ThimphuThromde

The evolution of the capital city

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Cover: **A view of Thimphu from Lungtenphu. Paddy lands of Thimphu valley (top)** *(bhutanstudies.org.bt)* **have given way to rapid urbanisation over the past few decades.**

Thimphu Thromde

Foreword

Spread over 26 sqkm on what used to be fertile paddy lands rising from the banks of the Wang chhu (river), Thimphu is a city that strives to maintain a balance with tradition and nature as it grapples with rapid urbanisation.

From a cluster of sheds around the Tashichhodzong in the early 60s, today it has grown into the largest city in the country where 115,000 people or 40 percent of the urban population lives. It is one of the fastest growing cities in the region, fueled by people moving to the capital in search of a better life.

Since the mid 80s, when urbanisation was acknowledged as a reality, the city's infrastructure has struggled to keep pace with the demand for urban services. Limited resources, lack of expertise and a population still adjusting to living in an urban setting have made it even more challenging.

Implementing the Thimphu Structure Plan (2002 -2027), a grand vision to guide the growth of the capital in a planned manner, has been at the heart of the Thromde's responsibilities in the past two decades. Land pooling, which drew a lot of controversy, has been successfully used to get landowners to contribute land on which common urban services have been built, including open recreational spaces, for the new extended neighbourhoods of the city. Today, most of the city has access to these improved services, although a lot more still needs to be done to make it even more efficient and accessible.

But Thimphu is also experiencing 'big city problems' with solid waste management, water supply, growing informal settlements, increasing pressure on the limited developable urban land and congestion in the core areas.

A rapid transit system to make public transport the most efficient way of getting around the city is being developed and essential services are being spread to the extended areas. A real time database is also being built for efficient decision making and service delivery. Affordable housing is another area that needs to be addressed but is outside the direct mandate of the municipal government.

The newly elected management is committed to completing the remaining works of the Thimphu Structure Plan as well as the 12th Plan priorities, which include developing and improving critical infrastructure, strengthening human resource, promoting entrepreneurship and exploring revenue sources to become self-sustaining.

While the Thimphu Structure Plan ends in 2027, Thimphu will continue to grow and face more complex urban issues in the near future. The Thromde will require strengthened capacity and legislation as it increases collaboration with the private sector and civil society to find innovative solutions to make Thimphu the best it can be.

Ugyen Dorji
Thimphu Thrompen

Contents

Introduction

This publication, the first of its kind by the Thimphu Thromde, attempts to portray the evolution of Thimphu from its days as a cluster of rice growing villages in Wang valley to the bustling capital city it is today.

To give it context, the publication begins with a brief history of Thimphu, including how it got its name, before delving into its journey as the new capital when Bhutan began planned development.

The publication also documents how the governance structure of the municipal authority changed through the years and its transition to an elected mayor and council.

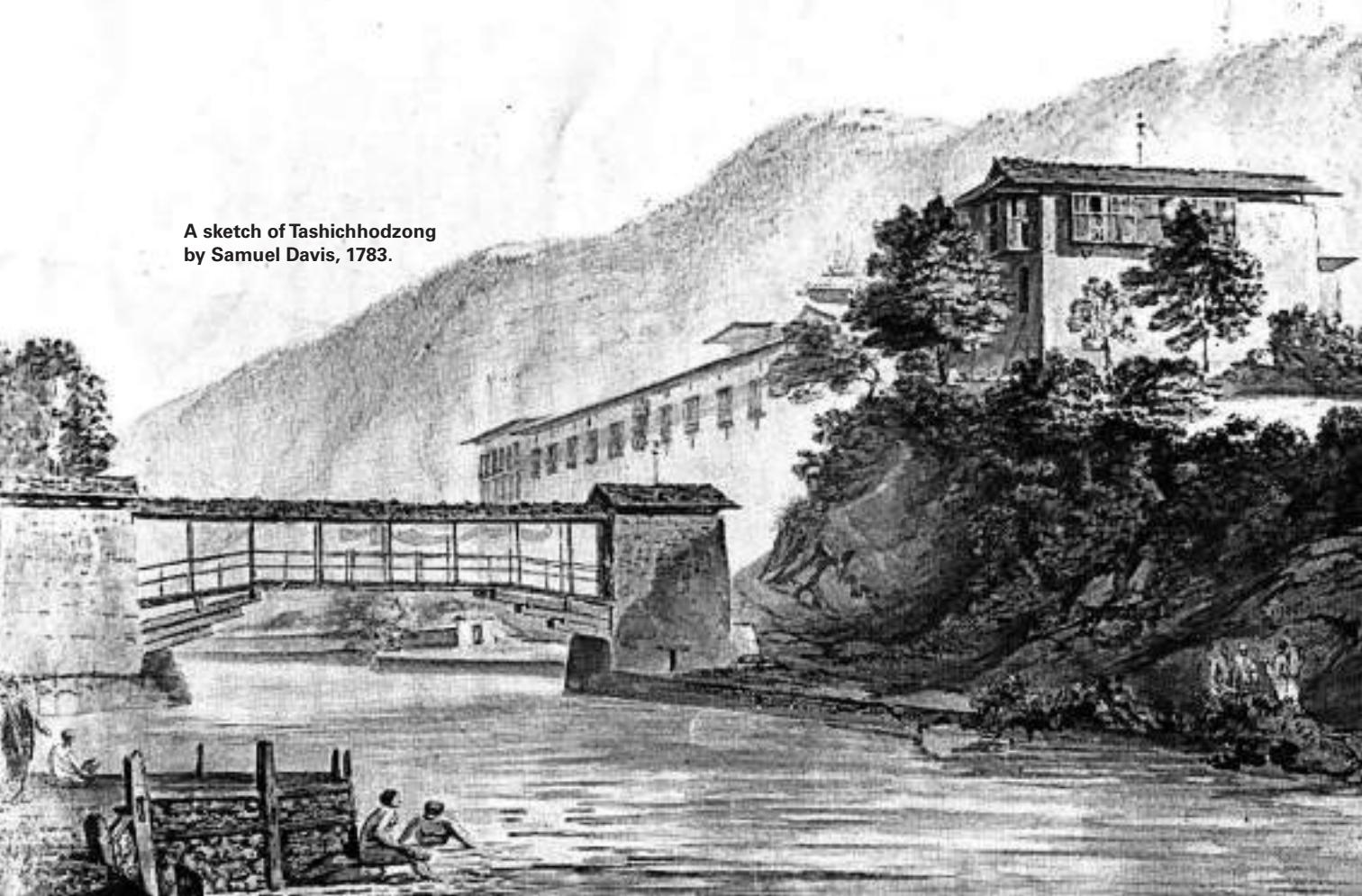
Presented in journalistic narrative with accompanying photographs the publication also looks at the services the city provides as well as the challenges facing the municipal government as the city continues to experience rapid growth.

The publication closes with a long view aimed at stimulating discussion on how the Thromde can move forward in the face of more complex urban challenges brought about by continued growth.

“

Looking out from their residence they could see that they were in a valley about five miles long and a mile broad surrounded by mountains. On the low ground near the river there were rice fields and the area looked fairly prosperous and well populated with villages also scattered on the hilltops”.

George Bogle’s mission to Bhutan, May 1774, from Peter Collister’s Bhutan and the British



A sketch of Tashichhodzong by Samuel Davis, 1783.

SECTION I

Brief history

Thimphu was once a rice growing village.

A new ancient capital

Barely six decades ago Thimphu was, like it had been for centuries, a cluster of rice growing villages in the fertile Wang region.

Then, Bhutan decided to embark on a new journey - to shed its isolation and modernise the subsistence agrarian economy. And Thimphu was to be at the centre of this change – as the new capital of a new Bhutan.

So began the urbanisation of Thimphu's paddy fields, the concreting of agricultural lands, a process that continues to this day as the city grapples to keep pace with rapid population growth, even as its residents adjust to living in an urban setting.

Yet Thimphu has always been at the centre of Bhutan, serving as the summer capital since the Zhabdrung who gave Bhutan its political identity and territorial integrity, built the Tashichhodzong in 1641. Since then, Thimphu has played host to the earliest British missions in the 18th century.

Thimphu, thus, has been witness to the turbulent times of state formation and nation building, set in motion almost four hundred years ago.

Today, it is the country's largest urban centre and among the fastest growing capitals in the world. Home to a fifth of the nation's population, it is the place where Bhutanese prefer to work, live and own property. Thimphu is in many ways a reflection of the national priorities and aspirations as well as of the challenges facing a traditional society in transition.

Named after a stone

The nation's capital city was, generally, known as the valley of Wang.

The name was inspired by the river, Wang chhu, that nourished settlements, a largely agrarian one, on its banks.

But with neighbouring communities, like most districts across the country, resounding with names from popular legends, the district capital had to have one too, just as rich and intriguing.

Thimphu, as it came to be known later, takes its name from a rather drab rock and a sinking one at that, on a hill, some 13 kilometres (kms) from the city centre. Thim, in local dialect means to sink and Phu translates to rock.

In the legend behind the rock, however, is the steam driving the national capital that wears the tag of being one of the rapidly growing cities in Southeast Asian region for the rate at which institutional infrastructures flourish and real estates boom as Bhutanese from various parts of the country fuel this burgeoning city.

Rolled in ancient myth and mystic, it is no ordinary rock though.

It is believed to be where, one of country's most powerful deities, Geynyen Jakpa Melan, devoutly referred to as Aap Geynyen, has been vanquished to.

According to oral accounts passed on for generations Aap Gyenyen is the emanation of Yidam Tandin, a deity before him, who appeared in person in front of Phajo Drugom Zhigpo, while he was meditating at Tango in 1224. He prophesied Phajo's triumph over rival Buddhist sects to establish the Drukpa Kagyue tradition in Bhutan.

A cross between a deity and a demon, Aap Geynyen was believed to occasionally visit neighbouring residents in human form, donning a black gho, a giant black hat and riding his black stallion.

A servant of great Drukpa masters, he was believed to serve locals around Dechenphu in their regular chores and others that required his supernatural interventions, like bringing rain and timely, good yield.

Today, Dechenphu monastery is a place for Thimphu residents to seek divine intervention.

The only condition was that he be served fresh meals. However, one day, a poor widow, whom Aap Geynyen helped fetch firewood, water and little yield from her farm offered him the day's left overs.

That was the last of Aap Geynyen people saw in his human form. He had turned malignant, a wrathful spirit pelting hails, causing drought and ruining yields around harvest tie. He was even accused of bringing about diseases and sickness among people until, one day Lam Jamyang Kuenga Sengye, a highly learned Buddhist monk subdued the deity and banished him into a rock at the entrance of the present day Dechenphu monastery.

The Lam ordered Aap Geynyen to appear in person only when commanded by monks of high spiritual ordain, but, otherwise to continue to be the protector of all who sought refuge in him. Today, Dechenphu monastery is a place for Thimphu residents to seek divine intervention through all times.

Tashichhodzong in 1955.

“

The favourable aspects of a site in Thimphu valley have made it eminently suitable for the capital”

Report titled “New Capital for Bhutan in the Thimphu Valley”
April 1963

1960s-1970s

SECTION II

Early years

The reconstruction of the Tashichhodzong was completed in 1968. *Photo: Glimpses of Bhutan, March 1969*

Early developments

The building of roads, schools, hospitals, and other basic infrastructure began in the 1960s with the start of the first five-year development plan with technical and financial assistance from India.

For the capital city, the completion of the 180 kms road from Phuentsholing in 1962 opened the floodgates to wheeled traffic and urban development. A key activity was the reconstruction and expansion of the Tashichhodzong, a huge project which drew a workforce from across the country and took seven years to be completed. Around that time, a settlement of shops began to mushroom around the Dzong, the centre of all activity in the capital.

By 1967, the Jungshina mini hydro plant, the country's first, began supplying power to government institutions and a few households in the valley, supplementing generator supply.

A new township

In 1968 the temporary shops around the Tashichhodzong were shifted to the shopping area of a new township planned for Thimphu. The area had 120 plots of varying sizes for shop buildings which were to be double storied and of traditional Bhutanese architecture and design. These double storied traditional buildings lining Norzin Lam, Thimphu's main street, stayed until the early 90s when concrete structures began to take over. A few remain today.

Land for the new township was acquired from farmers, who were paid a compensation, and sold to the public, civil and security agencies at an extra charge to cover for approach roads, water supply, electricity and other essential services.

More than two dozen village houses were also acquired from farmers that year, which were renovated and repaired to house staff of the development wing relocating from Paro.

Thimphu high street in 1963, in the background is Tashichhodzong

Photo: Hearts and Life and the kingdom of Bhutan by Dr Aubrey Leathem

The first settlers

The beginnings of a township in Thimphu valley began to appear in the late 60s from an area that would later grow into Norzin Lam, today the capital's business district and main thoroughfare.

It consisted of 16 shops in two rows amidst paddy fields, just beyond where the fuel station is located today, and was run by the earliest migrants to the capital; they were from Chapcha, Punakha, Gaselo and other nearby Dzongkhags who came after the country's first motorable road from Phuentsholing reached Thimphu in 1962.

All these shops were initially located near the Dzong in makeshift sheds where the civil service offices are today. Initially there were only five to six shops near the Dzong, which was under construction, and they were run by families from outside Thimphu.

In 1968, the government decided to give proper space for a shopping area and all the shops near the Dzong were moved down to the new location. Plots were allocated to build shops, but many were reluctant to take it up because they feared having to pay land tax.

The shops in the lower line were of two storeys. Each two storey structure, built in traditional Bhutanese style, were shared by two families and numbered Line 1, Shop number 1 and so on. The shops in the upper line, today facing the clock tower square, were of a single storey and numbered Line 2, Shop number 1 and so on. Between the shop lines was an unpaved road used by the few vehicles in Thimphu.

For a long time it used to be said that Thimphu is like a pair of arrows, in reference to the two lines of shops that made up the shopping area of the capital.

One of the last remaining traditional shop buildings along what used to be Line 1 of Norzin Lam.

Bhutan Hotel in 1982, now the office of the Ministry of Information and Communications. *bhutanstudies.org.bt*

The early 70s

Thimphu's first tourist hotels and the Changlimithang stadium were built in the early 70s as Bhutan prepared to host more than 150 international guests attending the coronation of The Fourth Druk Gyalpo in June 1974, the first time Bhutan opened its doors to so many outsiders.

The memorial chorten built in memory of The Third King, now a city landmark, also came up during this period.

Municipal Corporation formed

Thimphu's first Municipal Corporation was formed in December 1974 to develop, improve and maintain the national capital and promote health, welfare and education. Then, the municipal boundary extended from Dechencholing in the north to Wangchu Taba in the south and included YHSS, Changlimithang stadium and the government press area (now Kuensel Corporation).

The Municipal Corporation, headed by a chairman and assisted by a council, representing different sections of town, was tasked to regulate growth and development of the city, supervise all building activity, handle garbage disposal, provide public transportation, fire-fighting and also collect and impose taxes on buildings and land. The chairman and councillors were appointed by the government.

The corporation did not make much headway in town planning, given the shortage of trained personnel, especially planners.

No cultivation within town area

At the start of the 70s, the government decided that paddy cultivation in lands within the township area, acquired several years earlier, would no longer be allowed, but dry cultivation, including vegetables, would be permitted.

The government had permitted farmers to cultivate their land until it was required for building roads, houses and other infrastructure. But this understanding was impeding development of the township as projects had to wait for crops to be harvested before it could be implemented. Continued use of irrigation channels for paddy cultivation was also damaging the roads and parking areas. (Source: Kuensel)

These water tanks in Kungachholing, upper Mothithang, were built in the 70s and are still used to supply water to the core city area.

Thimphu's first water scheme

Thimphu's first water supply scheme was taken up in 1970 and by April 1971 began supplying water to the town area including Mothithang, Public School and the existing India House colony. The scheme had four concrete reservoirs of a capacity of 70,000 gallons each, located at Mothithang, two near the Junior High School and one at the Public School. The pipelines from Mothithang to the reservoirs above the Junior High School and in the Public School stretched for 6 kms.

The first phase of the scheme, which cost Nu 2.6 million, including the cost of filtration plant at Mothithang, became fully operational in the later part of 1972.

The scheme was designed to provide filtered water to a population of 25,000 at 25 gallons (100 litres) per head per day.

1980s

In the mid 80s, the parking area for trucks and the few Mahindra jeep taxis was in the centre of town.

2021

It was later developed into the town square with a seating gallery where open air performances, fairs, festivals and other promotional events are held.

> “Urbanisation is now a fact of life in Bhutan”
>
> **Thimphu Urban Development Plan 1986-2000**

1980s-2010

SECTION III

Start of planned development

Thimphu valley from Semtokha in 1982. *(bhutanstudies.org.bt)*

Urbanisation of Thimphu

1952

Thimphu chosen as new capital

A 405 hectare plot identified for schools, residences and offices

1960s

1968

First Thimphu town plan prepared but unimplemented

Thimphu Municipal Corporation (TMC) established

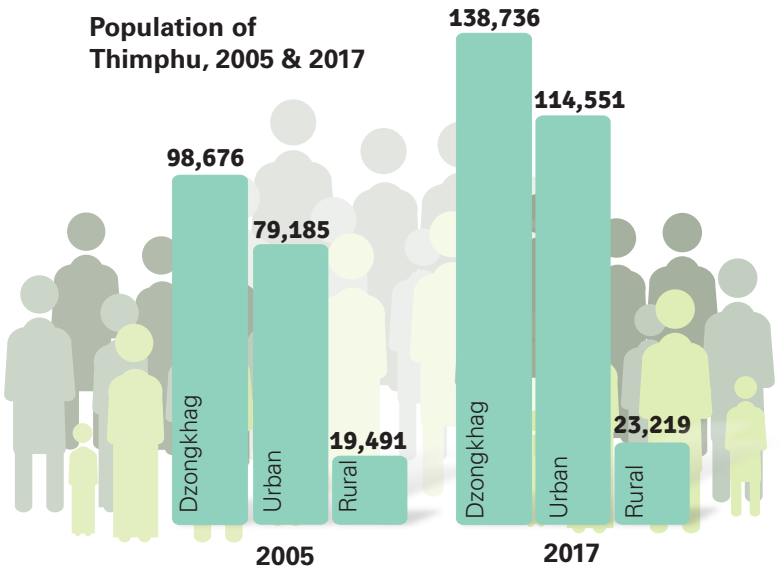
1974

1980s

Construction boom

First Thimphu urban development plan launched

1986



Thimphu municipality boundary extended from an area of 8 sqkm to 26 sqkm

1999

First Local Area Plan implemented

2009

2004 **2005**

Thimphu Structure Plan approved. Preparation began in 2001

2016 **2017**

Thimphu Thromde Development Control Regulation 2016 approved by the Thromde Council Members

Boundary expansion

A view of the core town area from Memorial Chorten in 1982. *(bhutanstudies.org.bt)*

A focus on Urban planning

In the mid 80s, the government established the National Urban Development Corporation (NUDC), a centralised agency, to mainstream urban planning for all townships in the country. This was in response to the beginnings of urban sprawl taking place in the larger urban centres.

It was around this time the country's earliest trained urban planners joined the government as the first donor supported urban planning projects came through.

Thimphu's first urban development plan was launched in 1986 to control and contain the capital's rapid and haphazard growth. According to the plan, about 32 percent of the land was for residential use, 20 percent for institutional use, and almost 20 percent for recreational areas and open spaces. Thirty-nine residential areas were designated, and most residential areas were to have a maximum height limit of two or three storeys. No buildings of more than four floors were to be permitted.

