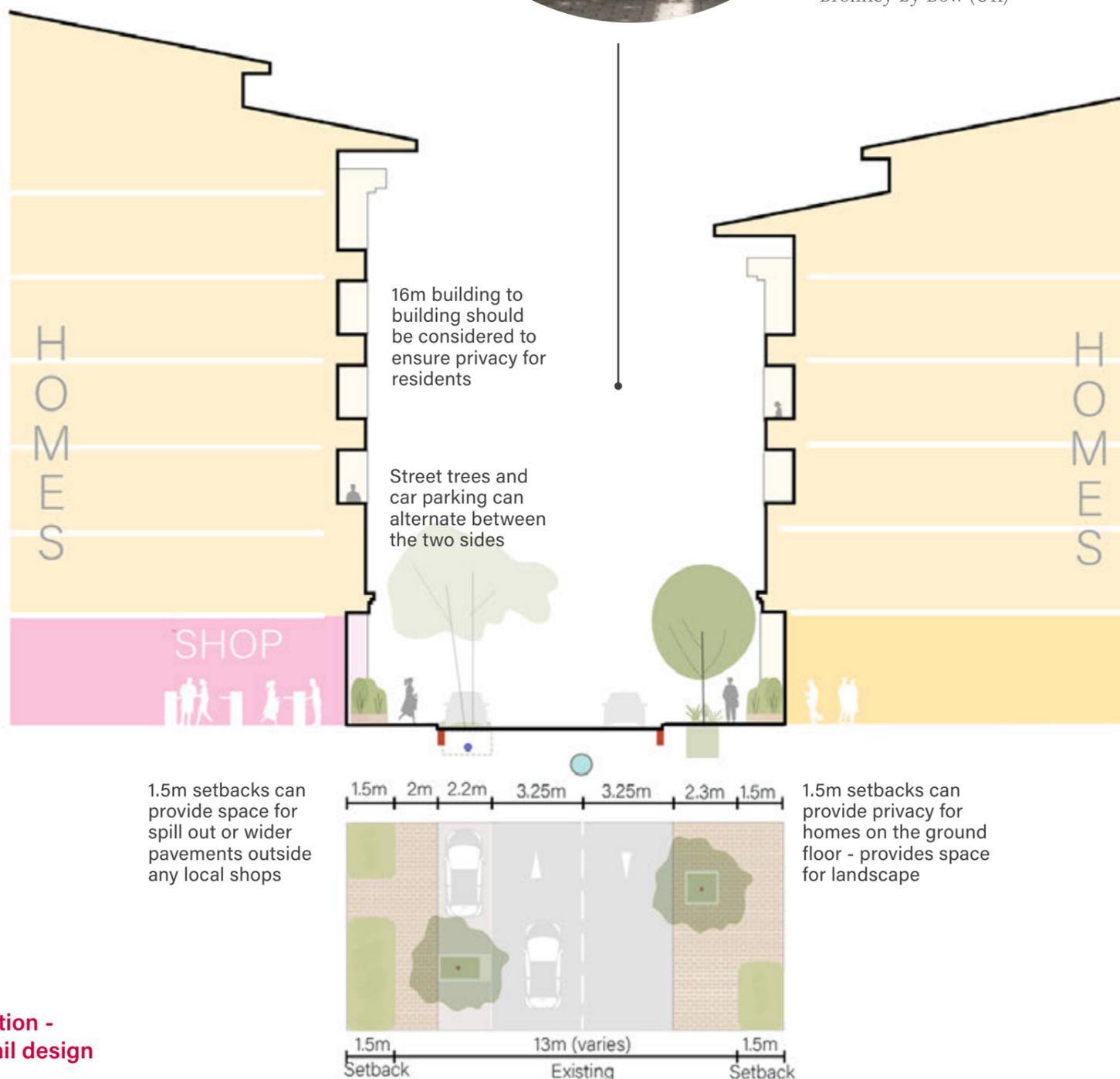


Figure 4.23 Precedent image: Bromley-by-Bow (UK)



Illustrative section - Subject to detail design

Figure 4.22 Street Section - Jangchub Lam

TERTIARY STREET: MIXED USE STREET (HOGDZIN LAM)

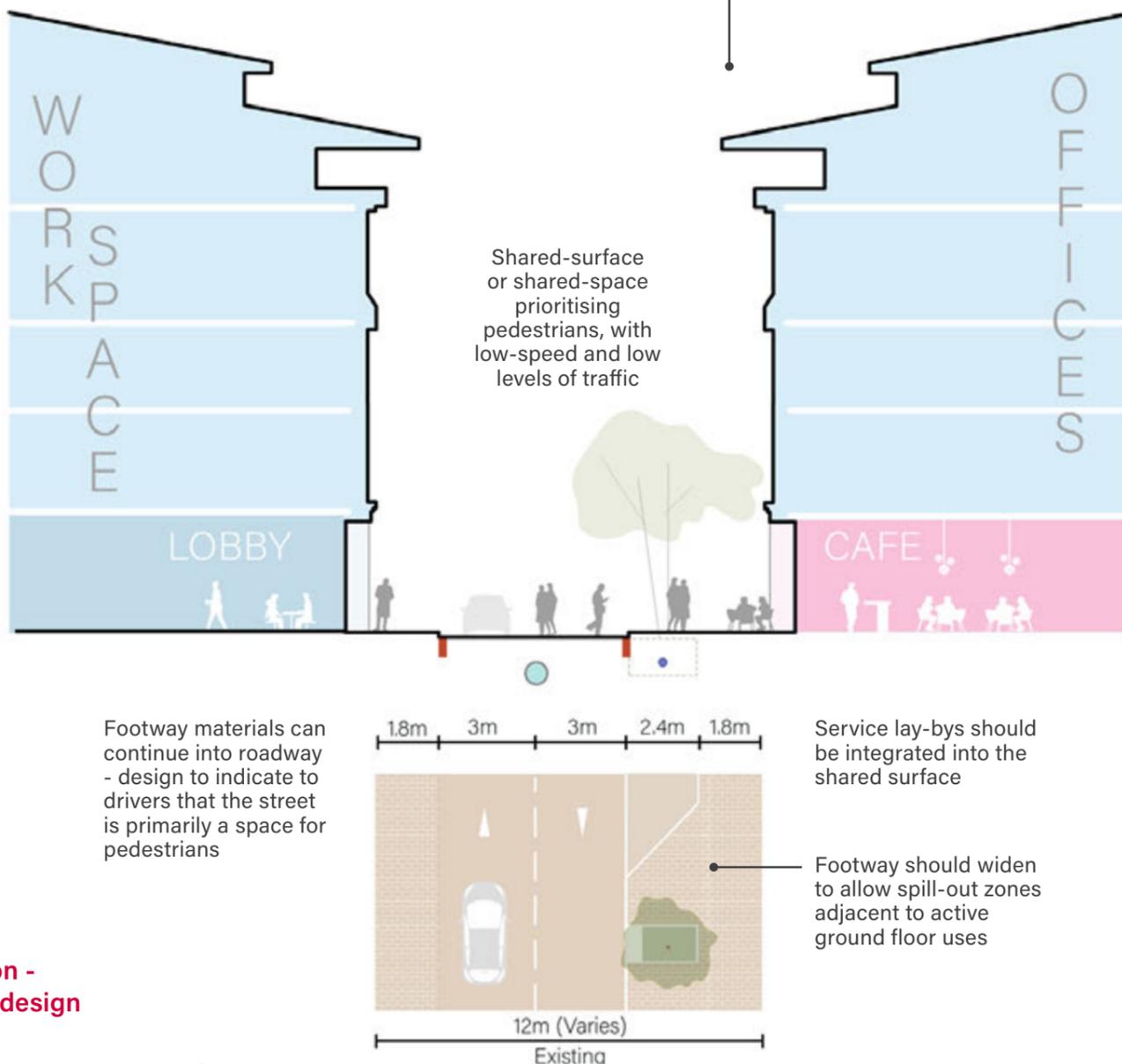
Hogdzin Lam will become a shared pedestrian/access street that provides pedestrian connectivity between Clock Tower Square and the Cultural Quarter in the north. It is lined mostly by 3-4 storeys mixed use buildings providing ground-floor activity in a human-scale environment. The transformation of Hogdzin Lam should build on its existing character to improve the pedestrian experience. Space for on-street car parking should be reduced to provide more generous space for pedestrian zones and landscape.

Key design considerations:

- Minimum 3m vehicle lanes.
- Minimum 1.8m continuous footpath (2m minimum desirable where space is available).
- Trees and landscaping should be provided to create interest and slow-traffic.
- Shared surface treatments could be considered for traffic calming.
- SuDs could be incorporated through use of open channels and rills.



Figure 4.25 Precedent image: Cowcross Street (UK)



Illustrative section - Subject to detail design

Figure 4.24 Street Section - Commercial Street



Figure 4.31 Incorporation of SuDS in narrower streets could be through open channels and rills



Figure 4.26 A shaded, riverside promenade at the downgraded Expressway



Figure 4.28 Play and planting incorporated into residential streets



Figure 4.27 Rain-gardens within wider streets



Figure 4.30 Space for different types of 'spill out' - narrow zone provides privacy for residents and interest and activity on the street.



Figure 4.32 Tactical Interventions: paint can be used to instantly transform a street and demarcate zones for spill-out/pedestrian use

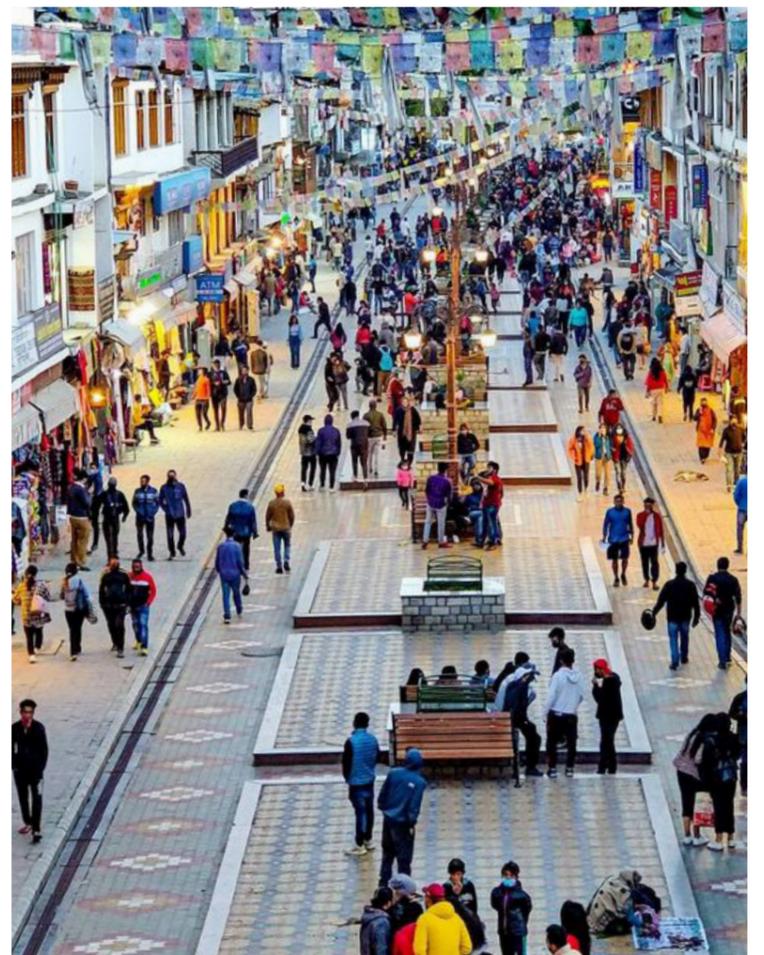


Figure 4.29 A highly, active and celebratory pedestrianised street

4.4 Clock Tower Sq & Norzin Lam

4.4.1 Vision

Thimphu's Clock Tower Square and Norzin Lam are key urban areas that play a significant role in shaping the city's identity. Norzin Lam, which is the principal "Great Street" identified in the CCAP spatial framework, is complemented by a series of pedestrian-oriented spaces that will make this area the main destination for citizens and visitors.

Clock Tower Square is in close proximity to Centenary Park which will be transformed into the city's Central City Park. This major green space will be a focus for national sporting events, recreation, play and other functions, while bringing greenery, water, landscape and ecology into the City Core.

As the principal places of the city, Clock Tower Square, Norzin Lam and Centenary Park should be well integrated into a sequence of connected public spaces.

An improved urban realm will deliver multi-functional green infrastructure, restoring the harmony between people, urban development and the natural environment. To achieve this, the open space network should prioritise the protection of valuable ecological and cultural landscapes as well as provide new and enhanced inclusive public open spaces.

Lastly, Clock Tower Square and Norzin Lam will be a demonstration of how the vision for rebalancing the needs of pedestrians and cars to encourage active travel and public transport use can be delivered.

PLACES

The key Places within the Clock Tower and Norzin Lam area are listed below:

- 1 Clock Tower Square is reinforced as the principal urban space in the city.
- 2 Norzin Lam is the principal 'Great Street' in the city and is extended to the south to reach the new riverside spaces.
- 3 Chang Lam forms the main public transport corridor through the City Core and one of the three 'Great Streets' of the City Core.
- 4 Centenary Park and the Bhutan Olympic Ground will be extended and upgraded to form the Central City Parks.
- 5 A new pedestrian only east-west link connects Clock Tower Square to Chang Lam and Centenary Park. Along this link, the 'Social Steps' allow accessible movement between the levels and will be an urban event.
- 6 The strategic pedestrian and cycle 'Greenway' route is incorporated within the Central City Parks and other new riverside spaces.
- 7 A new multi-level car park provides central parking at the Stadium/Centenary Park, as part of the central transit and mobility hub along Chang Lam.
- 8 Space for major pop-up events and festivals are provided within Centenary Park.
- 9 A new, iconic pedestrian bridge crosses the Wangchhu and connects uses, spaces and public transport on the eastern side of the river to the City Core.
- 10 The Stadium is upgraded to provide a national icon, a new city destination and events space and will provide additional activity within the Central City Park.
- 11 The Archery Ground can be retained within the Central City Parks as a showcase for traditional Bhutanese culture.
- 12 'Lungten Zampa Square' is a new urban space and city gateway located at the eastern end of Lungten Zampa.
- 13 A new vehicular and pedestrian river crossing at Lungten Zampa with vertical pedestrian connections between bridge level and the park and riverside below.
- 14 The traditional bridge at Lungten Zampa can be rebuilt to provide a pedestrian and cycle link between the western and eastern Central City Parks.
- 15 There is a new landscape setting for the National Memorial Chorten, incorporating an open, naturalised stream, reorganised traffic circulation and connections and views to the riverside.
- 16 The narrow spaces between buildings fronting Norzin Lam are revitalised as a series of 'Laneways' with new activity, public realm and lighting.
- 17 Existing streets and spaces to the west of Norzin Lam are improved to form a series of smaller, secondary courts and lanes.
- 18 An important north-south pedestrian link is formed to connect Clock Tower Square to the Cultural Quarter and the Royal Parks in the north.
- 19 A 'Green Stream' with a recreation and play theme, provides an east-west pedestrian connection along an open, cleaned watercourse that brings nature and ecology into the heart of the city.
- 20 'Hogdzin Square' is a new part urban, part green space to the north of Clock Tower Square and is located where the north-south link meets the 'Green Stream'.
- 21 Form a new 'Park Boulevard' through Centenary Park, with slow-traffic speeds, low-traffic flows and multiple crossig points for pedestrians.

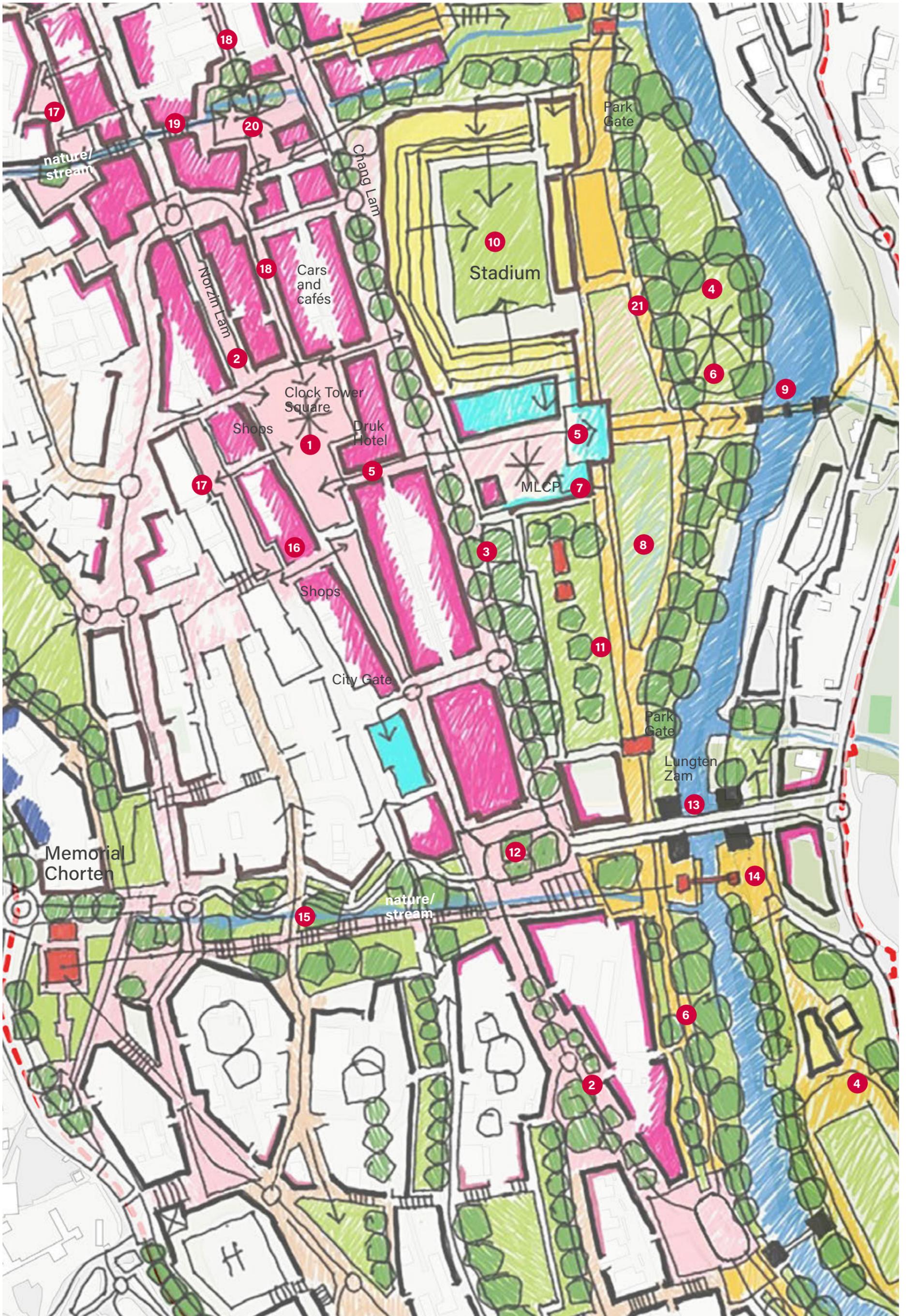


Figure 4.33 Vision for Clock Tower Square and Norzin Lam area

4.4.2 Urban Design Guidance

The following provides Character Area Guidance for the Clock Tower and Norzin Lam area:

RESPONDING TO CONTEXT

- Protect and enhance the existing setting of Clock Tower Square.
- Ensure the existing views to the eastern forested mountain slopes are protected into the future, with a restricted building height zone to the east of the square.
- Improve the settings for important heritage assets, such as the National Memorial Chorten, riverside chortens at Lungten Zam and Zangdok Pelri Lhakhang.
- Locations for high-quality landmarks and accent buildings are identified to frame key views and improve legibility.
- Consider rebuilding the historic bridge south of Lungten Zampa.
- Create a new riverside public realm that is designed to be resilient to flooding.

Recognise and celebrate other important views, such as:

- The city-scale view to Wangditse Lhakhang from the City Gate along Norzin Lam;
- Filtered views, through retained trees, between the riverside Chortens and the National Memorial Chorten.
- View from the City Gate through Clock Tower Square along Hogdzin Lam, terminating with a new, distinctive landmark building.

Please also refer to the Principles, Interventions and Spatial Plans within Ch03: Protections to ensure the correct response to requirements around Geo-hazards (Flood and Landslide) and Heritage.

URBAN STRUCTURE

- The new network of streets and spaces should seek to create a contrast of experience - from narrow, highly enclosed Laneways to open, urban spaces with views to surrounding mountainsides.
- Ensure strong spatial enclosure to Clock Tower Square and Hogdzin Square to the north and ensure these spaces are well defined by development frontage.
- Frame Norzin Lam and Clock Tower Square with primary frontages and colonnades. Primary frontages can include a higher proportion of ground floor active uses (such as retail, cafés, bars and clothing). Buildings should form a high degree of enclosure to the street/space and building or ground floor setbacks along primary frontages should only occur to accommodate spill-out zones, where ground-floor uses have a dedicated external outdoor space.
- Frame other important public spaces and pedestrian routes with secondary frontages. Secondary frontages can provide a diversity of uses such as services, community facilities, restaurants and businesses and front doors and lobbies to upper floor uses. Building setbacks along secondary frontages can also accommodate narrower spill-out zones that bring the life and activity of ground floor uses to the street.
- Ensure that active ground level frontages and high levels of overlooking are formed on frontages to Chang Lam and Green Streams, as part of any stadium redevelopment, upgrade or renovation.
- Form a River Square and Lungten Zampa Square that provides a rich and varied urban experience.
- Improve and integrate spaces between buildings fronting Norzin Lam to form a series of pedestrian 'Laneways' as part of the varied pedestrian experience.
- Activate Laneways with ground floor uses and spill out into the public realm, and introduce lighting and paving that make them feel safe and welcoming.
- Ensure that Clock Tower Square provides an iconic urban landmark for the city - a distinct character should be described through the use of materials, landmark frontages, unique planting and tree types, special lighting, etc.

The lower development heights of the Druk Hotel frontage at Clock Tower Square allows a strong relationship with the mountainside. This mimics a similar relationship at Tashichho Dzong.



Figure 4.34 Responding to Context: Maintaining views from Clock Tower Square to forested mountain slopes

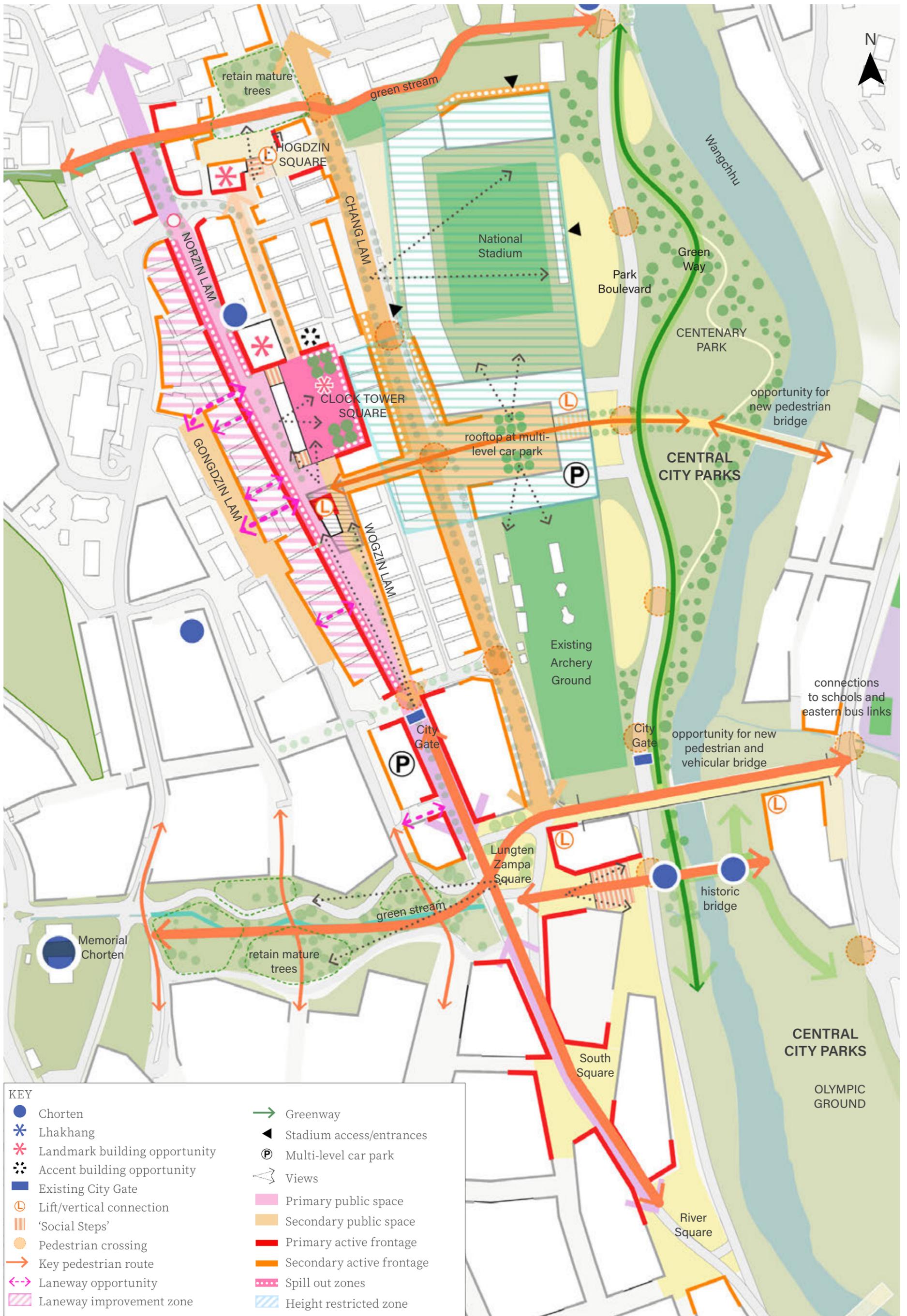


Figure 4.35 Clock Tower Square & Norzin Lam - Built form and Public Realm Guidelines

CONNECTIONS

- Rebalance the existing predominance of north-south orientated streets with a new network of east-west connections that integrate with the proposed 'Greenway'.
- Form a new primary east-west pedestrian connection between Clock Tower Square and Centenary Park. This route must provide accessible, vertical connections and become a landmark urban feature, celebrating views across the Park and promoting activity and social interaction (the 'Social Steps').
- Provide east-west pedestrian connections along the '108 Steps' Valley Park - connecting western communities and existing trekking trails to the City Core.
- Provide an east-west pedestrian connection along the 'Recreational Green Stream'.
- Establish a new north-south walking connection (with unobstructed pavements, signage and crossing points) between Clock Tower Square, the Cultural Quarter and the Royal Parks entrance.
- Promote Chang Lam as the primary public transport corridor through the City Core.
- Locate a new Central Mobility Hub/ bus Interchange at Chang Lam, in close proximity to Clock Tower Square. This should be integrated into the public realm treatment of the street and provide a street-based interchange between buses and other transport modes.
- Introduce pedestrian crossings along desire lines to ensure safe pedestrian movement and access to public transport.
- Remove the existing surface car parking at Centenary Park and consolidate parking within a multi-level car park, associated with the Central Mobility Hub.
- Introduce new pedestrian bridges across the Wangchhu to promote access between the eastern bus corridor, eastern communities and the City Core.

ACCESS AND CIRCULATION

The following provides more specific access and circulation guidance:

- Restrict vehicular access during the daytime along the southern extent of Norzin Lam to allow pedestrian priority. Service access to Norzin Lam primary frontages should be provided at restricted hours only.
- Provide service access to Norzin Lam shops and Clock Tower Square from secondary streets and spaces.
- Limit and moderate vehicular access and traffic flows through Centenary Park (along the 'Park Boulevard') during the daytime and early evenings, while ensuring access to the proposed multi-level car park and managed servicing of the stadium.
- Provide a drop-off area for taxis and general traffic to the south of Clock Tower Square at Wogzin Lam.
- Allow occasional service access through Clock Tower Square to allow for cleaning and set-up/servicing of events.
- Form the 'Park Boulevard' as a slow-speed, low-traffic street, as part of the Park. Introduce multiple crossing points to allow flow through the river. To restrict traffic flows, provide managed servicing of the Stadium.
- Provide new pedestrian entrances to the stadium and retain the historic stadium entrance facing Centenary Park.
- Provide a new public realm incorporating gathering/crowd control spaces at stadium entrances.
- Form new, safe and accessible vertical pedestrian circulation between Norzin Lam and Clock Tower Square lower level, between Hogdzin Lam and the new Hogdzin Square, between Chang Lam and Centenary Park and between Gongdzin Lam and the Laneways.
- Introduce junction improvements to reduce pedestrian and traffic conflicts at: Lungten Zampa, the National Memorial Chorten and Norzin Lam (at Policeman).

ACCESS AND CIRCULATION OPTIONS AT LUNGTEN ZAMPA

The following pages illustrates three options for the Access and Movement Guidelines, showing alternatives for improved pedestrian and vehicular circulation at Lungten Zampa. An appraisal process should be carried out to define the best option for the bridge.

All options follow the guidance below:

- Provide a new Lungten Zampa for pedestrians and vehicles to the north of the existing bridge, connecting the upper Lungten Zampa Square to Khamtoe Lam.
- Reduce traffic and pedestrian conflicts at the eastern and western approaches to Lungten Zampa.
- Consider rebuilding the historic bridge at the river level to provide a pedestrian only connection between Central City Parks.
- At Lungten Zampa, ensure vertical pedestrian circulation between the upper level pedestrian route and the Central City Park, river crossings and Greenway at the lower level.

OPTION 1

Option 1 (diagram on the right) illustrates a new river bridge for vehicular traffic and pedestrians at high level, to the north of the existing bridge. In this scenario, the existing bridge is removed and a new pedestrian crossing at low level is provided on the alignment of the lost historic bridge, reconnecting the existing riverside Chortens.

Access to the multi-level car park at the Stadium is provided from the low level Park Boulevard, as well as from the upper level at Chang Lam (potentially reducing the extent of the bus priority along Chang Lam).

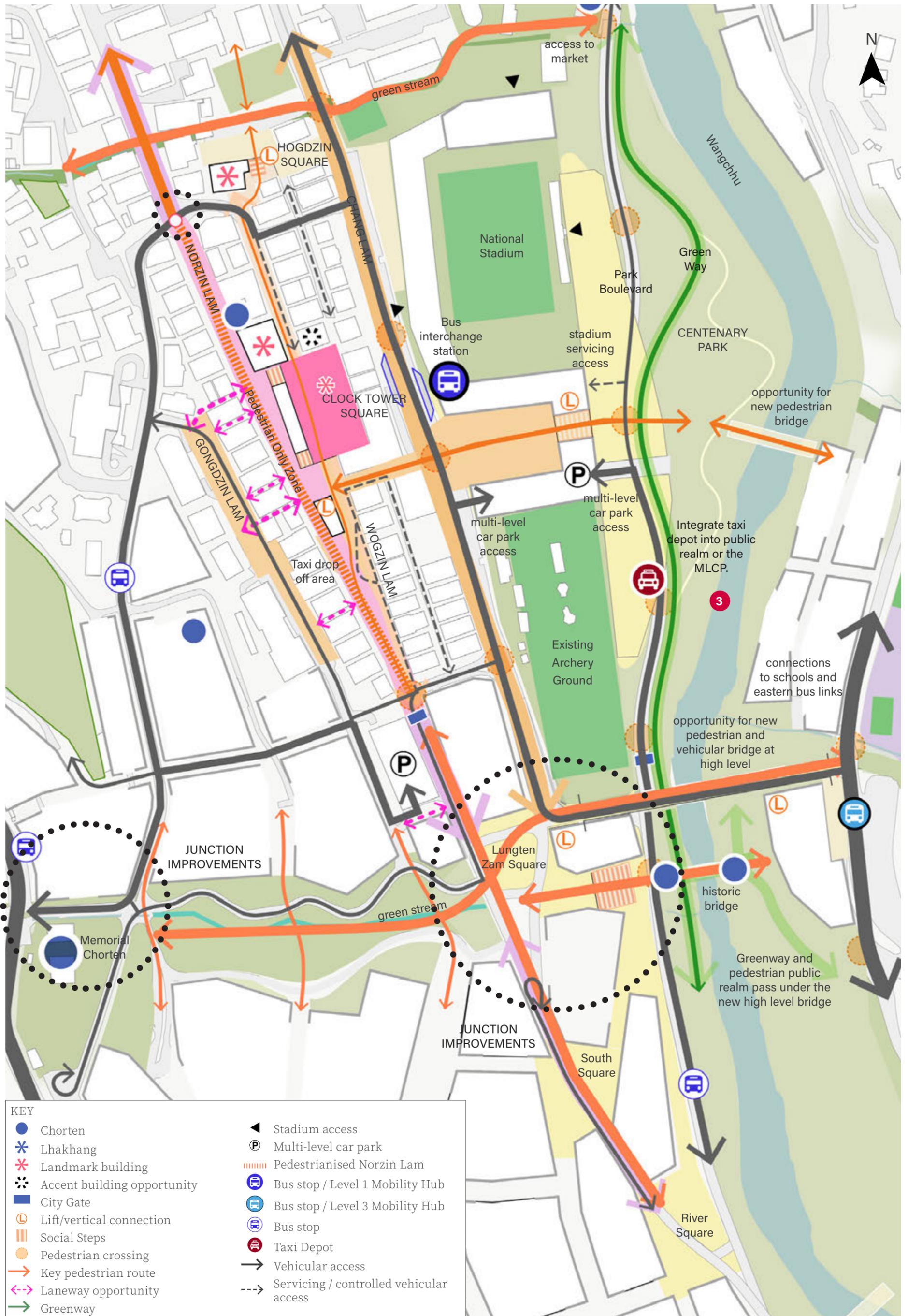


Figure 4.36 Clock Tower Square & Norzin Lam - Access and Movement Guidelines (Option 1)

OPTION 2

Option 2 illustrates a new river bridge for vehicular traffic and pedestrians at low level, to the north of the existing bridge. In this scenario, the existing bridge is retained to provide pedestrian and cycle movement across the river at high level.

A new pedestrian crossing on the alignment of the lost historic bridge can also be provided, but potentially duplicates the pedestrian connectivity already provided by the other bridges.

Since vehicular traffic at Lungten Zampa is kept at low level, access to the multi-level car park at the Stadium is provided from the low level Park Boulevard only, without requiring an upper level access from Chang Lam.



Figure 4.37 Clock Tower Square & Norzin Lam - Access and Movement Guidelines (Option 2)

OPTION 3

Option 3 also illustrates a new low level bridge for vehicular traffic and pedestrians at low level, to the north of the existing bridge which is retained.

The key difference in this option is the vehicular connectivity between the new low level bridge and Norzin Lam and Doebum Lam to the west, across the existing petrol station site.

In this scenario, the open spaces around Memorial Chorten and the 108 Steps Valley Park are kept free of vehicular movement to prioritise pedestrian circulation.

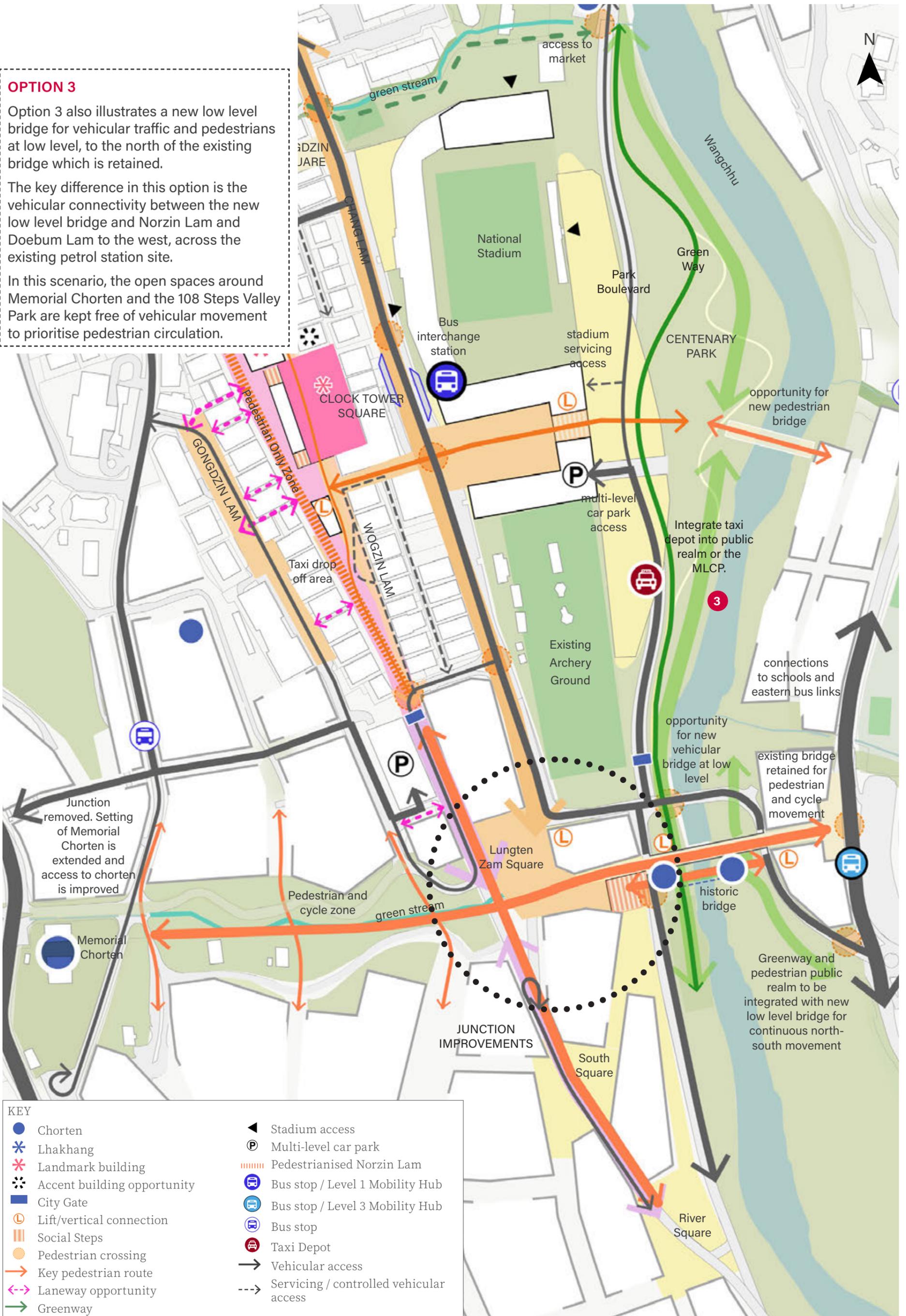


Figure 4.38 Clock Tower Square & Norzin Lam - Access and Movement Guidelines (Option 3)

BUILT FORM

- New development should deliver an urban density that supports an intensity of activity and use appropriate to the area, which is generally at 4-6 storeys.
- Frontages to Norzin Lam and Doebum Lam must not exceed the existing 6-storey maximum building height.
- Enforce a restricted building height zone, to the east of Clock Tower Square, limiting heights to 3-storey maximum, to protect existing views to the eastern mountains.
- Form primary frontages to Clock Tower Square and Norzin Lam.
- Provide greater enclosure to Clock Tower Square through the introduction of new development in vacant areas to the north and south of the space (see also p144-149).
- Locate landmark buildings to form the 'city gateway' space at the east of Lungten Zampa (Lungten Zampa Square).
- The design and orientation of frontages, balconies and rooftop spaces along Chang Lam should respond to the dramatic views across the Park and the riverside.

STREETS AND SPACES

- Along Norzin Lam and Chang Lam, rebalance the needs of pedestrians and traffic circulation and form a new, pedestrian-oriented public realm.
- Public realm design and treatment at Clock Tower Square and Norzin Lam should prioritise the social life of the city and encourage people to meet, gather and dwell throughout the day and evening - consider use of trees for shade, shelter, 'social steps', seating and lighting.
- Reinforce highly active ground floor frontages around Clock Tower Square, Norzin Lam and Chang Lam, with spill-out zones and high level of overlooking from upper floor uses.
- Ensure the priority and comfort of pedestrians in any new connection and any retrofit treatment of existing streets and introduce unobstructed pedestrian pathways, shade and shelter, signage and wayfinding, good lighting and places to stop and pause.
- Crossing points that prioritise pedestrian safety should be located at pedestrian desire lines.
- Introduce places of shelter from rain within the primary public spaces and at the Chang Lam Central Mobility Hub.
- Ensure continuous, unobstructed pedestrian surfaces and denote any change in level with visually contrasting materials.
- Integrate necessary utilities within/under pavements and roadways.
- Ensure that the Greenway is provided as a continuous and unobstructed pedestrian and cycle route through Centenary Park and the other riverside spaces.

NATURAL ENVIRONMENT

- Retain existing mature trees, particularly within riparian zones, key pedestrian routes and existing natural green spaces. Retain existing willow trees along Green Streams to maintain ecology and signify the presence of water in the urban environment.
- Introduce new street trees to provide shade and thermal comfort, habitat connectivity and improved air quality, drawing from native plant communities. Specification of distinct planting palettes can contribute to developing a unique identity along individual streets and spaces.
- Incorporate sustainable urban drainage systems (SuDS) where appropriate to support a stormwater drainage network.
- Planting should be designed to provide year-round interest, with naturalistic planting areas adding colour, vibrancy, and engaging the senses.
- Deliver connected green infrastructure between the Centenary Park and riverside riparian environments.
- Daylight the existing streams to the north of Clock Tower Square and along 108 Steps, celebrating the presence of water in the City Core and delivering water quality improvements, micro-climatic benefits and opportunities for recreation and play.
- Protect the riparian corridor along the Wangchhu and ensure improvements to its ecology.
- Design the riparian corridor to be environmentally sustainable, using green infrastructure to manage stormwater, preserving native plant and animal species, and minimizing the use of non-renewable resources.

