*Prosperity Fund*

GLOBAL FUTURE CITIES PROGRAMME

# BURSA

## CITY CONTEXT REPORT

Foreign & Commonwealth Office

UN-HABITAT
FOR A BETTER URBAN FUTURE

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November 2018

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UN HABITAT
FOR A BETTER URBAN FUTURE

Global Future Cities Programme
BURSA
City Context Report

UNITED NATIONS HUMAN SETTLEMENTS PROGRAMME
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# CONTENTS

# GLOBAL FUTURE CITIES PROGRAMME

## Introduction

### ABOUT THE GLOBAL FUTURE CITIES PROGRAMME

In 2015, the UK government created a new Cross-Government Prosperity Fund worth £1.3 billion from 2016-2021, in order to help promote economic growth in emerging economies. Its broad priorities include improving the business climate, competitiveness and operation of markets, energy and financial sector reform, and increasing the ability of governments to tackle corruption.

Emerging Economies still face considerable challenges such as uncontrolled urbanisation, climate change and high and persistent inequality which can lower long-term growth prospects. The Prosperity Fund supports the broad-based and inclusive growth needed to build prosperity and reduce poverty, but also make development overall more sustainable through the strengthening of Institutions and Improvement of the global business environment.

The Global Future Cities Programme (GFCP) is a specific component of the Prosperity Fund which aims to carry out targeted interventions to encourage sustainable urban development and increase prosperity whilst alleviating high levels of urban poverty. The programme will also create significant short and long-term business opportunities in growing markets, forecast to be regional growth hubs, including for UK exporters who are world recognised leaders in urban innovation.

The overall strategy of the Global Future Cities Programme is to deliver the Programme in two phases; a strategic development phase (2018), followed by an implementation phase (2019-2021). UN-Habitat, in collaboration with the International Growth Centre (IGC) and the UK Built Environment Advisory Group (UKBEAG), has been mandated by the UK Foreign and Commonwealth Office (UK FCO) to develop and undertake the strategic development phase. This in turn, will inform and shape the implementation phase, and collectively provide further evidence for the overall programme.

The Programme builds upon a coherent series of targeted interventions in 19 cities across 10 countries, to support and encourage the adoption of a more sustainable approach to urban development. In general, the proposed interventions aim to challenge urban sprawl and slum developments, thereby promoting more dense, connected and inclusive cities that in combination contribute to prosperity, achieving the Sustainable Development Goals (SDGs) and implementing the New Urban Agenda (NUA).

The Global Future Cities Programme builds upon three integrated pillars, that will address key barriers to prosperity, in selected cities:

- **Urban planning** – technical assistance for spatial restructuring (Public space, Heritage and urban renewal, Urban strategies and plans, Data systems for integrated urban planning);
- **Transportation** – technical assistance to support cities to develop integrated transport systems (Multi-modal mobility strategies and plans, Data systems for multi-modal mobility);
- **Resilience** – technical assistance to develop strategies to address the impact of climate change and ensure development is sustainable (Flood management plans and systems).

In order to capitalize on the proposed interventions and to ensure sustainability and impact in a longer-term perspective, the programme has a strong focus on technical support and institutional capacity development.

In many of the interventions, there is a particular focus on the potential of embedding smart/digital technology and data analysis platforms in urban governance and management processes. Integrating smart technologies is recognized as an instrumental area that significantly can improve the efficiency in the provision of key infrastructure services, enhance urban resilience, support evidence-based plans and strategies and promote integrated planning approaches across sectors.

### INTERVENTION DEVELOPMENT AND VALIDATION

Based on initial scoping studies and government-to-government engagement carried out by UK FCO, the UN-Habitat team worked with partner local authorities and wider stakeholders to corroborate their city development strategies, and to confirm, enhance and develop the intervention proposals.

In each city, a Local City Specialist, supported by the national and regional country offices of UN-Habitat and in liaison with the FCO local posts, took the lead in identifying stakeholders in a series of bilateral meetings, interviews and focal group discussions. This has collectively gathered information and provided more detailed knowledge and information on the City's visions and goals.

Based on this initial phase, a Charrette (planning workshop) involved high-level decision-makers from the public and private sectors together with civil society representatives. This facilitated discussion on the proposed and possible alternative interventions, related individual interests, technical opportunities and constraints, as well as political objectives. The outcome of the Charrette provided clarity on where stakeholders stand in relation to the strategic potential of the discussed projects and it allowed for the mobilisation of support.

At the same time, the Charrette allowed for the technical teams to proceed with the development of a Terms of Reference, outlining the specific scope and activities of each intervention. A final Validation Workshop assured consensus on the proposed projects and document's endorsement by the authorities.

Parallel to preparing the Terms of Reference, an evaluation of the interventions was initiated, aiming to address its feasibility within the local strategic context, identify potential impact on prosperity barriers and to explore the optimal delivery models. This process resulted in a set of City Context Reports as well as an analysis of the technical viability of the interventions. The analysis aimed at both informing the development of the Terms of Reference and the future implementation phase of the Programme.


### THE CITY CONTEXT REPORT

**Objectives**

A City Context Report is provided for each city of the Global Future Cities Programme. It serves as a tool to frame the proposed Programme interventions within the characteristics and pre-conditions of each city.

The Report targets a variety of stakeholders in the Programme: administrators, city managers, policy makers, legislators, private sector actors, donors, and local as well as international researchers and knowledge generators. The Reports also provide UKFCO the contextual setting of each proposed intervention, and can in addition, be used by the Service Providers as an entry point for the implementation phase.

By addressing the specific challenges facing each city, the Report illustrates how the interventions can work towards inclusive prosperity and sustainable urban development. The benefits of each intervention, however, cannot be achieved without certain enabling conditions to ensure its success. Therefore, critical aspects for the delivery of the proposed interventions and its success from a long-term perspective are outlined. Using thematic

best practices and evidence from global learnings and research, contextualised recommendations are provided on the conditions necessary for the intervention to be viable and to reach a maximum impact.

Essentially, the City Context Report serves to ensure that all actors within the Global Futures Cities Programme are aware of the specific conditions to be considered in the delivery of the proposed interventions, on a case-by-case basis.

**Set-up and Scope**

The first part of the City Context Report (General Overview) provides an overview of the Global Future Cities Programme and introduces the city from the perspective of the urban challenge which the proposed intervention intends to address.

The second part of the Report (Urban Analysis) more critically and technically analyses a selection of factors which need to be considered or to be in place for the intervention to succeed, addressing its feasibility, potential impact on prosperity barriers from a long-term perspective.

The third part of the Report (International Alignment and Technical Recommendations) presents short–and mid-term expected outcomes as well as long-term potential impacts. It further elaborates the contribution of the intervention to the achievement of the SDGs and the implementation of the New Urban Agenda as well as the programme objectives of the Prosperity Fund.

As the City Context Report is tailored directly to the Programme interventions, the analysis does not aim to comprehensively present all aspects of urban development. It does not elaborate on long term planning and transformation strategies, the effectiveness of policy or urban legislation, nor the entire municipal financial system. As such, it also excludes urban policy recommendations.

However, the Report has the scope to illustrate the general capacity of the city for project delivery, and in this regard, make recommendations to support implementation of the interventions and reaching set goals. The City Context Reports will be part of knowledge management for the Programme to generate local information and data on the cities as well as identify gaps in knowledge, systems or governance.

**Methodology**

Urban Analysis

The City Context Report provides a general analysis of the spatial, financial and legal conditions in the city that can either facilitate or hinder the implementation and the long-term sustainability of the proposed interventions in transport, resilience and urban planning.

This framework follows UN-Habitat's three-pronged approach, recognising the three essential components for a successful and sustainable urbanisation: 1. urban planning and design; 2. urban economy and municipal finance; 3. urban legislation, rules and regulations.

Firstly, the spatial analysis describes the existing urban context specific to the intervention. Urban mobility systems, vulnerability of the built environment, spatial form and trends are considered as possible challenges in urban management that the intervention can address.

Secondly, the financial analysis aims to identify the mechanisms in place by which the intervention could be sustainably financed in the long-run. This section outlines the city's municipal capacity, existing regional, national and international financial ecosystem and existing financing mechanisms at the municipal level.

Thirdly, from a legal perspective, the Report critically analyses how the intervention could be facilitated or challenged by the vision of the city and its governance hierarchy. Enablers and obstacles resulting from any relevant legislation, as well as sectoral frameworks (e.g. strategies, policies, planning frameworks and development plans, detailed plans of relevance) are also described.

This approach aims to offer implementing partners, stakeholders and donors a general context of the city and, with it, demonstrate the appropriateness of the intervention from a spatial, financial and legal point of view, while at the same time informing about potential barriers and enablers for its implementation.

Potential Impact to the Program Objectives and the SDGs

The Report also outlines the potential impact of the interventions, based on the specific activities and outputs proposed. Impact can arise from a complex interaction of context-specific factors, rather than as result of a single action, which makes it difficult to empirically quantify longer-run effects that go beyond the identification of program outputs. An empirical, comprehensive impact assessment is therefore not part of the scope of this report.

Nevertheless, the report outlines potential benefits that are only achievable under certain preconditions and activities. Thereby, short-, medium- and long-term outcomes are defined with reference to a project-cycle approach, which considers all the project phases from




*Planning and Design* through *Building*, to *Operating and Maintaining.*

Short-term outcomes are directly achieved through the implementation of the technical assistance support, within the 2-3 years scope of the Global Future Cities Program.

Mid-term outcomes are only realised once the intervention is executed through either capital investment, implementation of pilot projects or the actual enactment of legal documents, plans or masterplans, within a possible timeframe of 3 to 7 years.

The broader long-term impact of the interventions is linked to the sustainability of the interventions in a 7-15 years timeframe and relates to the operation and maintenance phase of the project cycle.

The City Context Reports further connect potential impacts to the Programme's objectives, taking into account also the Cross-cutting issues at the core of UN-Habitat's mandate from the UN General Assembly. Consequently, the Programme's objectives are summarized into five principles:

- Climate Change;
- Gender Equality;
- Human Rights;
- Youth;
- Sustainable and Inclusive Economic Growth.

Cross-cutting issues are addressed with explicit reference to the 2030 Sustainable Development Goals (SDGs) and the New Urban Agenda, in an attempt to ensure that the proposed interventions are in line with the design, implementation, review and success of the 2030 Agenda for Sustainable Development. Consistent with UN-Habitat's mandate, the SDG 11 Sustainable Cities and Communities is linked with the urban dimension of the other 16 goals as an essential part of the localisation of the SDGs. In this way, interventions can support localisation processes, to support local ownership and ensure SDG integration in sub-national strategies and plans.

Technical Recommendations and International Best Practices

The interventions proposed in the various cities of the Global Future Cities Programme were grouped into clusters according to their thematic entry-point, as an elaboration of the thematic pillars of Urban Planning, Transport and Resilience.

These clusters are:

- Public space
- Heritage and urban renewal
- Urban strategies and plans
- Data systems for integrated urban planning
- Multi-modal mobility strategies and plans
- Data systems for multi-modal mobility
- Flood management plans and systems

Combining the international experience in urban policy and project implementation of UN-Habitat and the leading academic research of IGC, each cluster was analysed to offer evidence-based recommendations for a successful Implementation and a maximised impact of the intervention. Specific reference was given to implemented plans and international best practices.

The recommendations inform the Planning and Design phase which coincides with the timeframe of the Global Future Cities Programme, and always aim for long-term sustainability of the interventions.