Thimphu's land use was based on a forecast population of 30,000 by the year 2000. The plan included five primary schools and relocation of government offices. The first urban development plan guided Thimphu's development until 2000.

Water supply and sanitation

In the mid 90s core Thimphu town, covering 8 sqkm, saw a spate of digging to lay pipes for an underground sewerage system. The Nu 204 million DANIDA assisted project laid sewerage pipes from three parts of the valley that connected to an 18-kilometre trunk pipeline taking waste to a modern open air plant in Babesa, then way out of the city limits. The plant would biologically treat the sewage and divert clean water back into the river.

About 10 kilometres of service connections from existing septic tanks to the new sewers and 20 kilometres of connections for wastewater from kitchens and bathrooms were built under the project, which covered about 40 percent of the city. Septic tanks outside the sewerage system would be emptied by vacuum tankers.

Besides an efficient disposal system, the project was expected to improve the health of Thimphu residents by reducing water-borne diseases like diarrhoea and dysentry attributed mainly to spillovers from sullage, discharge from kitchen and baths, open drains, and septic tank overflows.

The project, which began operations in 1996, also improved urban water supply and installed water metres to levy fees for water consumption and sewerage services. Service fees was met with much outcry from residents, and brought to the fore the issue of cost of services and paying for its operation and maintenance.

One of the open air sewerage ponds in Babesa.

A grand vision

At the turn of the millennium, urban planners, with support from policy makers, began to draw a new blueprint to guide Thimphu's development over the next 25 years. Then, the capital city was growing at seven percent per annum and straining existing services.

Known as the Thimphu Structure Plan 2002-2027, it was the first ever comprehensive framework to guide how space within the city could be used to achieve economic, social and environmental objectives for present and future generations. It included measures to protect the fragile environment, keep open spaces, manage heritage sites and an amenities plan to provide social infrastructure, among others.

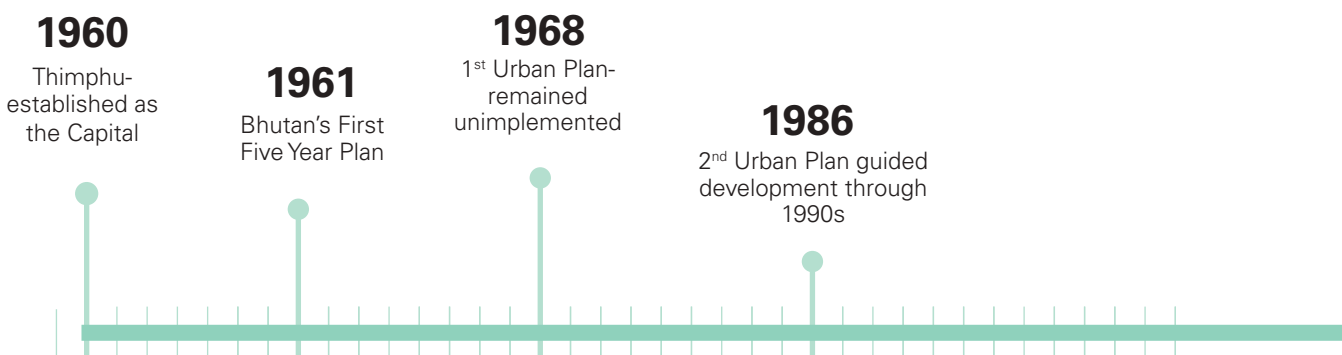
The new urban boundary, approved in 1999, extended from Changtagang in the north to Ngabirong chhu in the south, covering an area of 26 sqkm. About a third of the area was to be developed to accommodate the projected population growth in the next 25 years, and the remaining areas kept as open space and green areas.

Among the action plans proposed were measures to protect the fragile ecology, an open space system with footpaths, stairways and foot bridges, conservation of heritage sites, an urban corridor that provides a channel for disposing sewerage, allows for a rapid bus system connecting outer areas with the urban core, and a path for trunk infrastructure in the future. A defining aspect of the Plan was the participation of landowners in the planning process who contributed up to 30 percent of their land to implement the structure plan.

The plan also recognised that the city must be planned for future generations. The housing strategy for example looked at accommodating future residents in affordable, compact and walkable neighbourhoods. The plan also set aside space for social services and amenities so that future generations have access to basic health, education, water, electricity and communication.

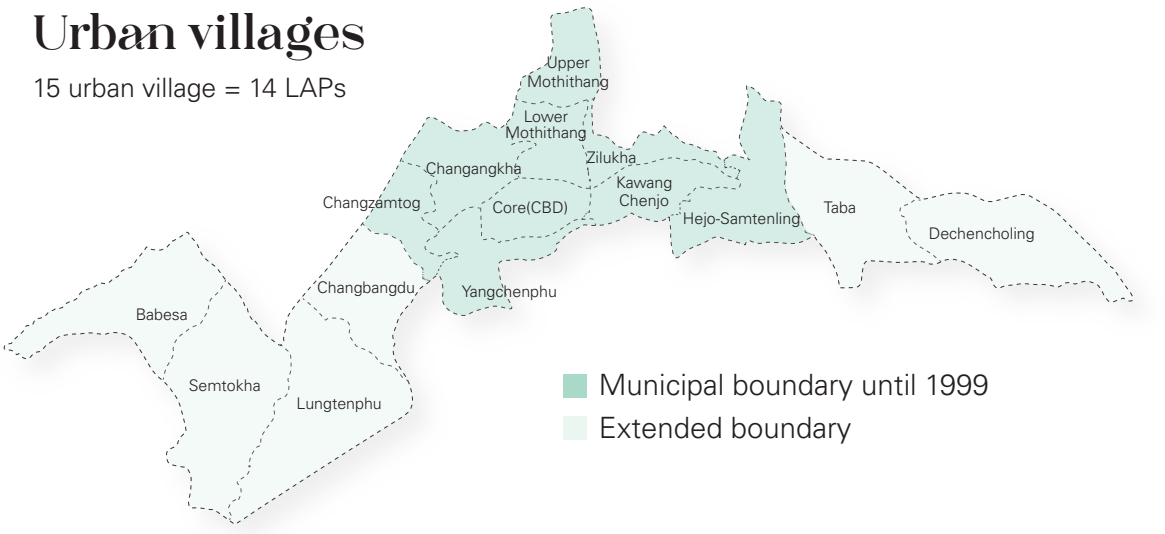
The plan, developed by the erstwhile Ministry of Information and Communications with international consultants, was approved by the cabinet in 2003. Imple-

City plan



Urban villages

15 urban village = 14 LAPs



mentation by the Thromde began in 2004, initiating what would become in the next decade the biggest construction boom to seize the capital city.

The development of LAP began with Lungtenphu, the first locality in the city to accept land pooling. It served as a pilot area to demonstrate the benefits of land pooling and convince land owners in other zones. Local leaders to policy makers were involved in convincing the affected property owners about the benefits of the Land Pooling Scheme.

The World Bank (WB), Asian Development Bank (ADB) and other donors invested in Thimphu city's development based on the vision of the structure plan.

1998
Strategic Plan influenced the extension of the Municipal Boundary

1999
Cabinet instruction to make Thimphu a Dream City

2000
Preparation of TSP begins

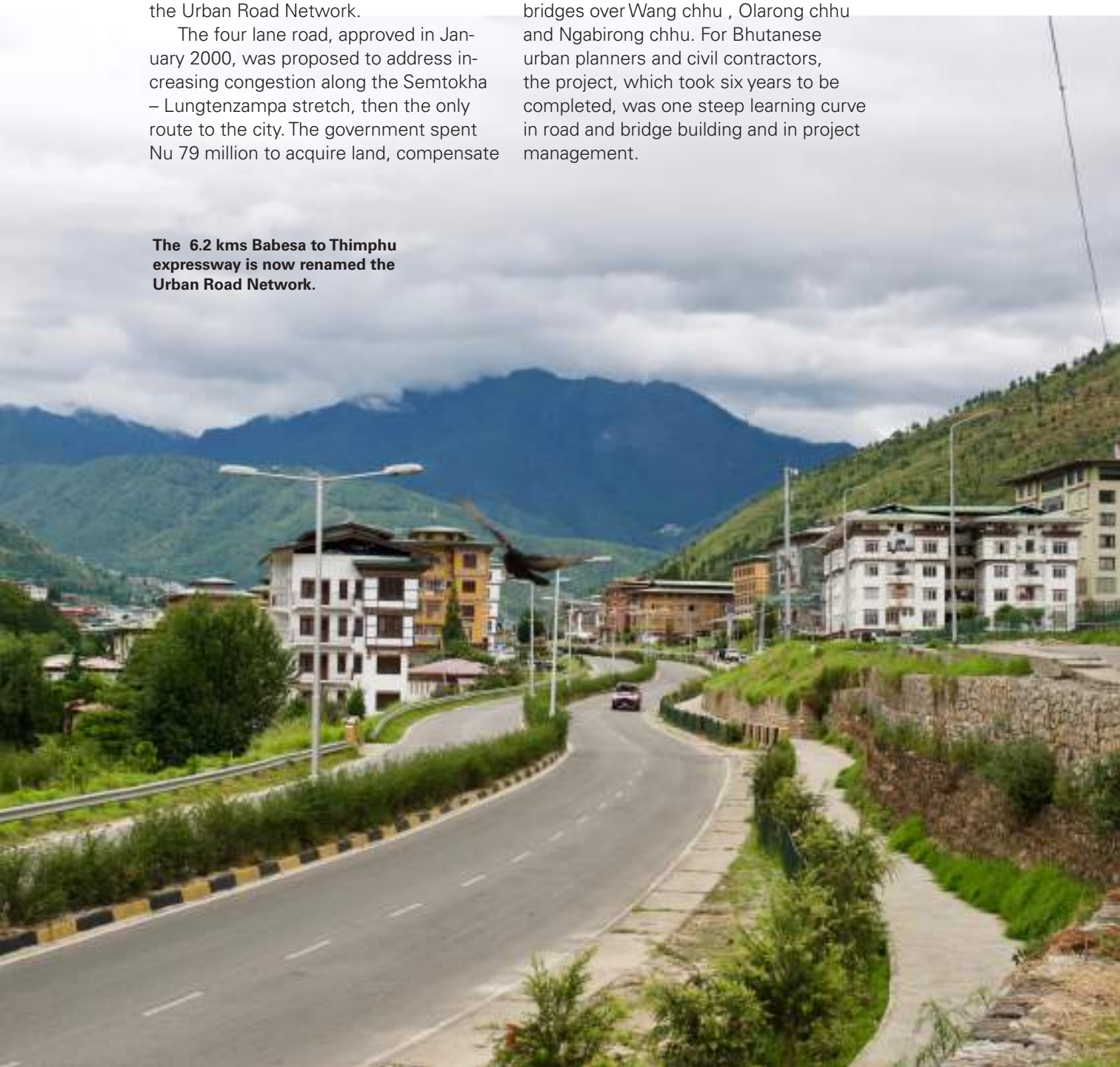
2004-05
Approval of TSP 2002-27

A major learning curve

A significant infrastructure project undertaken at the turn of the millennium that swallowed huge swathes of fertile paddy lands and eventually opened up South Thimphu to planned urban development was the 6.2 kms four lane Babesa – Thimphu road link, later named the Urban Road Network.

The four lane road, approved in January 2000, was proposed to address increasing congestion along the Semtokha – Lungtenzampa stretch, then the only route to the city. The government spent Nu 79 million to acquire land, compensate and relocate public utility services. About 26 acres of land, including 20 acres of wetland belonging to 90 owners, came under the project. The Government of India funded the expressway, the cost of which escalated from Nu 222 million to Nu 450 million with inclusion of three bridges over Wang chhu , Olarong chhu and Ngabirong chhu. For Bhutanese urban planners and civil contractors, the project, which took six years to be completed, was one steep learning curve in road and bridge building and in project management.

The 6.2 kms Babesa to Thimphu expressway is now renamed the Urban Road Network.



1980s

Norzin Lam in the mid 80s. Then, vehicles were few and traffic flowed both ways.

2021

Norzin Lam today is the capital's busiest one way street with retail shops, restaurants, hotels and banks.

Voters at a polling booth during the 2016 Thimphu Thromde elections.

“

… there is a need to provide democratic and accountable government for the urban communities, ensure the provision of urban services in a sustainable manner, and encourage the involvement of urban communities in the matters of urban governance ….”

Preamble,
Thromde Act of Bhutan 2007

2011–

SECTION IV

Elected office

Thromde becomes an elected office

An elected city council

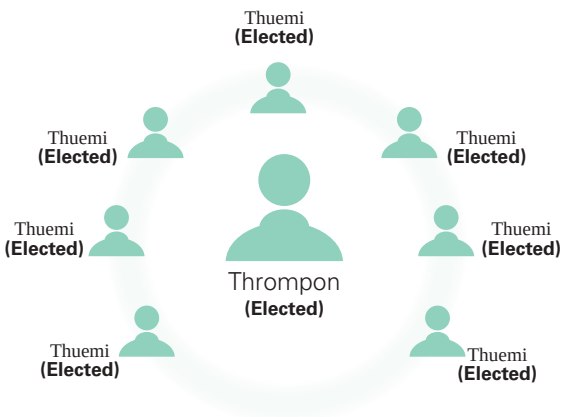
Since 2011, elected members have replaced appointed representatives to the city council, which includes the Mayor (Thrompon) as the chairperson and seven elected representatives of the city's constituencies (Thromde Thuemis).

The council is the highest decision-making authority of the Thimphu Thromde and handles landowner grievances, make rules and regulations consistent with national laws and reviews and approves the annual budget.

The council can levy taxes, fees and charges, raise, borrow, spend, and invest money to carry out its functions and formulate guidelines for entertainment and recreational activities and venues, workshops and squatter settlements. The Thuemis report to the council on deliberations and recommendations of the city zone committees.

The Thimphu Thromde implements the central government's five year urban development plan and the Thimphu Structure Plan 2002-2027. LAP is the primary mandate of the city in getting landowners to agree to land pooling and in executing the building of social infrastructure. Issues that cannot be resolved at the council is forwarded to the relevant ministry or central agency. Thromde staff report directly to the Executive Secretary (ES) who reports to the Thrompon.

City council (Thromde Tshogde)



Legislation

The Thimphu City Corporation became an autonomous body in 1995 through a Royal Charter that delinked it from the civil service to create an independent municipal authority.

In 1999, the Bhutan Municipal Act gave municipal authorities the legal teeth to enforce regulations and frame regulations to plan urban growth. This was repealed by the Thromde Act 2005. The Thromde Act was repealed by Local Government (LG) Act 2006, which in turn was replaced by LG Act 2009 and its amendment in 2014.

Despite several amendments, existing legislations have not adequately addressed governance issues facing urban planning and development.

Many of the legislations including the LG Act and Land Act are focused on rural governance and does not adequately capture complex aspects of urban governance. Although a spatial planning legislation is being drafted to address issues related to planning, participation and decision-making, there is no specific policy capturing the whole of urban governance affairs. An appropriate legislation and a dedicated policy for urban governance needs to be considered urgently.

Community involvement

Besides elected representatives (thuemis) who make up the municipality's decision-making body, the city also engages volunteers to bring about efficiencies in service delivery and strengthen community engagement.

Known as Midey Tshogpas, these volunteers keep an eye on the entire city and inform the Thromde of a burst water pipe, unpicked garbage as well as social issues that might be surfacing in their community.

At least 80 such volunteers, about 12 to 15 in each constituency, were appointed during the tenure of the last Thrompon. Norzin Lam, the city's main street, has five Midey Tshogpas.

One of the Midey Tshogpas of Norzin Lam said they basically act as a bridge between the Thromde administration and the community. Issues the community might be facing in terms of services is brought to the notice of the Thromde for immediate action.

Occasionally, they are also called for coordination meetings organised by the Thromde. For the Thromde, engaging volunteers from the community is aimed at building a sense of ownership of the city's public spaces and utilities, which is crucial for the city's proper growth and development.

How decisions are taken

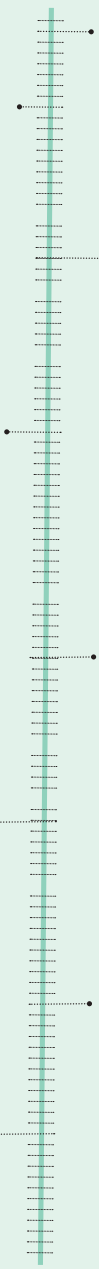
As the highest decision making body in the municipal government structure, the city council or Thromde Tshogde, meets once in three months to approve budgets and plans proposed by the management.

According to the elected representative (thuemi) of Dechencholing-Taba constituency, the council has been instrumental in bringing land and census services closer to people by instituting a division within the Thromde office.

When the Tshogde is divided over certain issues such as approval of budget for unplanned activities, it is usually resolved through simple majority vote. But often issues that are beyond Thromde's jurisdiction also comes to the Tshogde. For example, if the Thromde plans to develop an empty plot of government land, it needs the approval of the National Land Commission Secretariat (NLCS). When it comes to development of LAP, Thromde officials prepare it in consultation with the affected property owners and table it in the council for finalisation and recommendation.

Managed by

Governance milestones



1974
Thimphu Municipal Corporation established

1982
TMC functions under a Central Town Planning Committee (National Urban Development Corporation)

1995
A Royal Decree grants autonomy to TMC

1999
Enactment of the Bhutan Municipal Act 1999

2007
Thromde Act 2007 replaces the Municipal Act. Local Government Act is enacted

2009
LG Act 2007 and Thromde Act 2007 consolidated as the LG Act 2009

2014
LG Act 2009 is amended

2018
Formulation of the Local Government Rules and Regulations

Growing autonomy

Over the years more autonomy and authority has been devolved to the Thimphu Thromde through appropriate legislation and in keeping with its capacity to handle increasing responsibilities of a municipal government.

The biggest change came in 2011 when decision making powers moved to an elected council from a government appointed committee. This was in accordance with the country's transition to democratic governance.

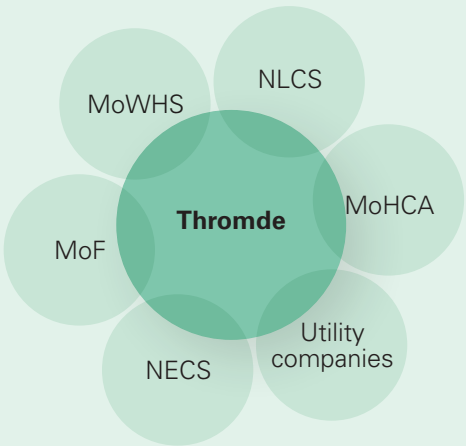
Almost immediately the Thromde took over the construction and maintenance of city roads which the relevant central agency had been trying to delegate for years.

Today, the Thromde also manages health and educational services within the city and more recently the city bus services under Bhutan Post came directly under the Thrompon.

But in many areas, the municipal local government still needs to work with central government agencies in implementing development plans. For example, the Ministry of Works and Human Settlements (MoWHS) retains urban policy making functions while the Thromde can modify urban rules and regulations. But any change to urban regulations needs the ministry's approval.

When it comes to land use, the city works closely with the NLCS to ensure land is not lost to encroachment.

The Thromde also must contend with the Ministry of Finance (MoF) in calculating value of land through the property assessment and valuation agency and in negotiating revision of fees and levies for urban services.



Then, there is the National Environment Commission Secretariat (NECS) to coordinate development control in environment precincts and the Ministry of Home and Cultural Affairs (MoHCA) to consult on changes to heritage sites within the city.

The priority of these central agencies have also led to deviations from approved plans.