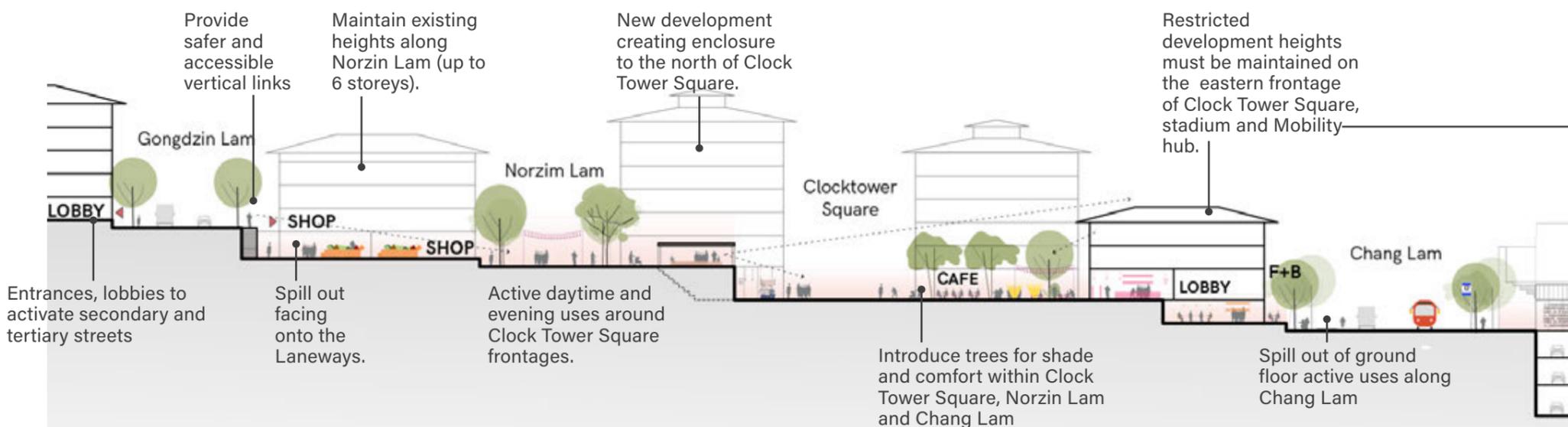


Figure 4.39 Section through Norzin Lam, Clock Tower Square, Chang Lam and Centenary Park



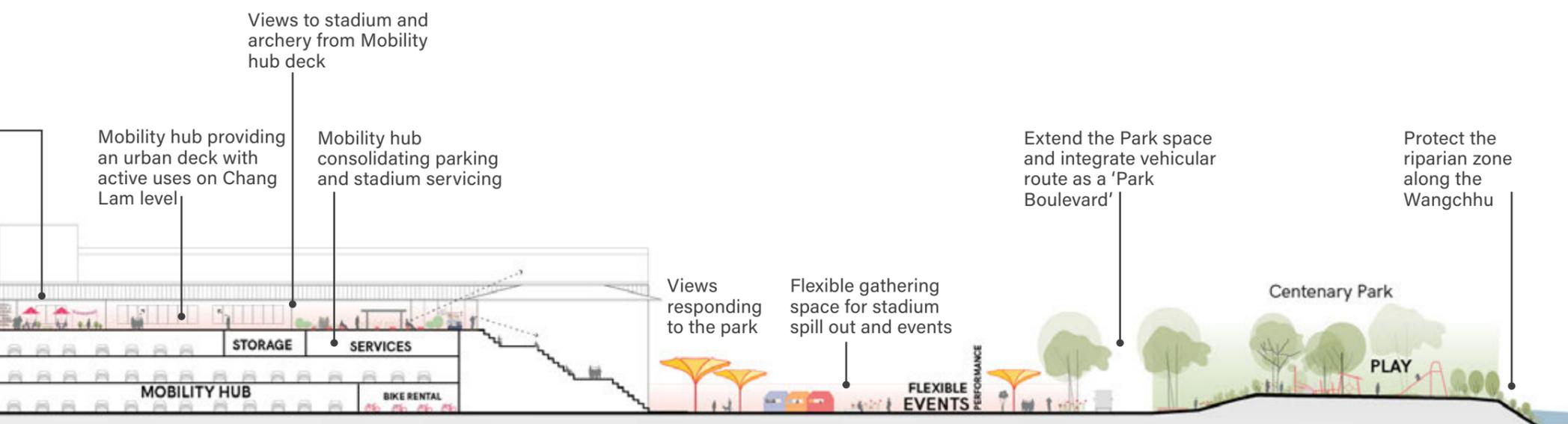
Figure 4.42 Melbourne has many examples of narrow laneways that offer more intimate spaces where people can gather.



Figure 4.40 Barangaroo South, in Sydney, illustrating how a pedestrianised Norzin Lam South could feel like, with active frontages, seating, planting and generous footways.



Figure 4.41 Sheffield's 'Gray to Green' scheme demonstrating how spaces for pedestrians, SuDS and buses could be organised along Chang Lam.



CLUSTERING OF USES

- Reinforce the existing activity clusters with additional uses that diversify the City Core, supported by the additional population of the new urban communities.
- Ensure that Clock Tower Square and Norzin Lam are at the heart of a bustling and vibrant City Core. Introduce and maintain uses such as shops, bars and cafés, hotels, leisure and evening uses, visitor information and public toilets around the Square.
- Showcase Bhutanese urban culture in Clock Tower Square throughout the year: encourage everyday activities, special events and evening activities. The Square should be a destination for residents and visitors, a place that everyone can enjoy at different times.
- Ensure Norzin Lam remains the primary retail street in the city.
- Reinforce the cluster of evening uses to the western frontage of Chang Lam and extend these uses to the north and south.
- Promote spill-out of ground floor activity into the public realm along Norzin Lam, Clock Tower Square and Chang Lam frontages eg. wares from shops, tables and chairs from cafés, moveable signage, etc.
- Activate the existing narrow spaces between the buildings along the Norzin Lam frontage to form a series of distinctive pedestrian 'Laneways'.
- Maintain and reinforce the secondary active frontages to Chang Lam, Hogdzin Lam and Wogzin Lam.
- Remove the tennis courts from along the 'Green Stream' and integrate this use into the Central City Parks, to form a greater recreational cluster and allow the space along the stream to be naturalised.
- Ensure activation and overlooking from development frontage along the 'Green Stream'. Introduce recreational and play spaces along the 'Green Stream' at more accessible and visible locations.

- KEY
- City Core Action Plan Boundary
 - Primary connections
 - E-W pedestrian links
 - Retail cluster
 - Workplace cluster
 - School cluster
 - Culture cluster
 - Sports and recreation cluster
 - Entertainment/ evening use cluster
 - Transport node
 - Emerging centres

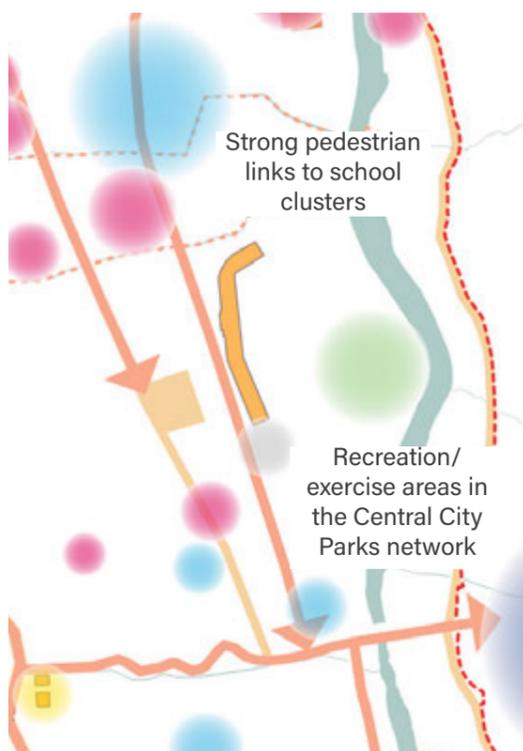


Figure 4.43 Weekday morning

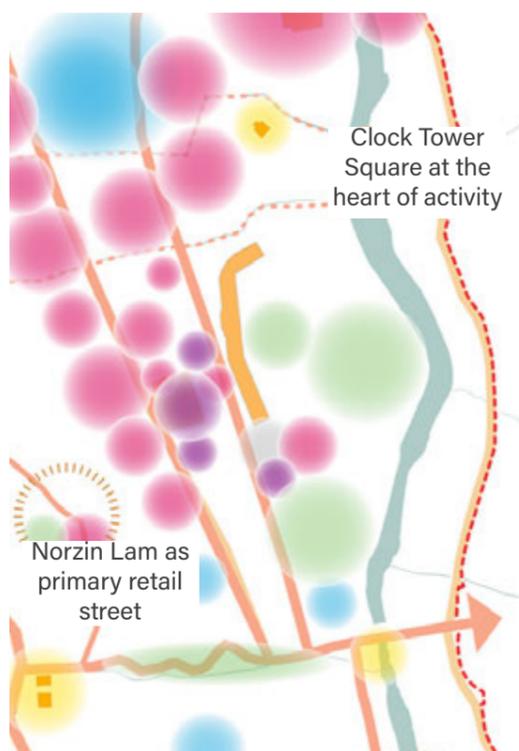


Figure 4.44 Weekday afternoon

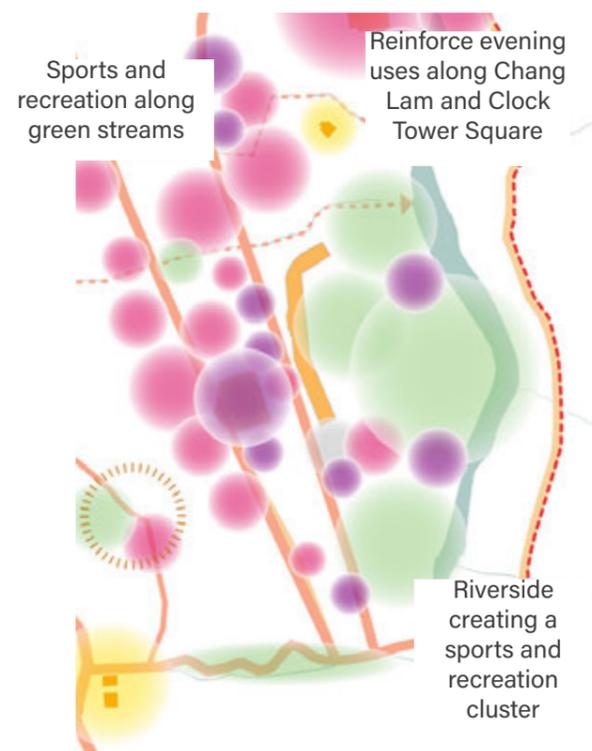


Figure 4.45 Weekday evening

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4.4.3 Clock Tower Square Guidance

EXISTING CONDITION

- Clock Tower Square is at a lower level with Norzin Lam raised on an upper level.
- Druk Hotel provides enclosure to the south and east.
- Norzin Lam buildings provide enclosure to the west.
- The Bank of Bhutan Building forms a 'landmark' building on the Square and provides good enclosure.
- The Square is less enclosed to the north and the south.
- There are two key views associated with Clock Tower Square: Norzin Lam is rotated on an axis so that Wangditse is visible along the street; and a second, more local view is formed along Wogzin and Hogdzin Lam, from the city gate through the Square.

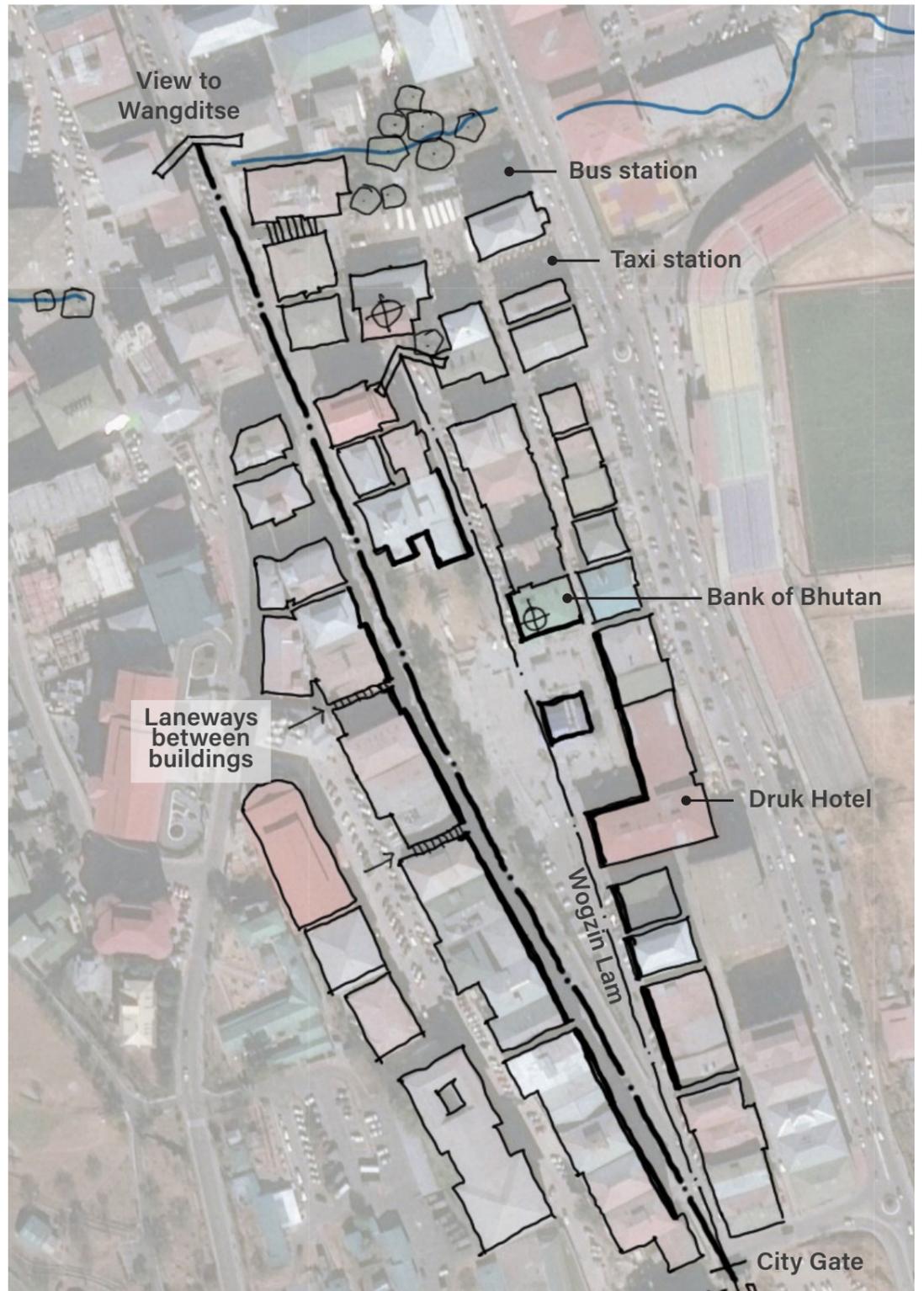


Figure 4.48 Existing condition

Local precedent: Tashichho Dzong

- The Tashichho Dzong has a well proportioned and enclosed sequence of squares.
- Building heights are sensitive to views of the mountains as a backdrop.
- Collonade creates enclosure and allows for visual and movement permeability.



Figure 4.47 Tashichho Dzong colonnade



Figure 4.46 Tashichho Dzong.

FORMING ENCLOSURE AND DEFINITION

- New development and strong frontage can be introduced to the north and south of the Square: a new building can be formed to the north, and a 'pavilion' building can be formed to the south. This strongly defines the space on all four sides.
- Any new development in these two locations must allow the two key views from the city gate to be retained through the Square and along Norzin Lam.
- The northern development should form a 'twin' building of the Bank of Bhutan Building and form an entrance/threshold into the Square.
- A new landmark building should be developed at the north of Hogdzin Lam to terminate the local view.



Figure 4.51 Clock Tower Square: opportunity to enclose southern edge.

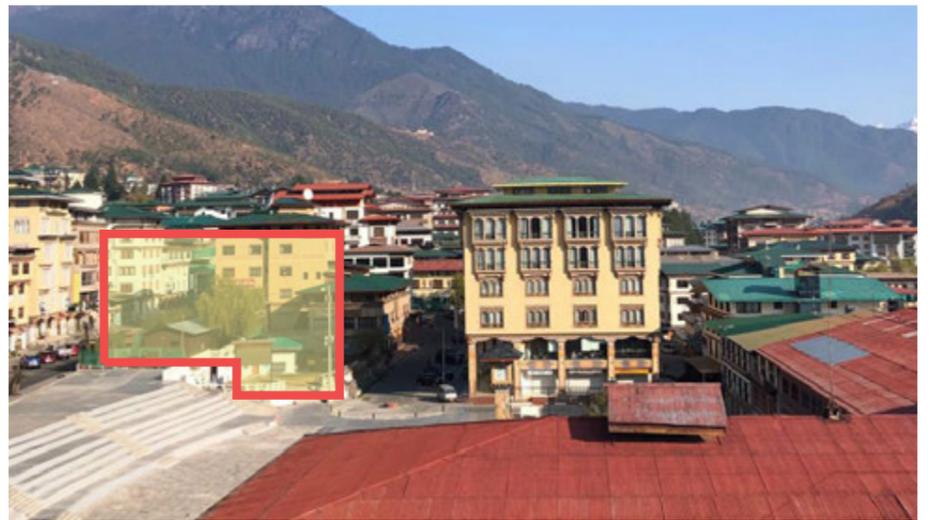


Figure 4.50 Clock Tower Square: opportunity to enclose northern edge.



Figure 4.52 Coal Drops Yard, London, multi-level square with activation



Figure 4.49 Clock Tower Square - opportunities for activation at different levels

CLOCK TOWER SQUARE DESIGN PRINCIPLES

- The design of Clock Tower Square and Norzin Lam should reflect their status as the principal urban space in the city and should be iconic to provide the city with a unique identity.
- New development opportunities to the north and south of the Square should serve to bring additional activity and additional enclosure and definition to the space.
- The space should consider day-to-day activity as well as larger events, and ensure that this is a space for citizens to meet, gather and socialise within.

Illustrative section - Subject to detail design

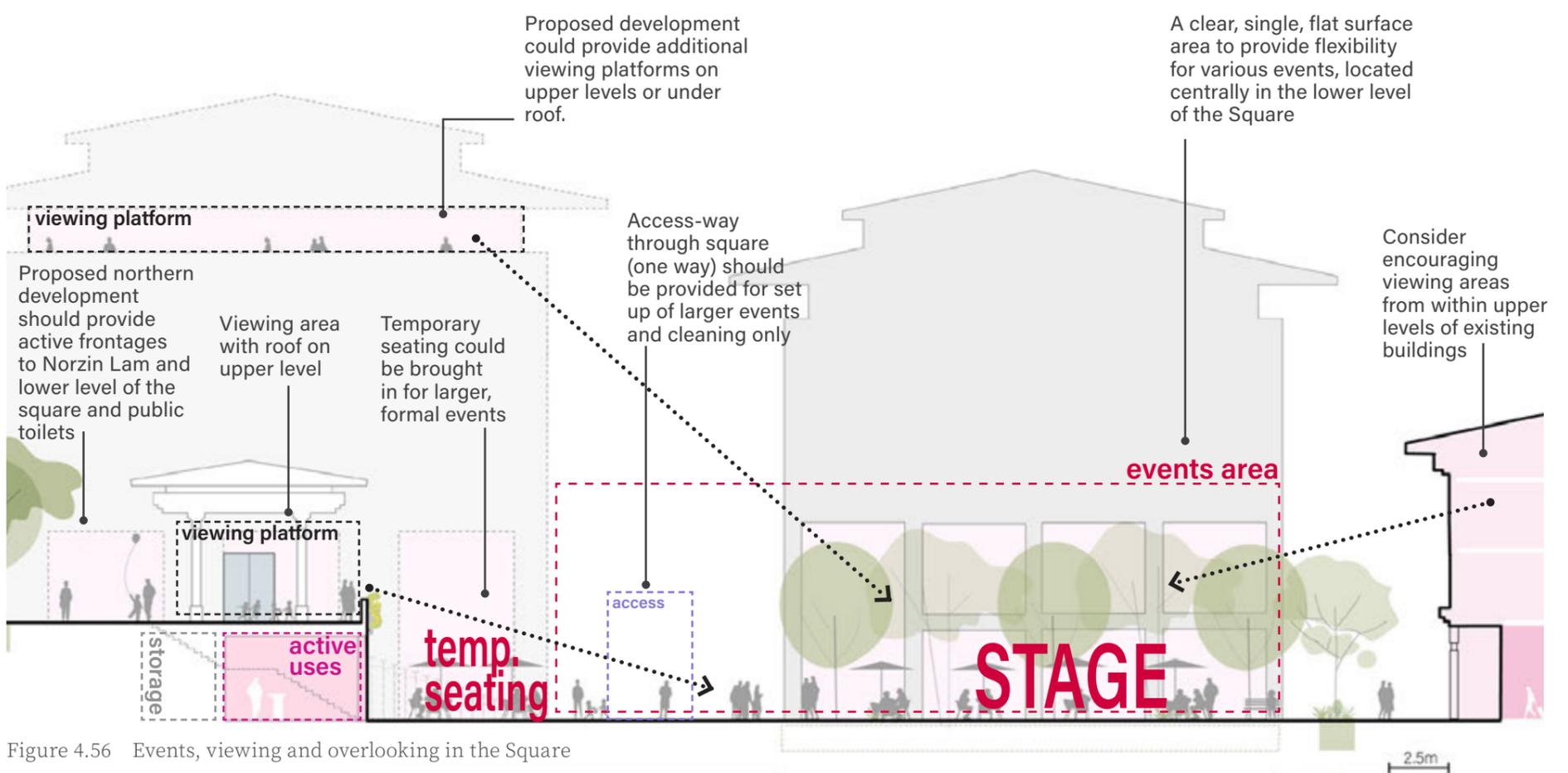


Figure 4.56 Events, viewing and overlooking in the Square



Figure 4.53 Activity at two levels with overlook from the upper level



Figure 4.54 Generous stairs allow for informal gathering



Figure 4.55 Place activity under the shade of trees to increase dwell times in Square

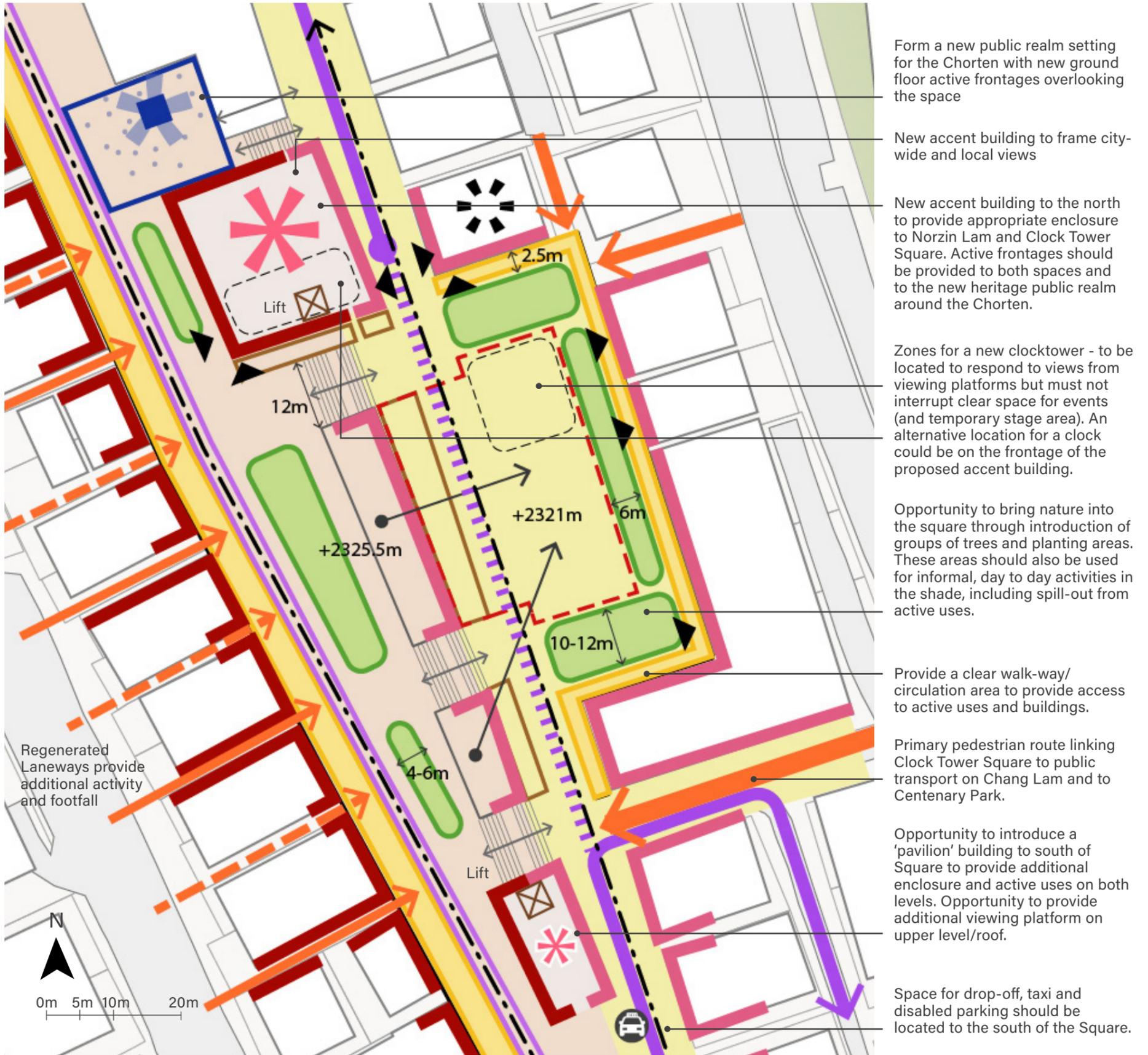


Figure 4.57 Clock Tower Square - design principles diagram

| KEY | |
|-----|--|
| | Chorten |
| | Accent building opportunity |
| | Existing accent building |
| | Pedestrian connections |
| | Laneways |
| | Citywide/local views |
| | Views from viewing platform |
| | Servicing route (restricted) |
| | Occasional servicing route |
| | Upper level public realm |
| | Lower level public realm |
| | Upper level active frontage |
| | Lower level active frontage |
| | Clear footway/circulation area |
| | Opportunity for groups of trees and planting |
| | Time-restricted servicing access |
| | Active spill out zones |
| | Area for events |
| | Public realm setting for Chorten |
| | Potential clock tower locations |
| | Entrances to buildings |
| | Potential location for public lift |

- Clock Tower Square should become one of the city's main public events spaces and a central area for events should be provided at the lower level. This should be a clear, single, flat surface with integrated utilities to allow for various events (consider water supply for temporary additional toilets, energy for lighting and audio-visual, etc.).
- The different levels within the space and the two development opportunities can introduce 'viewing platforms' to overlook the space.
- A pavillion should be provided on the upper level with covered space for day-to-day activity and small pop-up events (e.g. outdoor exhibitions, markets) and views over the lower events space.
- Active ground floor frontages should be provided on all frontages addressing the space, and spill-out from these uses should be encouraged into the public realm at both levels.
- Trees should be located to demarcate areas for spill-out from active uses (e.g. cafe tables) and other informal, day-to-day activities (e.g. seating) under shade.
- Trees should be located to provide shade to places of pedestrian activity - to encourage longer dwell times in the space and higher levels of footfall and activity.
- Within the tree zones there is opportunity to integrate low level planting, SuDs and permeable paving.
- Public realm treatment of both levels of the square should be related to the public realm treatment within Norzin Lam to describe these as associated spaces.
- At least two opportunities for locating a new clock are indicated (however, the location need not be limited to these). The clock should be located so that it can be visible from the viewing platforms on the upper level, but should not interrupt or restrict the flexibility of the events space. Another possibility is to locate a new clock on the frontage of the new development where it could be visible from Norzin Lam and from within the space.

Illustrative sections - Subject to detail design

Levels and Enclosure

The two different levels should be considered as part of one space, with Norzin Lam as the upper space within the Square. Increased enclosure and definition should be provided by two new buildings to the north and south. Levels provide the opportunity for viewing platforms to overlook the activity on the lower level or to view larger events. Staircases between the two levels should be generous in width and with deeper treads so that they can be used for informal sitting and gathering in smaller groups on a day to day basis. The two new buildings provide an opportunity to provide public lifts between the levels.

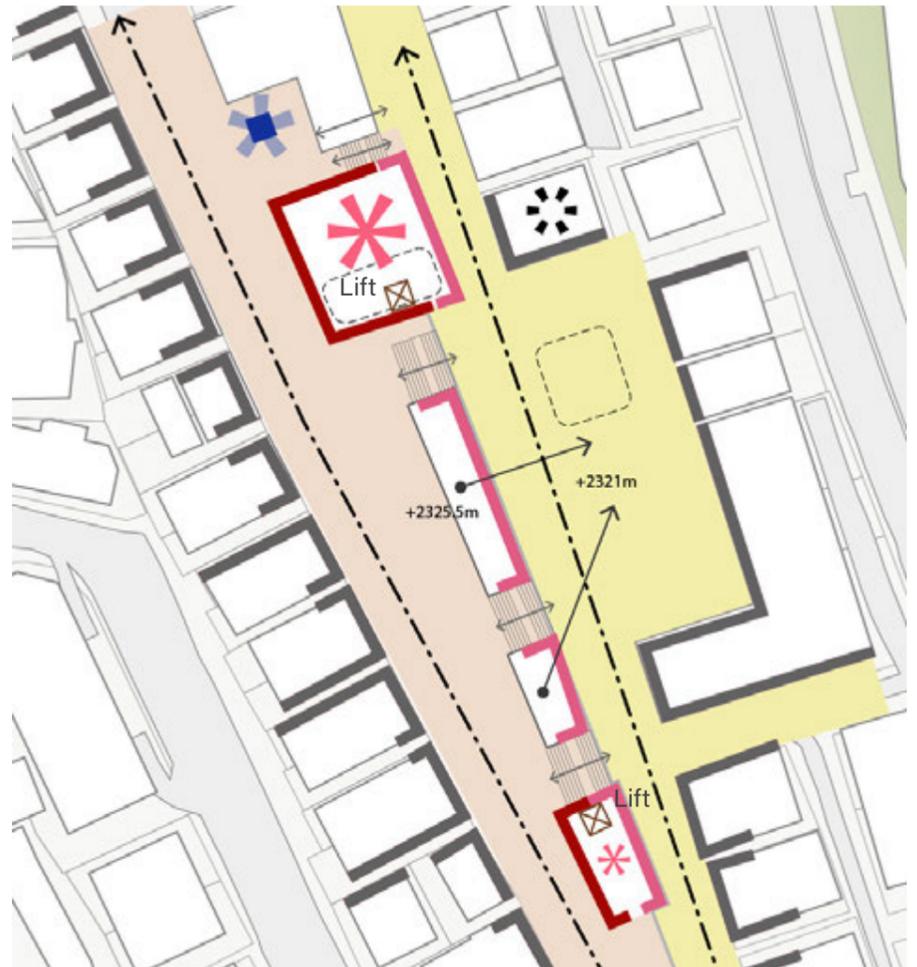


Figure 4.58 Two levels within the Square

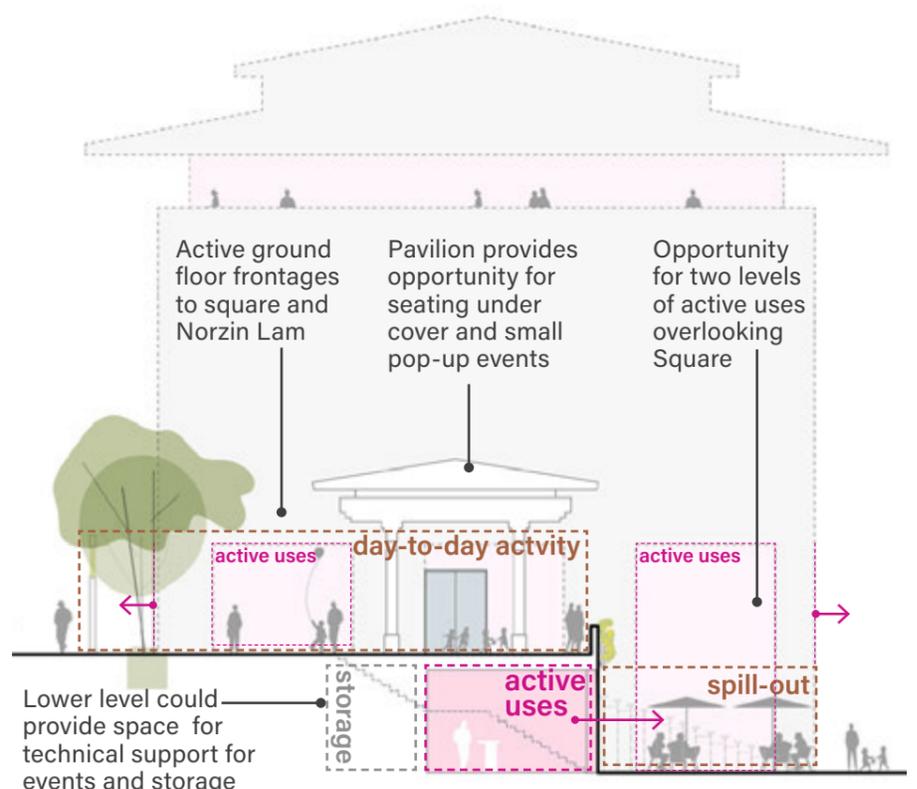


Figure 4.59 Two levels within the Square

Activity

Activity can be provided on frontages around the square at both levels and also tucked into the level change to address the lower level. Groups of trees should be located to demarcate active spaces that are provided shade on sunny days. An area for events should be provided centrally which can accommodate a range of events through the year. The two new buildings provide the opportunity to bring additional active uses, cultural and/or tourism related uses to the square and in addition could provide supporting uses such as public toilets, cycle parking and information about the city.



Figure 4.60 Activity within and around the Square

Circulation

Pedestrian routes connecting to public transit at Chang Lam as well as Norzin Lam's regenerated laneways will increase pedestrian activity and footfall to the square. Within the square a single, one-way access (visually unmarked) should be provided. This is for very occasional use, only to enable the setting-up of events and cleaning. Drop-off for taxis, private vehicles and disabled parking should be located to the south of the square. Consider public lifts to allow good access between levels. (See Norzin Lam section for detail on access within street).

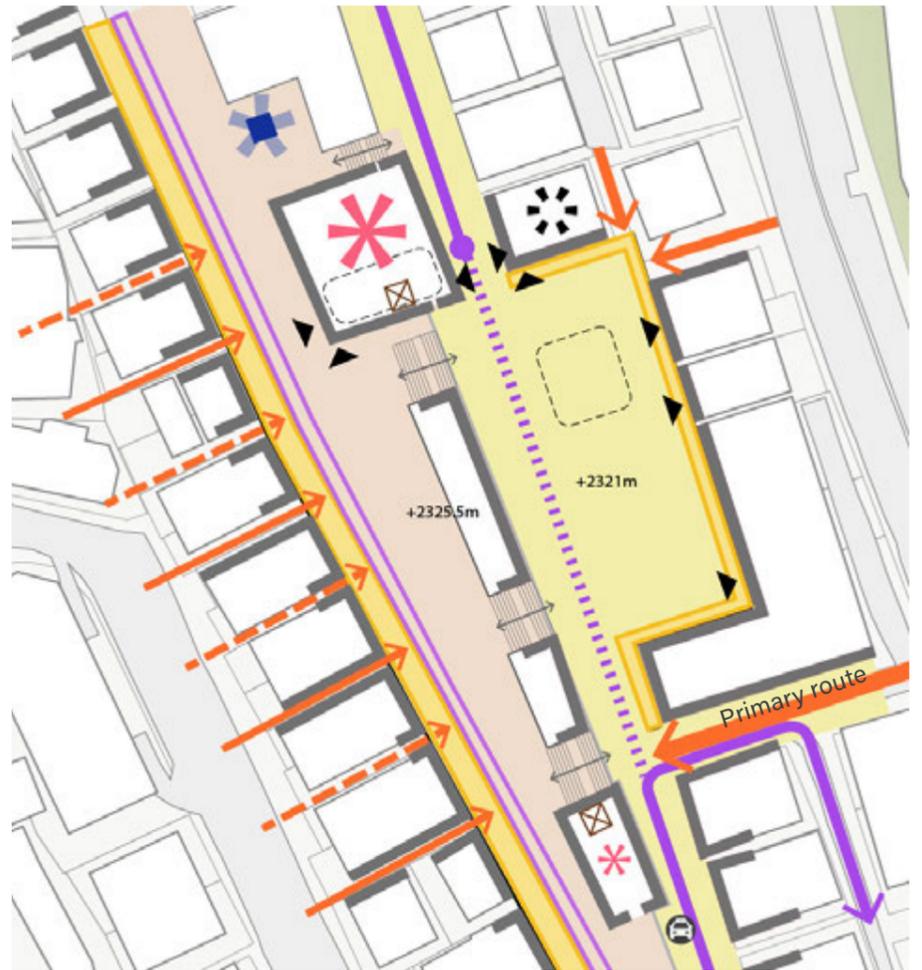


Figure 4.61 Circulation

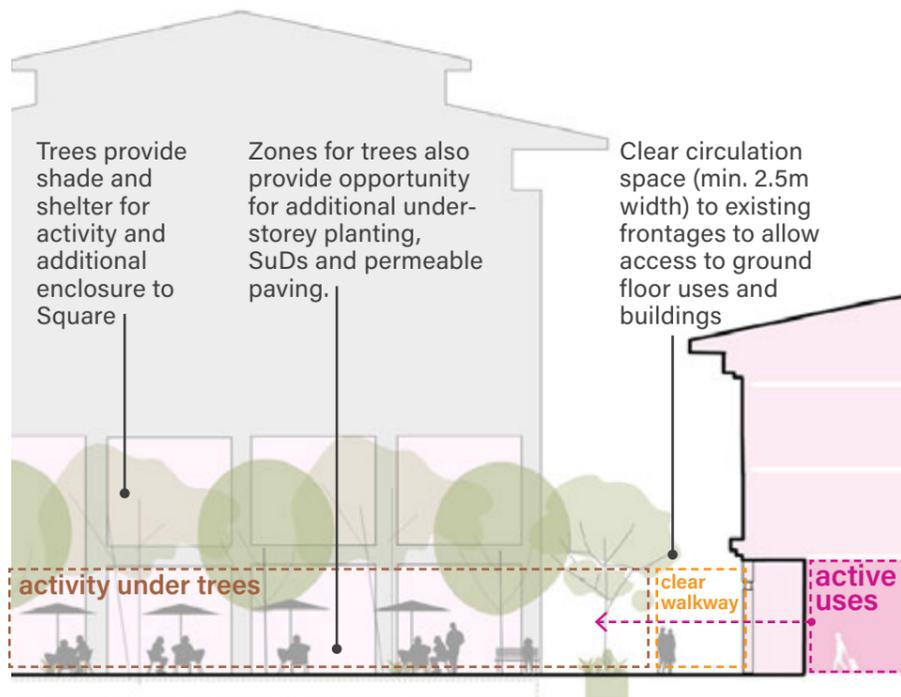


Figure 4.62 Activity at the lower level

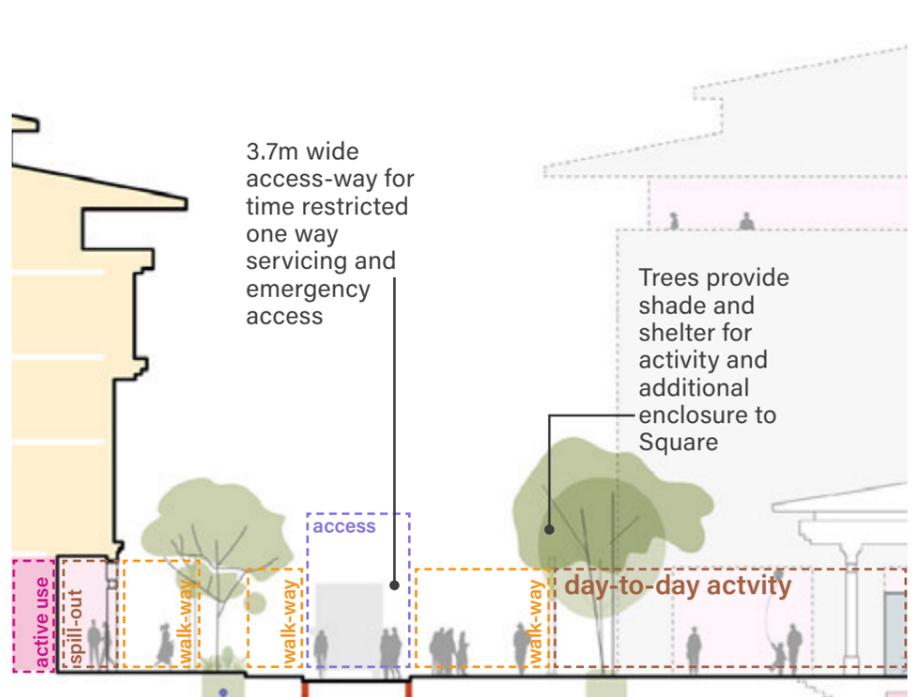


Figure 4.63 Activity and circulation at the upper level (Norzin Lam)

4.4.4 Laneways

PRINCIPLES

Along Norzin Lam, narrow spaces between buildings often serve as east-west public Laneways. There is an opportunity to improve the use and character of these spaces, to create high-quality pedestrian connections to Norzin Lam. This will improve character, offering a diverse set of spaces and could also increase footfall to Norzin Lam and Clock Tower Square.

Some interventions that could transform existing Laneways into safe and attractive spaces that can be enjoyed at different times of the day are described below.



Figure 4.66 Precedent image: Laneway in Melbourne (AUS), where signage, special shop fronts and narrow set-backs create spill out, high levels of activity and interest

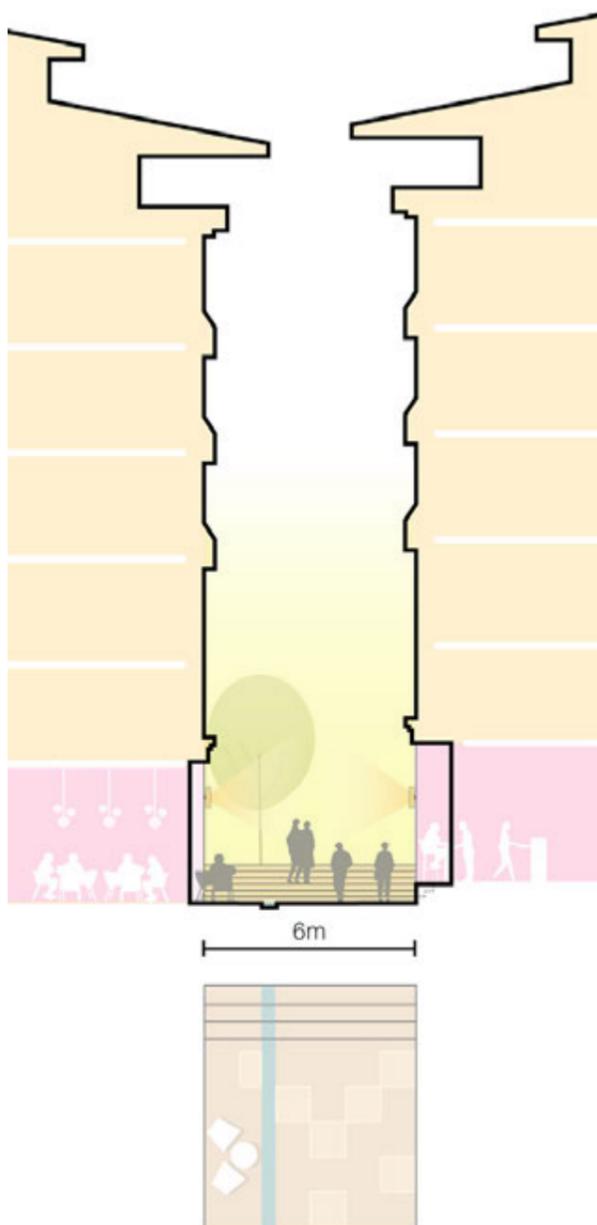


Figure 4.64 Section - Open Laneway (at a Green Stream)

A Laneway at a Green Stream

The Green Streams provide continuous east-west walking routes and naturalised corridors through the City Core. These meet Norzin Lam generally at a Laneway. The Laneways associated with a Green Stream should preferably always be open and accessible which means lighting, activity through the day and evening and safety are key considerations. Integrating water within the space safely should be considered, but how this is done must consider safety and reducing trip-hazard.