*Fig. 1. Bursa City aerial view (Source: Bursa Metropolitan Municipality)*



# Bursa

## GENERAL CONTEXT

Bursa is one of the oldest and most important historical cities in Turkey. It was the first capital of the Ottoman Empire in 14th Century AD. Due to its long history, throughout which it has housed diverse civilizations and cultures, Bursa is considered an important patrimonial site.

The city is the fourth most populous city in Turkey, having about 1,150,000 inhabitants within the urban extent and 2,936,000 in the whole province.[1] Over the past 35 years, the population in Bursa has rapidly increased due to strong internal migration driven by the region's fast-evolving industrial development. Population growth in Bursa exceeded the national average in the period from 2007 to 2014 and reached a net migration growth of 7.0% in 2015. The population projections expect a 12.2% population increase for 2023.

The migration and high population increase led to a rapid urban growth and the development of unplanned areas in the west, east and north axis of the city. Unplanned growth resulted in informal settlements with high densities, inadequate urban spaces, environmental degradation, and lack of public spaces and green areas.

The city has witnessed many catastrophes such as earthquakes, floods, and forest fires. Because of this, there is constant concern for renewing the urban construction to be resilient and resistant to natural disasters. Low-income settlements have a higher exposure to risk, due to a high average density of population, buildings and related functions as well as the vulnerable building stock, largely constructed before the introduction of anti-seismic standards and inside historic centres with limited open spaces.[2]

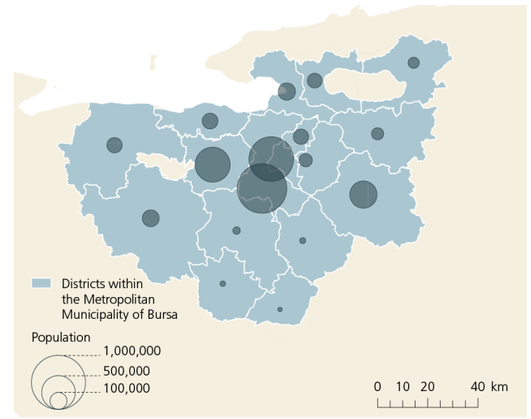


*Fig. 2. City of Bursa and Districts by density*

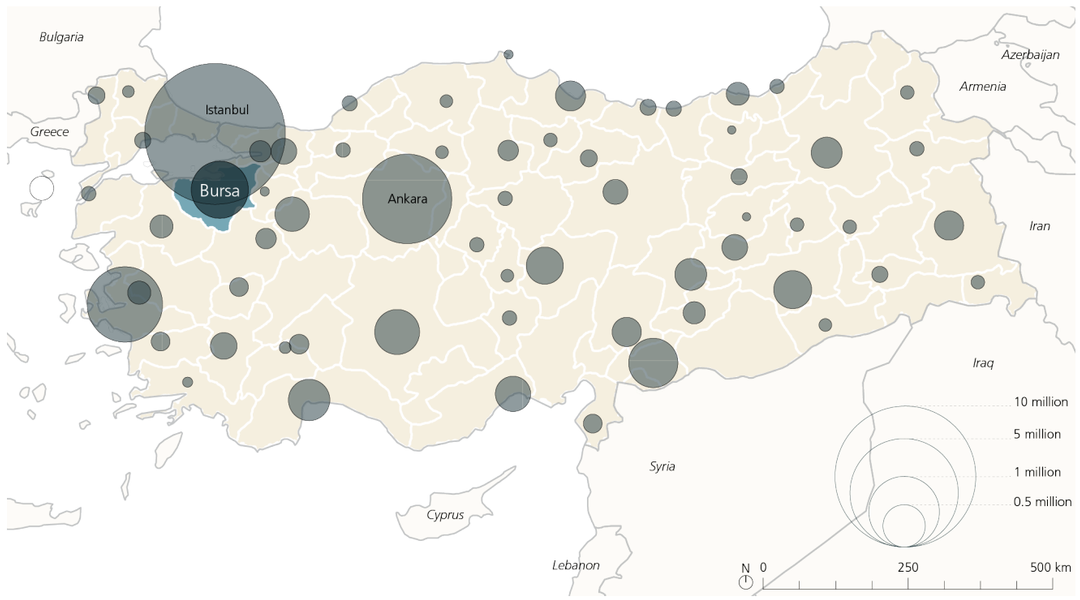


*Fig. 3. Bursa location in the national context*

Bursa is settled in a strategic location on the south-eastern shore of the Sea of Marmara. The provincial region is also closely linked to Istanbul, easily accessible across the Marmara Sea by ferry, which is constant and widely used by the population.

By and large, Bursa has good socio-economic indicators: while the national unemployment rate in 2013 was 9.0%, in Bursa it was 6.6%. Economically, Bursa stands out in the industrial sector, originally known as the historical textile centre of the Ottoman Empire. In addition, the service sector has become significantly more dynamic, which further enhances its image as a source of employment opportunities. However, the urban development of Bursa has not successfully accommodated the migratory flow triggered by its economic attractiveness, which has overwhelmed the city's infrastructure and public services.[3]

Industrial development in Bursa has spread all over the metropolitan region, with the highest concentration of industrial land use in the Western part of the city centre. However, middle income settlements where the working class resides have been developed on the East. As a result, daily commutes along the east – west axis, reaches to 1900 vehicles per hour in the peak hour, causing high levels of traffic congestion.

In this regard, Bursa is considered an adequate environment to implement smart city technologies in order to address better urban management and public service delivery. Smart city technologies are increasingly integrated into urban governance and management and are becoming a fast-developing business sector.

The Bursa Metropolitan Municipality (BMM) is the main administrative body at the provincial level and has legal mandate over municipal issues. BMM consists of 17 Municipal Districts, and the Osmangazi, Nilüfer and Yildirim Municipal Districts comprise the main urban extension of Bursa City.

## INTRODUCTION TO THE INTERVENTIONS

A series of consultative processes to develop the interventions included a participatory workshop with local government, civil society, private sectors, and academic stakeholders, continuous bilateral meetings with the technical and political representatives of the Bursa Metropolitan Municipality, and a final validation workshop. This enabled the city of Bursa together with the UK FCO and UN-Habitat to identify two areas of Intervention that match programmes and processes currently underway within the city:

- "Transforming Bursa into a Smart City-Capacity Development and Implementation Preparation": technical assistance and capacity building to the Bursa Metropolitan Municipality to develop a city-wide strategy for transforming Bursa into a Smart City, with the preparation of a pilot project in transport management.

- "Sustainable Urban Transformation Approach for Bursa": Technical assistance to the Bursa Metropolitan Municipality to prepare a comprehensive urban renewal plan in a central neighbourhood in Bursa.

## TRANSFORMING BURSA INTO A SMART CITY

### Problem Statement

Bursa's population growth and industrial development during the last decades led to rapid urbanisation of the city. In some cases, the urban expansion resulted in non-planned urban settlements with insufficient public space, poor quality of the built environment and high problems of traffic congestion which increasingly challenge municipal service provision. Meanwhile, planned initiatives have often been conducted in a fragmented, non-inclusive manner, negatively affecting the urban landscape and the social dynamics.

The strategic location of Bursa in the national and regional scale and the industrial zones situated throughout the urban area have brought high problems of traffic congestion. Furthermore, rapid urban sprawl and the development of unplanned urban settlements increase the cost of implementing and maintaining the transportation network. Infrastructure investments in transportation cannot keep up with the increasing demands of the growing population.

Efforts to provide adequate mobility services have also been challenged by a lack of coordination among different stakeholders, insufficient understanding of open innovation and use of new technologies, unwillingness to share data, poor data collection, analysis and management practices, lack of success to include citizens in the city decision-making processes, and lack of special emphasis on women, the poor, and other disadvantaged groups.

In view of the above, there is a need to explore alternative models, approaches and mechanisms for integrated urban planning and management in Bursa, that contribute to its sustainable urbanisation.



Although Bursa has invested in its transportation system, further efforts are needed to achieve a multimodal and sustainable transport system. Hence, these efforts should be supported with more effective traffic management and technology-driven solutions. Increasing capacity to collect and process urban data is transforming the traditional urban planning, management and governance of cities. Citizen-centric, accurate and timely service provision can provide smart solutions to urban problems, such as traffic congestion, overcrowded public transport, waste of energy and water, made possible by the instant transfer and processing of data. Smart City Technologies have the potential to improve municipal service delivery and quality of life of Bursa citizens with smart solutions that do not require large-scale physical infrastructure investments, and make significant contributions in solving the above mentioned problems.

### Intervention Description

The Global Future Cities Programme aims at technically assisting the implementation of smart city technologies to improve the Bursa Metropolitan Municipality's capacities in urban management in order to increase quality of life, social inclusion, sustainable mobility and comprehensive urban planning.

The specific objectives of this intervention are: i) Increasing the mobility of Bursa citizens by improving the traffic and public transportation management capacity of the Bursa Metropolitan Municipality (BMM); ii) Integrating mobility policies with complementary urban management areas (e.g. health, culture, safety, waste management, energy) to increase accessibility to municipal services; and iii) Increasing the BMM and other relevant public organisations in Bursa's capacity for data collection, management and analysis, for better service provision.

To achieve this goal, the intervention will assess the existing situation and set a policy implementation agenda (strategic plan) for city stakeholders to improve their institutional capacity (human resources, theoretical and practical knowledge) for smart city policies. Additionally, the intervention will include a pilot development on sustainable transport management.

In this way the intervention will prepare the BMM, public and private stakeholders, and the society in general for a transition towards a smart city. Through smart technologies implementation, Bursa will establish a high-quality data system which will improve service provision, decision-making processes, the development and application of urban policies and plans, intelligent use of resources, among other benefits.

In the long-term implementation of the proposed projects and policies, the intervention will contribute to increasing the efficient use of resources, enhance municipal response capacity in emergency situations, and increase participation of disadvantaged groups in urban governance, among others.

The main outputs defined for the intervention are:

- Stakeholder Engagement and Participatory Approach
- Context Analysis Report with Emphasis on Mobility
- Smart City Strategic Plan, that Includes Policy Framework, Action Plan and Project Proposals
- Data system and Data Governance Guide
- Capacity Development and Trainings
- Smart City Standards Turkish Translation
- Smart City Pilot Project Definition
- Smart City Observatory Set Up
- Monitoring and Impact Assessment.

**Main Stakeholder**

Bursa Metropolitan Municipality (BMM)

**Possible Project Partners**

- Bursa Technical University / Uludag University;
- Bursa Transport Public Transport Operations (BURULAŞ);
- Bilecik Development Agency (BEBKA);
- Districts Municipalities

**Thematic Cluster**

Data Systems for Urban Planning and Land Management

**Keywords**

Smart city, social inclusion, sustainability, urban planning, capacity building, data systems, urban management, smart technologies, urban policy

## SUSTAINABLE URBAN TRANSFORMATION APPROACH FOR BURSA

### Problem Statement

Urban renewal is one of the most urgent topics for Bursa. High migration rates, rapid population growth and industry development significantly increase the pressure on urban expansion, as well as for redevelopment and infill of existing urban areas. Experiences from previous stakeholder meetings identified dissatisfaction with the dominant plot-based renewal approach in Bursa.

Compensation mechanisms for tenants and residents, participatory processes, and inclusion of affordable housing in the urban renewal developments are often not implemented. On the other hand, construction of the necessary urban services for increased densities are the responsibility of local authorities. However, the municipalities lack adequate financial mechanisms for implementing the appropriate infrastructure for sustainable urban renewal.