Affordable housing in the city has been a long standing issue but it is the mandate of National Housing Development Corporation Limited (NHDCL) with the Thromde's role confined to identifying suitable sites and planning urban amenities.

There are utility companies like Bhutan Power Corporation, Bhutan Telecom and cable television service providers that the Thromde must work with to coordinate laying of infrastructure and service delivery.

Human resources

One employee for every 196 Thromde residents

Given its diverse responsibilities to deliver services and manage the growth and development of the capital city, the Thimphu Thromde is a relatively large organisation with more employees than a government ministry.

On the most recent count it had 586 employees of which 181 are regular employees – all civil servants - and 44 contract employees in the Thromde's eight divisions and secretariat. The rest make up the Thromde workforce engaged in cleaning and maintenance services.

The infrastructure division, which looks after the city's roads, sewerage, water supply, streetlights and other facilities, has 49 staff, the highest number.

The other divisions include environment, development regulation, urban planning, education, finance, land and legal. The Thromde's health services recently took over satellite clinics spread across the city from the health ministry. The Thromde also provides customer care, census, and ICT services related to land, tenancy and water.

Thromde	**1 staff : 196 people**
RCSC	**1 staff : 24 people**

On a national scale, there is one civil servant for every 24 Bhutanese. By that comparison the Thimphu Thromde is understaffed with one Thromde employee for 196 city residents. Its 586 employees serve a city of 115,000 people.

Under the education division, where the Thromde manages infrastructure development of schools in the city as well as placement of students, around 1,200 teachers and principals and 16 ECCD facilitators are listed as Thromde staff but are paid by their parent ministry. Likewise, 31 medical staff under the health ministry's payroll are also listed as Thimphu Thromde staff.

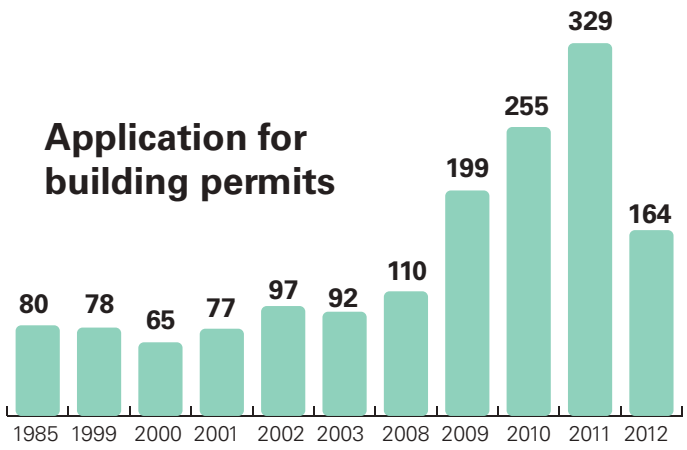
Implementing the grand vision

When Thimphu's first elected Thromde council took office, the city was turning into one big construction site. Private concrete structures were mushrooming in South Thimphu where basic infrastructure such as roads, water supply, footpaths and other services were being built under the finalised LAP.

This was evidence that the Thimphu Structure Plan was finally happening on the ground. For the newly elected Thromde Council, it already had its work cut out in preparing and implementing the LAP in north Thimphu where not everyone had agreed to land pooling.

Implementing the Thimphu Structure Plan (2002-2027) through the LAP took as long as six years in some cases as consent to land pooling took time and then the private plots had to be reconfigured to access municipal services.

Actual implementation began from Lungtenphu in 2009, the first area that agreed to land pooling, when permits were given to build private structures. In 2009, an average of 200 building permits were issued annually by the city. This rose to more than 300 permits in 2011 and dropped to 50 in 2013 in the aftermath of the rupee crisis and the temporary freeze on housing loans. Most of the applications were for residential buildings to be rented out. Building several water supply and sewerage infrastructure projects as well expansion of the city's road network took place in the past decade following the Thromde's transition to an elected office.



Source: Thapa 2005, Rai 2013, UNCHS Habitat 1990

Google view of Lungtenphu in 2003 (left) and in 2013 after the LAP was implemented.

Top: **The Taba LAP in North Thimphu was developed after the Thromde became an elected office.** Below: **Development of South Thimphu began by 2010.**

Status of LAP Implementation as of 2021			
No.	**Area**	**Implementation Status**	**Remarks**
1	Dechencholing LAP	Fully Completed (WB)	Completed in all respect
2	Taba LAP	Partially completed	Lower Taba Completed (WB) & Upper Taba Water Supply and Internal Road Network pending
3	Langjophakha LAP	Fully Completed (WB)	Upper Langjophakha On-going
4	Hejo-Samtenling LAP	Partially Completed (WB)	Sewer Treatment Plant
5	Jungshina LAP	Partially Completed (WB)	Internal Road Network In-complete
6	Zilukha Area Action Plan	Partially completed (RGoB)	Sewer Network In-complete
7	Changzamtog Middle LAP	On-going (RGoB)	Not fully completed
8	Changzamtog Upper & Lower LAP	On-going (RGoB)	Not fully completed.
9	Changbangdu LAP	Fully Completed (ADB)	Completed in all respect
10	Lungtenphu LAP	Fully Completed (ADB)	Completed in all respect
11	Semtokha Workshop Area	Partially Complete (RGoB)	Sewer and Water Supply Network incomplete
12	Semtokha LAP	Fully Completed (ADB)	Completed in all respect
13	Babesa LAP	Fully Completed (ADB)	Completed in all respect
14	Serbithang LAP	Not yet initiated	Not yet started
15	Babesa & Semtokha E4 LAP	In-complete (RGoB)	On-going
16	Dechencholing Satellite Town	In-complete (RGoB)	Road Network Development on-going
17	Core Area (8 sqkm)	Completed	Improvement/Redevelopment work on-going
18	Pamtsho E4 Area	In-complete	Road Network Development On-going
19	Lubding Area & E4	In-complete	On-going planning work
20	Chang Gedaphu Area & E4	In-complete	On-going
21	Yangchenphu Area	In-complete	On-going
22	Changjiji Area	In-complete	Road Network Pending

Pooling land to build the city

As opposed to the difficult and expensive process of land acquisition, a key element of the capital city's urban expansion has been the concept of land pooling where landowners contribute a portion of their holdings in return for common urban infrastructure and public amenities. As of 2014, a total of 2,611 landowners in Thimphu city had contributed more than 260 acres of land for planned urban infrastructure. On average, landowners have contributed between 28 to 30 percent of their land to land pooling.

The concept, adopted in different ways in many countries, was tested for the first time in the late 90s in Changzamtog, to build the city's ring road, where it met with resistance and attracted controversy.

For the capital city, land pooling made it possible to implement the Thimphu Structure Plan (2002-27). Common urban facilities such as roads, drainage, sewerage and water supply systems, footpaths and recreational spaces have come up on pooled land.

While the central agencies had identified areas (precincts) for specific use, the Thromde's urban planners prepared the detailed LAP, measuring about a sqkm each, to implement the Thimphu Structure Plan on the ground.

For the Thromde's urban planners, this meant first finding out how much pooled land would be required for a particular precinct for roads, drainage, footpaths, sewerage and water supply systems and other public amenities.

In drawing out the detailed LAP, the Thromde follows the planning standard guidelines to decide on where to locate a school, health centre and other urban facilities, which is largely determined by population size.

The plots of land are reconfigured and laid out in a way that all have access to urban facilities.

Once the plans are finalised, land holding details are updated and accepted by the property owners. The Infrastructure Division then steps in to build and maintain the common infrastructure. The Development Regulatory Division ensures constructions follow building rules, government land is not encroached upon and public property is not damaged.

Today, land pooling has become the standard procedure for urban expansion in the country providing cash strapped municipal authorities land for development and landowners with urban amenities. The land pooling scheme has been implemented only in those areas falling under the Local Area Plan. As for the core area of 8 sqkm, there is no land pooling.

City financing

Internal revenue

When it comes to building roads and new infrastructure, the Thimphu Thromde still relies on government funds. It received a budget of Nu 2.2 billion in the 11th Plan to build new infrastructure, twice the amount allocated to a Dzongkhag. For the ongoing 12th Plan it is close to Nu 5 billion.

But where the Thromde has made strides is in generating revenue to meet current expenditure, which means paying salaries of its permanent and contract staff and covering operational and maintenance costs of its vehicles and assets.

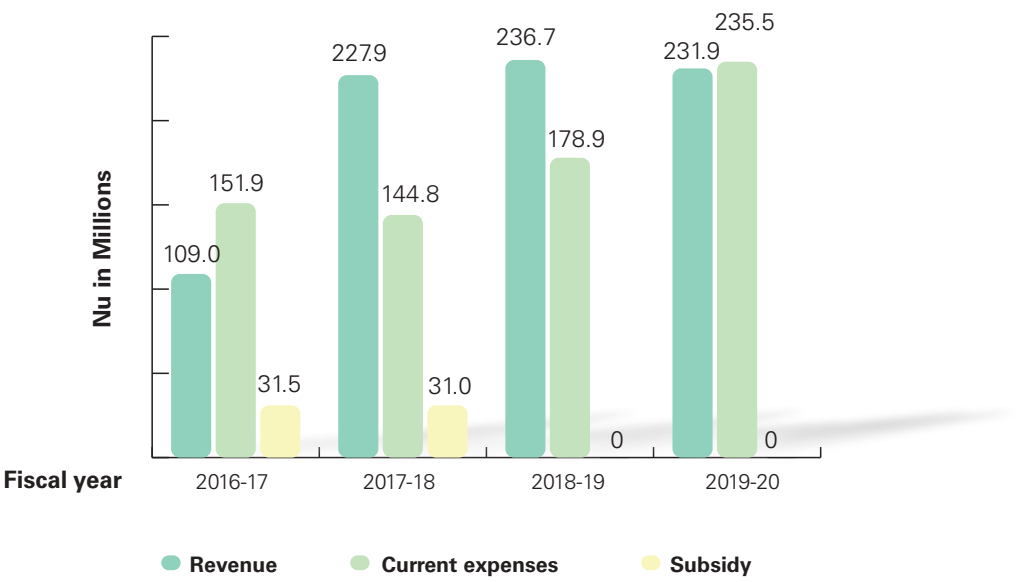
Since the first year of the 12th Plan (2018-19), the Thromde discontinued the government subsidy to meet current expenses with annual revenue increasing from Nu 109 million in 2016-17 to Nu 231 million in 2019-20.

In the first and second year of the 12th Plan, the Thromde had a surplus fund of about Nu 61 million after deducting expenses. This was used to top up the budget for building the six kms footpath from Lungtenzampa to Ngabirong chhu along the Thimphu – Babesa Urban Road Network.

The Thromde's main revenue sources are property transfer tax, land tax, water and sewerage charges and rentals from infrastructure. Property transfer tax and water and sewerage charges contribute more than half the total revenue with almost Nu 60 million coming from water and sewerage charges.

While increasing real estate transactions pushed revenue, several initiatives to rationalise costs also made a significant impact. For instance, garbage collection outsourced to private parties from 2010 not only improved services but also

Rising revenue



brought down maintenance costs of its aging vehicle fleet to less than Nu 9 million a year.

Street lighting, was another expensive affair. One lamp consumed around 400 watts, enough to light a household. There were around 3,000 lamps in 2010 that brought bills amounting to about Nu 700,000 a month. The Thromde spent about Nu 20 million to replace all lamps with LED bulbs. Even with a little over 5,000 lamps today, the Thromde's power bills remain as that of 2010, a saving of about Nu 800,000 a month.

Financial autonomy still remains a far-fetched dream. The Thromde does not have the authority to alter service fees and taxes. Sewerage and water charges, which remain low, was last revised in 2013. Likewise land tax was revised in 2011, but property tax, which includes garbage fees, has not changed since 1992.

Some of the revenue streams from infrastructure and services provided by the Thromde are collected by different agencies. The Thromde is exploring investment plans and developing a financial strategy to achieve financial sustainability.

South Thimphu

ADB has supported the building of roads and water supply systems for Lungtenphu, Semtokha, Babesa and Changbangdu in South Thimphu as part of the Thimphu Structure Plan.

This was done under the Urban Infrastructure Development Project which began in 2007 and ended in 2016. Initial funding was projected at USD 15 million, which increased to USD 24 million by the end of the project. ADB provided concessional financing with some contribution from the Royal Government.

ADB also provided financing for the ongoing sewerage and water treatment plant project in Babesa, which has a capacity to treat 12 million litres of wastewater a day and will cater to the core city area and south Thimphu.

ADB provided a concessional loan of USD 14.3 million for the automated indoor plant, which will begin operations in January 2022, and eventually replace the existing open air treatment plant. The running cost of the new plant is estimated to be USD 500,000 a year.

The ADB funded sewerage treatment plant in South Thimphu.

North Thimphu

Under the Bhutan Urban Development Project, the World Bank financed the construction of water and sewerage treatment plants, water supply, road widening, drainage, and walk-ways among others in North Thimphu

The North Thimphu areas include Taba, Jungshina, Langjophakha, Samtenling, Hejo, Dechencholing and Pamtsho.

The development of North Thimphu was approved in 2010 with a budget of USD 12 million and an additional financing of USD 17 million focused on municipal finance and management, northern area development in Thimphu and building capacity of Thromde officials.

One of the most recent projects supported by the World Bank in Thimphu Thromde is tapping of drinking water from Dodena for communities of Taba, Jungshina, Langjophakha, Yangchenphu and Changjiji. The project cost USD 8 million and has eased water shortages in the city to a large extent.

Even prior to the development of North Thimphu, the World Bank partnered with the Thimphu Thromde, where the Royal Government contributed Nu 86 million, under the Bhutan Urban Development Project I and II.

The first Urban Development Project focused on improving the quality of life in Bhutan's urban centres by strengthening local financial and institutional capacity to deliver efficient services to residents.

The water treatment plant in Taba funded by World Bank.

The Thromde's surplus revenue was used to top up the budget for the 6.2 kms footpath from Lungtenzampa to Babesa.

The Thromde's Infrastructure Division replaces an aging lamp post.

SECTION V

City services

Since becoming the national capital in 1955, Thimphu Thromde has grown rapidly as the new economic and governance hub of the country.

In the early years of the millennium, it was even regarded as one of the fastest growing capital cities in the world, with population growth rates at more than 10 percent per annum.

Thimphu Thromde has better urban infrastructure and services compared to other cities in the country, but has struggled to keep up with the city's rapid growth. According to the 2017 census, the city has a population of 115,000 people that is growing at double the national growth rate of 1.3 percent, largely because of rural-urban migration.

This has resulted in unplanned development in peripheral areas, shortage of affordable housing, issues of clean and reliable drinking water, solid waste management, traffic congestion and pollution.

The Thromde provides a host of services from urban planning to garbage collection as part of its mandate to make Thimphu a livable and green city.

WATER SUPPLY

Supply of safe and reliable drinking water is one of the basic services the Thromde is mandated to provide to all residents. However, with Thimphu's growing population and mushrooming structures, providing uninterrupted water supply to all residents remains a challenge for the Thromde.

There are five streams above the city from where water is tapped into five treatment plants and 32 reservoirs supplying drinking water.

Thimphu Thromde's water supply system

Water treatment Plant	Capacity (million litres per day)	Year estd.	Raw water intake	Supply area
Mothithang	6.5	1970s	Pumla, Dami-lum and Phajoding streams	Upper and lower Mothithang, Chan-gangkha, NPPF colony, JDWNRH and Yangchen-phu
Jungshina	6.5	2001	Samteling stream	Hejo, Dzong area, Norzin lamwog (core area), low-er Changzamtog
Bore hole (3 nos)	1.8	2012	Wang chhu (infiltrated water)	Changzamtog
Dechen-choling	1.4	2014	Dechen-choling Stream	Dangrina and satellite town
Chamgang	6.5	2014	Chamgang stream	Changbangdu, Lungten-phu, Olakha, Semtokha and Babesa
Taba	10	2019	Dodena	Lower Taba, Langjop-hakha, Yangchenphu area, Changdelo, Changjiji, Norzin lamwog, Lower Mothithang, Chan-gangkha

Enough on paper

WATER

Theoretically, Thimphu city has enough water for all its residents sourced from five streams. Daily consumption is less than 20,000m3 (cumecs) against a supply capacity of 30,900m3 from five treatments plants and three borehole pumps delivered through 70 kms of distribution pipes.

There are also numerous community sources independently managed by communities.

Yet, not enough water and erratic supply is the number one complaint of residents.

When the Nu 400 million Dodena scheme was commissioned in 2019, the capital's largest treatment plant with a capacity of 10,000m3 a day, it was supposed to resolve most of the city's water issues. The plant is specifically meant to supply water to Taba, Langjophaka all the way down to Changjiji. However, equitable distribution with adequate pressure for the whole area is still a challenge due to system loss and network issues. It is estimated that 30 percent of water supplied is lost in distribution.

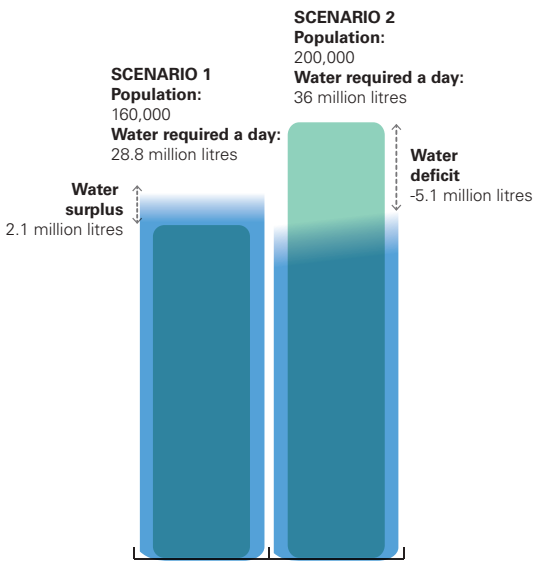
As the central water scheme for the capital, the Water Treatment Plant in Taba has kept provision for an additional 5,000m3 capacity in the future.

Through the central water scheme, the main transmission trunk line connects to the existing tanks at Langjophaka, Yangchenphu and Changjiji on the left bank of the Wang chhu, and Hejo-Samtenling, Pamtsho and Jungshina. The central water supply scheme will also augment supply to the core city up to the planned period as well as Begana and Kabisa.

Two water treatment plants are being built to increase supply to South Thimphu. A 2 million litres per day (2,000m3) plant near the Royal Thimphu College (RTC) will become operational by January 2022 and supply water to Serbithang, parts of Babesa while also addressing the acute

The plant at Taba treats water sourced from Dodena. It is the largest treatment plant in Thimphu.

Thimphu Thromde's projected water demand scenario by 2027



With per capita consumption taken at 180 litres a person a day

shortage in the Debsi area.

The construction of a 3.5 MLD (3,500m3) plant in Chamgang to provide treated water to the community around the Semtokha Dzong and parts of Semtokha E4 zone will be completed by the end of 2022. Both plants will use the community's existing untreated water source from Chamgang and Ngabirong chhu.

Thimphu's first treatment plant in Kuengacholing, Mothithang, was built in the 1970s with a capacity of 6,500m3 a day and fed the core city extending from Mothithang to Changangkha and upper Changzomtog. The plant was renovated in 2007. Another plant in Jungshina was built in 2001 with a capacity of 6,500m3 a day to supply the core city, Changzamtog and Hejo.

In 2014, a 1,400m3 treatment plant was built in Dechencholing to cater to residents of the area. That same year, a 6,500m3 plant was built in Chamgang to cover Lungtenphu, Babesa, Olakha and Changbangdu in South Thimphu. The supply from Chamgang faces problems almost every year during monsoons with landslides washing away main supply lines fixed to the steep hillsides.

