

## Istanbul Sustainable Urban Mobility Plan SUMP



**Global Future Cities Programme Turkey** 



**UN@HABITAT** 







DEPARTMENT of TRANSPORTATION DIRECTORATE of TRANSPORTATION ARUP PLANNING

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This report has been prepared specifically for Istanbul Metropolitan Municipality (IMM) in order to be a guide document for the implementation phase of the Istanbul Sustainable Urban Mobility Plan (SUMP).

The financial recommendations/analyses in this report are based on the available information, examples, acceptances and interpretations at the preparation time of the report, and the necessity of detailed financial feasibility studies may arise in the process of transforming projects into investments.

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### We shape a better world. ARUP

### Foreword



#### Dear Istanbulite.

Throughout its long history, Istanbul has always been an important world centre, including in terms of economy and population density as well as its history and culture. Since taking office, we have adopted a holistic, next-generation, municipal management approach to achieve our vision for the city's future and to implement our municipal management strategy. We are committed to a participatory decisionmaking process to ensure not only that we solve Istanbul's current problems, but also that we take into account its global role.

Therefore, in line with the 2020-2024 Strategic Plan of Istanbul Metropolitan Municipality, which we developed with a unique participatory approach, we have prepared the first Sustainable Urban Mobility Plan in Turkey to achieve our dream of a 'Fair. Creative and Green Istanbul'.

The Sustainable Urban Mobility Plan for Istanbul has been created by Arup (one of the world's leading engineering, design and consulting companies), UN Habitat and Istanbul Metropolitan Municipality's Transportation Department, Transport Planning Directorate under the Global Future Cities Programme in Turkey, supported by the UK's Foreign, Commonwealth and Development Office.

A SUMP should improve the quality of life of city residents, reduce private car use and motivate residents to use environment-friendly transportation systems/modes of transport, and it should include all stakeholders in the planning process. As announced in November 2021, the main objectives of the SUMP for Istanbul include; decarbonising the transportation system to support Istanbul's target to become a carbon neutral and climate resilient city by 2050, in line with the Istanbul Climate Vision; a better integration of public transport within the city and with other modes of transport; and reducing dependency on private cars and traffic congestion.

Accordingly, we have developed projects to decarbonise the Metrobus/BRT and IETT bus fleets. We will be creating low emission zones in the city's central districts to reduce car use, carbon emissions and air pollution. We are proposing projects for parking management and to increase the share of pedestrian and cycling modes.

I would like to thank everyone who worked for and contributed to the development of the Sustainable Urban Mobility Plan for Istanbul, which has brought a new perspective to the city's urban transportation planning

#### Ekrem İmamoğlu

Mayor of Istanbul Metropolitan Municipality

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# **Abbreviations**

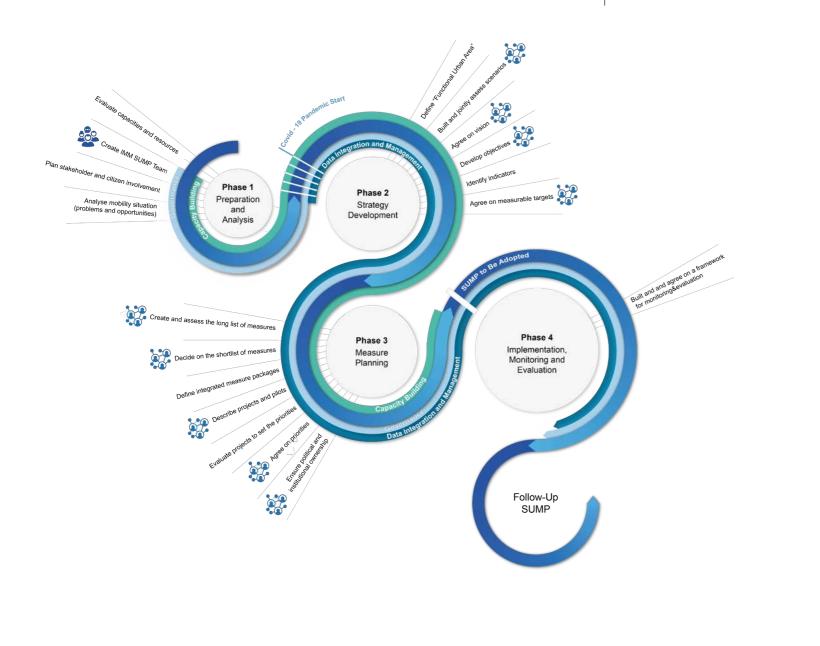
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BSIP         CCC         CD2         EU         EU         CD0         CD1         CD2         EU         CD2         CD3         CD4         CD5			BCR
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ELTIS         FCDO         GDP         GESI         GHG         INMCC         INMCC         ILTIS         ILTIS         ILTIS         INMCC         ILTIS			CO2
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IMM           INMCC           ITM           LEZ           LGBTI-           MCA           NGO           PM           SDG           SUMP           CO2           TurkSTAT           UK           UN			GHG
INMCC         ITM         LEZ         LGBTI+         MCA         NGO         PM         PT         SDG         SIA         SUMP         tCO2         TurkSTAT         UK			IETT
ITM           LEZ           LGBTI+           MCA           NGO           PM           SDG           SIA           SUMP           tCO2           TurkSTAT           UK			IMM
LEZ LGBT+ MCA MCA MGO MGO MI MO MO MO MO MO MO MO MO MO MO			INMCC
LGBTI+ MCA NGO PM PT SDG SDG SDG SIA SUMP tCO2 TurkSTAT UK			ITM
МСА NGO РМ РТ SDG SDG SIA SUMP tCO2 TurkSTAT UK			LEZ
NGO PM PT SDG SDG SIA SUMP tCO2 TurkSTAT UK			LGBTI+
РМ РТ SDG SIA SUMP tCO2 TurkSTAT UK UN			MCA
PT         SDG         SIA         SUMP         tCO2         TurkSTAT         UK         UN			NGO
SDG SIA SUMP tCO2 TurkSTAT UK UN			PM
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Business-as-Usual
Benefit-Cost Ratio
Bus Rapid Transit
Bus Service Improvement Programme
Construction Materials Concentration Centre
Carbon Dioxide
European Union
Urban Mobility Observatory
Foreign Commonwealth and Development Office
Gross Domestic Product
Gender Equality and Social Inclusion
Green House Gases
Istanbul Electric Tram and Tunnel
Istanbul Metropolitan Municipality
Istanbul Network Management Control Centre
Istanbul Transportation Model
Low Emission Zone
Lesbian, Gay, Bisexual, Transgender and Intersex
Multi Criteria Analysis
Non-Governmental Organisation
Particulate Matter
Public Transport
Sustainable Development Goals
Social Inclusion Assessment
Sustainable Urban Mobility Plan
Ton Carbon Dioxide
Turkish Statistical Institute
Turkish Statistical Institute United Kingdom

### **Executive Summary**

This report presents the studies completed for the Istanbul Sustainable Urban Mobility Plan (SUMP). The SUMP concept was developed by the European Union (EU) at the beginning of the 2010s, when it became evident that conventional transport planning did not provide effective solutions and tools to address the complex mobility issues faced by modern cities. Transport planning has a long history in Istanbul and Turkey. Conventional transportation master plans have focused primarily on increasing the capacity for trips by developing significant infrastructure projects. However, the Istanbul SUMP opens a new chapter in the city's transport development by placing people, accessibility and public engagement at the centre of the planning process, with the aim of improving quality of life for all. The Istanbul SUMP process was prepared in line with the EU requirements and is shown in the figure below



follow:

- governance and other sectoral relationships.
- were defined to measure the SUMP objectives.
- quantitative and qualitative appraisals.
- of the proposed SUMP projects.

In addition to these steps, a governance structure was developed to define the basic principles and framework for the planning and implementation of the Istanbul SUMP. Throughout the development of the Istanbul SUMP, a capacity building programme was developed, based around the needs of IMM. A training programme and a variety of workshops captured the basic theoretical and practical aspects of the SUMP. Finally, a specific study on data management and integration was undertaken.

The Istanbul SUMP is the first SUMP in Turkey and a global first in a mega city with a population of 16 million. The core objective of this new planning approach is to put citizens at the centre of planning processes and to encourage the use of sustainable transport, such as public transport, walking and cycling. The plan also focuses on reducing car dependency and the adverse effects of carbon emissions, air and noise pollution, and accidents.

The Istanbul SUMP also aims to enable citizens and stakeholders to be part of the planning and implementation process and to meet everyone's mobility needs, particularly those of underrepresented groups. Despite the limitations created by the Covid-19 pandemic, 134 out of 255 stakeholders identified for the Istanbul SUMP were reached through surveys, workshops and focus group meetings held in 24 separate online sessions in 4 stages, and their active participation was ensured throughout the SUMP study.

The steps of the planning and implementation cycle of the Istanbul SUMP are outlined as

• Preparation and analysis: Institutional resources and the local planning context were assessed. An interdepartmental SUMP team within the Istanbul Metropolitan Municipality (IMM) was established to promote collaboration and create ownership of the SUMP. An extensive stakeholder participation and engagement strategy was undertaken, and a social inclusion analysis was carried out to develop a definition of underrepresented groups. Furthermore, the current situation in Istanbul was analysed in terms of demographics, employment, economy, climate change,

• Strategy development: The functional urban area of the Istanbul SUMP was defined. Scenarios, vision and objectives were developed with the engagement of the IMM SUMP Team as well as other relevant stakeholders. A series of indicators

• Measure planning: A longlist of measures was prepared, including contributions of the IMM SUMP Team and other stakeholders to ensure that social inclusion and gender equality were considered. This step was followed by shortlisting all proposed policies into measure packages. The Istanbul SUMP projects were chosen by considering international best practice, professional experience, the pipeline projects of IMM and action suggestions made by stakeholders during workshops. The selected projects were prioritised, based on a combination of

• Implementation, monitoring and evaluation: A systematic monitoring and evaluation framework was developed to track the success of the implementation

### **Current Situation, Trends and Projections**

In the context of Istanbul SUMP, the current state of mobility in the city was assessed based on in the context of different factors. Projections for each of these factors were made to 2040 and are summarised below.

- Population, Employment and Economy: According to the future projections based on the Business as Usual (BaU) scenario, which is the reference scenario, the population of the city will increase to 18.9 million and employment will increase to 6.6 million by 2040.
- Travel Demand and Modal Split: The strategic transport model, Istanbul Transportation Model (ITM), was used to predict the future travel demand. It estimated that daily trips will increase to 38.1 million and the daily public transportation trips will increase to 11.1 million by 2040. Moreover, by 2040 the share of trips being made on the rail network in the peak hour is estimated to increase from 24.6% to 47.2%.
- Car Ownership and Traffic Congestion: Car ownership in Istanbul was 191 cars per 1,000 persons in 2020. It is estimated that car ownership will increase by 39% between by 2040 and, if effective policy measures are not implemented to curb car use, traffic congestion problems will persist. Alternatively, the implementation of the Istanbul SUMP projects is estimated to reduce the car/kilometres travelled in the peak hour by 12.8% by 2040 compared to 2020.
- Active Modes and Micro-Mobility: Active modes of transport (walking and cycling) play an important role in reducing the environmental impact of transport and contribute to a healthier way of life. Although the share of trips made on foot is high (40,5%), Istanbul cannot be characterised as a 'walkable city'. It is clear that a more systematic and comprehensive approach is needed for walking and cycling in Istanbul. Even though alternative micro-mobility options like e-bikes and e-scooters are not regarded as active mobility, they are becoming more popular. The Istanbul SUMP includes proposals related to these modes.
- Climate Crisis, Air Pollution and Road Safety: In Istanbul, in 2019 28% of GHG emissions resulted from the transportation sector. Apart from the impacts on climate change, motor vehicle traffic reduces air quality and produces noise pollution. The policies related to the decarbonisation of transport were developed to meet the challenges of the climate crisis. However, despite the improvements in recent years, road safety is a serious problem. Trucks not only increase carbon emissions and reduce air quality they are also an issue when it comes to road safety in the city. It is essential to find safe, environmentally friendly, cost effective and intelligent solutions especially for the supply chain and transportation of construction materials.
- •Governance: The governance structure strongly affects decisions on land use and transportation that determine mobility options in Istanbul. In this context, the negative effects caused by the strong decision-making power of central government as currently observed were highlighted and the importance of developing independent audit mechanisms for the improvement of existing structures was underlined.
- •Plans and Policy Documents: Other ongoing or completed plans and policy documents in Istanbul were assessed in accordance with the Istanbul SUMP. Moreover, regional and national plans were noted.

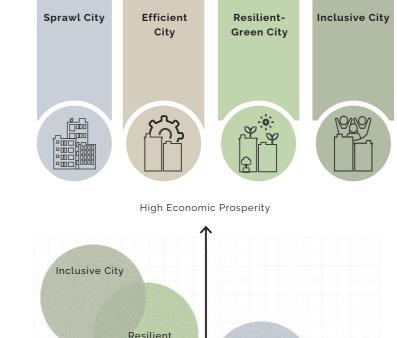
### Scenarios, Vision, Objectives and Projects

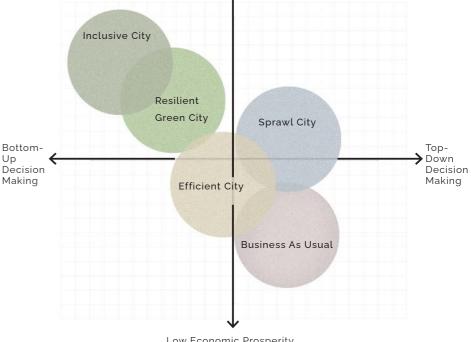
Urban planning considers uncertainties in a city's future. Two external factors were selected from a wide list of uncertainties to build future scenarios in the Istanbul SUMP:

• Economic prosperity: Low economic prosperity assumes that regional economic differences and the wealth gap between rich and poor will persist, and that a larger proportion of households will have lower incomes. High economic prosperity, on the other hand, corresponds to a more balanced regional distribution of economic wealth, a reduction in income gaps across the population and higher household incomes.

top-down structure.

The scenarios were differentiated by the level of economic prosperity and the decisionmaking structure as shown below.





BaU is today's situation, while the Sprawl City scenario assumes that economic prosperity will increase, but the governance structure implies that the dominant trends will be unplanned growth and lead to further urban sprawl.

• Governance: Bottom-up decision making is desired, as opposed to the current

Low Economic Prosperity

The Efficient City, Resilient-Green City and Inclusive City scenarios, foresee improvements in efficiency, resilience and inclusiveness. The main change to achieve these scenarios will be in travel behaviour. The Inclusive City scenario offers an opportunity for a transportation structure that increasingly meets the needs of different socio-economic and demographic groups.

The Istanbul SUMP is based on the vision of an urban future guided by objectives, strategic indicators and targets, and the selection of suitable measures. The vision and objectives were developed in collaboration with the stakeholders. **The Vision for the Istanbul SUMP** developed during this process is:

"An inclusive and innovative transport system, focusing on people and the environment, providing the right mix of safe, integrated, accessible and affordable mobility alternatives, compatible with the unique geography and historical values of Istanbul for a sustainable and resilient future."

The Istanbul SUMP vision is based on nine key objectives that must be achieved as the plan progresses. These are:

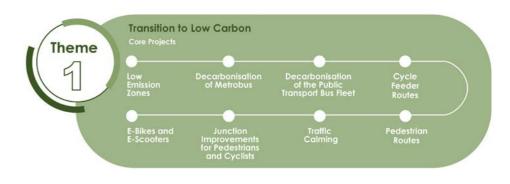


A set of critical indicators were developed for each objective to monitor its implementation. A baseline value for each indicator was defined, where possible, and targets were developed. A comprehensive plan of actions was developed to achieve the SUMP targets, objectives, and vision. This resulted in **26 core projects** based around three themes: **Transition to Low Carbon, Seamless Transfer and Integration,** and **Reducing Congestion.** Moreover, four cross-cutting themes, relevant to all core projects were also determined. These are: Gender Equality and Social Inclusion, Safety, Resilience, and Innovation.

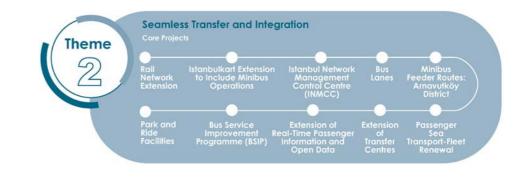
#### Projects

Every project is described in terms of its content, the problems it addresses, its relations with other projects, the preparatory work that needs to be undertaken before implementation and its needs for monitoring and follow up.

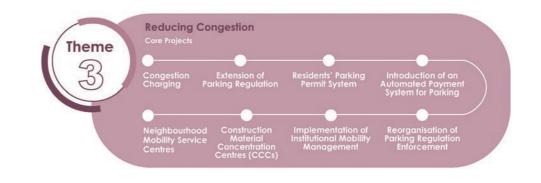
The main premise of the projects grouped under the Transition to Low Carbon theme was to reduce transport-related carbon emissions through a number of interventions that alter travel behaviour by restricting car use, decarbonising the existing public transport fleet, and promoting active mobility. Eight projects that were proposed under this theme are given below:



The main purpose of the projects grouped under the Seamless Transfer and Integration theme was to promote public transport use by offering residents an accessible, integrated, inclusive, safe and comfortable transport system. Ten projects that were proposed under this theme are given below:



The main purpose of the projects under the Reducing Congestion theme was to reduce private car users to switch to sustainable alternatives by focusing on reducing the use of private vehicles through push or pull interventions. Eight projects that were proposed under this theme are given below:



#### The Benefits of the Projects to Istanbul

The benefits of the projects for Istanbul are appraised in three different ways:

• Transport system and SUMP objectives:

o Quantitatively appraised through a benefit-cost ratio (BCR), used for 8 out of 26 projects.

According to this appraisal, the 2040 targets as 0.29 tCO2 emissions per capita and 0.07 kg particulate matter (PM) per capita will be reached, yet the 30% reduction of travel time spent on the network will not be achieved by these 8 projects.

> o Qualitatively appraised through a multi-criteria analysis (MCA), in which the expected contribution to achieving the objectives was scored, which was used for 18 out of 26 projects.

According to this appraisal, Extension of Transfer Centres, Passenger Sea Transport-Fleet Renewal, Istanbul Network Management Control Centre, Extension of Real Time Passenger Information and Open Data, and Minibus Feeder Routes: Arnavutköy District projects represent 63% of the overall anticipated impact of the 18 qualitatively appraised projects.

• Gender Equality and Social Inclusion (GESI):

o 18 parameters that related to social, environment and public health, economic and political impacts were considered.

According to this appraisal, 14 out of 26 projects received a score above the average GESI score. The top five projects are Rail Network Extensions, Pedestrian Routes, Cycle Feeder Routes, Junction Improvements for Pedestrians and Cyclists, and Implementation of Institutional Mobility Management.

• Sustainable Development Goals (SDGs):

o A tailored SDG tool that consists of 80 performance criteria based on SDGs and related targets which were developed by the United Nations (UN) was developed to evaluate the projects.

As a result of the appraisal made at different stages of the project in terms of SDGs, it can be stated that the Istanbul SUMP contributes to SDGs at a high level.

#### **All Scores Combined**

A methodology was developed to combine the scores of different appraisal methods as well as scores given by the stakeholder. The combined scores were weighted across each of the appraisal methods and projects were listed according to the weighted scores. The highest score was taken as 1.0, and the rest was calculated accordingly. The project based around reorganising the regulation of parking enforcement had the lowest score of 0.47 whilst the project of extending the rail network had the highest score of 1.0. Moreover, out of 26 projects, 23 had a score of over 0.50. According to the general overview, it can be concluded that none of the projects received a particularly low score and the results are balanced across the different transport modes and environmental impacts.

#### Governance

The governance structure of the Istanbul SUMP should be based on three principles as follow:

- Effective cooperation between institutions at national, metropolitan and district levels,
- Participatory approach throughout the planning and implementation process,
- Data driven decision making and data management.

Recommendations for the governance of the Istanbul SUMP were made by considering two different scenarios: the Do-minimum and Do-maximum scenarios:

•The Do-minimum scenario assumes that the current national and local governance processes in Turkey will continue, and that the SUMP is not a mandatory planning document.

•The Do-maximum scenario assumes that transport master plans will be transformed into the SUMP, which will be acknowledged within national legislation.

#### **Funding and Roadmap**

The Istanbul SUMP projects were categorised into short term (2022-2024), medium term (2025-2032) and the long term (2033-2040). This was based on the project type and on discussions with IMM. The scale of investment costs of each project were divided into three main groups, low cost (0-10 million TL), medium cost (10-100 million TL), and high cost (above 100 million TL).

#### **Monitoring and Evaluation**

One of the key elements of the SUMP implementation process was the monitoring and evaluation of all activities and projects. Monitoring is the systematic collection of data on specified indicators, while evaluation is the systematic and objective assessment of an ongoing plan, using information provided by the monitoring process to determine potential adjustments and re-planning during SUMP implementation. Monitoring and evaluation will be carried out across two levels, at the project level and at the strategic level. Two types of report will be produced for the Istanbul SUMP related to monitoring and evaluation. Monitoring reports will be produced regularly and whenever indicators are reviewed and evaluation reports will be produced when projects and their impacts are evaluated.

#### **Next Steps**

The Istanbul SUMP is the first SUMP in Turkey. Other Turkish cities will be developing SUMPs soon as these cities shift from conventional transport planning to more strategic and inclusive planning for sustainable mobility.

Before implementation, the Istanbul SUMP needs to be adopted by IMM in order to gain institutional ownership and political support. Continuous monitoring and evaluation of the proposed interventions and the new challenges and opportunities will be needed throughout the implementation process. These include looking at potential synergies with other policies, including climate changes, land use, social inclusion and gender equality. A number of preparatory initiatives need to be undertaken in order for the Istanbul SUMP to be implemented effectively:

- within this (partly new) setting.

Finally, it should be noted that IMM has been awarded an EU fund to carry out a complementary SUMP that will build on the new perspective set by the first Istanbul SUMP. This plan will focus on detailed analyses of the interventions with the support of an activitybased transport model at a more granular level. In this context, it will be possible to detail existing SUMP studies and move them forward to the next stage, thereby preserving the dynamic structure of the study.

• Preparation of the internal organisation in IMM and assignment of specific tasks related to the projects; the Istanbul SUMP proposes an organisation within IMM that takes the implementation tasks on board and assigns projects to officials

• Select the rail network extensions projects with the highest potential to improve accessibility and to increase the use of public transport.

•Consider how governance issues can be solved, taking advantage of existing institutional structures under the current governing principles.



# Introduction

## The Need for the Istanbul SUMP

Istanbul is a city of culture and commerce and attracts visitors from all over the world. It is the most significant economic centre in Turkey and a gateway to developing regions and cultures. However, Istanbul is a congested city, facing significant mobility, traffic and environmental problems.

Transport planning has a long history in Istanbul and Turkey. Previous conventional transportation master plans have focused primarily on traffic and on finding ways to provide capacity for movement by developing significant road and rail projects. However, a Sustainable Urban Mobility Plan (SUMP) places people, accessibility and public engagement at the centre of the planning process, with the aim of delivering improved quality of life for all. This approach acknowledges that integration must happen across all modes, all planning institutions, all disciplines and all citizens and stakeholders. It provides a systematic monitoring and evaluation process for the SUMP strategy delivery and implementation, ensuring that targets are based around an appropriate set of actions. It is important to highlight that a SUMP is a structured, but flexible, process. It provides an approach to define issues and develop solutions, while also allowing a focus on the specific needs of the city/location by developing targeted measures and customised action plans.

The SUMP concept was developed by the EU in 2009–2013, at a time when it became evident that conventional transport planning did not provide effective solutions and tools to address the mobility issues faced by modern cities. The SUMP development process is governed by ELTIS (the EU's urban mobility observatory, funded by the Directorate General for Mobility and Transport), whose Guidelines on Developing and Implementing a Sustainable Urban Mobility Plan was first published in 2013<sup>1</sup>. Although a SUMP is not a mandatory planning document and, generally, is not legally enforceable under any international or national regulation, the guidelines have been widely used by many European cities. It is highly recommended that cities not yet familiar with sustainable urban mobility planning, use this approach and guidelines

A SUMP is defined as 'a strategic plan designed to satisfy the mobility needs of people and businesses in cities and their surroundings for a better quality of life. It builds on existing planning practices and takes due consideration of integration, participation, and evaluation principles.'<sup>2</sup>

The full planning and implementation cycle of the Istanbul SUMP, which is adapted from the ELTIS guidelines, is presented in Figure 1a.

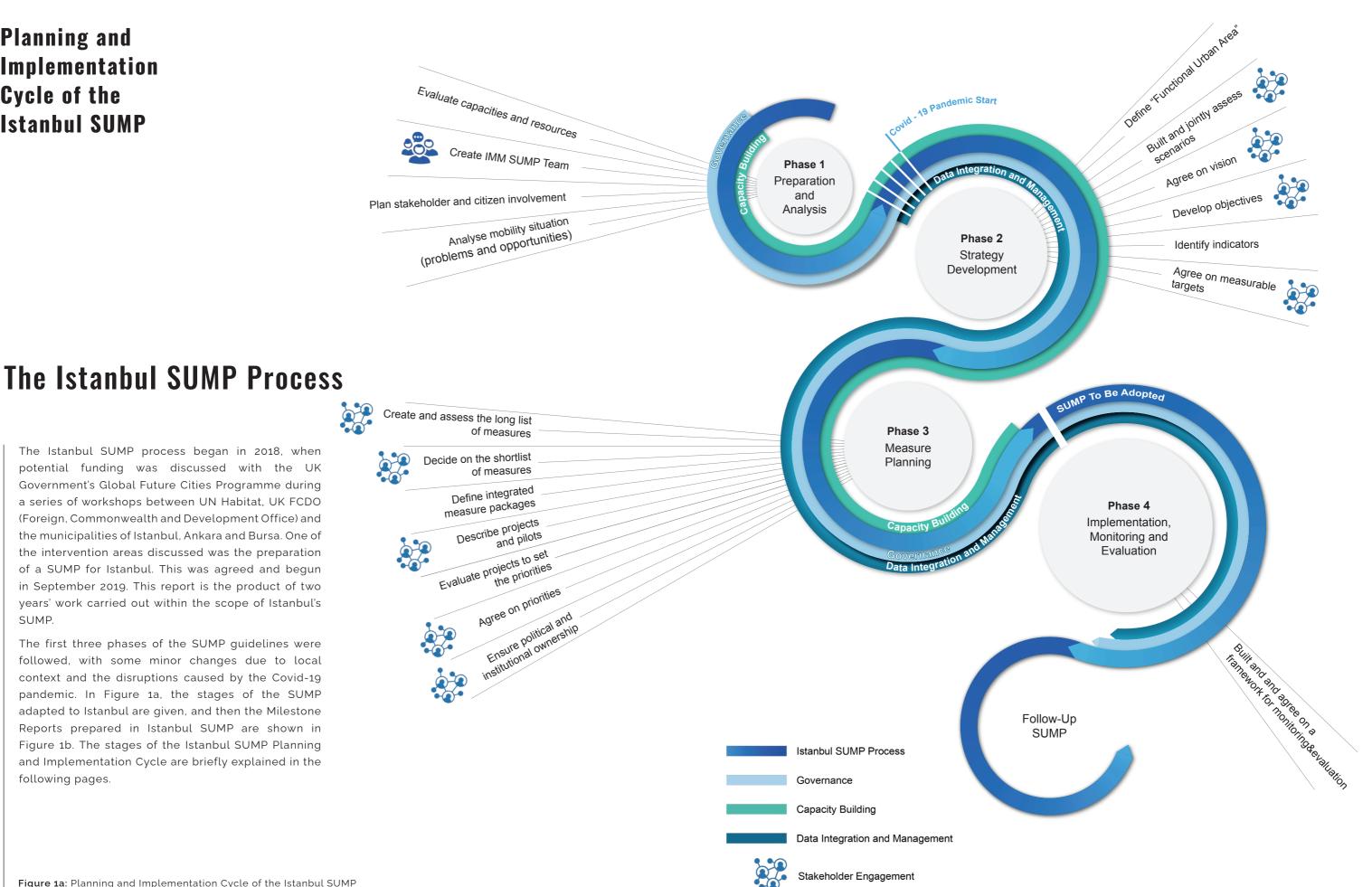
<sup>1</sup>Rupprecht Consult (editor), Guidelines for Developing and Implementing a Sustainable Urban Mobility Plan, Second Edition, 2019. <sup>2</sup> Ibid

01

### **Planning and** Implementation Cycle of the **Istanbul SUMP**

SUMP.

following pages.







outputs are listed below:

- developed.