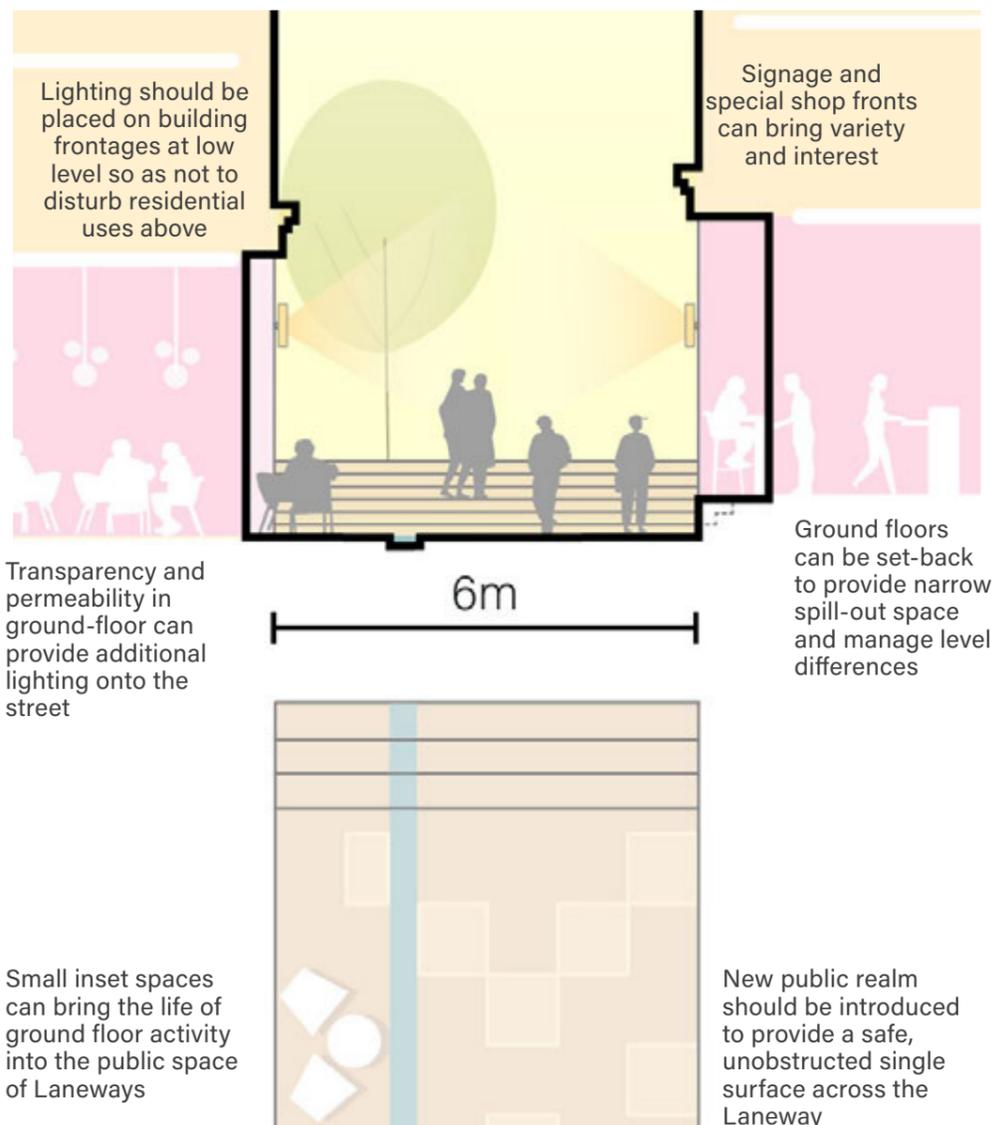


Figure 4.65 Section Enlargement - Open Laneway (at a Green Stream)



Figure 4.70 Precedent image: covered arcade in Cardiff (UK), where pattern and colour is introduced to the flooring.



Figure 4.69 Precedent image: Lighting in Conduit Court in London (UK), where special lighting gives the Laneway a bespoke character.



Figure 4.71 Introducing water safely within a confined space - the decorative grill means that the sound of running water will be apparent, while reducing trip hazards.

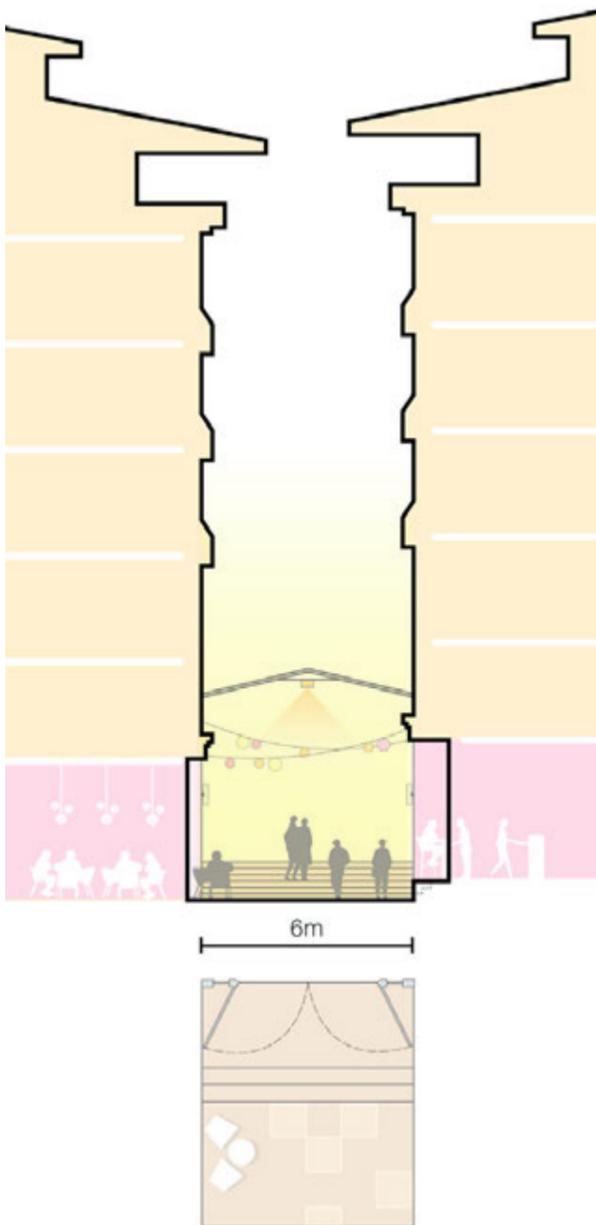
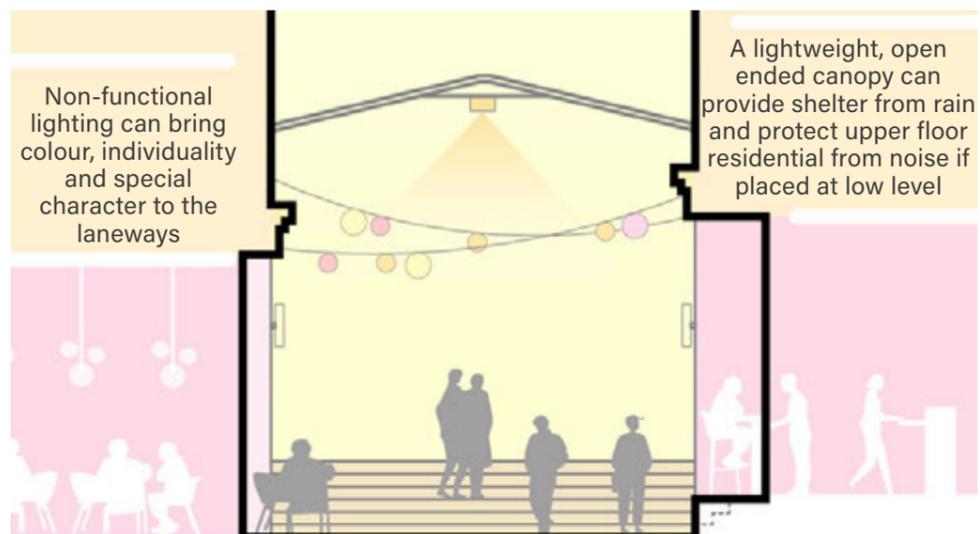


Figure 4.67 Section - Laneway with arcade



New public realm surfaces can introduce pattern and colour for delight, interest and to give each Laneway a special identity

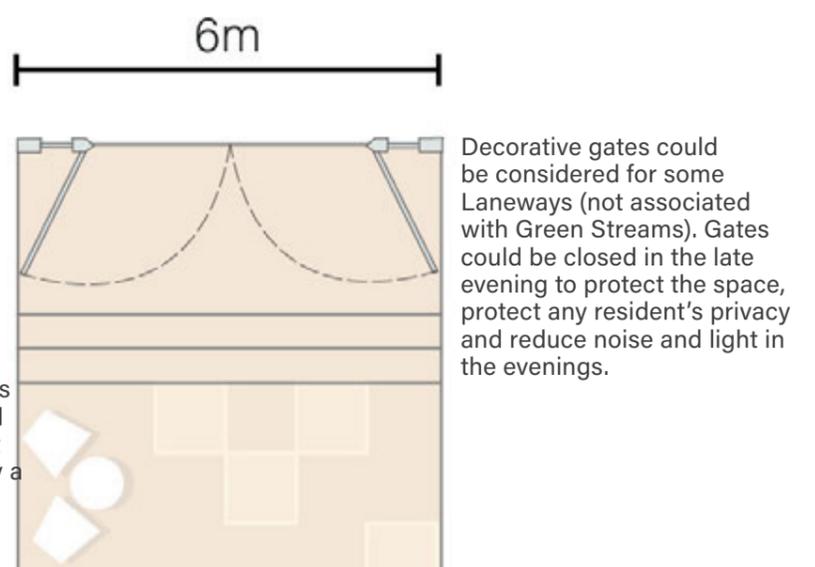


Figure 4.68 Section Enlargement - Laneway with arcade

4.5 Market & Financial Quarters

4.5.1 Vision

The Central Farmers Market (CFM) is an important destination for the whole city and sits in close proximity to the Wangchhu and heritage assets such as the Zangdok Pelri Lhakhang and the traditional wooden bridge which is in use as a pedestrian crossing over the river.

There are other markets in close proximity to the CFM: the Craft Market on the eastern side of the river, across the traditional bridge; and the newer Kaja Throm market, which is a temporary facility while the CFM building is refurbished. A further centrally located market, another Craft Market, sits more remotely, along the northern part of Norzin Lam. All these markets are more 'street-based' with stalls in open air, located within streets and spaces.

The area around the CFM is one of the most active parts of the City Core, attracting a high degree of pedestrian footfall, but also generating significant traffic movements.

However, the area has huge potential to form a special and unique part of the City Core: a Market Quarter. By celebrating, improving and formalising the existing street markets and creating a pedestrian-oriented public realm that connects these street-based activities to the riverside, this area can be transformed.

An existing workplace and commercial cluster around the middle section of Norzin Lam will be intensified with additional workplaces and a mix of associated active uses to create an office-led cluster or 'Financial Quarter'. This area will have a strong relationship to Norzin Lam, the public transport along Chang Lam as well as the new Cultural and Market Quarters.

The Market Quarter and the Financial Quarter will be well integrated with the surrounding assets such as the Stadium, the riverside park system and the proposed Cultural Quarter to the northwest.

An improved public realm will protect and enhance heritage assets while embedding them in the everyday life of the Market Quarter. The public realm must deliver multi-functional spaces that can stay active throughout the day, integrate nature into the city and rebalance the priority between people and cars.

PLACES

The key Places within the Market Quarter and Financial Quarter are listed below:

- 1 The Central Farmers Market (CFM) is upgraded and is augmented with street-based markets in new urban spaces.
- 2 The CFM building is partially re-purposed to allow space for deliveries, waste management and other supporting services.
- 3 A pedestrian focused public realm is created around the CFM with time-limited servicing, that embeds the market area within the riverside spaces.
- 4 Small-scale urban squares to the west of the Market building form a cluster of active spaces overlooking Zangdok Pelri Lhakhang.
- 5 A market food hall remains open into the evening and creates an evening use anchor.
- 6 A pedestrian network between Norzin Lam and the riverside connects the different street-based markets ensuring footfall.
- 7 The setting of Zangdok Pelri Lhakhang is improved and a publicly accessible Nursery Garden is created - part of the riverside parks system.
- 8 The existing stream is daylighted and naturalised forming a 'Green Stream' with a Spiritual, contemplative theme. This is integrated into the Lhakhang Gardens.
- 9 There is a new public realm setting for the Traditional Bridge which provides a new pedestrian gateway space into the city. At the east a new pedestrian bridge provides access to public transport.
- 10 Public spaces around the Market, the riverside public realm, Centenary Park and the Lhakhang Gardens will be generally traffic-free during the day.
- 11 The new street-based markets are formalised, with timber stall structures and canopies that provide a new identity for the markets.
- 12 Evening uses are concentrated around and overlooking the Lhakhang Gardens and will provide activation throughout the day and evening.
- 13 A multi-level car park and mobility hub is provided on Chang Lam, in close proximity to the Market and Financial Quarters, supporting 'park and walk' strategies.
- 14 Commercial frontages to Norzin Lam are retained and a mix of active uses are located on the ground floor of buildings in the Financial Quarter.
- 15 An important north-south link is continued through the Financial Quarter, connecting Clock Tower Square to the Cultural Quarter and Royal Parks in the north.
- 16 Taxi drop off and other amenities such as bike rentals are located at the mobility hub in association with the public transport accessibility along Chang Lam and along the Greenway.
- 17 The strategic pedestrian and cycle 'Greenway' along the Wangchhu is integrated into Tarayana Park and the riverside spaces and provides connection to the riverside parks system throughout the city.

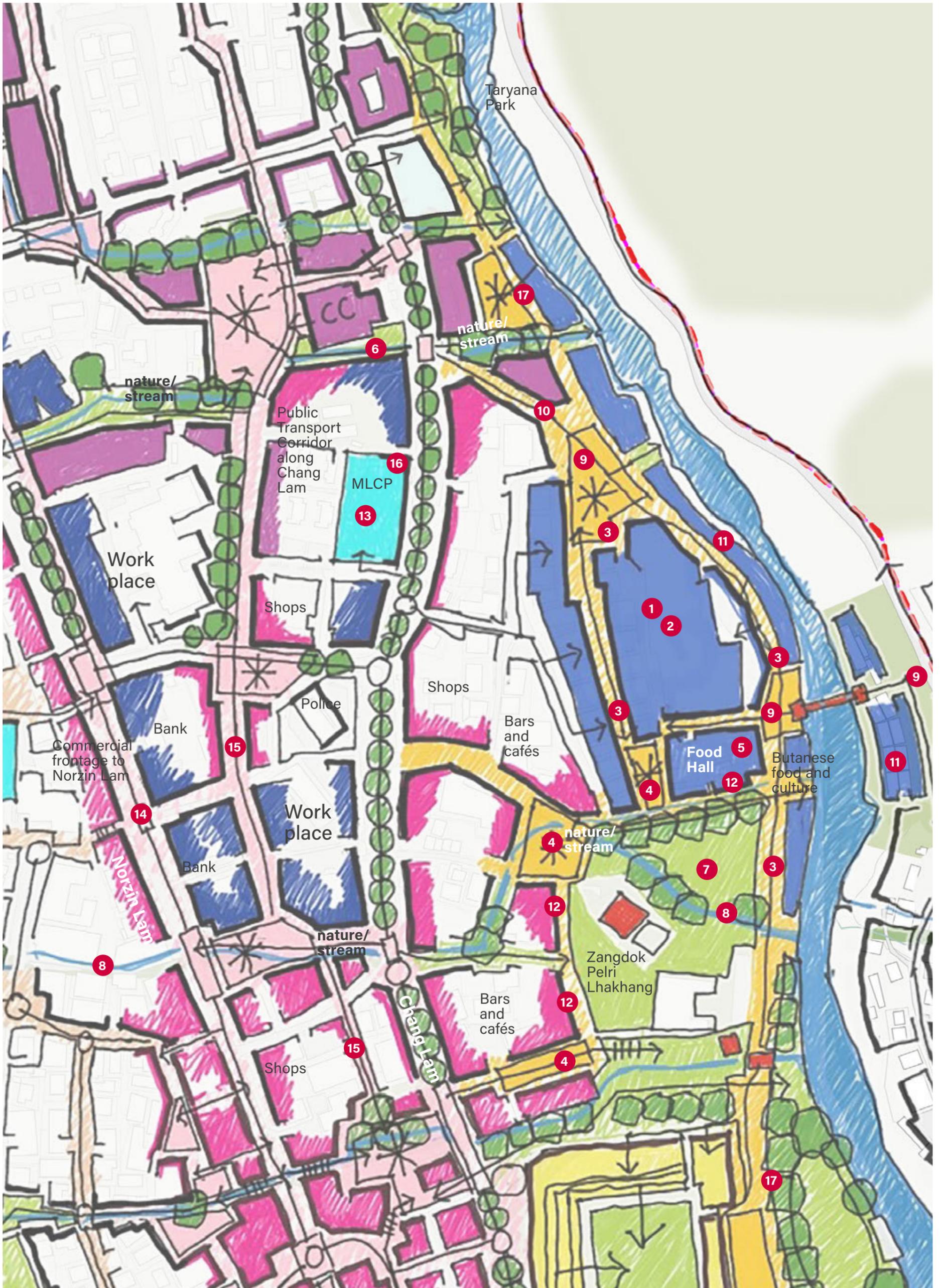


Figure 4.72 Vision for Market Quarter and Financial Quarter

4.5.2 Urban Design Guidance

The following provides Character Area Guidance for the Market Quarter and Financial District:

RESPONDING TO CONTEXT

- Improve pedestrian access to and interaction with the riverside environment.
- Improve the setting of the Traditional Bridge and improve the arrival experience of pedestrians as they enter the Market Quarter from the east.
- Create a new, publicly accessible landscape setting for the Zangdok Pelri Lhakhang in the form of public gardens with the Green Stream integrated within the space.
- Ensure that existing views from the Traditional Bridge to the north and south along the river are preserved as highly natural views along the riparian corridor and minimise urban development encroaching into these view corridors.
- Any re-purposing or upgrade of the CFM building and any part of the riverside Market Quarter must respond to views from the eastern road - east facing frontages and the roof-scape will be highly visible.
- Create a new riverside public realm that is designed to be resilient to flooding.

Please also refer to the Principles, Interventions and Spatial Plans within Ch03: Protections to ensure the correct response to requirements around Geo-hazards (Flood and Landslide) and Heritage.

URBAN STRUCTURE

- Primary frontages are located along Norzin Lam, overlooking the riverside public realm, overlooking the Lhakhang Gardens and overlooking the new market spaces within the Market Quarter.
- Secondary frontages are located along Chang Lam, the new north-south link through the Financial Quarter, overlooking the Lhakhang Gardens and other key pedestrian-oriented links through the Market Quarter.
- Reconfigure the existing street and spaces to the west of the CFM building to form a pedestrian priority series of market spaces. Retain strong enclosure of these spaces with active building frontages.
- Consider reconfiguring the urban blocks to the south of the CFM building to form an active, pedestrian 'Laneway', connecting the Traditional Bridge directly to the market spaces to the west of the CFM building (see p152-153 for guidance on forming Laneways in Norzin Lam which can also be applied here).
- Consider forming new active frontages and development to the east of the CFM building to activate and overlook the riverside public realm and respond to views from Khamtoe Lam.

NATURAL ENVIRONMENT

- Daylight the existing stream to the north of the Zangdok Pelri Lhakhang, celebrating the presence of water in the City Core and delivering water quality improvements, microclimatic benefits and opportunities for recreation and play.
- Integrate the stream into the Lhakhang Gardens and theme as the 'Spiritual Green Stream.' Consider diverting its course to form a distinctive natural feature in the new Gardens.
- Retain existing mature trees, particularly within riparian zones, along key pedestrian routes and within existing natural green spaces. Retain existing willow trees along Green Streams to signify the presence of water in the urban environment.
- Introduce new street trees to provide shade and thermal comfort, habitat connectivity and improved air quality, drawing from native plant communities. Specification of distinct planting palettes can contribute to developing a unique identity along individual streets and spaces.
- Incorporate sustainable urban drainage systems (SuDS) where appropriate to support stormwater drainage networks.
- Planting should be designed to provide year-round interest, with naturalistic planting areas adding colour, vibrancy, and engaging the senses.
- Protect the riparian corridor along the Wangchhu and ensure improvements to its ecology.
- Design the riparian corridor to be environmentally sustainable, using green infrastructure to manage stormwater, preserving native plant and animal species, and minimizing the use of non-renewable resources.

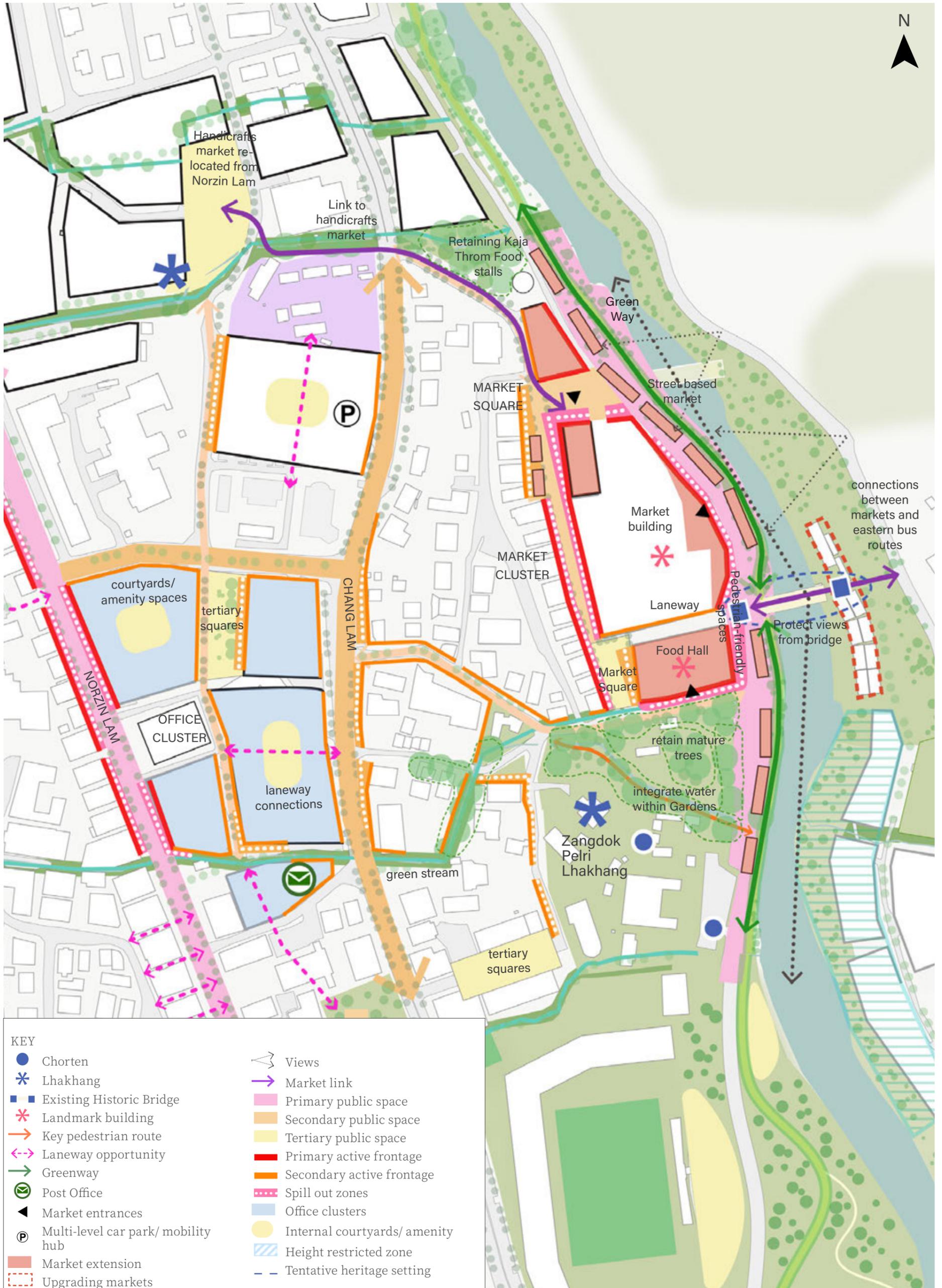


Figure 4.73 Market Quarter and Financial Quarter - Built form and Public Realm Guidelines

CONNECTIONS

- At the mid-section of Norzin Lam, rebalance the needs of pedestrians with the needs of traffic and form a new public realm. Public realm treatment should be related to the treatment of the southern section of Norzin Lam through the use of planting, street trees and materials.
- Reform Chang Lam as the main public transport corridor through the City Core.
- Reduce traffic and traffic infrastructure to allow more pedestrian-friendly public spaces along the river and within the Market Quarter.
- Create a direct pedestrian connection between public transport on Khamtoe Lam to the eastern Craft Market and the Market Quarter, incorporating the Traditional Bridge.
- Create walking routes along the 'Spiritual Green Stream' to connect western communities with the Lhaxhang Gardens, the Market Quarter and the riverside public realm.
- Establish a new north-south walking connection (with unobstructed pavements, signage and crossing points) through the Financial District, that forms a link between Clock Tower Square and the Royal Parks entrance at Happiness Gardens.

- Ensure good walking connections (clear pavements, signage and crossing points) between the Market Quarter and public transport on Chang Lam.
- Introduce a multi-level car park along Chang Lam to provide parking for visitors/users of the Market Quarter and employees of the Financial Quarter. This provides the opportunity to reconfigure existing employee parking areas to introduce additional floor area, additional mixed use, activity and public realm.
- Introduce Green Travel Plans for larger institutional and governmental institutions within the Financial District to encourage greater use of public transport and other active modes of transport.

ACCESS AND CIRCULATION

The following provides more specific access and circulation Guidance:

- Reorganise and/or limit service access to the CFM building and other market uses to minimise impact of traffic on new markets and riverside public realm. Consider limiting most access to certain times of the day and using tertiary streets for access to shops on primary or secondary frontages.
- Consider providing the majority of vehicular servicing and access to the Market Quarter from the north of the City Core to minimise impact of traffic on the riverside public realm and Centenary Park.

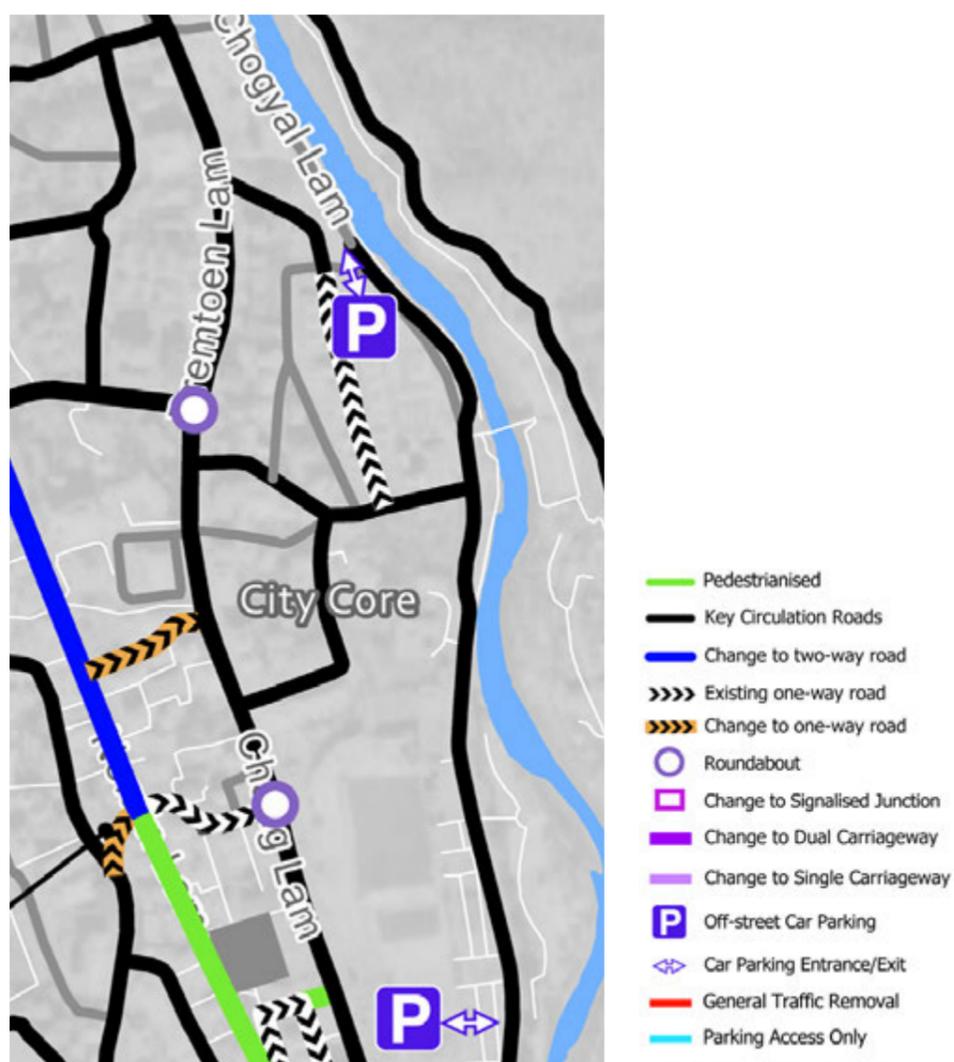


Figure 4.74 Circulation within the Market Area (LETMP)



| KEY | |
|-----|---|
| ● | Chorten |
| ✳ | Lhakhang |
| ✳ | Landmark building |
| ○ | Pedestrian crossing |
| → | Key pedestrian route |
| ↔ | Laneway opportunity |
| → | Greenway |
| ◀ | Market access |
| Ⓟ | Multi-level car park |
| Ⓡ | Bus stop / Level 1 Mobility Hub |
| Ⓡ | Bus stop |
| Ⓜ | Post Office |
| → | Vehicular access |
| --- | Servicing / controlled vehicular access |

Figure 4.75 Market Quarter and Financial Quarter - Access and Movement Guidelines

BUILT FORM

- Built form and roofscape must consider and respond to views from higher ground along the eastern road and make a response in design that identifies the Market and Market Quarter as a special place within the City Core.
- Consider the roof-scape of the CFM building and provide interest and quality for the view from the Khamtoe Lam. Remove any existing rooftop services and plant and restrict any new services being added.
- Provide new development and frontage to the east side of the CFM building to enclose, overlook and activate the riverside public realm.
- Any new development must form a new setting for the Traditional Bridge.
- Maintain a high degree of enclosure and overlooking to Chang Lam.
- At the proposed Financial District, increase the development density, without increasing general heights above 5-6 storeys.
- Maintain the existing development massing of the Market Quarter but intensify uses within the area.
- Maintain building heights within the Financial District - 5-6 storeys maximum.

STREETS AND SPACES

- At Norzin Lam (mid section), continue public realm materials, street trees and planting from the southern section of Norzin Lam to provide a single identity for the street.
- Create a new riverside public realm along the river that connects Tarayana Park, to the Traditional Bridge and to Centenary Park and incorporates the proposed Greenway pedestrian and cycle route.
- Locate new street-based markets in streets and spaces to the east and west of the CFM building.
- Along Norzin Lam and Chang Lam, rebalance the needs of pedestrians and traffic circulation and form a new, pedestrian-oriented public realm.
- Reinforce highly active ground floor frontages around the market spaces, along Norzin Lam, with spill-out zones. Ensure a high level of overlooking from upper floor uses.
- Create new, publicly accessible Gardens for the Zangdok Pelri Lhakang. Consider forming a productive garden of flowers and food growing with a tranquil atmosphere to contrast with Centenary Park and the Market Quarter.
- Ensure the priority and comfort of pedestrians in any new connection and any retrofit treatment of existing streets and introduce unobstructed pedestrian pathways, shade and shelter, signage and wayfinding, good lighting and places to stop and pause.
- Crossing points that prioritise pedestrian safety should be located at pedestrian desire lines.
- Introduce places of shelter from rain within the primary public spaces at the new Lhakhang Gardens and the riverside.
- Ensure continuous, unobstructed pedestrian surfaces and denote any change in level with visually contrasting materials.
- Integrate necessary utilities within/under pavements and roadways.
- Ensure that the Greenway is provided as a continuous and unobstructed pedestrian and cycle route through the riverside spaces and ensure connection to the Central City Park spaces in the south.



Figure 4.76 Precedent image: Night market in Seoul (KR)



Figure 4.77 Precedent image: New Holland Island landscape, Saint Petersburg (RUS)

CLUSTERING OF USES

- Intensify and augment the existing market uses in and around the CFM building. Consider further street-based markets with different themes and price points, a market food hall, and a greater selection of small shops and enterprises.
- Reinforce the financial and business uses to the west of the Market Quarter and re-brand as the Financial District of Thimphu. Form an intensive, office-led, but mixed use cluster within the City Core.
- Formalise and make permanent the Kaja Throm Market stalls as part of an augmented Market Quarter. Re-locate street markets into the spaces and streets around the CFM building and along the riverside.
- Retain and improve the Craft Market on the eastern side of the river and integrate fully into the Market Quarter.
- Extend the hours of activity within the Market Quarter and introduce early evening activity, such as an evening market, dining in the food hall, and extended opening hours for shops, restaurants, cafés and bars.
- Activate market spaces and the riverside public realm with market stalls and spill out from existing shops.
- Maintain active frontages to Norzin Lam, Chang Lam and the proposed Market Quarter spaces.
- Introduce more ground floor activity and spill out along frontages overlooking the Zangdock Pelri Lhakang Gardens.
- Ensure activation and overlooking from development frontage along the 'Green Stream'. Introduce spiritual and/or contemplative spaces along the 'Green Stream' at more accessible and visible locations.
- Consider the facilities required to support the operation of the Market Quarter as a whole - storage for traders, a dedicated waste hub (for traders of all the different markets), administration and support for enterprise and new start-up businesses. Consider locating these centrally within the CFM building.

KEY

- City Core Action Plan Boundary
- Primary connections
- - -> E-W pedestrian links
- Retail cluster
- Workplace cluster
- School cluster
- Culture cluster
- Sports and recreation cluster
- Entertainment/ evening use cluster
- Transport node
- ▬ Emerging centres

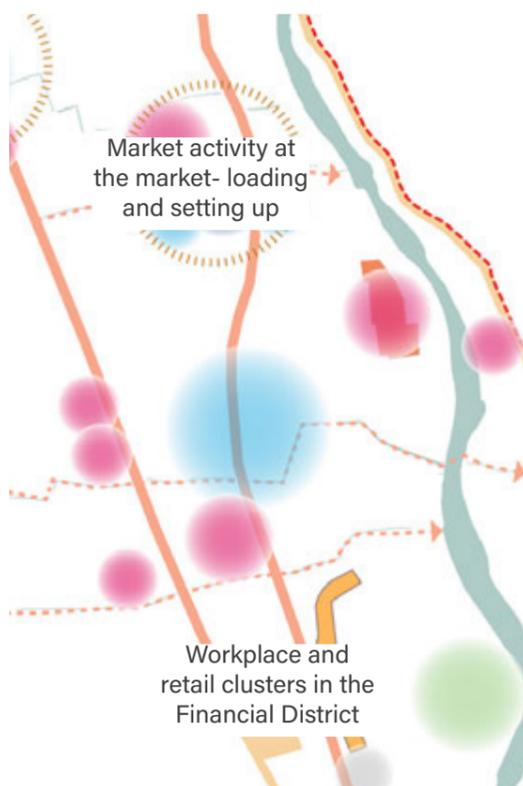


Figure 4.78 Weekday morning



Figure 4.80 Weekday afternoon

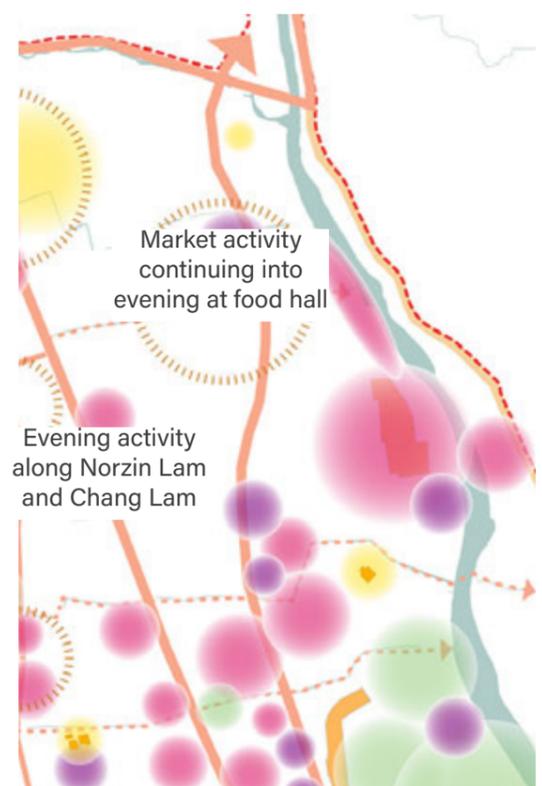


Figure 4.79 Weekday evening

4.6 Cultural Quarter

4.6.1 Vision

The Cultural Quarter is a new, major city scale destination and activity cluster that builds on existing cultural institutions and leisure and cultural uses located to the north of the City Core and its proximity to the Market Quarter and Norzin Lam. It will be a place for citizens and visitors to the city alike to enjoy and learn more about traditional and contemporary Bhutanese culture.

Culture is not just about institutions, but also about a living culture brought about by individuals, small creative businesses and community groups. The Cultural Quarter aims to bring the larger institutions together while making new space for the smaller individuals and cultural groups to co-exist.

The Cultural Quarter will form an area between the more commercial parts of the City Core at Clock Tower Square and the new Happiness Gardens to the north of Chubachhu. It will also provide a network of east-west connections between Norzin Lam and the market and riverside spaces.

A new cultural anchor will be formed at the north of Norzin Lam, reinforcing the Textile Museum with another major institution (perhaps the Centre for Performing Arts could be re-located) and providing both a destination that draws footfall north from Clock Tower Square, and a 'gateway' into the Cultural Quarter.

A new urban Square will form a focus for the Quarter, located at the centre of the area, adjacent to existing streams and the north-south walking route that connects Clock Tower Square with the Happiness Gardens. The City Cinema will front onto this space and new development will provide active frontage and spill-out.

The Craft Market will be relocated from Norzin Lam to this new square - providing it with a new adjacency to the Market Quarter.

Space on ground floors can be provided for workshops and studios where Bhutanese arts and crafts can continue to be practised and showcased. New creative business and community groups can be supported and provided cheaper spaces - creating an area full of creative enterprise.

A northern gateway will be formed from a new public realm, re-configured traffic circulation and high-quality new development, which provides a transition to Kawajangsa and the Royal Parks

Doebum Lam is transformed to become the Royal Boulevard and new urban communities live between this and Norzam Lam, enjoying proximity to City Core facilities: leisure and culture, work and public transport.

PLACES

The key Places within the Cultural Quarter area are listed below:

- 1 Norzin Lam is the principal 'Great Street' in the city: new landscape and planting strongly relates to the southern sections of the street.
- 2 Doebum Lam is transformed with new public realm and tree planting to form the 'Royal Boulevard'.
- 3 Chang Lam forms the main public transport corridor through the City Core and one of the three 'Great Streets' of the City Core.
- 4 Northern gateway between the City Core, Kawajangsa and the Royal Parks.
- 5 The new Cultural Square forms a focus for the Cultural Quarter and provides the area with a unique identity.
- 6 The existing Craft Market on Norzin Lam is relocated to the Cultural Quarter to activate key spaces and form a stronger link between the it and the Market Quarter.
- 7 A cultural anchor is formed to the north of Norzin Lam, consisting of the Textile Museum and other cultural institutions and uses.
- 8 MLCP located along Chang Lam to provide parking for visitors/users of the Cultural Quarter and employees of the Financial District and promote 'park and walk' strategies.
- 9 The north-south walking route between Clock Tower Square and the Royal Parks entrance.
- 10 A new pedestrian bridge across the Chubachhu forms a direct connection to the Royal Parks entrance.
- 11 'Green Streams' are formed with a cultural theme and provide east-west pedestrian connections along an open, cleaned watercourse and bring nature and ecology into the heart of the city.
- 12 Public transport and interchange is located along Doebum Lam.
- 13 Strong connections through the Cultural Quarter link Norzin Lam to the riverside spaces and Market Quarter.
- 14 Over time, a new landmark frontage overlooking the Chubachhu and Royal Parks can be formed.
- 15 Tarayana Park is integrated within the riverside spaces along the Wangchhu. The proposed city-wide 'Greenway' will pass through the Park, connecting communities north to south.
- 16 The existing Primary School is retained and integrated into the neighbourhood to serve the urban population in and around the Cultural Quarter.

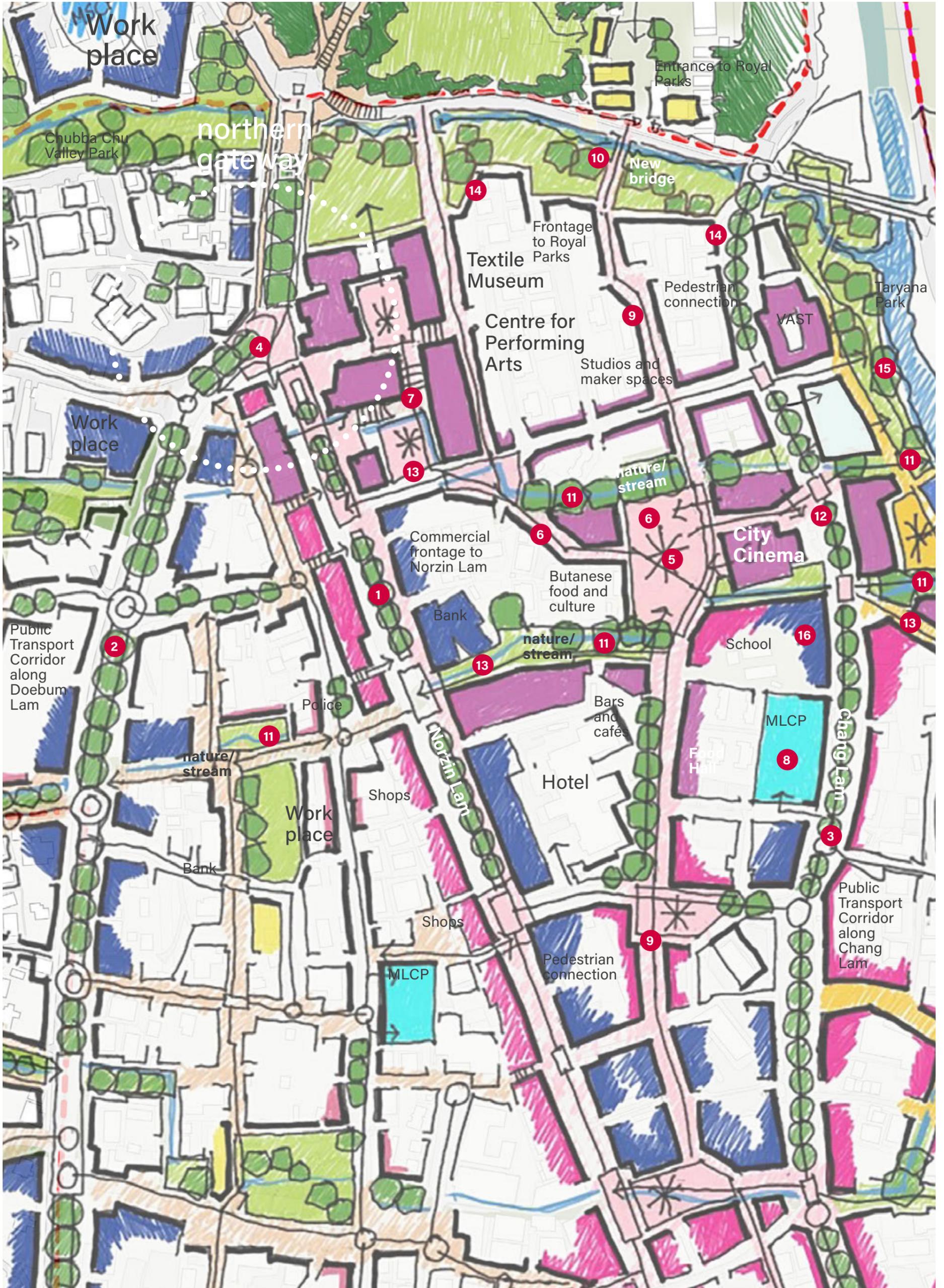


Figure 4.81 Vision at the Cultural Quarter.