In recent years three bore hole pumps were also were installed for ground infiltration in Changzamtog. These boreholes have an operational capacity of 1,800m3.

The demand for water is increasing as the city grows rapidly. For example, non-revenue water supply, which is the unbilled but authorised water supply to labour camps, nurseries, public infrastructure, and fire hydrants alone increased from 2,510m3 in 2006-07 to 4,019m3 in 2015-16.

With per capita consumption taken at 180 litres a person a day, Thimphu is projected to require 28.8 million litres a day in 2027, when the city population reaches 160,000. If population reaches 200,000, the city will experience a deficit of 5.1 million litres a day by 2027 with daily demand projected at 36 million litres.

Tackling the issue

There are several residences that have private water connections and are not connected to the Thromde water supply. Besides private lines, there are also community water supply lines in 14 locations across Thimphu.

These community lines are not treated and in some areas the Thromde has augmented supply by building storage tanks and laying network pipes.

Most sources for community water lines are maintained by Thimphu Thromde up until the tanks after which the communities take over. Extended areas of the Thromde are dependent on the community lines and the community takes the monitoring charge.

WATER

Thromde is planning to gradually integrate the community lines into the Thromde water supply, but communities have been resisting the move as they claim they inherited the community water sources from their ancestors.

It took the Thromde three public consultations to convince residents that community supply is not treated and hence pose health risks. Community lines are also not managed well and it often causes damage to other infrastructure. New constructions also pose challenges to water supply lines. At times, the entire line needs to be realigned when it involves a road construction.

There are also issues with the old distribution network, particularly in the core town area, with no information on how it was planned in the 60s and 70s. When issues emerge along this network, the Thromde ends up digging the entire area looking for the fault. Major leakages also occur from these underground pipes that have long outlived its lifespan.

About 30 percent of Thromde's water is also supplied without any charges to a few institutions, construction sites, squatter settlements and public places. These areas have high wastage since it is not billed. The plan now is to install metres to ascertain and reduce wastage.

But uninterrupted supply is not possible in some areas due to water pressure and terrain.

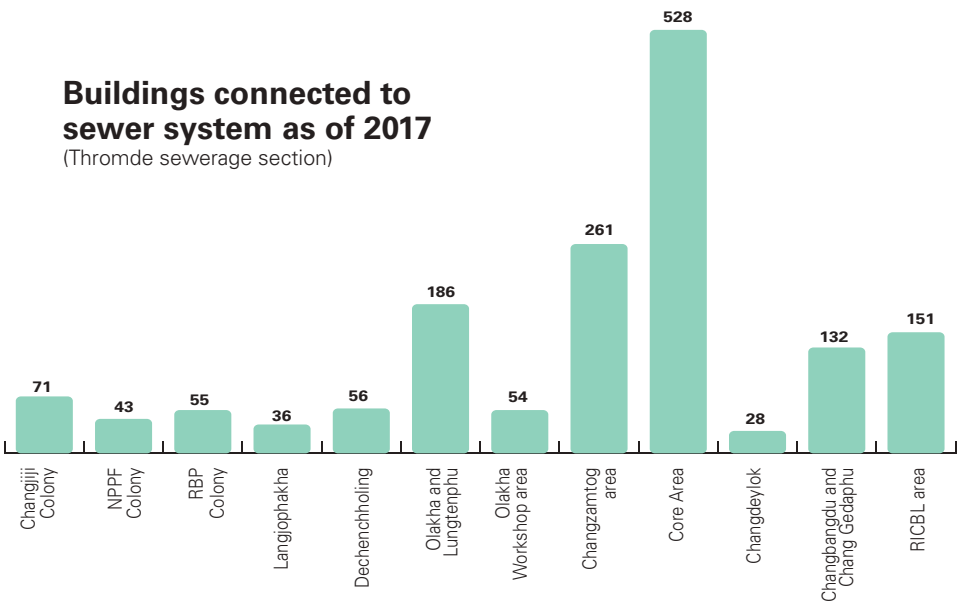
SEWERAGE

Thimphu Thromde got its first sewerage system in the mid 90s through a DANIDA project. It could treat 1.75 million litres of wastewater a day and catered to about 16,000 residents in the core area or about 40 percent of the city's population.

The gravity system carried wastewater through a network of underground pipes to several large open air ponds in Babesa, then far away from the city limits, where waste naturally decomposed and clean water flowed back into the river. Households not connected to the system used the services of sewerage tankers to empty stand-alone septic tanks.

Since then, the sewerage network coverage has expanded to cater to Thimphu's rapidly increasing population.

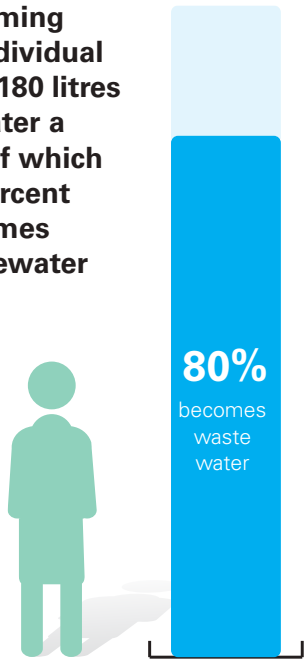
The system, particularly the one built in the 90s, faces challenges of overflows and blockages during the rainy season because of sediment collection in the pipes and the dumping of garbage in sewer lines.



Thimphu Thromde sewerage system

SL No	Plant	Year established	Capacity in million litres per day (MLD)	Coverage
1	Dechencholing	2013	0.75	RBG Colony and Dangrina
2	Taba	2018	1	Taba
3	Hejo	2019	0.1	Hejo village. Provision for new STP construction
4	Jungshina	Under construction	1	Under construction
5	Langjophakha	2016	0.6	Langjophakha
6	Yangchenphu	2016	2	Yangchenphu, Zi-lukha, Kawajangsa and Mothithang
7	Babesa	To be completed in 2021	12	South Thimphu and Core area
8	Babesa	1996	1.75	(will be decommissioned)

Assuming an individual uses 180 litres of water a day of which 80 percent becomes wastewater



Taba's independent sewerage treatment plant.

SCENARIO 1

Thimphu city will face a capacity shortfall of

7.5 MLD by 2027 if the city's population grows to

160,000 with wastewater generation at

23,040,000 litres.

SCENARIO 2

The shortfall would be

12.45 MLD if the city's population grows to

200,000 with wastewater generation at

28,800,000 litres.

This would require building additional treatment plants. The new plant in Babesa has kept provision for future expansion.

A vastly expanded network

SEWERAGE

Expanding the sewerage network to provide a safe disposal system for the capital's toilet and kitchen wastewater has been a key undertaking of the Thromde in the past decade. Thimphu got its first sewerage system in the mid 90s that could treat 1.75 million litres a day and served the city's core town area. The open-air treatment system, defined by several large ponds on a 13-acre area, was set up in Babesa.

Today, the city's sewerage network has been expanded to handle more than 16 million litres of wastewater a day and covers at least 80 percent of households in the city.

The city's main sewerage plant is an automated indoor system adjacent to the open-air system that is still in use. This new plant with a capacity to treat 12 million litres a day will cater to more than 100,000 users, from the core city area and south Thimphu, and will have minimal odour issues unlike the open system.

Built with assistance from the Asian Development Bank (ADB) the automated plant is installed with a sequential batch reactor (SBR) technology that is artificially fed with oxygen to decompose sewage waste. It also has a pumping station for low lying areas like Babesa, a disinfection tank and a screening system to trap nonbiodegradable waste. The cleaned wastewater will be released into the river.

This new USD 11.57 million plant, built on a five-acre area, is expected to become operational by January 2022 and will eventually replace the existing open air lagoon system.

There are six other smaller independent sewerage plants servicing different locations across the city with a total capacity to handle seven million litres of wastewater a day. These independent plants have been built with assistance from the Government of India, the World Bank, the Government of Japan and the Royal Government of Bhutan. One more small sewerage plant is being built for the Jungshina locality.

An estimated 20 percent of the city's households are not connected to the network because of steep terrain and location issues. These households which have stand alone septic tanks use the Thromde's sewerage tankers when it needs emptying.

A sewarage plant under construction for the Jungshina locality.

The new indoor treatment plant can treat 12 million litres of wastewater a day.

The odour control unit of the new plant.

User habits have not changed

A thin metal rod sticks out of an open manhole brimming with sewer water along a leafy road in the city's congested vegetable market area. Two men attach metal pieces to the rod as more of it goes into the open manhole.

This location is one of the perennial problem spots of Thimphu's sewerage network; it overflows when it rains because of sediment settled in the sewer. The sediment deposits must be churned with the rod to create a flow.

SEWERAGE

Rain gutter water from several buildings in the area also drain into the sewer network. Overflows along Norzin Lam, the city's main thoroughfare, is also because of illegal rain gutter connections. In winter, cooking oil dumped into the system solidifies inside the sewer pipes constricting flow and leading to overflows.

Sanitary pads, diapers, rags, small bottles, condoms, cutlery, wood, hair, cigarette stubs, food waste (bones) also create blockages in the network. Thromde officials say inappropriate material enter the sewers through the inspection chamber of buildings, where the service line to buildings connects to the sewerage network.

The Thromde attends to three to eight blocked and overflowing sewer lines every day. On average, waste to fill a 50-litre bin is removed from the sewer lines daily. Some blocks take days or even weeks to clear. The city is equipped with a few jetting and suction trucks to flush out blocks and clean sewer lines. The same machine is also used to service homes with standalone septic tanks.

"The network has expanded but user habits have remained the same," said the Thromde's sewerage service in-charge, who has been with the Thromde for the past 12 years.

The Thromde has a cleaning team of six people to attend to sewerage blocks.

The Thromde's workforce clean blocked sewers in the vegetable market area (top) and along Chang Lam (below).

Better, but a long way to go

Until recently using a public toilet in the capital was at best an awful experience. It was as filthy as it could be, and one would have to tiptoe to avoid stepping on excreta. The taps and doors would be broken, and the toilet bowl filled to the brim.

They were built in locations such as the bus terminal and the vegetable market to prevent open defecation and improve sanitation and hygiene. But maintaining the toilet was no one's responsibility.

SEWERAGE

In the mid 90s, Sulabh International, an Indian NGO, began operating and maintaining a toilet and bathing complex in the weekend vegetable market area on a pay and use basis. This opened a whole new possibility of maintaining public toilets. The centenary farmers' market, which opened in 2008, adopted the pay and use model to manage its toilets for the weekend crowd of vegetable sellers and shoppers.

Since 2010, some civil society organisations and social entrepreneurs have taken up maintenance of public toilets in the capital from the Thimphu Thromde.

Today both Dr. Toilet, a private enterprise, and Bhutan Toilet Organisation, manage the capital's public toilets while also actively advocating cleanliness, hygiene and good toilet culture. There are around 21 public toilets in Thimphu today, some are not used.

A public toilet in the city.


NO SMOKING
GENTS
PLEASE DONT SMOKE
WED RATHER DIE
OF NATURAL
CAUSES

WASTE

Waste management has historically been a problem in Thimphu and the situation has been exacerbated by rapid urban growth with the waste management system struggling to cope.

The Thromde has tried numerous means to address the issue beginning with open pits, cleaning campaigns, advocacy and now the waste drop-off centres.

Today garbage collection has been outsourced to private operators and a recovery facility established. Still, garbage dumping is rife and much of it ends up in the city's drainage system, streams and rivers.

The solution to the issue rests with the people's mentality and cooperation to reduce, recycle, reuse and refuse, to lessen the burden on the Memelakha landfill which has long outlived its lifespan.

Garbage in the city is collected thrice a week.

A drop-off centre in the core city area.

Drop-off Centres

More recently, drop-off centres were established for residents who cannot catch the waste collection trucks to drop their waste. The first drop-off centre near Kelki School, where waste is segregated for recycling, is already proving to be effective.

On August 28, 2021, Her Majesty the Gyaltsuen inaugurated another drop-off centre in Dangrina as part of the government's Waste Flagship Programme. Eight more drop-off centres are expected to come into operation soon in the capital.

These initiatives are geared towards achieving zero waste by 2030. More infrastructure like a material recovery facility, recycling and waste segregation plant and wet waste management technologies are in the plans.

A number of small electric waste collection vehicles have also been bought to access narrow streets and corners of the city.

What a waste!

Back in the 1980s, Thimphu was already a bustling town with more than 10,000 people but it barely generated any solid waste. Then, households did not throw away many things after use. The empty powdered milk tin stored dry snacks, the juice pet bottle held locally brewed ara, plastic bags wrapped dry meat or butter. Cattle and horses and household pets consumed food leftovers.

But by the 90s, the situation had changed dramatically. The city's population had grown rapidly, and garbage was spilling out of homes and into open spaces with consumption patterns leaning towards packaged foods and a growing list of disposables.

WASTE

That was when Thimphu got its first landfill at Memelakha, 12 kms from the city, and a few tractors did the rounds collecting garbage in the core town area.

In the early years of the new millennium, the Thromde installed open pit bins in numerous locations around town for residents to dispose garbage. But this became an eyesore as the pits overflowed and attracted strays that further scattered the mix of wet and dry waste.

Black bins were also distributed to shops in town to prevent littering and enable orderly collection but after a while the bins too ended up as trash.

Numerous campaigns were held to segregate garbage into paper, plastic and glass to promote recycling. This did not gain much traction as segregated garbage got dumped together in the same truck. Today, segregation of dry and wet waste is being promoted at the household level with scheduled wet and dry waste collection days.

There is no reliable data on how much solid waste the city generates. In 2007 the city was producing 35 Metric Tonnes (MT) of waste a day, 11 MT more than 2001. A 2020 study estimated daily waste generation at 43 MT, not counting the illegal dumping happening in many parts of the city.

The city spends at least Nu 17 million a year for waste collection or Nu 1.4 for every kilogramme of waste generated.

Waste collection was outsourced to private firms, Greener Way in 2010, Clean City in 2012 and Green Bhutan Services in 2020, to improve collection. In 2013, the city supported Greener Way in setting up a material recovery facility to reduce waste going to the Memelakha landfill. This has reduced cost and enhanced efficiency.

All the garbage collection trucks are installed with a GPS tracking system to monitor frequency and movement in response to numerous complaints on erratic timings.

Meanwhile, the Memelakha landfill continues to be used. While measures are being taken to extend its capacity, projections indicate that it may not be able to handle the waste volume by 2027 when the city will generate almost 100 metric tonnes of solid waste a day if the population is 160,000. If the population reaches 200,000 by 2027, solid waste is estimated to be 124 metric tonnes a day.

Types of waste

Waste is classified into 11 types, of which organic waste amounts to more than half, followed by plastic and paper. Then there is hazardous and medical waste like cosmetics, batteries, bulbs, pesticides, needles and syringes. The JDWNR Hospital alone generated 145 MT of medical waste, 34 percent of the total healthcare waste, from December 2016 to December 2017. This hazardous medical waste managed by Ministry of Health is either autoclaved or incinerated.

To reduce burden on the landfill and avoid leaching, a compost plant was established in 2010 at Serbithang to handle biodegradable waste. The plant had a capacity to decompose 25MT of wet waste in a month. But in 2016, the NECS asked the Thromde to either shift the plant or improve the facility because residents complained of foul smell from the plant.

Waste from construction and demolition sites are also emerging as a challenge. While the recyclable waste are sold to scrap dealers, there are no proper procedures and arrangements for handling construction and demolition waste and no designated site for its disposal. Illegal dumping of excavated soil along road slopes is also a major issue.

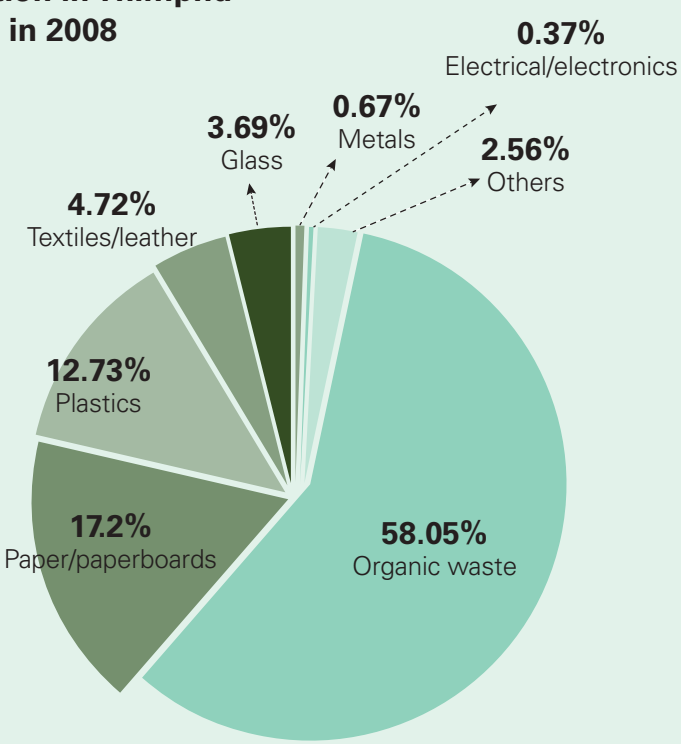
Currently, about 70 percent of households in the Thromde have access to waste management system and 15MT of waste are being recycled every month.

WASTE

Collection frequency

- Thrice a week (one wet and 2 dry)
- A total of 6,813 collection trips and roughly about 6,813 MT of solid waste collected in 2016
- At present, Thromde has 24 garbage trucks, 13 trucks (compactor and open trucks) are with Greener way and 5 with Clean city.

Municipal solid waste composition in Thimphu Thromde in 2008



Electronic waste can be dropped at the drop-off centre.

Segregating recyclable waste at a drop-off centre.

The capital's dumpyard

WASTE

Sprawling over more than 2-acre land, Memelakha is where the capital's waste is dumped.

About 50 vehicles visit the landfill every day to dump what the city throws away.

The Memelakha landfill in-charge maintains a register of the visiting vehicles and ensures waste is segregated and disposed in appropriate locations. "If I'm not around, some people just trash the roadsides, or dump their waste anywhere at the site," he said.

Initially designed to hold eight to 10 metric tonnes of waste a day for a population of around 15,000 in 1994, the waste arriving at the landfill has tripled with the city's population which has grown by almost 10 times.

The landfill, meant to last 10 years, has long exceeded its lifespan. The municipality has been clearing more area by scooping out soil from the slopes behind the landfill.

While waste segregation is done at source, due to lack of dumping space and closure of compost plant in Serbithang, both wet and dry waste are being dumped at Memelakha. It has meant minimal waste segregation and recovery of recyclable materials. Due to this, leachate overflow was identified as a major issue at the landfill.

With the first transfer station and manual segregation established at Olakha, some of the recyclables are collected and sold to local scrap dealers.

The first waste drop-off centre adjacent to the National Resources Development Corporation Limited (NRDCL) office, offers some leverage by improving waste recovery and segregation within the city core.

With the National Waste Management Flagship Programme to kick off in the current plan, the Memelakha landfill that has been in operation since 1994 is planned to be decommissioned in 2023.

The Memelakha landfill.

DRAINAGE

Thimphu Thromde's steep terrain provides a natural system for its streams and rainwater to drain into the Wang chhu.

But increasing concretisation of city has resulted in diversions from the natural watercourse and surface run-off. Today the existing drainage network is struggling to cater to an increasingly high-density population putting additional pressure on the limited and poor quality infrastructure and in some areas it is non-existent.