- a long list and a short list respectively.
- that were conducted.
- tool (Indicator Dashboard).

The scope of the Istanbul SUMP Milestone Reports, the main activities carried out and

• M1 Participation and Engagement Plan: The engagement strategy and a structured inventory of (potential) stakeholders in the Istanbul transport planning landscape were developed. The methodology for stakeholder and citizen involvement was

 M2 Context - Specific Guidelines for the Istanbul SUMP Preparation: Extensive literature review was carried out to identify lessons learned and best practices from different cities. The existing situation regarding transport-based inequalities was defined using an extensive analysis of the local context, current planning practices and its suitability for SUMP planning and implementation.

• M3 Governance Structure for Istanbul SUMP: Analysis of the current planning practices including legal and regulatory situation and governance networks and institutional barriers and gaps within IMM was carried out and the governance framework and structure for the Istanbul SUMP was developed.

• M4.1 Strategy Development – Vision and Scenarios: The Istanbul SUMP vision was established and other than the Business as Usual scenario, four scenarios were defined by evaluating potential uncertainties in the future.

• M4.2 Strategy Development - SUMP Vision, Objectives, Targets and Indicators: Objectives, targets and indicators were defined based on the Istanbul SUMP vision.

• M5 Measures Planning: Policy measures of SUMP were determined by developing

• M6 SUMP Implementation Plan Roadmap: Concrete SUMP projects were developed and evaluated by breaking down the measures into projects. Core projects were prioritised by means of various assessment methods and the Istanbul SUMP implementation plan roadmap was developed.

• M7 Capacity Building for Database Integration: A data strategy and roadmap was developed within data integration framework and capacity building workshops

• M8 Monitoring and Evaluation System for the SUMP: Monitoring and evaluation framework was delivered by developing a dedicated monitoring and evaluation

• M10 Capacity Building and Training for SUMP: The requirements of the newly formed SUMP Team within IMM were developed and a curriculum of training modules relating to the different SUMP phases was were delivered, workshops about GESI, stakeholder engagement and communication were also conducted. Knowledge sharing workshops were held with the participation of experts on best practices in other cities and peer authority. Moreover, applied training on the Istanbul Transport Model was successfully carried out.

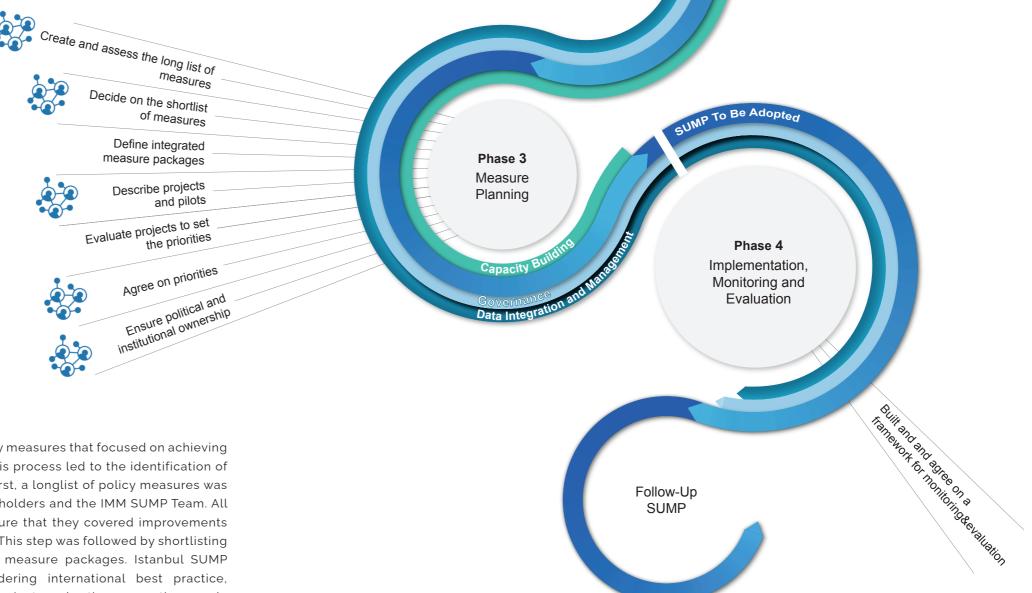
### • Preparation and Analysis

Institutional resources and the local planning context were assessed. A dedicated interdepartmental SUMP team was established to promote collaboration and to create ownership of the SUMP within Istanbul Metropolitan Municipality. An extensive stakeholder participation and engagement strategy was undertaken, and an analysis of existing mobility in Istanbul (barriers, gaps, problems and opportunities) was carried out. A social inclusion analysis defined the underrepresented groups in Istanbul's transport system and explored the barriers to their participation in urban life.



### Strategy Development

The first step was to define the functional area of the Istanbul SUMP to ensure that the strategy covered the appropriate geographic area and was not limited to the city's administrative borders. All key stakeholders were included in this phase. Despite the Covid-19 pandemic and associated lockdowns, the Istanbul SUMP aimed to sustain a high level of stakeholder participation, including from underrepresented groups in society, and undertook oneto-one online meetings when necessary. To this end, the Istanbul SUMP expanded the definition of underrepresented groups in the Global Future Cities Programme to include individuals working in the informal sector, poor households living on the periphery, LGBTI+, individuals with chronic illnesses and carers - in addition to the eight groups defined in the programme (women, the elderly, children/youth, low-income groups/unemployed populations, individuals living with disabilities, ethnic minorities, refugees and foreigners/ tourists). At this stage of the stakeholder engagement process, all underrepresented groups identified by the Program in Istanbul were represented. The next step was to develop and agree the vision and objectives for the SUMP, which included contributions from NGOs, businesses, professional chambers, experts and the IMM SUMP Team. Based on the existing and future challenges facing the city, five scenarios were developed to capture future uncertainty regarding growth and development in Istanbul. Finally, a series of indicators were developed to measure the defined SUMP objectives.



### • Measure Planning

This stage of the study developed policy measures that focused on achieving the objectives of the Istanbul SUMP. This process led to the identification of intervention areas and core projects. First, a longlist of policy measures was prepared with the contribution of stakeholders and the IMM SUMP Team. All policy measures were reviewed to ensure that they covered improvements to social inclusion and gender equality. This step was followed by shortlisting all proposed policies and developing measure packages. Istanbul SUMP projects were determined by considering international best practice, professional experience, IMM pipeline projects and action suggestions made by stakeholders during workshops. A monitoring and evaluation framework was also developed to monitor the success of the proposed SUMP projects. Finally, the projects were prioritised based on a combination of quantitative and qualitative appraisal approaches.

### • Implementation, Monitoring and Evaluation

This phase will commence after IMM starts to realise the Istanbul SUMP Implementation Plan Roadmap. In order to gain institutional ownership, related units of IMM should undertake their responsibilities that are defined in the framework of SUMP Governance Plan. Moreover, IMM will take benefit from the monitoring process which is defined in the context of the plan for following up the implementation and performance of SUMP regularly and continuously. This process may deliver new challenges and opportunities to influence future SUMP implementation. This includes looking at potential synergies with other policies, including such elements as social inclusion and gender equality. At this stage, it is critical to review whether the current SUMP approach accounts for these elements or whether it needs to be adjusted to ensure their better consideration.

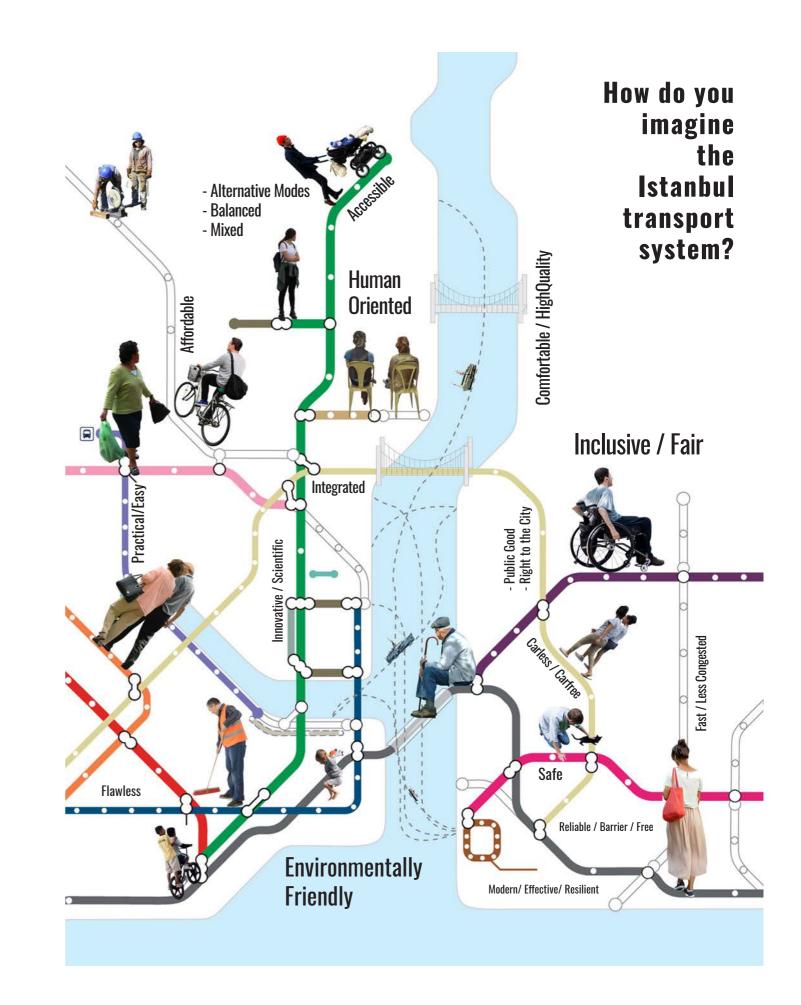
In addition to the phases defined in the ELTIS SUMP cycle, a governance structure was developed for the basic principles and framework in the planning and implementation of the Istanbul SUMP; a capacity building programme was developed based around the needs of IMM; a training programme and a variety of workshops captured the basic theoretical and practical aspects of SUMP planning; a specific study on **data management** and integration for capacity building focused on the needs of IMM.

The Istanbul SUMP is the first in Turkey and is the first global SUMP for a mega city with a population approaching 16 million. It reflects the radical changes in transport policy goals that enable citizens and stakeholders to take part in planning and implementation processes and that provide mobility for everyone, particularly for underrepresented groups. It also focuses on reducing: car dependency and use; the adverse effects of traffic, such as carbon emissions, air and noise pollution; and accidents. The core objectives of this new approach are to develop a mobility and transport system that takes all these aspects into account and focuses on people rather than traffic by placing more emphasis on promoting sustainable means of transport, such as public transport, walking and cycling.

Previously, conventional transport plans have been treated as technical exercises based on expert analysis. However, the culture of participation has gradually changed this approach in Turkish planning practices. In parallel with the current development of transport plans in other major cities, such as Ankara and Izmir, the Istanbul SUMP sets a new standard and priorities for incorporating as many stakeholders and citizens as possible in the planning process. Despite the Covid-19 pandemic, which lasted throughout the SUMP development, citizens and stakeholders were involved throughout, with a range of public participation and engagement formats. Workshops, focus groups and expert meetings provided highly valuable inputs that were incorporated into the development of the Istanbul SUMP (Figure 2). The process included a multidisciplinary and multilevel collaboration between parties and organisations to coordinate policies and measures, such as land-use and environmental planning, economic development, safety, health, education and information technologies, and social inclusion and gender equality. In this context, over the course of the Istanbul SUMP, 134 out of 255 stakeholders identified for Istanbul SUMP were reached through surveys, workshops and focus group meetings held in 24 separate online sessions in 4 stages, and their active participation was ensured throughout the SUMP studies from the point of view of "leave no one behind"3.

The Istanbul SUMP process included a multidisciplinary and multilevel collaboration between various parties and organisations to coordinate policies and measures in the areas such as land-use and environmental planning, economic development, safety, health, education and information technologies, and social inclusion and gender equality.

3 Leave No One Behind, A call to action for gender Equality and Women's Economic Empowerment. Report of the UN Secretary General's High-Level Panel on Women's Economic Empowerment, 2016. The Global Future Cities Prosperity Fund Programme by the UK FCDO, which Istanbul SUMP is a part of, expands this call to the least represented groups in cities (children/ youth, low-income groups/unemploved populations, individuals living with disabilities, ethnic minorities, refugees and foreigners/tourists



### • Stakeholder Engagement

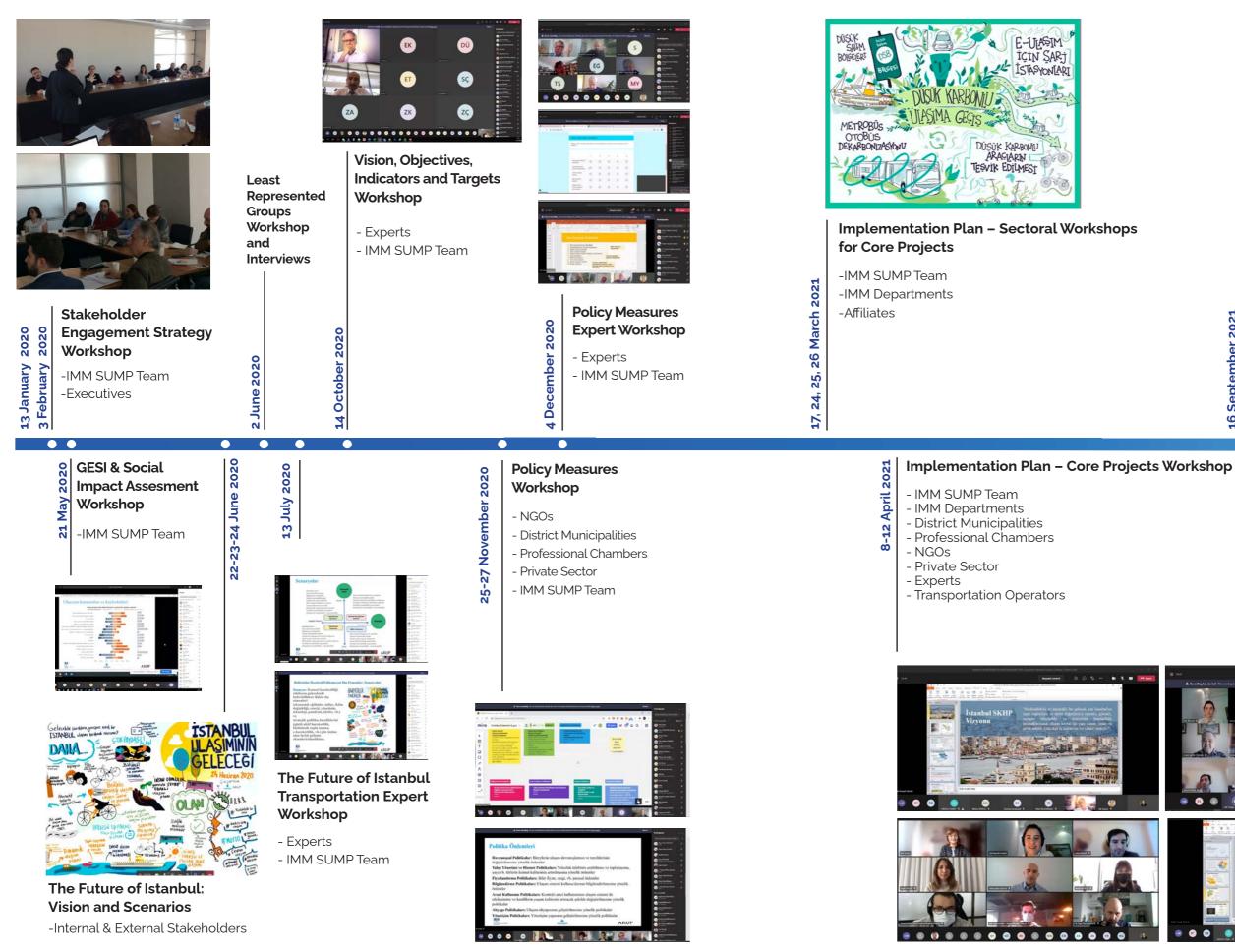
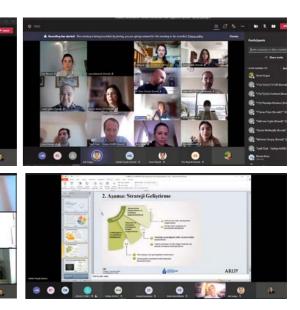


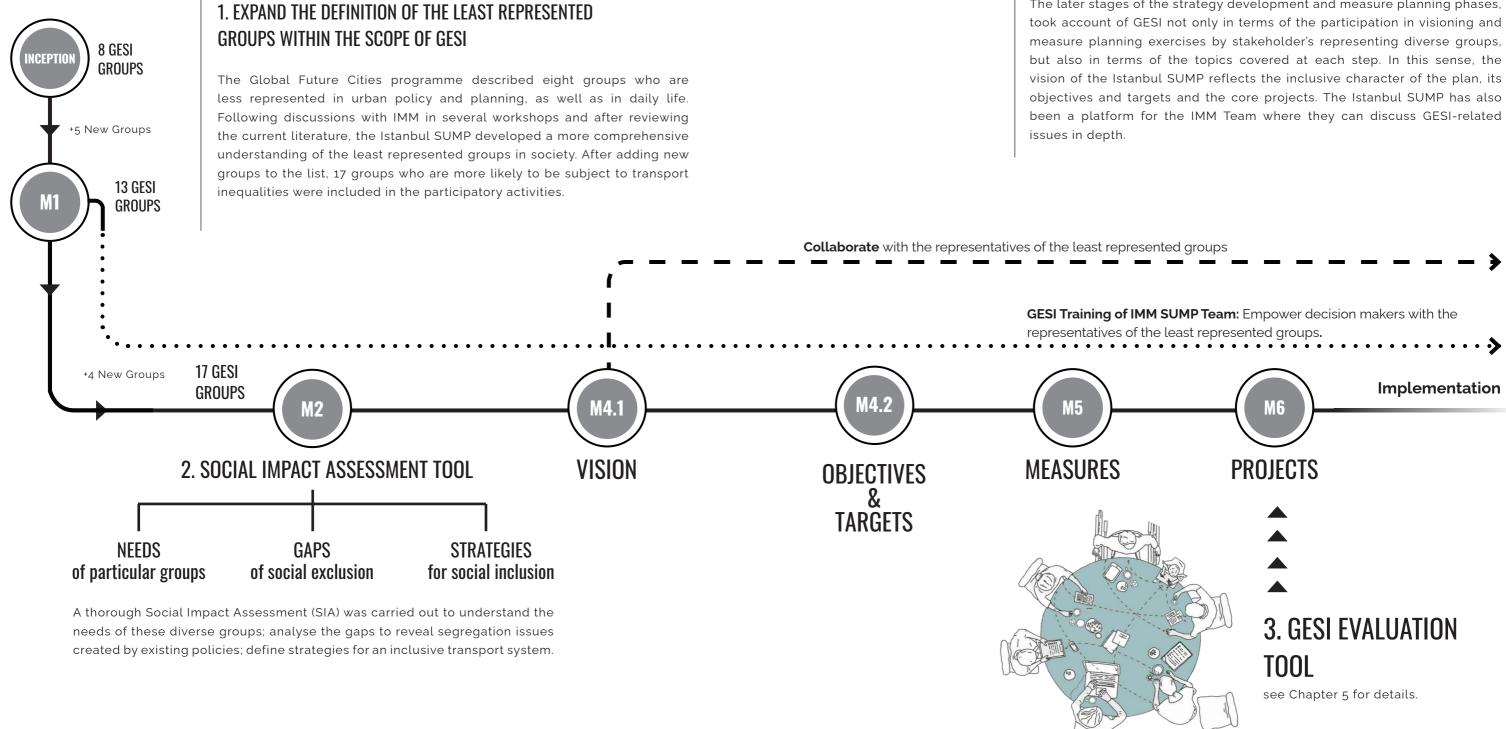


Figure 2: Stakeholder Participation



### **Gender Equality and Social Inclusion (GESI)**

GESI has been one of the most prominent topics during the preparation of the Istanbul SUMP. Based on the understanding that mobility patterns are often gendered and that citizens from diverse backgrounds have varied transport needs, the Istanbul SUMP tackled GESI-related issues at every step of the planning process.



The later stages of the strategy development and measure planning phases,



## Mobility in Istanbul: The Current Situation, Trends and Projections

This section of the report presents the current situation in Istanbul in terms of demographics, employment, economy, climate change, governance and other sectoral relationships. It also outlines future projections and the possible impacts of trends on travel demand and modal share through to 2040. This provides the baseline on mobility in the city.

02

## Population, Employment and Urban Growth

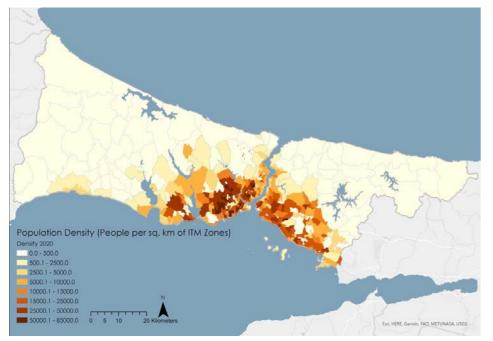
With a population of 15.4 million people spread over an area of 5,461 km<sup>2,</sup> Istanbul is the most populous city in Europe and the world's thirteenth most densely populated city. It has an average population density of 2,820 people/km<sup>2</sup>, while in a number of districts density exceeds 40,000 people/km<sup>2</sup> (Figure 3).

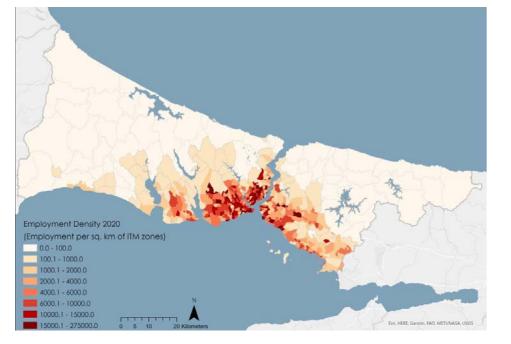


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## Istanbul is the most populous city in Europe and the world's thirteenth most densely populated city.

Significant migration into the city has been created by large wealth differences with Turkish regions and, coupled with unplanned urbanisation, this has had a profound effect on Istanbul's economic development. The population of the city has grown rapidly, from 11 million in 2000, to 15.4 million in 2020. Employment has also increased significantly, from 3.5 million jobs in 2000 to 4.9 million in 2020<sup>4</sup> (Figure 4).





After the 1970s, major transportation investments, such as the Bosporus bridges, ring roads, highways and the new airport, triggered city growth to the north, which overran its natural and ecological boundaries. These largescale projects have irreversibly changed the macroform of the city through enormous economic, social and environmental effects. An unsustainable and limited transport system has emerged that cannot meet the mobility and accessibility needs of the city due to such factors as: land-use patterns formed by rapid and unplanned urbanisation; a growing population and motorisation; an inadequate public transportation system. For the city's sustainability, the transportation system needs to support compact, polycentric development that is coordinated with land use planning. For example, the 'Canal Istanbul', a large-scale project proposed by the government, is located

Figure 3: Distribution of Population Density in Istanbul (2020)

Figure 4: Distribution of Employment Density in Istanbul (2020)

4 Ahmet Mithat Kiziroğlu, Employment in Turkey and Istanbul Since 1980, Journal of Labour and Society, 2014/3. in an area with insufficient public transport access. It will therefore increase demand for transport, add to vehicle traffic, and place further pressure on the area's transport network.

Population and employment projections in the Istanbul SUMP are based on a BaU scenario, which is the reference for appraising proposed projects. This scenario assumes that all transportation projects under construction or already committed to will be implemented in the 2040 transport network. The BaU scenario estimates that the population of Istanbul, which is 15.4 million in 2020, will increase to 18.9 million and that employment of 4.9 million in 2020, will increase to 6.6 million by 2040 (Figure 5). These figures are based on population projections for Turkey (2018–2040) and Istanbul (2021–2025) made by TurkSTAT (Turkish Statistical Institution). Moreover, as seen on Figure 5, it was foreseen that the number of daily trips which is 30.3 million in 2020 will increase to 38.1 million in 2040.

The distribution of projected population and employment in Istanbul in 2040 are shown in Figures 6 and 7. As seen on Figure 6, population in transportation zones will be dense in central areas in 2040 like in 2020, on the other hand population density will increase in outer areas as well. Additionally, as seen on Figure 7, it was foreseen that the distribution of employment density in transportation zones in 2040 will be in line with the distribution of population density.

Population Density (People per sq. km of ITM Zone Density 2040 0.0 - 500.0 500.1 - 2500.0 500.1 - 2500.0 500.1 - 2500.0 500.1 - 2500.0 500.1 - 2500.0

of Population Density in Istanbul (2040)

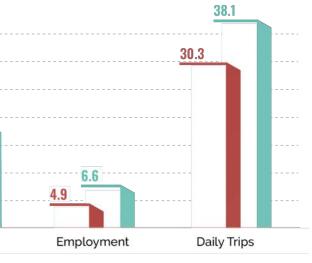
Figure 6: Distribution

Figure 5: Population, Employment, and the

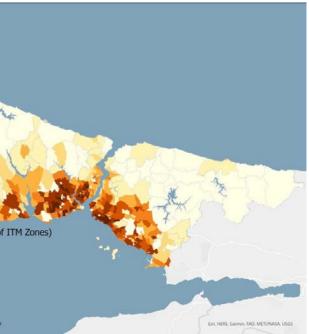
Number of Daily Trips

(2020-2040)

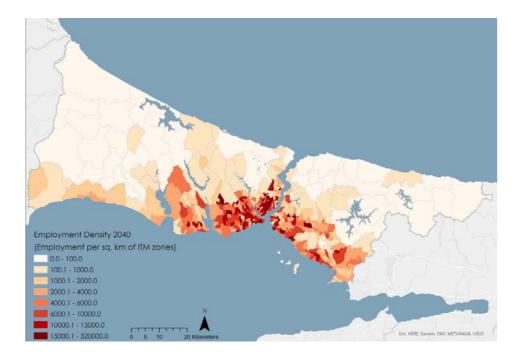
44



#### 2020 2040



45



### Economy

Due to its strategic location between Europe and Asia, Istanbul has always been a major economic centre. The city hosts 20% of the country's workforce and accounts for a third of national production in the industrial and service sectors. 31.7% of Turkey's total GDP is produced by Istanbul in 2019<sup>5</sup>. Increased prosperity promotes car ownership and use, which enables people to travel more. Furthermore, migration within Turkey has led to inequality within Istanbul. The Gini coefficient in Istanbul, which is used to measure income inequality with values between 0 and 1, increased from 0.35 in 2003, to 0.40 in 2015, to 0.45 in 2020.