4.6.2 Urban Design Guidance

The following provides Character Area Guidance for the Cultural Quarter area:

RESPONDING TO CONTEXT

- Create a greater activity focus for the city within the northern City Core, by building on and reinforcing with other cultural and complementary uses, the existing cultural uses such as Textile Museum, City Cinema and VAST.
- Form a strong north-south pedestrian link through the Cultural Quarter that provides a continuous connection between Clock Tower Square and the Royal Parks (Happiness Gardens). Provide a new pedestrian bridge across the Chubachhu that links directly to the Royal Parks entrance.
- Form strong east-west connections, along streets and 'Green Streams' between Norzin Lam, the Cultural Quarter and extending to the Market Quarter and riverside spaces.
- Reinforce the Textile Museum with other cultural institutions and cultural uses and create a cultural anchor at the north of Norzin Lam and a 'gateway' into the Cultural Quarter from the west.

Please also refer to the Principles, Interventions and Spatial Plans within Ch03: Protections to ensure the correct response to requirements around Geo-hazards (Flood and Landslide) and Heritage.

URBAN STRUCTURE

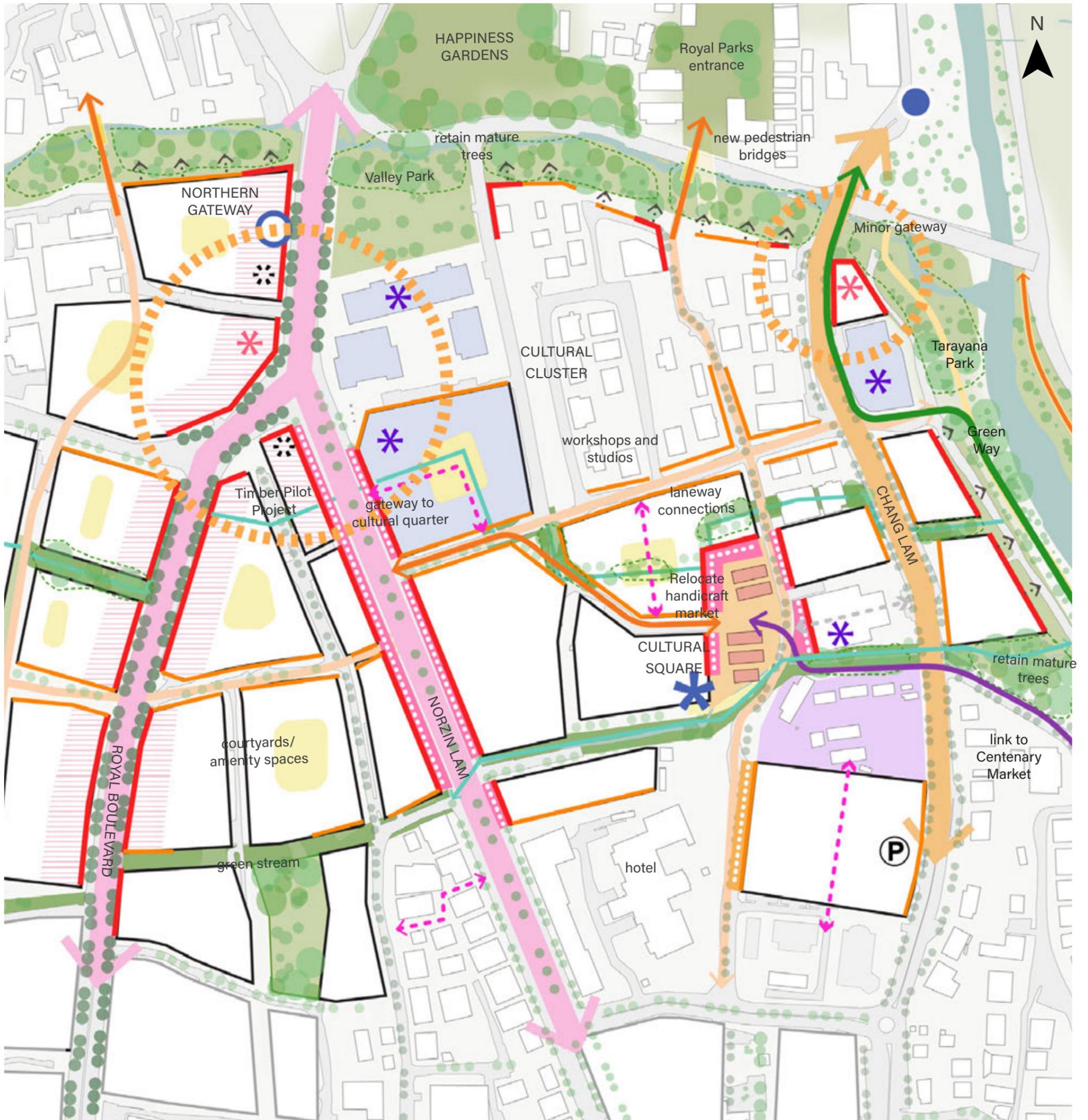
- Form a new, iconic urban square that provides the Cultural Quarter with a unique identity.
- Cluster existing and new cultural and leisure uses around the square, including the City Cinema and the existing Lhakhang.
- Form a new northern gateway, through a combination of new public realm, traffic management and high-quality development, to ensure strong connections between the City Core and the Royal Parks.
- Primary frontages are located along Norzin Lam, around the Cultural Square and along the Royal Boulevard.
- Secondary frontages are located along Chang Lam and the north-south pedestrian connection between Clock Tower Square and the Royal Parks.
- Any new development along the Wangchhu and Chubachhu should respond to these important natural open spaces with high-quality frontages with a high degree of enclosure and overlooking.
- New development should form strong frontage and enclosure along Norzin Lam and Chang Lam, reinforcing their importance as 'Great Streets'.
- Create east-west pedestrian connections, along the 'Cultural Green Streams' which link Norzin Lam with the riverside.
- Integrate Tarayana Park into the new riverside spaces.
- Create a landmark development to the north of Chang Lam to form a City Core minor 'gateway'.

NATURAL ENVIRONMENT

- Daylight and integrate the two existing waterways to form 'Green Streams', with an active, cultural theme, possibly diverting their course to bring natural features into the Cultural Square.
- Retain existing mature trees, particularly within riparian zones, along key pedestrian routes and within existing natural green spaces. Retain existing willow trees along 'Green Streams' to signify the presence of water in the urban environment.
- Introduce new street trees to provide shade and thermal comfort, habitat connectivity and improved air quality, drawing from native plant communities. Specification of distinct planting palettes can contribute to developing a unique identity along individual streets and spaces.
- Incorporate sustainable urban drainage systems (SuDS) where appropriate to support stormwater drainage network.
- Planting should be designed to provide year-round interest, with naturalistic planting areas adding colour, vibrancy, and engaging the senses.
- Protect and enhance the riparian corridor along the Chubachhu and Wangchhu and ensure improvements to ecology.
- Design the riparian corridor along Chubachhu to be environmentally sustainable, using green infrastructure to manage stormwater, preserving native plant and animal species, and minimizing the use of non-renewable resources.



Figure 4.82 Existing cultural uses at the Cultural Quarter



| KEY | |
|-----|------------------------------------|
| ● | Chorten |
| ✳ | Lhakhang |
| ○ | Vernacular Architecture Site |
| ✳ | Landmark building |
| ✳ | Accent building opportunity |
| ✳ | Cultural Anchor |
| Ⓟ | Multi-level car park/ mobility hub |
| ▨ | Tall building zone |
| ■ | Markets |
| ⊙ | Gateway |
| ■ | Cultural building clusters |
| ↔ | Views |
| → | Key pedestrian route |
| ↔ | Laneway opportunity |
| → | Greenway |
| → | Market link |
| ■ | Primary public space |
| ■ | Secondary public space |
| ■ | Primary active frontage |
| ■ | Secondary active frontage |
| ■ | Spill out zones |
| ■ | New bridges |
| ■ | Internal courtyards/ amenity |

Figure 4.83 Cultural Quarter - Built form and Public Realm Guidelines

CONNECTIONS

- Transform Doebum Lam into the 'Royal Boulevard' - the main public transport corridor and traffic route to the west of the City Core.
- Provide an east-west pedestrian connection along the Chubachhu Valley Park - connecting western communities and existing mountain trails to the City Core and riverside.
- Create walking routes along 'Green Streams' to connect western communities with the Cultural Quarter and the riverside public realm.
- Promote Chang Lam as the primary public transport corridor through the City Core.
- Establish a new north-south walking connection (with unobstructed pavements, signage and crossing points) through the Cultural Quarter that forms a link between Clock Tower Square and the Royal Parks entrance at Happiness Gardens.
- Provide a new pedestrian bridge across the Chubachhu to provide access directly to the Royal Parks entrance.

- Improve the tertiary street network by creating continuous connections and avoiding cul-de-sacs.
- Ensure good walking connections (clear pavements, signage and crossing points) between the Norzin Lam, through Cultural Quarter to public transport on Chang Lam and to Market Quarter and riverside.
- Introduce a MLCP along Chang Lam to provide parking for visitors/users of the Cultural Quarter and employees of the Financial District.
- Integrate the Greenway into the new riverside spaces, with an improved crossing towards the Royal Parks.

ACCESS AND CIRCULATION

The following provides more specific access and circulation Guidance:

- Limit vehicular movement and allow timed servicing only to uses around important public realm such as Cultural Quarter Square.
- Introduce junction improvements to reduce pedestrian and traffic conflicts at: the junction between Doebum Lam and Norzin Lam, the junction of Chang Lam and Dechen Lam and at junction of Samten Lam and Norzin Lam.
- Introduce a 'bus gate' on Norzin Lam to reduce/control general traffic while providing bus priority.

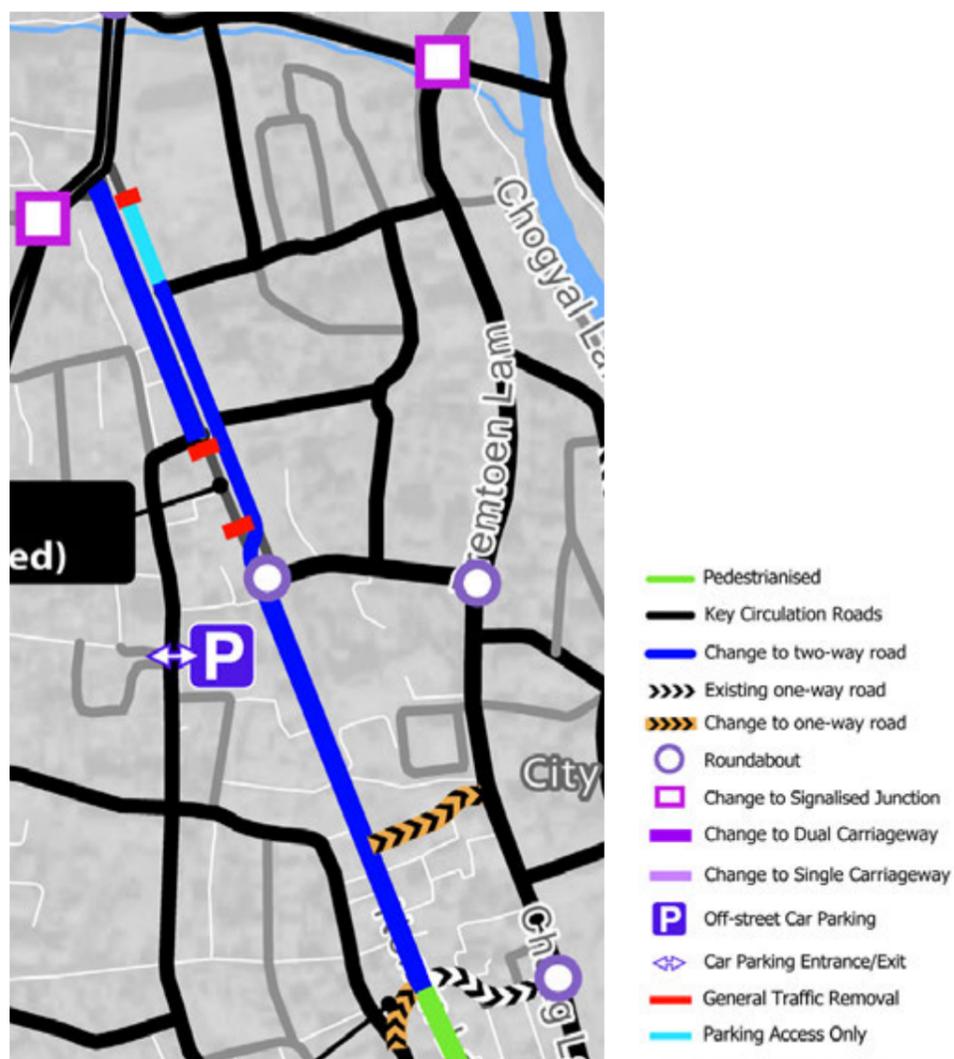
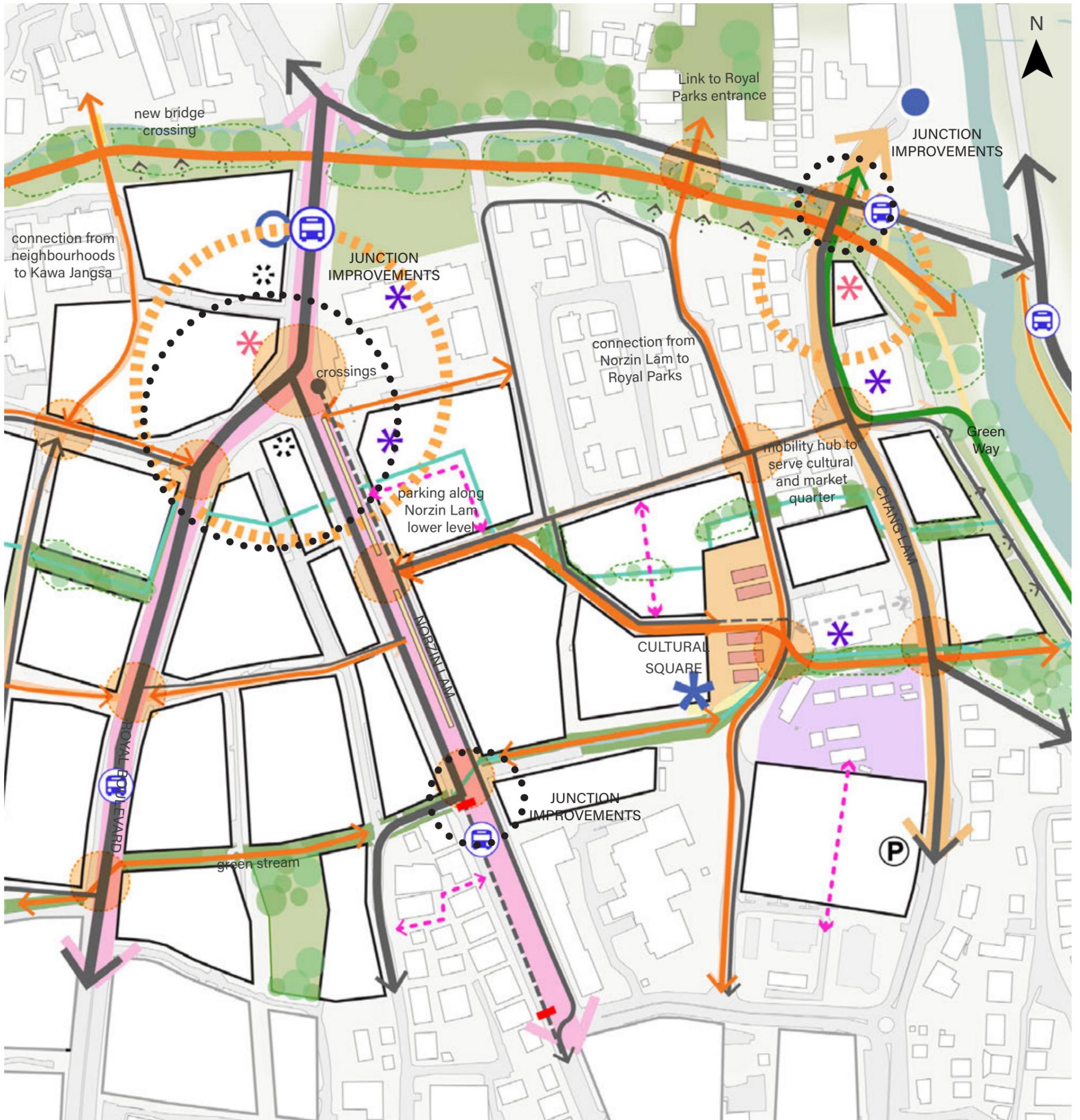


Figure 4.84 Circulation within the Norzin Lam (north section) (LETMP)



| KEY | |
|---------|---|
| ● | Chorten |
| ✱ | Lhakhang |
| □ | Vernacular Architecture Site |
| ✱ | Landmark building |
| ✱ | Accent building opportunity |
| ✱ | Cultural Anchor |
| Ⓟ | Multi-level car park |
| ○ | Pedestrian crossing |
| → | Key pedestrian route |
| ↔ | Laneway opportunity |
| → | Greenway |
| → | Vehicular access |
| - - - → | Servicing / controlled vehicular access |
| ■ | Bus Gate |
| Ⓡ | Bus Stop |
| ■ | New bridges |

Figure 4.85 Cultural Quarter - Access and movement guidelines

BUILT FORM

- Maintain existing enclosure and ensure any new development frontage forms strong enclosure to Doebum Lam and Norzin Lam.
- Maintain the existing development heights of the Cultural Quarter but intensify uses within the area.
- Maintain building heights within the Cultural Quarter 4-5 storeys maximum.
- Provide landmark and accent buildings at the northern end of Doebum Lam, to denote the northern gateway. Maximum development heights - 5-6 storeys
- Provide, over time, along the Chubachhu a high-quality residential frontage that forms a landmark 'Royal Parks frontage' that overlooks the Valley Park and the Royal Parks.
- Any new infill development outside of the identified development parcels, must be configured to form strong enclosure, active frontage and overlooking to streets and spaces.

STREETS AND SPACES

- At Norzin Lam (north), continue public realm materials, street trees and planting from the southern section of Norzin Lam.
- Rebalance the needs of pedestrians and traffic circulation and form a new public realm on Chang Lam, Norzin Lam and Doebum Lam.
- Reinforce highly active ground floor frontages around Norzin Lam and around the Cultural Quarter, with spill-out zones and a high level of overlooking from upper floor uses.
- Ensure the priority and comfort of pedestrians in any new connection and any retrofit treatment of existing streets and introduce unobstructed pedestrian pathways, shade and shelter, signage and wayfinding, good lighting and places to stop and pause.
- Crossing points that prioritise pedestrian safety should be located at pedestrian desire lines.
- Ensure continuous, unobstructed pedestrian surfaces and denote any change in level with visually contrasting materials.
- Integrate necessary utilities within/under pavements and roadways.
- Form courtyards or green amenity spaces within urban blocks for the use of residents.
- Introduce significant/more mature trees along Doebum Lam. Specify a distinct planting palette for this street that is applied to the whole length of the street through the City Core.



Figure 4.86 Workshops for arts & crafts could be hosted in the Cultural Quarter.



Figure 4.87 Yejin Southeast Cultural Plaza, Yangzhou (CHN)



Figure 4.88 Gillet Square, London (UK)

CLUSTERING OF USES

- Create a cultural destination at the Textile Museum through the introduction of new cultural institutions and uses or relocation of existing institutions to the vacant site to the south of building.
- Relocate the existing Craft Market on Norzin Lam (north) to within the Cultural Quarter.
- Occupy the Cultural Square and east-west streets to either side of the Square with the Craft Market, and ensure a strong link between the Craft Market and the Markets Quarter is formed.
- Introduce additional evening activities, such as bars, cafés and restaurants to form an evening cluster and reinforce the Cinema Cinema as a cultural destination.
- Create spill-out spaces around the Cultural Square to ensure a high degree of activation of the public realm.
- Ensure activation and overlooking from development frontage along the 'Green Streams' Introduce cultural themed activities within open spaces along the 'Green Streams' at more accessible and visible locations.
- Consider locating other cultural and community uses within the Cultural Quarter such as a Library, Centre for Performing Arts, etc.
- Form active frontage to Norzin Lam, Doebum Lam and Cultural Square.
- Consider re-purposing existing ground floors along secondary and tertiary streets and spaces to provide artists studios, craft workshops and maker spaces. Make visible the internal activity to showcase Bhutanese arts and crafts.
- Introduce community facilities commensurate with a neighbourhood centre to support the existing and new urban community and introduce new residential uses within the Cultural Quarter and to the west of Norzin Lam, to build a greater urban population and promote activity within streets and spaces.
- Retain and integrate the existing primary school to serve the residential community within and around the Cultural Quarter.

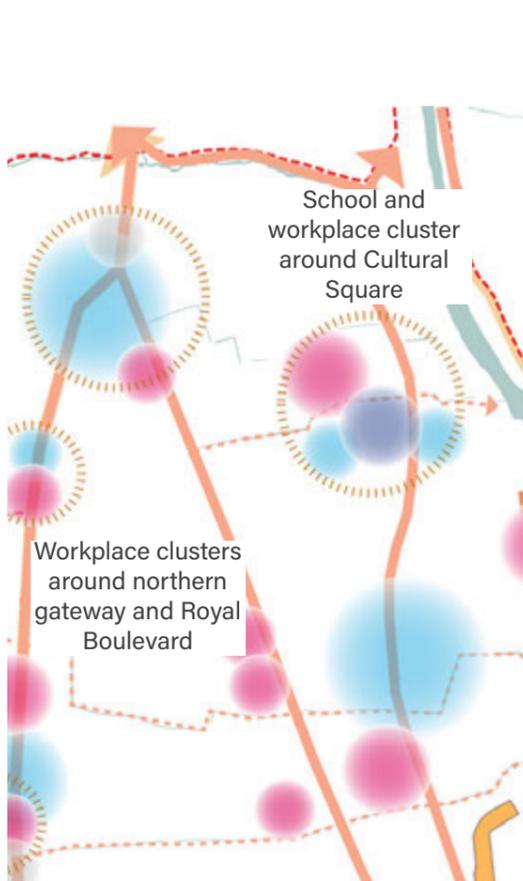


Figure 4.89 Weekday morning

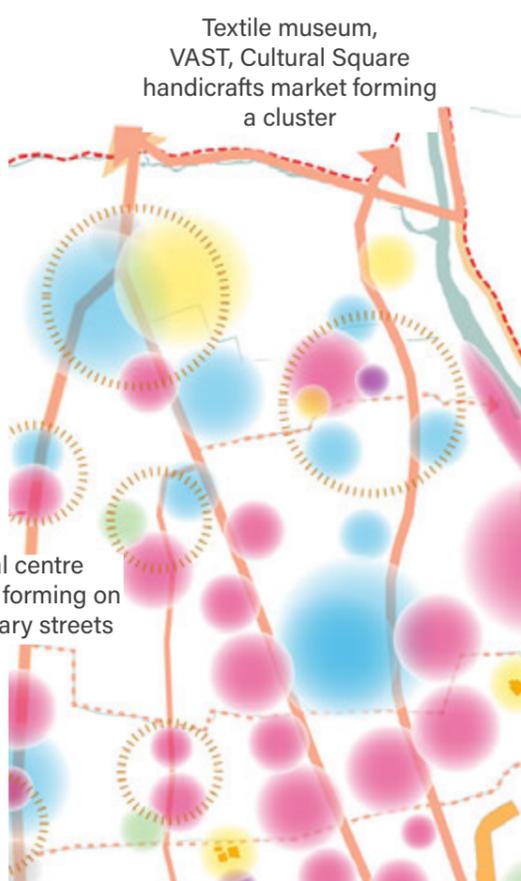


Figure 4.91 Weekday afternoon

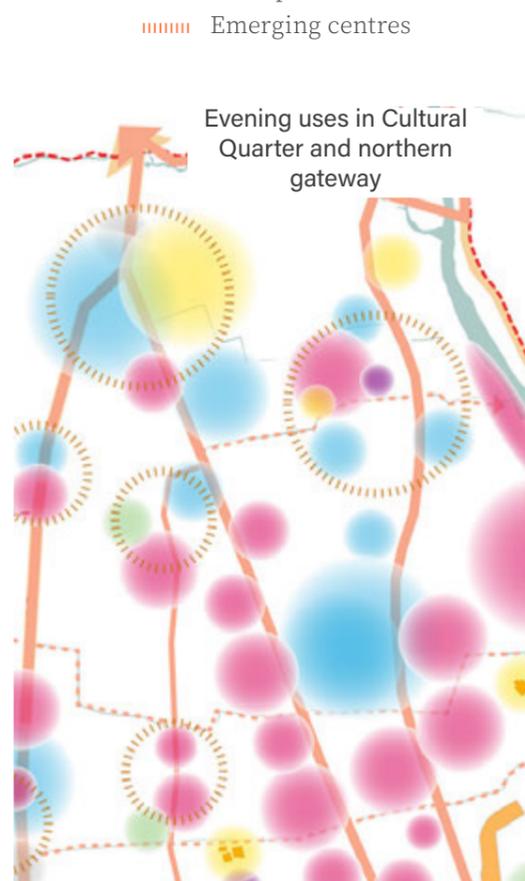


Figure 4.90 Weekday evening

- KEY
- City Core Action Plan Boundary
 - Primary connections
 - - - E-W pedestrian links
 - Retail cluster
 - Workplace cluster
 - School cluster
 - Culture cluster
 - Sports and recreation cluster
 - Entertainment/ evening use cluster
 - Transport node
 - ▬ Emerging centres

Ch.05

Phasing



5.1 Phasing

5.1.1 Phasing and Review Cycles

THE EXTENDED CITY CORE

The 'Extended City Core' is identified as a 'Catalytic Project' within the TSP 2023.

A range of Catalytic Projects of varying scale and complexity have been identified in the TSP 2023 to help deliver the transformation required to realise the vision for Thimphu.

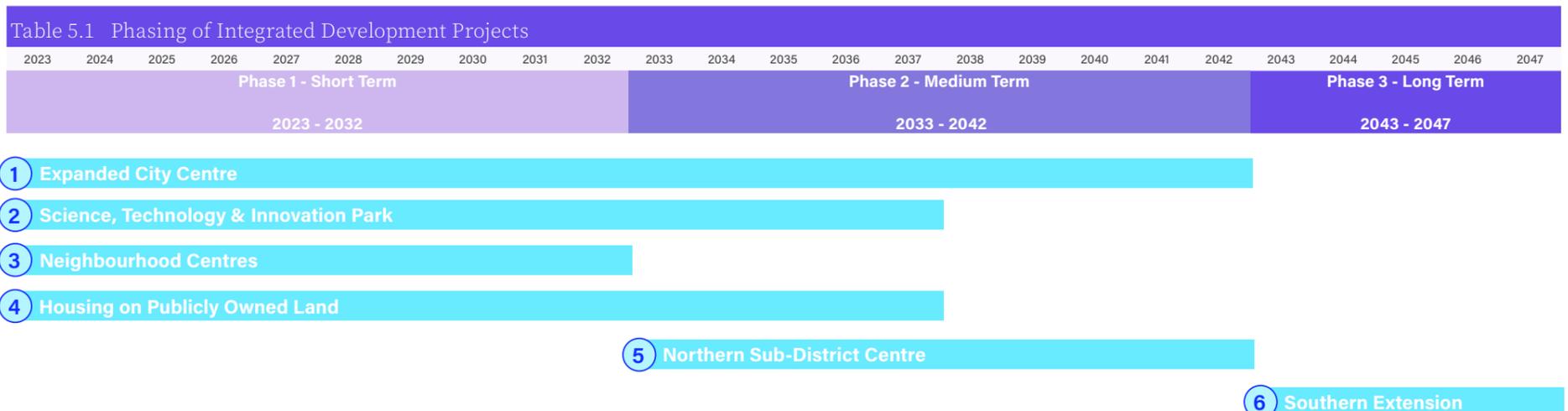
To give structure and establish hierarchy and priority, the Catalytic Projects are categorised into three types:

- Foundation and infrastructure projects;
- Integrated development projects;
- Local projects.

The 'Extended City Core' is identified as one of six key Integrated Development Projects. These are projects that are large scale, complex efforts spanning across more than one sector, which are also of strategic significance. Given their complexity they should ideally be planned and delivered in an integrated manner by a dedicated managing authority, coordinating efforts within different sectors.

Within the 'Extended City Core' project, development, priority projects and interventions will be delivered over a 20+ year period, and mainly within the 'short-term' and 'medium-term' phases defined in the TSP (see opposite page). Progress at the City Core will be reviewed through the TSP Review Cycles outlined opposite.

Please refer to TSP 2023, Chapter 13 and Chapter 14 for more detail Integrated Development Projects and the Priority Projects for the City Core.



Key principles for establishing TSP 2023 phasing include:

TSP review cycles

Over 20 years have passed since the first introduction of the TSP 2002. During this time, no reviews were undertaken to accommodate changing circumstances or absorb lessons learnt.

TSP 2023 will be reviewed through a 10-year cyclical review process as illustrated in Figure 5.1, with the next review expected to occur in 2033.

The 10-yearly review cycle is expected to identify recommendations for updates, to improve plan outcomes based on lessons learnt through implementation. The cycle aligns with the TSP 2023 phasing and how the plan prioritises:

Phase 1

- Short term initiatives
- 10 years: 2023 - 2033

Phase 2

- Medium term initiatives
- 10 years: 2033 - 2043

Phase 3

- Long term initiatives
- 5 years: 2043 - 2047

Census cycles

Future 10-yearly censuses will occur in 2027, 2037, and 2047. These will directly influence the ongoing TSP review process by taking stock of growth mid plan review period.

Five-yearly interim review cycles can provide updates on demographic and economic data based on the most recent census data.

Funding cycles

TSP 2023 reviews can also inform the Royal Government of Bhutan's five-yearly investment cycle decisions. The current five-year plan runs from 2018 to 2023.

Investment priorities identified through TSP 2023 can inform the subsequent 13th investment plan running from 2023 to 2028.

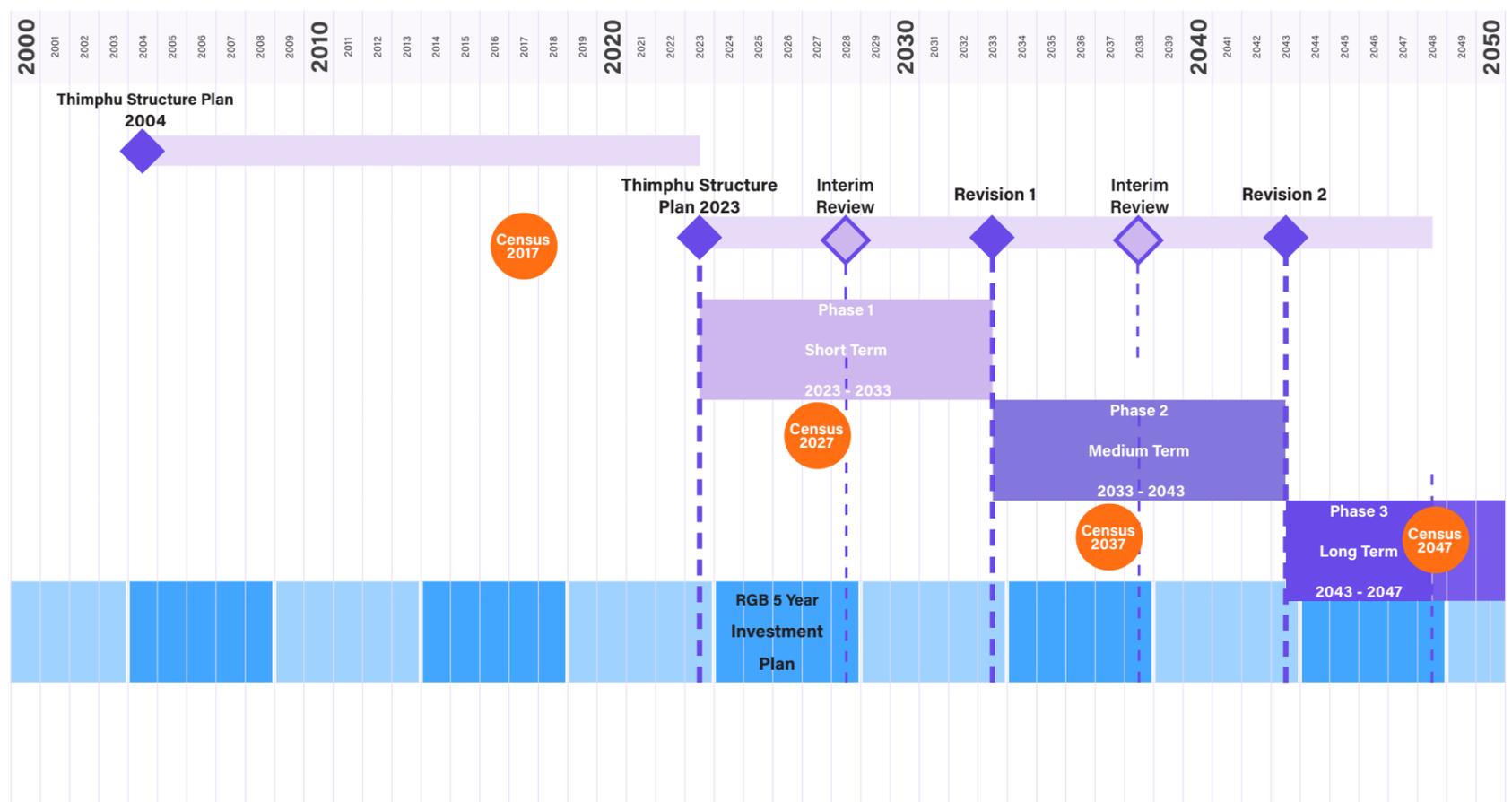


Figure 5.1 Establishing a Cyclical Review Process (extract from the TSP 2023)

5.1.2 Indicative Phasing Strategy

PHASING PRINCIPLES

The sub-phasing within the 'Extended City Core' project can be outlined in different ways. These pages set out one potential strategy, illustrated on the right) that meets the following Phasing Principles:

- 5 sub-phases, each with a duration of approximately 5 years.
- Each sub-phase delivering approximately 1,300 homes, equivalent to about 325 homes per year.
- Phase 1a delivering catalyst projects to unlock the transformation of the City Core, including the southern junction, the Expressway and southern Doebum Lam and the Lungten Zampa.
- A model neighbourhood in Phase 1a demonstrates a new way of building, creating learning opportunities to inform subsequent housing projects.
- Phase 1b completing an important segment of the Wangchhu side transformation with the Markets Quarter
- The Financial Quarter and Royal Boulevard development delivers a significant amount of workspaces in Phase 1b.
- Phase 1c delivers upgrades to the National Memorial Chorten and Chubachhu Valley Parks, alongside the Cultural Quarter and residential neighbourhoods.
- Phase 2a and 2b unlock the RBP compound and complete the expansion of the City Core towards the south and the east, connecting to the riverside Central City Parks.

This scenario provides an illustration of how development could come forward in the City Core and sets some of the key principles that any phasing scenario should follow:

- Tactical interventions should be introduced in very early stages to test and demonstrate the benefits of and build support for key permanent interventions.
- The Southern junction (at Doebum Lam and the Expressway) and the southern section of Doebum Lam are catalyst projects that, if implemented early will unlock potential in the City Core, including the pedestrianisation of Norzin Lam and the re-organising/re-purposing to Lungten Zampa.
- The focus for early transformation within the City Core should be at the Clock Tower Square, Norzin Lam and the Central City Parks.
- The focus for housing and employment development should be around the western core initially, with later development focused at the Southern City Core.

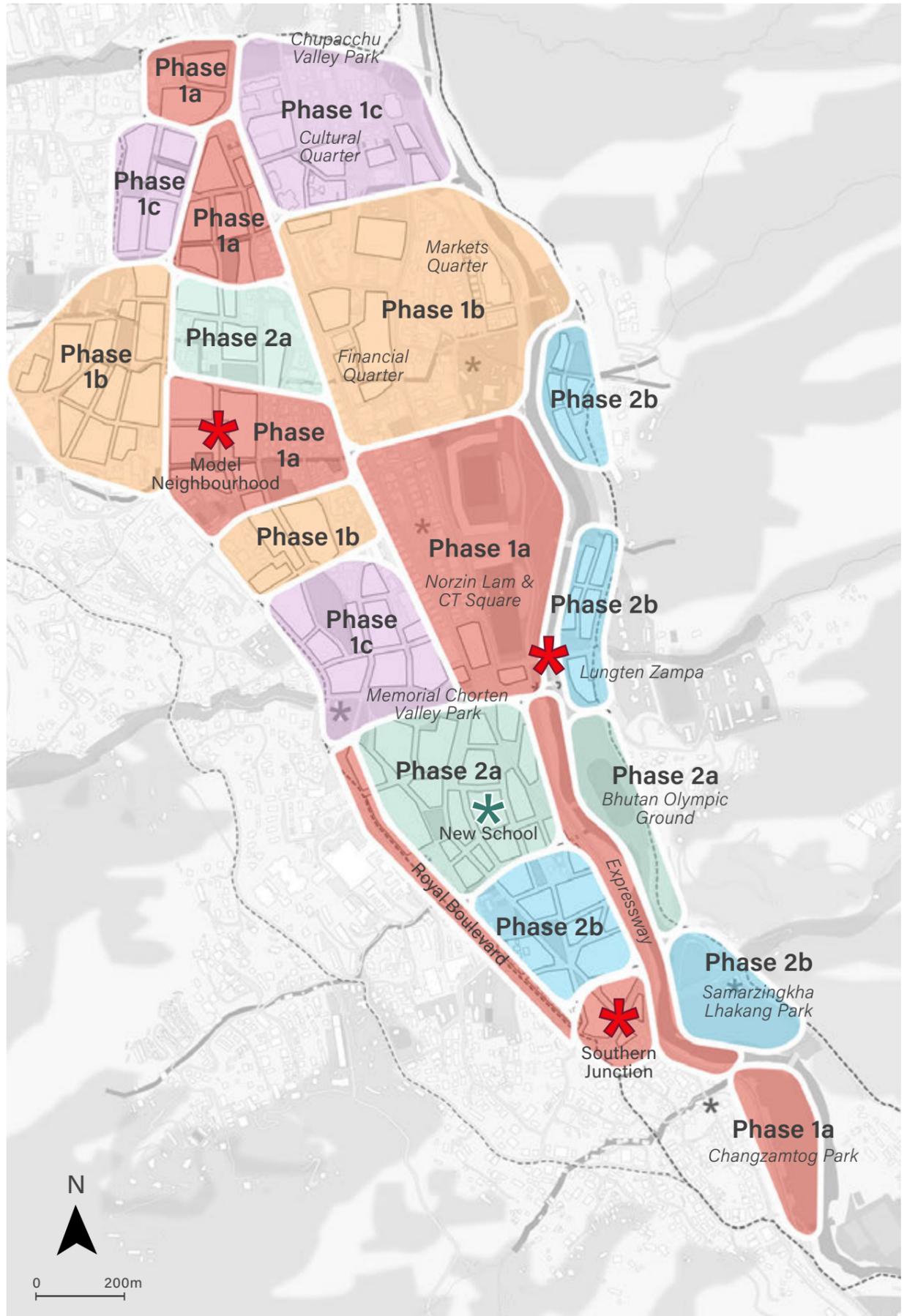
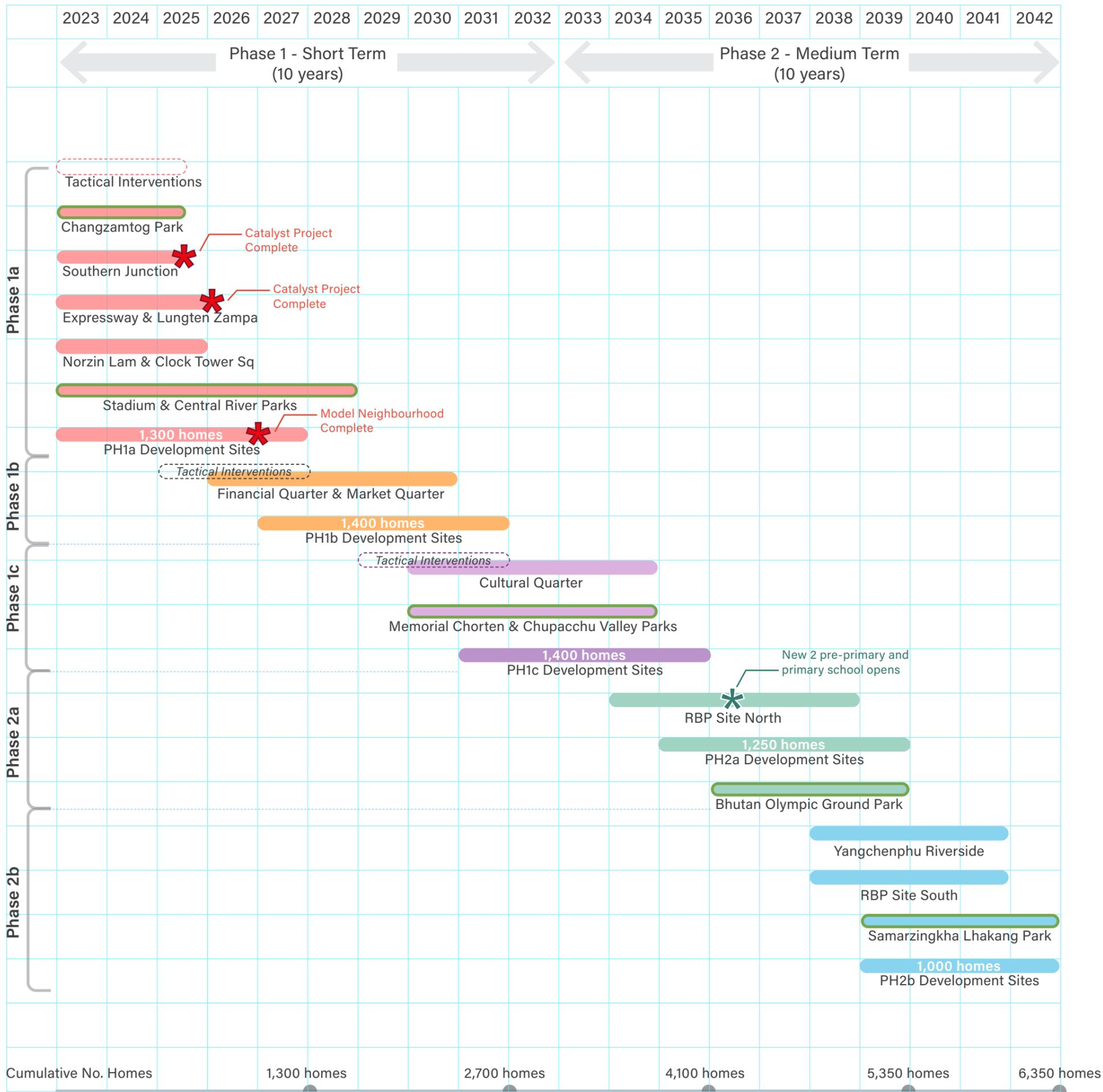


Figure 5.2 Phasing Strategy

KEY

- Phase 1a
- Phase 1b
- Phase 1c
- Phase 2a
- Phase 2b



Appendices



Ch.06

Baseline Analysis



6.1 The Urban Context

6.1.1 Baseline and Opportunities Overview

The following pages provide an overview of the current baseline physical conditions in the City Core, including conditions relating to Transport, Green Infrastructure and Utilities (Arup) and deepens the spatial understanding of this part of the city from stages of work relating to the Structure Plan.