Clogging and stagnation caused by garbage and other waste is a common issue, resulting in storm water running on the road and causing partial flooding. In some cases, septic tank overflows are also discharged into the drainage system and households that are not connected to the Thromde water supply system have placed water pipes along drains, increasing the risks of water contamination and health issues.

The Thimphu Thromde and the Flood and Engineering and Management Division under the Ministry of Works and Human Settlements have prepared the Storm Water Master Plan. Most storm water drainage follows the alignment of natural water courses.

The city's drain cleaning team is largely a women workforce.

In many parts of the city roads become gushing streams when it rains.

An almost full stormwater drain near the Taba bridge.

Small humepipe drains like this one blocks easily because it is used to lay private water pipes.

Down the drain

DRAINAGE

Overflowing drains are a norm in Thimphu Thromde every time it rains.

Little pools around patches of road with poor drainage, along with trash flushed by rain, joining the erupting sewage, has long brought the Thromde much disrepute and criticism.

The cause, clogged drains from household waste, litter and construction debris.

Thromde workers unearth at least five kilogrammes of garbage from sections of the drain along swimming pool area almost everyday. Many Thimphu residents, Thromde officials said, dispose their wet waste into the drains wrapped in plastic bags.

In some parts of the Thromde, like around Mothithang, water pipes and electrical ducts choke the drains. This is common in the populated settlements in Thimphu. The rain-fed swollen drainage water spills onto the roads during the monsoon.

With most drains eventually emptying into the Wang chhu, the Thromde's environmental division is concerned over the growing waste trashed in drains.

The drainage network in Thimphu spans about 300 kms.

Six days a week

DRAINAGE

Using crowbars the group of workers push into place the heavy iron grill drain cover spanning the road to the Youth Centre. Earlier that morning, workers spent two hours clearing the small drain of construction debris, plastic bags, gunny sacks and small bottles that had caused it to overflow and form fast flowing rivulets to the lower part of town.

An internet cable line illegally laid in the drain snapped during cleaning. Plastic trash wrapped around service cables and pipes laid in the drains made it more prone to blockages.

A few years ago, a huge stone had entered a hume-pipe drain at the Changangkha Lhakhang junction flooding classrooms of a nearby school. The Thromde inspector had to get in with a rock hammer and break the stone until it could be pulled out by a rope.

According to Thromde inspectors, drainage in the core city area are a problem because they were built a long time ago and are small in size. Community water pipes laid in the drains to supplement erratic city supply led to constant blockages. The drains also suffered from gradient issues leading to formation of puddles that damage roads and allow mosquitoes to breed.

In the newly developed areas the drains are covered and much bigger which makes it easier to clean. But some recently built stormwater drains around the city are already clogged and hardened with debris and trash. Thromde officials are not sure what to do as covered drains are difficult to clean and open drains are used as a garbage dump.

The area around the 17th century Tashichhodzong, the seat of government, is designated as a heritage precinct with stringent restrictions on new constructions.

PRESERVING HERITAGE

Preserving the country's traditional and cultural heritage has been a national priority since the beginning of modern development. The first commercial structures to come up along Norzin Lam, Thimphu's first street, were traditional houses built of stone, wood and mud.

Balance with tradition is one of the principles of intelligent urbanism that has guided the development of the Thimphu Structure Plan. Accordingly, several areas within the city such as Changangkha, Tashichhodzong and Dechenphodrang, home to some of the oldest living monuments and monasteries in the country, have been designated as heritage precincts with stringent restrictions on new constructions.

Stone prayer walls and chortens and villages houses of a bygone era have also been preserved to keep the city's ancient heritage intact.

Traditional architecture

HERITAGE

Thimphu is often presented as a city that balances modernity with tradition. This can be seen and experienced at many levels and one of them is in the architecture.

While much of old Thimphu's mud and wood structures has been torn down to make way for larger concrete buildings with the latest amenities, it is a standing rule that all new constructions incorporate elements of traditional architecture.

This has resulted in a certain kind of uniformity in the way city buildings look, most noticeably in the design of windows and cornices. While institutional and government buildings as well as high end hotels have much more elaborate elements of traditional architecture, from the carved wooden pillars to intricately carved wooden cornices, the same cannot be said for the majority of commercial buildings built to provide rental space. This has led critics to comment that regulation has instead led to a dilution of traditional architecture.

Still, the city is blessed with numerous historical monuments that have been restored and conserved. Access to these treasures are also being improved.

Traditional village homes preserved in Babesa.

The old mule track and walking trail to Tashichhodzong passed by this ancient mani stone wall which today overlooks the Babesa-Thimphu Urban Road Network (expressway). There are 11 mani walls within the municipal boundary.

Restoring the Lungtenzampa nye

HERITAGE

Hidden beneath Lungtenzampa Bridge, the gateway to Thimphu in the past, is a sacred site of historical importance to Bhutan. Lam Phajo Drugom Zhigpo, who visited Bhutan in the 13th century and established the Drukpa Kagyue School, is said to have met his consort, Khandro Sonam Peldon, near the bridge.

Lungtenzampa translates as the 'Bridge of Prophecy' where both Lam Phajo and Khandro Sonam built a stupa on either side of the river. There are several impressions of the couple at the site today and many pilgrims and devotees visit to offer prayers and circumambulate the stupa.

Spreading the teachings of the Drukpa Kagyue lineage across the country, Lam Phajo held considerable spiritual and political influence during the time. Khandro Sonam Peldon gave birth to seven sons, four of whom continued to strengthen the Drukpa Kagyue institution in Bhutan.

Today, the pilgrimage site is under threat of being overwhelmed by litter especially near the taxi terminal and the RBP office as it falls in the backyard. There are no lights and toilet facilities for pilgrims and the site is looked after by a caretaker sustaining on the offerings made by pilgrims.

Restoring the site to its former glory is one of the major projects the Thromde is looking to undertake as part of its mandate to preserve the valley's rich Buddhist heritage. The restoration and preservation of the site will be done together with the building of a new Lungtenzampa bridge.

One of the Lungtenzampa chortens along the Babesa Thimphu Urban Road Network (expressway).

LAND AND LEGAL SERVICES

Land is the most crucial aspect of urban development. The Thromde has instituted a Land Record and Survey Division to manage, regulate and administer urban land and carry out cadastral surveys. While authority on use of government land rests with the NLCS, Thromde's role is to bring services closer to the people.

Likewise, many of the disputes the Thromde handles pertain to land and tenancy. Instituting a just and fair dispute resolution mechanism remains critical. To this effect, the Thromde has also instituted a Legal Division within its administration. The division also gives legal advice to the council and management of the city.

Governing city land

LAND

There is one spacious room in the crammed Thromde office that no one occupies; it is filled with rows of steel racks holding 6,800 hard-bound plastic files that go up to the ceiling.

It is in this room that the Land Record and Survey Division officials sometimes spend an entire day going through the files that contain details of every plot of land in the city- size, transaction, use and ownership. The files also contain drawings of buildings as well as records of any legal or transfer issues.

On average, the Thromde receives 200 property ownership transfer applications in a year.

As of February 2021, there were 6,150 thrams and 6,819 plots in Thimphu Thromde. Dratshang Lhentshog and the armed forces own most of the land in Thimphu. All public institutions are given a land use certificate, wherein they can occupy the land for indefinite period but cannot sell or mortgage. More than 200 acres of land owned by Dratshang is registered as freehold, like any other private Thram holder.

Details of every plot of land in Thimphu city is in this room.

The office was upgraded to a full-fledged division in 2019 to strengthen and manage land administration within the Thromde. Its primary task is to manage, regulate and administer urban land and carry out cadastral surveys. It also facilitates online land transaction, processing private land acquisitions, land substitution and compensation and allot state land for lease.

A land committee within the Thromde chaired by the Executive Secretary make recommendations on land substitution, boundary realignment and registration, but the final authority rests with the NLCS. The Thromde has authority to allow temporary lease up to a year. This is mostly to do with construction of labour camps and sheds to store materials.

Prior to the National Cadastral Re-survey Program (NCRP) and even before the Thimphu Structure Plan was implemented, land records were maintained by the erstwhile Thimphu City Corporation until it was taken back by the then Department of Survey and Land Records under the Ministry of Agriculture. After the completion of NCRP, thram records were uploaded on eSakor, an online database for land records, developed by NLCS. The Thromde uses the same system to facilitate the services. In fact, the division is manned by NLCS officials on deputation.

Land issues

The 26 sqkm area under the Thimphu Thromde comprises the gewogs of Chang and Kawang. Natives of these two gewogs possess the land ownership certificate of this area. Other registered landowners are those who were allotted plots through government order to build houses and operate businesses when Thimphu became the capital city. Then there are those who got land through the Royal Kasho.

LAND

But there are also people who are unable to provide evidence of being natives of Chang and Kawang gewogs, nor possess government allotment orders or a Royal Kasho to register land they occupy. The Thromde, in such cases, does not give permission to build and restricts transactions, until the issue is resolved.

Some cases pertain to excess land people have been occupying for generations and are not willing to give up. In most cases, people have appealed for Kidu and cases have been pending.

The land committee has still not resolved some issues pertaining to land substitution for private lands acquired by the Thromde to, for example, construct the bus terminal in Olakha, Diplomatic enclave and Green area in Hejo.

There are also a few cases where people have not yet accepted the land pooling scheme.

Numerous disputes also pertain to boundary encroachment and obstructing the right of way. Many a times, the committee intervenes to settle disputes over sewer lines, drains and water pipes of one household passing through property of another household.

A summary of Registered land within Thimphu Thromde as of 18 June, 2021			
	Total No of Thrams 6,208		
	Total No of Plots 2,894		
No.	**Category**	**Plots**	**Area (Sqkm)**
1	Pvt (Individual, family, Joint, Corporation)	6,185	7.12
2	Religious Institution	129	0.51
3	Gerab Dratshang	128	0.4
4	Private Lhakhang	2	0.003
5	Govt Institution	285	4.3
6	Corporation	27	0.5
7	Crown Property	27	1.56
8	CSO	9	0.06
9	Diplomatic Mission	1	0.006
10	Unknown (Pending cases, disputed plots, unendorsed, etc.)	101	0.14
	Total	**6,894**	**14.599**
	Percentage of Registered land out of 26 Sqkm.	**56%**	

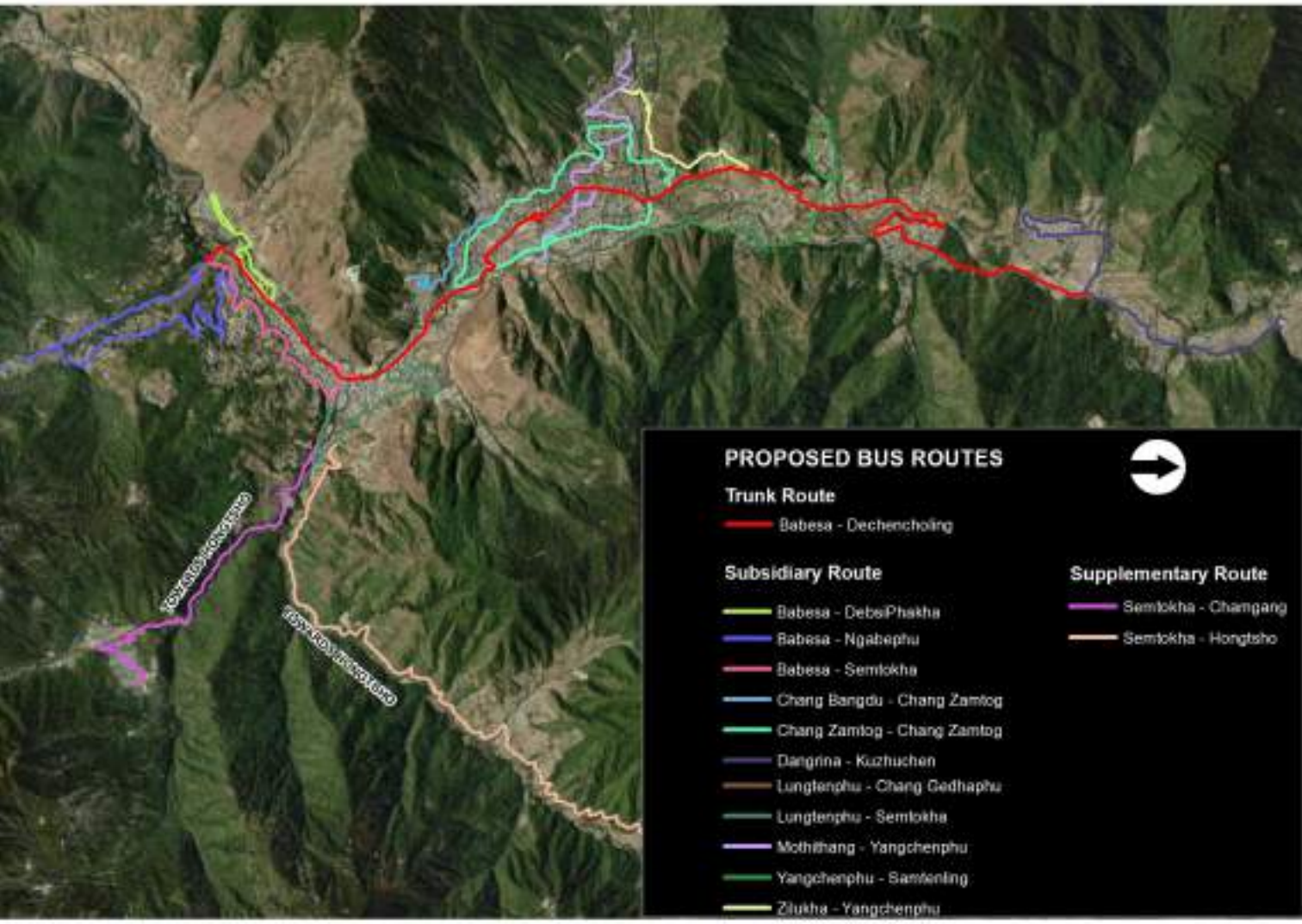
Thimthrom's legal recourse

Rent payment delays and failures on the part of tenants, and landlords jacking up rents against the Tenancy Act, are a common issue the legal office handles. Last year, 150 such cases reached the office.

In its initial years, the Thromde's legal section mostly dealt with land transactions. Today, however, its roles and responsibilities have evolved and diversified and include representing the Thromde in court, providing in-house legal advice, assisting courts of law with Thromde's perspectives, summoning Thromde residents to courts and settling disputes related to the Tenancy Act.

LEGAL

Resolving disputes arising from violation of Tenancy Act provisions take up much of the time. The Legal Division involves only when disputing parties fail to settle mutually. The matter is usually submitted to the dispute settlement committee, which hands out decisions in writing, based on evidence. The services are provided for free.



Thimphu Thromde's revised bus routes.

TRANSPORT AND MOBILITY

The absence of an adequate and well established city public transport system had led to an explosion in private cars and taxis that is beginning to choke Thimphu's limited roads.

Besides traffic congestion, it has also resulted in worsening air quality and excessive on-street parking. In Thimphu thromde, there is one car for every two residents, which is very high compared to other global cities.

In recent years, Thimphu's road network has seen significant expansion to improve traffic flow but many sections are already experiencing overload and congestion. However, major plans are in place to beef up city transport.

To improve mobility and pedestrian safety, a number of footpaths have been built in many parts of the city. There are plans to build more footpaths connecting the inner core of the city and revamp existing ones to meet the objective of making Thimphu a walkable and differently-abled city. The city's first overhead bridge has been constructed at Olakha at a busy crossing, and traffic lights for pedestrian crossings are being explored. Also in the plans are bicycle lanes to be built in the 30 metre green buffer zone by the banks of the Wang chhu.

City transport

City bus services in Thimphu Thromde began in 1999 with four 20-seater buses commuting passengers between Babesa down south and Jungshina and Dechenchholing up north. Then the city had a population of about 30,000 residents.

In 2001, the government directed the Thimphu City Corporation to hand over operations to the Bhutan Postal Corporation which was already operating intra-district public transport. From 2021, operations came directly under the Thimphu Thrompon.

The service received a major boost in November (2021) when 27 new buses equipped with global positioning (audio) system to announce stops, smart card readers and ramps for differently-abled passengers, joined the existing fleet of 41 buses. A mobile App (Gaykid ride) that gives live information on location, schedule, routes, stops and fares was also launched with the new buses.

The launch of the new fleet also heralded the start of the new bus routes and stops identified by the Thromde's geographic information system (GIS). In total, the 21 kms trunk route from Dangrina to Babesa will have 168 stops and two terminals in north and south Thimphu. The infrastructure for the stops and terminals will be built over the next two years.

MOBILITY

Of the 68 buses in the fleet, 44 are in operation along the trunk and five of the seven subsidiary routes as well as on the six supplementary routes. Service timings will extend to 10 pm by next year when additional drivers who are being trained join the fleet and cover all routes.

The new city buses began operations in November 2021.

The new buses are equipped with facilities to cater to the differently-abled.

A walkable city

MOBILITY

For years, a section of the railed sidewalk along Norzin Lam stared into a huge storm water drain, about 20 metres below, that was always trashed with garbage.

Today, this petrifying and unpleasant section is no longer there. In its place is a wide metal stairway that provides a short cut to the city bus stand and Chang Lam.

The stairway, installed in 2019, is part of the Thromde's initiative to provide safe walking spaces within the city.

An elaborate citywide pathway system that crosses through green areas and intertwines with heritage walks and river promenades is very much part of the 25 year Thimphu Structure Plan that emphasises the "pedestrian movement system". Footpaths are also an integral feature of the city's planned neighbourhoods making everything accessible within walking distance.

The Thromde has built about 13 kms of footpaths and walkways in Lower Taba LAP, Jungshina, Thai Pavilion and from Lungtenzampa to Dechen Zam on the other side of the Thim chhu. A 4.2 kms footpath has also been built from Lungtenzampa to Semtokha with resting places and railings.

The parks in Samtenling, Dangrina, Ludrong and Olakha have all been developed with basic walkways and other infrastructure. Footpaths are also being built along the 4-lane road from the Bhutan Telecom junction till Jungshina and the new Lungtenzampa bridge will be a pedestrian friendly structure with walkways and staircases.

Thimphu's first overhead foot bridge has also been built at Olakha. As of now humped zebra crossings and traffic police help to keep crossings safe for pedestrians along the Babesa-Thimphu Urban Road Network.

An underground passageway built several years ago near the swimming pool complex for safe crossings did not have the intended impact with people using it as a toilet and to smoke.

The rebuilt Bazam (traditional cantilever bridge) connecting Changzamtog to Changjiji was opened to pedestrians in mid 2021.

The 4.2 kms footpath from Lungtenzampa to Semtokha.

Thimphu's first overhead bridge opened to pedestrians in mid December.

Closing Norzin Lam to traffic ?

MOBILITY

Closing Norzin Lam, the capital city's main thoroughfare, to traffic is part of the Thimphu Structure Plan (TSP) to decongest the city centre, promote healthy living and make the city pedestrian friendly.

In preparation for this move, the city initiated building two multi-level carparking facilities to remove parking along Norzin Lam and also built an additional access road to take traffic away from entering the city centre.

But the plan, which reverses the current movement pattern by prioritising pedestrians over vehicles, is stuck because of objections from property owners and businesses along Norzin Lam. Businesses and property owners have complained that they would be severely affected by the plan. It would be inconvenient to move goods and rentals might be hit.

In October 2019, the government halted the Thromde's plan of removing the parking spaces along Norzin Lam and suggested that the plan be reviewed once more before implementation. Concerns were expressed over whether adequate public infrastructure were in place to go ahead with the plan.

What Norzin Lam looks like when it is closed to traffic.