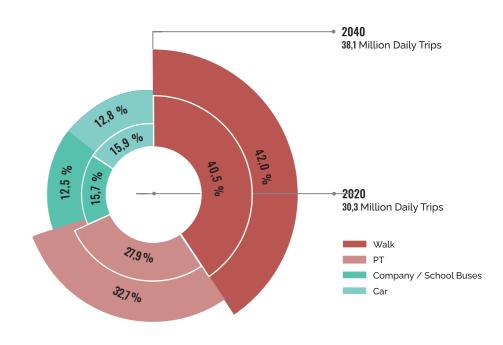
It is very difficult to predict Turkey's future economic situation. Therefore, during scenario development for the Istanbul SUMP, economic status was selected as one of the axes of uncertainty. While in BaU scenario low economic prosperity was taken into consideration, for the other four scenarios it is assumed that economic prosperity will increase compared to current situation. Low economic prosperity corresponds with a socio-economic structure in which unstable regional economic development gaps persist, the gap between rich and poor deepens, and a larger segment of the population has lower household incomes. High economic prosperity corresponds to a reduction in income gaps between citizens, a more balanced regional distribution of economic wealth and higher household incomes.

Figure 7: Distribution of Employment Density in Istanbul (2040)

## Travel Demand and Modal Split

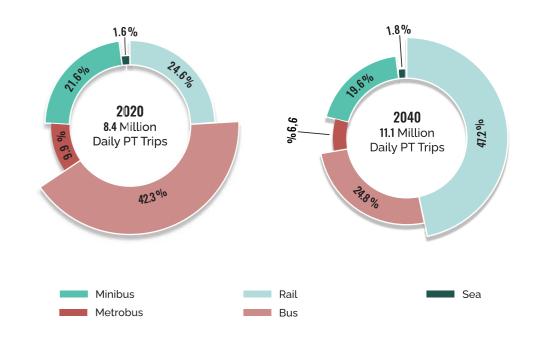
The strategic Istanbul Transportation Model (ITM) was used to predict future travel demand. It provided the necessary outputs to evaluate rail system projects planned and proposed within the Istanbul SUMP to 2040. It should be noted that more detailed micro-modelling tools will be needed to analyse the effects of, for instance, low emission and congestion pricing zones, bus lanes and parking pricing policies.

Figure 8: Modal Split Shares of Daily Trips (%, peak hour) (2020– 2040)



According to the ITM forecasts, the number of daily trips, which is 30.3 million in 2020, will exceed 38 million in 2040, that is, 7.7 million more daily trips will be made in Istanbul (Figure 5).

Figure 9: Modal Split Shares of Daily Public Transport Trips (%, peak hour) (2020-2040)



5 TurkSTAT, 2020

As shown in Figure 8, the share of sustainable trips by walking (40%) and public transport (28%) is at a significant level. The forecasts done with ITM for 2040 also show that after implementing the committed-to railway projects, the share of car in modal share will decrease from 15.9% to 12.8%, on the other hand the share of public transport will increase from 27.9% to 32.7% (Figure 8).

Within public transport trips, the rail share is estimated to grow substantially from 24.6% to 47.2% as a result of the implementation of the planned railway extensions in Istanbul. While bus and minibus shares are estimated to decrease (Figure 9).

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### **Car Ownership and Traffic Congestion**

The number of registered motor vehicles and cars in Istanbul has increased rapidly since 2005 (Figure 10). In 2020, 4.3 million motor vehicles were registered in Istanbul, of which almost 3 million were cars.

Based on the number of registered vehicles in 2020<sup>6</sup>, average Turkish car ownership is 151 cars per 1,000 people, which rises to 191 cars per 1,000 in Istanbul (Figure 11). Both figures are low compared to EU countries. The ITM predicts that car ownership in the city will increase by 39% between 2020 and 2040. The share of cars for daily trips was 16% in 2020 (Figure 8).

Traffic congestion is one of the main problems for quality of life in Istanbul. According to 2019 Inrix traffic congestion rankings, Istanbul is ranked the fourth most congested city in the world - after Bogota (Colombia), Rio de Janeiro (Brazil) and Mexico City (Mexico) - with 153 hours per driver annually lost through congestion.

<sup>6</sup>TurkSTAT publishes car ownership data monthly but population data is released annually. Therefore, when car ownership is calculated in any month of a year, the number of cars comes from the vear of calculation. but population numbers belong to the previous year. Therefore, it is more accurate to give values for 2020.

Figure 10: The Number of Registered Motor Vehicles and Cars in Istanbul (2005-2020)

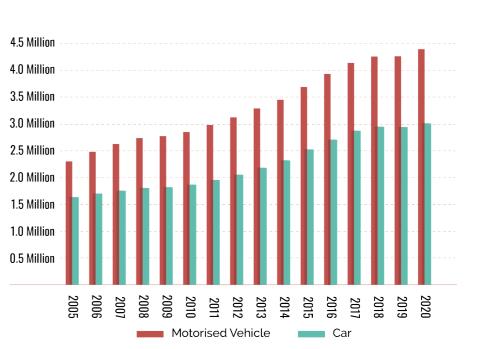
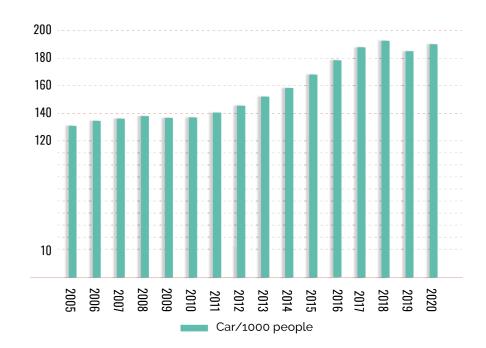


Figure 11: Car Ownership per 1,000 Inhabitants in Istanbul (2005-2020)



peak hours by 10.1% in 2030 and 12.8% in 2040.

This data shows that if effective policy measures are not implemented to curb car use in Istanbul, the rise in car ownership will worsen the city's traffic congestion problem. It is estimated that Istanbul SUMP projects will decrease car-kilometres in

## **Public Transport**

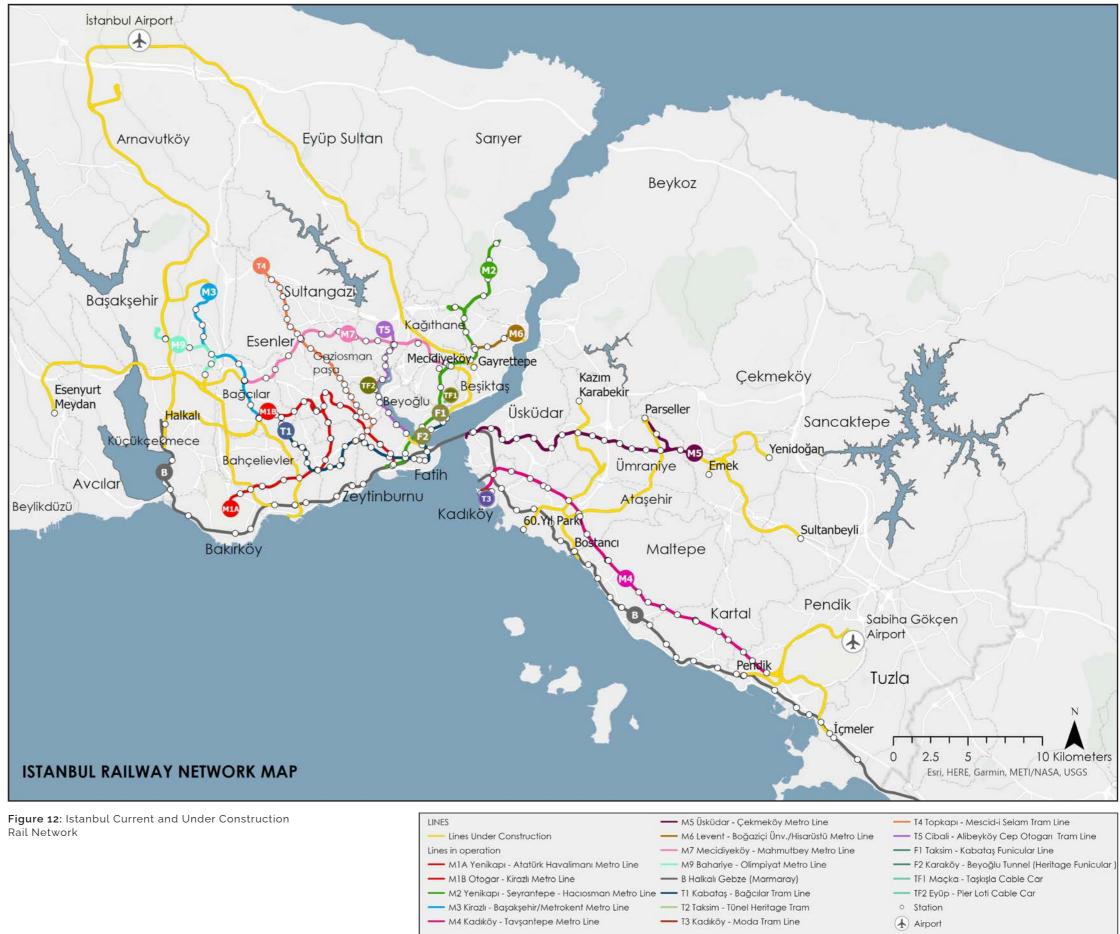
More than 30 million daily trips are made in Istanbul, so the public transport system plays a vital role in supporting the economy and providing citizens with access to basic services, such as work, health and education, through healthy and environmentally sustainable options. In recent years, much has been invested in the city's public transport system. The rail network is gradually being developed and the public transport network is being improved by implementing additional technology and smart applications. Today, Istanbul has 262.15 km of operational rail network, with a total of 208.90 km being constructed, of which 103.30 km is being built by the Ministry of Transport and Infrastructure. The rail network projects currently being planned will extend the overall network to 637.90 km by 2029 (Figure 12). Moreover, with the lines planned to be opened after 2029, the length of the rail system network is targeted to reach 817.51 km in 2040.

Recent public transport projects - such as the Metrobus, the Marmaray rail improvements and other rail system projects have strengthened social inclusion and improved access to economic, social and cultural opportunities for people living in the outer regions of the city.

Nevertheless, Istanbul's public transport system must improve its integration and inclusiveness, accessibility and affordability, reliability and safety. The main areas for improvement are: integrating the public transport system within itself and with other modes (walking, cycling, micro-mobility vehicles and cars); providing affordable public transport services for the poor and for underrepresented groups; improving access to the system for the elderly and disabled.

Rubber-tyred vehicles (bus, minibus and dolmus) make up 74% of public transport trips. When the rail network extensions are completed as planned, the share of the rail system in public transport will nearly double from 24% to 47%.

Sea transportation also needs to be addressed within Istanbul's public transportation system, which has been shaped by the city's geography and its relationship with the sea. Istanbul has effectively four different coastlines, on the north and south sides of the city and along the Bosporus and the Golden Horn. The total length is more than 500 km and therefore offers a great potential for water-based mobility options.







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Sea transport accounts for about 2.5% of daily public transport trips in Istanbul. Coast crossings are at the forefront of journeys where sea transportation can be used most effectively. According to the Istanbul Urban Transportation Master Plan Household Survey Report (2012)<sup>7</sup>, daily coast crossings are given as 4% and, according to ITM's 2020 results, coast crossings during morning peak hours are 7.3%. In addition, 5% of total coast crossings are made on sea transport lines. The significance of sea transport for Istanbul was one of the most discussed topics in the workshops with stakeholders and citizens during the Istanbul SUMP planning process.

Increasing the capacity of sea transport and developing the sea transport in public transport are among the main objectives of IMM, and several planning and project studies are carried out in this direction. The Sea Taxi Project, which has been carried out recently, can be given as an example for these studies. With this project, which was implemented on December 1, 2021, it was aimed to increase the share of sea transport in Istanbul and to offer an alternative outside the City Lines ferry time. Strategies are being determined for the integration of sea transport with land and rail transport within in the scope of Sea Transport Development and Integration Strategies Project which will be completed by the end of 2022. Moreover, the planning of new sea lines, routes and piers in line with the transportation projects carried out throughout the city, and the maintenance, repair and improvement works of the existing piers continue regularly.



7 http://www.ibb. gov.tr/tr-TR/ kurumsal/Birimler/ ulasimPlanlama/ ocum/%C4%B0UAP\_ Ana\_Raporu.pdf

## Active Modes and Micro-Mobility

Active modes of transport (walking and cycling) play an important role in reducing the environmental impact of transport and contribute to a healthy way of life. The healthy streets approach in the Istanbul SUMP aims to plan and design streets to support and encourage walking and cycling, which is a key strategy for improving citizens' quality of life.

In anticipation, Pedestrian and Bicycle Units have been established within the IMM Transportation Planning Directorate, to be responsible for policies and projects related to walking and cycling.

Although Istanbul is quite hilly, the dense and mixed land use and the generally short streets promote walking; however, it is neither safe nor pleasant due to poorly designed and maintained footways. Street furniture, signs and lamp posts are poorly situated and illegally parked cars frequently block pavements. Walking as a mode of transport does not have a positive image among the citizens of Istanbul. Although the share of trips made on foot is high (40% of total trips), Istanbul's walkability is low and a systematic and comprehensive policy needs to be implemented to increase walking trips in the city. For this purpose, the IMM Transportation Planning Directorate developed a Pedestrian Master Plan.

Rather than being seen as a mode of transport, cycling in Istanbul is currently primarily for sports and leisure. Although there have been some institutional developments, planning and infrastructure works, significant changes are required to create an integrated and safe cycle network with appropriate parking facilities. By the end of 2021, there are 374 km of cycle routes and a bike sharing scheme across the city. There is a strong sense that cycling could play a prominent role in first/last-kilometre trips if it was supported by cycle feeder routes that connect public transport hubs and transfer centres with key utilities, such as residential, work and education.

Alternative micro-mobility options, like e-bikes and e-scooters, are becoming more popular. Even though they may not be regarded as active mobility, they are emerging technologies that offer potential benefits to sustainable mobility.

### Climate Crisis, Air Pollution and Road Safety

According to the total GHG inventory of 2019, 28% of the GHG emissions that cause climate change in Istanbul are caused by transportation. Although the base year of work is taken as 2019 within the scope of the Istanbul SUMP, it is seen that this rate has decreased to 26% according to the inventory study updated in 2020. While 99% of the GHG emissions from transportation originate from motor vehicles, the total of GHG emissions from railway and seaway is approximately 1%. Within the scope of 'Deadline 2020', a series of meetings held in Copenhagen in November 2019, IMM Mayor Mr. Ekrem İmamoğlu signed a commitment to 'a carbon neutral and resilient city by 2050'. This is a very important step in reducing motor vehicle emissions and improving the quality of life of Istanbul residents. The revised Climate Change Action Plan framework aims to achieve a 73% reduction in carbon emissions from transportation by 2030, 94% by 2040 and 100% by 2050, in a so-called Extended Ambitious Scenario<sup>8</sup>. In addition to transportation and logistics, the Climate Change Action Plan study covers ten sectors, including energy production and distribution, industry, land use, buildings, waste management and water resources.

Apart from its climate impact, motor vehicle traffic reduces air quality and produces noise pollution. Segments of the population with lower incomes, mostly residing in the outskirts of the city, are more vulnerable to health problems caused by air pollution. To improve air quality and to meet the challenges of the climate crisis, it is vital to introduce policies that reduce car dependency and urban space occupied by cars and that decarbonise the transportation system and increase its resilience.

Despite the improvements made in road safety in recent years, the number of accidents in Istanbul is high. According to TurkSTAT data, 322 people lost their lives in traffic accidents in Istanbul in 2020. Istanbul is the city with the highest number of fatal/injury road traffic accidents in Turkey<sup>9</sup>.

Trucks not only cause increased carbon emissions and reduced air quality but are also an issue when it comes to road safety in the city. The construction sector in Turkey is currently at the forefront of the country's economic activities. In Istanbul, large urban transformation projects are being implemented and therefore it is essential to find safe, environmentally friendly, cost effective and intelligent solutions for the construction supply chain and material transportation.



The Climate Vision of Istanbul and Revised Istanbul Climate Change Action Plan Introduction Meeting

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### Governance

The governance structure strongly affects decisions on land use and transportation that determine the choice of mobility options in Istanbul. As a result of legal and structural arrangements over the last two decades, central government has become more powerful in all decision-making mechanisms, including at local level. In order to reduce the negative effects of those decisions, independent auditing processes need to be developed.

It is not possible to predict Turkey's future governance structure, therefore governance structure was selected as one of the two main external factors that are likely to shape future scenarios, the other being economic prosperity. A fair, equitable and inclusive urban sustainability can only be achieved with the collaboration of central government, local municipalities, citizens and other stakeholders.



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## **Plans and Policy Documents**

Several planning studies related with different areas and sectors were conducted or are ongoing in Istanbul. Sectoral plans such as the Istanbul Parking Master Plan, revision of the Istanbul Bicycle Master Plan, Istanbul Pedestrian Master Plan, Istanbul Logistics Master Plan, Istanbul Public Transport Master Plan, Istanbul Traffic Safety Master Plan, Istanbul Vision 2050 and the Istanbul Climate Change Action Plan have been completed or related studies are in progress. Evaluations will ensure that these ongoing plans are compatible with the Istanbul SUMP.

Istanbul also prepared a Local Equality Action Plan 2021-2024, which contains measures to secure 24-hour access rights, to ensure transportation for disabled people, to provide multilingual services and measures related to rights for those working in the transportation sector.

Regionally, the Marmara Region Spatial Development Strategic Framework Document was completed in October 2021 by the Union of Marmara Municipalities that includes IMM as a Member.

In addition to many laws, regulations and directives, the National Transport Master Plan and Turkey Logistics Master Plan have been completed at national level. Although these plans were only completed recently, it was decided to merge these two plans to become the National Transport and Logistics Master Plan. This study is still ongoing.

9 TurkSTAT, 2020



## Scenarios, Vision and Objectives

This chapter describes the development of the Istanbul SUMP strategy, which is based on an analysis of the current transport system in Istanbul and the challenges that were identified. First, scenarios, a vision, objectives and targets were developed and then projects were defined to achieve them. Every step of this phase was carried out in a participatory manner. A range of virtual workshops were organised to discuss the opinions of different parties, including NGOs and representatives of various IMM units.

03

Figure 13: External Factors That Influence Mobility in Istanbul

## Looking Ahead

In developing the SUMP for Istanbul, it is important to consider external factors that have a significant effect on mobility. These were identified through a series of workshops with stakeholders and the outcomes are presented in Figure 13.



Some of these external factors are considered more certain than others. For example, the current trend in population dynamics indicates that population growth is quite certain in the foreseeable future. Also, climate change is happening now and we already find ourselves in a pandemic environment, while a seismic event is not an uncommon experience. Technology is already developing at a significant rate and this trend is unlikely to change. In contrast, economic prosperity and the governance system are the least certain and the most difficult to predict. In fact, they have been the two critical uncertainties in the development of Istanbul for several years.

Predicting the economic situation in Turkey in 2040 is challenging. Therefore, it is reasonable to conclude that it could cover quite a range. Low economic prosperity is typically associated with an unbalanced regional economic development, a significant gap between rich and poor and low household income in larger populations. Whereas high economic prosperity leads to a more balanced regional distribution of economic development that narrows the gap between rich and poor and increases household income.

It is also highly uncertain how the quality, effectiveness and structure of governance in Turkey will develop. Different approaches will profoundly impact mobility patterns in Istanbul. The decision-making structure could change in a number of different ways, ranging from top-down to bottom-up. In a top-down approach, central government plays a key role and has strong power and influence over local municipalities. Bottom-up decision making offers a more decentralised governance structure, in which local authorities have more power and citizens and stakeholders are more engaged in the city's decision-making processes.

The Istanbul SUMP envisages dealing with these uncertainties by using scenarios for a 'What if?' approach by asking, for example, 'What policies and projects would be needed and are possible when economic growth is limited?' or 'What policies and projects would be needed and are possible in bottom-up decision making?' Such an approach enables the development of versatile solutions and a preparedness for different events. Five scenarios were developed around two main uncertainties, as presented in Figure 14.

Currently, Istanbul finds itself in the bottom-right quadrant due to the existing economic outlook and decision-making structure (Figure 14). This situation is referred to as the business-as-usual, or BaU, scenario, in which almost all problems and challenges being experienced today will continue to exist.

Evidently, future changes in the economy and/or governance would move the city to another quadrant in the same figure. Four potential futures for Istanbul were developed during the study:



In the **Sprawl City Scenario**, the economy improves compared to current trends, but the governance structure is the same. An improved economy may lead to improvements in factors such as technology development or production/consumption opportunities. However, unplanned growth and sprawl will be two dominant trends and will increase the outlying districts' dependency on the city centre in terms of employment and services.

In the **Efficient City, Resilient/Green City** and **Inclusive City** scenarios improvements in efficiency, resilience and inclusiveness may be expected. These will gradually change urban life through better accessibility, increased social awareness, balanced growth and equal distribution of available resources/opportunities. The main change envisaged in these scenarios is altered travel behaviour of citizens. As the **Inclusive City Scenario** is approached, there will be an opportunity for a transportation network structure that meets the mobility needs of different socio-economic and demographic groups. Increased accessibility will reduce travel demand and mobility and lead to fewer people needing to make long-distance trips. This would increase the quality of life across the entire city.

These scenarios are possible futures for Istanbul, depending on how the uncertainties evolve, but the one desired future is the **Inclusive City Scenario**. However, depending on the development of the governance structure and the economy, one of the other futures could occur. The characteristics of each scenario are presented in more detail in Table 1.





High Economic Prosperity

Low Economic Prosperity

Dimensions / Criteria / Filters /	,	SCENARIO - 1 Business as Usual	SCENARIO - 2 Sprawl City	SCENARIO - 3 Efficient City	SCENARIO - 4 Resilient-Green City	SCENARIO - 5 Inclusive City
Economy	Economic Trends	Lower prosperity, increased gaps in the regional development in the country, lower household income	Higher prosperity, rebalanced economic development of regions in the country, the rich-poor gap has narrowed, higher household income	Lower prosperity, increased gaps in the country's regional development, lower household income	Higher prosperity, rebalanced economic development of regions in the country, higher household income	Higher prosperity, rebalanced economic development of regions in the country, higher household income
	Production and Consumption	Globalised economy, operating global brands, with localised distribution and supply chains	Globalised economy, operating global brands, with localised distribution and supply chains	Community organised small-scale production and distribution	Community organised small-scale production and distribution	Community organised small-scale production and distribution
Governance		Top-down decision-making, central government plays an important role and has a strong decision-making power over the local municipalities	Top-down decision-making, central government plays an important role and has a strong decision-making power over the local municipalities	Bottom-up decision-making, local authorities gain more power and funding, decentralised governance solutions are preferred	Bottom-up decision-making, local authorities gain more power and funding, decentralised governance solutions are preferred	Bottom-up decision-making, local authorities gain more power and funding, decentralised governance solutions are dominant
Funding		Low ad hoc funding, focus on PPP investments and public money spent on guarantees given to private sector, limited external funding availability	Higher, substantial external funding availability but focusing on specific inititatives (large infrastructure projects)	Limited and targeted towards sustainable policies	High and targeted towards sustainable policies	Higher and better targeted funding with a special focus on zero-carbon, small scale horticulture, local production/ consumption, etc.
Land Use		Polycentric development, employment is confined within existing business and industrial areas, sprawl towards city's forests and water catchment areas, the car-dominant urban model persists, freeways to connect them, parking supply follows demand with no optimal enforcement	Polycentric development, urban sprawl continues, the car-dominant urban model persists, toll roads to connect them, parking supply matches demand with more off-street provisions and better enforcement	More efficient polycentric urban form, compact city, city of short distances, connected neighbourhoods, local centres, decentralisation, supply of parking is limited in order to reduce road congestion, parking price reflects scarcity of parking spaces	More efficient polycentric urban form, compact city, city of short distances, connected neighbourhoods, neighbourhood-centric planning, local centres, decentralisation, supply of parking is limited in order to reduce road congestion, parking price reflects scarcity of parking spaces, low-carbon zones are defined, increased amount of green and public spaces	Compact and polycentric city, city of short distances, connected neighbourhoods, cars are banned in central areas, parking will only be available off-street, car-parks replaced by urban farms or public spaces
Population		Population continues to grow unchecked	Population continues to grow unchecked	People tend to live, play and work in the same locality, government is incentivising population shifts to second- and third-tier cities	People tend to live, play and work in the same locality, government is incentivising population shifts to second- and third-tier cities	Population rebalanced/redistributed and some people move to live and work to oth centres and cities
	Accessibility	Low level of accessibility	Low level of accessibility	Increased accessibility for all	Increased accessibility for all	Increased accessibility for all
Mobility Trends and Transport	Mobility Demand	Increased transport demand, traffic congestion, long commutes to centres, increased commuter jams, travelling long distances for work and education as affordable housing in main employment areas is limited	Increased transport demand, high level of car ownership and use, increased commuter jams, emphasis on road, traffic management and parking investments	Reduced transport demand, efficient use of transport infrastructure, making the poor a priority	Reduced transport demand, high car ownership but less car use	Reduced mobility needs, slow city
Issues	Mobility Choice	PT and car mainly, car culture, low awareness of active travel, traditional PT integration, socially acceptable pricing for PT, PT persists but suffers through lack of investment	Low importance of active modes, car culture, shared mobility, mobility management, higher price for better services for PT, innovative mobility alternatives (MaaS, shared mobility and e-mobility)	Emphasis on active modes and place making, innovative mobility alternatives (shared mobility, e-mobility), advanced PT integration, socially acceptable pricing for PT, PT persists but suffers through lack of investment	Emphasis on PT and active modes and place making, active travel culture, innovative mobility alternatives (shared mobility, e-mobility), higher and socially adjusted price for better service	Almost completely car-free, emphasis on active transport modes, advanced and high quality shared mobility supported by the loc government
	Social Inclusion	Low level of social inclusion	Low level of social inclusion	High level of social inclusion due to active travel culture and PT focus	High level of social inclusion due to active travel culture and PT focus	High level of social inclusion
Social Trends	Awareness	Low level of public and political awareness of sustainability	Low level of public and political awareness of sustainability	High level of awareness regarding sustainability issues	High level of awareness regarding sustainability issues	High level of awareness regarding sustainability issues
Tienus	Inequalities	Inequalities persist, decision makers have no vision for inequalities, civil society is less diverse and vibrant, less protest and political violence	Inequalities persist, decision makers have no vision for inequalities, civil society is less diverse and vibrant, less protest and political violence	Steps taken to reduce inequalities, decision makers have a vision for inequalities	Steps taken to reduce inequalities, decision makers have a vision for inequalities	Reduced inequalities through accommodating different needs of all under-represented groups
Energy		Traditional energy sources, fossil fuels still dominate, petrol lobby continues to be powerful	Combination of traditional and alternative energy sources with more focus on the first, fossil fuels still dominate	Combination of traditional and alternative energy sources with more focus on the latter, investments focused on reducing energy demand and increasing efficiency	Focus on alternative, clean energy resources, fossil fuel use is becoming a thing of the past	Focus on alternative, clean energy resources, fossil fuel use is becoming a thing of the past
Technology Uptake		Low level of technology uptake	Higher level of technology uptake, but it is single-focused, negative disruption	 Lower and ad hoc, private led technology uptake, technological developments focus on efficiency	High but better contolled technology uptake, streamlined innovation, positive disruption, smart technology is everywhere and helps to integrate diverse systems	High but better contolled technology uptake, streanlined innovation, positive disruption, smar technology is everywhere and helps to integrate diverse systems
Resilience to External Factors		Low level of resilience to external factors such as pandemics, climate change and earthquake, decision makers have no vision regarding climate change	Low level of resilience for climate change, high level of resilience for pandemics (more use of private transport means)	High level of resilience due to focus on active travel and shared mobility, climate action emphasises mitigation	High level of resilience due to focus on active travel and shared mobility, climate action emphasises mitigation	High level of resilience due to focus on active travel and shared mobility, climate action emphasises mitigation

 Table 1: Istanbul SUMP Scenarios and Specifications

## Istanbul SUMP Vision

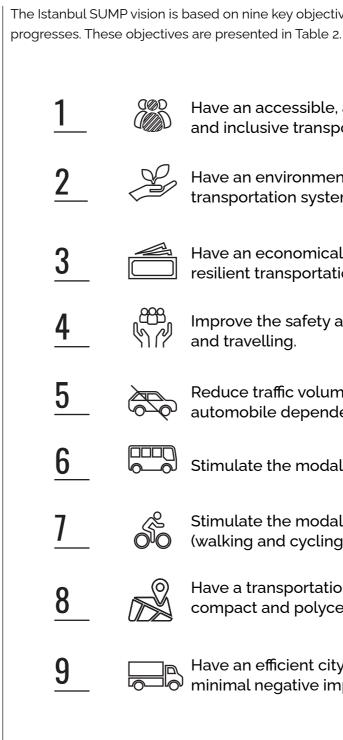
The transportation situation was studied in detail before Istanbul SUMP's vision was produced. The vision and objectives were developed by ensuring strong communication (the most important element of the process) with a wide range of stakeholders. Uncertainties that the city may face in the future were also taken into account and the vision for the Istanbul SUMP that came from this process is:

"An inclusive and innovative transport system, focusing on people and the environment, providing the right mix of safe, integrated, accessible and affordable mobility alternatives, compatible with the unique geography and historical values of Istanbul for a sustainable and resilient future."