Considering the baseline physical analysis and the concurrent Structure Plan development, this document then explores and documents key opportunities within the Study Area Boundary.

CHALLENGES

- Topography
- Impacts of Ownership
- Under utilization of land
- Congestion of Land Use
- A fragmented street network
- Lack of public realm
- Transport and accessibility
- Green Infrastructure
- Water
- Utilities

ASSETS

- National Assets
- Heritage and Views
- Cultural Assets in the Core
- Activity in the Core

OPPORTUNITIES

- Public Ownership of Strategic sites
- Potential Capacity in the City Core
- DCR Reform

6.1.2 Topography

TOPOGRAPHY

- The City Core is relatively flat compared to other areas of the city. However there are still significant level changes within the City Core.
- There is a 56m level drop (E-W) from Doebum Lam to the Centenary Park at the river.
- There is a 40m level drop between the north and south ends of Norzin Lam.
- The topography provides a significant challenge to improve pedestrian linkages across the city and limit the use of cars.

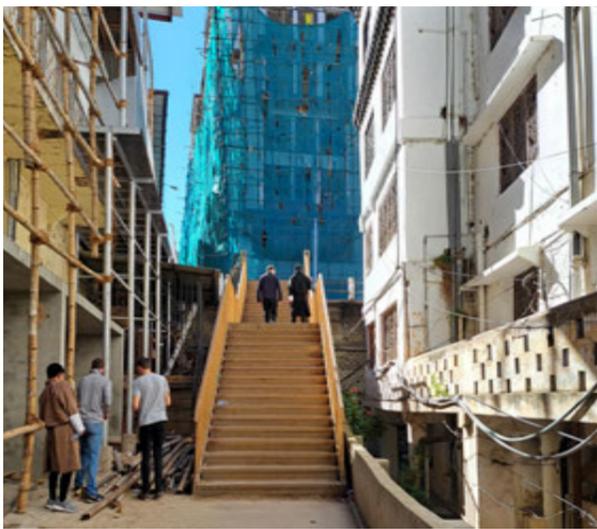


Figure 6.2 Level difference along E-W routes



Figure 6.3 Level difference between Chang Lam and Centenary Park



Figure 6.4 Level difference on west side of Doebum Lam

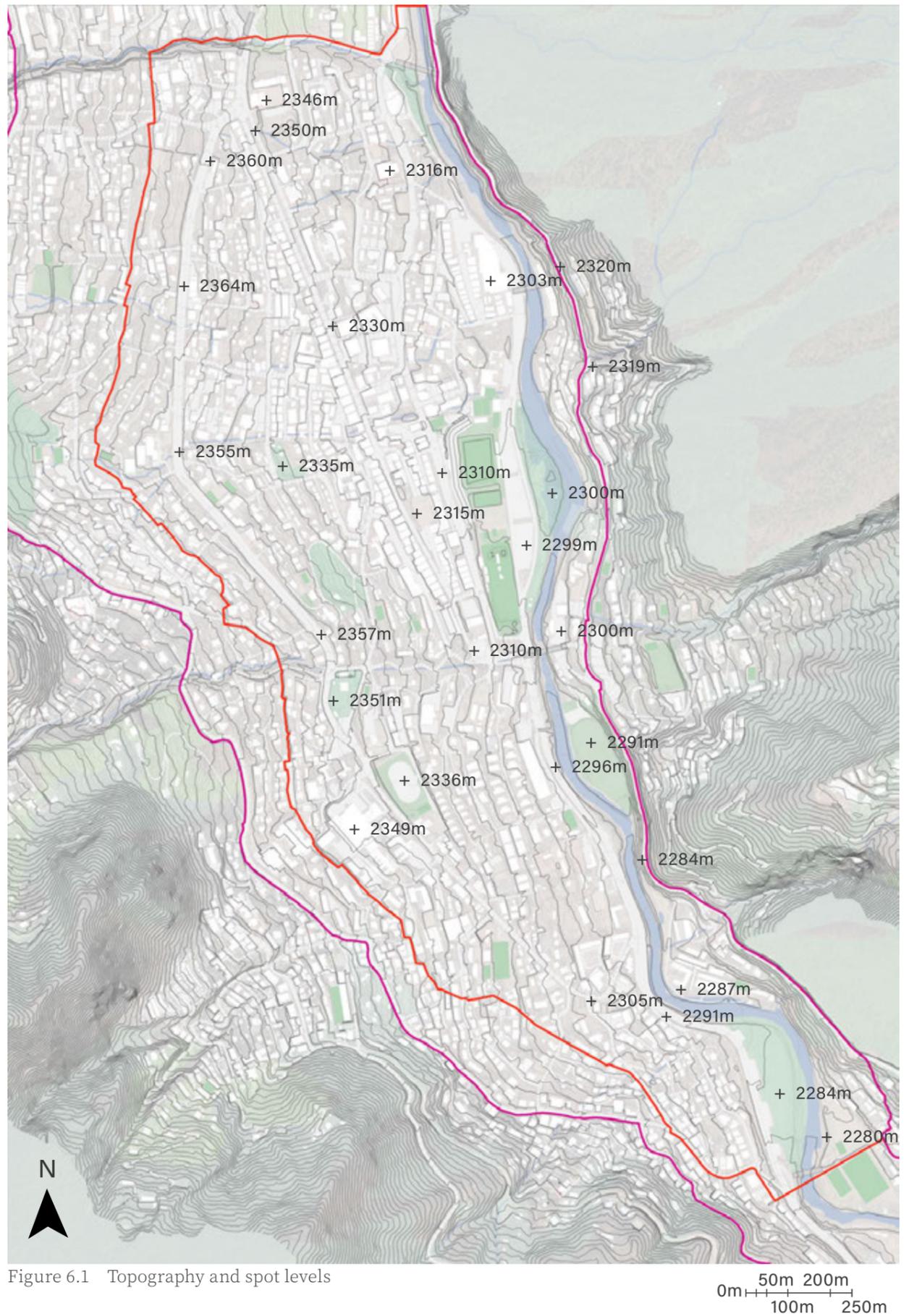


Figure 6.1 Topography and spot levels

KEY

City Core Action Plan Boundary

City Core Context boundary

+x m Spot Heights

CITY SECTIONS

Section 1-1 cuts across the northern part of Norzin Lam - observations are as follows:

- The eastern edge of Norzin Lam consists of taller buildings while the western edge varies in height.
- The eastern bank of the river is a lot steeper, limiting development on that side.
- The area at the north of Norzin Lam has a lot of underutilised plots and unformed streets which provides a opportunity to transform this area and increase connection and legibility across the City Core.
- The level difference between Doebum Lam and Norzin Lam is around 20m and to the river is around 60m.

Section 2-2 cuts across the southern part of Norzin Lam, at Clock Tower Square. Observations are as follows:

- The buildings on either side of Norzin Lam are more fully formed in this area with dense mixed use development. There are still underutilised sites on the western part of the City Core closer to Doebum Lam.
- The eastern bank of the river continues to be steep and has limited potential for development.
- There is no direct access between existing assets such as Clock Tower Square and Centenary Park and there is a significant level difference of 18m.

Section 3-3 cuts across the hospital and RBP areas, to the south of the Memorial Chorten. Observations are as follows:

- This section demonstrates the steepest level change within the City Core with a drop of 60m between Doebum Lam and the hospital and the Expressway at the river.
- The RBP site is a low density area in the City Core that provides a medium term opportunity to consolidate and increase the density in this area, however the topography here forms challenges for access and forming density.

Improving pedestrian connectivity while working with fairly extreme level changes is a primary challenge in the City Core. Pedestrian connections are at present limited due in part to the topography, but ensuring strong east-west and north-south connectivity across the City Core will be vital in establishing more active, low-carbon modes of transport, increasing density, forming a coherent City Core and strong, connected urban communities.

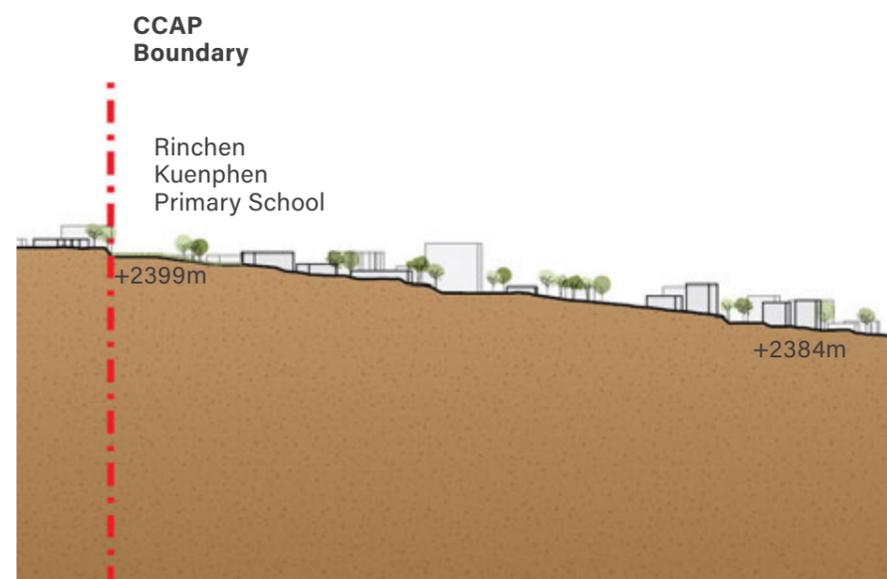


Figure 6.5 Section 1-1 at northern section of Norzin Lam

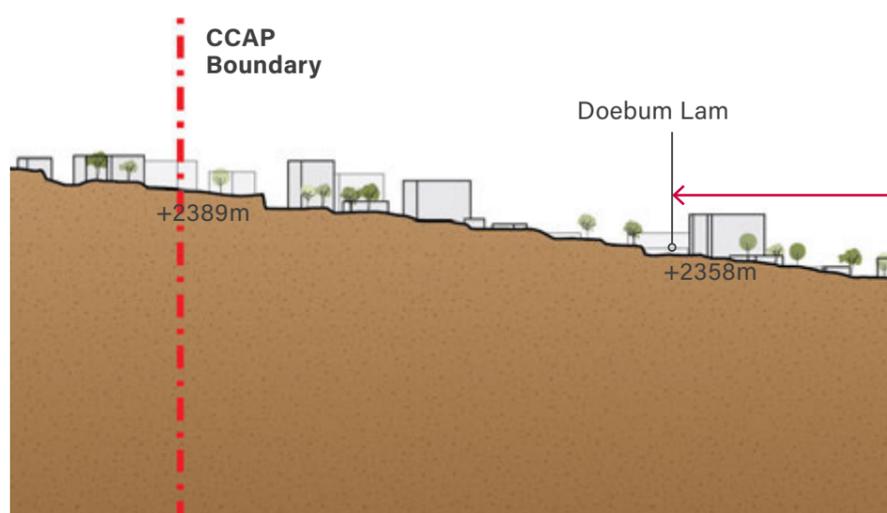


Figure 6.6 Section 2-2 Changlimithang Football Stadium

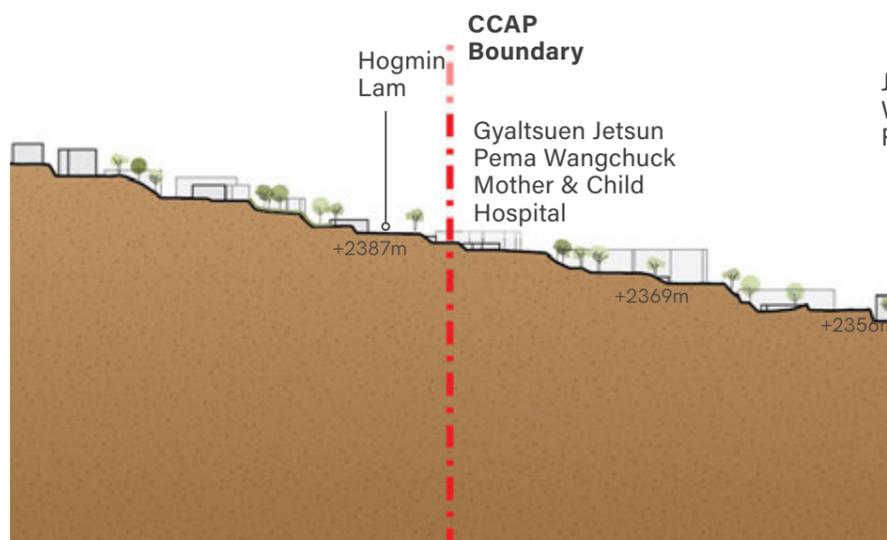


Figure 6.7 Section 3-3 Jigme Dorji Wangchuck National Referral Hospital

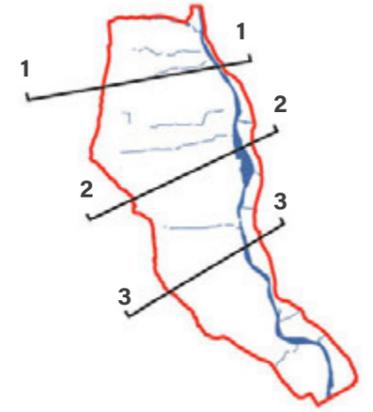
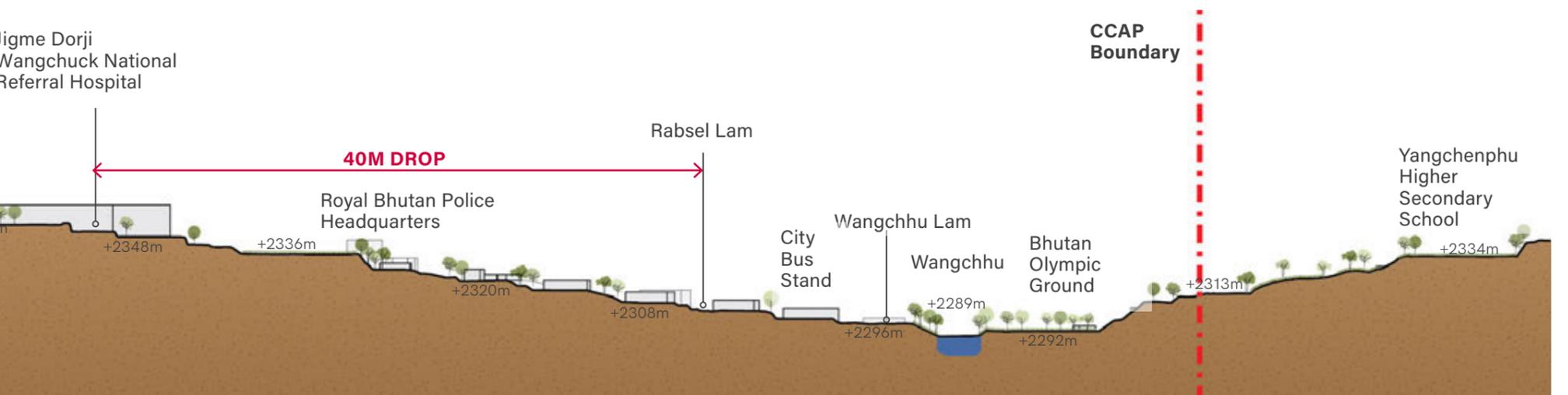
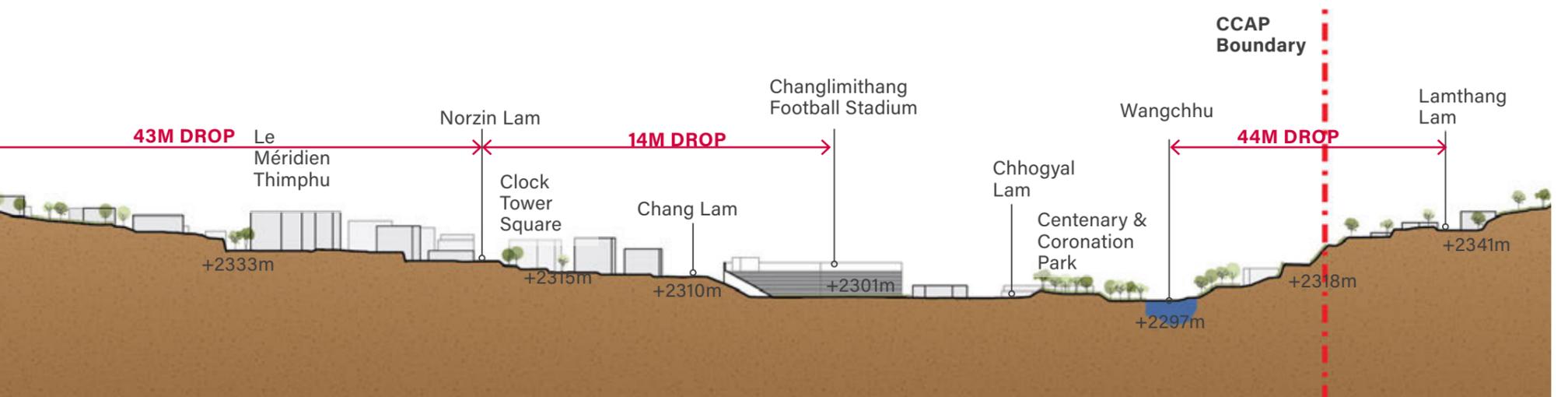
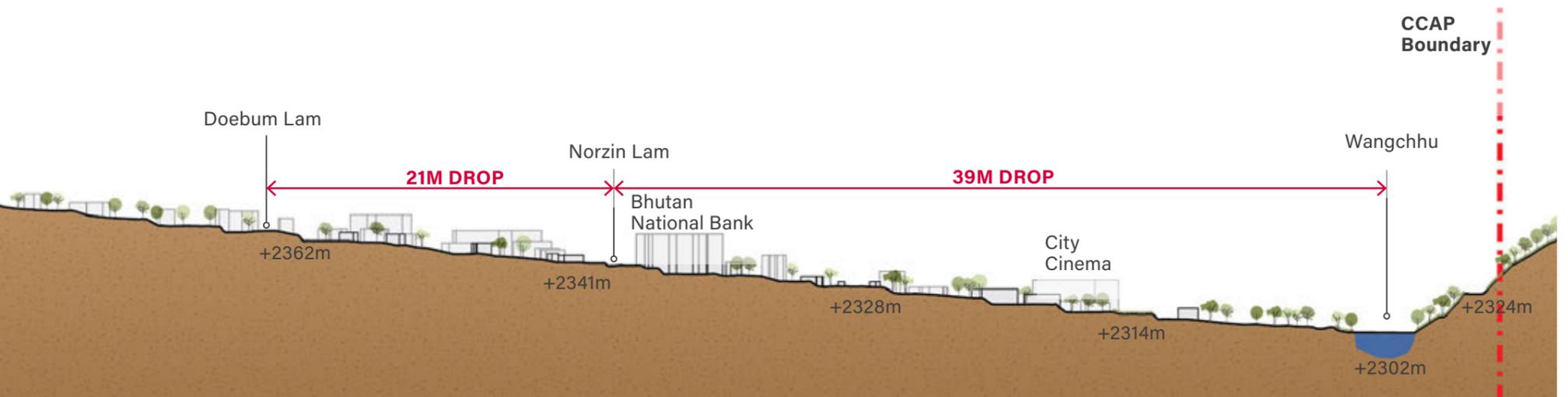


Figure 6.8 Section Key



6.1.3 Impact of Ownership

Land ownership in the core is a mix of public and private land - generally, the public land holdings are large in area and concentrated to the west and south of the City Core, while private ownership is highly fragmented and concentrated in the key commercial areas along Norzin Lam and around the market. Owing to the small sized private land parcels development feels piecemeal and haphazard, with this fragmented ownership pattern having an impact on:

- Forming a coherent and connected network of streets, leading to a lack of legibility, direct connections and accessibility;
- Built form and providing well-formed streets and a street based, urban townscape;
- On forming diverse character - producing a very dispersed land-use pattern, while very similar point blocks with setbacks and maximum permissible height are developed everywhere;
- The extent and the quality of the public realm - there are streets without pavements, with trip hazards and visual clutter and limited outdoor spaces for people to gather in and use.

Taking account of land ownership and the amount of privatised/enclosed land there is as little as 22% 'open' space or space that can be for people.

A large area of public land is located to the south of the present-day City Core. This is occupied by the RBP compound - a privatised, inaccessible part of the city, where there is no general access or connections. In addition, there is a significant portion of the City Core that falls under the ownership of government institutions. This provides a very significant opportunity to extend and regenerate the City Core.

Land ownership-
impact on
street network,
connectivity, built
form and character

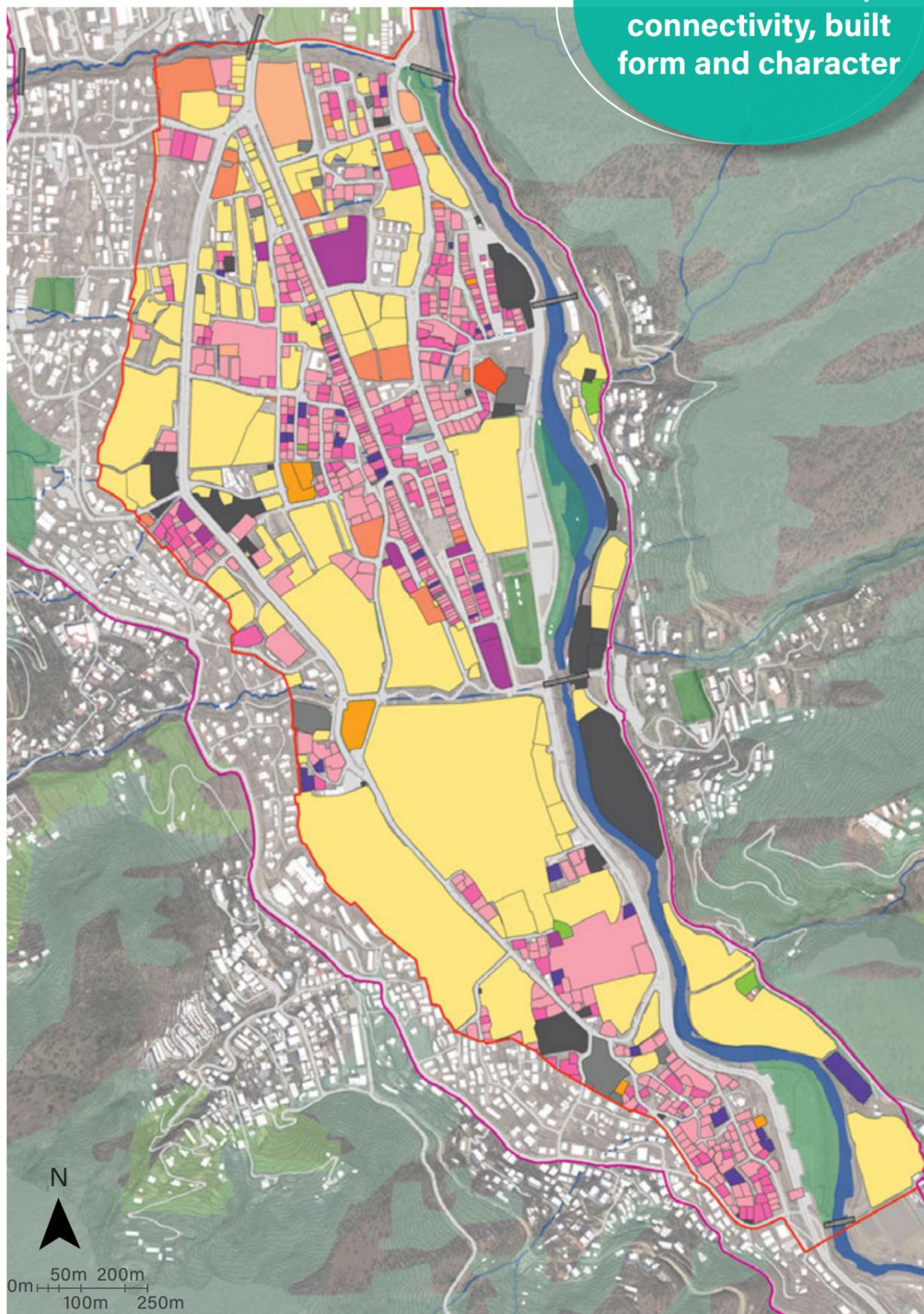


Figure 6.9 Land Ownership

- KEY
- City Centre Action Plan Boundary
 - City Centre Context Boundary
- PRIVATE OWNERSHIP**
- Individual Person
 - Join Owner
 - Private Corporation
 - Family Land
- OTHER**
- Religious Institution
 - Government Institution
 - Gerab Dratshang
 - Crown Property
 - Corporation
 - Civil Society Organisation
 - Unknown



Figure 6.14 Piece meal development



Figure 6.10 Lack of spaces between buildings for gathering areas



Figure 6.15 Leftover setback spaces between developments



Figure 6.11 Lack of frontage and buildings do not form streets



Figure 6.12 Similar point blocks- lack of diverse character



Figure 6.13 Lack of coherence

6.1.4 Under-utilization of Land

The land-ownership pattern within the City Core also has an impact on the utilisation of land. Private ownerships tend to be built to the maximum allowable density, while public lands are much less dense, characterised by low density housing with gardens or government buildings surrounded with parking areas. The diagram on this page shows the massing and footprint of buildings within the City Core with observations as follows:

- Buildings around Norzin Lam tend to be the tallest in the city. They are typically 4-6 storeys tall. They also occupy the maximum footprint allowable within their land-holding, leaving narrow gaps between buildings.
- Areas to the east of Norzin Lam, around the Central Farmers Market, are also relatively dense and follow the same development pattern, with heights varying from 3-5 storeys.
- The Changzamtog area is also a fairly dense part of the city with heights ranging from 2-6 storeys. Buildings here, however, are set further apart than within the present City Core.
- Areas to the west of Norzin Lam, to either side of Doebum Lam, and to the south at the RBP compound are of low height, generally 1 to 3 storeys, and buildings are set within large, open areas of space (which are either used as garden space or car parking).

The areas to the west and south represent a huge underutilisation of scarce land within the City Core.

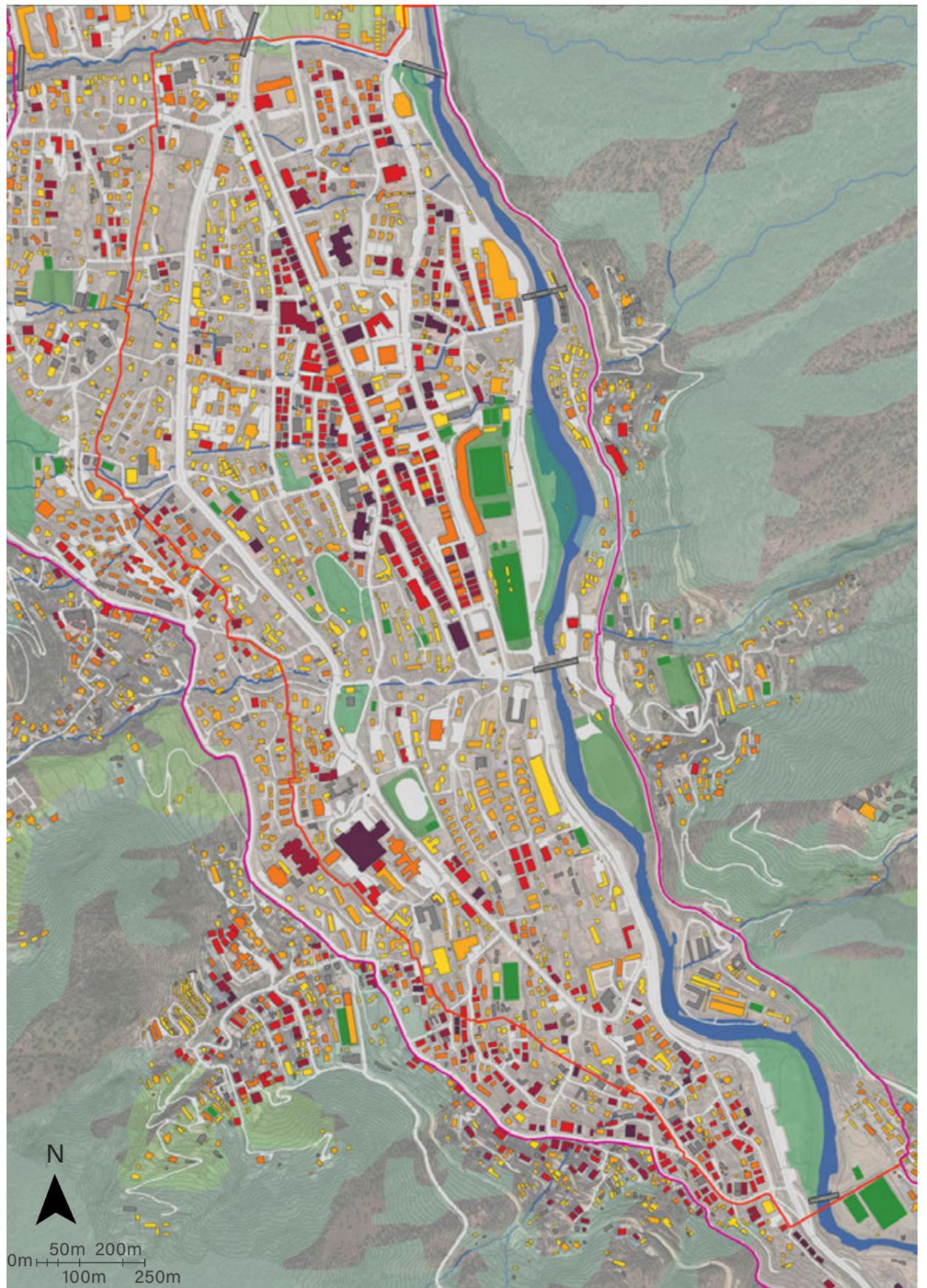


Figure 6.16 Massing - demonstrating the underutilisation of land



Figure 6.17 Taller development within the City Core



Figure 6.18 Underutilised sites to the west of the City Core

KEY

- City Core Action Plan Boundary
- City Core Context boundary
- 1 storey
- 2 storey
- 3 storey
- 4 storey
- 5 storey
- 6 storey
- Unknown

6.1.5 Land Use Congestion

Although there are significant areas of the City Core that are underutilised, there are also key locations where there is an over-concentration of use, leading to traffic congestion and its various negative impacts, and potentially, in a future where the city has grown, a reduction in ease of access and functionality. These are critical city functions: the hospital and Central Farmers Market.

THE REFERRAL HOSPITAL

- The Hospital area is an important function and destination and is located in the Changzamtog neighbourhood. The hospital generates significant amounts of traffic and footfall. With the growth of the city's population, it is anticipated that the provision of health infrastructure will need to expand.
- However, health facilities need to be better distributed across the city to allow ease of access for all communities, ease the pressure on the Referral Hospital and reduce the traffic movements concentrated at the hospital.

CENTRAL FARMERS MARKET

The CFM also occupies a significant area within the City Core next to the river and contribute to a lot of congestion.

- A portion of the CFM can be retained in the centre and the rest of it redistributed across the city to the local neighbourhood markets.
- Initiatives such as the Kaja Throm have been very successful. These should be capitalised upon to think about a more street based market next to the CFM building, thereby opening up opportunities to repurpose the existing structure.



Figure 6.19 The Referral Hospital Complex



Figure 6.20 Central Farmers Markets

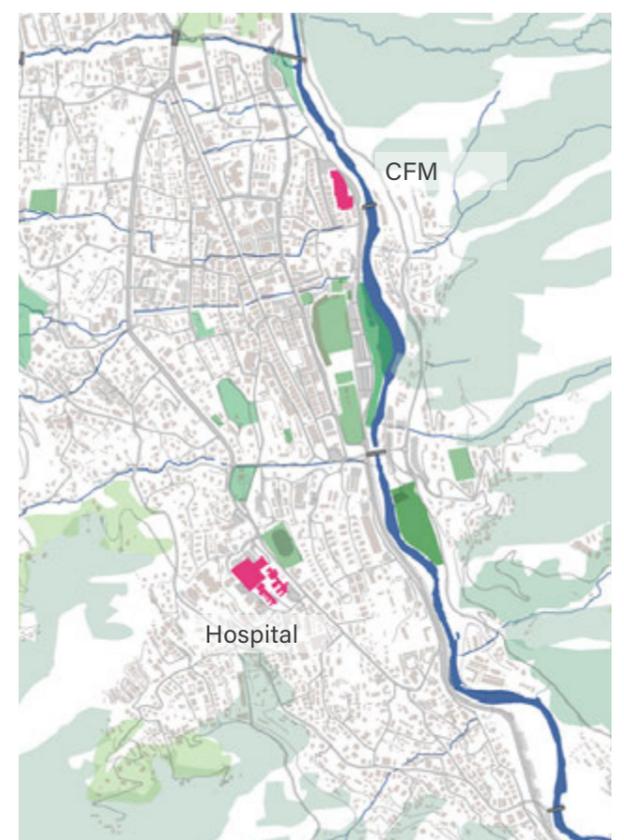


Figure 6.21 Location Map

6.1.6 A fragmented street network

- Generally, continuous connections are better formed on north-south running streets such as Doebum Lam, Norzin Lam and Chang Lam. However, this leads to these streets becoming the primary connections and taking high amounts of traffic movements from across the city.
- Generally, the more secondary and tertiary streets within the areas between the primary streets do not form continuous connections and there is a high number of dead-end streets and cul-de-sacs, especially to the west of Norzin Lam.
- This results in a fragmented street network and a lack of continuous connection north-to-south and east-to-west at a more granular scale. The east-to-west connection across the City Core is significantly disrupted as there are only two major east-to-west running streets - at Memorial Chorten and at Chubachhu in the north.
- There are a few pedestrian only east-west routes, but these are fragmented.
- The topography provides a significant challenge to improve pedestrian linkages across the City Core.

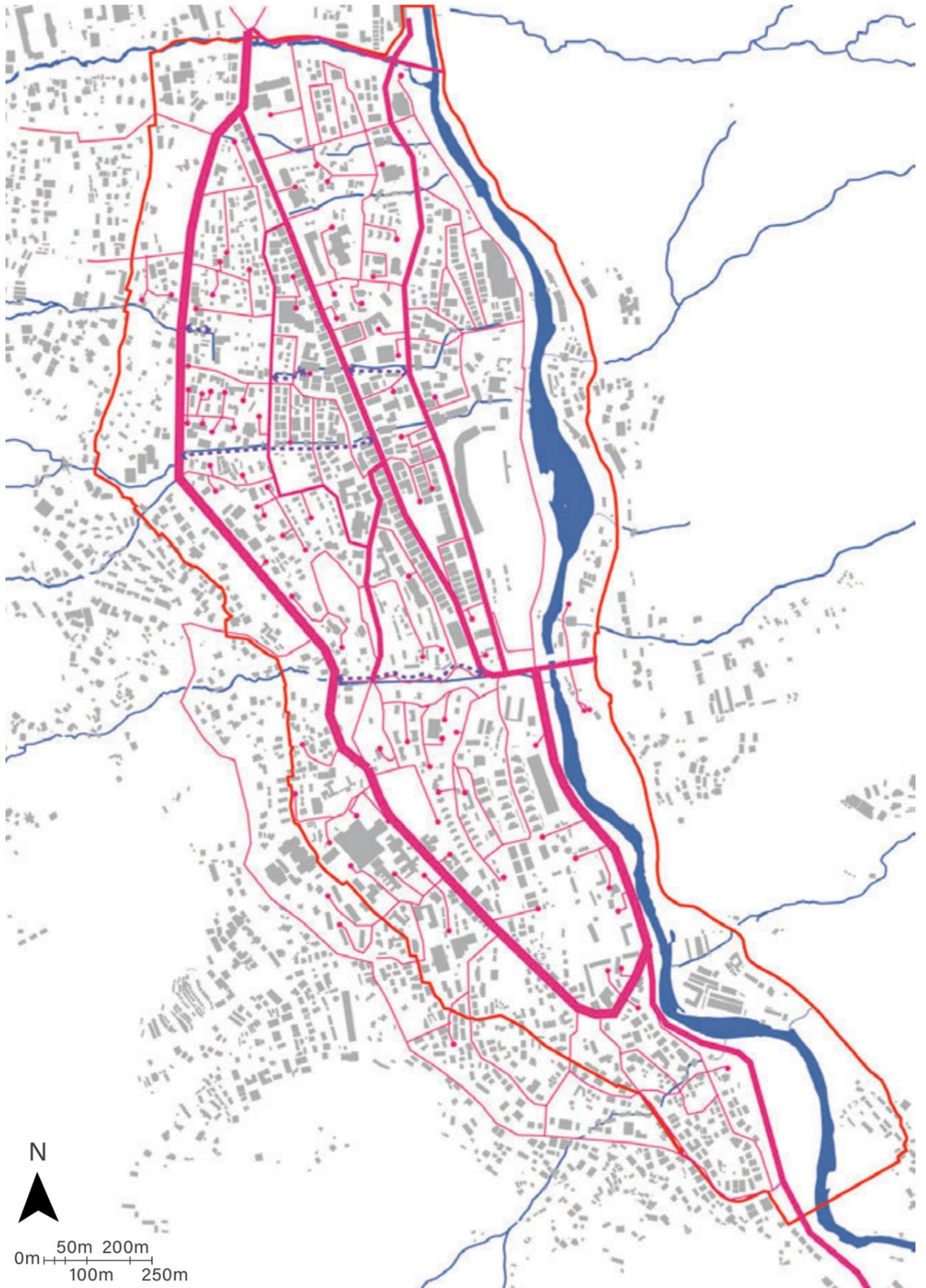


Figure 6.22 Street network in the City Core



Figure 6.25 Pedestrian links across levels



Figure 6.24 Car parking taking over public realm



Figure 6.23 Dead ends with car parking

- KEY
- City Core Action Plan Boundary
 - Vehicular Routes
 - Dead ends
 - Pedestrian Routes

6.1.7 A lack of a Public Realm

- Space for cars takes precedent over spaces for people.
- Within the study area boundary, the City Core has 61% 'open' space (when building footprint and road space are measured).
- At Norzin Lam (within the area defined by the blue line) there is 47% 'open' space.
- However, taking account of a very privatised land ownership and land use pattern, there is as little as 22% 'open' space or space that can be used by people and pedestrians.
- At the very heart of the city, where people and pedestrians should take precedence, there is more space for cars than people.

At the very heart of the city, where people should be gathering, there is more space for cars than for people.



Figure 6.28 Car filled streets in the core



Figure 6.26 Stadium parking area

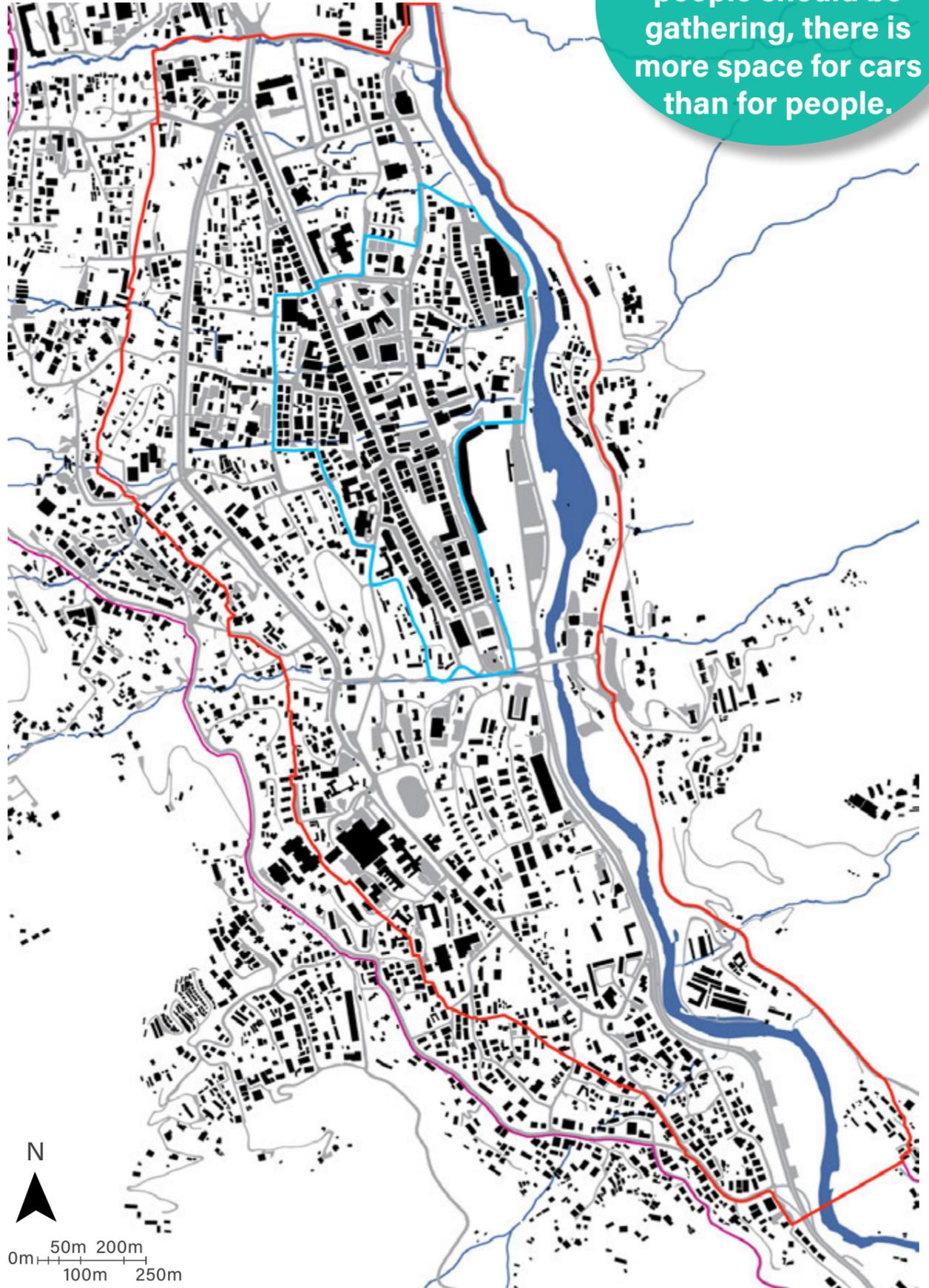


Figure 6.29 Space left for the people



Figure 6.27 Around Norzin Lam

KEY
▭ City Core Action Plan Boundary
▭ City Core Context boundary
▭ Area around Norzin Lam

6.1.8 Transport and Accessibility

The City Core is the most important destination in Thimphu, as people travel there to access the mix of economic, social, cultural, administrative and recreational activities. The dominant movements are along north-south routes, which follow the orientation of the valley and the Wangchhu. These routes are interconnected by many east-west routes. There are only occasional bridges connecting the city to the eastern bank of the river, however, development on this side of the river is limited. The Royal Bhutan Police site, inaccessible for through-movement, forms another barrier to movement in the City Core.