One of the new (wheelchair accessible) footpaths built in 2021 that connects Lungtenzampa with the Memorial Chorten.

Making Thimphu more inclusive

MOBILITY

Thimphu city severely lacks infrastructure for the differently-abled. In a city where vehicle traffic has been prioritised over pedestrian mobility, building infrastructure for the differently abled has not quite received importance.

In recent years though, some initiatives have been taken by the Thromde to make the city more inclusive.

For example, the six kms walkway from Lungtenzampa to the Babesa roundabout has a width of two metres to make it friendly for wheelchairs, bicyclers and pedestrians. In some areas, the width is less than two metres because of existing infrastructure.

There is also a plan to revamp the 1.5 kms long pavement along Norzin Lam to make it more friendly for wheelchair users.

The Bhutan Building rules of 2002 has a set of guidelines for designing new facilities and retro fit options for existing structures to make it differently-abled but it has not been adopted because of cost implications.

A government policy is now in place to promote inclusive development by mainstreaming disability in development plans and programmes and to improve access to opportunities and services.

City roads

MOBILITY

Soon after becoming an elected office in 2011, the Thromde took over the city's roads from the Works and Human Settlement Ministry. It was one way to ensure funds for city roads were not prioritised elsewhere, like highways for example.

As of 2020, the Thromde had built an additional 100 kms of roads to improve mobility and ease traffic flow. This increased the city's roads to more than 300 kms.

The Thromde has also invested in machinery to carry out heavy jobs such as formation cutting.

Of the new roads built, many were short stretches to provide optional access to the crowded sections of the city. One such road that opened more than a year ago is the 200 metre stretch (Gongdzin Lam) below the IMTRAT Hospital area that connects Chorten Lam to Dzogchhen Lam. This stretch was built as part of the plan to pedestrainise Norzin Lam.

The Chubachu to Jungshina stretch has also been widened to a four-lane road with support from the Government of India.

The new access road (Gongdzin Lam) below the IMTRAT Hospital.

One of the two multi-level car parks that opened in 2019.

No parking

Parking fees were introduced two decades ago within the core city area to discourage long duration parking while also providing a maintenance revenue stream for the Thromde.

Since then, parking spaces within the city has struggled to keep up with the unrestrained import of vehicles. An estimated 13 new vehicles enter the western region everyday according to government data.

In 2020, there were more than 112,000 vehicles in the country, a five percent increase from the previous year, of which an estimated 60,000 were in the western region. The city has an estimated 2,246 on street and off-street parking slots including free parking for taxi pick and drop and the two multi – level car parks. Of this, 2,129 are for four-wheelers and 117 are for two-wheelers. The number of parking slots has been increasing from 1,462 in 2016 to 1,739 in 2018 and to 2,054 in 2020.

But this increase is insignificant compared to the growth in vehicle numbers which has fluctuated between 10 to 16 percent in the past decade for Thimphu city.

According to a study by the Thromde, the city will need more than 18,247 parking spaces by 2027 if a car is parked for three to five hours.

One reason why parking in the core city is a problem today is because the area was built-up when there were very few cars in the city. At the same time, new private buildings in the core area found it more profitable to pay the fine and convert the ground parking provision to rental space.

MOBILITY

Wherever possible, the Thromde is trying to widen existing city roads to create space to improve parking management.

With one car for every two Thromde residents, parking is becoming a key consideration for renting space in the city. This is compelling new constructions to keep provision for parking spaces.

Management of parking spaces within the city is contracted out to private operators.

Cycling by the Wang chhu

MOBILITY

For the longest time, riding bicycles in Bhutan was considered an activity for the flatlands of the foothills, where it was used for the most part as a mode of transport.

Today, the bicycle is used much more in the hilly regions of Thimphu and Paro for sports and recreation with enthusiasts negotiating climbs to the top of mountain passes and speeding down into the valley on gear cycles suited for mountain terrain.

A direct spin off from tourism, people taking to cycling in Thimphu has visibly grown in recent years. Numerous off road biking trails through the city's pine forests have also been developed by enthusiasts. Cycling for leisure received a major boost during the COVID-19 pandemic.

According to the Thimphu Structure Plan, the city has provision to build cycling lanes along the banks of the Wang chhu where a 30-metre no construction buffer zone has been kept for footpaths and greenery.

This could further boost cycling in the capital and encourage its use as a mode of transport.

Bikers take a breather at Kuenselphodrang, overlooking Thimphu city.

CUSTOMER SERVICES

With the expansion of Thromde services, the Thromde's role has also been evolving from an implementing agency to service delivery. While much of the customer services followed its corporatisation, it was only in 2011 that the Thromde instituted a customer care division to improve customer service.

To further enhance service delivery and reduce turn-around time, without requiring face-to-face interaction with its customers, the Thromde has embarked on a digitisation drive. Today, the Thromde offers 10 services via the G2C online platform and has launched a new mobile App, TTPay, to provide diverse services.

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TTPay, the Thromde's new service app.

Serving online

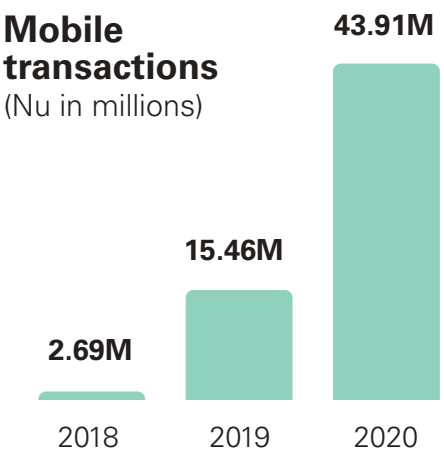
ICT

Although initially mired with glitches, today the online system has become the norm to access services. Digitisation of services began in 2010 under the G2C (Government to Citizen) services initiated by the first elected government. Some basic services were piloted in 2013 to reduce turn-around time, enhancing accessibility and strengthening accountability.

The Thromde now offers 10 online services through the G2C platform and mobile Apps.

Today the Thromde is under pressure to add more services online such as payments for availing sewer tank cleaning services.

The Thromde is looking at an integrated payment system for all municipal services by integrating Thromde's ICT gateway with that of the telcos, banks and other service providers.



Online city address

In today's era of internet connectivity and instant communication where locations can be searched on a digital map, what purpose would a physical address serve? A lot, say Thromde officials who are working on an ongoing city address project for the capital.

By mapping the city in detail, the Thromde would be in a better position to provide more efficient services since it will be possible to pinpoint service connections at a location.

All buildings will be numbered and given an identity. An accurate map of buildings and houses and number of residents are critical information to help carry out search and rescue, provide food and medical aid and protection services during emergencies and disasters.

Royal Thimphu College students were engaged to collect data on building, streets, and roads as well as bus stops and ATM machines. These maps can be accessed through a mobile device and can be updated by anyone.

Several attempts were made in the past to establish a city address system. The first was in 1987 when all streets

and roads were named. Signboards were made uniform with red and yellow colours and houses numbered.

Another attempt was made in 2001 when planning for the Thimphu Structure Plan took off. Then in 2015, the Thromde and Bhutan Post launched a project for proper city addressing and postal addresses.

The Open Street Map (OSM) of Thimphu city was updated, a collaborative and participatory project, to create freely accessible and editable maps. Signboards were again made uniform.

Despite these attempts, Thimphu residents are still not familiar with street and road names except for Norzin Lam.

Now, the Thromde is launching a geo data base city addressing system where every housing unit in Thimphu will be reflected in the map along with the street name and postal code.

The database will be uploaded onto different platforms such as Google Maps or Maps.me based on the public's preferences or convenience and this will show the address and directions to users.

A building in Thimphu with the old numbering. All buildings will be numbered under the city address project.

Customer care

The Thromde has a toll free number, 1009, to attend to customer complaints regarding services and most complaints pertain to water supply. Customer care personnel keep a detailed record of who and when a complaint is made and call plumbers assigned to designated areas to get feedback after service is restored.

Dealing with angry clients who are not keen to listen is a regular occurrence.

Customer care also handles applications and complaints lodged through the G2C online services.

ICT

Residents also call the toll free number to complain about waste collection, drainage, road and sewer leakages.

With the completion of the Dodena water supply project, complaints on water services have decreased substantially according to Thromde officials. However, when there is service breakdown, for instance landslides washing pipes, complaints shoot up. At such times, the Thromde engages water supply tankers to distribute water to the affected areas.

Customer care counters at the Thromde office.

HEALTH AND EDUCATION

In recent years the management of health and education services have also been transferred to the municipal administration in keeping with global trends that elected local governments are in a better position to implement policies that ensure equitable and universal access to quality health and education.

Apart from planning the expansion of health and educational infrastructure within the city limits in a manner that benefits all communities, the Thromde also manages student admission, teacher placement and location of facilities.

An outdoor gym below Kuenselphodrang.

Health centres for communities

In August 2020, the Thimphu Thromde established a health services unit to provide comprehensive services to residents living in the extended areas. Health centres in the five areas of Babesa, Changjiji, Dechencholing, Hejo and Mothithang will also be upgraded.

People living in these areas can avail basic health services, including X-rays, ultrasound and advanced laboratory tests in these health centres.

With Asian Development Bank funding, three additional health centres will be built at Babesa, Hejo and Mothithang.

A general doctor, two nurses, two health assistants, one lab technician, a pharmacist and an X-ray/ultrasound technician will operate each of the upgraded health centres.

Thromde officials said that any new infrastructural development must be aligned with the vision of making Thimphu a healthy city. More recreational parks, outdoor gyms, clean and safe drinking water, improved waste management and encouraging walking and cycling are critical to fulfilling that vision.

Accommodating more students

With around 20 percent of Thimphu city's population comprising students, accommodating their growing numbers, in the schools across the city is a challenge the Thromde Education Division has to deal with every year.

Between 2019 and 2020, there were roughly 2,000 new students.

Rural-urban migration and parents preferring to send their children to study in Thimphu due to the notion that schools in Thimphu perform better and students get good exposure are the major reasons for the growth in student numbers.

EDUCATION

Although the government envisions a teacher student ratio of 1:30, the current average ratio in Thimphu Thromde is 1:40.

Infrastructure development, to accommodate increasing number of students, is one major activity the Thromde Education Division is engaged in currently. Thromde officials spend around three days a week visiting various schools where constructions are underway.

Due to limited space in the capital, building integrated classrooms and vertical expansion are the only options to create more room.

Currently, around four constructions are underway across several schools in Thimphu and two new primary schools will be built in Dangrina and Bebena in North Thimphu. The Thromde is also upgrading two schools to higher secondary schools based on population and catchment. The Babesa Middle Secondary School was upgraded to Higher Secondary two years ago.

This move is aligned with the Thromde's overall plan of decongesting the core city area. The Thromde also provided 23 city buses to ferry students and discourage use of private cars.

The Thromde Education Division also focusses on professional development of teachers through various teacher training programmes every year.

Students comprise almost a fifth of the city's population.

Government schools and teachers in the capital in 2020

3 Early Childhood Care and Development	**4** Higher Secondary Schools
19 Primary and middle secondary schools	**1,225** Teachers

ENVIRONMENT

Balancing development with nature is one of the themes of the Thimphu Structure Plan that visualises Thimphu Thromde as a "dream city" by 2027 "with adequate space to work, drive, jog, cycle, picnic, relax and be close to nature".

This balance is sought through the Precinct Plan which is based on land use and guides building regulations. It identifies certain areas as ecologically sensitive where no building activity is permitted such as steep slopes and riverbanks, even if it is privately owned. This has been followed in most areas. But other green spaces within the city belonging to private owners have been lost to development, over which the city has no say.

At the same time, several parks and recreational spaces have been developed in recent decades providing much needed breathing room in a landscape rapidly being consumed by concrete structures. The parks and gardens spread around the city are regularly maintained by the Thromde beautification team.

List of operational parks in Thimphu Thromde

Sl. No	Name of the Parks	Area in square metres (sqm)
1	Taba Community Park	1982.9 sqm
2	Ozone Park	3402 sqm
3	Thai Pavilion	3736 sqm
4	Bebena Park	5117.7 sqm
5	Coronation Park	20,620 sqm
6	Thimphu Ecological Park	40,452 sqm
7	Dangrina Recreational Park	11,152 sqm
Note: Number of Parks as of 2021		

List of microgardens (2021)

Si.No	Name	Location	Area
1	Bhutan Association of Women Entrepreneurs	Thori Lam	503 sqm
2	Bhutan Chamber of Commerce and Industry	Doebum Lam	181.7+1619.6 = 1801.32 sqm
3	Changangkha MSS	Doebum Lam	816.15 sqm
4	Bhutan Takewondo Federation	Doebum Lam	395.43 sqm
5	DGPC	Thori lam	388 sqm
6	Department of Revenue and Customs	Norzin lam	284.5 sqm
7	National Housing and Development Corporation Limited	Doebum Lam and Expressway	(1005.47 + 196.11) sqm + 304 sqm = 1505.57 sqm
8	National Institute for Zorig Chusum	Lhado lam	452.66 sqm
9	Royal Textile Academy	Desi Lam	103 sqm
10	Taxi Tshogpa	Norzin lam	71.79 sqm + 49.45 sqm = 121.24 sqm
11	Department of National Properties	Doebum Lam	74.26 sqm
12	Ministry of Education	Drophen Lam	590.84 sqm
13	BICMA	Semya Lam	1374 sqm
14	Ministry of Economic Affairs	Doebum Lam	725.52 sqm
15	Dr.Toilet (Micrograden)	Behind Thai Temple	60 sqm
16	Kuensel Corporation	Near Expressway	491 sqm excluding substation measuring 27 sqm
17	BPC	Samten Lam	119.45 sqm

For some green and aesthetics

ENVIRONMENT

The nation's capital is a sprawling expansion of shops, hotels, residential buildings and roads that wind up hills, heralding extension says a World Bank report that points to the lack of open areas and green spaces within the built-up areas of the city.

According to the city's own records, open green spaces declined by half, from 0.726 sqkm in 2007 to 0.335 sqkm in 2017 within the city's 26 sqkm area. Similarly, urban forest cover also declined from 4.35 sqkm to 3.9 sqkm in the same period.

Thromde officials say open green spaces have reduced mainly because of constructions in private land over which it has no control. However, the green buffer, 30 metres on either side of the riverbanks and 15 metres along the streams, are still intact in most places. No constructions are permitted in these areas even if it is private land. These spaces are to be developed into parks with footpaths and biking lanes.

The Thromde is also greening and beautifying Thimphu. The urban forestry and city beautification section was formed in 2011 marshalling workers, who were otherwise, deployed for paddy cultivation behind the Tashichhodzong, and an Environment Officer.

From California poppy along core city road dividers to spaced out mini gardens and parks around landmarks in the city, the division's dozen workers tend to them

California poppy bloom on the dividers of the Royal Boulevard.

The Coronation park.

all. The division runs a nursery, executes park development works and issues forest clearance permits.

The upkeep of seasonal blooms amid constrained manpower is one challenge, guarding them from theft and pickers is quite another. CCTVs were installed along streets that deterred theft and pickers during the day, but it proved ineffective in the dark.

To encourage private participation and drive ownership, the Thromde outsourced park and garden management. However, save for the Thai Temple park, which is managed by a private entity, others have yet to build the success narrative.

The management of some 67,895 sqm of park area comprising the Coronation Park, Thimphu Ecological Park and the Ozone Park is still under the Thromde. Additional parks will soon open in the city outskirts of Dangrina, Olakha, Samtenling and Bebena.

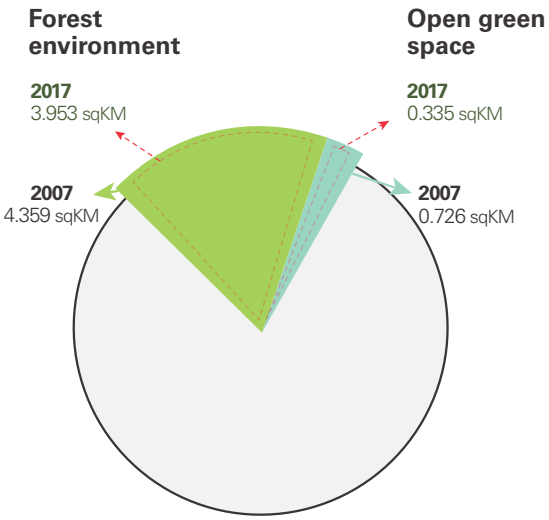
Through institutional support, about 15 micro gardens constituting around 12,540 sqm area have been adopted by various offices.

The division also initiated the "My Tree" programme that encourages school students and individuals to plant trees at designated locations on Social Forestry Day. Schools are awarded cash prizes and certificates based on the survival rate.

Urban forestry is another critical area for the Thromde to ensure greenery and public health and safety. As of now little

or no expertise exists in the field of urban forestry, which requires gauging trees growing in urban centres for health risk, potential for infrastructure damage, pollution and blockage of water and drainage systems. Thromde officials are building an inventory of urban forests, one that will also record plant and tree species at risk of extinction.

Shrinking green space



The Ozone park in Mothithang.

Thimphu city from Kuenselphodrang view point

CHALLENGES

From packs of strays that traumatise school children and have long disturbed visitors to the city to deteriorating air quality and an acute shortage of affordable housing, the capital city faces a host of challenges as it strives to become a clean, green, culturally vibrant and livable city.

In many cases, the city has limited authority to do anything. It would require intervention from other agencies empowered to address these issues at a national level.

Air quality worsening

ENVIRONMENT

Air quality is an important determinant of a livable and healthy city and in Thimphu, it has been deteriorating with the rapid increase in vehicles, persistent forest fires and burning of firewood in winter.

An air quality monitoring station set up in Thimphu in 2016 has recorded increasing levels of the annual average PM10 measurements. PM or particulate matter, measured on a scale of 2.5 and 10 diametre measurements, show levels below the national permissible standard of 60 micrograms, but above the World Health Organization (WHO) guideline.