## Istanbul SUMP **Objectives**

Table 2: Istanbul SUMP Objectives



The Istanbul SUMP vision is based on nine key objectives that must be achieved as the plan

Have an accessible, affordable, integrated and inclusive transportation system.

Have an environmentally sustainable transportation system.

Have an economically sustainable and resilient transportation system.

Improve the safety and security of transport and travelling.

Reduce traffic volumes, congestion and automobile dependency.

Stimulate the modal shift to public transport.

Stimulate the modal shift to active modes (walking and cycling).

Have a transportation system that promotes compact and polycentric development.

Have an efficient city logistics system with minimal negative impact.

Indicators selected to monitor progress in achieving the objectives of Istanbul SUMP, and their baseline data and target year (2040) values are presented in Table 3.

 Table 3: Istanbul SUMP Objectives,

 Indicators and Targets Table

### **Objective 1**

Have an accessible, affordable, integrated and inclusive transportation system.

Indicators	Baseline Data	Targets (2040)
Percentage of the poorest quintile (lowest 20%) of the population's household budget spent on transportation	8.3% (TurkSTAT, 2019)	5% (poorest quintile)
Percentage of jobs accessible within 30 min of PT travel time	Average 7.8% (Transport model analysis, 2020, ITM)	30%
Percentage of population within 15 min travel time by public transport or 10 min travel time by active modes to rail transit and BRT stations	67% (Istanbul average, based on BRT stations and 15 min PT travel time.)	30% increase
Percentage of rail transit and BRT stations with step-free access	Rail systems 100% - 2020 BRT 75% (2020)	100% compliance
Percentage of buses that are wheelchair accessible, and have provision for the visual and hearing impaired	%100 (2020, for wheelchair accessibility only).	100% compliance
Percentage of bus stops that are wheelchair accessible, including streets within 250 m radius of bus stops	Data not available.	50%-100% compliance
Average travel time to and from work or an educational establishment, using any mode of transport	Work trips: 41.9 min School trips: 23.3 min (2012, Household Travel Survey Data)	Work trips: 30 min. School trips: 15 min.



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### **Objective 2**

Have an environmentally sustainable transportation system.

Indicators	Baseline Data	Targets (2040)
Per capita well-to-wheel GHG emissions by all urban area passenger and freight transport modes	GHG =0.92 tCO2 eq per capita (2021, Revised Istanbul Climate Action Plan)	60% reduction
Share of electric, hybrid, hydrogen vehicles used in the PT fleet	3.59% for Buses – 2020. Rail is electrified already.	100% for buses and rail.
Share of electric, hybrid, hydrogen cars and taxis	0.05% of taxis in Istanbul (2020) 0.2% of cars in Turkey (2020)	50%
Percentage of population affected by different urban transport noise levels	<55 dBA - 67% 55-59 12% 60-64 9% 65-69 6% 70-74 3% >75 0.3% (Noise Level Action Plan, 2019).	Total affected over 65 dB decrease by 75%, Total affected over 55 dB decrease by 50%

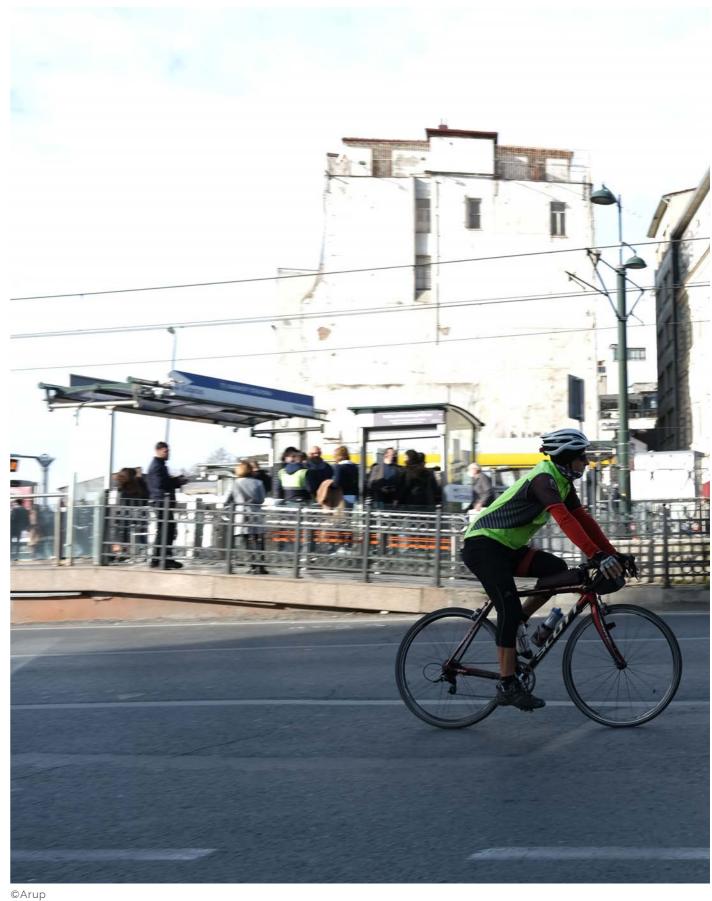
### **Objective 3**

Have an economically sustainable and resilient transportation system.



Y

Indicators	Baseline Data	Targets (2040)
Cost recovery (revenue/cost) ratios of PT operators	Metro 0.6 (2020)	Maintain minimum of: 0.8 for metro 0.6 for bus 0.9 for ferries

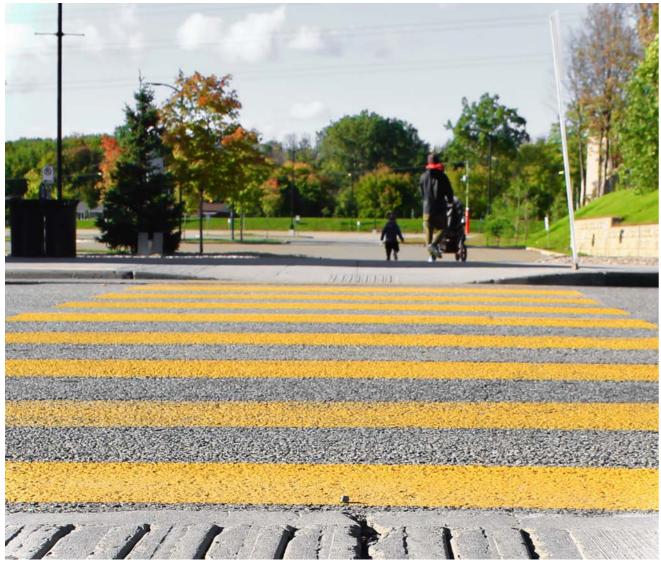


### **Objective 4**

Improve the safety and security of transport and travelling.

Indicators	Baseline Data	Targets (2040)	
Per capita fatalities	2.3 per hundred thousand (2019)	Zero fatalities in traffic accident in central areas (mixed-use) 60% reduction in main arterials	
Per capita serious injuries	1.4 per thousand (2019)	70% reduction	

888 81 12



©Unsplash

<b>Objective 5</b> Reduce traffic volumes, congestion and automobile depen			
Indicators	Baseline Data		
Delays in road traffic during peak hou compared to off-peak travel (private r traffic)	oad		
Sum of weighted averages of vehicle traffic during peak hours over 10 representative corridors			
Sum of reductions in on-street and of street vehicle parking spaces remove 10 representative central areas			



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#### **Objective 6**

Stimulate the modal shift to public transport.

Indicators	Baseline Data	Targets (2040)
Share of PT in total modal split	28% (IMM Transport Report, 2017)	35%
The perceived satisfaction of using public transport	81% for rail (2019) 67.8% for bus (2019)	85%-90% for rail transit and sea, 75%-80% for bus
Percentage of the IMM budget allocated to public transport investments	30.7% (2020)	To be defined after the completion of the current and under construction projects

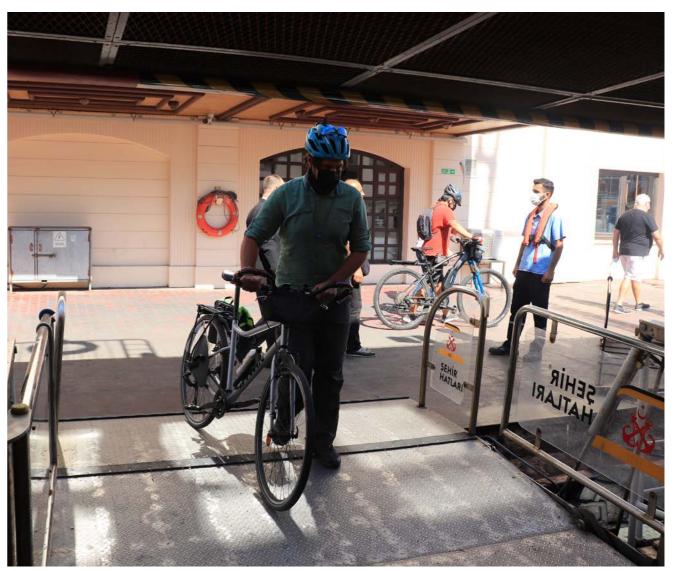


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#### **Objective 7**

Stimulate the modal shift to active modes (walking and cycling).

Indicators	Baseline Data
Percentage of trips made by active modes	Walk 40.5% (ITM, Peak hour) Bicycle 0.07% (2012)
Walkability index	To be defined after completion of project that is defined in Pedestria Plan
Length of a dedicated cycle infrastructure	374 km (2020)



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Targets (2040)
Walk 45% Bicycle 5%

after completion of the lefined in Pedestrian Master

To be revised and published every 2 years after the completion of proposed project in the context of Pedestrian Master Plan and it is recommended to develop targets accordingly

3,680 km

#### **Objective 8**

Have a transportation system that promotes compact and polycentric development



Indicators	Baseline Data	Targets (2040)
Average trip lengths for work, school and other trips	Private Vehicle: 47.2 min (ITM Data) Subscription Bus: 56.6 min (ITM Data)	20% reduction for each mode
Percentage of trips made by active modes	Walk 40.5% (ITM, Peak hour) Bicycle 0.07% (2012)	Walk 45% Bicycle 5%

## **Objective 9** Have an efficient city logistics system with minimal negative impact.

Indicators	Baseline Data
Percentage of truck traffic to overall traffic in selected central areas for daytime hours (07:00–19:00)	To be calculate participatory m



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#### Targets (2040)

ated after selecting areas by 50% reduction methods

## **Development of Measures** and **Projects**

A comprehensive action plan was developed to achieve the Istanbul SUMP vision, objectives and targets. This action plan consists of policies and core projects that came out of a series of expert workshops and engagement activities. The key steps are summarised in Table 4.

in Chapter 4.

Figure 15: SUMP Measure Packages,

Governance Structure for Istanbul SUMP

Table 4: Development of Measures and Projects - Key Steps

### **Developing and Selecting SUMP Core Projects**

**79 Policy Measures** 

#### **Step 1 - Long List of Measures**

A longlist of measures and interventions was developed based on an analysis of the local transport situation, on professional expertise and on international best practice, along with focus group meetings with IMM units and stakeholders..

**59** Policy Measures and 8 Measure **Packages** 

#### **Step 2 - Short List of Measures and Measure Packages**

The most effective measures were selected based on their contribution to the SUMP objectives and their relevance to the current IMM pipeline of projects. Complementary and synergetic measures were defined, and all shortlisted measures were combined into eight measure packages.

**26 Core Projects** 

#### **Step 3 - Core Projects**

Core projects were selected from the 175 projects which were recommended in a number of stakeholder workshops for 59 policy measures. They were evaluated and grouped according to the shortlist of policy measures determined in Step 2. IMM units were consulted about current priorities and potential locations. The core projects were appraised either quantitatively or qualitatively.

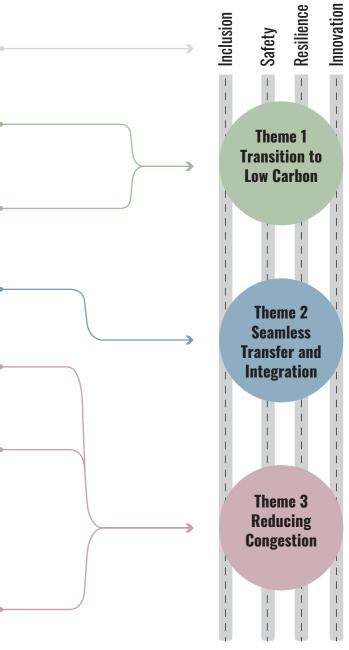
**3 SUMP Themes** and 4 Cross-**Cutting Themes** 

#### **Step 4 - SUMP Themes**

By analysing the measure packages (from Step 2) 26 core projects were grouped under three main SUMP Themes. In addition, four cross-cutting SUMP themes were determined that were relevant to all core projects. This process is illustrated in Figure 15.



As it shown in Figure 15, all projects are grouped under three themes: Transition to Low Carbon; Seamless Transfer and Integration; and Reducing Congestion. Four cross-cutting themes of Inclusion, Safety, Resilience and Innovation were also defined. The SUMP themes are discussed in this chapter and details about their respective core projects are



## **Theme 1: Transition to Low Carbon**

The main objective of the projects under this theme is to ensure that the Istanbul transport system is environmentally friendly and promotes sustainable, active and healthy lifestyles for citizens. The eight core projects proposed as part of this theme are listed in Figure 16.



#### **Transition to Low Carbon Core Projects**

Low Emission Zones Decarbonisation of Metrobus Decarbonisation of the Public Transport Bus Fleet Cycle Feeder Routes Pedestrian Routes Traffic Calming Junction Improvements for Pedestrians and Cyclists E-Bikes and E-Scooters



## **Theme 2: Seamless Transfer and Integration**

The main objective of projects under this theme is to promote a shift to public transport by ensuring an integrated, inclusive, safe and comfortable transport system that is accessible for all citizens. The ten core projects proposed as part of this theme are listed in Figure 17.



#### Seamless Transfer and Integration Core Projects Rail Network Extension

Istanbulkart Extension to Include Minibus Operations Istanbul Network Management Control Centre (INMCC) Bus lanes



Minibus Feeder Routes: Arnavutköy District Passenger Sea Transport – Fleet Renewal Extension of Transfer Centres

Extension of Real-Time Passenger Information and Open Data Bus Service/Frequency Improvement Programme Park and Ride Facilities

## **Theme 3: Reducing Congestion**

This theme represents the projects managing travel demand, with a particular focus on private car use. They include improving alternatives that will attract travellers to sustainable modes of transport and creating demand management measures that will push travellers away from private cars. The eight core projects proposed as part of this theme are listed in Figure 18.



Congestion Charging Extension of Parking Regulation Residents' Parking Permit System Introduction of an Automated Payment System for Parking Reorganisation of Parking Regulation Enforcement Implementation of Institutional Mobility Management Construction Concentration Centres (CCCs) Neighbourhood Mobility Service Centres



Figure 16: Transition to Low Carbon

Figure 17: Seamless Transfer and Integration

Figure 18: Reducing Congestion

## **Cross-cutting Themes**

All policies, projects and actions developed under the three main themes are cut across by the following four sub-themes

## Safetv

One of the most prominent cross-cutting issues in the Istanbul SUMP is road safety, and almost all policies and measures in the SUMP refer to safety. Promoting walking, cycling and public transport cannot be managed without ensuring safety in traffic.

## Inclusion/Gender Equality and Social Inclusion (GESI)

Gender Equality and Social Inclusion (GESI) was one of the most prominent topics in setting the Istanbul SUMP stakeholder engagement framework. Every proposed project was developed to meet GESI criteria and ensure the equal participation of all citizens in daily urban life by creating safe, secure, affordable and healthy mobility opportunities.

## Resilience

Resilience is important not only in the planning but also in the operation of transportation systems, which should carry on under difficult circumstances, such as accidents, disasters, severe weather conditions, infrastructure construction and major/international events. The Covid-19 pandemic highlighted that the transportation system should be able to function under unprecedented conditions and recover quickly after crises and disasters.

### Innovation

Innovation helps to achieve sustainable urban mobility through integrated, inclusive, data driven and smart solutions. These solutions vary from real time user information systems to network management centres. New technologies can: increase the efficiency of a transportation system; minimise private vehicle use through public transport innovations; provide societal, environmental and economic benefits. Innovations can improve citizens' guality of life and is important in densely populated cities suffering from severe congestion problems, such as Istanbul,



# The Projects: **Definition and Characteristics**



This chapter describes the 26 core projects under three main themes. "Theme 1: Transition to Low Carbon", which aims to make Istanbul's transport networks environmentally friendly and to promote sustainable, active and healthy lifestyles, was created on the basis of policy measures aimed at transitioning to low carbon and promoting active mobility. "Theme 2: Seamless Transfer and Integration", which aims to promote the transition to public transport by offering an accessible, integrated, inclusive, safe and comfortable transport system for all, was prepared on the basis of policy measures on transfer and integration of types. "Theme 3: Reducing Congestion", which aims to manage travel demand with a focus on reducing private vehicle journeys; It is based on policy measures aimed at improving urban freight transport and traffic flow, promoting car-free lifestyles/reducing travel volume.

Chapter 5 discusses how these projects contribute to the SUMP objectives and explains the project appraisal phase in detail. Project appraisals took account the following:

Projects were appraised quantitatively or qualitatively: Of the 26 main projects proposed, eight were analysed quantitatively using externalities including emissions (in terms of exhaust output or energy production), time lost in traffic, number of accidents and impacts on human health. For each of these eight projects a quantitative assessment was made using the calculated economic size of the externalities, and a benefit-cost ratio was determined. These calculations could not be made for all projects, and the MCA method was adopted for a qualitative assessment of the remaining 18 projects, taking into account expert opinions and potential contribution to achieving the Istanbul SUMP objectives. Table 5 shows which method was used for each project.

Gender Equality and Social Inclusion (GESI) Impact: Members of the IMM SUMP Team scored each project's GESI impact, based on 18 parameters under 4 impacts such as social impacts (accessibility, safety, empowerment of underrepresented groups, sense of freedom), environment and public health (physical activity,



#### Quantitative Assessment

#### **Qualitative Assessment**

Rail Network Extensions
Low Emission Zones
Decarbonisation of the Public Transport Bus Fleet
Decarbonisation of Metrobus
Extension of Parking Regulation

#### Bus Lanes

Cycle Feeder Routes

Bus Service Improvement Programme (BSIP)

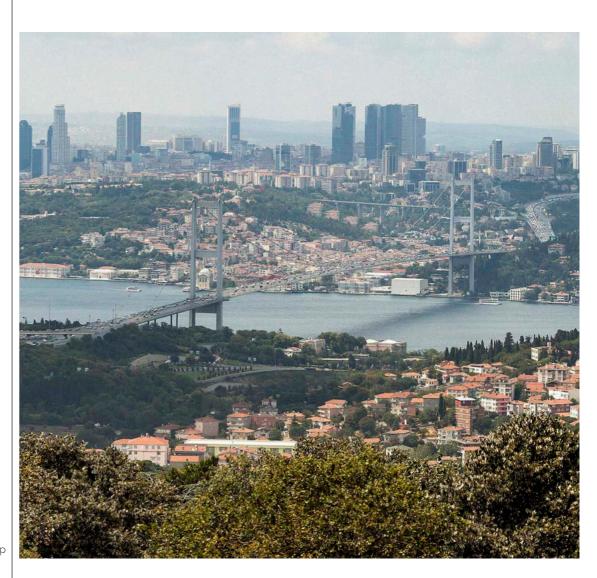
	Istanbulkart Extension to Include Minibus Operations
	Istanbulkart Network Management Control Centre (INMCC)
I	Residents' Parking Permit System
	Introduction of an Automated Payment System for Parking
	Reorganisation of Parking Regulation Enforcemer
	Minibus Feeder Routes: Arnavutköy District
	Passenger Sea Transport, Fleet Renewal
	Extension of Transfer Centres
	Traffic Calming
	Pedestrian Routes
	Junction Improvements for Pedestrains and Cyclists
	Extension of Real Time Passenger Information and Open Data
	Implementation of Institutional Mobility Management
	Construction Materials Concentration Centres (CCCs)
	Park and Ride Facilities
	E-Bikes and E-Scooters

Table 5: SUMPProjects ListedAccording to AppraisalMethod

impacts (governance and participation).

Contribution to Sustainable Development Goals (SDGs): Each project was scored according to 19 out of 80 performance criteria, adapted to the Istanbul SUMP and based on UN SDGs.

Each project's scores from the three types of appraisal were standardised within a 0-100 range and combined and were then weighted by the Project Team. At the end of this process, combined scores were calculated for each project.



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pollution, emissions), economic impacts (travel time, affordability, disaster resilience, land use, local economy, informal transport, wealth) and political

# **Theme 1** Transition to Low Carbon



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This theme advocates mutually supportive projects that reduce GHGs from transportation to make Istanbul's transport system environment-friendly and to promote a sustainable, active and healthy lifestyle for its residents. This theme adopts the following key approaches:

- Managing vehicle traffic through measures such as spatial restrictions and pricing,
- Encouraging the use of cleaner and environment-friendly vehicles,
- Reallocating the street space to increase the share of walking and cycling for a healthier, cleaner and inclusive urban space.

Eight projects were proposed under this theme and these were grouped under decarbonisation of public transport and interventions that encourage active mobility.

Decarbonisation interventions include practices to reduce air (and, as a secondary benefit, noise) pollution from vehicles. These projects are: the **Decarbonisation of the Public Transport Bus Fleet** and the **Decarbonisation of Metrobus** by using electric vehicles in public transportation; the **E-Bikes and E-Scooters** project is a suitable and efficient option, especially for first/last mile trips; the **Low Emission Zones (LEZ)** project is part of implementing restrictions and/or pricing on air pollution originating from vehicles.

Interventions to encourage active mobility improve infrastructure and safety levels for better integration of walking and cycling. Active mobility is important for health, economic, social and environmental benefits in metropolitan areas. A major part of daily mobility needs can be met by encouraging active modes of transport, such as cycling and walking for short distance trips to key destinations, and to and from public transport stops for long distance trips. Four projects aim to increase daily active mobility in Istanbul: Cycle Feeder Routes, Pedestrian Routes, Traffic Calming and Junction Improvements for Pedestrians and Cyclists. These proposals will trigger a behavioural change to increase use of active modes, increasing quality of life in the city and supporting citizens in reclaiming public space by reallocating street space.

Low Emission Zones are one of the demand management policies to discourage the use of motor vehicles in designated areas if they do not meet emission standards. Vehicles that do not comply cannot use the zone at all or can only use it at a price, according to the "polluter pays" principle. These zones: (i) relieve traffic congestion; (ii) discourage private car use; (iii) increase the share of trips made by public transport and active modes; and (iv) make the city safer and healthier for people. Although the contribution of LEZs to the overall reduction in emissions in the city is low, there will be local area benefits as air quality improves. If this project is implemented, its local impacts will need careful monitoring to avoid spatial segregation and social exclusion. The first LEZ pilot project in Istanbul is planned for the Historic Peninsula (Eminönü), followed by Kadıköy (Moda District).

#### **Problem Description**

Air pollution arises from transportation is high and this decreases the air quality and threatens the health of citizens.

#### **Relation with Other Projects**

Congestion Charging

Istanbul Network Management Control Centre (INMCC)

#### **Preparatory Tasks**

- A feasibility study for LEZ.
- A study to look at legislation to allow IMM to collect revenue.
- Review of IMM's institutional capacity in line with the Istanbul Climate Change Action Plan (ICCAP).

• Defining a price policy for drivers who want to enter the LEZ with their private vehicles, which ranges according to the emission levels of the vehicles and which promotes drivers to use low emission vehicles.

- Consideration for the LEZ to comply with EU vehicle regulations.
- Approval process from public authorities.
- •Establishing a database includes all vehicles currently using the area which is defined as the LEZ.

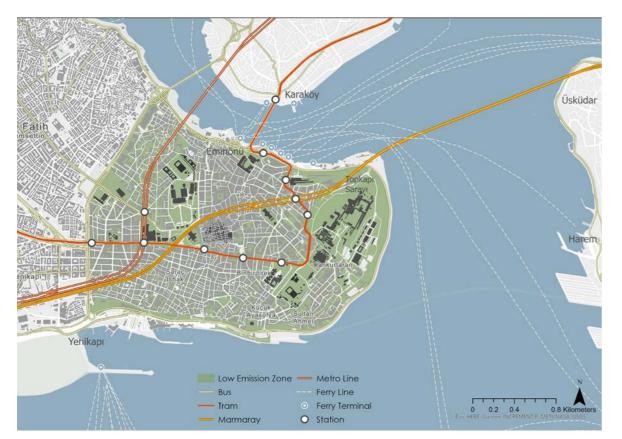
#### Follow-Up Tasks

Launch an air quality monitoring programme.