People access the city via driving and parking, either in multi-level car parks or on street, and by foot or using bus services and taxis.

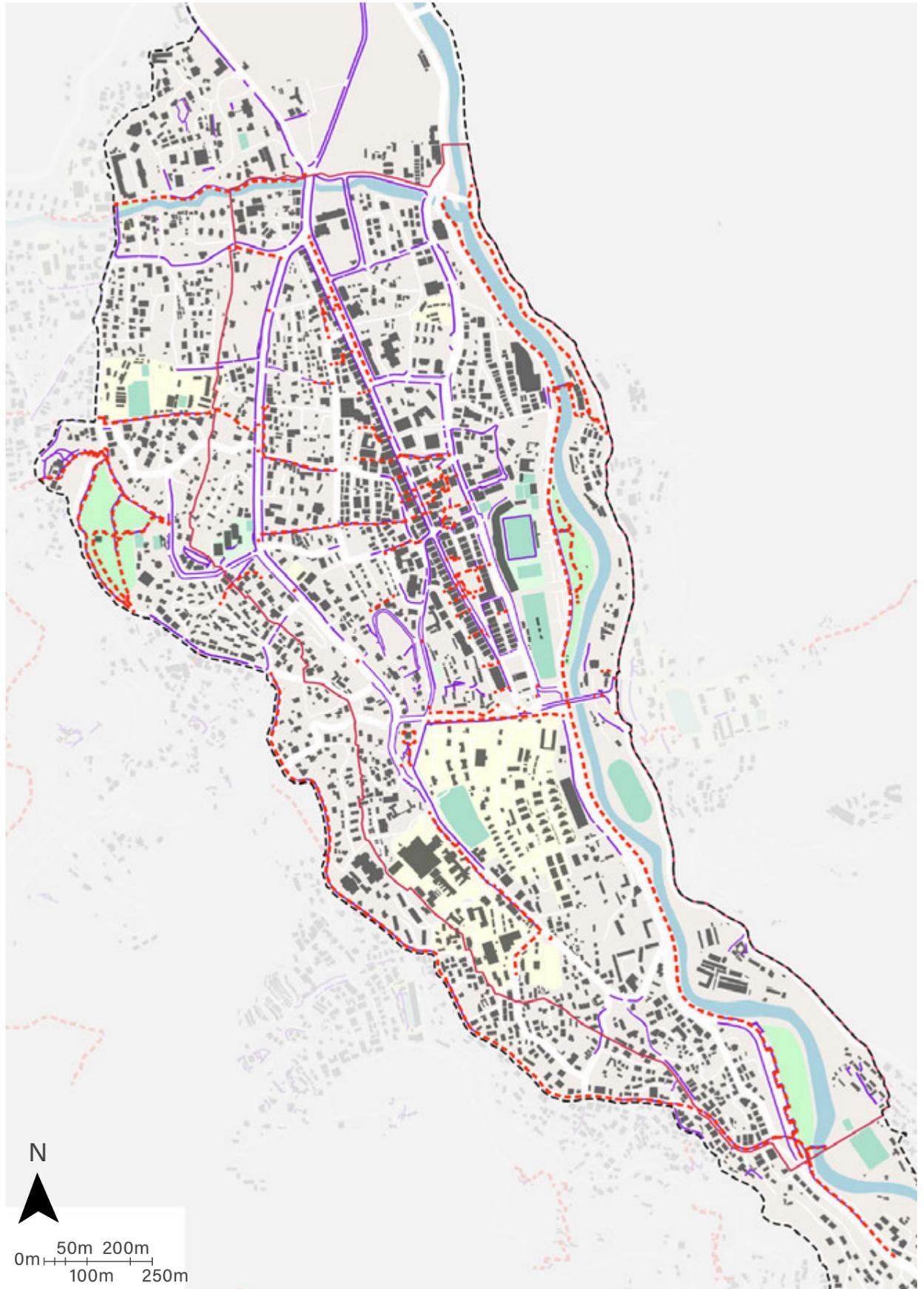


Figure 6.30 Pedestrian network within the City Core



Figure 6.32 Lungten Zampa footpaths are narrow, hindering pedestrian movements



Figure 6.31 Pedestrian footpath surfaces on Norzin Lam are uneven, poorly maintained and poorly integrated with adjacent buildings.



KEY

- Existing pedestrian links
- Pedestrian footpaths

Bus routes are predominantly north south, primarily along Doebum Lam and Chang Lam, providing good coverage across the City Core. A city bus station and taxi zone next to Chang Lam, and the regional bus station under Lungten Zam bridge are the two primary bus terminus.

Car parks are available at various locations within the City Core. The largest car park is at National Stadium (710 spaces), and in multi-level car parking buildings on Phendey Lam (166 spaces) and Norzin Lam (216 spaces). Norzin Lam provides on-street car parking spaces along its western edge (320 spaces).

Because roads are not conducive to heavy goods vehicles, delivery of goods to the City Core is mostly carried out by small trucks and vans, which generally stop on-street and interfere with traffic flow. Goods movement and deliveries are challenged by organisational and infrastructural aspects:

- A lack of centralized distribution;
- No building addresses;
- No kerbside commercial loading zones;
- Lack of kerb cuts;
- Poor quality pavement; and
- No dedicated freight entrances or loading docks.



Figure 6.35 Poor pedestrian connectivity to bus stops, including lack of road-crossing facilities.



Figure 6.34 Current bus stops have no waiting area for passengers. Passengers often stand on road surfaces while waiting.



Figure 6.33 Public transport and parking in the City Core

KEY

- Babesa via Lungtenphu
- CBT KGC via Kawajangsa
- CBT KGC via Memorial Chorten
- CBT Mothithang via Zilukha
- Flyover Dajophakha
- Hongtsho
- Kuenselphodrang
- Ngabiphu RTC
- Trunk Lane via JDWNRH
- Trunk Lane via Town
- Existing parking facilities
- City bus station
- Regional bus station



Figure 6.36 Disconnected bus stops from footpaths and the road

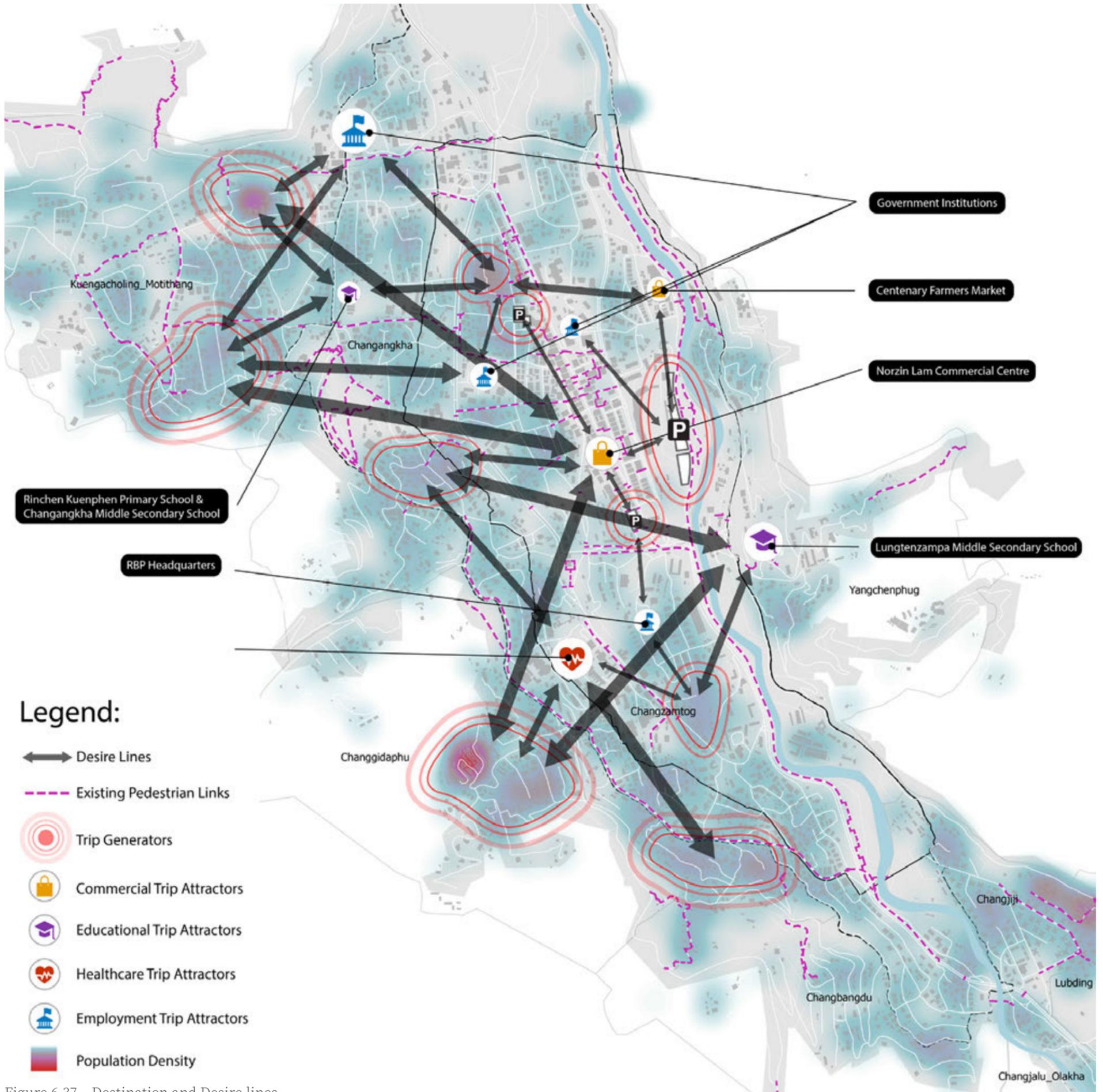


Figure 6.37 Destination and Desire lines



Figure 6.41 Lungten Zampa/Norzin Lam junction is a bottleneck for traffic and is not pedestrian friendly



Figure 6.38 U-turn locations on the Expressway result in unsafe traffic conditions.



Figure 6.42 Underutilised car park at National Stadium (West of Centenary Park)



Figure 6.39 Chevron on-street parking spaces are not conducive to high pedestrian volumes.



Figure 6.40 Typical delivery vehicles in the City Core



6.1.9 Green Infrastructure

CURRENT CONDITIONS

The Wangchhu is the dominant environmental feature in the City Core, with a sequence of connected spaces extending along its riverfront, from Kaja Throm market through Centenary Park to Dechan Zam Bridge and beyond. The busy four-lane Expressway separates the City Core from the residential neighbourhoods that extend westwards into the forested hillsides, with Changankha Lhakhang and the Thimphu Ecological Park anchoring an important heritage movement corridor which follows the route of a culverted stream towards Norzin Lam and the Wangchhu.

The City Core benefits from heritage structures, open spaces and riverside environments, but these are fragmented by major road infrastructure and disconnected pedestrian trails. With the exception of Centenary Park, high-quality, accessible green open space is lacking and fragmented pedestrian connectivity along river tributaries, many of which have been culverted into covered concrete channels, restricts lateral east-west movement into and across the City Core. The landscape setting for Zangdo Pelri Lhakhang is compromised, and the riverfront corridor between Centenary Park and Changlimithang Football Stadium is dominated by major road infrastructure and expansive parking areas.

There is little in the way of street tree planting or connected green infrastructure across the City Core. A severe lack of pedestrian routes and designated crossings inhibit permeability through the Centre, and unconsolidated bollards, columns and guardrails contribute to street clutter.



Figure 6.43 Green Infrastructure current conditions

KEY

- City Core Action Plan Boundary
- Public open space
- Heritage Landscape
- Private open space
- River and streams
- River 30m buffer
- Sports pitches
- Markets
- Clock Tower Square
- Heritage bridge
- Heritage trail
- Main heritage site
- Lhakhang
- Chorten
- Stream (open)
- Drainage channel (culverted)
- Key pedestrian connection



Figure 6.48 Car dominated public realm



Figure 6.44 Zangdo Pelri Lhakhang



Figure 6.49 Kaja Throm Market



Figure 6.45 Expressway as a barrier for movement

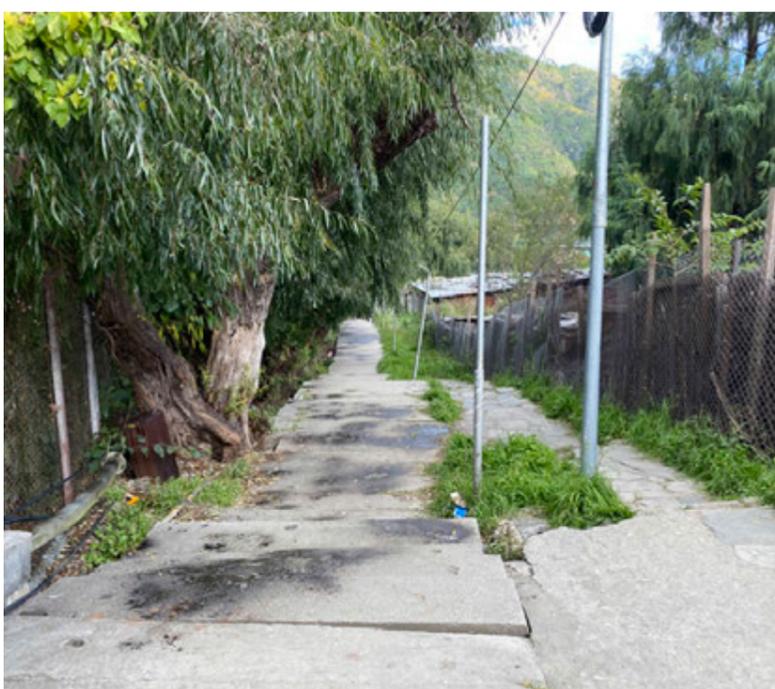


Figure 6.46 Existing pedestrian connection along culverted stream



Figure 6.47 Wangchhu River

6.1.10 Water

WATER

The total current demand for potable water for the City Core is approximately 2MLD (million litres per day). The City Core is served by from Taba, Motithang and Jungshina Water Treatment Plants (WTPs). These WTPs also supply all neighbourhoods between Taba and Changzamtog. Six service tanks at four locations control the pressure and flow into the City Core water supply zone. Supply is intermittent due to availability of water in the entire network. The service tanks have a combined capacity of 1.56ML (million litres).

There is good coverage of existing water mains serving the City Core area to deliver potable water to existing properties. However, many of these water mains are laid through stormwater drains and are therefore at a higher risk of damage and deterioration, resulting in leakage and reduced pressure and flow to customers. A recent Water Loss Audit identified losses of 47.5% in the City Core.

WASTEWATER

Wastewater from the City Core is conveyed to Babesa Wastewater Treatment Plant (WWTP) with a similar discharge volume to the potable demand. The local sewer networks discharge to the primary trunk sewer main which runs along Wangchhu Lam / Doebum Lam. Babesa WWTP accepts blackwater and greywater (unlike some other WWTPs in Thimphu), however some greywater discharge to the stormwater system still exists. In other cases, stormwater drains are connected to the wastewater sewers. Some properties (<10%) are on septic tanks.

STORMWATER

Stormwater runoff in the City Core is collected by a network of open and closed drains which ultimately discharge to the Wangchhu. Several natural watercourses run west-east through the City Core, however, most of these are culverted through urban areas. Power, communications and water mains are often laid through stormwater drains which reduce their capacity. There are no notable Sustainable Drainage Systems (SuDS) within the City Core which results in poor stormwater quality.

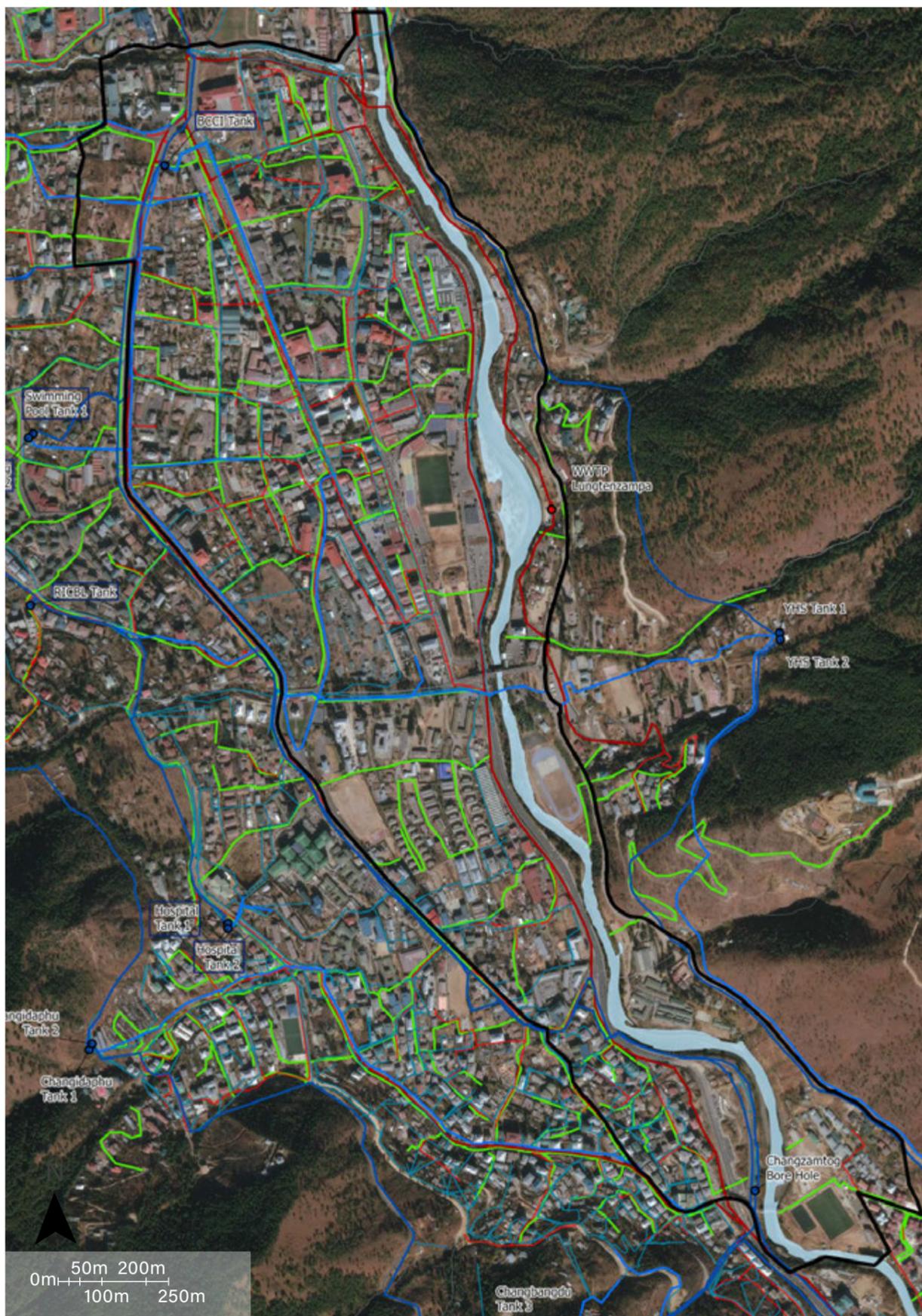


Figure 6.50 Water Infrastructure current conditions

- KEY
- City Core Action Plan Boundary
 - Water**
 - Service tanks
 - Tanks serving City Core
 - Water trunk supply mains
 - Water trunk distribution mains
 - Local distribution mains
 - Wastewater**
 - Wastewater treatment plant
 - Sewer trunk mains
 - Local sewer mains
 - Stormwater**
 - Water bodies
 - Stormwater drains



Figure 6.53 BCCI Tank Overflowing (From Water Loss Audit)



Figure 6.56 Leakage Repair Before/After (From Water Loss Audit)



Figure 6.51 Existing Stormwater Culvert



Figure 6.54 Utilities Laid in Stormwater Drain



Figure 6.52 Utilities laid through Stormwater Culvert



Figure 6.55 Concrete Channel - Unmaintained and Multiple Utilities

6.1.11 Utilities

ENERGY, TELECOMS AND WASTE

Additional utilities – telecoms, energy and waste services – serve the City Core area. These services have expanded to match population growth, and will expand further to accommodate higher density and new land uses in the City Core. Increased demand on the telecoms network is expected as Thimphu grows its service and information economy. A transition towards electric vehicles will increase electricity demand within the city centre.

Key energy generation and waste management sites are located outside the City Core. However, new opportunities around distribution networks can be explored to improve robustness, resilience and efficiency of utility services. Combined underground utility ducts will rationalize access and maintenance for key infrastructures. Burying infrastructure – and developing secondary or alternative corridors – increases resilience against natural hazards. Underground networks also minimize aesthetic impacts and protect sight lines, respecting the unique cultural and visual landscape.

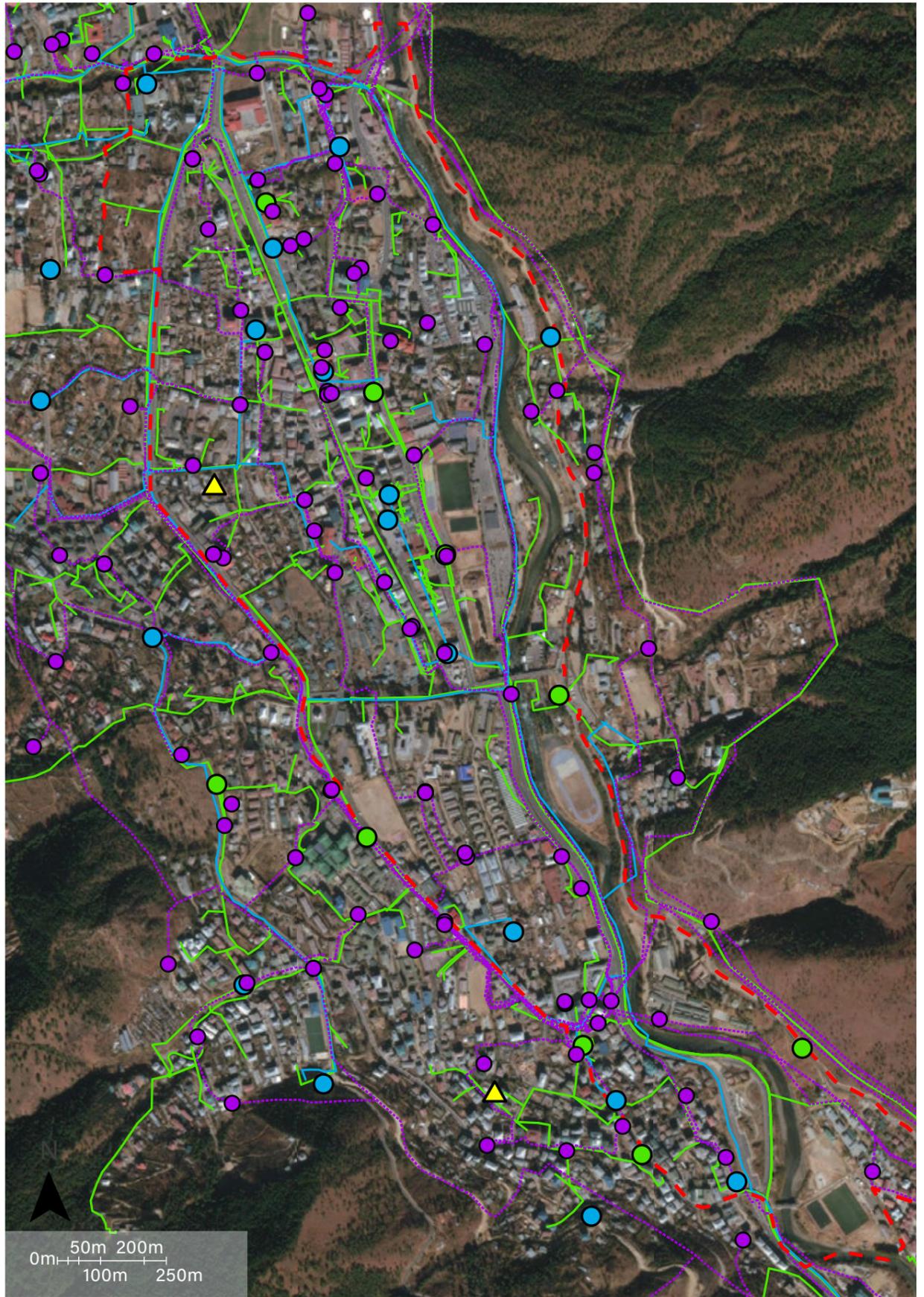


Figure 6.57 Existing utilities infrastructure

- KEY
- City Core Action Plan Boundary
 - Energy
 - Electricity transformers
 - Electricity lines
 - Telecoms
 - Bhutan Telecom poles
 - Bhutan Telecom fibre
 - Tashicell poles
 - Tashicell fibre
 - Waste
 - ▲ Waste drop off centre

ENERGY

The City Core is densely populated with a cluster of commercial, residential and public buildings that consume a large share of electricity consumption. The majority of electricity usage is consumed for space heating (in the cold season), cooking, generating hot water, and lighting in residential buildings; and lighting and space heating in public and commercial buildings.

Partially due to a lack of regulation around building insulation, many buildings are poorly insulated. Electric heating appliances put a strain on the grid during the dry season, when electricity production is insufficient at national level.

There is a lack of a promising alternative source of energy to properly minimise electricity consumption in the sectors. Electric heating appliances, which are the most popular method of space heating, place strain on the grid during the dry season when electricity production is insufficient at national level. This deficit in power generation leads to further reliance on imported power from India.

Electricity demand for space heating often records two main peak demands, in the early mornings and evenings. This requirement may put stress on the network grid and cause curtailments in the future when the electricity appliances growth. The overhead electricity distribution network faces a risk of flood damage.

At the city-scale, the energy supply system cannot be said to be resilient. Bhutan suffers from a power deficit and reliance on electricity imports from India to meet seasonal peak demand. An electricity network that relies on an overhead distribution network also faces risks from natural hazards, including flood damage.

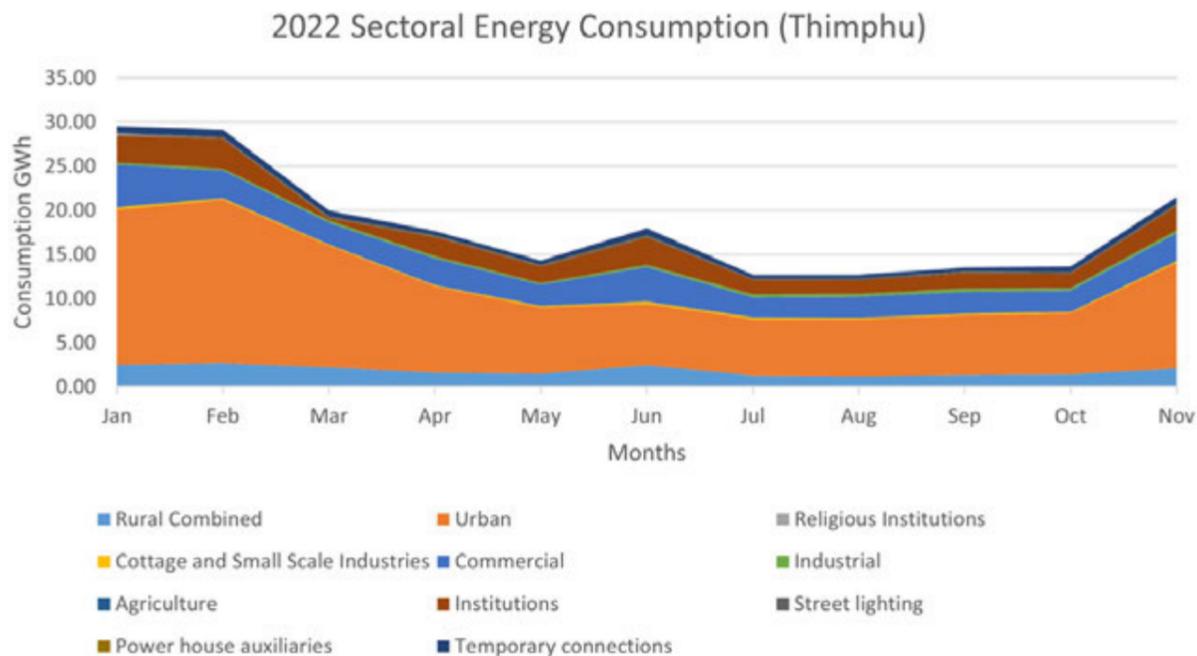


Figure 6.58 Energy consumption sector by sector for Thimphu.

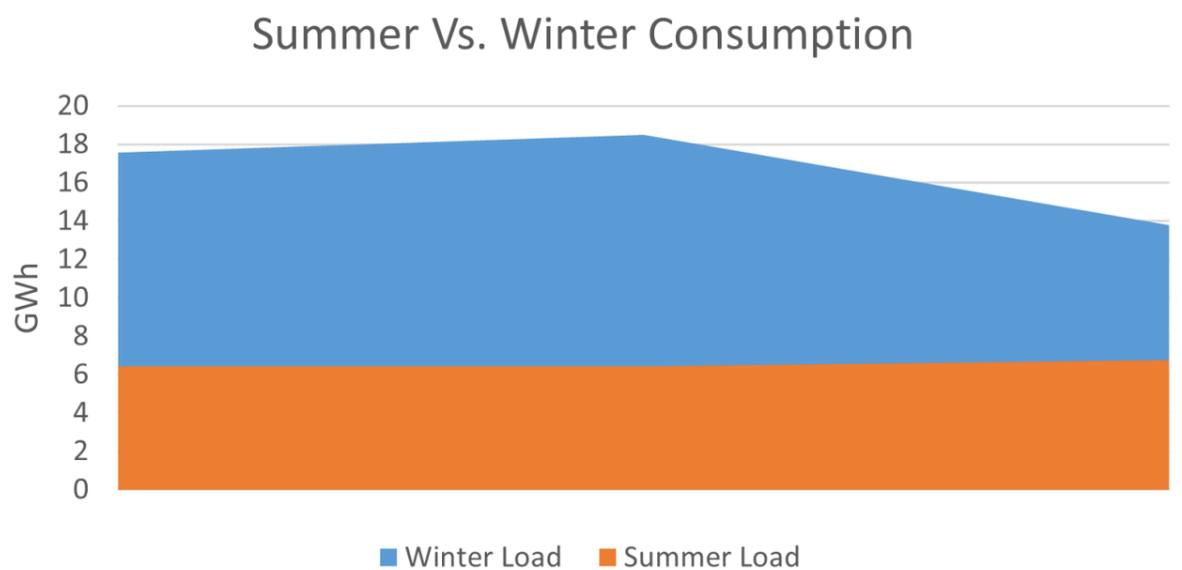


Figure 6.59 Winter Space Heating Load Vs. Minimum Summer Load.

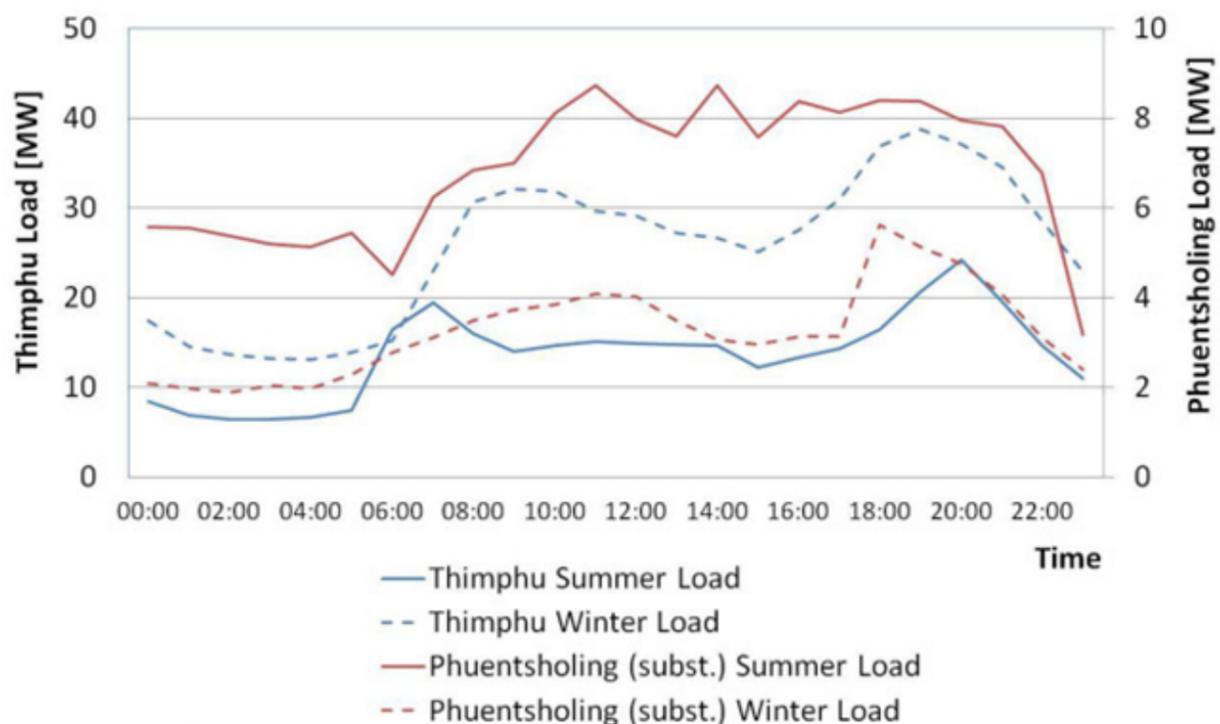


Figure 6.60 Typical daily load curves from different regions of Bhutan.

TELECOMS

The current internet access is primarily reliant on the mobile networks rather than the fixed network.

Fixed Network

This service is primarily provided by Bhutan Telecoms (BT). Access/wayleave and the last-mile implementation to get cabling laid in the ground have proved to be difficult. It has been proposed that the authority would be better placed to coordinate Right of Way field implementation.

The authority expressed they have installed duct infrastructure in the past. This was not adequately utilised due to:

- Inadequate coordination with providers.
- Loss of infrastructure during natural disasters.
- Poor separation and designation of infrastructure for diverse services including telecommunications and electrical cabling.
- The authority also commented that some of the installed duct infrastructures were not able to be located since there was a lack of records.

Mobile Network

BT and TashiCell expressed the need for expanding their existing mobile network infrastructure to accommodate growing market demand. Their current approach to the deployment of infrastructure includes:

- Use of dedicated infrastructure.
- Sharing infrastructure between themselves.
- Use of 3rd party infrastructure.

BT and TashiCell shared the key constraints with expanding the existing mobile network infrastructure which were as follows:

- Space for installation of new masts.
- Negative impact on the visual landscape.
- Concerns raised by citizens about electromagnetic emissions from mobile infrastructure installations.

Fixed connections to mobile network sites are largely via overhead cable lines. However, overhead lines are being replaced by underground infrastructure. The fixed connections for TashiCell's mobile sites in Thimphu have been replaced by underground infrastructure.

For both the fixed network and mobile network, constraints around telecommunications installation within the City Core relate to restrictions on space, aesthetics and potential impact on sight lines, and the public's safety perception of telecommunication equipment, which can be particularly acute in the City Core where there is a high demand for services and infrastructure provision.

WASTE

Waste Generation

Organic waste makes up a significant proportion of waste and poses an opportunity for diverting waste from landfill. The recyclable fraction of the dry waste does not appear to be segregated at source and should be addressed.

Waste Collection

In Thimphu, there are neighbourhoods serviced by waste collection trucks but it is not widespread. The trucks do not allow for waste segregation.

Waste Drop-off Hubs

Around 10 waste collection hubs (drop off centres) have been provided in Thimphu however there is only 1 no. hub within the City Core. More will be needed to facilitate waste segregation. The scale of these hubs may need to be altered for the City Core scale.



Figure 6.62 Example of waste collection in Thimphu.



Figure 6.61 Waste collection hub with waste segregation (wet, household/hazardous, other, dry).

6.1.12 National Assets

NATURAL FEATURES AND HERITAGE

- There are significant national assets, both built and natural, present in and around the City Core. These existing assets and proposed improvements from the Thimphu Structure plan as well as other ongoing initiatives form the 'setting' for the City Core.
- The ambition to significantly improve the public transport, pedestrian and cycle infrastructure provide the foundations for a well connected City Core.
- The Wangchhu, a stunning natural asset runs through the heart of the city.
- The Central Farmers Market, National Stadium, archery grounds, Centenary Park, and Athletic track have the potential to become a continuous sequence of high-quality, multifunctional open spaces with pedestrian priority connections along the river. These form the Wangchhu Gardens.
- To the north, the Tashichho Dzong and its expansive setting including protected wetlands, Ludrong Memorial Gardens, the Royal Thimphu Golf Course, the crematorium and under construction Rhododendron Gardens and Happiness Gardens is one of the most important sites in the country.
- The ongoing Tashichho Dzong Gardens project presents an opportunity to deliver a significant Royal Park in the heart of the city, as a multi-functional public space and setting for the Dzong. This works in conjunction with the other landscape protection and enhancement proposals around the river and its tributaries.
- To the south, the proposals for Changzamtog Park will form a new community asset for the surrounding neighbourhoods of Changzamtog and Chanjiji.
- The eastern side of the core has a steep topography with beautiful forested hillsides.
- To the west are existing communities that can have the potential to be intensified and better serviced.



Figure 6.63 Tashichho Dzong Gardens



Figure 6.66 Tashichho Dzong and its setting



Figure 6.65 Setting of the City Core



Figure 6.64 Chubbar Chu Valley Park

KEY

- City Core Action Plan Boundary
- City Core Context boundary
- Public open space
- Public open space (under construction)
- Heritage landscape
- River and streams
- River 30m buffer
- Private open space
- Sports pitches
- Markets
- Clock Tower Square
- Heritage bridge
- Heritage trail
- Main heritage site
- Lhakhang
- Chorten
- Flood zone
- Eastern hillsides
- Emerging River Gardens
- Landscape links to north and south

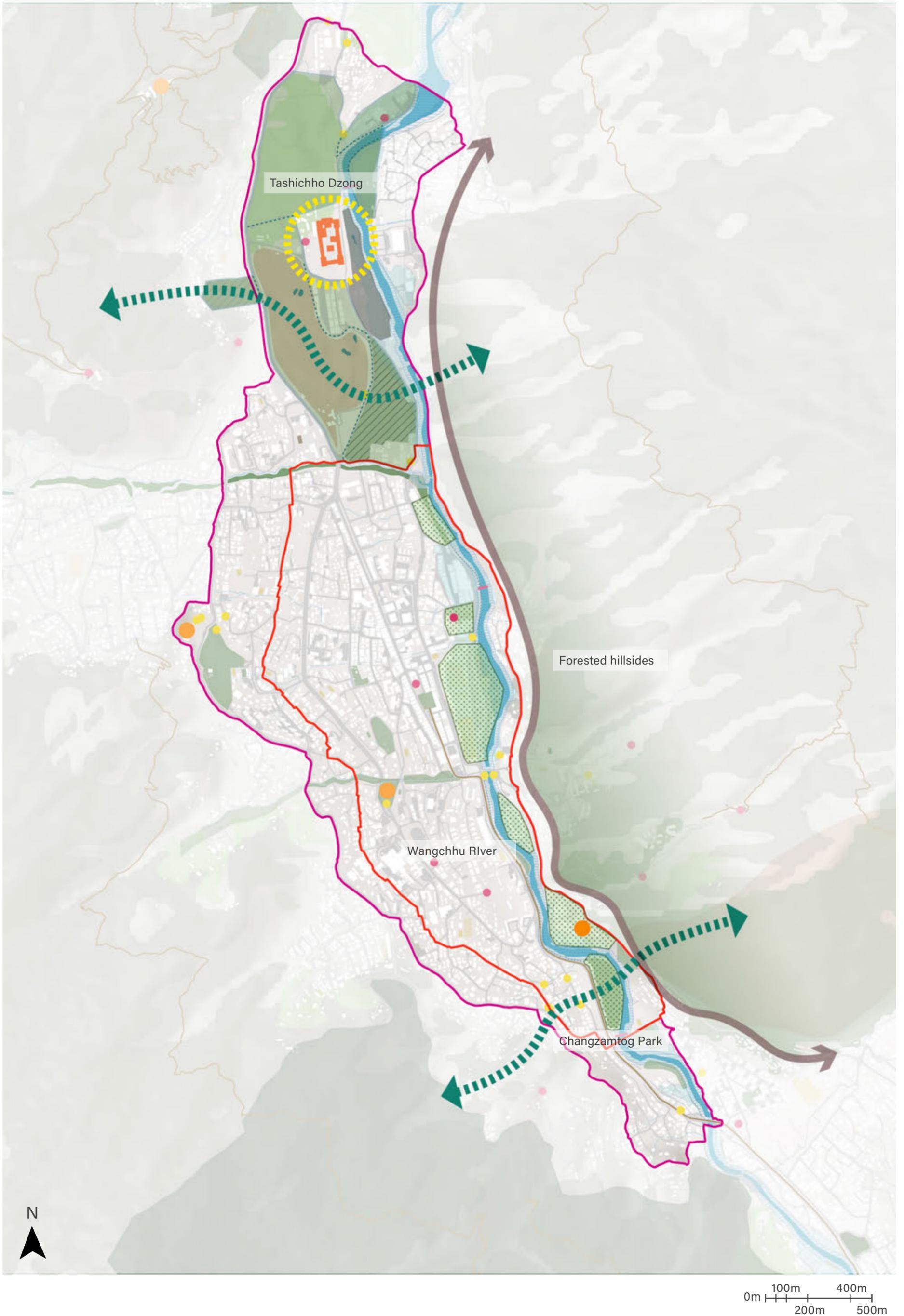


Figure 6.67 The setting of the City Core

6.1.13 Heritage assets

HERITAGE AND VIEWS

- There are several heritage assets within the City Core including some nationally significant assets. The lhakhangs, chortens and water have a relationship that can be better revealed.
- The setting of some of these assets is currently compromised. There is a potential to integrate them with the green and blue networks and to make them a part of the pedestrian experience and way finding tools within the city.
- There is a natural order and system for the location of these heritage assets as they form key view corridors across the city. Some of these corridors are already compromised and obstructed by the built form.
- The Druk Wangditse Lhakhang is an important visual marker in the city and Norzin Lam is orientated to form a view axis to the Lhakhang.
- The traditional bridge at the Central Farmers Market forms a key crossing point, a visual focus and allows for important views along the river corridors.
- The Memorial Chorten is a visual and active 'focus' within the City Core and can be placed more centrally within an extended core.