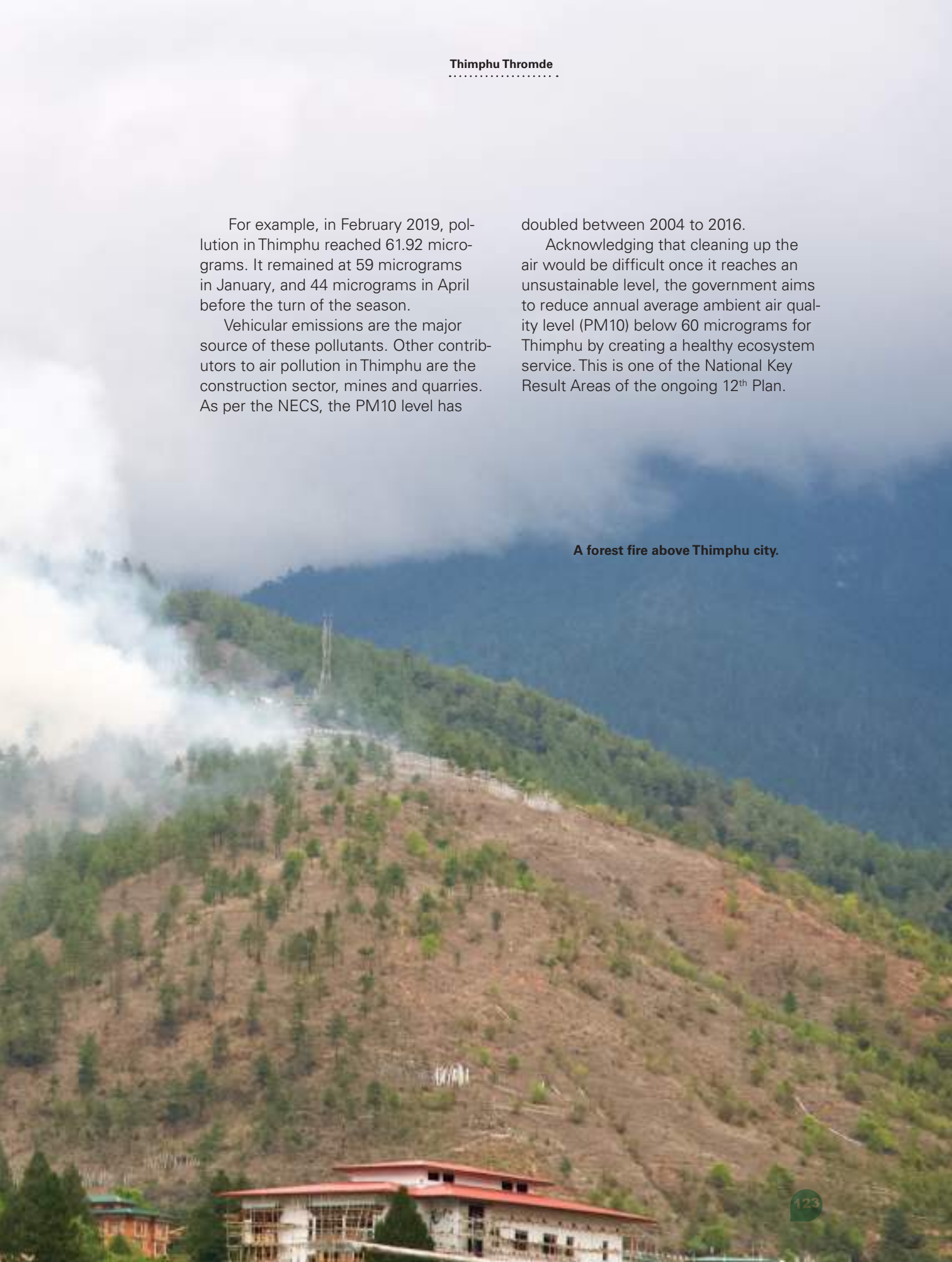
PM2.5 is generally described as finer particles than PM10 and is more harmful to health.

In winter, it sometimes exceeds national standards.

For example, in February 2019, pollution in Thimphu reached 61.92 micrograms. It remained at 59 micrograms in January, and 44 micrograms in April before the turn of the season.

Vehicular emissions are the major source of these pollutants. Other contributors to air pollution in Thimphu are the construction sector, mines and quarries. As per the NECS, the PM10 level has doubled between 2004 to 2016.

Acknowledging that cleaning up the air would be difficult once it reaches an unsustainable level, the government aims to reduce annual average ambient air quality level (PM10) below 60 micrograms for Thimphu by creating a healthy ecosystem service. This is one of the National Key Result Areas of the ongoing 12th Plan.



A forest fire above Thimphu city.

A city of migrants

Thimphu is a city of migrants – a veritable melting pot of the nation's diversity, who far outnumber the local inhabitants of the valley.

Since the start of modern development in the 1960s, people have been leaving the countryside for the new urban settlements that emerged with expansion of government institutions and growth in trade and commerce.

Over the decades, more and more Bhutanese completing schooling have headed for the towns in search of employment and economic opportunities, fueling rapid urbanisation. And the capital has been the preferred destination.

MIGRATION

Thimphu is a magnet for migrants for obvious reasons. All government ministries, head offices of corporate agencies, financial institutions, army, police and international organisations are based in the capital, including the national referral hospital and a private college. Tourism has been a big pull factor, best represented in the increasing number of hotels and related services that employ thousands.

Today, one in seven Bhutanese live in the capital, home to 40 percent of the country's urban population. The capital's population is estimated to be growing at four percent annually (5,000 people), twice the national population growth rate, and outpacing the city's ability to provide services. Those migrating to Thimphu are mainly younger people under 30 looking for work in service-oriented jobs in hospitality, entertainment and transport.

By some accounts Thimphu had already grown into a town of about 10,000 people by the late 70s. This increased to about 25,000 by the 1990s.

The first housing and population census in 2005 put Thimphu city's population at a little more than 79,000. This had increased to 115,000 by the second housing census in 2017.

According to 2017 census data, 68,310 persons had migrated to Thimphu Thromde and 20,096 had left Thimphu Thromde since 2005. This is a net migration of around 48,000 persons in 12 years – almost equal to the population of Phuentsholing, Gelephu and Samdrup Jongkhar Thromdes put together.

Crowds at the annual Thimphu Tshechu.

A dream and a nightmare

MOBILITY

The dream of every Bhutanese to own a car is becoming a nightmare for urban townships, particularly the capital, where rising vehicle numbers is resulting in frequent traffic jams, a shortage of parking space and easily agitated motorists.

According to government data, Bhutan imports an average of 22 vehicles every day and most are headed for the western region which include the districts of Thimphu, Paro, Wangduephodrang, Punakha and Gasa. Of the 114,000 vehicles in the country as of March (2021) more than 60,000 were in the western region according to road safety data.

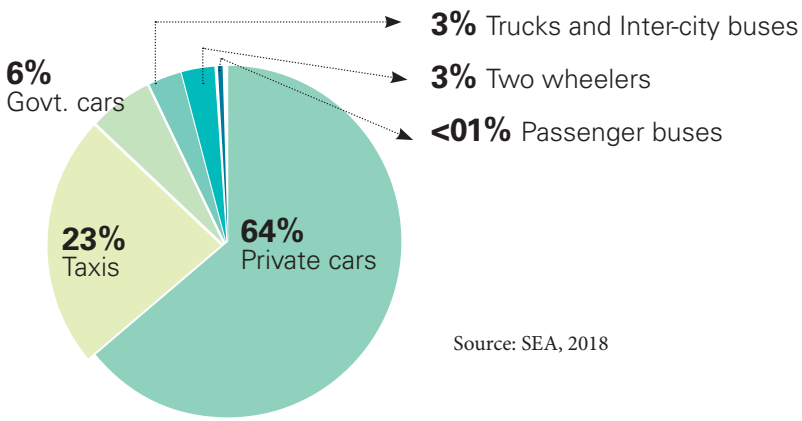
Twenty years ago, the region was home to about 11,000 vehicles, mostly scooters. Then, only a minority owned private cars and the rest were government issued vehicles. By 2009, it increased to 25,000. Today there are 60,878 vehicles in the western region.

Vehicles in the western region has been growing by around 5,000 every year since 2015 driven by rapid urbanisation, easy access to loans and an inadequate public transport system. It is estimated that roughly 13 cars enter the western region everyday, with most headed for Thimphu.

The rapid increase in vehicles has also increased road mishaps. In 2019, there were 326 incidences of motor vehicle mishaps in Thimphu city leading to 132 injuries and two deaths.

More than half the vehicles in the country are in the western region.

Thimphu city's peak hour traffic composition



Source: SEA, 2018

Crime

Thimphu could be among the capital cities with the lowest crime rates. From that perspective, Thimphu is one of the safest capitals.

Yet, within the country itself, it has the highest crime rates. As the country's largest urban centre grappling with rural urban migration, unemployment and urban poverty, the city is a hotbed for crime.

On average, five criminal offenses are reported every day in Thimphu, constituting half the crimes in the country. Of the 4,085 criminal offenses reported in 2019, 1,889 were in Thimphu according to the Royal Bhutan Police. Most cases pertained to larceny, robbery, battery, burglary, illicit trafficking of drugs, substance abuse and auto stripping.

While curbing crime isn't the direct responsibility of the Thromde it does impact the Thromde's vision of building a vibrant, progressive, safe, and livable city.

The increasing use of CCTV cameras and more street lighting has made many residents feel more safer.

The Thromde has encouraged schools under its jurisdiction to pay special attention to students with disciplinary issues. It has also involved people in recovery to operate stalls in public parks, giving them gainful employment.

Top cases reported in Thimphu (2019)	
281	Battery
160	Burglary
397	Larceny
101	Auto stripping
238	Substance abuse
53	Illicit trafficking of narcotic drugs
14	Robbery

Street lighting has brightened dark stretches of the city.

Affordable housing

Affordable housing in capital city has long been a concern, even before the Thimphu Structure Plan came into place. In the 90s and early 2000s, city authorities were specifically directed to dismantle squatter settlements that were beginning to emerge in certain parts of the city.

According to the Bhutan Living Standard Survey (BLSS), 2017, 17 percent of households in the Thimphu Dzongkhag live in rent free dwellings, 24 percent own their dwellings and 59 percent pay rent. Of the rent-paying households, 85 percent live in dwellings owned by private individuals, and 14 percent in government and public housing.

In the capital, most of the rental housing is provided by the private sector. Others providing housing are the NHDCL and National Pension and Provident Fund (NPPF) which rent space to civil servants at lower than the market rate. A few government agencies and private organisations also provide housing for their employees.

While access to proper and affordable housing is fundamental to socioeconomic wellbeing, the Thimphu Thromde is not directly responsible for providing affordable housing apart from identifying suitable sites, ensuring all the basic urban amenities and constructions follow building rules and standards.

The Thromde itself has more than 350 workforce employees who live in sheds, semi-permanent and permanent houses.

In 2000, the government initiated the Changjiji Housing Colony project for low to middle-income civil servants, partly to avoid informal settlements. It comprises 73 buildings with 700 apartments for about 3,000 people. Another government housing project initiated in 2002 was a low cost home ownership scheme, also at Changjiji, funded by DANIDA. It was meant for the lowest income section of the regular civil servants. The project built 32 dwellings of three types with cost of the dwellings between Nu 100,000 to Nu 250,000.

No other housing projects have been undertaken by the government since then. Studies indicate that Thimphu has enough housing stock to accommodate an additional 120,000 people in the next decade or so. But this housing stock will be coming from the private sector which is not aimed at addressing low cost housing.

The Changjiji colony, the only housing project for low to middle income civil servants in Thimphu, was initiated two decades ago.

Designs and drawings of buildings must meet safety standards for construction approval.

Disaster prone

Bhutan's fragile ecosystem, geological conditions, steep terrain and active tectonic process taking place in the Himalayas makes the nation prone to several natural disasters. Earthquakes, flashfloods and fire hazards are the three major calamities that Thimphu Thromde is vulnerable to.

While most of the earthquakes so far have been of moderate magnitude, it is believed that the fault line could break in a single massive earthquake across all of Bhutan at once. This level of disaster could destroy communication channels, roads, bridges, water and electricity supply and other essentials resulting in major damage and casualties.

The Thromde's disaster management plan is aligned with the Thimphu Dzongkhag's Disaster Contingency Plan of 2017 which contains Standard Operating Procedures (SOP) and responsibilities of various response coordination teams.

The Thromde ensures that constructions within the Throm are adequately protected against earthquakes, windstorms and fires by only approving designs and drawings that meet the national building safety standards.

Rapid urbanisation is also pushing settlements towards the forest and exposing communities to the hazards of forest fire. Every dry season, Thimphu experiences multiple outbreaks of forest fires.

During summer, heavy rainfall causes flooding and inundations along the Wang chhu. Studies are being carried out to create buffer zones along streams and rivers to reduce vulnerability from floods.

1982

The upper end of Norzin Lam in 1982 with uniform traditional structures that came up in 70s and 80s.

2021

Most of the traditional buildings have been replaced by multi storied concrete structures.

“

“True to the objective of enhancing decentralisation, resources have been doubled for local governments in the 12th FYP compared to 11th FYP resulting in an equal share of capital resources as the central agencies.”

Lyonchhen Lotay Tshering, 2nd February 2019
12FYP VOL III THIMPHU THROMDE

SECTION VI

What next

Close to Nu 5 billion has been allocated to Thimphu Thromde in the 12th Plan to develop key urban infrastructure and improve water supply and waste management systems among other priorities.

Developing infrastructure takes up almost Nu 3.1 billion and includes reconstruction of the Lungtenzampa bridge, Local Area Plan and urban amenities for Hejo Samtenling and Jungshina Pamtsho, a bus terminal at Semtokha, redevelopment of Norzin Lam, new roads, footpaths, common service ducts, new sewerage lines and infrastructure for the Bus Rapid Transit System.

Some of the infrastructure work is already ongoing and nearing completion such as the ADB and WB funded projects for waste-water treatment plants and central water supply projects.

The future is zero waste

The Thimphu Thromde plans to handle the city's mounting garbage problem by minimising waste generation at the source through segregation of materials that can be recycled and reused.

It aims to shift from the traditional linear economic model of "take, make, consume and dispose" to a circular model that ensures extreme reuse and recycling, ultimately resulting in zero waste.

As of now the Thromde lacks facilities for separate collection of wet (biodegradable) waste and dry (reusable & recyclable) waste. There are also no provisions to collect and dispose hazardous waste from households.

Under the government's National Waste Management Flagship Programme, every household will be provided with three coloured bins: Blue for dry waste, Green for wet and Red for hazardous waste and a nominal fee will be charged for waste collection. An Integrated Waste Management Facility is being planned wherein NECS and Thimphu Thromde plans to build recycling plazas, stockyards, incinerators for hazardous wastes, compost plants, construction and demolition plant, and a sanitary landfill. The recycling plaza proposes to have second-hand shops, and a flea market for selling recyclable items. These recycling plazas are expected to become self-sustaining in the long run. Drop-off centres like the one below Kelki School have been established across the city (Dangrina, Jungshina, Bebena, Mothithang, Changzamtog, Changbangdu, Lungtenphu, Tshalumaphay and Chubogang).

The Thromde has budgeted more than Nu 100 million for waste management in the 12th Plan.

According to the Thimphu Waste Management Strategy document, a mobile application (App) will also be launched that will allow residents to track garbage collection trucks to make pick up more efficient. Waste reduction, segregation and recycling initiatives will be recorded and tracked through a solid waste information system.

Currently, waste management, which is heavily subsidised by the government, is a liability for the Thromde. Only few households pay a minimal fee for waste services compared to the high proportion of unserved households. The fee collected is only 6 percent of the expenditure incurred. Thus, the Thromde is also looking into the current tariff system for waste collection services and the possibility of charging for waste collection.

A new waste drop-off centre in Tshalumaphey built under the government's Waste Flagship Programme.

Strengthening distribution

Thimphu city's water supply woes is expected to be eased through the government's Water Flagship Programme that envisions 24 hours water supply to all urban and rural households, as well as for irrigation.

The programme will be implemented by the NECS and MoWHS with local governments, including Thromdes, and the Ministries of Health, Agriculture, and Finance. A central agency will be created to monitor the programme.

Currently, an indicative outlay of Nu 3 billion has been earmarked for the programme to build new water supply schemes, rehabilitate existing water supply schemes, water source protection and for water quality testing and surveillance.

The Thromde's plan under the flagship is to strengthen the distribution system by replacing the underground GI pipes supplying water to the core city area, which has long exceeded its functional lifespan, to plug distribution leakages.

The Thromde is planning to conduct a network analysis and prepare a digitised network map of the distribution lines. A water supply master plan is also on the cards.

The Thromde also plans to install computerised tools such as SCADA to accurately monitor water supply by using sensors to pinpoint problematic areas.

Demand management measures such as 100% metering, billing of authorised consumption, promoting water saving devices and awareness campaigns are also in the Thromde's plan. At the same time, the Thromde also needs to build its capacity and invest in equipment.

Improving the urban ecosystem

Thimphu Thromde management authorities are learning how to integrate Ecosystem-based Adaptation (EbA) into urban development plans. This is the first component of a project, which began in June 2021, to reduce vulnerability of the urban poor to the effects of climate change.

The project, being implemented on a pilot, is designed to enable the urban poor to adapt to climate change by protecting, maintaining and rehabilitating priority ecosystems in urban areas through nature based solutions.

Training Thromde officials on decision making tools to use the ecosystem-based approach in their design implementation will continue for a year.

The second component has two pilot activities: to build two blocks of low cost housing that is environmentally friendly and enable occupants to do gardening and be self-sufficient in vegetables; and protecting the low lying areas of Wang chhu from future floods by planting flood resistant plantations such as mangroves rather than building hard structures.

The third component of the project is to improve the livelihood of the urban poor by promoting food security through urban agriculture and vegetable production. This will be done in a 10 acre area in Hejo, Taba and Samtenling and in the areas where the urban poor are resettled. As of now, the project is in the process of identifying the ultimate beneficiaries and looking at the possibilities of leasing land from the government and institutions where vegetables can be cultivated.

When the project winds up in 2023, it would have strengthened the institutional capacity of city management authorities and urban communities to respond to climate change and increased public awareness of the benefits of urban EbA approaches.

Low lying areas of the Wang chhu will be protected from flooding.

Decongesting the core

As more and more vehicles and people gather at the city core for shopping, business, leisure and to avail health and education services, decongesting the city centre has become a matter of immediate concern for the capital city.

The Thimphu Structure Plan identifies development of neighbourhood nodes to provide essential and commercial services in the city's extended areas to reduce the need to travel to the city centre.

There are nine neighbourhood nodes in the Structure Plan which are conceived to be predominantly pedestrian providing an environment where people can leisurely shop, take walks, meet friends and where children can play. Other features are shaded waiting areas with proper sitting arrangements and facilities for persons with disabilities. Firefighting, solid waste disposal, clinic, school, public toilets, postal services and infrastructure maintenance services are among the facilities planned for the neighbourhood nodes.

However, the city has not been able to implement the neighborhood nodes and in some cases the pooled land for the purpose could not be retained for their intended use.

Still, the Thromde has been tackling decongestion by making more services available in other parts of the city. Permanent vegetable sheds have already been built in various residential neighbourhoods to decongest the popular and hugely successful Farmers' Centenary Market. But getting vendors to move out to the new locations has drawn flak.

The Thimphu Thromde is also in the process of upgrading schools and health centres located away from the core city area.

Another strategy, is improving the bus service by expanding the fleet and increasing frequency and widening main city roads. There is a plan to implement the neighbourhood node on a pilot in the Taba urban village.

50,000 (estimated)
vehicles

114,551 (PHCB 2017)
population

1 car
for every two people

68
City busses

26 sq/km
Thimphu thromde's area

300 kms
Road network

The new vegetable market in Lungtenphu.

Decongestion efforts

Transport and mobility

- Additional 27 city buses
- Smart card system ticketing, Mobile App, GPS Bus information system
- Increase frequency and timing of city bus service
- Introduce smaller buses for subsidiary routes
- Road widening
- Multi-level car parks

Services and Commercial centres

- Establish vegetable sheds in urban villages
- Establish Drop-off centres

Health and education

- Upgrade existing health centres in various communities
- Build additional health centres in Babesa, Hejo and Mothithang
- Build new schools away from the city centre
- Upgrade more schools to higher secondary level

Data driven planning

The Thimphu Thromde is creating and designing a comprehensive geo-database that will provide reliable and up-to date data for planning and executing projects. Using satellite images, taken during the first nation-wide lockdown in 2020, the geo-database will include information on water supply, sewerage, drainage, roads, parking areas, footpaths and streetlights among others.

With this system, Thromde officials can source detailed information on specific facilities like the number of streetlights, the type of bulb, wattage, their illumination radius, location of the switch, etc.