Beneficiaries	Owner/Responsible			
Population, especially groups living within the LEZ area.	IMM			
Project Process				
Preparation	Pilot			
Duration: Short Scope: Feasibility studies	Duration: Medium Scope: Pilot area imple			
Estimated Budget	<b>Financing Source</b>			
High Cost – Above 100 million TL	IMM, domestic and fore			
Contribution to SUMP Objectives				
1 2 3 4 5	6 7 8			
Index Values of Appraisals				



**Rank** : 3/26



LEZ Pilot Area in the Historic Peninsula Eminönü





The Decarbonisation of Metrobus project proposes the electric conversion of all buses that serve the D100 Highway in European side of the city. This will improve air quality for users of the highfrequency Metrobus system and for residents along the route. Although this project will make a low contribution to the reduction of emissions throughout the city and its investment costs are high, in the long run it will lead to a decrease in operating costs by reducing fuel and maintenance costs and, thanks to improved air quality, will decrease expenditure on health issues caused by air pollution. Creating a completely clean system and ensuring its economic sustainability by converting the public transport bus fleet and Metrobus to electric vehicles depends on the availability of electricity from local renewable sources.

#### **Problem Description**

Air pollution arises from transportation is high and this decreases the air quality and threatens the health of citizens.

## **Relation with Other Projects**

• Decarbonisation of the Public Transport Bus Fleet

#### **Preparatory Tasks**

• Developing Electric Vehicle Master Plan by 2050. The "2021 EV City Casebook – Scaling up to Mass Adoption" provides a good benchmark.

- Building a long-term sustainable plan for incentives/subsidies and investment in electric vehicles.
- Need to set ambitious, yet realistic targets backed by achievable action plans.
- Prepare a Low Carbon Transport Strategy, based upon the available technologies and aligned with the Istanbul Climate Change Action Plan (ICCAP).
- Moving to low carbon sources of energy in transport helping people make low carbon decisions.

#### Follow-Up Tasks

• Launch an air quality monitoring programme.

Beneficiaries	Owner/Responsible
Istanbul citizens, population especially groups living proximate to the Metrobus System.	IMM/IETT
Project Process	
Preparation	Pilot
Duration: Short Scope: Feasibility studies, decision of technology system	Duration: - Scope: -

ated Budget		Fina	ncii	ng S	sour	<b>;e</b>
Ost –	Above 100 million TL	IMM.	tax	disc	ounts	in





**Rank**: 23/26







Decarbonisation of the Public Transport Bus Fleet project entails the use of electric and/or hybrid buses along urban corridors. In the long run, cleaner vehicles reduce the adverse environmental impact of road transport by decreasing nitrogen oxide (NOx) and PM emissions, while mitigating the exposure of pedestrians, cyclists, the elderly, people with health problems, pregnant women, children and infants to air pollution-related health problems. A secondary benefit will come from transferring the existing bus fleet, which will become idle after the conversion, to other cities in Turkey that are trying to develop a public transport system. This should reduce dependence on private cars throughout the country and contribute to social inclusion by increasing accessibility to public transport systems. Even though direct local benefits and indirect national impacts will be high, the overall contribution of this project to mitigating emissions in Istanbul is low as the share of buses in the transportation system in Istanbul is limited.



©Unsplash

#### **Problem Description**

Air pollution arises from transportation is high and this decreases the air quality and threatens the health of citizens.

#### **Relation with Other Projects**

Decarbonisation of Metrobus

#### **Preparatory Tasks**

• Developing Electric Vehicle Master Plan by 2050. The "2021 EV City Casebook – Scaling up to Mass Adoption" provides a good benchmark.

- Building a long-term sustainable plan for incentives/subsidies and investment in electric vehicles.
- Need to set ambitious, yet realistic targets backed by achievable action plans.
- Prepare a Low Carbon Transport Strategy, based upon the available technologies and aligned with the Istanbul Climate Change Action Plan (ICCAP).
- Moving to low carbon sources of energy in transport helping people make low carbon decisions.

#### **Follow-Up Tasks**

• Launch an air quality monitoring programme.

Beneficiaries	Owner/Responsible
Population, especially groups living in close proximate of arterial routes operating buses	IMM/IETT
Project Process	
Preparation	Pilot
Duration: Short Scope: Feasibility studies, decision of technology system	Duration: Short and Me Scope: Pilot implemen
Estimated Budget	<b>Financing Source</b>
High Cost – Above 100 million TL	IMM, tax discounts, inc

#### **Contribution to SUMP Objectives**



**Index Values of Appraisals** 

**Benefit Cost Ratio Sustainable Development Goals Gender Equality and Social Inclusion Combined Score** 

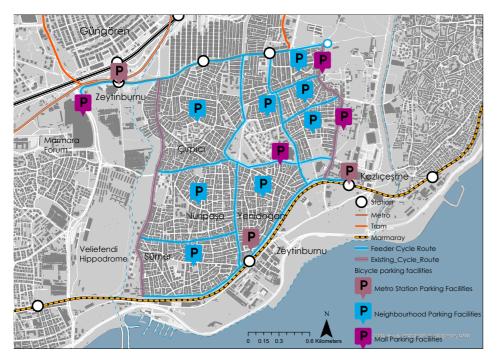


**Rank**: 24/26



	Third Parties Involved	
	Public transport vehicle ope	rators
1edium Intation	Implementation Duration: Medium and Long Scope: Roll-out of the project citywide	:t
centives for sale		
9		
		Index
		6
		63
		7
		39
	100	

The main focus of the Cycle Feeder Routes project is on the feeder function of cycling, especially so that bicycles are used for the first/last mile to access public transport stations and stops. In addition to its health benefits, cycling empowers women and provides opportunities for independent mobility, especially for low-income groups. Apart from the fact that being able to ride a bicycle at an early age is beneficial to a child's mental and social development, cycling also makes the streets more liveable and lively, and therefore enhances security. The Cycle Feeder Routes project is especially important as it will provide safe, pleasant and comfortable access, often with dedicated bike lanes, to high-capacity and rapid public transport modes, such as Metrobus, LRT and Metro, which are not always in walking distance. Two pilot implementation areas are proposed: part of Zeytinburnu district and Bostancı-Küçükyalı. The project also includes investing in cycling infrastructure around Metro stations in coordination with the Istanbul Bicycle Master Plan. From a broader perspective, through the changes brought about by this project, citizens of Istanbul will develop cycling habits, and the share of cycling trips will increase as safer bicycle lanes are introduced to the city in the medium and the long term.



Zeytinburnu Pilot Area (European Side)

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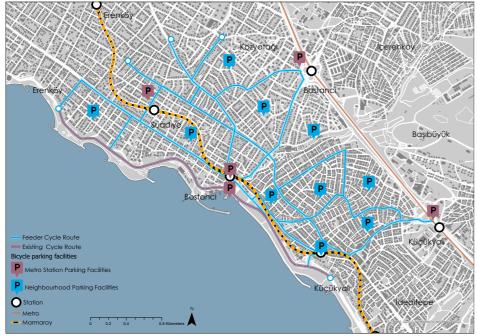
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Bostanci / Kucukyali Pilot Area (Asian Side)

#### **Problem Description**

Bicycle is not chosen as a transportation mode due to the low awareness of cycling. Additionally, integration of current cycle infrastructure with public transport is low.

#### **Relation with Other Projects**

- Traffic Calming
- Junction Improvements for Pedestrians and Cyclists
- E-Bikes and E-Scooters
- Extension of Transfer Centres

#### **Preparatory Tasks**

- Detailed design of route corridors and application of parking restrictions and displacement of parking.
- Undertake a consultation engagement process with stakeholders and residents along the routes to gain acceptance of the proposals.

• Istanbul Bicycle Master Plan should adopt the following key principles: Comprehensive cycle network, Feeder function, Integration with PT, Cycle parking, Bike sharing, Holistic design approach.

#### **Follow-Up Tasks**

- Automatic bike counters could be placed and changes in bike sharing can be analysed.
- Launch an air quality monitoring programme.
- Inform citizens with various campaigns, about choices of modes.

Beneficiaries	Owner/Responsible
City population, Cycling NGOs, IMM,	IMM
District Municipalities	

#### **Project Process**

.....

Preparation	Pilot
Duration:-	Duration: Short
Scope: -	Scope: Pilot area impl

#### **Estimated Budget Financing Source**

High Cost – Above 100 million TL

## **Contribution to SUMP Objectives**



**Index Values of Appraisals** 

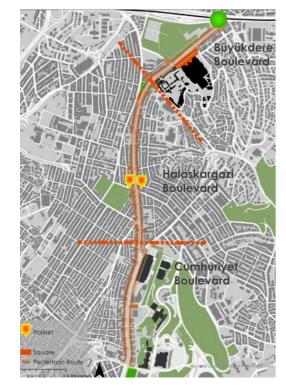


**Rank**: 4/26



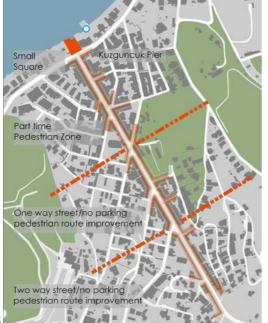
Owner/Responsible	Third Parties Involved
IMM	Citizens and Cycling NGOs, District Municipalities, ISPARK
<b>Pilot</b> Duration: Short Scope: Pilot area implementation	Implementation Duration: Medium and Long Scope: Roll-out of the project citywide
Financing Source	
IMM, district municipalities	
	Index
Ģ	52
•	• 100
• •	74
	76
0	100

The Istanbul SUMP aims to make walking a safe, pleasant, comfortable and healthy mode of transport for more people in the city. The Pedestrian Routes project will enhance existing pedestrian paths and build new ones to improve access to public transport and key attraction centres and to connect squares and green areas to main centres, in coordination with the Istanbul Pedestrian Master Plan. Some of the practices that may be adopted are: improving control of cars occupying pavements; engineering continuous pavements as part of a pedestrian network; increasing the attractiveness, safety and quality of pedestrian spaces; prioritising pedestrians over vehicle traffic; and applying universal design standards to pedestrian spaces. Two pilot axes have been identified in Istanbul, the first is Halaskargazi Street, located in the Sisli district, which has one of the highest rates of pedestrian accidents in the city and connects Taksim and Mecidiyeköy square projects. The second is leading Street, which is one of the busiest roads within the pedestrian-intensive district of Kuzguncuk. Following these two pilots, the proposal is to extend pedestrian routes to other districts.



Location of Halaskargazi/Cumhuriyet Avenue pedestrian route improvements





Kuzguncuk Pedestrian Improvement

#### **Problem Description**

Existing footpaths in the city do not provide a good pedestrian experience. Streets and roads are dominated by car traffic.

#### **Relation with Other Projects**

- Traffic Calming
- Junction Improvements for Pedestrians and Cyclists
- Extension of Parking Regulation
- Reorganisation of Parking Regulation Enforcement

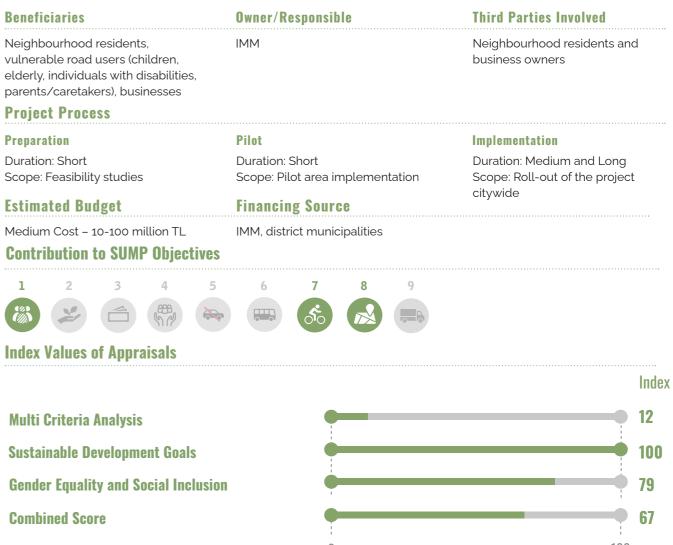
#### **Preparatory Tasks**

- Detailed design of route corridors and application of parking restrictions and displacement of parking.
- Undertake a consultation engagement process with stakeholders and residents along the routes to gain acceptance of the proposals.
- Align the objectives of the Istanbul Pedestrian Master Plan with the Istanbul SUMP.
- Development of a comprehensive walking strategy.

#### Follow-Up Tasks

- Automatic people counters could be placed to record changes in people walking. • Pedestrian surveys can be carried out to ask people for their opinion on the introduced
- interventions.
- Business surveys can also be carried out to identify if their customer numbers changed due to interventions.
- Walking buses for school children are a good way to promote walking at an early age.

Benefic	ciaries				Owner/R	esponsib	le
Neighbourhood residents, vulnerable road users (children, elderly, individuals with disabilities, parents/caretakers), businesses		IMM					
Projec	t Proce	SS					
Prepara	tion				Pilot		
	n: Short Feasibility	y studies	5		Duration: Scope: Pi	Short lot area ir	nple
Estima	ted Bud	lget			Financi	ng Sour	ce
Medium	n Cost – 1	10-100 m	illion TL		IMM, dist	rict munic	cipa
Contri	bution t	to SUMI	P Objec	tives			
1	2	3	4	5	6	7	



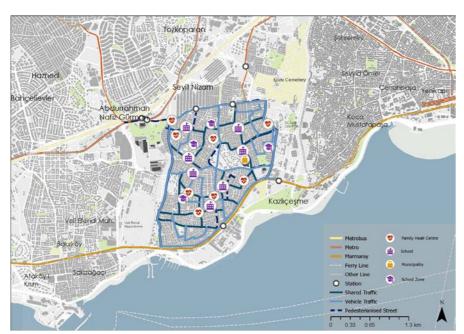
#### **Combined Score**



**Rank**: 8/26



The Traffic Calming project aims to reduce car dependency in the urban area and to make the city more liveable for all demographic and socio-economic groups. Reducing the use of motor vehicles is essential for a sustainable transport system and for mobility. This project proposes a combination of traffic calming measures for volume and speed control. Interventions will include: changing street alignments and geometry; widening pavements; narrowing vehicle lanes for level passenger crossings; reducing vehicle speeds for pedestrian crossings; increasing pedestrian spaces on streets using landscaping; reducing on-street parking and allocating those spaces for public transport stops. Traffic calming interventions are generally associated with increasing health and safety benefits, which not only reduces health costs but also boosts the local economy and reduces crime rates. These practices will also increase the daily activity level of individuals by creating attractive areas for pedestrians. As part of this project, a pilot application area (as complementary to the Cycle Feeder Routes project) was selected in Zeytinburnu. This area provides several opportunities due to the large number of commercial activities, schools and health facilities, as well as connections to key public transport modes, such as Marmaray, LRT and the Metrobus. After the pilot, traffic calming methods will be implemented in other districts, especially in pedestrian-intensive areas, around schools, health institutions and other public buildings.



#### Traffic Calming Project / Zeytinburnu

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**Proposed Hierarchy of Roads** 

#### **Problem Description**

- Problems with pedestrian safety (including vulnerable road users) in neighbourhoods and (day/care
- & primary) school catchment areas (500 m radius)
- Poor pedestrian infrastructure and parked cars.
- Lack of public space in neighbourhoods as well as safe areas/playgrounds for kids (more notable during Covid-19).
- Noise and air pollution within neighbourhoods..

#### **Relation with Other Projects**

- Pedestrian Routes
- Junction Improvements for Pedestrians and Cyclists
- Extension of Parking Regulation
- Reorganisation of Parking Regulation Enforcement
- Introduction of an Automated Payment System for Parking

#### **Preparatory Tasks**

- Detailed design of route corridors and application of parking restrictions and displacement of parking.
- Undertake a consultation engagement process with stakeholders and residents along the routes to gain acceptance of the proposals.
- Approval process from public authoritie.

#### **Follow-Up Tasks**

- Automatic people counters could be placed to record changes in people walking. • Pedestrian surveys can be carried out to ask people for their opinion on the introduced interventions.
- Air quality controls can be conducted in the area to demonstrate the changes in emissions.

Beneficiaries	Owner/Responsible
Neighbourhood residents and vulnerable road users (children, elderly, individuals with disabilities, parents/caretakers)	IMM

#### **Project Process**

Pilot Duration: Short Scope: Pilot area impl

**Financing Source** 

**Estimated Budget** Medium Cost – 10-100 million TL

## IMM, district municipa

**Contribution to SUMP Objectives** 

## 1 2 5

**Index Values of Appraisals** 



**Sustainable Development Goals** 

**Gender Equality and Social Inclusion** 

**Combined Score** 



**Rank**: 10/26



	Third Parties Involved	
	Neighbourhood residents and business owners, School shut companies	
ementation	Implementation Duration: Medium and Long Scope: Roll-out of the project citywide	
lities		
8 9		
		Index
		23
		90
		54
		63

The Junction Improvements for Pedestrians and Cyclists project will ensure that junctions are designed and upgraded to provide safe and convenient crossings for pedestrians and cyclists, giving them priority and an uninterrupted active transport network. Junctions are generally seen as part of the road network, and their importance for pedestrians and cyclists is underestimated. The project recommends reducing waiting times at junctions for pedestrians and cyclists and proposes interventions at different scales. Pedestrian and cycle bridges are recommended along the main arteries. Such bridges can be attractive facilities, with the application of design principles that take account of climate conditions for landscape elements, floor coverings, lighting and materials. In addition, level crossings, raised junctions, textured crossings and accessible pedestrian signals with shorter waiting times would be implemented in central areas. The pilot proposal is to improve three junctions: a proposed pedestrian-cycle bridge over the Ümraniye Kemerdere Junction on D016 highway, as an example of a macro-scale intervention; an intersection in Pendik district, to be geometrically designed as a safe junction for cyclists, as an example of a meso-scale intervention; a signal-crossing in Levent to connect Plazas and the Levent Carsi, designed as a raised junction (at the same level as the pavement) to reduce waiting times for pedestrians, as an example of a micro-scale intervention.

#### Ф 9 Ð 0 5 S 5 9 5 **d**5 70 Ф



#### **Problem Description**

The design and operation of the existing junctions are car oriented pedestrians and cyclists are very long. The current design is not provision for disabled users is poor. Safety and inclusion are not

#### **Relation with Other Projects**

- Cycle Feeder Routes
- Pedestrian Routes

#### **Preparatory Tasks**

• Prepare a detailed design of the junction upgrades.

 Undertake a consultation engagement process with stakehold them about proposals, their benefits and to gain acceptance of

#### Follow-Up Tasks

• Automatic people counters could be placed to record changes in walk and cycle trip patterns.

• Pedestrian surveys can be carried out to ask people for their opinion on the introduced interventions.

Beneficiaries	Owner/Responsible
Neighbourhood residents, vulnerable road users (children, elderly, individuals with disabilities, parents/caretakers), businesses	IMM
Project Process	

#### Project Process

Preparation	Pilot
Duration: - Scope: -	Duration: Short Scope: Pilot area impl
Estimated Budget	<b>Financing Source</b>
High Cost – Above 100 million TL	IMM, district municipa

#### **Contribution to SUMP Objectives**



#### **Index Values of Appraisals**

Multi Criteria Analysis **Sustainable Development Goals Gender Equality and Social Inclusion Combined Score** 



**Rank**: 12/26

ed. As a result, waiting times for
pedestrian and cycle friendly. The
considered

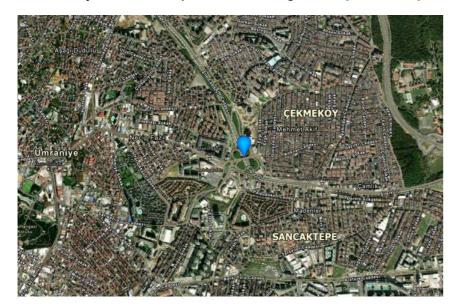


lers and affected	users to	inform
the proposals.		

	Third Parties Involved Neighbourhood residents and business owners	k
ementation	<b>Implementation</b> Duration: Medium and Long Scope: Roll-out of the project citywide	
alities		
8 9		
		Index
		9
		88
		70
		60
	100	



Levent – Büyükdere Avenue pedestrian crossing / raised junction (major road)



Kemerdere Junction, Pedestrian Crossing



Pendik Cycle Crossing



Ağaoğlu Çekme Park Sitesi • •

cöy

The E-Bikes and E-Scooters project focuses on micro-mobility in Istanbul. Its aim is to increase use of these modes of transport across the city, especially for first/last mile trips. This project also contributes to the innovation theme, as it is supported by the entrepreneurship ecosystem and smart applications. E-bikes and e-scooters offer an alternative not for active mobility but to short car and bus/minibus trips. Regulating location choices for e-scooters is of the upmost importance, and proposals include university campuses, commercial areas and transfer centres. Pilot areas cover the Beşiktaş Pier-Yıldız Technical University Campus, Istanbul Technical University Taşkışla Campus, and Nişantaşı.

#### **Problem Description**

Create alternative for short car trips.

#### **Relation with Other Projects**

- Cycle Feeder Routes
- Neighbourhood Mobility Service Centres

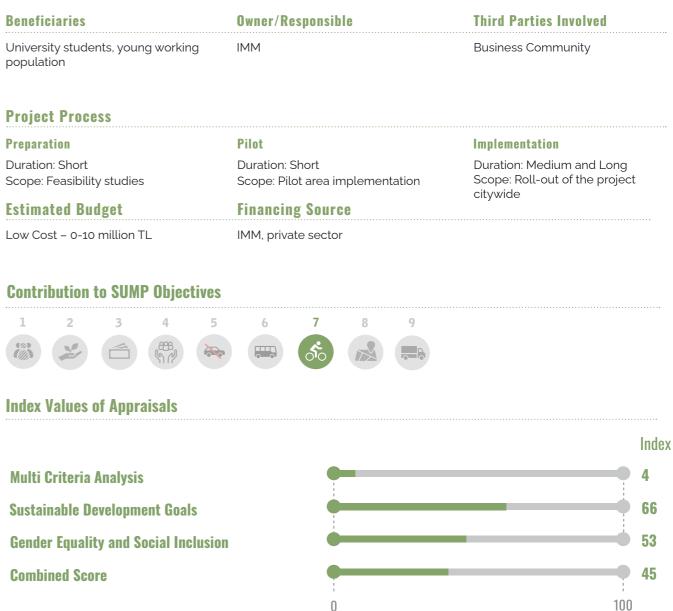
#### **Follow-Up Tasks**

- Monitor distribution of e-scooters and regularly receive data from companies on the uses of e-scooters to determine key locations for new infrastructure development.
- Monitor accidents and develop necessary precautions.

• Observe charging fees of companies and provide incentives for low-cost companies (e.g. giving priority in the number of licenses).

## population

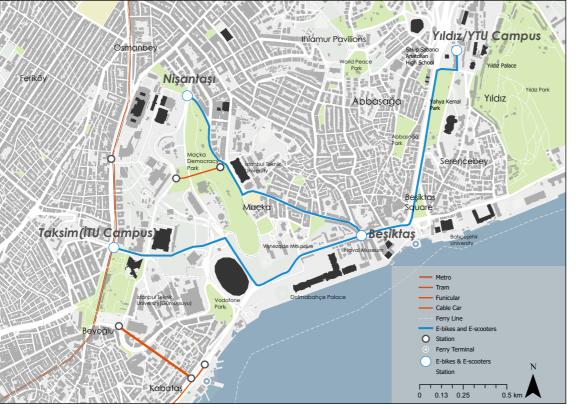
Preparation	Pilot
Duration: Short Scope: Feasibility studies	Duration: Short Scope: Pilot area imple
Estimated Budget	<b>Financing Source</b>
Low Cost - 0-10 million TI	IMM private sector



0



**Rank**: 20/26



Beşiktaş (Pier) – Yıldız /YTÜ Campus – Taksim (İTÜ Campus) / Beşiktaş – Nişantaşı



# Theme 2

## Seamless Transfer and Integration



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The main purpose of the projects under this theme is to offer an accessible, integrated, inclusive, safe and comfortable transport system to residents of Istanbul and to promote a shift to using public transport.

The expansion of Istanbul's rail network has changed the behaviour of public transport users in Istanbul. Previously, passengers had to access the nearest bus station to begin their journey, now they can use the nearest rail station. This change has created a significant accessibility issue that is known as a first/last mile problem. The opportunity to address this issue is increasing with every new Metro line, given the spatial distribution of the population in Istanbul adjacent to rail stations. Only one-third of Istanbul citizens live within 500 metres of a station and around 90% live within 3 kilometres. Therefore, introducing first/last-mile accessibility solutions to the rail network and focusing on areas where there is no direct access to a rail station, is one of the priorities of Theme 2. The aim is to extend the rail network and improve sea transport, but an increase in car ownership will put additional pressure on the highway network. Buses operated under the control of IETT, have a daily ridership of over 3 million passengers, representing 30% of the city's total daily public transport passengers. Bus lines can make more efficient use of limited road space than private cars. Therefore, policies and projects that promote a transition from private car trips to bus trips are among the focal points of Theme 2.

The main project under this theme is the **Rail Network Extension** project. The Istanbul public transport system is undergoing a transformation towards a system dominated by rail systems, and this will continue at an accelerated pace. However, the area covered by the rail network is not the only indicator of an efficient and accessible transportation system. New rail systems need to integrate with other transport modes to provide access to the rail system network using different solutions for those living at a distance from the stations. The true potential of sea transport should be maximised and policies developed to make the limited road network more efficient so that bus use becomes more attractive than private vehicle use. The projects proposed in this theme cover all these points.

Istanbul's transport system is in the middle of a rail system revolution that is expected to last for 30-40 years, and the resulting integrated rail system network will be one of Istanbul's most important gains in the transition from private cars to public transport. This puts the Rail Network Extension project at the heart of this theme – and perhaps of all SUMP activities. This project covers a total of 27 rail lines, 14 of which are under construction and 13 are planned. Considering the total benefits of all quantitatively appraised projects, this project is predicted to provide 39% of exhaust emission reductions, 85% of wellto-tank emission reductions, 56% of air pollution reductions, 90% of all time savings and 67% of all reduced accidents.

#### **Problem Description**

Rail network does not cover citywide. Public transport system heavily depends on road based modes (bus and minibus).

#### **Relation with Other Projects**

- Cycle Feeder Routes
- Pedestrian Routes
- Passenger Sea Transport-Fleet Renewal
- Extension of Transfer Centres
- Park and Ride Facilities

#### **Preparatory Tasks**

• Undertake a feasibility study to confirm the correct location of stations, number of required vehicles, operational framework, exact benefits and costs.

• Undertake a consultation engagement process with stakeholders and residents along the routes to gain acceptance of the proposals.

• Prepare the detailed designs of lines for construction and assess further rail lines.

#### Follow-Up Tasks

- Track and monitor the ridership and occupancy.
- Analyse modal shift after new line put into operation.
- Closely monitor the progress of construction for ongoing works.
- Perform qualitative customer satisfaction analyses.