Figure 6.69 Compromised setting of Zangdo Peri Lhakhang



Figure 6.68 Wangchhu traditional bridge connecting Kaja Throm to the Riverside Crafts Market



Figure 6.73 The Memorial Chorten hidden behind the red roofs



Figure 6.70 View towards Buddha Dordenma from the bridge to the right



Figure 6.71 The 'tree chorten' marking the view to Wangditse Lhakhang

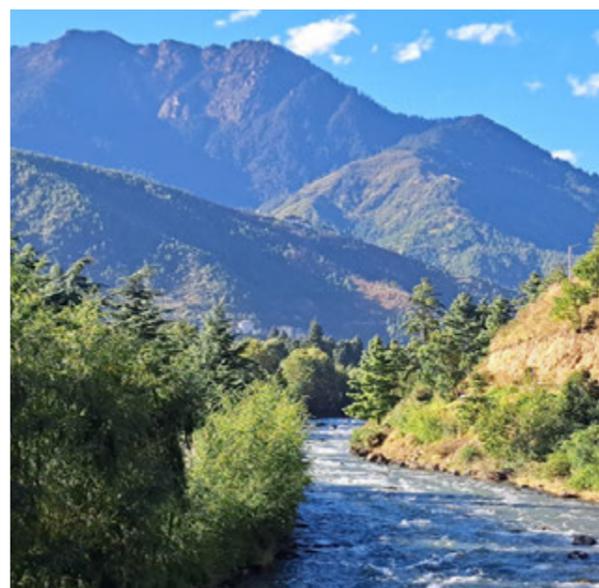


Figure 6.72 View towards Druk Wangditse from the bridge to the left

KEY

- City Core Action Plan Boundary
- City Core Context boundary
- B Significant heritage asset
- Lhakhang
- Chorten
- Other
- Bridges- Traditional
- Compromised Setting
- View Corridors

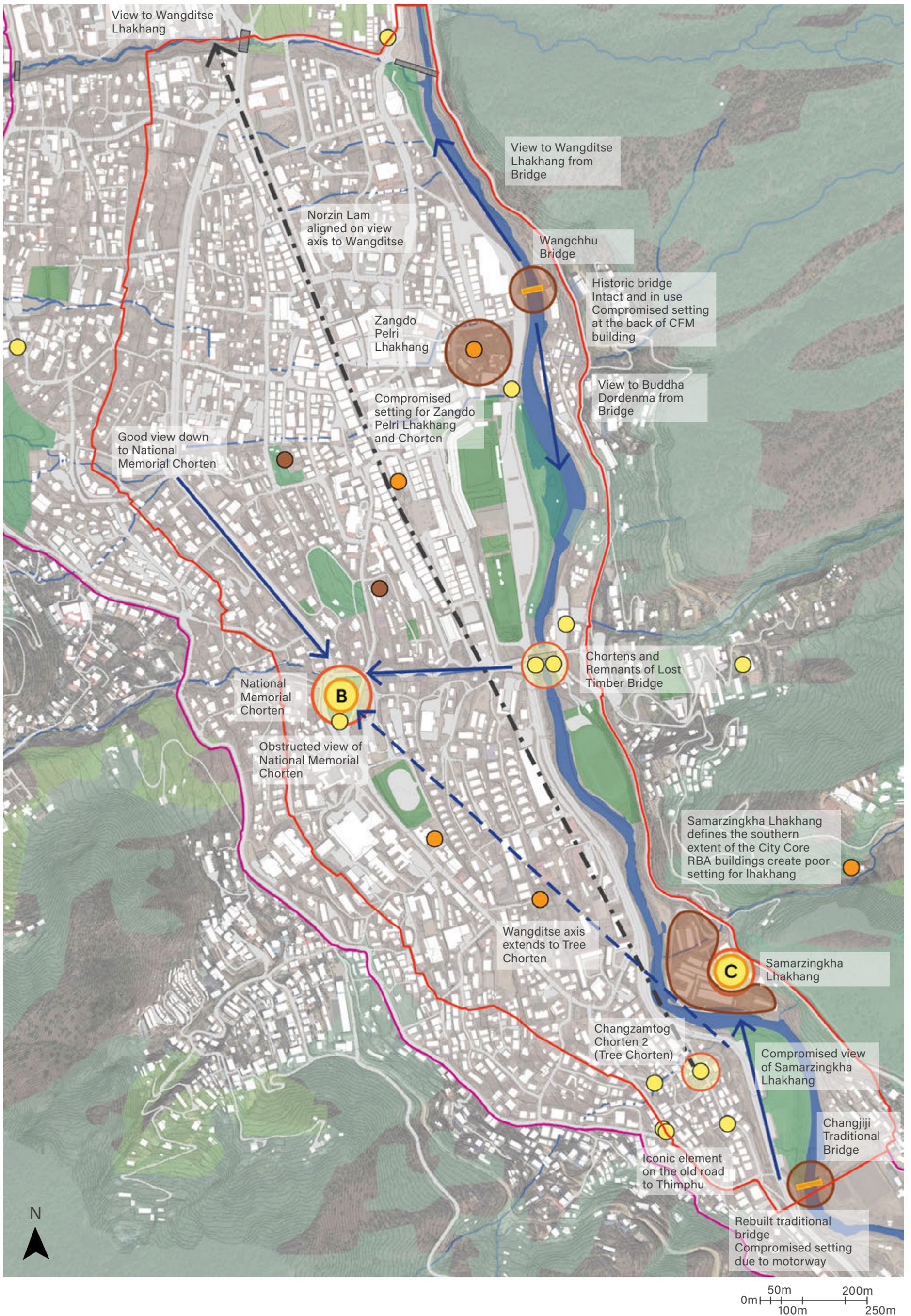


Figure 6.74 Heritage, views and settings

6.1.14 Cultural assets in the Core

NORZIN LAM AND CLOCK TOWER

- Norzin Lam is the main street of the city and is the hub of activity. It has a concentration of retail, restaurants, hospitality, workspace and entertainment areas that provide a mixed use central street.
- Clock Tower Square is the primary public space in the city and is one of the focal points both for special events as well as day to day leisure activities.



Figure 6.76 Norzin Lam



Figure 6.75 Clock Tower Square

STADIUM AND CENTENARY PARKS

- The Stadium, Archery grounds and Centenary Park are the primary recreation areas within the city.
- Nestled between the river and the vibrant commercial areas of the core, they have the potential to be a very special place with a mix of activated and quieter spaces.
- They further can be connected to the surrounding landscape assets such as the Athletic track and the Royal Parks to the north.



Figure 6.78 Stadium



Figure 6.77 Archery Grounds

KAJA TROM AND TEXTILE MARKETS

- The City Core has a variety of interesting markets that add a lot of vitality.
- The Kaja Throm is a recent initiative with vegetable markets, food stalls and a children's park area that became a huge success.
- The crafts market on the eastern side of the river is an important element within the larger markets offer.
- The handicrafts market along the north section of Norzin Lam attracts a lot of visitors as well.
- These markets have the potential to cluster together to form a coherent market quarter.



Figure 6.80 Kaja Throm



Figure 6.79 Craft markets

TEXTILE MUSEUM, CENTRE FOR PERFORMING ARTS AND CITY CINEMA

- The textile museum is an important venue during special occasions such as the Tshechu and also is an important institution in the core.
- The Centre for Performing Arts next to the Royal Parks, the VAST school and the city cinema are all in close proximity.
- These have the potential to cluster together to form a meaningful cultural district within the City Core.



Figure 6.82 Textile Museum



Figure 6.81 VAST

NATIONAL MEMORIAL CHORTEN

- The National Memorial and the 108 steps is a cultural landmark in the centre of the city.
- This has the potential to be an important pedestrian route that connects to the River parks network.



Figure 6.84 National Memorial



Figure 6.83 108 steps

VIBRANT NIGHTLIFE

- Thimphu has a vibrant night life and music scene that should be built upon further.
- Places like Mojo Park are busy everyday as people gather after work to relax and enjoy the atmosphere.



Figure 6.85 Night time economy



6.1.15 Activity in the City Core

UNDERSTANDING ACTIVITY PATTERNS

This section starts mapping out the existing activity patterns in the City Core. This was done in collaboration with the Ministry team based on the information and narrative they provided. This starts to provide a story of the daily and weekly life of the city. This helps in understanding the existing clustering that can be enhanced and identify gaps and challenges that can be addressed.

WEEKDAY - 6:00 AM- 10:30 AM

Thimphu city opens with early travellers leaving the city by gathering at RSTA bus booking (near Lungten Zampa), where they get some morning snacks at 5-6 a.m. in the morning (famous Bhutanese rice porridge with bone pieces/cheese). There are also vehicles loading or unloading goods for the Central Farmers Market and shops along the Norzin Lam, as the heavy vehicles are not allowed to enter the city from 08:00AM - 09:30AM. The CFM parking gets crowded with Boleros (Medium Good Vehicles) in the mornings as they bring vegetables and fruits to sell both at wholesale and retail. The street cleaners also get to work early in the morning before the peak hours with their brooms.

Few people would be seen jogging early in the morning along the Wangchhu, the BOC ground and Doebum Lam. There are also people circumambulating the Memorial chorten early in the morning right after dawn.

Gradually, the roads within the city is used by parents dropping their children to schools located within the City Core and other schools nearby. This is followed by government, private, corporation and institution employees commuting to work around 8:00AM-9:00AM during the weekdays. While some of them move across the City Core to workplaces located in different directions, some of them stop at the City Core as most of the institutional establishments such as MoIT, RBP, Royal Textile, MoICE, banks etc. are located within the City Core.

The banks, Thimphu Court of Justice and RICBL (Royal Insurance Corporation of Bhutan) would experience more number of people availing their services.

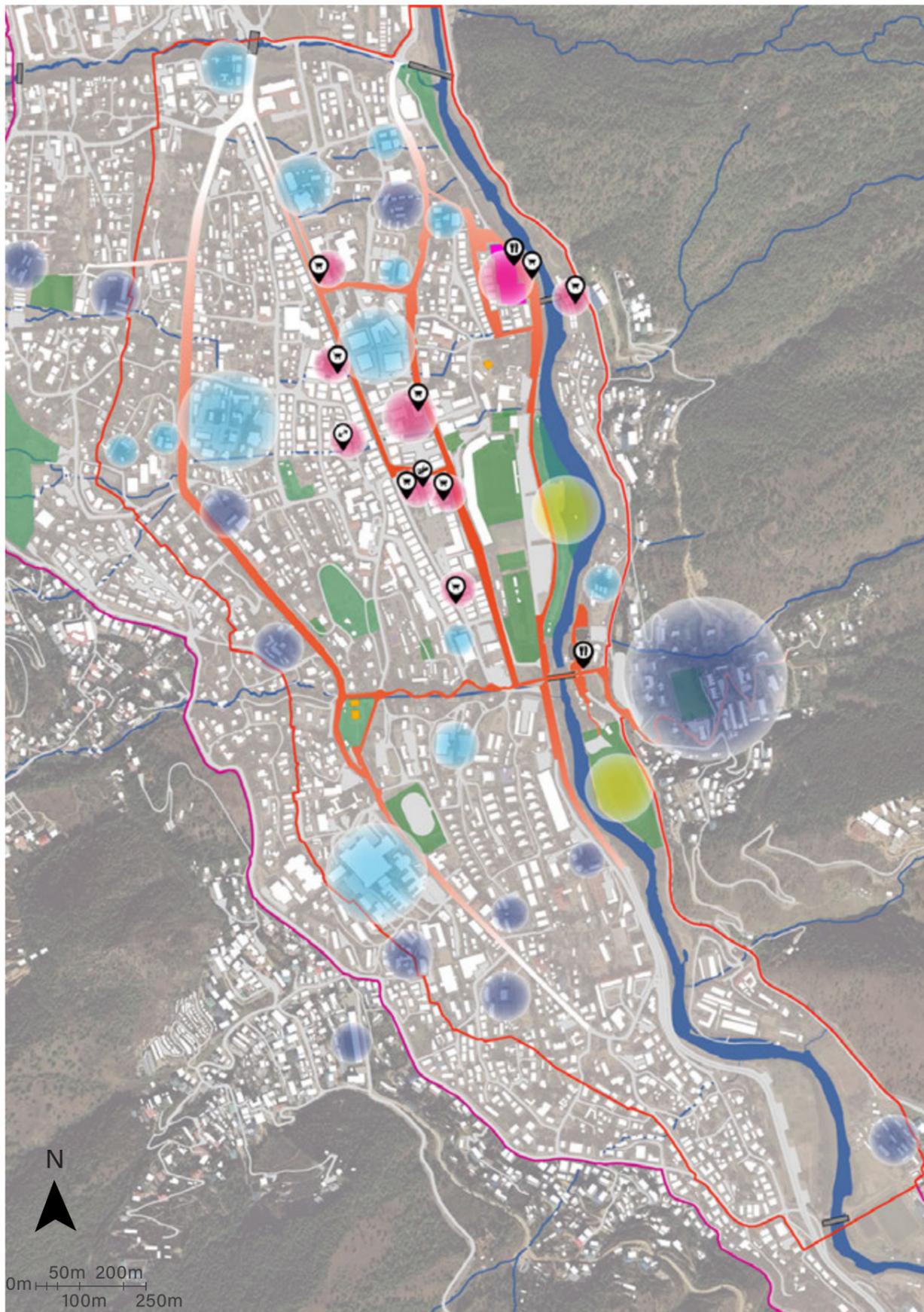


Figure 6.86 Weekday- Morning activity mapping

- KEY
- City Core Action Plan Boundary
 - City Core Context boundary
 - Workplace clusters
 - Education clusters
 - Shopping clusters
 - Sports and Recreation Cluster
 - Travel clusters
 - Active Streets
 - Religious sites

WEEKDAY - 11:00 AM- 3 PM

Around 8-11 a.m. in the morning, the retail shops within the city open. The City Core especially along the Changlam and Norzin Lam attracts many pedestrians visiting restaurants and cafés for lunch including the office goers. The younger generation who are on vacation or completed high school would congregate at the clock tower to meet their friends. Some are spotted making TikTok videos or practising dance for competitions as well. The office employees would use the remaining time of their lunch break to visit the nearby shops for some dessert (doma) or to strike off some items from their household shopping list.

The national archery ground is a popular spot for the elder generation, who come to engage in friendly competitions and shoot-out with friends. The sound of arrows hitting their targets echoes through the park, as the seniors enjoy the camaraderie and the thrill of the game.

Some of the religious spots such as the Zangdopelri near CFM, Chorten and Deyma Lhakhang near Thai Temple would be occupied by the elderly and their escorts to circumambulate or offer butter lamps. The peaceful atmosphere and the chance to connect with their spiritual beliefs provide a nice contrast to the hustle and bustle of the city.

Some small children's would be spotted at the Coronation Park making sand castles or playing swing and slides. These are especially children who have a parent staying at home or are accompanied by their grandparents or sitters.

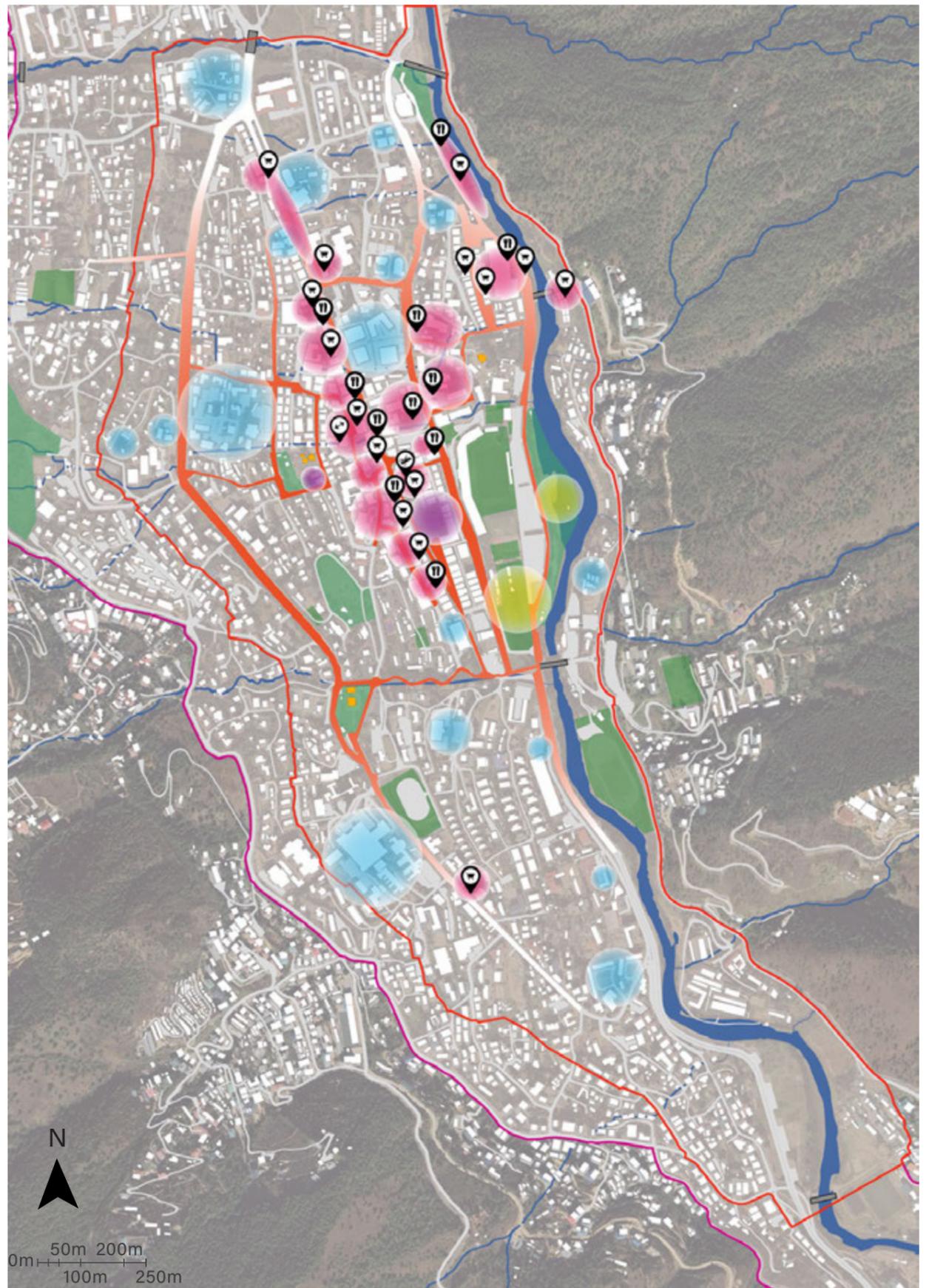


Figure 6.87 Weekday- Afternoon activity mapping

- KEY
- ▭ City Core Action Plan Boundary
 - ▭ City Core Context boundary
 - Workplace clusters
 - Education clusters
 - Shopping clusters
 - Sports and Recreation Cluster
 - Entertainment clusters
 - Active Streets
 - Religious sites

WEEKDAY- AFTER 5PM

Around 5:00PM, with the closing of the offices, some congestion of cars would be observed along the roads in the city. There would also be many pedestrians walking towards the taxi rank and bus station to travel to their homes. Some would have coffee or evening snacks in the nearby cafés or restaurants with their colleagues and friends. It is also a period where people would come shopping in the City Core before heading towards their homes.

The Changlimithang playgrounds would also get busier with football and other sports. The fuel depot near the RBP colony gate and near the Department of Tourism would also see cars queued up for fuel refills.

As people attempt to leave the city centre for their homes, there is also influx of people with dinner or entertainment commitments with their friends and families.

Especially on Friday later in the evening, people begin to gather along the bustling streets of Chang Lam. The air is filled with the sounds of chatter and laughter as friends and strangers alike come out to enjoy the nightlife.

As they walk along the crowded sidewalks, they pass by a variety of bars and clubs, each offering something different to the party-goers. Some opt for a more laid-back atmosphere, choosing to grab a drink and catch up with friends at a casual bar. Others are looking for a more lively experience and head to a club, where the music is loud and the dance floor is packed (Viva and Space34).

People are dressed in their finest attire, looking to let loose and have a good time.

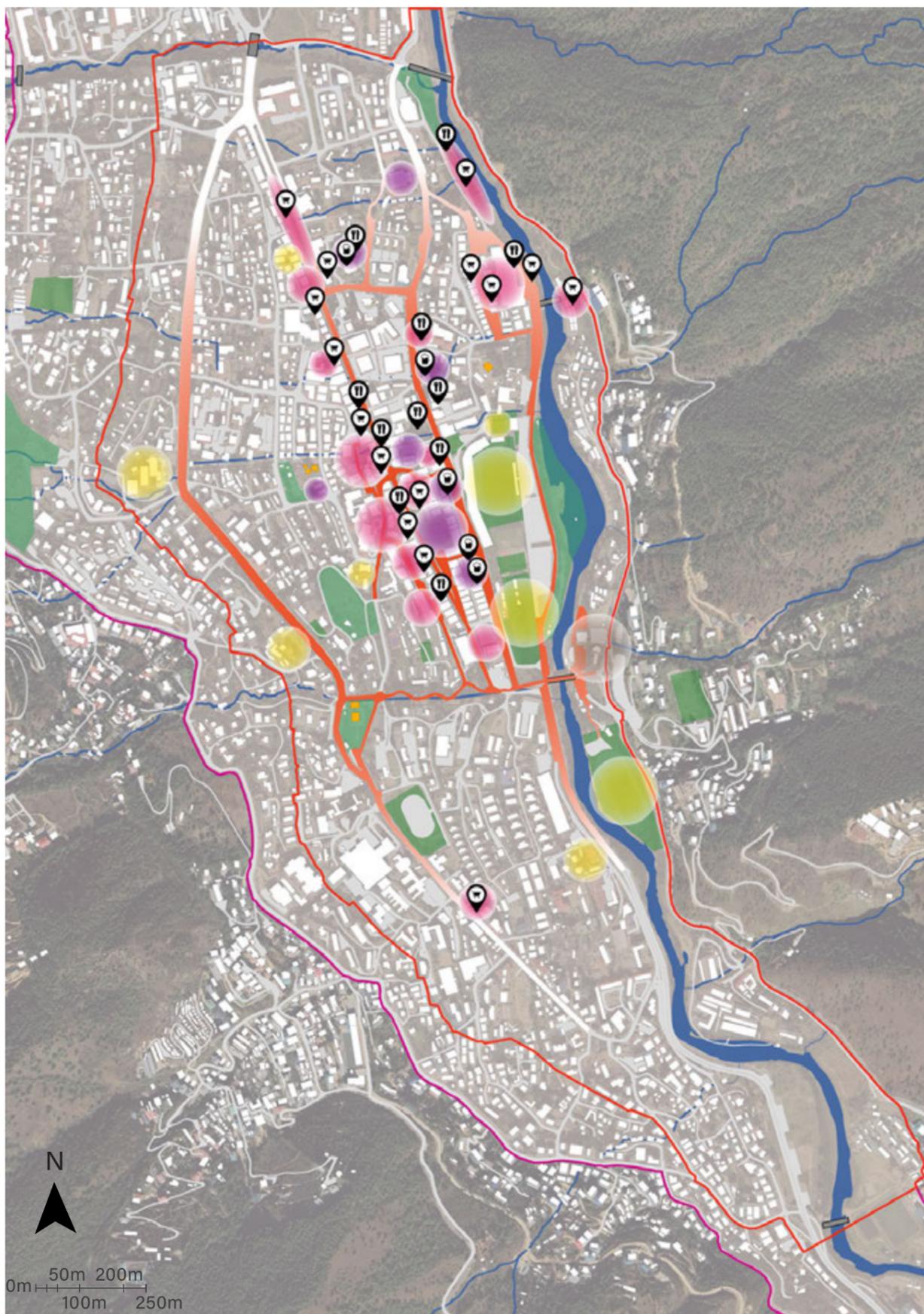


Figure 6.88 Weekday- Evening activity mapping

- KEY
- City Core Action Plan Boundary
 - City Core Context boundary
 - Workplace clusters
 - Education clusters
 - Shopping clusters
 - Sports and Recreation Cluster
 - Entertainment cluster
 - Travel clusters
 - Active Streets
 - Religious sites

WEEKEND- DAYTIME

The city of Thimphu, the capital of Bhutan, is usually bustling with activity during the weekdays as government officials and business people go about their daily routines. But on weekends, the city takes on a different character with travellers making their way to various destinations around the country at the bus booking counters. Vendors set up shop selling delicious momos and rice porridge, a popular Bhutanese delicacy.

As the sun rises on a typical weekend morning, the streets are relatively quiet, with only a few joggers making their way along the Memorial Chorten trail to Lungten Zampa. Residents rush to buy fresh vegetables and fruits on weekend morning to the CFM or the Kaja Throm. Most low and middle income families also buy groceries and meat from the retail outlets near the CFM as prices tend to be lower and more competitive compared to shops located elsewhere.

As the afternoon approaches, the city's parks and playgrounds come to life as children and their parents gather to play and enjoy the beautiful weather. In particular, the Centenary Park is a popular spot for families to spend their weekends, with its playgrounds, picnic areas, and scenic walking trails. Centenary Park is also a popular picnic spot for young families with children. Families either eat packed lunch from home or buy from the canteen in the park or order delivery of junk food. It is also frequented on weekend by young couples.

Parents on weekends also take their children out to the smaller play zones housed in commercial buildings within the City Core. This normally takes place from late morning to early evening.

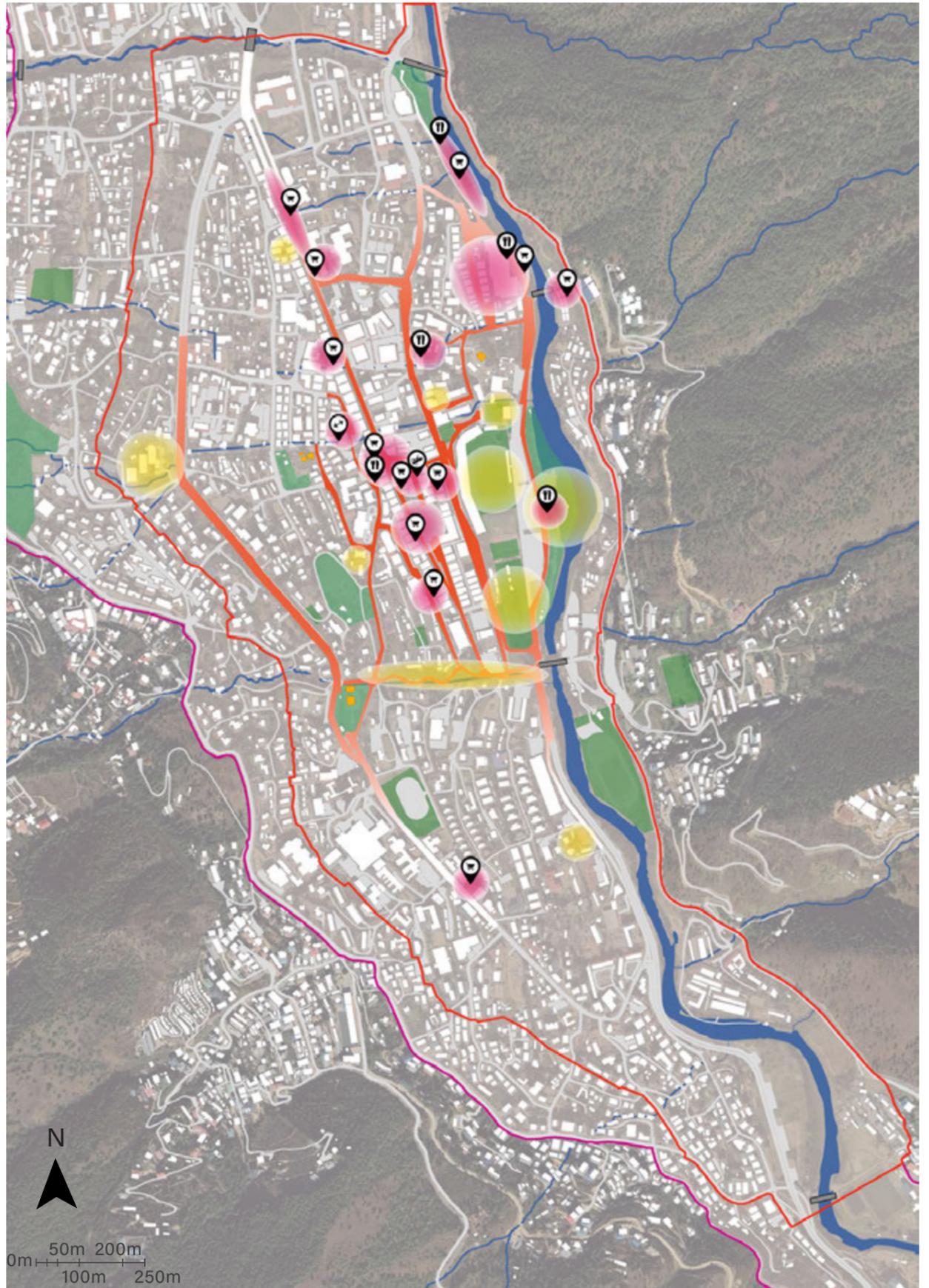


Figure 6.89 Weekend- daytime activity mapping

- KEY
- ▭ City Core Action Plan Boundary
 - ▭ City Core Context boundary
 - Shopping clusters
 - Sports and Recreation Cluster
 - Active Streets
 - Religious sites

WEEKEND- EVENING

As the sun sets over the city, the hustle and bustle of the streets continue with bars and restaurants opening their doors to customers. The city is alive with the sound of chatter and laughter as people search for the perfect spot to unwind after a long week of work. The Norzin Lam is particularly busy, with many young people congregating in groups at bars and pubs. The nightlife scene continues to heat up as the evening progresses, with clubs like Mojo Park and Space34 becoming increasingly crowded along the Chang Lam. The streets outside karaoke bars and clubs will be filled with vendors selling delicious street food such as momos, fried rice, and rice porridge, as people gather. It is a vibrant and exciting scene that truly comes to life as the night goes on.

The City Core has concentrated activity in and around Norzin Lam and Chang Lam. The activity tapers off as we move away from these streets. They are the epicentre for the nighttime economy as well as the primary retail and restaurants. There are other areas such as the spaces around Doebum Lam that have some existing activity. But they are fairly disconnected from the other activity clusters. The northern part of the core has low activity with only a few clusters of workspaces. Recreation spaces around the river also have the potential to be enhanced and better connected to the bustling City Core.

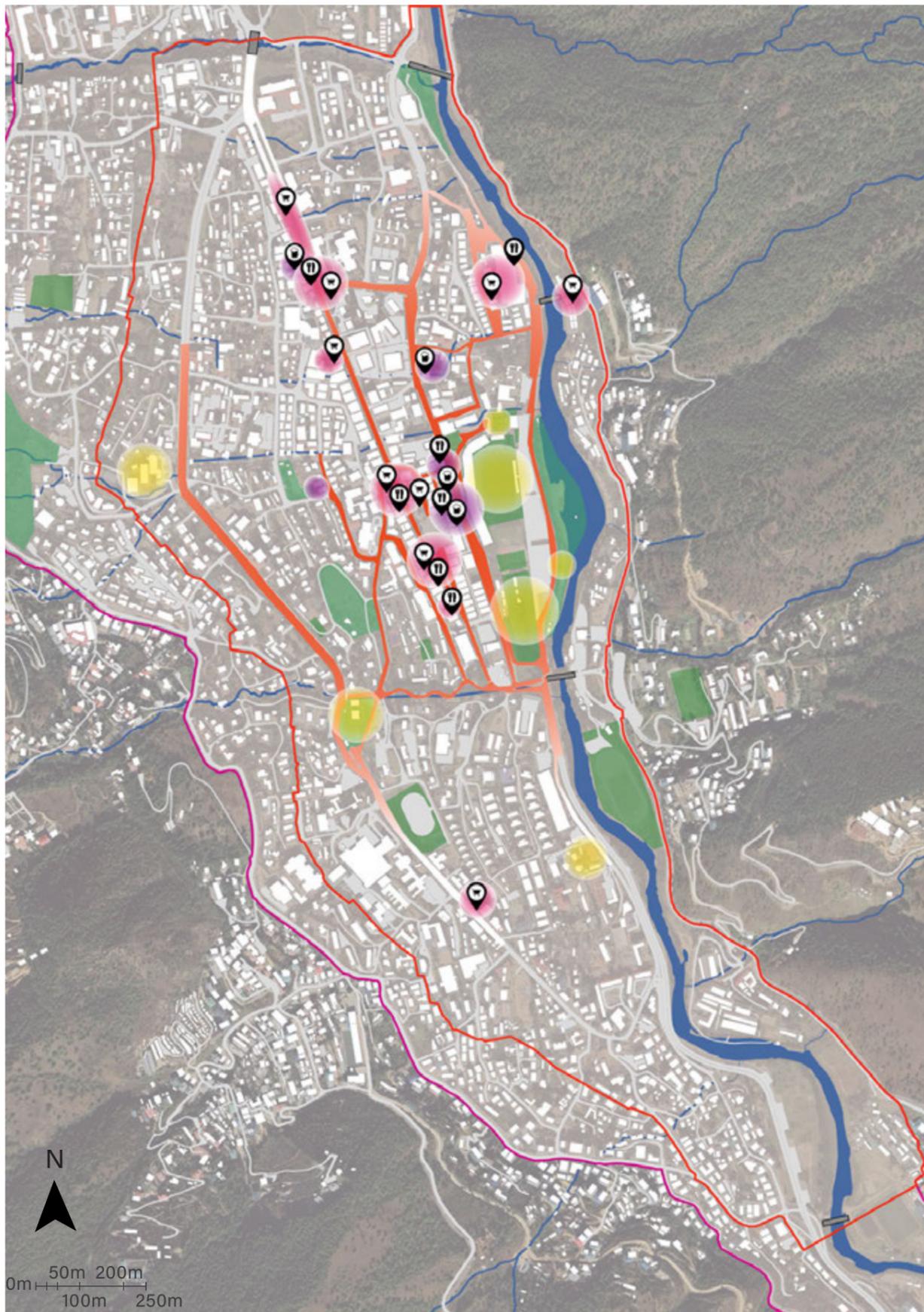


Figure 6.90 Weekend- Evening activity mapping

- KEY
- City Core Action Plan Boundary
 - City Core Context boundary
 - Shopping clusters
 - Sports and Recreation Cluster
 - Entertainment cluster
 - Active Streets
 - Religious sites

Need more information on special days to map out activities and a festival calendar for the city

FESTIVAL DAYS

On National Day, if it is held in Thimphu, people camp overnight with excitement and anticipation for the celebrations ahead at the Changlingmithang National Stadium. As the sun rises, the traditional Bhutanese dresses worn by men and women alike start to fill the stadium, adding to the festive atmosphere. The main event of the day is the parade, which begins with a grand procession of the King, the Queen, and other dignitaries, who are greeted by the crowd with cheers and applause. It is followed by Marchang offering and other offerings to the local deity. Then, His Majesty the King addresses the nation regarding the country's situation. It is followed by local artists and entertainers performing for the audience, showcasing the country's rich cultural heritage and its continued strive for peace and prosperity. It is a day when the people of Bhutan come together to celebrate their nation and its accomplishments and to look forward to a bright future. As the day ends, the program concludes with a national lucky draw with good prizes.

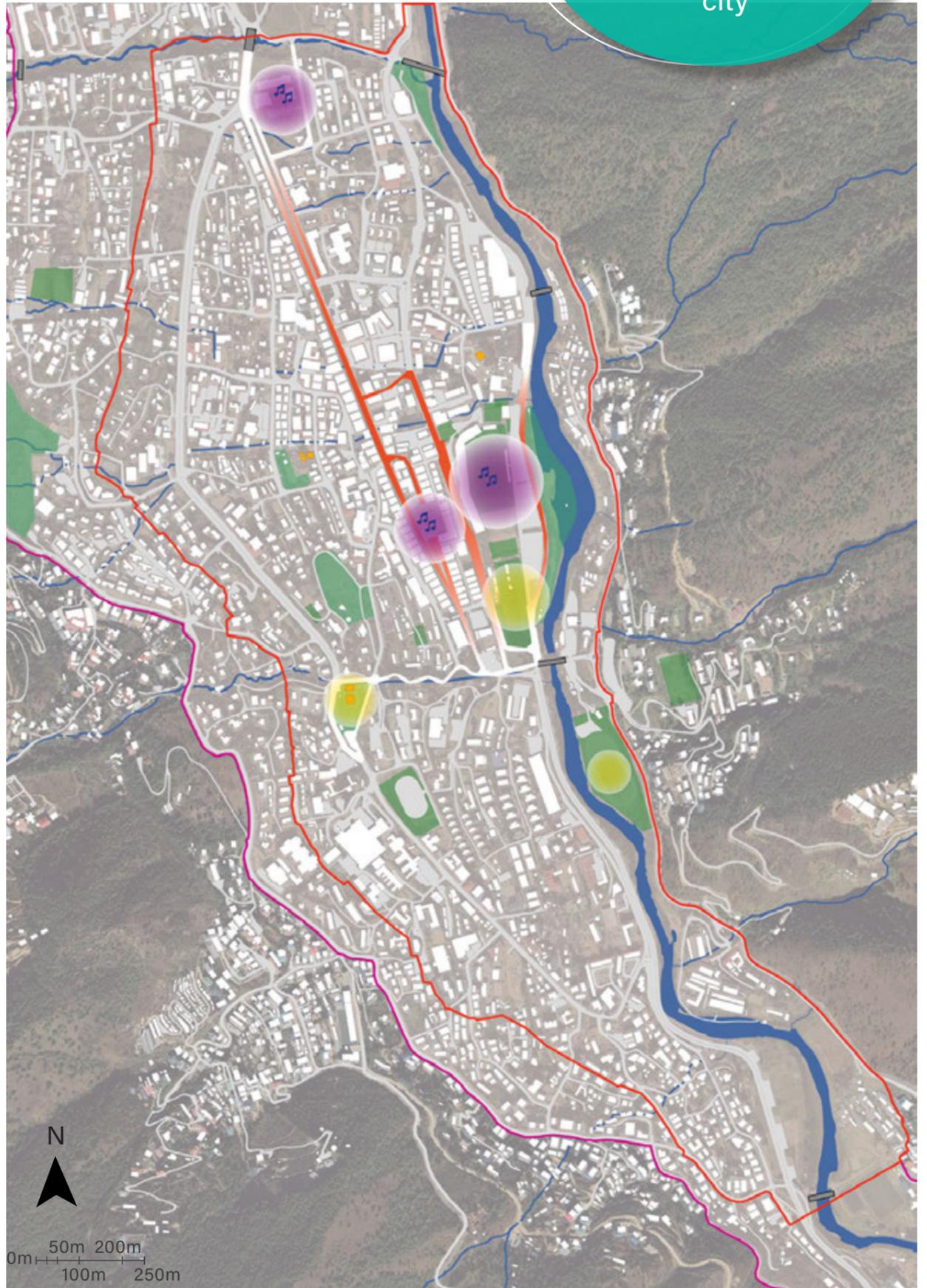


Figure 6.91 Festival day activity mapping

- KEY
- ▭ City Core Action Plan Boundary
 - ▭ City Core Context boundary
 - Sports and Recreation Cluster
 - Entertainment cluster
 - Active Streets
 - Religious sites

Ch.07

Infrastructure Interdependencies



7.1 Infrastructure interdependencies

INTERDEPENDENCIES - TRANSPORT

Resilience

- Overreliance on a limited number of travel modes, nodes or links reduces the transport network's resilience to disruptions from natural hazards or other unexpected events.
- A diverse transport network with an appropriate balance between the various modes – while focused on sustainable transport principles -- provides resilience to the city.

Natural Environment

- New linkages within the City Centre can improve access to natural features
- The proposed greenway along Wangchhu, the link between the Clock Tower and Centenary Park, and the use of Mothithang Chu as a green east-west link will give people access to natural amenities within and near the City Core.

Economy

Pedestrian improvements and car parking reorganisation in the City Core will enhance the access to and attractiveness of businesses (retail, tourism, etc), and enhance its economic viability.

Population

- Improved accessibility between residential areas and City Core employment, education, health, retail and leisure opportunities will lead to more compact and attractive neighbourhoods
- Improved transportation services improve living conditions for the wider population of Thimphu.

Governance

Transport strategies are linked to wider governance objectives to develop a safe, convenient and efficient network that can be implemented and regulated to ensure quality service.

Heritage and culture

- Heritage and cultural elements should be protected during the planning and implementation of transportation projects
- An enhanced transport network will provide the wider population of Thimphu access to heritage and cultural sites.

Social infrastructure

Improved connections to schools, hospitals, and community facilities.

Housing

Improved transport services support the release of sites for housing in areas that are suitable from a sustainable mobility viewpoint.

Utilities

- Poorly planned utility works can compromise existing or proposed transportation infrastructure.
- An open line of communication between the transportation and utilities departments is vital

INTERDEPENDENCIES - GREEN INFRA

The green infrastructure vision for the CCAP has been developed in close collaboration with other technical disciplines, with critical interdependencies explored in detail to ensure integrated project outcomes. The following interdependencies have been identified:

- A successful network of blue-green infrastructure that integrates with the stormwater drainage system can support biodiversity improvement, connect people and nature, and provide public amenity. Considering the extent of hard drainage infrastructure and channelised tributaries across the City Core, there is significant opportunity to introduce nature-based solutions in the form of re-naturalised 'green streams', swales and raingardens. These interventions will help manage runoff flows and associated flood risk, filter and clean the water before it enters the Wangchhu, support aquatic and riparian habitats, and contribute to the health and wellbeing of people who visit, live and work in the City Core.
- Well-managed green infrastructure should be a key component of the proposed active travel network and overall transport masterplan. In addition to increasing dedicated space for pedestrians and cyclists, removing clutter and delivering accessible routes, street tree planting plays a critical role in providing shade, contributing to thermal comfort, improving air quality and connecting habitats.
- Green infrastructure has the potential to contribute to city resilience and support in mitigating hazard risks associated with climate change and pressures caused by rapid urbanisation – in particular, river flooding and landslides. Landscape features can support the future resilience of Thimphu if aligned with disaster and climate risk considerations, and coordinated with broader land use planning.

Resilience

Opportunity for green infrastructure to mitigate hazard risks and contribute to future resilience

Economy

- Job creation
- Revenue-generating opportunities associated with the landscape

Population

Integrated green infrastructure to support the

health and wellbeing of local population

Heritage and culture

- Landscape setting around heritage structures
- Opportunity to re-connect lost heritage trails

Social infrastructure

Green infrastructure as important social infrastructure; provision of open spaces to encourage sport and recreation, engaging with nature and support healthy living

Housing

- Reducing heat and cooling costs
- Increasing property value

Transport

Street greening to support active travel network and deliver connected green infrastructure

Utilities

- Reducing flood risk through increased green spaces and sustainable urban drainage systems (SuDS)
- Reducing potential 'heat island effects' by creating new green spaces within the urban fabric that provide micro-climate cooling

INTERDEPENDENCIES -WATER

Creating green infrastructure and sustainable/natural drainage solutions requires an integrated approach between the Water and Landscape teams. Several areas throughout the city have been identified for enhancing green-blue infrastructure and creating new open spaces for public use. Incorporating sustainable/natural drainage solutions into these areas will treat stormwater runoff from the surrounding urban catchments and improve downstream water quality. The existing stormwater drainage network is dominated by concrete channels which fail to contribute any benefits with regards to water quality or biodiversity. There is a significant opportunity to introduce nature-based solutions in the form of re-naturalised 'green streams,' swales and raingardens which will enhance water quality and biodiversity within the City Core.

An integrated approach to planning utilities will contribute to resilient and reliable power, telecommunications and water networks. Identifying routes prone to natural hazards (e.g., flooding, landslides) and diverting and protecting trunk lines which could be affected is essential to maintaining supplies. Many utility lines are laid through stormwater drains which increases the risk of damage and reduces the conveyance capacity of the drains. These services should be diverted and buried under public roads, ensuring they are adequately protected from accidental damage and accessible for necessary operations and maintenance. To minimise disruption and create construction efficiencies, utility diversions should form part of road and street redevelopments.