Planned and relatively large-scale urban renewal projects require long term commitment and additional financial contribution and they bring lower profit rates compared to the plot-based renewal approach. Hence, they are not considered feasible, neither by the private sector, nor by the local governments or residents.

In view of the above, there is a need to explore alternative development models, approaches and mechanisms for urban renewal to contribute to sustainable urbanisation, taking into account urban planning and design, legal frameworks, financial mechanisms, and whereby the ultimate beneficiaries (the residents) can benefit from the proposed development.

### Intervention Description

The Global Future Cities Programme aims to provide technical assistance to the development of the "Sustainable Urban Transformation Approach for Bursa." This intervention will identify an integrated urban renewal approach that takes into account social inclusion, environmental sustainability, and urban planning standards while looking at financial feasibility. The intervention will develop an alternative proposal for the Yalova Yolu urban renewal project that will be prepared with a participatory approach. To achieve this, the intervention will undertake context and legal analysis; develop an urban development model by improving existing urban renewal project towards achievement of intervention objectives; develop a viable financial plan for project implementation; prepare a step-by-step implementation guide and undertake a wider impact assessment.

Additionally, it will demonstrate how an urban renewal process could be planned and executed in a participative manner, resulting in local urban life improvements, minimizing negative impacts from the process, avoiding forced evictions, and meeting residents' demands.

In the long-term, the intervention is expected to influence and change the private sector's approach to urban renewal, which currently is based on maximizing rent at the expense of social amenities and environmental standards. The intervention may also impact citizens' views and engagement in urban renewal schemes, in particular if participatory processes can be demonstrated.

If applied successfully, the intervention is expected to become a best practice for municipalities, to share the infrastructural and urban planning related costs and burdens of the urban renewal projects with the private sector and landowners.

The main deliverables of the intervention are:

- Participation, Communication and Monitoring Strategy
- Urban Diagnostics, that include Context Analysis of Urban, Legal, Financial and Socio-Economic existing conditions.
- Plan Revision and Feasibility Studies including Technical, Social and Economic.
- Urban Design Guide for Inclusive Urban Renewal in Bursa
- Management and Implementation Plan for The Urban Renewal Project
- Policy Recommendation Report
- Impact Assessment

**Main Stakeholder**

Bursa Metropolitan Municipality (BMM)

**Possible Project Partners**

Osmangazi Municipality; Bursa Metropolitan City Council; Housing Development Administration of Turkey (TOKI); Bursa Eskisehir Bilecik Development Agency (BEBKA); Bursa Technical University; Chamber of Urban Planners; Chamber of Civil Engineers; Chamber of Architects

**Thematic Cluster**

Heritage and Urban Renewal

**Keywords**
Urban renewal, disaster risk, sustainability, participatory processes, urban planning, financial mechanisms, social inclusion.




*Fig. 4. Bursa City Centre (Source:Tom Venables, UKBEAG)*

# URBAN ANALYSIS

## Spatial Context

### URBAN FORM AND HISTORICAL CONTEXT

Currently, the Bursa Metropolitan Municipality (BMM) area extends a total of 10.811 km² along the Sea of Marmara coast in north-western Anatolia. The built-up area of the city of Bursa extends 1.036[4] km² lengthwise along the horizontal axis that connects with Ankara, on the east, and Izmir, on the west. The urban concentration hosts the districts of Nilüfer, Osmangazi, Yıldırım, Gürsu and Kestel.

The city's strategic geographical location, together with the fertile land and political and cultural history made it one of the most important metropolitan agglomerations of Turkey in the last centuries.Historically, the first human settlement appeared around the 5200 BC[5] and the first city can be dated from 200 BC, the ancient Greek city of Cius.[6] It was a commercial node of silk during the Byzantine period and became the first capital of the Ottoman Empire in 1326.

The industrial development of the city initiated in the early twentieth century during the republic period, starting the urban growth and transformations of Bursa. Despite plans to prevent the unplanned growth of the city into natural protected areas, it continued its expansion towards the north and the east and west axis.

After 2000, urban regeneration was defined as a strategy with the collaboration of the local authorities and the private sector. The Environmental Order Plan for the Bursa Metropolitan Region in 1/100,000 scale, which started in 1998, put the revisions of areas which could not fulfil the needs of the city on the agenda, thus encouraging urban regeneration or renovation projects, either by competitions or public enterprises.[7]

### MAIN URBAN CHALLENGES

The central and historical areas of the city (districts of Osmangazi and Yıldırım) have suffered a process of urban degradation due to the west-oriented urban expansion of the last decades.[8] While new residential areas of middle- and upper-income populations dominate the western region, low-income neighbourhoods, including informal settlements, are concentrated in the central and eastern regions.

*Fig. 5. Yalova Yolu neighbourhood aerial view (Source: Bursa Metropolitan Municipality)*



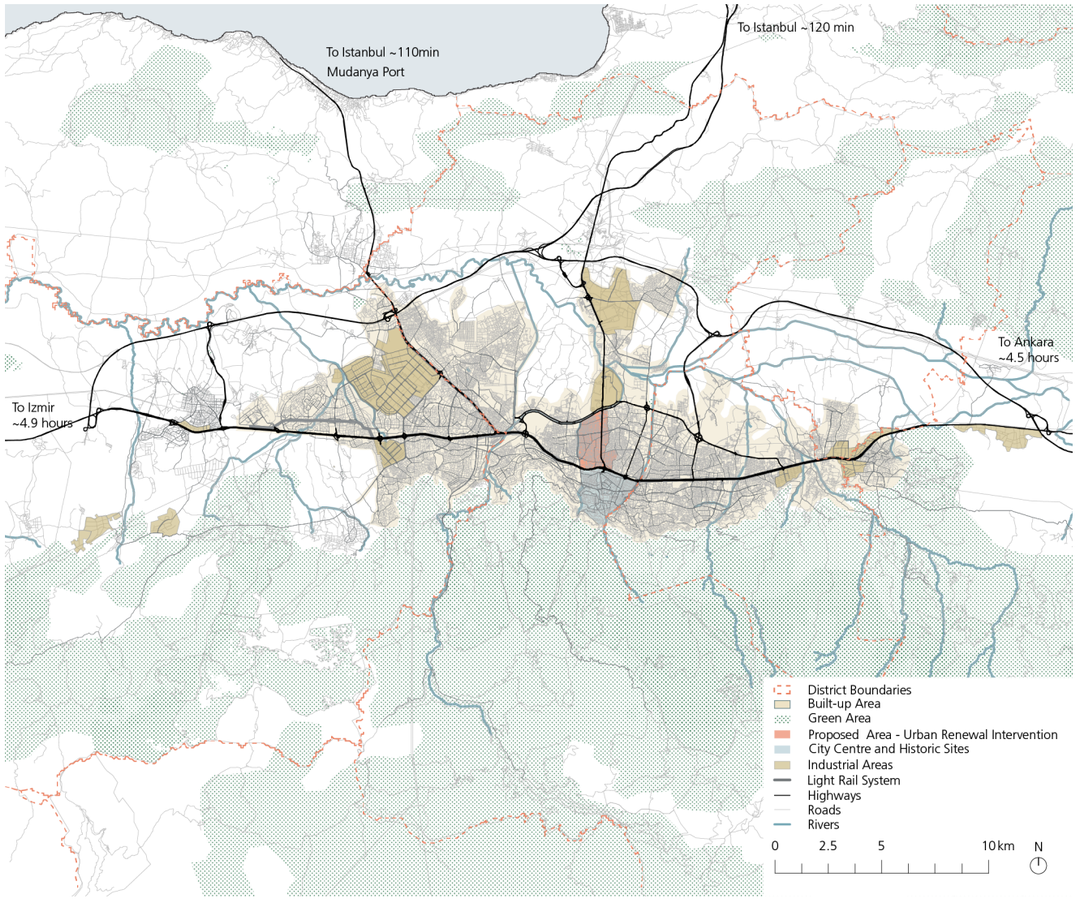


*Fig. 6. Bursa City*

The provision of urban basic services covers the whole metropolitan region, though significant bottlenecks exist in the rural areas on the Southern and Eastern edges of the provincial region. However, there are many environmental issues that can be solved with the better management of basic services. Solid waste from the most populated districts is not fully disposed in regular landfills,[9] many industrial zones do not have wastewater treatment facilities,[10] water resource networks needs improvements to decrease losses and pollution,[11] and levels of energy efficiency have to be increased.[12]

Spatial planning frameworks and strategies have facilitated the settlement of big industrial plants within the urban extension. Industrial zones are situated throughout the built-up area, among three main agglomerations: in the east, west and north of the city. The expansion of the industrial zones has constrained the urban development and menaced the natural environment,[13] affecting urban mobility and neighbourhoods' quality of life. However, the current tendency of the sector is moving towards green-industry and low-impact standards for industrial activities.

Improving mobility and decreasing carbon emissions are also a need for the city. Although there has been significant investment in transport in Bursa, further efforts are necessary to achieve the integration of multimodality in the city's transport system, and promote sustainable modes of transport.[14]

### Existing Challenges of the Mobility System

Bursa plays an important role in the regional and national connectivity as a daily route of industrial products and vehicular circulation. It is located on the Ankara State

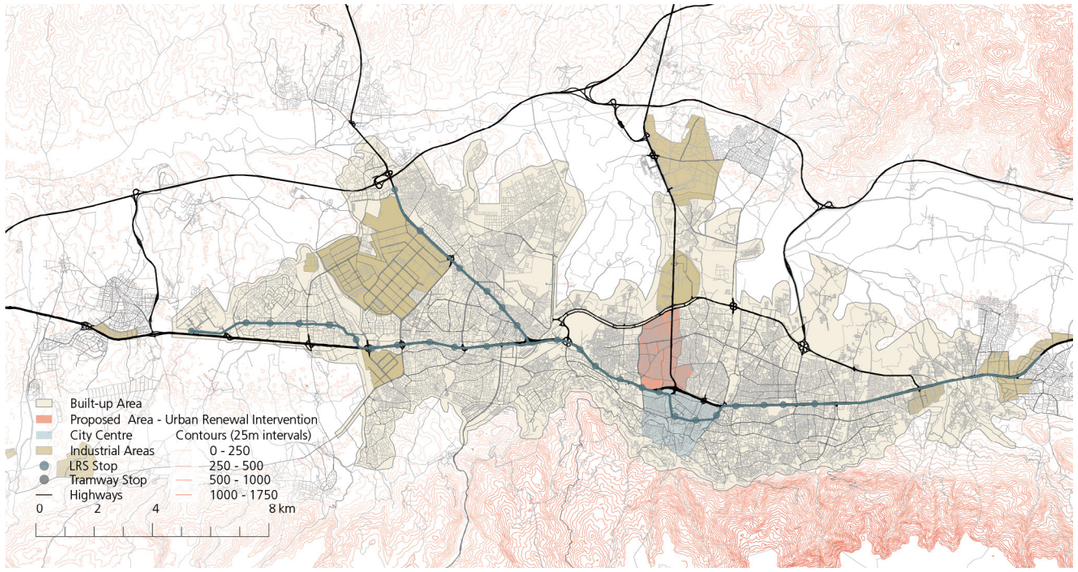


*Fig. 7. Bursa Urban Structure and Main Transport*

Motorway and has direct connections with Istanbul and other cities, including the Istanbul – Kocaeli – Bursa industrial corridor. Cargo and passenger transportation, made by land and sea and air transportation has development potential. Sea transportation is made in Mudanya and Gemlik districts and the air transportation in Yenişehir district.[15]

Many residential areas are in the city outskirts, close to industrial zones, while the commercial and institutional activities are concentrated in the city centre. This land use distribution triggers high loads of traffic along the linear east-west axis that structures Bursa.