Beneficiaries	Owner/Responsible
Public transport users	IMM as a provider of i Metro Istanbul Inc. as
Project Process	
Preparation	Pilot
Duration: - Scope: -	Duration: - Scope: -
Estimated Budget	<b>Financing Source</b>

High Cost – Above 100 million TL

#### Financing Source IMM, related ministry,

## **Contribution to SUMP Objectives**



**Index Values of Appraisals** 

**Benefit Cost Ratio Sustainable Development Goals Gender Equality and Social Inclusion Combined Score** 



**Rank**: 1/26

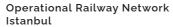


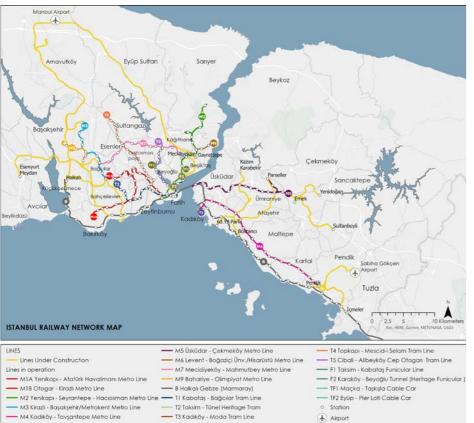
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	Third Parties Involved	
nfrastructure operator	All transport operators	
	Implementation	1
	Duration: Short, Medium and Scope: Completion of the pla and ongoing projects	
PPP projects		
8 9		
		Index
	1	60
		63
		100
		80
	100	







Lines Under Construction and Operation





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#### **Problem Description**

The core policy objective of the Istanbulkart extension is to deliver an integrated public transport network for Istanbul which enables travel across all significant public transport modes by one means of payment.

#### **Relation with Other Projects**

Minibus Feeder Routes: Arnavutköy District

#### **Preparatory Tasks**

• Install validators on minibuses, including devising and installing the functionality necessary to enable identification of the minibus location using GPS.

• On a general level, a process of gradually convincing all District Minibus Operators Chambers in Istanbul is necessary to move to the new system. At a detailed level, agreement by each relevant Minibus Operators Chamber (for the relevant district) is needed to change to a flat fare system, and agreement as to what that fare should be.

• The method of taxation of minibus operator income will need to change as the process of recording and receiving income will change, and legislative decisions should be arranged on granting concessions on minibus travel for concession-holders.

#### **Follow-Up Tasks**

- Promotion efforts to ensure that inhabitants are aware of the fact that some minibuses are included in Istanbulkart system.
- On-going data analysis of the Istanbulkart data to understand the usage patterns in depth.

Beneficiaries	Owner/Responsible
Passengers	IMM
Project Process	
Preparation	Pilot
Duration: - Scope: -	Duration: Short Scope: Transition to ad Istanbulkart system or
Estimated Budget	<b>Financing Source</b>
High Cost – Above 100 million TL	IMM, private sector
<b>Contribution to SUMP Objectives</b>	
<b>1</b> 2 <b>3</b> 4 5	6 7
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Index Values of Appraisals	

**Multi Criteria Analysis Sustainable Development Goals Gender Equality and Social Inclusion Combined Score** 



**Rank**: 16/26



	Third Parties Involved	
	Various chambers of minibus operators	
doption of n minibuses	<b>Implementation</b> Duration: Short and Medium Scope: Transition to gross-co	ntract
8 9		
		Index
		28
		66
		36
		50
	100	

With the increase in population and the high number of private and public transport vehicles, there is a need to manage Istanbul's transport network proactively. This need can only be met by making traffic management smarter and integrated with public transport. The main aim of the Istanbul Network Management Control Centre (INMCC) is to provide a unified view across the highway network throughout the Istanbul Metropolitan area, by creating a single control centre and operating platform that supplies information on all transport modes across the highway network. The INMCC will supply the current Transportation Management Centre (TMC) with data that covers bus and minibus operations and that monitors traffic signals and traffic flow as the first step, followed by co-management to cover all forms of transport. TMC's responsibilities will need to expand in the long run, to include public transport operators, emergency services, the police and road maintenance crews. The INMCC will be an important element in the effective management of the highway network and, ultimately, the city's mobility.



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#### **Problem Description**

There are currently environmental problems, such as air quality and noise associated with congestion on the highway network. In addition, there are still problems with delays on the highway network during peak hours resulting in unreliability journey times for both cars and buses and reduced capacity due to accidents and road maintenance..

#### **Relation with Other Projects**

- Low Emission Zones
- Congestion Charging
- Bus Lanes
- Park and Ride Facilities
- Extension of Parking Regulation
- Reorganisation of Parking Regulation Enforcement

#### **Preparatory Tasks**

- Undertake a detailed review of the capacity and function of th
- Develop policy goals and define scope of the INMCC services

• Undertake key stakeholder consultation to encompass a broad identify the INMCC services which are viable and how they shou

#### Follow-Up Tasks

- Set up user surveys to monitor user satisfaction of the highway
- Set up measures to monitor incident clearance within 1 hour a

• Average bus and general traffic speeds and measure reductio peak traffic conditions.

Beneficiaries	Owner/Responsible
Car drivers, bus users, emergency services, IMM and residents of Istanbul	IMM
Project Process	
Preparation	Pilot
Duration: Short	Duration: -
Scope: Development of ITS architecture and policy goals	Scope: -
Estimated Budget	<b>Financing Source</b>

High Cost - Above 100 million TL

IMM

#### **Contribution to SUMP Objectives**



**Index Values of Appraisals** 

**Multi Criteria Analysis Sustainable Development Goals Gender Equality and Social Inclusion Combined Score** 



**Rank**: 6/26

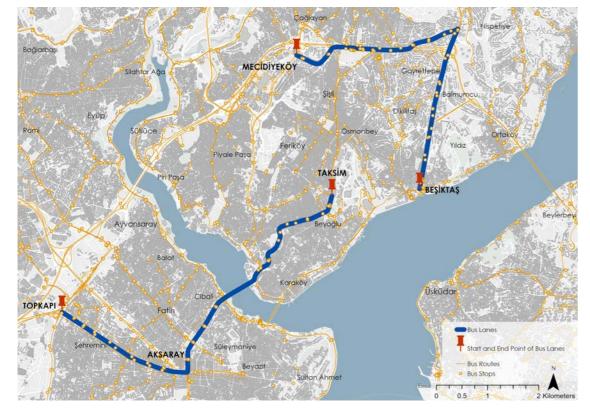


ne existing TMC for Istanbul. Is to be selected. Ider view of the existing TMC and uld be implemented.		
y network. and delay during road works. on in journey times under ordinary and		
Third Parties Involved		
Public, public transport a emergency services	and	
<b>Implementation</b> Duration: Medium Scope: Roll-out of the pr	roject	
		Index
	!	75
		73
		50
		72
	100	

To fulfil the SUMP vision for Istanbul to promote a sustainable transportation system, the proposed routes in the Bus Lanes project will create a network of bus lanes along Istanbul's major arteries to encourage public transport usage and to improve air quality. These special lanes give priority to buses, reducing travel time and increasing the reliability of buses compared to traffic on congested arteries. They also significantly help reduce air pollution on roads that serve general vehicular traffic, where one or more lanes are reserved for public transport buses.



Routes of Kızıltoprak-Bostancı and Kadıköy (Ziverbey)-Maltepe bus lanes



Routes of Millet Cd-Aksaray-Taksim and Okmeydanı-Mecidiyeköy-Barbaros Blv-Beşiktaş bus lanes

#### **Problem Description**

Inefficient operation performance, delays in bus services and reduced reliability of bus services.

#### **Preparatory Tasks**

- Undertake a feasibility study to confirm the correct location of pilot corridors.
- Detailed design of route corridors and application of parking restrictions and displacement of parking,
- An enforcement framework for lanes being used by unauthorized vehicles or illegal parking on the corridors should be established.

#### **Follow-Up Tasks**

- Monitor bus ridership and occupancy.
- Monitor bus lane utilisation, bus volumes and general traffic on the corridor.
- Establish a bus lane strategy and roll out programme.

Beneficiaries	Owner/Responsible
Public transport users; bus, minibus and dolmus operators	IETT

#### **Project Process**

Preparation	Pilot
Duration: Short	Duration: Short
Scope: Feasibility studies	Scope: Pilot area impl

Estimated Budget	Financing Source
High Cost – Above 100 million TL	IMM

#### **Contribution to SUMP Objectives**



**Index Values of Appraisals** 

**Benefit Cost Ratio Sustainable Development Goals Gender Equality and Social Inclusion Combined Score** 

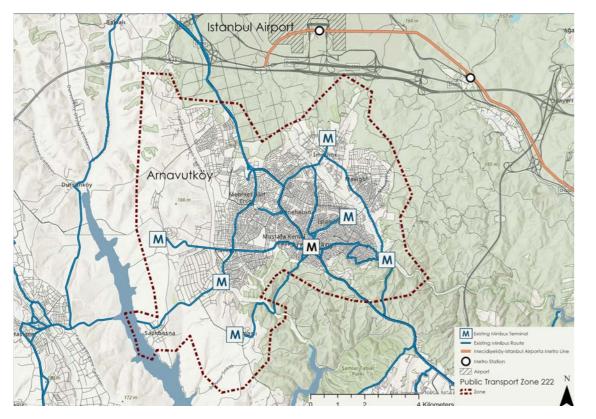


**Rank**: 7/26

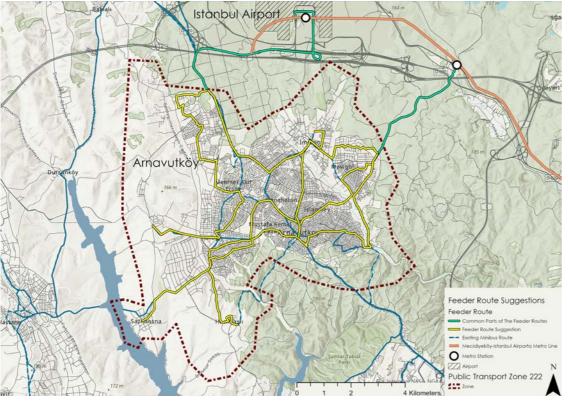


	Third Parties Involved	
	Minibus and dolmus operato	rs, police
ementation	Implementation Duration: Medium Scope: Roll-out of the project	t
8 9		
	ę	Index 77
		64 49
	100	70

The Minibus Feeder Routes project aims to provide feeder minibus lines to access the main bus and rail stations. As part of this project, a pilot application has been proposed for Arnavutköy district. In order to commercially satisfy the minibus operators, the project includes introducing a gross wage contract system for minibuses in the long term, to increase service quality and to reduce competition through route tendering. This will also guarantee service standards



Current minibus routes in the Arnavutkoy district



Suggested minibus feeder routes in the Arnavutkoy district

#### **Problem Description**

To maximise use of Metro lines, there must be good public transport services to and from stations. Minibuses play a very important role but are presently unregulated and do not provide reliable timetabled services.

#### **Relation with Other Projects**

- Istanbulkart Extension to Include Minibus Operations
- Extension of Transfer Centres

#### **Preparatory Tasks**

• If interim pilot gross cost contracts are launched, monitoring will be required during these interim contracts to minimise fraud by operators and/or passengers.

### **Follow-Up Tasks**

- Online tracking of the vehicles to ensure that the drivers meet the design standards of the service.
- Promotion efforts to ensure that inhabitants are aware of the routes and their attributes.
- On-going data analysis of the Istanbulkart data to understand the usage patterns in depth.

Beneficiaries	Owner/Responsible
People living in the catchment area of the selected stations	IMM
Project Process	

Preparation	Pilot
Duration: - Scope: -	Duration: Short Scope: Definition of pil
scope	Scope. Demnition of pit

Estimated Budget	Financing Source
Low Cost – 0-10 million TL	IMM

#### **Contribution to SUMP Objectives**



**Index Values of Appraisals** 

Multi Criteria Analysis Sustainable Development Goals Gender Equality and Social Inclusion Combined Score



**Rank**: 18/26



	Third Parties Involved IMM or a dedicated new unit public transport operators	and
lot routes	<b>Implementation</b> Duration: Medium Scope: Roll-out of the project citywide	
8 9		
		Index
		46
		61
		21
		47
	100	

Istanbul has a coastline of over 500 kilometres, which should create opportunities for sea transport, but this mode has been neglected for years. Sea-based transport offers connectivity between the two continents and is an alternative to the city's congested highway network. As part of the Passenger Sea Transport - Fleet Renewal project, four main categories connect sea transport to the transport network, including: (i) coordinating with the four funicular lines in the Rail Network Extension project that integrate with the rail network; (ii) developing a new Sea Transport Master Plan as an overarching policy to organise ongoing efforts; (iii) extending sea taxi operations, which started in August 2021 with 50 sea taxis, which IMM supports as a demand-responsive mode (this project will also provide insights into sea transport demand around the city); (iv) adjusting the City Lines fleet composition that includes six different categories of vessel.



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#### **Problem Description**

- Sea transport is not used effectively.
- Does not cover city well with frequent services.
- Public transport integration of all modes is not sufficient.

#### **Relation with Other Projects**

- Extension of Transfer Centres
- Rail Network Extension
- Minibus Feeder Routes: Arnavutköy District

#### **Preparatory Tasks**

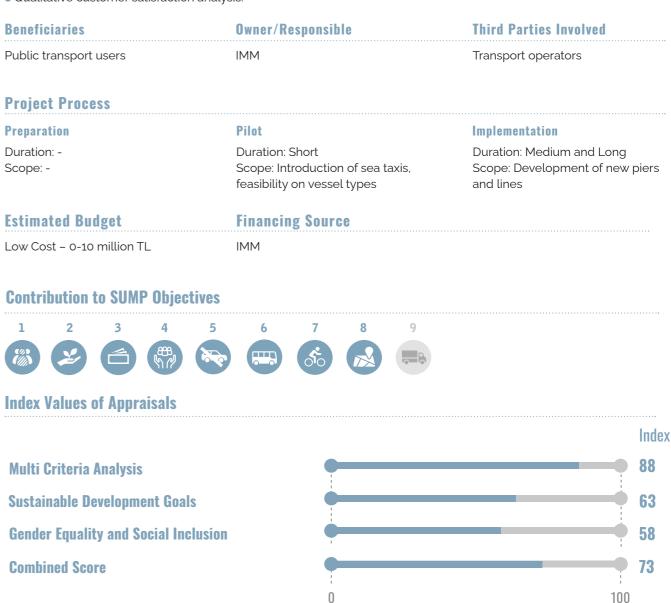
- Sea Transport Master Plan.
- Legislation/policy study.
- Feasibility study integrated into Sea Transport Master Plan for vehicle types and capacities.

#### **Follow-Up Tasks**

- Monitor modal share of sea transport, vessel utilization and line frequency.
- Qualitative customer satisfaction analysis.

Beneficiaries	Owner/Responsible
Public transport users	IMM

	Dilat
aration	Pilot
tion: -	Duration: Short
De: -	Scope: Introduction of
	feasibility on vessel typ
mated Budget	<b>Financing Source</b>
Cost – 0-10 million TL	IMM



**Multi Criteria Analysis Sustainable Development Goals Gender Equality and Social Inclusion Combined Score** 



**Rank**: 5/26



Transfer centres enable a smooth and trouble-free transition from one means of transport to another (a change of mode or simply a change of vehicle) within a traveller's end-to-end journey. Having a sustainable transport system in the city depends on having a public transport system that meets citizens' needs. The Extension of Transfer Centres project will create a fully integrated public transport network for Istanbul, based on a high-quality design and focused on meeting user needs. This will be achieved by implementing a series of policies and projects, but at their heart is establishing a series of fully functioning transfer centres.

#### **Problem Description**

Poor connectivity outside the city centre to and from Rapid Transit (i.e. Metro lines, Tram Lines, Metrobus and Marmaray) results in underusage of the Rapid Transit lines and over usage of (and congestion on) the road network. The core policy objective of the Extension of Transfer Centres is to create such a fully integrated public transport network for Istanbul.

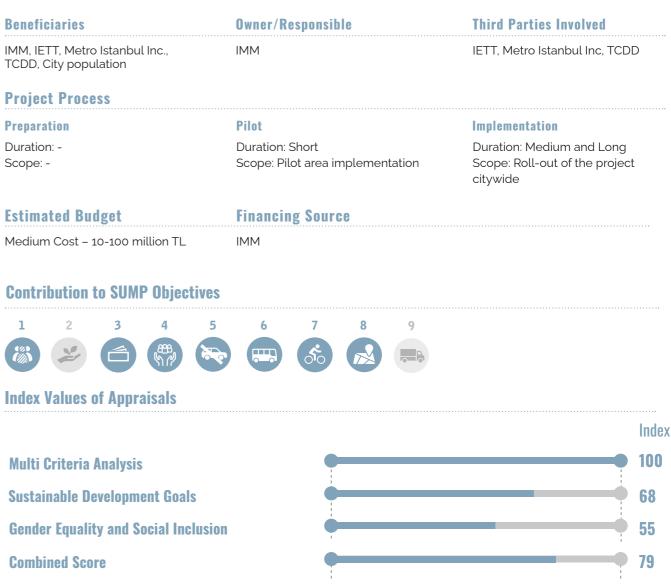
#### **Relation with Other Projects**

- Cycle Feeder Routes
- Rail Network Extension
- Passenger Sea Transport-Fleet Renewal
- Feeder Routes: Arnavutköy District

#### **Follow-Up Tasks**

- Passenger approval and information usage surveys.
- Video footage of passenger movement through Transfer Centres before and after changes.
- Monitoring of use of facilities at Transfer Centres in the pilot.

Beneficiaries	Owner/Responsible	
MM, IETT, Metro Istanbul Inc., CDD, City population	IMM	
Project Process		
reparation	Pilot	
Duration: - Scope: -	Duration: Short Scope: Pilot area imp	
stimated Budget	<b>Financing Source</b>	





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Rank: 2/26
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The Extension of Real Time Passenger Information and Open Data has two aims. The first is to make passengers aware of real time travel information for public transport vehicles, which differs from static timetable departure information. This information raises satisfaction levels by helping passengers to optimise their journey and reduce travel time. This is also important in encouraging the transition to public transport. The second aim is to adopt an open data philosophy. The use of high-quality open data is also mentioned in the SUMP guidelines as an important recommendation for the planning process. Using open data that citizens and stakeholders can also access and use makes planning and operation processes more transparent. This enhances the decision-making process, improves service planning and quality, and enables public participation.

#### **Problem Description**

 Real-Time Passenger Information: Inconvenience (for passengers) that arises from changing departure information due to real-world events.

• Open Data: Lack of creative ideas that might help solving important social and economic problems.

#### **Relation with Other Projects**

- Extension of Transfer Centres
- Minibus Feeder Routes: Arnavutköy District
- Rail Network Extension

#### **Preparatory Tasks**

• Real-Time Passenger Information: Assessment of the current situation of the data produced by the vehicles of each mode and planning and realisation of the projects that will ensure that the deficiencies are completed.

• Open Data: Assessment of current situation of datasets and planning and realisation of the projects that will ensure that the datasets can work with each other properly.

#### **Follow-Up Tasks**

• Real-Time Passenger Information: Promotion efforts to ensure that citizens are aware of the information itself and the appropriate channels that are providing it.

• Open Data: Implement promotion campaigns in the form of traditional marketing efforts and innovative events such as hackathons or competitions.

Beneficiaries	Owner/Responsible
IMM, PT operators, City population	IMM
Project Process	
Preparation	Pilot

Preparation Pilot	
Duration: - Duratio	n: -
Scope: - Scope:	-

Estimated Budget	<b>Financing Source</b>
High Cost – Above 100 million TL	IMM

#### **Contribution to SUMP Objectives**



**Index Values of Appraisals** 

**Multi Criteria Analysis Sustainable Development Goals Gender Equality and Social Inclusion Combined Score** 

**Rank**: 13/26



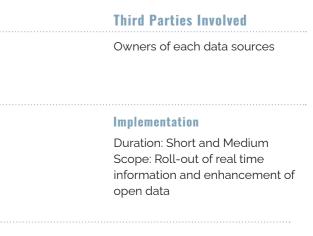
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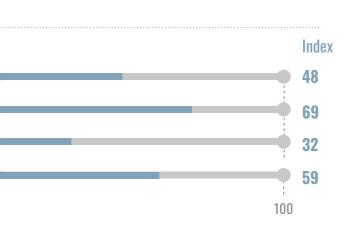




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The Bus Service Improvements Programme (BSIP) aims to improve accessibility to public transport throughout the city by increasing the frequency of buses. In the outer areas of Istanbul, it is common for buses to be limited to two or even one bus per hour, which does not attract use. Initially, the BSIP will build on existing routes and timetables, to focus on increasing service frequency. IETT constantly re-plans routes to meet demand arising from the development of new settlements, the opening of new Metro lines, and other changes; IETT also adds new lines as needed. BSIP should focus on peripheral areas and then be applied throughout the city to become an integral part of the city's constant route optimisation.

#### **Problem Description**

Unattractiveness and low frequency of bus services in some parts of the city.

#### **Relation with Other Projects**

- Extension of Transfer Centres
- Minibus Feeder Routes: Arnavutköy District
- Rail Network Extension

#### **Follow-Up Tasks**

• IETT should be encouraged to monitor ridership on BSIP routes. The Istanbul Transport Model (ITM) may be used to provide annual updates of public transport accessibility indicators.

Beneficiaries	Owner/Responsible
City population especially non car	IMM, IETT
owners in outer areas	

Project Process		
Preparation	Pilot	
Duration: - Scope: -	Duration: Short Scope: Pilot impleme	
Estimated Budget	Financing Source	

Lotinatoa B		
•••••		
High Cost – Al	bove 100 million TL	IMM

#### **Contribution to SUMP Objectives**



**Index Values of Appraisals** 

**Benefit Cost Ratio Sustainable Development Goals Gender Equality and Social Inclusion Combined Score** 

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	Third Parties Involved	
	District authorities. Some extra for bus parking and servicing required. Minibus operators sl informed (parallel project to e them to provide improved fee route services)	may be hould be engage
	Implementation	
	Duration: Medium	
ntation	Scope: Roll-out of the project	
8 9		
		Index
		9
		64
		51
	1	51
	Ť	VI

The Park and Ride Facilities project will allow private vehicle users to park near a station and transfer to public transport to continue their trip. This increases access to the rail system network for those residing in areas where public transport is not developed and reduces private car trips to densely populated and crowded city centres. These facilities will offer high-capacity, convenient and safe parking locations outside city centres, and a direct connection to various public transportation modes, particularly rail systems. They will help to reduce traffic congestion and parking demand in city centres. The key objectives of the Park and Ride Facilities project are: (i) reducing congestion on main arteries to/from city centres; (ii) increasing public transport ridership; (iii) reducing transport-related emissions per capita; and (iv) limiting parking demand in city centres. The success of this project is closely related to the level of service of the connected public transport mode. Therefore, the first facilities should be integrated with fast and reliable services, like the Metro.

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Pendik 6

#### **Problem Description**

Existing facilities are promising but not enough to instigate a significant shift.

#### **Relation with Other Projects**

- Extension of Transfer Centres
- Rail Network Extension

#### **Preparatory Tasks**

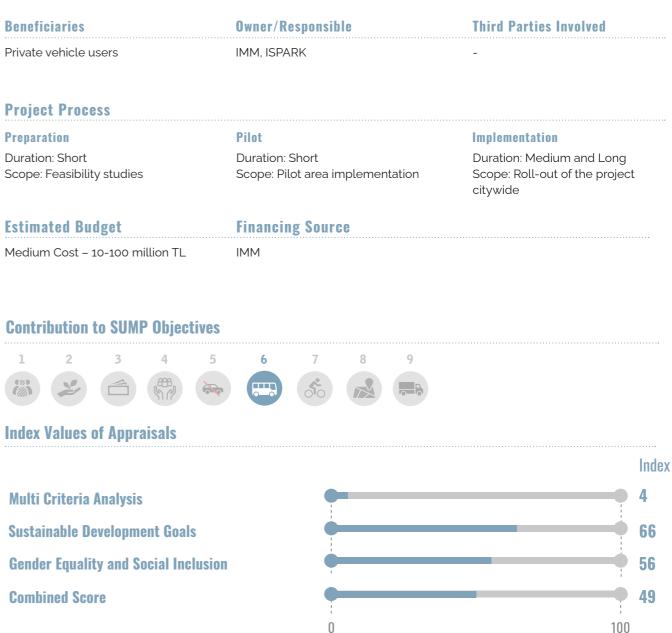
- Determining existing supply in terms of capacity and turnover rate.
- Updating the existing parking demand model.
- As a part of the demand model, performing sensitivity analyses of parking fee and distance to the destination.

#### **Follow-Up Tasks**

• Using following criterias to evaluate the Park and Ride Facilities; turnover rate, access mode share, operating cost per parking space.

IMM, ISPARK
Pilot
Duration: Short

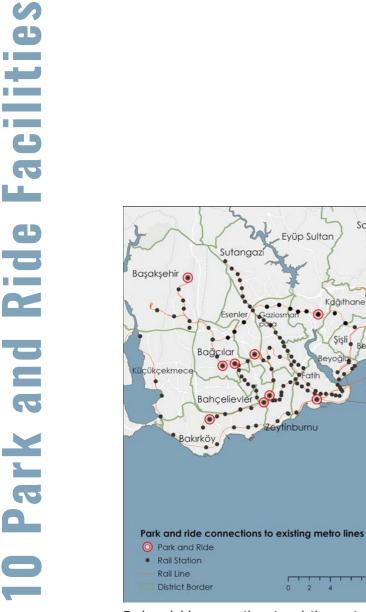
Estimated Budget	<b>Financing Source</b>
Medium Cost – 10-100 million TL	IMM





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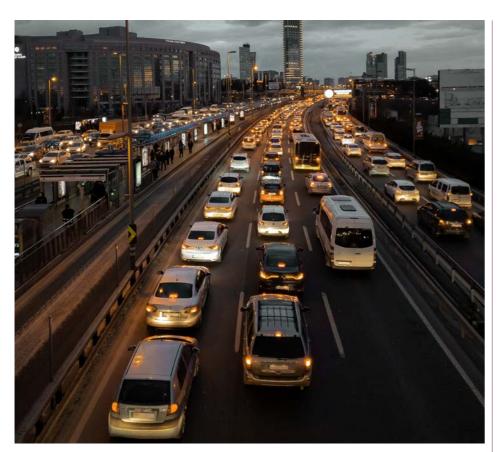
Park and ride connections to existing metro lines

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# Theme 3 Reducing Congestion



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The projects under this theme aim to solve traffic congestion problems in Istanbul by reducing the use of private cars, which is the main source of these problems. The projects improve alternatives to private car use (pull) by attracting trips to sustainable modes, and deter travellers from private car use (push) through demand management measures. Theme 3 projects offer solutions in the context of demand and mobility management, parking regulations and freight transport management.

Parking regulations and demand management strategies related to parking are among the measures that can be taken against traffic congestion problems in cities. Considering that all vehicles need parking spaces at their destinations, practices such as restricting parking supply (or not providing parking spaces) or setting parking fees high enough to deter users and so on, have a high probability of success. Moreover, in metropolitan cities like Istanbul, it is impossible to cope with the parking demand from an ever-increasing number of motor vehicles. As part of the Istanbul SUMP, the parking issue has been addressed from different aspects with four core projects that are interconnected in terms of content and scope, and are the cornerstones of newly developed parking policies.

One of the topics covered under Theme 3 is mobility management. This includes interventions to change the choices and behaviours of citizens regarding transportation, and to ensure that sustainable transportation modes are used more frequently. These practices usually include both soft measures, such as providing information or organising services, and stronger measures, such as imposing taxes or introducing regulations. A combination of complementary soft and hard measures leads to efficient management practices. Of the three mobility management projects developed under Theme 3, the **Implementation of Institutional Mobility Management** and the **Neighbourhood Mobility Service Centres** are soft measures, while **Congestion Charging** is a hard measure.