Population growth will impact water and wastewater demand, but growth in specific areas will be constrained by the availability of water services. The long-term strategy will provide adequate water supply and wastewater drainage for all properties. However, the programme for the upgrading of treatment plants, pipelines and storage tanks will depend on the phasing of this growth, ensuring that existing properties and customers are not negatively impacted by the additional demands.

Resilience

- The network is unable to meet firefighting demand due to reliability, pipe capacity and fire hydrant availability.
- Trunk mains protected from damage due to natural hazards
- Water supply system can meet demands during periods of reduced yield from streams
- Improvements to stormwater

infrastructure to reduce flood risk to neighbourhoods

Natural Environment

- All wastewater is treated prior to discharge to the environment
- Integrate SuDS features to enhance biodiversity within the city
- Reduce potable demand and water losses to minimise environmental effects on watercourses, particularly during lean season

Population

Direct link between population growth and water demand and wastewater discharge. Networks need to be upgraded / constructed to cater for this demand

Heritage and culture

Improving water quality, and daylighting culverted streams improves the health of local aquatic ecosystems and brings new opportunities to interact with a natural feature that has historically defined the city

Social Infrastructure

Schools and health centres to be adequately served by reliable water supply and wastewater services minimising community health risks

Housing

All new developments to incorporate SuDS measures to reduce surface water runoff rates, potable demand and impacts on water quality

Transport

- New / upgraded transport corridors to incorporate SuDS to reduce and treat stormwater runoff
- To minimise disruption and create construction efficiencies, utility diversions should form part of road and street redevelopments

Utilities

- Existing utilities to be diverted outside of stormwater drains and culverts
- Solid waste management is needed to reduce dumping to both wastewater and stormwater drains

INTERDEPENDENCIES - ENERGY

Energy consumption depends on demand from a multitude of sectors and uses. Because energy feeds into almost every aspect of modern life -- cooking, lighting, heating and cooling -- there are inherent interdependencies where energy is to be used, by what capacity, and where.

Resilience

The energy network is exposed to natural hazards such as landslides and flooding, which may disrupt transmission and could disrupt supply throughout the City Core and across the city

Natural Environment

Optimising the use of indigenous resources for renewable energy production such as solar and wood. In terms of wood resources, an integrated approach with Natural Environment and Energy disciplines may give an idea of how much of heating demand within the City Core can be covered by wood resource.

Population

Population growth prediction in short/medium/long term within the City Core can give the energy team a direction of energy demand so that diversity and magnitude of internal energy generation can be properly aligned.

Governance

A policy framework that uses financial support and taxation can be an effective means of behavioural change, roof-top solar PV, and BER within the City Core. Energy policies can have more appropriate insights by an integrated approach with the Governance discipline.

Social infrastructure

A reliable energy supply is key to ensuring proper function of schools, hospitals, cultural centres and other key social infrastructure.

Housing

- A better understanding of existing and planned housing structures and conditions in the City Core will help to properly evaluate alternative energy usage conditions and electricity production at the point of consumption, including roof-top solar.
- To investigate the most viable electricity consumption alternative in dwellings, energy planning should account for the capacities of the gas grid connection and efficiency grades.

Transport

An increase in private EV ownership is expected to take place within the City Core. An integrated approach with transport planning is required to understand better development strategy of EV vehicle and constraints of charging stations.

Utilities

A shared trenchwork between gas, power, telecoms, and water may reduce the requirements for multiple utilities excavations.

INTERDEPENDENCIES - TELECOMS

The interventions will be developed through an integrated approach with other disciplines. There are two key drivers for the interdependencies:

- Why telecommunication infrastructure will be needed – capturing smart city aspirations and use cases to understand the demand for telecommunication.
- Establishing guiding principles for telecommunication infrastructure provisions.

Resilience

- Coordinating with the geohazard specialists to advise providers on the safe location of infrastructure based on information about areas of high/medium/low risk from natural hazards.
- Use of smart city technology to capture data which could be used to improve disaster management plans.

Natural Environment

Use of smart city technology to capture environmental data which could be used to drive improved air quality and enhance biodiversity.

Economy

Provision of telecoms infrastructure as an enabler for value added industries and digital economy.

Population

Equitable access to information and resources through availability of telecom infrastructure.

Governance

Adherence to the authority's guidelines to facilitate future installation of infrastructure.

Heritage and culture

Respect for heritage and cultural requirements in planning the placement of proposed infrastructure.

Social infrastructure

Facilitate social interaction in public spaces through the deployment of smart city initiatives.

Housing

- Provide digital connectivity to buildings through the expansion of fixed broadband infrastructure which could improve quality of life.
- Consideration for fixed infrastructure distribution in the design of new builds.

INTERDEPENDENCIES - WASTE

Transport

- Enabling smart transport initiatives through digital connectivity and smart city technology.
- Consideration for road works and other transport initiatives in planning infrastructure location and deployment activities.

Utilities

Coordinating with other services to develop resilient utility corridor(s).

Resilience

The City Core will need both a waste collection truck service but also waste drop-off locations that service neighbourhoods and are within walking distance for citizens.

Natural Environment

Improving waste collection facilities to target the increasing trend of littering that has been noted By the Ministry.

Economy

As the economy grows the waste stream will change, for example increasing amounts of electrical waste (e-waste) may be generated and require segregation.

Population

Direct link between population growth and waste generation needs to be considered.

Governance

- The National Waste Management Strategy 2019 noted that there are many agencies at a central and local level that play different roles in waste management but without proper coordination and this has left gaps in the required governance which hampers
- Increased governance is key to regulate polluting industries, particularly the automobile industry which should be encouraged to reduce their environmental impact.

Heritage and culture

The use of single-use plastic materials at cultural events is becoming more common. Restrictions must be put in place and awareness increased as to the impact these materials have on the environment.

Social infrastructure

Waste generated from hospitals and medical centres is increasing annually with no segregation between hazardous (~30%) and non-hazardous/general waste.

Housing

- The reuse of construction waste needs to be prioritised.
- New housing developments need to be designed to facilitate waste segregation by waste collection or have waste drop-off hubs within walking distance to service residents. Planning policy will be needed to support this.

Transport

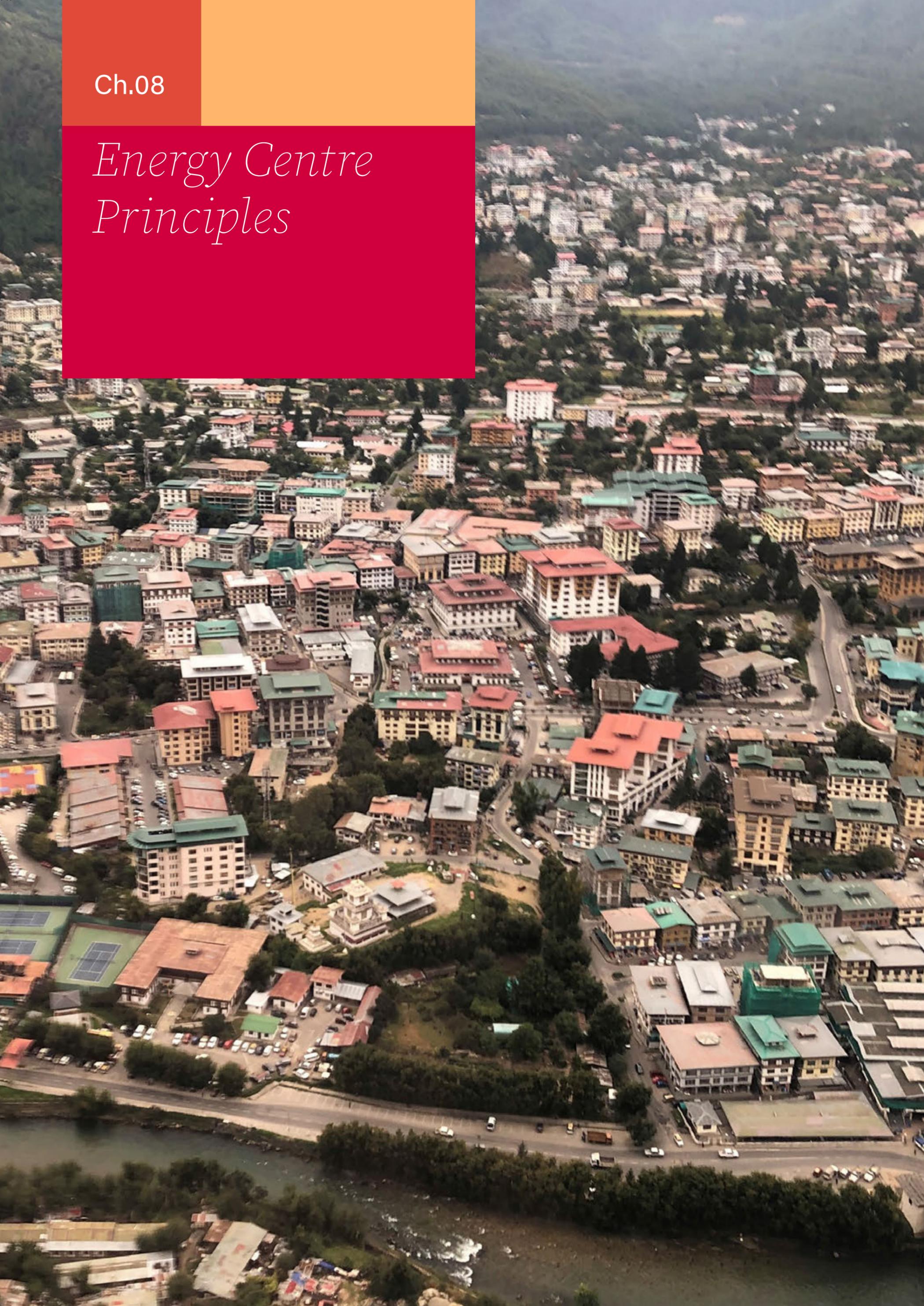
- Waste collection routes to be facilitated as part of future transport planning.
- Transport hubs in the City Core may provide potential locations for repair, reuse and rental hubs for citizens.

Utilities

- An integrated approach is required for managing wastewater sludge (e.g. composting, anaerobic digestors) and potential energy outputs of biogas that can be sold back to the community.
- Dumping of waste impacting stormwater infrastructure and causing blockages.

Ch.08

*Energy Centre
Principles*



8.1 Energy Centre Principle

8.1.1 Energy Centre Principle

CONCEPT AND BENEFITS

Energy centres aim at promoting the integration of decentralised energy generation (e.g., rooftop PV, geothermal and solar-thermal heat pump systems etc) at the point of consumption and at providing a flexible and 'smart' infrastructure to facilitate the local distribution and storage of that energy at the district level. This will avoid overburdening the main electricity network by reducing and shifting both the load of the power drawn from the network (consumption) as well as the feed-in loads during peak PV generation periods.

Energy centres should be sized based on the decentralised energy generation potential of the area and how many buildings can be supplied. This means these centres can range in size from a couple of buildings to a whole neighbourhood or district, depending on the type of quantity of energy generated. The catchment area for these centres will therefore vary by site and should be investigated on a site-by-site basis.

Further benefits include:

- Increasing the flexibility, resilience and 'smartness' of the energy infrastructure.
- Reducing energy system losses by providing generation close to centres of demand.
- Back-up supply from local generation and storage can act as local supply points during main electricity grid outages.
- Local generation and demand reduction allow more of the large-scale renewable energy generation (hydropower, large-scale PV and wind) to be exported or stored (e.g. as hydrogen).
- Creating incentives for developers to increase decentralized renewable energy generation and landlords to invest in retrofitting their buildings.
- Creating direct and indirect jobs in the power sector and across diverse small and medium enterprises.

PRINCIPLE

The concept of district energy centres is illustrated in the figure below.

It consists of the following components:

1. Energy prosumers:

- New buildings should feature rooftop solar plants and heat pumps. In the design-phases of the building, an integral energy concept that includes energy exchanges with the neighbourhood should be developed. If possible, the solar plants and heat pumps can be oversized to increase the decentralised energy generation potential and turn them into 'prosumers' that export surplus energy to the surrounding buildings
- Industry and commercial buildings should also be fitted out with solar plants. Additionally, the potential of waste heat recovery from cooling or industrial processes should be exploited (e.g. with heat pumps).
- Existing buildings would mainly act as consumers but could gradually be equipped with solar plans.
- Electric and hydrogen charging stations can be used to increase the flexibility of the system by using car batteries and hydrogen storage capacities.

2. An infrastructure backbone consisting of:

- Smart electricity microgrid with dynamic predictive control to facilitate the power distribution and integration of locally and renewable generated power. The microgrid would be connected to the main electricity network
- Potential other energy networks such as heating and cooling to facilitate thermal energy distribution and storage from decentralised and centralised thermal energy sources (industry waste heat, wastewater and geothermal heat pumps etc.).



Prosumers

- High energy efficiency buildings
- Local energy generation (PV, ST, waste heat from Industry)



Infrastructure Backbone

- Integrated and intelligent infrastructure
- Smart electricity microgrid ± heating and cooling networks, hydrogen pipeline

3. Energy substations:

- Small-scale energy substations in all buildings.
- Large-scale energy substations in newer buildings including thermal and electricity/hydrogen storage. In combination with the energy networks, they would reduce the space demand for the retrofitting of existing building substations.

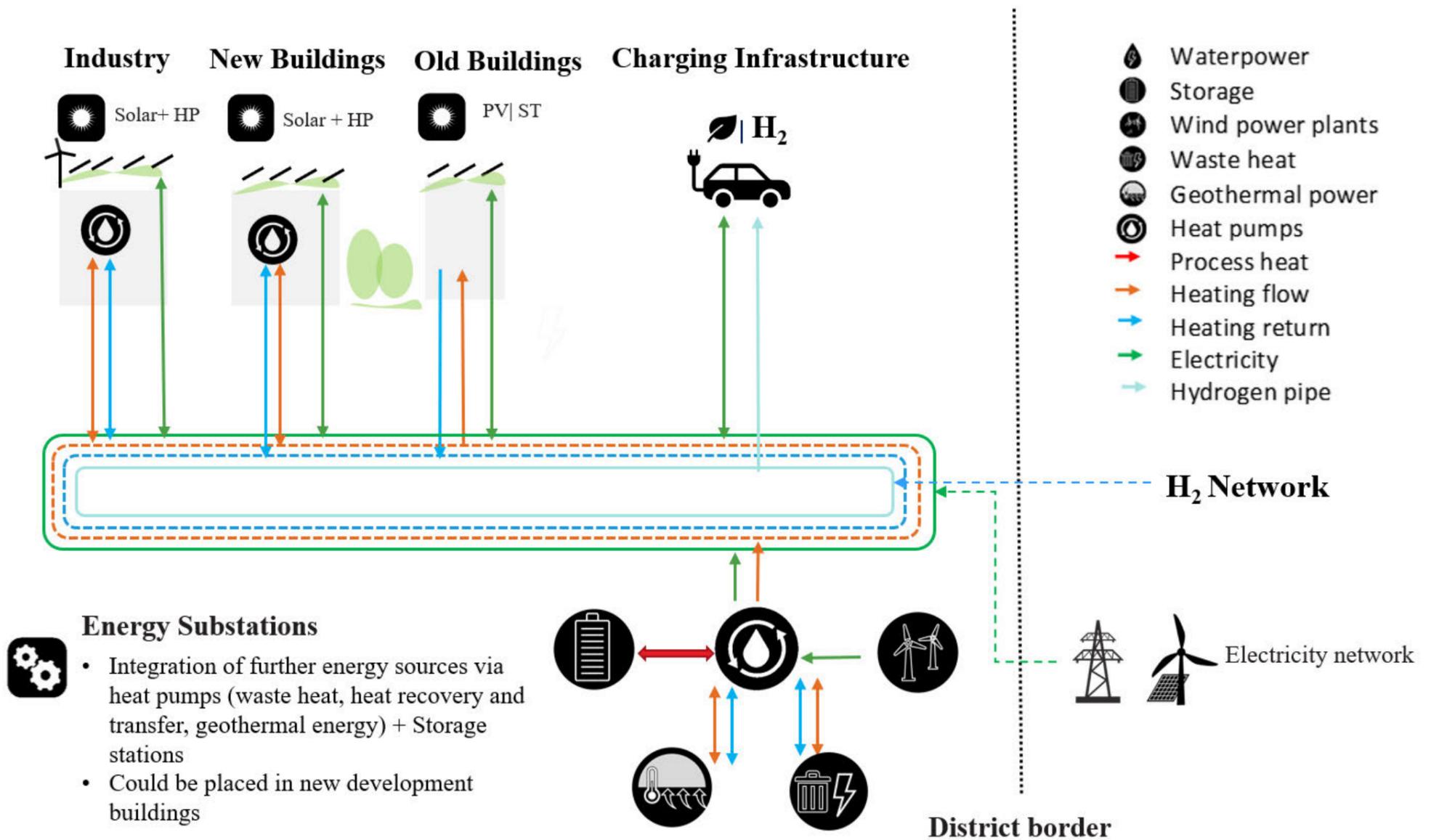


Figure 8.1 An 'Energy Centre' functioning scheme

Ch.09

Telecoms



9.1 Telecoms

9.1.1 Suggestions for a Mobile Planning Application

File Note

| | |
|-----------------------|--|
| Project title | Thimphu Structure Plan |
| Job number | 285126-15 |
| File reference | TSP-Telecoms-FN001 |
| cc | Kinley Dema, Roshan Rai, Kinzang Deki and George Beane |
| Prepared by | Anni Feng, Ebere Jude Akele and Ayman Toema |
| Date | 12 April 2023 |
| Subject | Content Suggestions for Mobile Planning Application |

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1. Introduction

Following on from the virtual meeting with the Ministry which took place on 6th April 2023, this file note contains Arup's suggestions on the type of information that could be requested from the mobile operators when submitting a planning application.

The suggestions presented are based on Arup team's experience with planning applications in the UK. The types of information suggested in this document aim to help the Ministry with the decision-making process and to enable a consistent set of information to be gathered through future mobile planning application.

During the virtual meeting, a number of Thimphu-specific considerations were captured. These have been incorporated into the suggestions for the Ministry's consideration. Please refer to Section 3 for updates on these items.

2. Suggestions

The following sub-sections represent the information that could be requested in the planning application. Please note that these suggestions are applicable to various types of installations, i.e. not limited to ground-based mobile mast installations.

2.1 Site Location

This includes information about the site, e.g. address and basic description of the site if there is no postcode.

Survey photos of the site and measurements, e.g. site area, could be included.

2.2 Applicant/Agent Details

This includes information about the applicant or the agent acting on behalf of the applicant, e.g. name/company and contact details.

2.3 Description of the Proposal

This includes details of the proposed installation.

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This part of the application could contain a list of questions relating to:

- a. details of the proposed installation
 - i. this could be a summary statement when asked as part of an application form. In which case, a more detailed statement could be submitted by the mobile operators to present supplementary information about the design (including basis for siting and appearance), planning considerations (compliance with local, national and international policy and guidelines) and technical justification (coverage, capacity, quality, health & safety and radio implications)
 - ii. alternatively, a comprehensive Planning, Design and Access Statement could be requested to cover the details of the proposed installation in point i above, and include consideration of the points listed below
- b. If proposed installation is a ground-based mast, what alternative(s) were considered and on what basis were they discounted.
 - i. evidence to demonstrate that the mobile operator has explored the option of rooftop installations before proposing a ground-based mast solution
 - i. include consideration of installing on public buildings
- c. existing use of the site
 - i. what is the current use
 - ii. is the site currently vacant
- d. contamination
 - i. is the land known to be contaminated
 - ii. is contamination suspected
 - iii. is the proposed use vulnerable to the presence of contamination
- e. pedestrian and vehicle access, roads and rights of way
 - i. is a new or altered vehicular/pedestrian access proposed to or from the public highway
 - ii. are there any new public roads or public rights of way provided within or adjacent to the site
 - iii. is there any requirement for diversions/extinguishments and/or creation of rights of way
- f. vehicle parking
 - i. are there any existing vehicle/cycle parking spaces within the site

- ii. will the proposed installation add/remove any parking spaces
- g. vegetation, e.g. trees and hedges
 - i. is there any vegetation on the proposed site
 - ii. is there vegetation on land adjacent to the proposed installation site that could impact the installation or might be important as part of the local landscape character
- h. biodiversity and geological conservation
 - i. are there any protected and priority species
 - ii. are there any designated sites, important habitats or other biodiversity features
 - iii. are there any features of geological conservation importance
- i. cultural and heritage site consideration
 - i. is the proposed installation in the proximity of sites with cultural and/or heritage importance – Ministry to consider adding specific (quantified) requirement, e.g. distance away from the cultural/heritage site
- j. geohazards, e.g. landslide
 - i. is the site within an area of high, medium or low geohazard
- k. flood risk assessment
 - i. is the site at risk of flooding
 - ii. is the site within [20metres] of a watercourse – distance constraint shown in brackets to be reviewed and defined by the Ministry
 - iii. will the proposal increase flood risk elsewhere
 - iv. how will surface water be disposed of
- l. foul sewage
 - i. how will foul sewage be disposed of
 - ii. will the proposed installation connect to an existing drainage system
- m. waste storage and collection
 - i. are there areas to store and aid the collection of waste
 - ii. are there arrangements in place for the separate storage and collection of recyclable waste
 - iii. is there a need to dispose of trade effluents or trade waste
- n. impact on residential units

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- i. will the proposed installation gain, lose or change use of residential units
- o. impact on non-residential floorspace
 - i. will the proposed installation gain, lose or change of use of non-residential floorspace
- p. impact on employment
 - i. are there any existing employees on the site
 - ii. will the proposed installation increase or decrease the number of employees
- q. hazardous substances
 - i. is there any use or storage of hazardous substances
- r. site visit
 - i. can the site be seen from a public road, public footpath or other public land
 - ii. contact information for the Ministry/other authority in order to make any site visit appointment as deemed necessary

The Ministry could consider encouraging mobile operators to seek prior advice (from the Ministry) about the planning application before formal submission.

The mobile operators should be requested to submit evidence of any relevant risk assessments and the associated mitigation measures.

Regarding disaster/hazard zones, installation in high hazard areas should be prevented. However, installations in medium/low hazard areas could be permitted if mitigation measures are in place.

2.4 Certificates and Declarations

This includes any relevant land ownership certificate and declaration of conformity with the ICNIRP (International Commission on Non-Ionizing Radiation Protection) guidelines for limiting exposure to electromagnetic fields (100 kHz to 300 GHz). Assessment of conformity or any related evidence should be submitted by the mobile operators.

3. Updates on Thimphu-Specific Considerations

During the virtual meeting, the following Thimphu-specific considerations were discussed:

- a. The cultural and heritage building requirement should be made mandatory. – This has been included in the list of suggestions in Section 2. Ministry to consider adding any specific (quantified) requirement for mobile operators’ reference.
- b. The Ministry felt it was essential that the mobile operators consider the option of rooftop installations before proposing ground-based mast installations. In addition, this could potentially be incentivised by allowing rooftop installations on public buildings free of charge. – This has been included in the list of suggestions in Section 2.

Ministry to consider whether it will be feasible to host rooftop installations on public buildings, and the contractual/commercial basis on which mobile operator installations will be hosted on public buildings (e.g. free of charge or annual rental, length of term and duties of each party).

- c. Disaster/hazard zones – installation in high hazard areas should be prevented, but installations in medium/low hazard areas could be permitted if mitigation measures are in place. – This has been included in the list of suggestions in Section 2.
- d. Biodiversity and environmental factors. – This has been included in the list of suggestions in Section 2.

4. Next Steps

It is recommended that the Ministry team consider the following for each suggestion listed in this file note:

- a. its relevance in the Thimphu context
- b. its importance/priority, i.e. should it be a mandatory requirement
- c. what are the acceptance criteria for the Ministry and what happens if the mobile operator’s proposal does not align with the ‘ideal’ expectation, e.g. the proposed installation is adjacent to a cultural/heritage site
- d. any new requirements to add (which are specific to Thimphu)

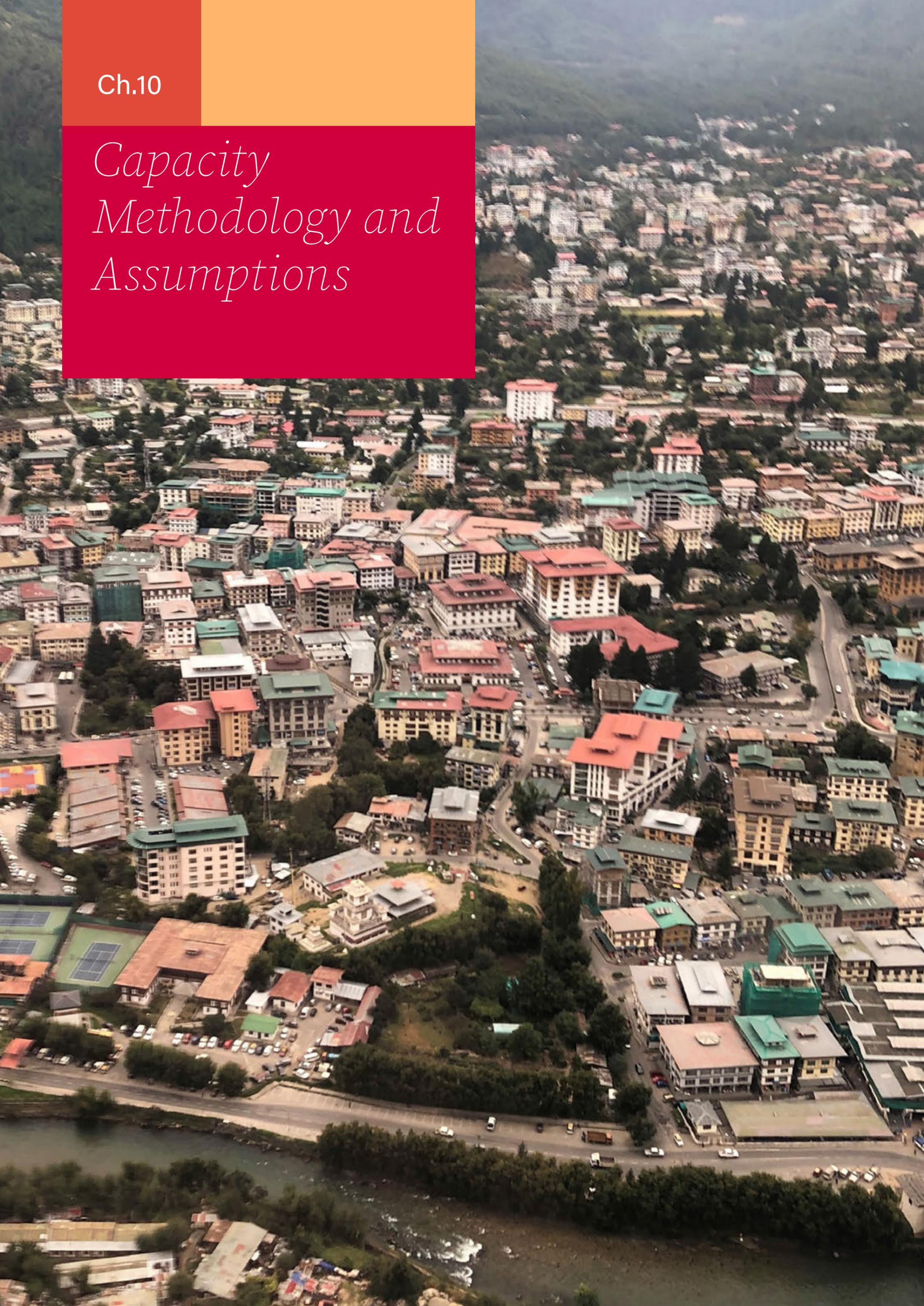
The Arup team would like to receive feedback from the Ministry on this file note by Friday 21st April. The team is available to discuss any further query which the Ministry might have.

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Ch.10

*Capacity
Methodology and
Assumptions*



10.1 Capacity Methodology

10.1.1 CCAP Capacity

NET DENSITY

- To estimate the development capacity within the CCAP strategic sites and opportunity areas the gross densities mapped at a strategic level in the TSP are converted into net densities.
- An average net density is applied to each urban parcel, according to the massing and character defined by the spatial principles and framework.
- The proposed densities in the CCAP are 'Medium-High' and above, as indicated in the TSP.
- The conversion of gross FAR to net FAR will vary according to the street widths, provision of open spaces and urban fabric specific to each place. The chart below describes how gross FAR is converted into net FAR for the purposes of this CCAP study.

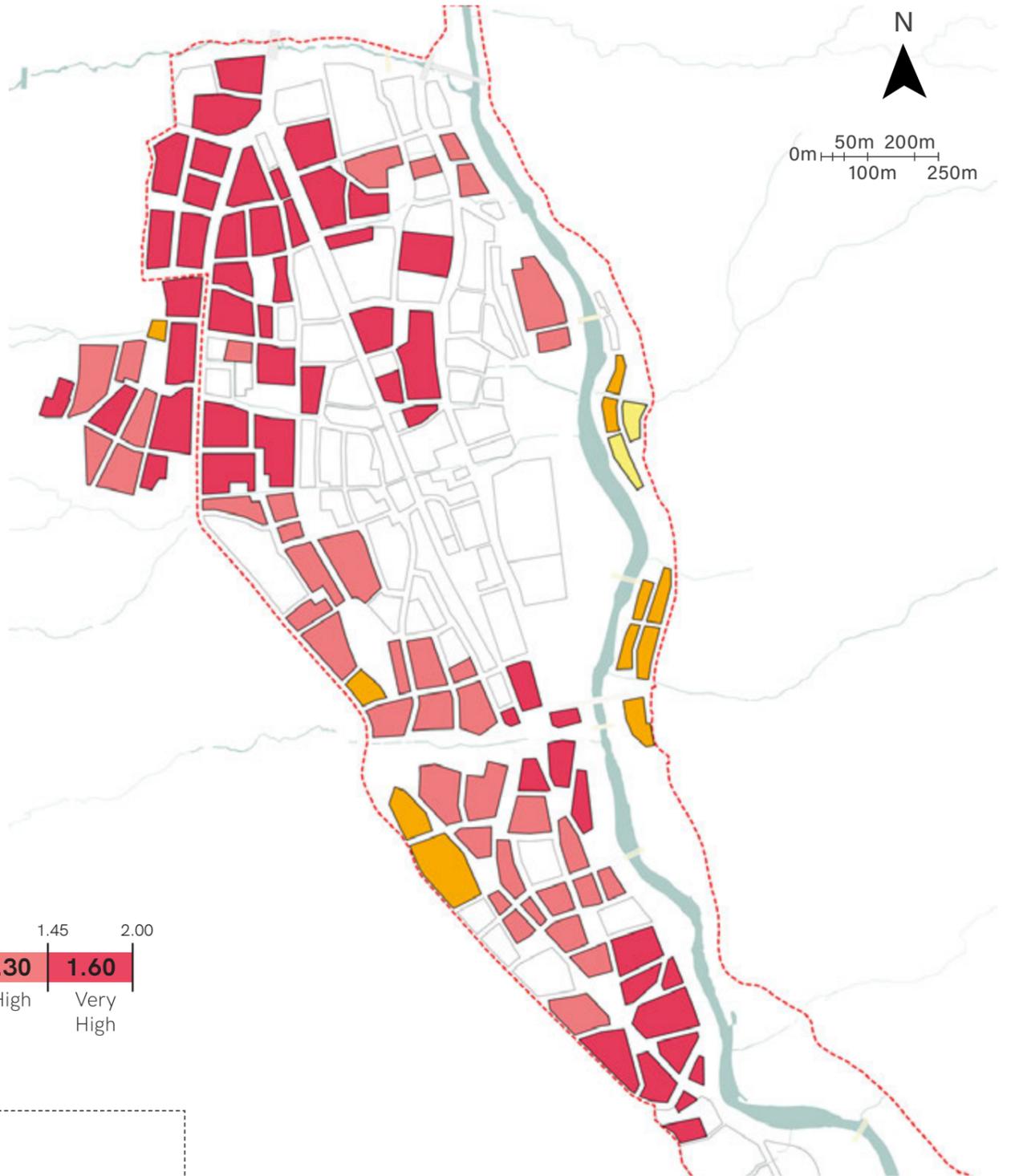


Figure 10.2 CCAP Net FAR per parcel



Figure 10.1 CCAP Gross FAR to Net FAR assumption

CAPACITY

- The net density assumptions result in an estimated total development capacity of approximately 1 mi sqm (GEA).
- This assumes existing buildings are disassembled. Throughout the regeneration process, where existing buildings are retained, the development capacity could be reduced or the parcel could work harder to deliver the proposed GEA.
- The table below outlines the development capacity per neighbourhood.
- The table is a summary of the total development potential. Different from the TSP methodology, it does not measure the difference between future capacity and existing capacity.
- The total number of jobs is an estimate based on the spatial capacity for F&B, retail and office uses.

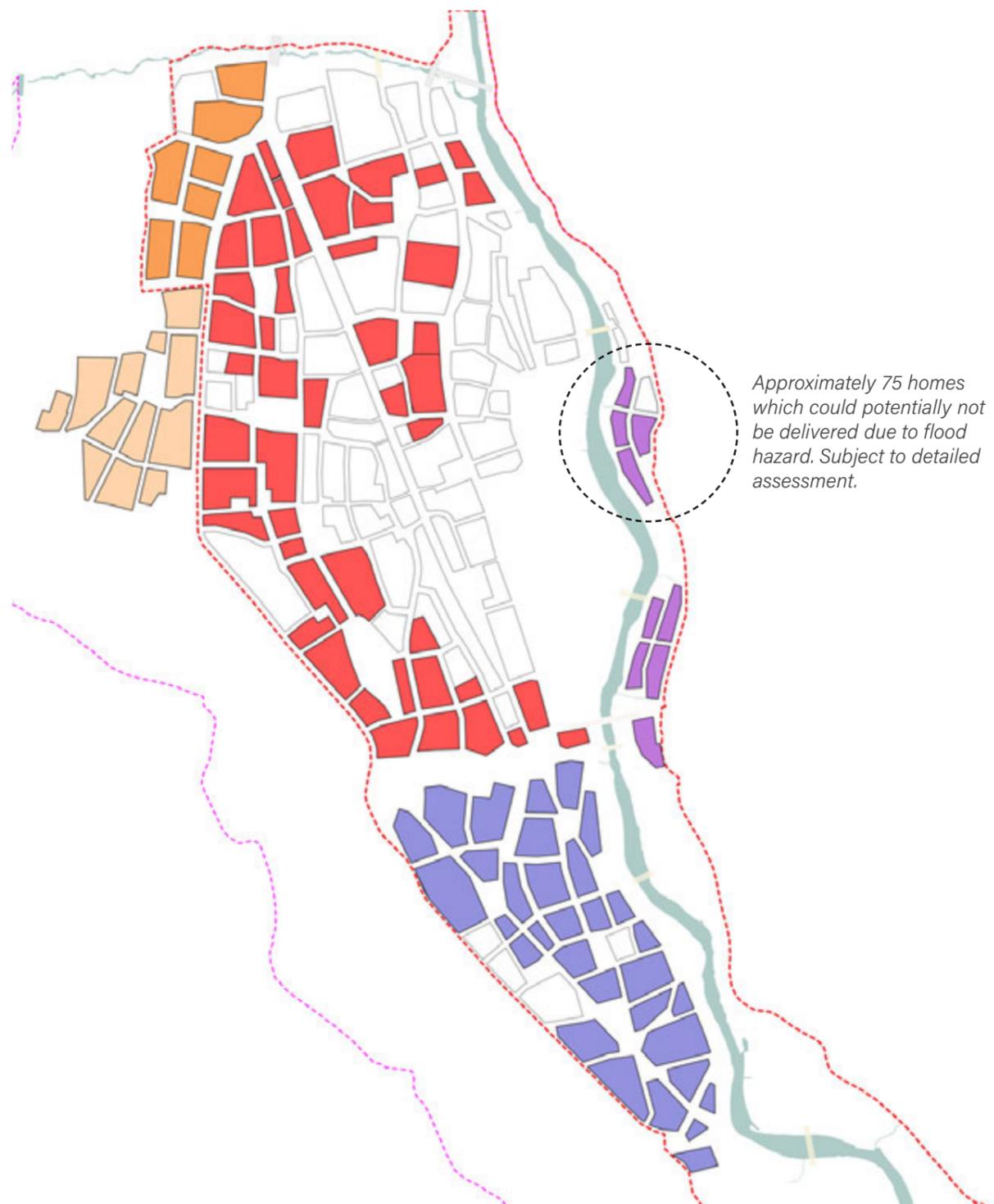


Figure 10.3 CCAP parcels identified for development capacity by neighbourhood

| Table 10.1 CCAP Development Capacity | | | | | | | | | | | | | | |
|--------------------------------------|------------------------------|--|------------|--------------------------------------|--|--|------------------------------|--------------------------------------|-----------------------------------|---|----------------------------|--------------|---------------|----------------|
| | | Net Developable Area (m ²) | Net FAR | Total Proposed GEA (m ²) | F&B, Retail, Community GEA (m ²) | Culture / Other uses GEA (m ²) | Office GEA (m ²) | Office Parking GEA (m ²) | Residential GEA (m ²) | Residential Parking GEA (m ²) | MLCP GEA (m ²) | No. Homes | Population | Total No. Jobs |
| AREAS WITHIN CCAP BOUNDARY | | | | | | | | | | | | | | |
| ■ | City Core | 251,000 | 2.0 | 490,500 | 47,000 | 15,500 | 82,500 | 15,500 | 284,000 | 30,000 | 16,000 | 2,600 | 8,100 | 7,750 |
| ■ | Yangchenphug | 27,500 | 1.1 | 30,000 | 1,000 | - | - | - | 26,500 | 3,000 | - | 250 | 750 | 50 |
| ■ | Changzamtog | 148,500 | 1.8 | 269,500 | 13,000 | - | 25,500 | 5,000 | 205,000 | 21,500 | - | 1,900 | 5,800 | 2,450 |
| ■ | Changangkha | 45,000 | 2.3 | 103,500 | 3,000 | - | 17,000 | 3,500 | 72,500 | 7,500 | - | 650 | 2,050 | 1,300 |
| | SUB-TOTAL | 472,000 | 1.9 | 893,500 | 64,000 | 15,500 | 125,000 | 23,500 | 587,500 | 62,000 | 16,000 | 5,400 | 16,700 | 11,550 |
| AREAS OUTSIDE CCAP BOUNDARY | | | | | | | | | | | | | | |
| ■ | Changangkha 2 Strategic Site | 65,000 | 2.0 | 133,000 | 6,500 | 2,500 | 9,000 | 1,500 | 102,500 | 11,000 | - | 950 | 2,900 | 950 |
| | TOTAL | 537,500 | 1.9 | 1,026,500 | 70,500 | 18,000 | 133,500 | 25,500 | 690,500 | 72,000 | 16,000 | 6,350 | 19,600 | 12,500 |

Notes

- Numbers might not add up due to rounding.
- MLCP = Multi-level car park.
- All areas are indicative.

10.1.2 Housing Assumptions

HOUSING MIX

- A housing mix distribution delivering 32% family housing is assumed for new development in the CCAP area.
- Housing units that are 2b4p or larger are considered family housing.
- The unit mix results in a 3.08 average person per household assumption.
- These assumptions align with the methodology described in the TSP.
- The potential housing mix distribution is not a recommendation and should be validated through a detailed housing needs assessment as well as an assessment of the housing market demand.

| Table 10.2 Unit Mix and GIA areas | | | | | | |
|-----------------------------------|--------------|--------------|---------------|---------------|---------------|------------------------------|
| | 1 bed (1b2p) | 2 bed (2b3p) | 2 bed (2b4p)* | 3 bed (3b5p)* | 4bed+ (4b6p)* | Average Unit Size (GIA, sqm) |
| GIA (sqm) | 50 | 61 | 70 | 86 | 113 | 62.2 |
| Unit Mix (%) | 38% | 30% | 20% | 10% | 2% | 100% |

Notes

- (*) Units considered as family housing
- GIA = Gross Internal Area
- b = bedrooms
- p = persons
- The average unit size (GIA) is based on the internal dwelling standards outlined in the London Plan Guidance, Housing Design Standards (June 2023).

GIA TO GEA

- For the purposes of calculating the capacity for new homes, the average unit size was converted from GIA to GEA.
- The GEA area takes into consideration spaces for external walls and façades, circulation and residential ancillary uses (eg. bin rooms, utility rooms, etc).
- The GIA to GEA conversion accounts for a 5sqm tolerance added to each unit, a 65% efficiency and a 5sqm allowance per unit for inset outdoor spaces or shared amenities. These are conservative assumptions that correspond to the level of design detail achieved in the CCAP.
- The resulting average unit size in GEA is 108.3 sqm.
- Vehicle parking areas are not included in the GEA.

| Table 10.3 GIA to GEA conversion | |
|----------------------------------|-------|
| Average unit size (GIA, sqm) | 62.2 |
| Tolerance (sqm) | 5 |
| Efficiency (%) | 0.65 |
| Inset outdoor space (sqm) | 5 |
| Average unit size (GEA, sqm) | 108.3 |

10.1.3 Parking Assumptions

| Table 10.4 Residential Parking Ratios | | | |
|---------------------------------------|---------------------------------|---------------------------------|---------------------------------|
| | Total | Off-plot | On-plot |
| Central Neighbourhoods | 0.5 parking spaces per dwelling | 0.2 parking spaces per dwelling | 0.3 parking spaces per dwelling |

Notes

- The CCAP follows the parking assumptions described in the TSP. CCAP neighbourhoods fall under ‘Central Neighbourhoods.’
- The residential parking ratios described in this section are based on precedent case studies, for the purposes of the housing capacity calculations only. They are not a policy recommendation.
- For the purposes of the housing capacity calculations, it was assumed that a portion of the parking provision could be provided off-plot.
- On-plot parking is provided within development parcels. They include parking spaces provided in basements, podiums or open parking courts, for example.
- Off-plot parking is provided outside development parcels. They include parking spaces provided on-street, or in shared parking areas, such as multi-level car parks or open parking courts on public land.
- The benefit of identifying on-plot vs off-plot parking ratios is to allow a reduction in parking provision over time, as the dependency on private vehicle ownership reduces as people begin to rely more on active mobility and public transport.
- In the future, off-plot parking spaces could be reduced and give room to landscape, parklets or additional pedestrian space, for example.
- In the CCAP, all on-plot parking provision is assumed to be ‘in-structure.’
- In-structure car parking includes parking spaces provided in buildings (eg. in undercrofts, podiums or basements). It therefore contributes to the total Residential GEA and the FAR capacity.
- The in-structure parking space area assumed is 38 sqm (GEA).

| Table 10.5 Office Car Parking Assumptions | | | |
|---|--|-------------------------|---------------------------------------|
| | Parking Ratio | % of which in-structure | In-structure parking space (GEA, sqm) |
| Central Neighbourhoods | 1 space per 200m ² office (GEA) | 100% | 38 sqm |

Notes

- The CCAP follows the parking assumptions described in the TSP. CCAP neighbourhoods fall under ‘Central Neighbourhoods.’
- The assumptions for office car parking informed the additional GEA requirement to complement the office demand calculated in the employment spatial distribution.
- These office car parking ratios are not a target or a recommendation.
- The in-structure parking space area assumed is 38 sqm (GEA).