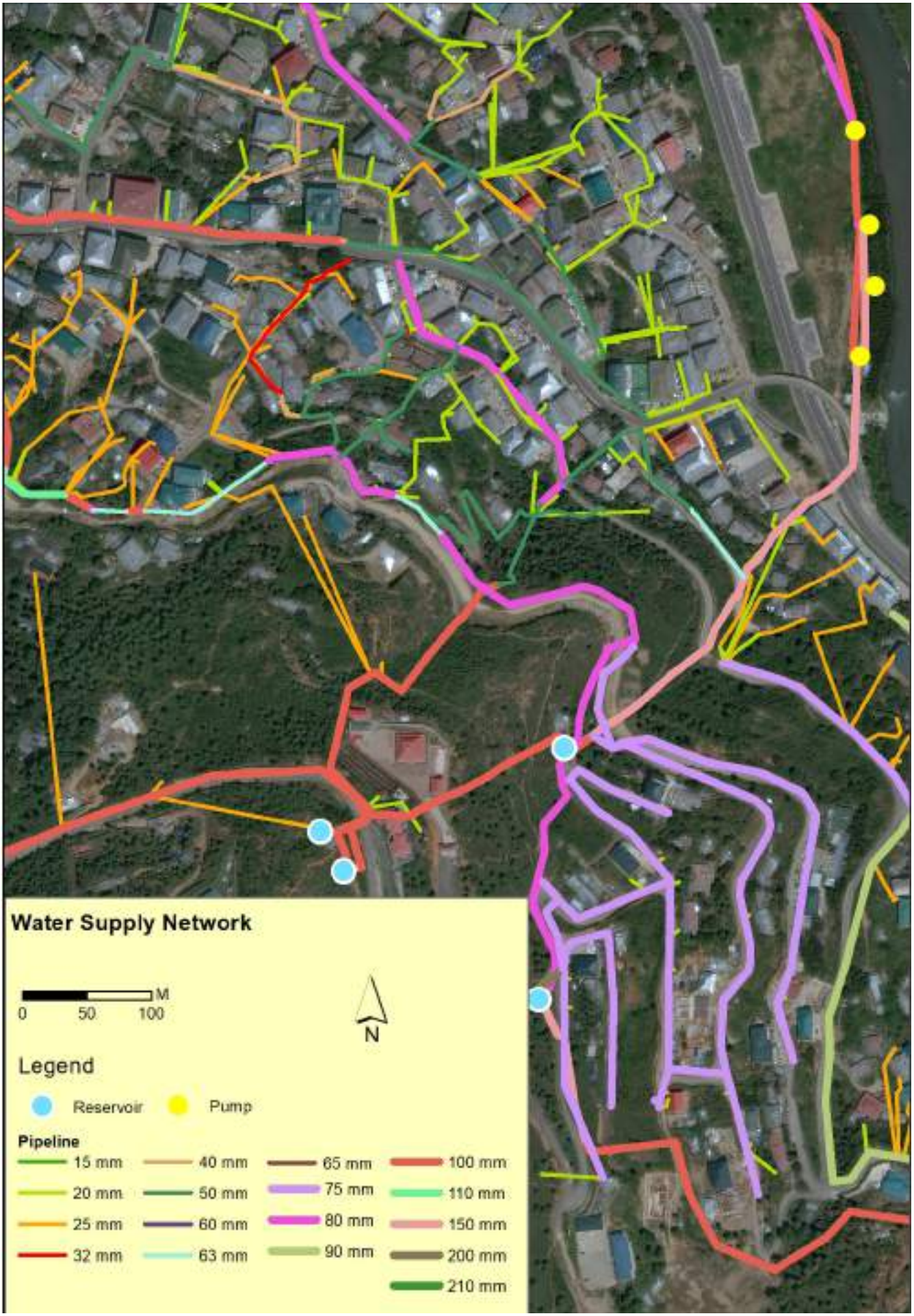
Thromde officials said the system would ease planning especially determining, for instance, adequate number of streetlamps and sewerage lines or water pipes for a particular neighbourhood.

The Thromde would know exactly where underground water pipes are located. If a new road is being planned at a particular location, the database would enable the Thromde to revise its plans to avoid damage to water lines or set up resources beforehand to deal with possible damage to pipes.

To make it easier to update information, the plan includes creating separate geo-databases for the Thromde's various divisions. Data will be updated by respective divisions from time to time.

Another important use is to carry out traffic flow and network analysis and to identify city bus stops across Thimphu based on residential density. The database will also help in creating an inventory of all Thromde properties.

While much of the information can be sourced from the satellite image, there are those that require actual field survey. The Thromde is in the process of collecting location-wise data of the city.


Water Supply Network
M
0
50
100
N
Legend
Reservoir
Pump
Pipeline
15 mm
20 mm
25 mm
32 mm
40 mm
50 mm
60 mm
63 mm
65 mm
75 mm
80 mm
90 mm
100 mm
110 mm
150 mm
200 mm
210 mm

Making buses the preferred mode

The Thimphu Thromde has begun work on a Bus Rapid Transit (BRT) system that aims to make city buses the preferred mode of transport in the city in terms of reliability, timing and affordability.

To achieve this, the system will operate on dedicated bus lanes, which means it will not get stuck in traffic jams. This is expected to reduce private ridership, discourage private car ownership and reduce congestion and vehicular pollution.

A new bus route will be prepared where some of the roads and lanes will be dedicated for city buses only. A 21 kms trunk route has been identified from Babesa in the south to Dangrina in the north. Subsidiary routes will also connect to the trunk route.

The Thromde is currently widening some of the city roads and has built a four-lane route from Chubachu to Jungshina. A total of 34 buses will ply the route. In between, smaller buses will be introduced across various subsidiary routes. According to city officials, a commuter would have to wait for up to 10 minutes to board a city bus which will run till 10 pm.

Currently, the Thimphu Thromde is preparing its Request for Proposal to solicit foreign consultants to carry out the feasibility study. It includes carrying out traffic flow and road network analysis, type of buses to be used, whether new multi-level car parks should be built, understanding current frequency and interviewing communities about their transport preferences. Around 1 million USD has been allocated by the Korea-World Bank partnership facility fund to carry out the study.

Once the study is done, several options will be presented to the government after which actual implementation will take place through the Global Climate Fund.

The widened Chubachu - Jungshina road is planned to have a dedicated bus lane.

Third route to city

Thimphu city will have a third entry and exit route with the construction of the 2.5 kms Debsi-Changbangdu road, to be built in the current plan.

The alignment of the 10-metre-wide road, which will form part of the northern trunk route, begins from the Changbangdu archery ground and follows the abandoned irrigation channel until the top of Pelkhil School. From there it will descend to the Anim Dratshang and connect to the existing road going to Debsi, a new residential settlement outside the city boundary on the right bank of the Wang chhu.

This new route, while directly serving Debsi, is expected to significantly reduce congestion along the Thimphu Babesa Urban Road Network (expressway), the city's main entry and exit route that experiences regular traffic snarls during peak hours.

Construction will begin once the Detailed Project Report (DPR) is finalised.

Map showing the final Right of Way of the planned Changbangdu-Debsi ring road.

A new bridge of prophecy

Replacing the existing Lungtenzampa bridge with a new double decker flyover structure is a key project the Thimphu Thromde will undertake to improve traffic flowing in and out of the city.

Estimated to cost between Nu 700-800 million, the new bridge will incorporate traditional architectural designs and will have pedestrian friendly features such as side walkways and staircases.

The construction was scheduled to begin in the second year of the 12th Plan but has been delayed because of the COVID-19 pandemic. Still, the Thromde is hopeful to get the project off the ground as soon as the situation improves and replace the existing bridge that was built in 1995 and does not meet modern day bridge standards.

One impediment to its construction is the Bhutan Oil Distributor fuel station. The station will most likely have to be relocated to accommodate the new double decker bridge if the present drawings and design are to be implemented.

The new bridge will also be known as Lungtenzampa, which means the 'bridge of prophecy' as it goes over a sacred site where Phajo Drugom Zhigpo met Sonam Peldon as prophesised.

One of the proposed designs for the new Lungtenzampa bridge by the Construction Development Corporation Limited.

Redevelopment of Norzin Lam

Public infrastructure along Norzin Lam, the earliest area of the capital to be built up, will be redeveloped with more pedestrian friendly amenities and proper footpaths. According to Thromde officials, all the sidewalks and pavements along Norzin Lam, that stretches for about 1.5 kms, will be rebuilt but not widened since there is no space to do so. The redevelopment work will also improve drains and sewer lines that tend to clog and overflow when it rains.

The clock tower square area will also be revitalised with proper walkable pavements and galleries.

Low income housing

Thimphu Thromde will get 110 housing units for the low income group and wage workers through the ADB funded Affordable Housing Project that will be implemented by the NHDCL.

The project aims to build 1,018 housing units in the first phase in Phuentsholing, Thimphu, Samdrup Jongkhar, Nganglam and Trashiyangtse.

In Thimphu, the proposal is to construct 110 housing units for the low-income group and the wage workers at Semtokha starting in the first quarter of 2022. In total eight buildings will be built of which, three buildings will have 60 one bedroom units, three buildings of category IV will have 30 units and three buildings of category III with 20 units.

The project is expected to be completed in two years and is estimated to accommodate at least 500 people.

The Thimphu Thromde will ensure that these units have access to all the basic urban amenities such as electricity, garbage collection and water supply.

Source: NHDCL

Building Type	Number	Units
Category III (Type 1)	2	20
Category IV (Type 1)	3	30
1 BHK	3	60
Total	**8**	**110**

A view of South Thimphu. Housing stock in the city has been left to the private sector that does not cater to the low income.

1980s

Namseling in the 1980s (top) and today (below). The urban sprawl has not yet reached Namseling which is about 6 kilometres from the southern municipal boundary.

2021

“

An overarching legislation and policy for urban governance is required, and all stakeholders need to assume greater ownership of the TSP to strengthen collaboration and expand partnerships for development while also mainstreaming inclusiveness. The Thromde’s human resources capacities also need to be strengthened, in addition to instituting measures to facilitate revenue generation and attain fiscal sustainability.”

Strategic Environment Assessment of the Thimphu Structure Plan 2018, Ministry of Works and Human Settlements

SECTION VII

The Long view

In 2027, a few years from now, the Thimphu Structure Plan will end. Then what happens?

While in the short term the demand for infrastructure, services and resources will continue to grow with population growth, what are the long term options for Thimphu Thromde as it heads into the future? Will it continue to expand its urban boundaries to accommodate growth? How can it become financially autonomous and actually have the resources to carry out development projects without relying on central government funding? Will residents have the right to vote in the municipal elections? Will it be able to harness new technologies to power clean energy transport? This section looks at some possibilities for the Thromde years down the line.

Financing the city

How can Thimphu Thromde achieve financial sustainability in the future, a goal central to improving services and tackling the increasingly complex challenges of rapid urbanisation?

As it stands today, the Thromde has reached a stage where it can generate enough revenue to cover employee salaries. These come from land tax, property transfer tax, sewerage, water, garbage collection charges, parking fees, and state rental income.

But for infrastructure projects, such as roads, it still depends on central government funds and their priorities.

The Thromde has no authority to alter or modify the tax regime and even revision or introduction of fees and charges needs clearance by the Finance Ministry.

The situation today is such that while the Thromde maintains the city roads, the city vehicles that use the amenities pay the fees and taxes to the transport authority. Likewise, license and renewal fees are collected by other government departments from establishments that exists in the Thromde.

These revenue streams should eventually pass on to the Thromde, as is the case in other cities, so that it can be pumped back for better services and urban infrastructure.

In many cities across the world, city managers govern the city with full authority over land, taxes, fees and charges. Even utility companies and law implementing bodies are governed by the city council. This gives the city full authority in running an urban government with decentralised powers. The right of municipalities to regulate all local affairs is underpinned by their entitlement to appropriate financial resources.

As is done elsewhere, the city, in the future, should have the autonomy to float stocks and bonds to finance major infrastructure projects and recover the costs through user fees. Such a system allows residents to become part owners of city amenities.

There are also growing numbers of impact investors interested to invest in socially and environmentally responsible projects. More private investment must be encouraged by fostering public-private partnerships.

The city must also consider investing in smart and green technologies, for instance solar powered street lighting. Some cities have already installed environmental sensors to street lighting to monitor air pollution, temperature, and parking spaces, among others.

Given the scale of the demand and the opportunities ahead, Thimphu Thromde must upgrade its regulatory environments and capacities. It must start thinking about an innovative urban finance ecosystem in collaboration with the government, corporate bodies and private sector.

Residential voting

The lack of voting rights for residents who do not have their census in the city becomes a heated topic of debate and discussion when municipal elections are around the corner.

Since Bhutan transitioned to democratic governance, there have been three municipal elections after every five years with the first one held in 2011. In all these elections only around 7,000 adults in Thimphu city, which today has a population of 115,000 people, were eligible to vote for the mayor and council members. Most of the eligible voters were people with traditional land holdings in the city. This has led to the accusation that the Mayor only serves the interests of the landed gentry because only they have the right to vote.

At the same time some are of the view that just by residing in a city does not give a person the automatic right to vote and stand in the city elections; they must transfer their census to the city and meet other standard electoral requirements.

As Bhutan journeys on its democratic path, the capital city will have to look at ways of how it can strengthen voting rights among its residents so that they have a say in city development and management and for greater diversity in candidates' selection.

Stringent requirements could be relaxed to first include people who own property and pay taxes in the capital and later expanded to those that have spent a certain number of years residing in the capital in moving to a more vibrant city based on democratic principles.

Private sector and civil society

How cities are managed in the future is only going to become more challenging as more people move to the urban centres that will continue to grow and face new challenges. Urban management left only to the government may not be enough to address new needs and new realities of a more complex urban setting.

As such, the private sector and civil society will have to play a more meaningful role in urban governance while the state creates a suitable political and legal environment.

Some of it is already happening with private operators entering into garbage collection and parking services, and civil society engaging in advocacy, environment and the needs of marginalised groups. But this is just the beginning of a trend that must become mainstream if Thimphu city is to become an exemplary city in the region that is culturally vibrant, progressive, safe and livable.

The future of the modern city will increasingly rely on its economic viability to be sustainable. This means creating an enabling environment for a robust private sector that can venture into critical service areas to sustain the urban economy and society.

The private sector can undertake stand-alone initiatives and get into public private partnerships in delivering services such as water supply and in infrastructure projects to address affordable housing and transport systems.

At the same time, the increasing emphasis on market driven principles and public private partnerships to address urban development, could marginalise the intended beneficiaries such as the urban poor from decision making and implementation. This was one of the shortfalls of the Thimphu Structure Plan and this is where civil society can play a meaningful role in creating more equitable and sustainable cities by pushing for bottom up community initiatives. Civil society organisations can also play a critical role in changing unsustainable social, ecological, economic, and cultural patterns.

As such it is crucial that elected municipal governments engage with the market and civil society and work together to create sustainable cities.

High tech transport systems

Going by present trends the number of vehicles in the country will increase well beyond 350,000 by 2040, which is less than two decades from now. That is thrice the number today of which at least 50,000 is estimated to be in Thimphu city.

For Thimphu city, this could mean heading straight into a traffic congestion and vehicular pollution nightmare that might take years to get out of; it has already run out of space to widen existing city roads in the core areas.

As a measure to discourage car ownership and reduce traffic congestion, the city is working on a Bus Rapid Transit System (BRTS) to make public transport the most convenient and affordable way to move to and from the city.

But in the long run, this may not be enough as Thimphu is bound to experience rapid growth for many more decades fueled by migration and economic prosperity. The capital must start looking at other transport systems to deliver clean, safe and affordable transport options that will become a necessity in the coming decades if it wants to remain as a green sustainable city.

Efficient light rail transport options, cable cars, pipelines and ropeways powered by clean energy sources must be explored even if the geographical terrain poses immense challenges. Efficient modes of mass transportation for people and freight could also connect Thimphu, Paro and Phuentsholing and drastically reduce dependence on road transport.

The other option to work around congestion and scarcity of land to build infrastructure, is to go for underground transport networks as is the case in some of the global cities.

Tunnels in the case of Bhutan could significantly shorten the present long journeys of short distances. One study in the past suggested that a tunnel between Thimphu and Paro could shorten travel time to 10 minutes between the two cities. This could drastically transform how the two cities grow in the future and address a whole gamut of issues from congestion to housing crunch.

Even if these alternative transport systems are developed in the capital, personal vehicles will still continue to be one of the major modes of transportation. Therefore, the promotion of electric cars must be explored further if Bhutan is to remain carbon negative.

The UNDP has estimated that by 2050, nearly 70 percent of the world's population will live in urban areas. Much of this will happen in Asia. Therefore, Bhutan must adapt to the changing times. Building an inclusive, livable urban centre by using technology and innovation must be an essential development priority.

City tourism and local economy

"Thimphu bustles with activity. Families shop and chat with friends along the city's main road, Norzin Lam, which steadily gathers more shade as each multistory office building sprouts along its edges," the World Bank describes Thimphu in one of its blogs.

Bhutan's private sector consists almost entirely of micro and small firms, with prestigious and high-paying jobs concentrated in the public sector. Thimphu's market is currently driven by consumption- by civil servants and corporate employees. But people coming to Thimphu in search of better opportunities are increasing and most are employed in the informal and the private sector.

Tourism, for instance, is the city's largest employer and perhaps holds the key to boosting the city's economy sustainably and in creating decent employment. Presently, the sector is estimated to employ 29,000 people when accounting for all linked sectors such as transport, restaurant and retail businesses and other service providers.

Sustainable tourism is thus a low hanging fruit. With few exceptions, it does not require sophisticated technology and a highly skilled workforce. Thimphu has already in place the basic and important amenities and attractions required for tourists- a pleasant climate, attractive scenery, historical sites and hospitable people. The city needs to ensure that it does not lose these unique selling points to rapid urbanisation while further developing potential tourist sites, new attractions and new infrastructure to be able to handle more visitors.

Thimphu could promote itself as a destination for international conferences through state of the art facilities and infrastructure. Its quiet and peaceful environment could serve as a perfect setting as a wellness destination.

Thus, urban planning ought to be looked at from a broader perspective. More jobs have to be created to enable people to earn a decent living. Sustainable solutions to socio-economic issues must be rolled out. Amidst these rapid changes, managing the quality of life in Thimphu and careful city planning is a prerequisite to sustain Bhutan's economic growth.

Regional development

While regional balanced development has been an aspiration for many decades now, not much has happened on the ground. In fact in Thimphu's case the opposite has taken place with corporate head offices moving to the capital and perpetuating the concentration of people, businesses and services in one valley.

Today, 40 percent of the country's urban population live in Thimphu and this is expected to double by 2030. There is only so much the capital can accommodate without having a detrimental effect on urban amenities and the quality of life of the city's residents.

In accommodating the rapid urban growth that is likely to continue for decades, the city can expand its boundaries and swallow up the fertile paddy lands in the peripheries, which might even be welcomed by owners because the land value suddenly skyrockets. As it is, the peripheries are already growing on their own with land in the city out of reach for most people.

But continuously pushing the urban boundaries is not a long term solution to manage the city's growth. A more sustainable option to ease the pressure on the capital is developing the nearby regions.

Thimphu Thromde interacts with a large hinterland including Kabesa, Begana, Dodena, Khasadrapchu, Bjemina as well as other districts including Paro, Punakha and Wangdue Phodrang.

Strategic issues in these areas also affect Thimphu. Therefore, further developments as well as some public institutions gradually moving to these areas will relieve the pressure on Thimphu.

A balanced regional development approach by spreading the benefits of development to other parts of the country can address other issues such as rural urban migration, unemployment and crime.

At the current pace of urbanisation in Thimphu, there is no more room for large infrastructural development although residential areas could accommodate increase in population until 2030. However, home ownership, housing affordability, accessibility, disaster resilience could pose additional challenges.

International institutions such as the World Bank have also suggested promoting regional development to build economic resilience. It may be the answer to tackle Thimphu's future growth sustainably.