Congestion Charging requires private car users to pay for entering certain areas. Its main purpose is to prevent congestion problems from heavy private car traffic, especially in central areas, to create more liveable spaces and to increase citizens' quality of life. Besides being a deterrent, Congestion Charging generates additional income, which can be used to improve air quality and the public transport system. Putting active transport arrangements in place will increase the success of this intervention. The Istanbul SUMP proposes a pilot Congestion Charging project in an area of approximately 6 km<sup>2</sup> in the Historic Peninsula. It is possible to run this in parallel with the LEZ (as proposed in Theme 1 and as happens in London). This pilot implementation will be a test bed for different pricing applications that may be launched in other parts of Istanbul in the coming years.

#### **Problem Description**

Air pollution arised from transportation is high and this decreases the air quality of citizens and threaten their health. Congestion and unreliable journey times for cars and buses.

#### **Relation with Other Projects**

- Low Emission Zones
- Istanbul Network Management Control Centre (INMCC)

#### **Preparatory Tasks**

• Using following in policy development phase; feasibility study, functional design, technical design, institutional and legal design and stakeholder engagement.

## **Follow-Up Tasks**

• Developing the implementation plan.

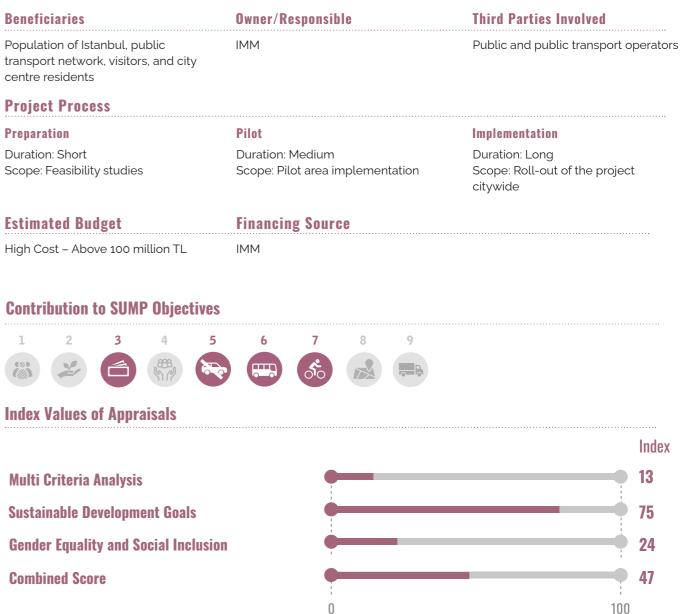
• Monitor congestion and travel times, travel patterns, public transport usage, and business, economy and accidents.

• Launch an air quality monitoring programme.

Beneficiaries	Owner/Responsible
Population of Istanbul, public transport network, visitors, and city centre residents	IMM
Project Process	
Preparation	Pilot
Duration: Short	Duration: Medium

Duration: Short	Duration: Medium
Scope: Feasibility studies	Scope: Pilot area impl

Estimated Budget	Financing Source
High Cost – Above 100 million TL	IMM





**Rank**: 19/26

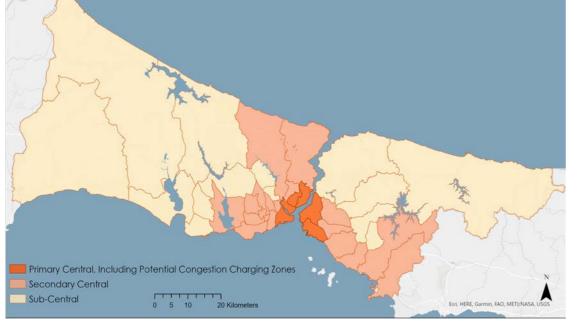


Congestion Charging Zone for the Historic Peninsula



The main project to focus on parking areas and prices is the Extension of Parking Regulations. The project classifies areas of Istanbul as primary central, secondary central and non-central, depending on parking demand, land use and so on, and parking supply and fees will be different in different areas. This will result in extended coverage of paid parking in the city, with varying fees based on the spatial classification (e.g. higher fees in primary central areas, lower fees in non-central areas). The main benefits of the project include: (i) ensuring more efficient use of existing parking spaces; (ii) clearing valuable public spaces of private cars; and (iii) creating an additional income source for the municipality by increasing revenues from parking management.

# 5 Ф arking 5



#### Location Map

A map with three different areas has been defined as follows: Primary, spatial, secondary, non- central areas.

#### **Problem Description**

Parking congestion, extensive park search traffic, parking management loss making, insufficient benefits from potential regulating power of parking management to decrease motorised traffic volume, pedestrian footways blocked by parked cars, extensive public space occupied by parked cars.

#### **Relation with Other Projects**

- Pedestrian Routes
- Traffic Calming
- Residents' Parking Permit System
- Introduction of an Automated Payment System for Parking
- Reorganisation of Parking Regulation Enforcement

#### **Preparatory Tasks**

• The revised parking policy needs to be drafted and decided.

• An improved legal framework, which makes sure that non-payment of the parking fee can actually be enforced and fines can effectively be collected.

## **Follow-Up Tasks**

 Monitor occupancy of parking places; to high occupancies may need changes in parking regulation, such as further increase of the parking fees.

• Monitor effectiveness of parking enforcement operation, non-payment.

Beneficiaries	Owner/Responsible
IMM/ISPARK, City population,	IMM, ISPARK
residents in affected areas	

#### **Project Process**

Preparation	Pilot
Duration: Short	Duration: Short
Scope: Legal framework	Scope: Pilot area impl

Estimated Budget	<b>Financing Source</b>
High Cost – Above 100 million TL	IMM

### **Contribution to SUMP Objectives**



**Index Values of Appraisals** 



**Rank**: 9/26



	Third Parties Involved	
	ISPARK, Districts, residents in areas, private operators parki facilities	
lementation	<b>Implementation</b> Duration: Medium Scope: Roll-out of the project citywide	
8 9		
		Index 62 63 44 67
	100	

The Residents' Parking Permit System offers discounts to residents where paid parking is introduced, for use of on-street parking spaces in their area. Residents can obtain neighbourhood parking permits, valid for a given period, at a lower price than the price for short-term parking. This project is complementary to parking policies, and ensures that neighbourhood residents do not have problems finding a parking spot.

#### **Problem Description**

Need to extend the areas with parking regulation and the need to protect the residential function of the parts of the city where these regulations will be introduced.

## **Relation with Other Projects**

• Extension of Parking Regulation

## **Preparatory Tasks**

- A proper legal framework needs to be established.
- The revised parking policy needs to be drafted and decided.

• ISPARK needs to develop an organisation that manages the permit system and has a squad of parking wardens available that enforce the regulation.

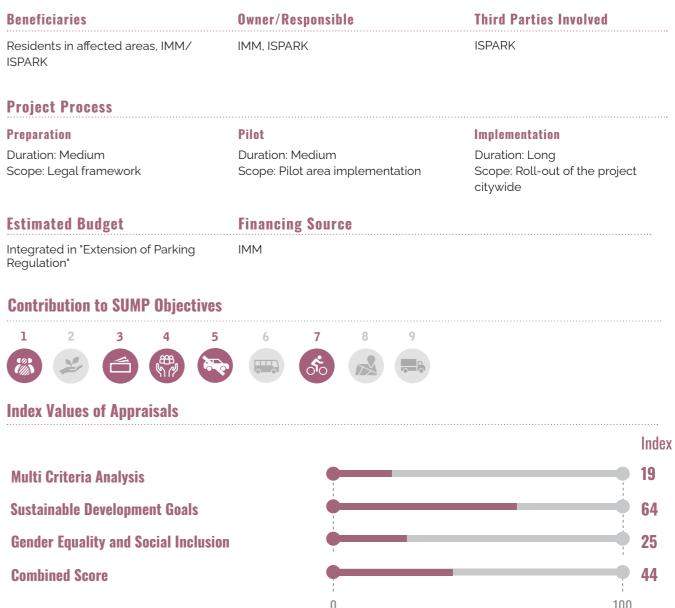
### **Follow-Up Tasks**

- Monitor the availability of parking space for residents.
- Monitor the number of permits sold in relation to available parking spaces per zone.

Beneficiaries	Owner/Responsible
Residents in affected areas, IMM/ ISPARK	IMM, ISPARK
Project Process	

Preparation	Pilot
Duration: Medium	Duration: M
Scope: Legal framework	Scope: Pilot

Estimated Budget	<b>Financing Source</b>
Integrated in "Extension of Parking	IMM





**Rank**: 22/26



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Introduction of an Automated Payment System for Parking also extends parking regulations by implementing a technological system to collect parking fees in the city. Currently, at roadside parking lots fees are paid to a site official; at outdoor and indoor parking lots, payment is made on exit. The proposed project will ensure the development and improvement of all aspects of the existing payment system. Increasing the efficiency of collecting parking fees, increases IMM revenues from parking management.

#### **Problem Description**

Need to implement an automated payment system, which is decisive for the effectiveness of the parking management operation in Istanbul.

#### **Relation with Other Projects**

- Extension of Parking Regulation
- Residents' Parking Permit System

#### **Preparatory Tasks**

- An improved legal framework.
- The revised parking policy needs to be drafted and decided.

#### Follow-Up Tasks

• To manage and monitor the contract with the service provider.

Beneficiaries	Owner/Responsible
Citizens/Users, IMM/ISPARK	IMM, ISPARK
Project Process	

Preparation	Pilot
Duration: Short and Medium	Duration: Medium
Scope: Legal framework	Scope: Pilot area impl

Estimated Budget	<b>Financing Source</b>
Initial costs beared by the selected provider	N/A

#### **Contribution to SUMP Objectives**



**Index Values of Appraisals** 

**Rank**: 25/26

Multi Criteria Analysis **Sustainable Development Goals Gender Equality and Social Inclusion Combined Score** 







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	Third Parties Involved	
	ISPARK, provider of services	
lementation	<b>Implementation</b> Duration: Long Scope: Roll-out of the project citywide	
8 9		
		Index
	I	15
_		69 10
		39
	: 100	

The fourth parking project is the Reorganisation of Parking Regulation Enforcement. This focuses on control and enforcement practices, another fundamental issue related to parking lots. Currently, ISPARK officials collect parking fees, while municipal traffic officers or traffic police enforce parking regulations (parking fines, etc.). Fines are imposed on the vehicle licence plate, not on the driver. This leads to a confusion about lines of authority and makes it difficult to follow up on fines or to inspect and enforce efficiently and reliably. This project aims to ensure that IMM acquires all inspection and enforcement powers regarding parking lots by making the necessary legal arrangements.

#### **Problem Description**

Need to implement an effective and efficient parking regulation enforcement, which is decisive for the effectiveness of the parking policy and for collecting the potential substantial revenues from parking.

#### **Relation with Other Projects**

- Extension of Parking Regulation
- Residents' Parking Permit System
- Introduction of an Automated Payment System for Parking

#### **Preparatory Tasks**

- An improved legal framework.
- The revised parking policy needs to be drafted and decided.

#### **Follow-Up Tasks**

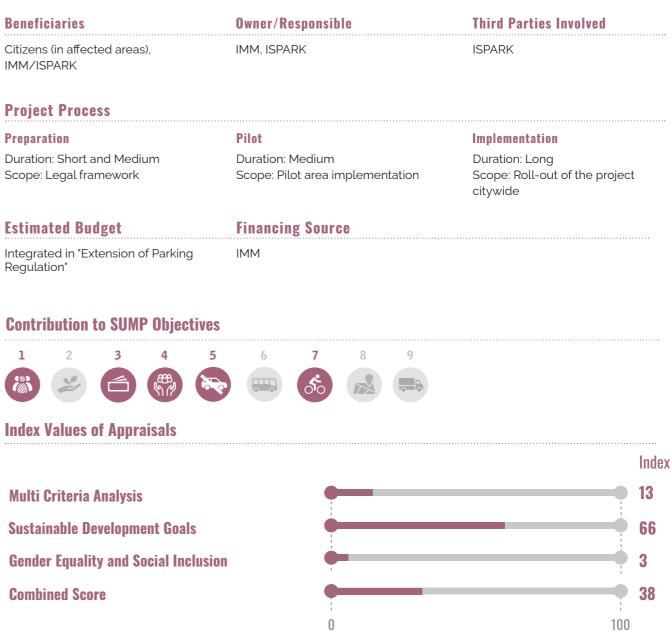
Monitor the following:

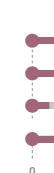
- Share of non-payment for on-street parked cars.
- Share of fines that could actually be collected, share of fines that lead to appeals and court cases.
- Costs and benefits of the parking enforcement operation.

Beneficiaries	Owner/Responsible
Citizens (in affected areas),	IMM, ISPARK
IMM/ISPARK	

Preparation	Pilot
Duration: Short and Medium	Duration: Medium
Scope: Legal framework	Scope: Pilot area im

Estimated Budget	Financing Sourc
Integrated in "Extension of Parking Regulation"	IMM





**Rank**: 26/26





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The Implementation of Institutional Mobility Management covers organised, and systematic actions that IMM can take to encourage citizens to use sustainable transport. These go from individual level actions (such as providing information about the benefits of cycling, support to make bikes available to employees and campaigns to promote walking), to corporate level policies (such as working from home and flexible working hours). The latter require cooperation between IMM and the private sector, while the former need citizens to change their habits. This project proposes promotional actions and incentives to increase the share of sustainable modes and to reduce traffic congestion.

Congested networks, especially during peak hours, car usage with all related negative impact.

#### **Preparatory Tasks**

• Building a network among institutions and companies above a certain size, seek cooperation with employer organisations, Chamber of Commerce etc. to get in contact with these employers.

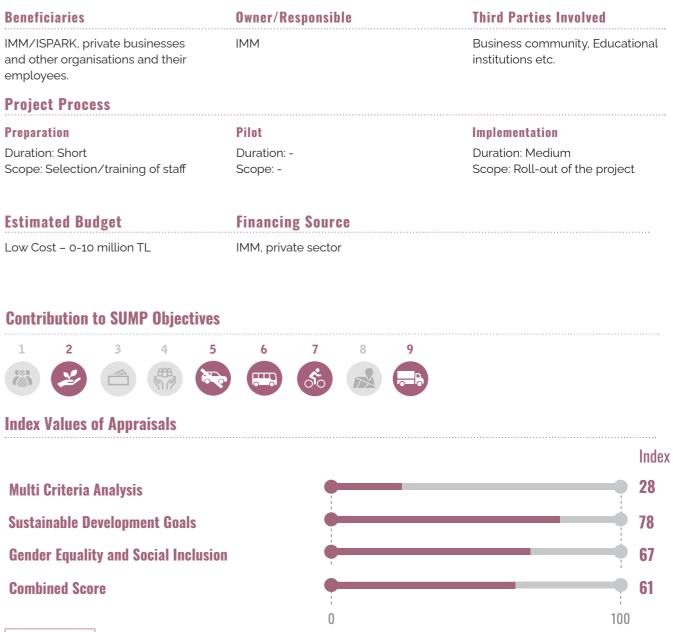
• Implementing mobility management in the own IMM organisation and in affiliated organisations to demonstrate good practice and success.

#### **Follow-Up Tasks**

• Monitoring number of organisations participating.

• Setting targets in each of these organisations in terms of results from the implemented programs and monitoring achievements of each of the targets within each of the participating organisations.

Beneficiaries	Owner/Responsible
IMM/ISPARK, private businesses and other organisations and their employees.	IMM
Project Process	
Preparation	Pilot
Duration: Short	Duration: -
Scope: Selection/training of staff	Scope: -
Estimated Budget	Financing Source
Low Cost – 0-10 million TL	IMM, private sector





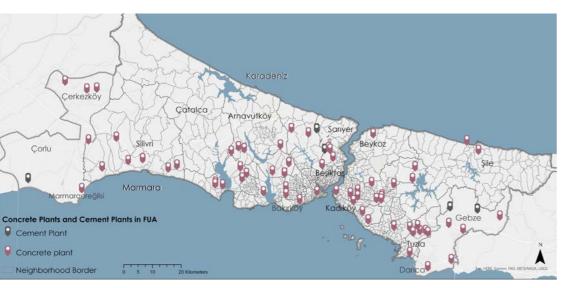




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The only project for the urban freight transport and logistics sector covered under Theme 3 are the Construction Materials Concentration Centres (CCCs). A CCC is a distribution centre for storing and consolidating construction materials according to requirements and then directing them to construction sites. The main policy objective is to provide environment-friendly and efficient solutions for the construction supply chain and material transportation logistics. Considering the number and volume of housing and transportation infrastructure constructions in Istanbul, it is possible to say that this project will play an important role in improving the city's air quality and increasing the quality of life of the citizens. This CCC project will develop business plans that address supply-related problems by developing sustainable solutions. Although the project has a limited implementation framework, it is important as it focuses on a sector that causes significant negative externalities in Istanbul.



**Concrete Plants and Cement Plants in FUA** 

### **Problem Description**

The construction industry is one of the biggest consumers and producers of freight transport in the urban areas of Turkey. This industry is normally very fragmented in a huge number of suppliers and distributors that deliver their materials and goods in different construction sites that they serve around a specific area. Some of the direct consequences of the fragmentation of the construction industry are the raise of the transport and production costs and the increase of the problems caused by the urban freight transport (i.e. congestion, accidents, GHG emissions, noise and air pollution, etc.) .

### **Relation with Other Projects**

Istanbul Network Management Control Centre (INMCC)

#### **Preparatory Tasks**

- Reviewing of IMM's institutional capacity in line with the Istanbul Logistics Master Plan (ILMP).
- Selecting the most suitable business models taking into account its commercial, financial and organisational feasibility.
- Setting up the data base for monitoring the schemes in the CCC areas.

### Follow-Up Tasks

• Delivery and pick up, activity monitoring and air quality monitoring database development.

Beneficiaries	Owner/Responsible			
Public authorities, transport companies, construction companies and general public	IMM			
Project Process				
Preparation	Pilot			
Duration: Medium Scope: Legal framework, feasibility studies	Duration: Medium Scope: Pilot area imple			

Estimated Budget	<b>Financing Source</b>
Medium Cost – 10-100 million TL	IMM, private sector

#### **Contribution to SUMP Objectives**



**Index Values of Appraisals** 



**Rank**: 21/26



	Third Parties Involved	
	Public authorities, Transport companies, Construction con Research organisations	npanies
ementation	<b>Implementation</b> Duration: Long Scope: Roll-out of the project	t
8 9		
		Index
-		21
		68
		34
		44
	100	

Neighbourhood Mobility Service Centres bring together different transport modes and mobilityrelated services in one location. A typical centre contains services such as storage/parking areas, shared mobility alternatives, information, consultancy, bicycle repair, logistics services and more. Their main purpose is to increase accessibility to services at the neighbourhood level and to encourage citizens to use sustainable mobility options. IMM is challenged to develop Neighbourhood Mobility Service Centres mainly through cooperating with the private sector and by providing land incentives or subsidies.

### **Problem Description**

Changing mobility needs of the population which is poorly facilitated; negative impact of (online shop) deliveries in residential areas.

#### **Relation with Other Projects**

- Implementation of Institutional Mobility Management
- E-Bikes and E-Scooters
- Cycle Feeder Routes

### **Preparatory Tasks**

• Select neighbourhoods with a population that is prone to adapt under consideration (young, starting families, highly educated et

- Bring together potential businesses (including from the logistic participation.
- Find space in real estate to establish a Service Centre.
- Start a feasibility study including a market study to define the potential business.

• Develop a business case for the Service Centre in cooperation with the business partners; consider the need for subsidising.

### **Follow-Up Tasks**

Monitor the following:

- Number of business partners interested in participation,
- Evaluation of business results,
- Goods put through, bicycles rented, shared cars rented etc. as

Beneficiaries	Owner/Responsible
Residents in residential areas,	IMM
selected businesses.	

### **Project Process**

Preparation	Pilot
Duration: Short Scope: Selection/training of staff	Duration: Short Scope: Pilot area imį

**Estimated Budget Financing Source** Medium Cost 10-100 million TL IMM, private sector

### **Contribution to SUMP Objectives**



**Index Values of Appraisals** 

**Multi Criteria Analysis Sustainable Development Goals Gender Equality and Social Inclusion Combined Score** 



**Rank**: 14/26





oting innovative concepts as the one tc.).
cal sector) that may be interested in

applicable	<u>)</u> .
------------	------------

le	Third Parties Involved	
	Business community, logistic stakeholders.	cs
	Implementation	
alementation	Duration: Medium and Long	<b>\</b> +
plementation	Scope: Roll-out of the projec	il.
6		
89		
		Index
		25
		88
		60
		59
	100	)



# **Appraisal:** The **Benefits for** Istanbul

05



<sup>10</sup> CE Delft, Handbook

on the external

Delft, 2019

costs of transport Version 2019 - 1.1. The Istanbul SUMP has clear targets, as listed in Chapter 3. The package of 26 projects and the implementation of related policies will contribute to achieving those targets. This chapter presents the results of all project appraisals and their different methodologies, such as benefit-cost ratios (BCR), multi-criteria analysis (MCA), GESI and SDG - as outlined briefly in Section 4.

The appraisal process does not provide definitive answers to concrete problems, but does help to understand relative priorities and to inform decision makers when choosing the most appropriate projects for given circumstances and specific locations. It should be noted that priorities may change as conditions change.

### **Quantitatively Appraised Projects**

It is difficult to predict to what extent projects will contribute to every target and whether those targets will be achieved; predictions improve when projects are quantitatively appraised.

To appraise projects that deliver different impacts, indicators were selected that included:

- Those considered very important in terms of sustainability (e.g. How well does the transport system perform in terms of sustainability?)
- Those from a common framework, using well-established international practice; this study used the EU publication, Handbook on the External Costs of Transport<sup>10</sup>.

the Istanbul SUMP, because not all baseline values were available.

150



These indicators represent the external costs of a transport system. As the term indicates, costs are expressed in monetary values, which are calculated by determining costs from unit consumption values (e.g. the value of a ton of CO2 emissions) by making assumptions specific to Istanbul. It was not possible to use the complete set of indicators selected for

The following indicators were used to calculate the impact of the quantitatively appraised projects (refer to Table 6 for a summary):

#### Congestion

This indicator usually refers to delays in road traffic during peak hours as compared to off-peak hours. The quantitative appraisal of the Istanbul SUMP projects uses 'Total time spent on the network' and does not take into account the difference between peak and off-peak road traffic. The benefits of the projects are expressed in terms of 'travel time saved'

#### Environmental sustainability

One of the key indicators for this objective is GHG emissions, which relates to the impact of motorised traffic on climate change. The Handbook on the External Costs of Transport refers to the CO<sub>2</sub> equivalent for this indicator, based on emission characteristics for relevant vehicle types. The emission of PM is an indicator for the impact of motorised transport on local air quality and citizens' health issues.

#### Road safety

The Istanbul SUMP uses fatal accidents and accidents with severe injuries as indicators. The Handbook on the External Costs of Transport (European Commission) uses a fatal accident equivalent, a unit that combines the cost of life, work power lost and medical costs.

Objective	Indicator	Target for 2040	Indicator used in overall evaluation
Reduce traffic volumes, congestion and automobile dependency	Delays in road traffic during peak hours compared to off-peak travel (private road traffic)	30% – 50% reduction	Time spent on the transportation network
Have an environmentally sustainable transportation system	Per capita well- to-wheel GHG emissions	60% reduction	Well-to-wheel CO2 equivalent emissions and PM emitted
Improve the safety and security of transport and travelling	Per capita fatal accidents and serious injuries	Zero fatalities in traffic accidents in the central areas (mixed-use) 60% reduction on main arterials 70% reduction in severe injuries	Fatal accident equivalent

Table 6: Overall Impact Valuation and Relation with SUMP Targets

### Monetary units as common denominator

For quantitatively appraised projects, costs and benefits need to be calculated in monetary units.

To calculate the monetary value of a benefit, certain assumptions need to be made, such as the value of travel time lost in congestion, the external costs of GHG emissions, health benefits or road accidents. The Istanbul SUMP used the Handbook on the External Costs of Transport (European Commission) and made some assumptions to reflect local prices.

### **Baseline Values**

Table 7: Baseline External Cost Values

<sup>11</sup>Energy Policies of IEA Countries, Turkey 2016 Review, International Energy Agency, Paris 2016 <sup>12</sup> Derived from 2016 figures (362 TRY)<sub>2021</sub> = (100 €/tons tCO-2eq)<sub>2016</sub> x (€/TRY= 3.20)2016 x (2016 -2021 GDP Growth in International US \$

= 1.13)

(2019)

Baseline values for the indicators, the current values, are needed to calculate the benefits of the projects in monetary units, for example, actual emissions or hours lost on the network. These are called physical values, for example, road safety is represented by the number of fatal accidents. However, accidents with severe injuries were also considered to calculate a figure for a fatal accidents equivalent.

### Well-to-Tank and Well-to-Wheel Emission Values

For CO2 emissions, two values were considered: tailpipe emissions and well-to-tank emissions:

The total CO<sub>2</sub> emissions for transport are the sum of tailpipe and well-to-tank emissions and this sum is referred to as well-to-wheel. The baseline values for external cost calculations are shown in Table 7.

External cost factor	Baseline physical values per year	Unit cost (TL)	Baseline monetary value per year (Million TL)
Time spent on the network	1,964 million hours	* Car: 38.4/hour * PT: 21.0/hour * Company/School * Bus: 9.0/hour	41,542
Air quality	2,604 tons PM emitted	1,377	843
Well-to-Wheel	10,642,510 tons CO2 emitted		1,819
Tailpipe emission	8,594,636 tons CO2 emitted	362 <sup>12</sup>	1,421
Well-to-tank	2,047,874 tons CO2 emitted		398
Road Safety	346.2 fatal accidents equivalent	7,464,358	3,467

• Tailpipe emissions are purely related to carbon fuels used in vehicles; consequently, the tailpipe emission of an electric vehicle is zero.

• The well to tank emissions, also known as upstream or indirect emissions, shows an average of all GHG emissions into the atmosphere from the production, processing and delivery of a fuel or energy source, up to the point a vehicle is fuelled. In the case of electricity, this depends on the power that is used for electric generation. When it is generated using carbon fuels, the emissions related to production and transport, as well as to power plants, are included. When it is generated by, for instance, hydro or wind power, well-to-tank emissions are zero. In 2015, 32% of Turkey's electricity was generated from renewable sources.<sup>11</sup>

### Impact of Business-as-Usual (BaU) Scenario

Significant developments need to be taken into account for a representative scenario of the future of Istanbul in the year 2040, the target year of the Istanbul SUMP, if no additional projects/interventions are implemented. This situation is BaU and developments considered as part of this scenario include:

- The municipality and other authorities have already decided to implement certain plans, irrespective of the implementation of the Istanbul SUMP. Examples of such plans are Metro and other rail projects that are already committed to and projects already being constructed.
- The assumption that the vehicle fleet in Istanbul will gradually change to electric, regardless of the projects proposed in the Istanbul SUMP. The production and sales figures of electric vehicles are rapidly increasing worldwide and the share of electric vehicles will increase in Turkey as well. Turkish authorities can even promote electric vehicles through tax incentives and other price instruments. However, it is considered that this is not within the decision-making power of IMM and therefore it was not considered as a possible project in the Istanbul SUMP.
- Calculations made in the framework of the Istanbul SUMP show that PM emissions in 2040 will be reduced, even if SUMP projects are not implemented, as a result of introducing electric vehicles in Turkey and Istanbul.
- As a result of introducing electric vehicles, CO<sub>2</sub> emissions increase over time, while tailpipe emissions decrease.
- Well-to-tank emissions increase considerably over the plan period. This shows that Turkey produces electricity, mainly using carbon fuels.