Besides the industry and heating-based air pollution, the use of private cars in the urban settlement along the Mudanya-Yalova -Ankara axis, also causes air pollution.[17] Traffic congestion and accessibility are major issues in Bursa. The lack of strategic planning affects the efficiency and provision of public transport and implementation of adequate mobility networks. The rapid urban sprawl and the development of unplanned urban settlements increases the cost of implementing and maintaining the transportation network.[16]

On the other hand, some improvements towards public transport efficiency have been made in Bursa, such as the electronic payment system implementation. The BursaKart can be used for metro, tram and bus, making the journey simpler, faster and hence more attractive as a mobility choice.

Furthermore, the city designed a light rail (LRT) system from 2002 onwards to address congestion in the urban core. The LRT, completed in 2007, has been successful in encouraging better connectivity and increased linkages between housing and employment markets. It has also significantly contributed to easing congestion and decreasing carbon emissions.

**Urban Resilience and Vulnerability**

Urban resilience is also an important topic for Bursa, because its geological and geomorphological structure of the city make it highly vulnerable to natural disasters. The main threats are earthquakes, due to its location in the active Northern Anatolian Fault Zone, but also floods, overflows and landslides, tsunamis and rockfalls affect the existing housing settlements.

The issuance of building permissions in vulnerable areas has been observed.[18] Over 150,000 buildings have been damaged since the last Century as a result of seismic movements, and floods have caused loss of lives and property.

However, urban disasters are also the outcomes of systematic governance insufficiencies that could, in theory, be addressed by improved public policies and accompanying management systems. In addition, because these hazards happen within natural ecosystems, which mostly spread across many jurisdictions and are disturbed by urban development, risk management requires coordination with nearby towns and rural districts.

**Smart City Technologies**

Well-coordinated urban management and governance between different entities and scales are key in order to address the main urban challenges of Bursa.Urban planning and management functions are being highly transformed by technological developments with an unprecedented capacity to collect and process urban data. A citizen-centric, more accurate and on-time service provision is becoming possible by the instant transfer and processing of data. With this data, Bursa can provide smart solutions to urban problems, such as traffic congestion, overcrowded public transport, and wasted energy and water.

The technology sector has the potential to improve municipal service delivery and quality of life for Bursa citizens with smart solutions that do not require large-scale physical infrastructure investments.

## URBAN TRANSFORMATION DYNAMICS

During the last decades, Bursa's urban expansion has often occurred in an unplanned manner, which has resulted in environmental degradation, increased urban risk, and a loss of green space.[19] Additionally, the continuous influx of migrants attracted by employment opportunities in the industrial sector, has made Bursa a city with one of the highest demands for housing in Turkey.[20]

Previous urban renewal examples in Bursa show a tendency for private sector-led urban renewal projects that cause increased densities, hence increasing the burdens on local governments for infrastructure and service provision. On the other hand, local government-led and planned urban renewal projects are difficult to implement because of the high investment costs.

The dominant urban renewal trend in the city is based on plot-based initiatives, instead of comprehensive planning projects.[21] This model has not provided appropriate solutions for social inclusion and environmental sustainability, and does not supply appropriate street networks and urban services for increased densities.

Additionally, these building-based urban renewal processes have impacted the urban landscape as they are progressively transforming the visual into a traditional homogeneous city.

*Fig. 8. Bursa city Centre (Source: Google Earth)*

**Spatial Context of the Urban Renewal Intervention: Yalova Yolu**

The Yalova Yolu neighborhood was chosen as the potential area for the implementation the Urban Renewal Plan of the Global Future Cities Programme.

The area is declared as an Urban Renewal Site by the Municipal Law (Law No. 5393, Article 73) and the Bursa Metropolitan Municipality, and it is located in the center of the city in the Osmangazi District Municipality, north of the historical area. It is framed by the '2. Kanal' Street to the West, the European Council Boulevard to the North, the 'Istanbul' Street's immediate building blocks to the East, and the 'Ankara Yolu' Street to the South. It covers roughly 350 hectares and has a population of 85,000 inhabitants.

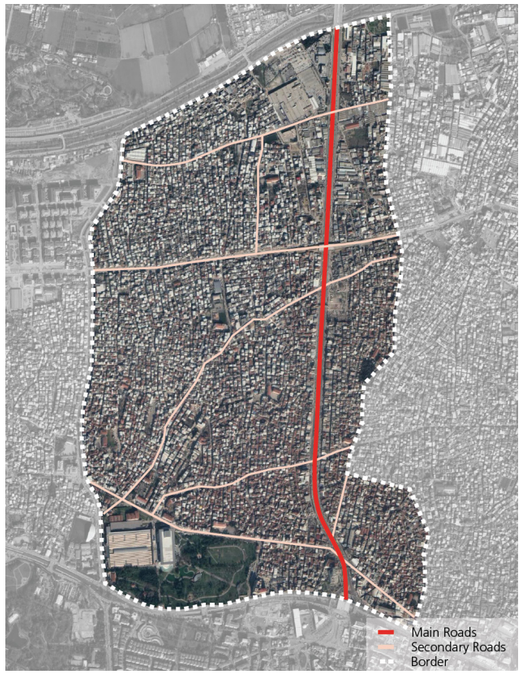


*Fig. 9. Yalova Yolu urban fabric*

The final spatial extension for the Urban Renewal Plan will be finally determined during the initial phase of the intervention implementation.

The area can be considered of high value as it is located in a strategic area that connects the historical centre in the south, the industrial areas and residential expansions in the north, and both west and east sides among the main Ankara Yolu corridor. The light rail extension line on Istanbul Street, the construction of which will be completed in 2019, will also increase the connectivity and value of the area.

The Yalova Yolu neighbourhood is currently occupied by a low-income settlement. The poor quality of the built environment and the environmental conditions make this area highly vulnerable to natural disasters. The average household size is 3.5 persons and the average densities range from 240 people/ha overall to 340 people/ha in housing areas.

The urban fabric is formed by an irregular street network that consists of small buildable plots with an average size of 100 units per 30 meters, with 3-4 storeys. The current land use is mainly housing and commercial activities. However, there is scarce public space (about 1% of the total area) and insufficient provision of public services and urban equipment.


*Fig. 10. Sample area in the Yalova Yolu area*



# Financial Context

## MUNICIPAL CAPACITY

In 2017, Bursa's municipal budget stood at approximately 350 million USD and approximately 178 USD per capita. This represents a moderate budget compared to other cities of the GFCP. As a crude comparison, Cape Town has a budget per capita of 761 USD, Belo Horizonte of 1000 USD and Melaka 103 USD. This shows a moderate budget capacity. However, Bursa is the fourth-largest economic contributor to Turkey's GDP with a share of 4%. This is largely due to the region's diversified economy.

In 2012, new governmental reforms[22] were instituted which reduced municipal dependency on central government transfers by providing larger cities with more competences. However, many cities in Turkey including BMM rely primarily on central government transfers to finance its expenditure.

Government transfers make up about 54% of Bursa's expenditure. The municipality's own-source revenues, as shown in the Figure below, mainly come from real estate taxe,s representing 25% of the revenues of the city. Other sources are related to Enterprise and Property (12%), Services and Sales (8%) and Transport Revenue (4%).

Expenditures are slightly higher than revenues. The total expenditure in 2017 stood at 2,375,000,000 Turkish Lira (TRY) or about 380 million USD. Main expenditures come from the Department of Transport (41%) and Railways Directorate (40%) followed by the Strategy and Evaluation Directorate (16%).

## FINANCING MECHANISMS

**Urban Renewal**

Urban renewal projects require large-scale investments. However, as explained above, Bursa does not have a high revenue stream and depends largely on central transfers for financing expenditures. This will require financing through a variety of debt instruments that can be in form or private or public debt.

Private debt can include borrowing directly from the market such as commercial banks and other private financial institutions. Public debt on the other hand, includes the use of tools such as "tax incremental financing" or "revenue bonds" that consist in local governments investing in public infrastructure up-front that will be paid back in the future, either backed by full government faith or against a revenue stream that will be generated by the project.

Bursa has the p legal ability and precedent to borrow both domestically and internationally, but with legal restrictions.[23] The BMM requires permission from the Central Government (through the Ministry of Finance) for all foreign borrowings, regardless of if they require sovereign guarantees. On the local borrowing front, the BMM is allowed to borrow domestically for up to 10% of the 're-valuated value' of the preceding annual budget revenues.[24]

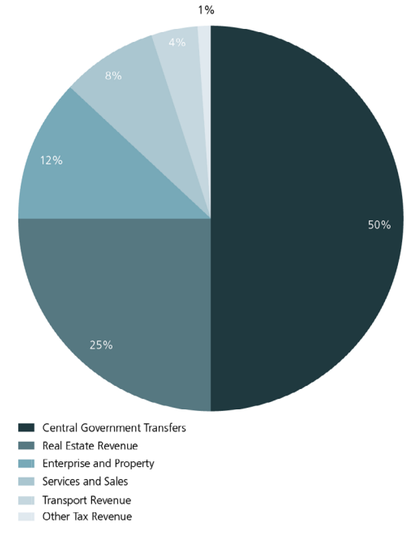


*Fig. 11. Bursa Metropolitan Municipality Revenues*

Since 2014 there have been some initiatives by the national government to create tools to finance urban redevelopment such as "urban renewal bonds" and "real-estate certificates." Nevertheless, given the volatility of the current Turkish economy it is not clear how certain it is the possibility of using these new financing tools in the market.

As most debt will have to be backed by a revenue stream, the city will have to consider suitable funding mechanisms from the outset. As Bursa plans for the city to revitalise the urban centre to ensure more mixed-use development, land values will increase in these two areas. Therefore, having land value capture instruments in place will be key. Considering that, as explained above, taxes on real estate revenue forms a bulk of the local revenue, this signals a strong potential role for land value capture for future financing. Alternatively, the city could also implement land-based finance mechanisms through a fee system such as a betterment levy[25] or impact /extraction fee.[26]

Acquiring additional land needed for regeneration would be an important consideration, especially as the regeneration area of Yalova Yolu is already built. Turkey already has a history of using area-based land readjustment models and has the legal instruments[27] to facilitate contributions from private land owners to the public use.[28]

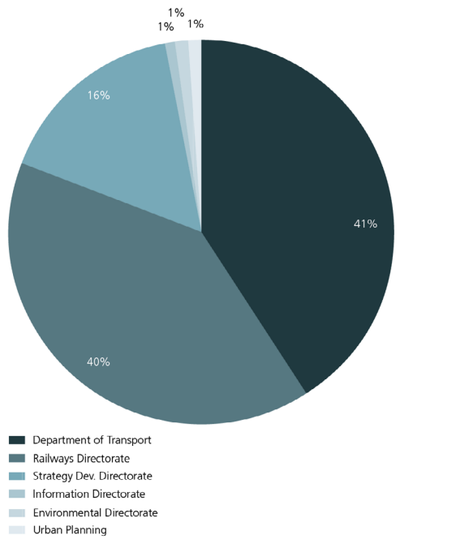


*Fig. 12. Bursa Metropolitan Municipality Expenditures*

Currently, BMM provides increased building rights (Floor Area Ratios) for compensation of urbanisation costs. Developers retain the additional construction rights and in exchange, landowners are provided with new housing units without significant financial contribution. This model lacks a comprehensive approach for social inclusion as the new developed areas are not affordable for the initial tenants and residents. As Bursa would like this urban renewal to also result in affordable housing, financial instruments should be used to generate funds to cross-subsidize affordable housing.

**Urban Mobility**

Bursa has substantially invested in improving the transportation system. For instance, in the 1990s, development was expanded in commercial areas close to transport spots, and in 2007 the light rail system became operational.[29] However, the main barrier to expand and improve the transportation system is financial.[30] Every ten years the bus system requires huge investments.[31]

Regarding the smart city plan with a focus on transport, there is scope to bring in the private sector to help the city of Bursa establish a platform for data collection, sharing and overall coordination. The private sector may have experience and capacity to set up these systems. Additionally, the improvement of the transport system can lead to increased revenues due to increased transport use.

Turkey has extensive experience with Public Private Partnerships (PPPs), especially in the energy and transport sectors. The Economist ranked Turkey in the top five of "PPP operational maturity" within its regional context.[32] There is a national legal framework regulating PPPs in the country that includes procurement laws[33] and laws on privatization practices.[34] However, there are a few weaknesses in the PPP system, particularly regarding its implementation at the municipal level. This includes a lack of a specialised PPP unit[35] to provide guidance and capacity in sub-national PPP implementation. Additionally, although there are some experiences of implementing PPPs in Bursa, PPPs in Turkey are rarely implemented at subnational level due to a lack of technical capacity.[36]



# Legal Context

## URBAN GOVERNANCE STRUCTURE

**Bursa Metropolitan Municipality**

The Bursa Metropolitan Municipality (BMM) has legal mandate over municipal issues. The Turkish Law No. 3391 ("The law on the Establishment of three Districts in Bursa City Centre, namely Osmangazi, Yıldırım and Nilüfer" passed in 1987) created Bursa as a 'metropolitan municipality.'[37] Turkish Law No. 5216 (the 'Greater City Law', passed in 2004) regulates BMM's governance role and grants BMM with municipal responsibilities such as transport, urban renewal and sanitation services.[38]

BMM consists of 17 district municipalities. Each district's mayor forms part of the municipal council, which is the principal legislative body of Bursa. This provides a built-in institutional mechanism of coordination between district and metropolitan level municipalities.[39]

**Bursa City Council**

Since Turkey implemented a Local Agenda 21,[40] following the United Nations Conference on the Environment and Development, City Councils, made up of civil society representatives, were established to facilitate greater citizen participation in planning and decision making. Each Turkish metropolitan municipality has a City council, but generally speaking, these councils have not had strong influence. That said, the Bursa City Council is recognised as one of the most effective in Turkey and has been successful in terms of citizen engagement and other initiatives. The City Council played an active role in the preparation of the Environmental Plan,[41] demonstrating their strong engagement.

**Governance of Urban Renewal Processes**

BMM has the legal mandate to implement urban renewal projects in the city. Despite BMM having an urban transformation department, a specific framework on urban renewal is lacking, which could shape all urban transformation projects in the city. There are also concerns that there is a lack of a single definition of what continues as urban renewal in Turkey, as well as a lack of coordination of the actors undertaking urban renewal developments.

The Housing Development Administration of Turkey (TOKI), which is affiliated with the central government, is responsible for housing production for low income groups and renewal of the housing stock in areas under disaster risk. TOKİ undertook an urban renewal project in the Osmangazi's Doğanbey neighbourhood of Bursa in 2013 in partnership with the district municipality, not BMM. This development of high-rise apartment complexes in the city centre was criticized for not fulfilling the cultural needs of residents, and not maintaining the unique historical value of the urban form.[42]

Some Turkish scholars[43] advocate for citizens' participation in the initial stage of the urban renewal process, because if consultation is done after the plan is defined, there is no possibility for people to express their expectations about the intervention so that there can be adaptations.

**Governance and Coordination of Transport**

The BMM has a clear mandate to implement and invest in local transport infrastructure. BMM operates most of the city's public transport system, except minibuses, which are privately owned and are organized as a cooperative. BMM's Transport Department coordinates the transport network, while the Bursa Transport Public Transport Operations (BURULAS), a BMM-owned company, is responsible for operating public transportation, including the LRT system. BURULAS's duties are not only limited to public transportation, as BMM has outsourced the Transportation Master Plan revision to this organization, which is currently under review. Furthermore, the Bursa Metropolitan Municipality Transportation Coordination Center (UKOME) is responsible for coordinating transport initiatives and related projects.

The city also has a unique agency that controls the public transportation systems, called BURULAS. It is responsible for operating the light rail, tramways, 400 buses, intercity services, ferries and regulates private bus services. The city has been very active in the public transport sector, investing in the expansion of tram and metro lines, as well as has made important efforts to promote efficiency in operations using new technologies.

National and district level actors also have some authority over road and transport management. The National Ministry of Transport and Infrastructure constructs and operates national and regional highways and railways

(often though partial privatisation and PPP models) and controls the sea and air traffic (ports are mostly privately operated). Furthermore, some small, local roads are maintained by lower-tier districts.

Despite the many agencies working in transport, there is a need to further strengthen coordination in order to tackle issues of inefficiency. For example, many bus routes in the city pass through the densely populated city centre square - this is not necessary and adds to congestion in the city centre area. This could be a result of limited data on transport use in the city.

### URBAN PLANNING FRAMEWORK

#### Statutory Planning Hierarchy

The main city statutory plan is the Environmental Order Plan (EOP), which includes the land uses, densities, urban expansions, andurban and socioeconomic development strategies. The regional plan is a strategic plan developed by BEBKA agency.[44] Hierarchically, it is on above the EOP and should guide it. However, it is not what happens, rather it has more an advisory than statutory role. Lastly, local plans are drafted and applied by the BMM and by the districts. They include master plans and implementation plans. There are also sector specific plans such as the under-review Bursa transportation master plan.[45]

### LEGAL FRAMEWORK FOR URBAN RENEWAL

The Municipal Law number 5393 of 2005 legitimized urban renewal under Article 69 of the law titled "land and housing production" and Article 73 titled "urban transformation and development." Since then, urban renewal has been promoted for the purpose of preventing areas from the risk of earthquakes and other natural disasters. The 2012 Turkish Law 6306 (officially the Law on the Regeneration of Areas under Disaster Risk) is the principal law on urban renewal, which approaches the concept from the perspective of enhancing old structures for disaster management. This law set a target is to construct approximately 14 million housing units within the scope of urban transformation in the next 20 years in Turkey.[46] This law specifies procedures and principles on renewal of urban districts, but compensation and resettlement for existing residents is not compulsory.[47]

BMM has the legal mandate to undertake land readjustment, which is a commonly used method for urban renewal projects. The Development Act of 1985 granted the municipality the right to undertake land readjustment practices, but with the restriction of a maximum contribution of 40% from private landowners.

### LEGAL FRAMEWORK FOR DATA USE AND SMART TECHNOLOGIES

#### Data Collection, Standards and Management

The central government, BMM, and the lower districts all collect some form of data, but there is no clear legal distinction between the data collection mandate of these government layers. Therefore, there is an overlap of responsibility concerning data governance. For example, BMM uses the CitySurf program – which contains open access information about address data, important locations and transport information[48] – for providing a 3D representation of city data, including the spatial structure of the city,[49] which can be helpful for urban planning. However, although BMM maintains a data inventory where it assembles all the data it collects, there is no integrated mechanism for inter-institutional cooperation. There is also evidence that inter-institutional *competition* hampers dialogue and coordination in planning and data sharing.[50]

#### Open Access Data and Data Sharing

The Law on the Right to Access Information No. 4982 ensures open data which is of public interest. However, bureaucracy and information sharing culture in government is currently not open. Without clear open data standards, data sets cannot be shared without security concerns. There are no standards or protocol for sharing data between government agencies, so they can only exchange data which can only be used publicly (leaking data is a judicial matter). Some data is openly shared but not in accordance with open data standards, so it is not standardized. There is a clear need for open data *procedures and standards* in law.

#### Data Protection

Turkey has national laws which protect personal data. The principal act is the Law No. 6698 on Protection of Personal Data (2016),[51] which instates standard practices and procedures for handling of personal data; and protects the privacy of individuals.[52]

#### Smart City Policy

Under this context, the Turkish Ministry of Environment and Urbanism is preparing a national smart city strategy, which is expected to enter into force at the beginning of 2019. It is also anticipated that local governments will be encouraged to develop city-wide smart city strategic plans following the publication of the national smart city strategy.



# INTERNATIONAL ALIGNMENT AND TECHNICAL RECOMMENDATIONS

## Potential Impact

The potential impact analysis outlines the main benefits that can potentially be attained through the Global Future Cities Programme in each city. The impact analysis covers three phases: short-, medium- and long-term. Nevertheless, as impact can arise from a complex interaction of context-specific factors, rather than as result of a single action. An empirical, comprehensive impact assessment is therefore not part of the scope of this report.

The short term refers to the outcomes that can be achieved through the implementation of the technical assistance support that is provided through the interventions within the 2-3 years' scope of the Global Future Cities Programme.

The mid-term outcomes are only achievable once the intervention is executed at the city level either through capital investments or the legal validation of key polices and plans. This phase accounts for approximately 3-7 years. The long-term impact of the interventions is linked to the sustainability of the interventions in a 7-15 years' timeframe and is related to the project cycle phase of operation and maintenance.

### SHORT-TERM OUTCOME

The Global Future Cities Programme short-term outcomes will be a result of the technical assistance and the capacity building implemented in Bursa for the development of the "City Smart Strategy" and the "Sustainable Urban Transformation Approach" interventions.

Bursa's policies, strategies and plans should integrate the cross-cutting approach for gender and social inclusion. Additionally, the integration of citizen participation in decision making processes will be addressed by the different phases of the urban renewal intervention and the Smart City Strategy.

The Smart City Strategy will improve governance and integrated management within the different entities of Bursa Metropolitan Municipality and increase communication and collaboration with the National Government, especially the Ministry of Environment and Urbanism (MEU), which is currently preparing the national Smart City Strategy and will prepare the National Spatial Strategic Plan. For the urban renewal plan development, the communication and cooperation with Osmangazi District Municipality will be strengthened.

Data collection for transport and other relevant areas of urban management can increase the municipal capacity for evaluating and monitoring the future impact of urban plans, policies and strategies while increasing their abilities and tools to improve decision making processes. The integration of plans and frameworks to promote more sustainable, resilient and socially inclusive cities is another expected outcome of the Programme in the short-term.

One of the main outputs of the urban renewal intervention is the development of sustainable financing models for urban renewal, that enable the city to finance provision of basic services, local infrastructure, and social housing. This intervention will increase Bursa's municipal capacity for addressing land ownership rights and socially inclusive urban transformations.

### MEDIUM-TERM OUTCOME

In the mid-term timeline of 3-7 years, the potential impact of the Programme will depend on the legal effectiveness of the policies and plans developed, and the successful construction of the Smart Strategy pilot project and urban renewal project. Of course, this depends on the implementation modalities used during the Global Future Cities Programme.

As a main outcome, Bursa will develop comprehensive urban renewal instruments that enhance linkages between spatial, economic and social development. Additionally, the effective implementation of the Urban Renewal Project in the Yalova Yolu area should provide more equitable and effective provision of urban services and affordable housing.

The promotion of public, public-private and civil society partnerships should be part of the outcomes for the successful implementation of the two interventions for Bursa.

A City Observatory will be set up as a monitoring tool within the Smart City Strategy intervention. This will enhance citizen participation and provide open access information indicating the progress in implementation of project proposals and improvements in the city.

The Smart City Strategy will also increase the municipal capacity for urban management, especially in transport issues. The development and implementation of a project in the field of transportation, aims for increasing the efficiency of the transportation system, and mobility and accessibility for poor women and men and other marginalised groups. Additionally, it should have positive impacts for reducing traffic congestion in the city and air pollutant emissions.

### LONG-TERM POTENTIAL IMPACT

In the long-term, it is expected that the municipality will strengthen its capacities for planning, mobility, and managing sustainable and inclusive urban transformation. This should increase the quality of life, including the promotion of economic equality and poverty reduction in the city of Bursa.

Bursa should increasingly count with integrated plans, frameworks and approaches to promote more sustainable, resilient, and socially inclusive city, that are better managed by using smart technologies. The improved transport management has also a potential for increasing ability to access employment and services, particularly for women and lower income groups.

Finally, citizen engagement and gender representation in plan development and decision-making processes should be increased as a result of the Programme in the long term. Furthermore, better governance and integrated management of cities, including better coordination and cooperation between different entities, can potentially be achieved and improved in the long-term.

# Contribution to Sustainable Urban Development

### 2030 SUSTAINABLE DEVELOPMENT GOALS

The Global Future Cities Programme aims to contribute to the implementation of the 2030 Agenda for Sustainable Development, whilst mobilizing efforts to end all forms of poverty, fighting inequalities and tackling climate change, while ensuring that no one is left behind.


### AFFORDABLE AND ACCESSIBLE TRANSPORT SYSTEMS

The GFCP interventions in Bursa can broadly contribute to achieving SDG 11 as they provide safe, affordable, accessible and sustainable transport systems and urban services for all, particularly for women and children, older persons and persons with disabilities, by improving public transport and urban management. Additionally, the Programme will contribute to enhancing inclusive and sustainable urbanisation and capacity for participatory, integrated and sustainable human settlement planning and management.


### ACCESS TO HOUSING AND BASIC SERVICES

Furthermore, the urban renewal intervention can directly contribute to ensure access for all to adequate, safe and affordable housing and basic services (SDG 11.1) and considerably increase the access to safe, inclusive and accessible, green and public spaces (SDG 11.7). The plan will take into account the social inclusion of the existing community and give women equal rights to ownership and control over land (SDG 5.a).




### ENSURING EQUAL OPPORTUNITIES

The revision of existing regulatory frameworks for urban renewal will take into account the promotion of appropriate legislation, policies and actions to ensure equal opportunity and reduce inequalities of outcome (SDG 10.3).


### INCREASED ACCESS TO JOBS

In a complementary way, the Smart City Strategy for Bursa will emphasize the promotion of gender equality and the empowerment of women and girls (SDG 5.c) and leverage smart technologies to promote development-oriented policies that support productive activities, decent job creation, entrepreneurship, creativity and innovation, and encourage the formalisation and growth of micro-, small- and medium-sized enterprises, including through access to financial services (SDG 8.3).


### RESILIENT INFRASTRUCTURE

Better transport management will reduce air pollution and a more coordinated urban management approach can increase the resilience capacity of the city through the integration of climate change measures into national policies, strategies and planning (SDG 13.2). The Smart City Strategy will be focused on equitable and affordable access to quality, reliable, sustainable and resilient infrastructure to support economic development and human well-being (SDG 9.1).


### PARTICIPATORY DECISION-MAKING PROCESS

The collection of high-quality, timely and reliable disaggregated data is part of the expected outcomes of the intervention (SDG 17.18) as well as tools to contribute in the development of effective, accountable and transparent institutions at all levels (SDG 16.6).

Ensure responsive, inclusive, participatory and representative decision-making at all levels (SDG 16.7) will be addressed on both interventions.

Finally, the Programme is aligned with the SDG 17 in the short term as it will contribute to enhance the Global Partnership for Sustainable Development, complemented by multi-stakeholder partnerships that mobilize and share knowledge, expertise, technology and financial resources, to support the achievement of the Sustainable Development Goals in all countries (SDG 17.16).

### NEW URBAN AGENDA ALIGNMENT

At the United Nations Conference on Housing and Sustainable Urban Development (Habitat III) in Quito, Ecuador 2016, the New Urban Agenda (NUA) was adopted. This Agenda details how cities should be planned and managed to achieve sustainable urbanization. The New Urban Agenda encourages UN-Habitat, Member states, local authorities, and others to collaboratively generate **evidence-based** and **practical** guidance for implementing the urban dimension of the SDGs.

UN-Habitat's draft Action Framework for Implementation of the New Urban Agenda (AFINUA) is organized under five categories: (1) national urban policies; (2) urban legislation, rules and regulations; (3) urban planning and design; (4) urban economy and municipal finance; and (5) local implementation. The GFC Programme interventions align to the AFINUA in the following ways:

Coordination and cooperation between different institutions and levels of government during the Global Future Cities Programme in Bursa promotes two AFINUA key items: the alignment between national and sectoral development plans and policies at all territorial levels (AFINUA key item 1.4), and jurisdictional coordination and coherence (AFINUA key item 1.6).

The Smart City Strategy will develop tools to set up a planning and design process that is evidence based, integrated and participatory (AFINUA key 3.1) while liaise between citizens and government (AFINUA key item 5.6) and help local authorities to design and implement systems that ensure social, economic and safe physical access to quality basic services by all (AFINUA key item 4.5).

The urban renewal intervention directly addresses the urban planning and design category as well as the local implementation. It will develop tools for urban regeneration (AFINUA key item 5.2) and define urban space structure for connected, liveable, and walkable spaces (AFINUA key items 3.3 and 3.5) while promoting adequate and affordable housing strategies (AFINUA

key item 3.7) and adequate amounts of urban space for a variety of economic activities (AFINUA key item 3.8) and sustainable density and mixed use to attain the economies of agglomeration (AFINUA key item 3.4).

The development of sustainable financing mechanisms for urban renewal will help local authorities to design and implement a more inclusive, sustainable, equitable local financial and economic framework (AFINUA key item 4.2) and take into account the control of urban land price speculation (AFINUA key item 5.3). The intervention should also analyse the development of equitable legal instruments to capture and share the increase in land and property value generated as a result of the urban development process, ensuring that these do not result in unsustainable land use and consumption (AFINUA key item 2.6)

The urban renewal plan will distinguish public space from urban land (AFINUA key item 2.2) and recognize and regulate urban development (AFINUA key item 2.4) especially including resilient building codes, standards, development permits, land use by-laws and ordinances, and planning regulations, combating and preventing speculation, displacement, homelessness and arbitrary forced evictions (AFINUA key item 2.7).

mobility plans, strategies and policies provide greater awareness, capability and confidence, while establish regulatory frameworks resulting in higher incentives for partnerships and financial mechanisms.

The Smart City Strategy and the sustainable and inclusive Urban Renewal Plan for Bursa are important tools for a better urban management and development of the city, and they will contribute as reform drivers for more efficient urban planning, transparent policy making processes and more resilient and inclusive cities.

The four Cross-Cutting Issues of UN-Habitat, as identified in the Strategic Plan 2014-2019, are mainstreamed to ensure that all UN-Habitat work targets those with the most need and promotes socially and environmentally sustainable cities[53]. In this regard, the interventions detailed for Ankara are shaped under the mainstreaming of environmental safeguards, youth, gender equality and Human Rights.

The Smart City Strategy will address disaggregated data collection with emphasis on gender, age, and socio-economic conditions in order to provide tools for informing and monitoring the municipal performance. This and the urban renewal intervention include a gender equality, youth and human rights perspective.

## ALIGNMENT WITH CROSS-CUTTING ISSUES AND THE PROSPERITY FUND

The GFCP seeks to achieve higher rates of sustainable and inclusive growth while increasing long-term investments in sustainable urban projects. Urban transformation and

*Fig. 14. Bursa Night View (Source: Bursa Metropolitan Municipality)*



| Potential Benefit | Short term | Medium Term | Long term | SDG Alignment | | New Urban Agenda | Programme Objectives and Cross-cutting issues |
|---|---|---|---|---|---|---|---|
| | | | | GOALS | TARGETS | AFINUA KEY ITEM | 1. Climate change; 2. Gender equality; 3. Human Rights; 4. Youth; 5. Sustainable and inclusive economic growth |
| Better Governance & Integrated Management of cities including better coordination and cooperation between different levels of government. | | | | 17 | 17.14, 17.15 | 1.4, 1.6 | Climate change; Human Rights; Sustainable and inclusive economic growth |
| Increased local capacity for evaluating and monitoring the impact of urban plans, policies, and strategies. | | | | 17 | 17.16, 17.18 | 3.1 | Climate change; Gender equality; Human Rights; Youth |
| Increased capacity to prioritize strategies and improved tools for decision making based on informed demographic, economic, cultural, environmental and other holistic projections. | | | | 11, 17 | 11.a, 17.18 | 3.1 | Climate change; Gender equality; Human Rights; Youth; Sustainable and inclusive economic growth |
| Encouraged and/or promoted effective public, public-private and civil society partnerships | | | | 17 | 17.17 | 5.6 | Sustainable and inclusive economic growth |
| Sustainable financing models for urban renewal developed, that enable the city to finance provision of basic services, local infrastructure, and social housing. | | | | 11, 16 | 11.1, 16.6 | 4.2, 5.3 | Gender equality; Human Rights; Youth; Sustainable and inclusive economic growth |
| Better capacity of local governments for ensuring land ownership rights and addressing socially inclusive urban transformations. | | | | 5, 11 | 5.a, 11.1 | 2.7, 5.2 | Gender equality; Human Rights |
| Increased citizen participation in developing municipal plans and decision making processes. | | | | 11, 16 | 11.3, 16.7 | 3.1, 4.5, 5.6 | Gender equality; Human Rights; Youth |
| Integrated gender equality approach in policies, strategies and plans. | | | | 5 | 5.c | 3.1, 5.6 | Gender equality |
| Integrated plans, frameworks and approaches to promote more sustainable, resilient, and socially inclusive cities | | | | 11, 16 | 11.3, 11.b, 16.7 | 2.2, 2,6, 2.7, 3.7, 4.5, 5.2, 5.3 | Climate change; Gender equality; Human Rights; Youth |
| Comprehensive urban renewal instruments adopted, that enhance linkages between the spatial, economic and social development. | | | | 5, 10, 11 | 10.3, 11.1, 11.3, 5.a | 2.4, 2,6, 2.7, 3.4, 3.5, 3.7, 3.8, 5.2, 5.3 | Climate change; Human Rights; Sustainable and inclusive economic growth |
| More equitable and effective provision of urban services and affordable housing. | | | | 11 | 11.1 | 2.7, 3.7, 4.5 | Gender equality; Human Rights; Youth; Sustainable and inclusive economic growth |
| Increased efficiency of the transportation system, and mobility and accessibility for poor women and men and other marginalised groups. | | | | 9 | 9.1 | 3.3, 4.5, 5.3 | Gender equality; Human Rights; Youth; Sustainable and inclusive economic growth |
| Reduction in traffic congestion and in air pollutant emissions | | | | 13 | 13.2 | 3.5, 5.3 | Climate change |
| Increased ability to access employment and services, particularly for women and lower income groups | | | | 8 | 8.3 | 3.4, 3.8, 4.5 | Gender equality; Human Rights; Youth; Sustainable and inclusive economic growth |
| Increased quality of life, including the promotion of economic equality and poverty reduction. | | | | 1 | 1.2 | 3.5, 4.2, 4.5 | Gender equality; Human Rights; Youth; Sustainable and inclusive economic growth |

*Fig. 15. Potential Impact and Programme Objectives Alignment*

# Success Factors

The following statements are considered as evidenced success factors, based on international best practices, that should be considered for the two interventions in Bursa in order to achieve the maximum impact on the SDGs and the Programme Objectives, as well as to ensure the whole project-cycle sustainability.

## SPATIAL CONSIDERATIONS

### Coordinated, Realistic and Context-Relevant Urban Plans

The Urban Renewal Plan for Bursa should be credible, realistic, well-coordinated in order to succeed and be implementable. The plan should be realistic given the existing city land use, administrative and political constraints such as budgets for public investments, and realistic forecasts for urban population growth and population income levels. Additionally, it should consider the coordination between other strategic urban plans (e.g. transport)

### Mixed Land uses

Social and public infrastructure will need to be properly balanced with the need to create the right commercial environment to attract private participation and maximise economic benefits. Creating an optimal mix of uses requires project designers to consider a number of key elements. In this regard, the Urban Renewal Plan for Bursa can take the following into account:

- Need to maximise revenue: creating a use mix that creates sufficient financial return to cover necessary public contributions while creating an environment that stimulates demand.
- Integration with the local environment: mixed uses can help to define the character of surrounding amenities and act as a catalyst for urban renewal objectives in surrounding areas.
- Housing requirement and affordability: balancing the residential use mix between current and future demand requires a focus on various housing, including units, houses and affordable housing, to target a variety of potential users.
- Employment and retail: access to employment and retail is key to sustaining major renewal areas. However, oversupply can saturate the market or reduce the competitiveness of surrounding areas.
- Public spaces, amenities and facilities: this mix should include open spaces such as streets, parks and recreational areas, public facilities from medical centers and schools to community and youth centers, cultural centers and historic sites, and is critical to creating a livable and enjoyable environment.
- 24-hour activation: uses can be optimized to create activation of the site beyond the traditional two-hour rush in the mornings and evenings.
- Cohesion and social mix: use mix can provide effects on the wider urban area and contribute to the city's broader social mix.

### Adequate Space for Streets and an Efficient Street Network

The urban renewal Plan should define an adequate level of street network that not only works for vehicles and public transport but also specifically aims to attract pedestrians and cyclists.

*Fig. 16. Participatory and Inclusive Land Readjustment (PILaR) in Medellin (Source: UN-Habitat)*



It will include a street hierarchy with arterial routes and local streets based on traffic speed differences. The street network will also shape the urban structure which, in turn, sets the pattern of development blocks, streets, buildings, open spaces and landscape.

### Promoting Walkability

The spatial designs for the urban renewal intervention should promote walkability as a key measure to bring people into the public space, reduce congestion and boost the local economy and interactions. A vibrant street life encourages people to walk or cycle around, while a rational street network enables necessary city administrative services to be offered within walking or cycling distance and ensures security. High density, mixed land uses and a mix of socio-economic characteristics make proximity to work, home and services possible. Walkability helps to reduce automobile reliance and thus alleviate relevant congestion, air pollution and resource depletion issues. It is healthier to "walk more and drive less!" Pedestrians add an incredible amount of vibrancy to city life.

### Social Mix

UN-Habitat recommends that *"the availability of houses in different price ranges and tenure types in any given neighbourhood to accommodate different incomes; 20 to 50 per cent of the residential floor area is distributed to low cost housing, and each tenure type should be no more than 50 per cent of the total."* [54]

The urban renewal intervention for Bursa should promote the cohesion of and interaction between different social classes in the same community and to ensure accessibility to equitable urban opportunities by providing different types of housing. Mixed land-use and appropriate policy guidance lead to social mixing. In a mixed land-use neighbourhood, job opportunities are generated for residents from different backgrounds and with different income levels. People live and work in the same neighbourhood and form a diverse social network.

### Establish Planning Needs and Identify the Associated Data Requirements

A clear definition of planning problems will facilitate the scoping of the intervention and inform future data collection efforts. Identify datasets that correspond to planning activities and objectives. Datasets relevant for planning may include land-use data[55], disaggregated data on population characteristics, cadastral data[56], and physical geography data. The Australian Transport Assessment and Planning example provides a framework for urban planning problem identification.

### Build Capacity for Data Systems Management for Urban and Transport Planning

It is important to develop human capacities and quantitative skills within planning profession to match investments into data technology. Data based methods are often considered as part of an isolated branch within the transport or planning profession. However, the fundamental problems of transport and planning have not changed with the advance of big data.

It is crucial to develop human capacities and quantitative skills in the planning profession in parallel with investments into data technology. This ensures that the information encapsulated in expensive datasets can be turned into actual benefits for users and operators.

Capacity building efforts for the Smart City Strategy in Bursa may include training workshops, partnerships with academic institutions or the private sector, and hiring of new personnel. Necessary skills may include geospatial analysis, computer programming, statistics, and database management. The Rio Operations Center is an example of how partnership with a technology company can build local capacity for embedding a large-scale data system in a city.

### Information is One of the Key Enablers of Efficient Individual Travel Decisions

The transport system of large metropolitan areas offers a wide variety of travel options for daily commuting as well as ad hoc business trips. This is especially the case in Istanbul where several types of transport operate in the city.

Reliable information available for commuters can significantly improve the efficiency of individual travel decisions and consequently the transport system as a whole. Additionally, real-time travel information can reduce uncertainty in large transport networks facing challenges in service reliability.

The inclusion of strategies and tools for collecting, managing and providing open data to transport users and planners is recommended. Such interventions create value for society through the reduction in the perceived user costs of urban mobility and evidence-based information for decision making in the transport planning exercise.

### Develop a Strategy for Digital Inclusion

Citizens who lack access to digital services may be excluded from planning processes and are put at a disadvantage when it comes to accessing the city and its services. Research on the "digital divide" indicates

that individuals who lack basic digital skills, network connections, and usage opportunities may not be able to benefit from city services or information which are delivered through digital platforms, such as a municipality's open data portal. For instance, the Smart Cities for All initiative works towards building inclusive smart cities and promotes digital urban interventions that are accessible to elderly and disabled populations.[57]

**Ensure Representativeness in Datasets**

Where appropriate, data collection efforts should be evenly distributed across geographic and socioeconomic communities. Communities that are not represented in data may be excluded from policy and planning decisions, potentially exacerbating existing social divides.[58]

**Consider Balancing Authoritative Datasets with Information that Reflects Local Perspectives**

A focus solely on authoritative, government-generated data (such as that from Census surveys) may result in a top-down approach that disregards local perspectives. Information generated by citizens, or in direct consultation with citizens, should also be included in the planning process. While traditional methods of public consultation continue to play an important role in planning processes, planners are looking to incorporate newer types of public engagement, which are made possible through data systems and technology. For example, volunteered geographic information (VGI) and other crowdsourced data can be a valuable source of planning information that is sensitive to the local context (see Goodchild, 2007) and inexpensive to collect.

However, it may be difficult to assess the quality and accuracy of crowdsourced information as the identity, expertise, and motivation of a contributor often remains unknown. Platforms that incorporate VGI, such as OpenStreetMap, may in part rely on "Linus's Law" to ensure a satisfactory degree of data accuracy. This phenomenon indicates that inaccurate data will be flagged or corrected when there is a large enough crowd engaged in contributing content. The PetaBencana.id example also exemplifies how crowdsourced data can be used to monitor flood conditions in real time.[59]

## FINANCIAL CONSIDERATIONS

**Strengthen Municipal Capacity for Land Value Capture and Financing Mechanisms**

The implementation of urban renewal projects and transportation investments can increase land values. Therefore, having land value capture instruments in place will be key. Evidence shows that transport investments can raise land values in surrounding areas; for example, estimates from Bogota indicate a 15-20% increase in nearby land values in response to BRT extensions.

Land value capture is an efficient instrument as land is in fixed supply and therefore taxing it should not have adverse effects on investments. Land value capture instruments include aspects like development fees charged to nearby landowners to fund the infrastructure or tax increment financing to enable property taxes to recoup revenues from increasing property values. Ensuring financing mechanisms are in place is also important to ensure long run sustainability of the system.

The city of Bursa may want to also consider some more indirect value capture instruments, such as impact fees or exaction, as the regenerated land will need to be serviced particularly to attract firms to what was once purely a residential area. The intervention should take into account the following challenges related with this type of instruments:

- Institutions: Requires strong land institutions vibrant construction/real estate markets
- Assessment: How do you understand the costs upfront, particularly if the development is fully new
- Incentive: If fees are too high then may be disincentive private sector from investing
- Resistance: negotiations with private sector
- Equity: Broader goals of public provision

**Alternative Funding Streams**

The private sector can also be engaged in urban regeneration and transformation projects. However, if private sector capital is used to finance these projects, the city needs to ensure that there is a sufficient funding stream.

Outside value capture, other funding streams could include user fees, repurposing of properties or making the private property owners, to pay for the renewal themselves. Where there are underutilised properties, such as the ones that were previous government buildings, these could be repurposed and used for commercial purposes (e.g. cafes or museums). This would result in revenue from renting out the buildings.

**Investments on Data Collection Can Effect Positively the Long-Term Economy of the City**

In order to implement any strategy, to raise sufficient finance or to make timely decisions, cities require data. Data can be costly to collect on a regular basis. However, in setting up data systems, it will not only have benefits for the city, but is in an investment into a collective good with spill over effects to other parts of the economy. Data for transport management can improve efficiencies and thus lead to cost savings and potential revenue increases across the system in the long-term.

**Incentivize Private Investment**

Even with an inspiring vision, optimal design and an efficient delivery mechanism, the success of urban renewal projects often rests in the ability of government and private investors to incentivize private and community participation and support.

Governments have a critical role in creating the right mix of incentives to encourage urban renewal. Setting a clear policy framework is critical in providing developers and the community with sufficient certainty to invest in renewal concepts. This is key for the financial viability and the capacity to generate income at a required rate of return.

Incentives can take multiple forms and are usually best combined to create a more benign investment environment. Common incentives often include:

- Zoning and planning changes: Increases in density allow developers to spread land costs across a larger sellable area, while rezoning of individual parcels of land offers increased certainty to developers considering underwriting new projects.
- Infrastructure delivery: indications of public infrastructure investments in plans is often unconvincing, as it is often unrealistic or too ambitious; greater certainty can be achieved by moving public infrastructure projects into the delivery stage.
- Taxation: tax in its various forms always creates incentives and disincentives for private developers.
- Minimize risking: governments can materially assist in containing the risk associated to renewal projects by purchasing or leasing the development product, potentially reducing equity and debt borrowing risks for developers.
- Streamlined approval processes: in assessing the timing risk on potential projects, developers often look for tangible evidence of streamlined approval processes that can provide greater certainty that approvals will be assessed and granted in a transparent and coordinated way.

**Accompanying Transport Plans with A Realistic Financing and Funding Strategy for Anticipated Investments, Programmes and Projects**

Public transport is an economic system, that, if well integrated, can provide larger efficiency gains and other benefits than if each system operates individually. Improvements in connectivity in a city is one of the main ways that urbanisation can support economic growth in the long run.

Consistently one of the major barriers to implementation of transportation plans is that they include financially unsustainable projects. The aforementioned cost-benefit analyses of each of the individual investments should be used to help decide what to include in the plan.

Financing large-scale transport investments will require a mix of sources and will most likely involve borrowing, either at a national or international level. This is particularly the case at the initial capital investment phases of infrastructure investments. However, where borrowing is involved, a clear funding stream should be determined from the outset, to ensure that the city can pay back the loan. Linking land-use planning to transport policy also enables cities to recoup investments in transport through land-value capture.

Administratively, given land is immovable and many of the characteristics of valuation are observable, it is relatively easier to tax than other more mobile factors. Furthermore, given that the investments that will be made as a result of the integrated multimodal public transport plan will likely be done by governments, it is fair that the rise in land values that arise as a result should not accrue to private individuals.

**Reusing (Recycling) Transport Data for Multiple Purposes**

Using transport data efficiently does not necessarily require investments in data collection, as data is constantly generated in various parts of the technological process of travelling.

For example, the original purpose of smart card systems in public transport was to improve customer experience, but as a side product, operators can extract useful information from the digital footprint of e-ticket use. Data owners should have the ability to find all areas within transport planning and operational processes where new data sources can be re-used successfully. At some point this success factor meets the requirement of interoperability: the beneficiary of reusing available data sources can often be other service providers, or other institutions within the same industry.

On the other hand, data collection can be shaped by planning objectives. To avoid duplicating datasets and wasting data collection resources, searching for existing relevant datasets that may have been collected by other organisations and explore partnerships with other

institutions is recommended. Urban data centres in the Netherlands, for example, are supported through a partnership with the national statistics institution (CBS) to gain access to a wide range of existing datasets.

## LEGAL CONSIDERATIONS

### Engaging Community and Stakeholder Support

The transformation of urban space directly affects the future of communities and all individuals within it, so engaging the relevant stakeholders and keeping them on-side throughout the duration of the development process is crucial.

Some stakeholders have a direct role to play in the legal and planning processes. Others are *interested observers* whose opinions are relevant and, if not supportive, can have adverse effects on the overall level of community and social support for a project.

Considerable opposition during the development life-cycle can be prevented by avoiding perceived insensitivities and distorted perceptions. Communities should feel that their desires and aspirations are put at the same level of consideration as the one of "big business" and investors. Residents and local business should not rest assured that the project will not harm them with higher cost of living and new competition.

From the creation of the project vision through to the operations and life-cycle management of the development, stakeholders need to be kept informed, involved and supportive of the project and its overall direction. A long-term, comprehensive vision designed to allow for public participation should be the base for this.

### Adequate Compensation within Compulsory Land Acquisition

Land acquisition by governments is sometimes necessary for increasing resilience and safer environments or improving land use efficiency, through vital infrastructure projects or placement of large job-creating industries. Where possible this should be facilitated through voluntary market exchange, but compulsory land acquisition is also justified if adequate compensation is given to those displaced.

Urban renewal Plan should consider the necessary strategies for the inclusion of affected residents in nearby areas when compulsory land acquisition happens. If this option is not viable adequate compensation mechanisms that ensure social integration and provision of livelihoods for displaced communities are needed.

Adequate compensation includes payment of the market value of land (before redevelopment projects are announced) as well as an amount to cover the loss of social networks and disruption of livelihoods due to relocation.

Investment in legal and administrative capacity to run a smooth appeals process is also necessary to limit social unrest and ensure land ownership rights are observed. Relocation areas should be well connected to avoid socio-economic exclusion and incentivising informal settlement.

### Alternatives to Forced Eviction and Forced Eviction Due Process

Especially when urban renewal programmes involve informal areas, eviction may become justified and unavoidable. In that case, it is important to assure that evictions carried out do not violate the human rights of affected persons and groups. All potential risks should be taken into account when evaluating the impact of such an action, in terms of costs and damages that could occur as a result of an eviction or displacement.[60]

Consultations with the affected individuals, households and communities must be held to ensure that their needs are taken into account. It is also important to consider alternative solutions prior to necessitating a displacement.

### Integration Across all Relevant Government Institutions

Multiple levels of government have different authorities over various parts of transport planning and other relevant areas of urban management. This often creates overlaps in jurisdiction and unclear mandates, making it difficult to coordinate. This can be one of the major challenges for designing and implementing the Smart City Strategy. Thus, effective coordination mechanisms, such as joint planning authorities, need to be set up.

### Leverage Data Systems and Civic Technologies for Public Engagement

Data systems and digital technology create the opportunity for new approaches to public engagement in urban planning. For example, online apps and tools can facilitate two-way communication between citizens and the municipal government and raise awareness on local urban development plans. Crowdsourcing and the collection of VGI also allows citizens to share their local knowledge. Citizen Budget, for example, is an online tool developed by the non-profit organization Open North, that can be deployed in cities to solicit feedback from citizens on municipal budgets.[61]



### Build and Formalize Practices for Integrating Data Analysisinto Decision-Making Processes

Consider how the information obtained from data analysis will inform and support urban planning decision-making. Data systems may be applied to measure the impact of previous plans and policies, which can inform the making of an urban planning. Qualitative information may also be integrated into these practices.[62]

### Create Policies and Protocols for Data Sharing

The Bursa Smart City Strategy will involve coordination and data sharing between government departments. It is important that policies and protocols for data sharing are in place. These policies must comply with relevant data protection and privacy laws. Such policies can, for example, cover privacy and security considerations and outline clear responsibilities for data ownership. The development of protocols and policies for data sharing can be an opportunity to adopt data standards, and create protocols for data quality monitoring.

The INSPIRE Directive, for example, enables environmental data sharing through out the EU by outlining a set of data standards across 34 spatial data themes. This cross-boundary data sharing initiative has assisted in environmental policy-making efforts by making data more accessible. Indonesia's One Map policy also illustrates how the centralized management of geospatial data at a national level can resolve issues such as overlapping land claims.[63]

### Adopt Data Standards to Promote Usability and Interoperability of Datasets

The adoption of data standards can promote interoperability of datasets, allowing for data from a variety of sources to be combined and compared. The adoption of standards can also facilitate data sharing between departments and institutions. Types of data standards may include those that govern metadata, specification of character formats, predefined vocabularies, and file formats (Sieber and Bloom, 2018). Standardised data can also be used by software developers to create apps.

For example, the adoption of GTFS (general transit feed specification) by many transit operators around the world has led to the creation of transit apps (such as the Transit App) that combine multiple sources of transit schedules around the world. Open511 and GTFS are examples of existing data standards for road event data and transit data, respectively. Moreover, the Open Data Standards Directory provides detailed information on existing data standards for data from categories such as crime, expenses, and election results.[64]

### Practice effective data custodianship

Data custodians should be appointed in a given government unit or department as those responsible for managing datasets throughout all phases of the data lifecycle. This includes activities such as creating, maintaining, and enforcing data standards, and ensuring the availability and quality of datasets. Best practices in data management should be formalized through policies and guidelines. Such policies and guidelines may include topics such as data security procedures, data access, and appropriate disposal of data. To ensure accountability, each dataset should have one (and only one) data custodian. For example, the province of British Columbia, in Canada, publishes data custodian guidelines.[65]

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25 This is a fee that reflects the increase in land value as a result of the investments made by the city government. This is levied just once following the completion of the investments.

26 This is a required contribution by the private sector to cover the cost of additional infrastructure and public services as a result of a development. Impact fee includes all costs necessary to ultimately service the developed piece of land, is be paid to the city upfront in conjunction with issuing the development rights to the land. Extraction fee is when the developer receives the rights to develop a piece of land but has to also include the infrastructure that will be necessary to service that land.

27 The city can use the title no.18 in act no. 3194 to undertake land readjustment schemes.

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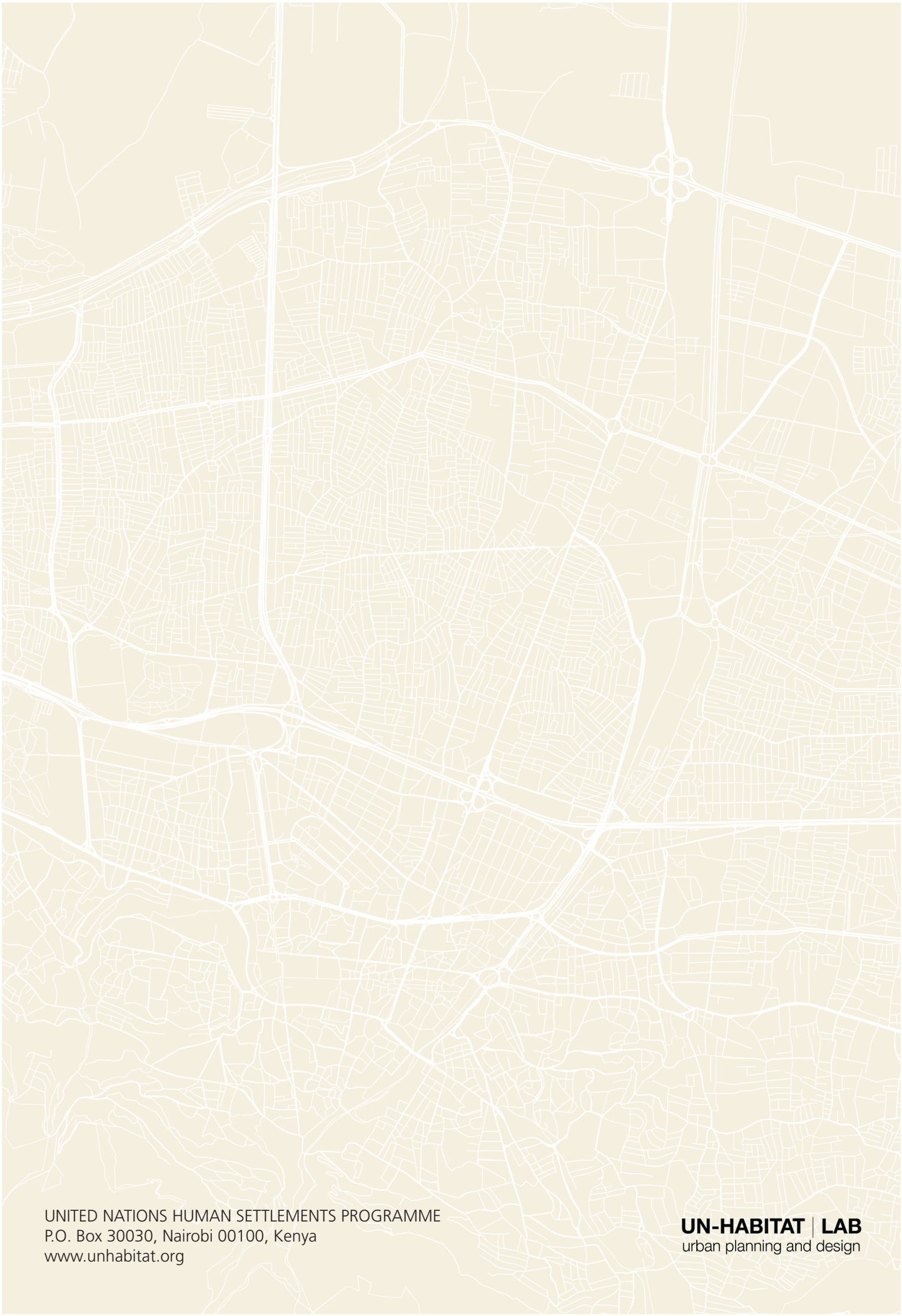

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