The comparisons between BaU and SUMP projects implemented (indicated as SUMP in the graphs) are given in the following graphs. Some graphs also compare the BaU scenario with 2040 targets.

PM emissions for the BaU scenario and the SUMP target are shown in Figures 19 and 20 respectively, and CO2 emissions are shown in Figure 21.

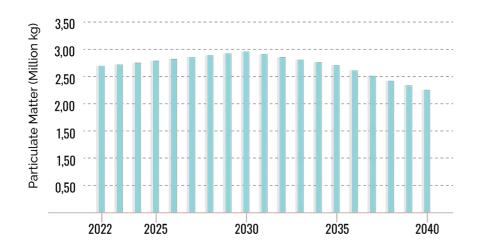


Figure 19: Total PM Emission in BaU Scenario

(60% reduction).

Matter

Particulat

Figure 20: Per Capita capita) PM Emissions in BaU Scenario and 2040 **Emission Target** per Values ion (kg Emissi

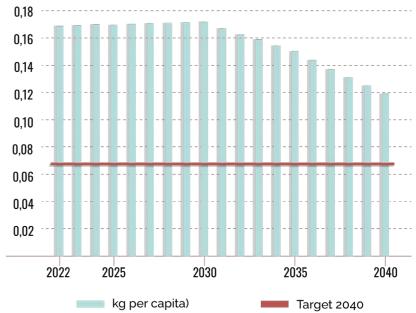


Figure 21 shows total tCO2 emissions per capita in the BaU scenario and the target in 2040. For the total tCO2 per capita, the baseline value (current) is 0.72 and the target is 0.29 (60% reduction)

Figure 21: Per Capita CO<sub>2</sub> Emissions in BaU Scenario and 2040 Emission Target Values

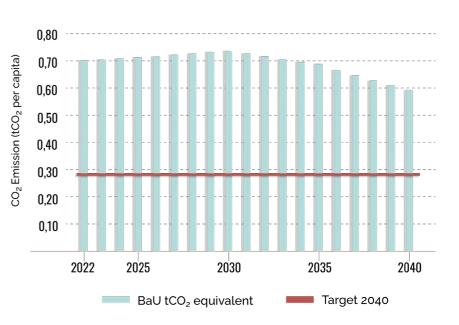


Figure 20 shows the 2040 target for well-to-wheel PM emissions per capita as a straight line (0.07 kg per capita). For PM emissions, it is assumed it will be in line with CO2 emissions Figure 22 shows total well-to-tank and tailpipe tCO<sub>2</sub> emissions equivalent for the BaU scenario between the base year and 2040. Figure 22 shows that the share of tailpipe emissions in well-to-wheel emissions decreases as 2040 approaches – a result of the market penetration of electric vehicles.

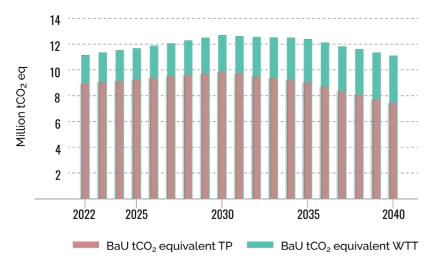


Figure 23 shows the expected development in the number of fatalities (expressed in fatal accident equivalent). Without other policies being implemented, the number of fatalities mainly depends on the development of traffic volumes and therefore shows a linear increase.

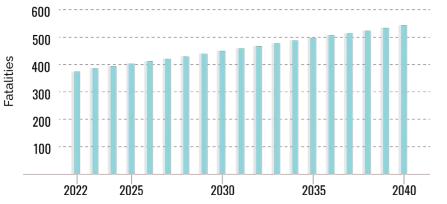
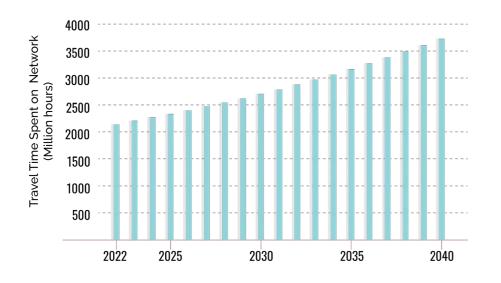


Figure 24 illustrates time spent on the network in the BaU scenario and shows a constant increase to 2040. The target for 2040 agreed in the framework preparation for the Istanbul SUMP is a range of 30%–50% reduction.



**Figure 22**: Total CO2 Emissions in BaU Scenario

Figure 23: BaU

Fatalities (Total)

Scenario Road Safety: Development of Table 8: Projectmethodology is shown in Table 8.Impact Matrix for<br/>the Quantitatively<br/>Appraised ProjectsCPROJECTS

Figure 25: Comparison

of Total CO<sub>2</sub> Emission

in BaU Scenario and

SUMP

Ch
PROJECTS
Rail Network Extensions
Low Emission Zones
Decarbonisation of The Public
Transport Bus Fleet
Decarbonisation of Metrobus
Extension of Parking
Regulation
Bus Lanes
Cycle Feeder Routes
Bus Service Improvement

Programme (BSIP)

### Climate Change and CO<sub>2</sub> Emissions

According to the GHG inventory made within the scope of the Istanbul Climate Change Action Plan, the shares of CH4 (0.40%) and N2O (1.48%) among the emissions from the transportation sector in 2019 are at a very low level compared to the share of CO2 (98.12%). Therefore, only CO2 emissions are taken into account within the scope of the Istanbul SUMP.

Figures 25 and 26 show the dev projects implemented:

• Figure 25: total tCO2 emissions (well-to-wheel)

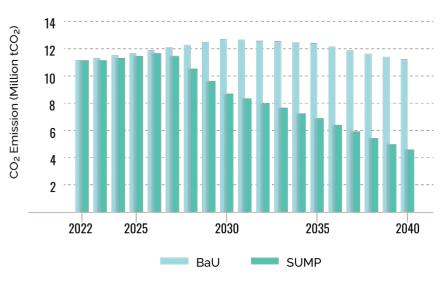
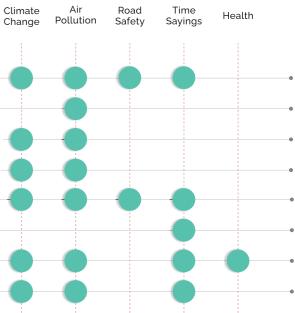


Figure 24: BaU Scenario Congestion: Development of Hours Spent on the Network (Total)

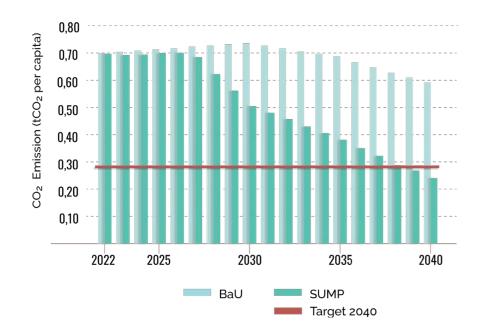
### **Project Contributions to Targets**

All projects contribute to a certain extent to addressing Istanbul's mobility issues. This section explores the impacts of the quantitatively appraised projects on the indicators selected from the Handbook on the External Costs of Transportation. Not all projects will have an impact on all indicators, which is obvious for some projects, for instance: decarbonisation projects have no impact on congestion or road safety; the introduction of bus lanes is assumed to have a marginal impact on air quality and is therefore not considered. The relation between projects and impacts as considered in the appraisal



Figures 25 and 26 show the development of CO2 emissions in BaU scenario and with 8





• Figure 26: per capita tCO<sub>2</sub> emissions (well-to-wheel) and the target for 2040 as a straight line.

It is seen in Figure 25 that the change in total CO2 emissions by years and the impact of 8 projects, and in Figure 26, 8 projects evaluated quantitatively will reduce the per capita CO2 emission value and the target value will be reached by 2040.

Figure 27 shows the contribution of the eight projects to CO2 emissions for well-to-tank; the contribution of energy production for car fuels and tailpipe emissions. The contribution of well-to-tank increases slightly over the period of the plan, but since the eight SUMP projects considered in this graph have a strong positive impact on emissions, the target will be achieved by 2040.

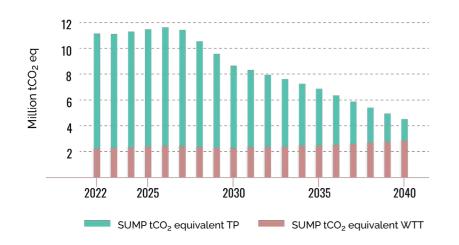


Figure 26: CO2 Target Emissions and Comparison of Per Capita CO2 Emissions in BaU Scenario and SUMP

Figure 27:

Emissions

Contribution of the

8 Projects to Total

Reduction (tailpipe

seperated) of CO2

and well-to-tank

Figure 28: Comparison of Total PM Emission in BaU Scenario and with 8 Projects Implemented in SUMP

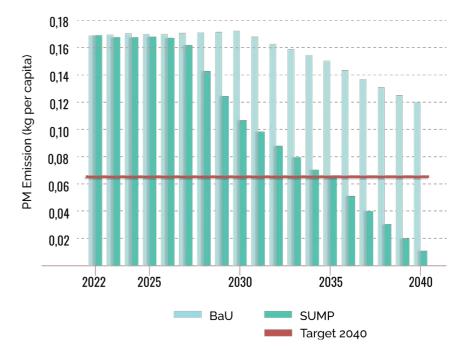
Figure 29: Comparison of Per Capita PM Emissions in BaU Scenario and SUMP with and without Projects Implemented and SUMP Target

### Air Pollution

Figure <sup>28</sup> shows the development of PM emissions in two scenarios: with (SUMP) and without (BaU) implementing the quantitatively appraised projects. The BaU scenario shows some decrease in emissions, which results from the introduction of electric vehicles.

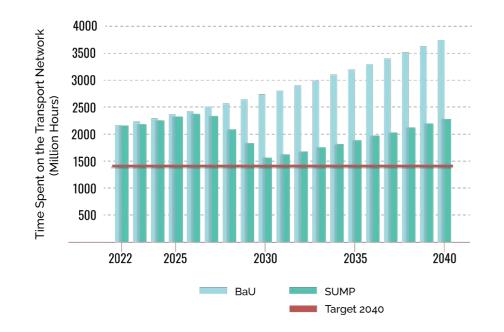
Figure 29 shows the development of per capita PM emissions for BaU, with and without the SUMP implementation. It shows that, with the implementation of the quantitatively appraised SUMP projects, the provisional target (0.07 kg per capita) will be achieved by the year 2034.





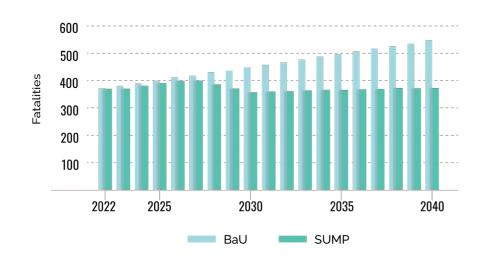
### Congestion

Figure 30 shows the impact of the projects on the hours spent on the transport network (all modes; for BaU with and without the SUMP implementation). The SUMP (with projects) scenario shows a sharp decrease around 2030, when the calculation assumes that significant Metro projects are in operation. This is a simplified presentation, because it assumes that all rail projects will be operational within a short timescale. This and the impact of other projects show a considerable positive impact on congestion, although not enough to achieve the target in 2040 (30% reduction).



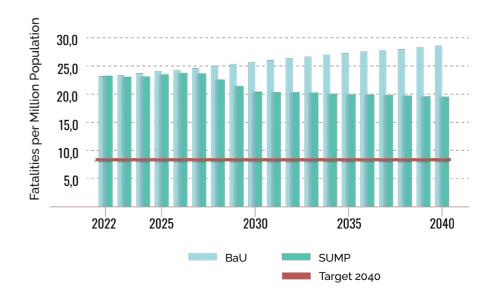
### **Road Safety**

The number of fatalities after the eight projects are implemented shows a similar trajectory to the one that shows hours spent on the network. This is due to the fact that, in general terms, traffic safety is linked to total vehicle kilometres on the network (Figure 31).



#### Figure 30: Comparison of Hours Spent on the Network in BaU Scenario and SUMP with and without Projects Implemented and SUMP Target (million hours/year)

Figure 32: Comparison of Fatalities per 1 Million Population in BaU Scenario and SUMP with and without Projects Implemented and SUMP Target Figure 32 shows the number of fatalities per 1 million population in both SUMP and BaU cases. The target is 9 fatalities per 1 million population in 2040. although the target should be zero deaths. However, the forecasts for traffic volumes, population and vehicle ownership are a serious barrier to achieving that target. Also, it is not possible to reach the envisaged target by implementing the eight projects considered in this evaluation, so more policies focused on traffic safety are needed to achieve the target. The SUMP does plan for the implementation of several projects that will increase road safety, although these were not considered in the quantitative appraisal.



### **Cumulative Benefits**

As mentioned, physical benefits (e.g. kg emission, number of accidents) can be expressed in monetary terms using the values from the Handbook on the External Costs of Transport to convert physical values to monetary values (see Table 7). This allows a comparison of the impact of projects with different characteristics and an adding up different benefits.

Figure 33 shows the share of monetary value of the quantitatively appraised projects as part of the total benefits calculated. The following remarks apply:

- considerable benefits.

#### Figure 31: Comparison of Fatalities in BaU Scenario and SUMP Depending on Development of Road Safety with and without Projects Implemented

• The most benefits are generated by the Rail Network Extension project. It should be kept in mind that this project (in fact a total of 27, which includes 13 ongoing and 14 planned rail line projects) is also very expensive.

• The Extension of Parking Regulation and Bus Lanes projects generate

• Other projects deliver fewer benefits because they are limited in scale or in investments and are therefore not shown separately.

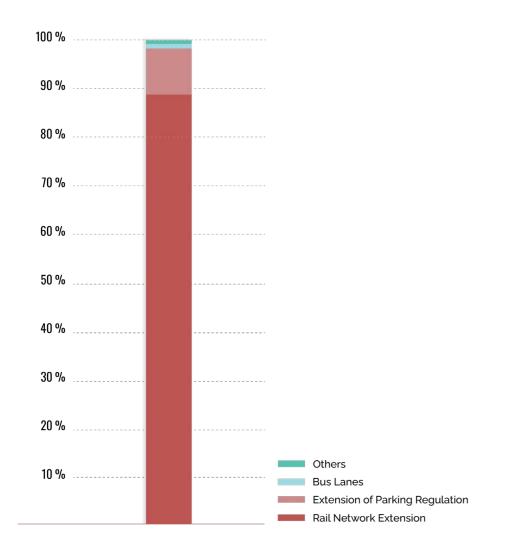


Figure 34 shows which benefits originate from which projects. Over 82% of benefits are time savings, which are mostly generated by the implementation of projects in the context of the rail network extension. Benefits for the environment are mostly generated by the decarbonisation projects.

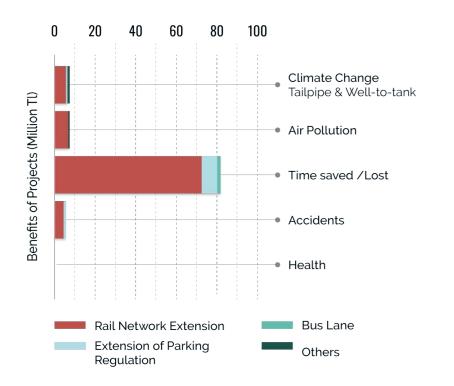


Figure 33: Relative Comparison of Achieved Benefits from Quantitatively Appraised Projects As previously noted, some projects generate considerable benefits, but are expensive. The BCR indicates benefits relative to the price of implementation. Figure 35 ranks the quantitatively appraised projects according to their BCR. Most projects are attractive, with a BCR value higher than 1.50. The Low Emission Zones project has the highest BCR (3.25), followed by Bus Lanes (2.49), Extension of Parking Regulations (2.02), and Rail Network Extension (1.95). The Bus Service Improvement Programme (BSIP) project has a relatively lower return on investment, but offers other benefits, such as a positive impact on inclusiveness, which is very hard to quantify. It should be noted that a more detailed cost-benefit analysis needs to be carried out for each project before implementation.

Figure 35: Quantitatively Appraised Projects Ranked According to BCR Values

Figure 36: Distribution

of Benefits of

Quantitatively Appraised Projects (%) 0.0 0.5 1.0 1.5 2.0 2.5 3.0 3.5 BCR

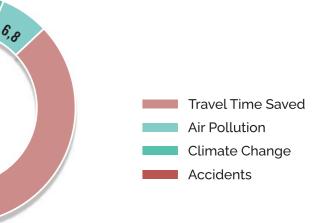
Figure 36 shows the distribution of total benefits of the quantitatively appraised projects; 82.4% of total monetary benefits account for the value of travel time to be saved by the implementation of projects mostly generated by the Rail Network Extension project.

0,03 Health 5,9 6,8 4,9 82,4

Figure 34: Origin of Generated Benefits







## **Qualitatively Appraised Projects**

The MCA was used to qualitatively appraise 18 SUMP projects. The framework for this assessment was developed by the Project Team. Stakeholders, including the Project Team and the IMM SUMP Team, participated in several surveys to score the qualitatively appraised projects. Besides this scoring, an objective's weighting, determined before the Implementation Plan Roadmap phase by participatory methods, was also taken into account. The weighted scores for each project were determined and named as their MCA score.

As part of this MCA appraisal, every project was scored in terms of its anticipated contribution to nine SUMP objectives and related indicators. These scores were obtained from four seperate survey results arranged in different stages. The Project Team and the IMM SUMP Team determined the contribution of the qualitatively appraised projects to selected indicators with the help of a 5-point-Likert scale. All scores were combined with the help of several calculations to derive the final contribution score, which was called an MCA score.

Figure 37 shows that the highest MCA scores belong to five projects: the Extension of Transfer Centres (65.3); Passenger Sea Transport – Fleet Renewal (57.3); Istanbul Network Management Control Centre (INMCC) (48.9); Extension of Real Time Passenger Information and Open Data (31.2); and Minibus Feeder Routes: Arnavutköy District (29.8). These five projects represent 63% of the overall anticipated SUMP impact of qualitative projects. This is presented graphically in Figure 37.

Pedestrian Routes Junction Improvements for Pedestrians and Cyclists Park and Ride Facilities	_			• 7.7 • 6.0 • 2.5
Introduction of an Automated Payment System for Parking Reorganisation of Parking Regulation Enforcement Congestion Charging				• 9.5 • 8.8 • 8.8
Construction Materials Concentration Centres (CCCs)				• 13.4
Istanbulkart Extension to Include Minibus Operations				• 18.0 • 16.2 • 14.9
Passenger Sea Transport - Fleet Renewal Istanbul Network Management Control Centre (INMCC) Extension of Real Time Passenger Information and Open Data Minibus Feeder Routes: Arnavutköy District Implementation of Institutional Mobility Management				• 57.3 • 48.9 • 31.2 • 29.8 • 18.4
Extension of Transfer Centres				• 65.3

Figure 37: Final MCA Scores of Qualitatively Appraise

MCA Score



Table 9 shows the contribution of qualitatively appraised projects to the 9 objectives of SUMP.

13 projects out of 18 contribute to Objective 7 - "Stimulate the modal shift to active modes (walking and cycling)" through selected indicators according to Table 9. On the other hand, 3 projects contribute to Objective 9 - "Have an efficient city logistics system with minimal negative impact".

### **Gender Equality and Social Inclusion (GESI) Benefits**

The Istanbul SUMP differs from other SUMP studies in foreign countries in its specific focus on GESI-related issues and it has developed its own GESI appraisal framework to evaluate core projects on social inclusion and gender equality goals, tailored for the Istanbul context. A series of workshops and surveys with the IMM SUMP Team, first, discussed how and why GESI is an important concept in relation to transport policy, second, defined the GESI parameters specific, and third, evaluated the proposed core projects using the GESI parameters. As a result, the IMM SUMP Team evaluated the anticipated GESI impacts of 26 core projects based on 18 parameters related to: social impacts (accessibility, safety, empowerment of the underrepresented groups and the feeling of freedom); environment and public health (physical activity, pollution and emissions); economic impacts (travel time, affordability, disaster resilience, land use, local economy, informal transport and wealth); and political impacts on governance and participation. Out of 26 projects, 14 received an above-average GESI score. As it seen on the Table 13, the Rail Network Extension project received the highest GESI score, followed by three active transport-related projects and then projects related to mobility management and public transport (including Extension of Transfer Centres, Passenger Sea Transport - Fleet Renewal, Bus Service Improvement Programme (BSIP) and Bus Lanes).

#### Project

Table 10: Final GESI

Scores of the Projects

Rail Network Extension
Pedestrian Routes
Cycle Feeder Routes
Junction Improvements for Pedest
Implementation of Institutional Mo
Neighbourhood Mobility Service C
Passenger Sea Transport- Fleet Re
Park and Ride Facilities
Extension of Transfer Centres
Traffic Calming
E-Bikes and E-Scooters
Bus Service Improvement Program
Istanbul Network Management Co
Bus Lanes
Extension of Parking Regulation
Low Emission Zones
Minibus Feeder Routes: Arnavutköy
Construction Materials Concentrat
Extension of Real Time Passenger
Residents' Parking Permit System -
Congestion Charging
Istanbulkart Extension to Include N
Decarbonisation of Metrobus
Introduction of an Automated Payr
Decarbonisation of The Public Trar
Reorganisation of Parking Regulati
Reorganisation of Farking Regulation
While the Istanbul SUMP promot LEZ, etc.) and active mobility, it neighbourhoods that are sterile, In this sense, while transportation
ather land use policies, it is also po

	GESI Score
	• 19.15
	• 15.08
	• 14.27
trians and Cyclists	• 13.50
bility Management	• 12.85
Centres	• 11.50
enewal	• 11.08
	• 10.81
	• 10.62
	• 10.35
	• 10.15
nme (BSIP)	• 9.81
ntrol Centre (INMCC)	• 9.58
	• 9.35
	• 8.46
	• 7.42
y District	• 6.92
tion Centres (CCCs)	• 6.46
Information and Open Data	• 6.19
	• 4.77
	• 4.69
Minibus Operations	• 4.12
	• 2.73
ment System for Parking	
nsport Bus Fleet	• 1.42
ion Enforcement	• 0.50
	0.00

tes low-carbon mobility policies (traffic congestion tax, should refrain from creating gentrified and segregated homogeneous and where poorer groups cannot reside. policies need to be handled together with housing and other land use policies, it is also necessary to work on soft policies, such as rent control and social assistance for food and other basic needs. Different sectors and responsible units must work together to eliminate transport-based inequalities, and the Istanbul SUMP has created an important platform for such studies.

### Sustainable Development Goals Assessment

The SDGs are key elements of the action plan to ensure sustainable development on a global scale. Developed by the United Nations (UN), they consist of 17 goals and 169 targets<sup>13</sup>.

By using a tailored SDG tool, 80 basic principles (performance criteria) were developed, based on those goals and targets, and adapted for use in the Istanbul SUMP. Most of these basic principles cover more than one SDG, and each principle acts as a combined indicator to monitor the progress towards the related goals. Istanbul SUMP is in line and contributes to the achievement of SDG 1 (No Poverty), SDG 3 (Good Health and Well-Being), SDG 5 (Gender Equality), SDG 8 (Decent Work and Economic Growth), SDG 9 (Industry, Innovation and Infrastructure), SDG 10 (Reduced Inequalities), SDG 11 (Sustainable Cities and Communities), SDG 12 (Responsible Consumption and Production), SDG 13 (Climate Action), SDG 16 (Peace, Justice and Strong Institutions) and SDG 17 (Partnerships for the Goals) given in Figure 38.

Once a phase of the Istanbul SUMP was completed, the principles related to SUMP phases were evaluated to see whether the combined indicators were met to appraise the phase according to the SDGs. Three SDG workshops were held periodically to hear the opinions of IMM officials on compliance with these basic principles. Istanbul SUMP's alignment to the SDGs is shown in Figure 38. In the figure, end-of-the Project targets, phase targets and phase evaluation results are presented together.

Figure 38 shows that according to the results of the third workshop, Istanbul SUMP reached its full potential for SDG 1, SDG 3, SDG 8 and SDG 9. SDG 11. The project's contribution to SDG 11 that is the most benefitting goal from Istanbul SUMP is 96% of its full potential while the project's contribution to rest of the SDGs is over 93%.



Within the scope of all these appraisals, a

thorough examination was made for 79 (longlist) policy measures derived from the vision and objectives of the Istanbul SUMP, and 26 core projects developed based on these policy measures. The overall conclusion drawn from appraisals is that the outputs of different phases of the Istanbul SUMP contribute adequately to the SDGs. In other words, the Istanbul SUMP is doing its part in achieving global SDGs in all aspects, from scope to context, vision and projects. As one of the few settlements in the world in terms of its population and many other characteristics, Istanbul makes a significant contribution to the SDGs, thanks to the Istanbul SUMP.

<sup>13</sup> https://www.tr.undp. ora/content/ turkey/tr/home/ sustainabledevelopment-goals. html

### All Scores Combined

A methodology was developed to arrive at a combined score. This procedure combines BCR, MCA, SDG and GESI scores, along with scores from stakeholder workshops. Since all scores have different characteristics and ratings, they were standardised and weighted for each assessment method. These weights were determined by the Project Team. Combined scores take a maximum value of 1.0.

Table 11 shows the combined scores and ranks projects accordingly.

#### Project

Table 11: Ranking

According to the Combined Scores

of the Core Projects

Rail Network Extension Extension of Transfer Centres Low Emission Zones Cvcle Feeder Routes Passenger Sea Transport- Fleet Re Istanbul Network Management Co Bus Lanes Pedestrian Routes Extension of Parking Regulation Traffic Calming Implementation of Institutional Mo Junction Improvements for Pedest Neighbourhood Mobility Service C Extension of Real Time Passenger Bus Service Improvement Program Istanbulkart Extension to Include Park and Ride Facilities Minibus Feeder Routes: Arnavutkö Congestion Charging E-Bikes and E-Scooters Construction Materials Concentrat Residents' Parking Permit System Decarbonisation of Metrobus Decarbonisation of The Public Tran Introduction of an Automated Pay Reorganisation of Parking Regulati

According to the general overview, it can be concluded that none of the projects received a particularly low score. Two public transport project that are about better connections are at the top of the list. For the rest, there is no clear view on what modes are specifically favoured and there are various public transport projects at different levels in the list, the same goes for active mode projects. It shows that the results are balanced across the different transport modes and environmental impacts.

	Combined Score
	• 1.00
	• 0.99
	• 0.95
	• 0.95
enewal	• 0.91
ontrol Centre (INMCC)	• 0.90
	• 0.88
	• 0.84
	• 0.84
	• 0.78
obility Management	• 0.76
trians and Cyclists	
Centres	
Information and Open Data	
mme (BSIP)	
Minibus Operations	
	• 0.61
by District	
	• 0.59
	• 0.53
tion Centres (CCCs)	
	• 0.54
and and Dura Elization	• 0.50
nsport Bus Fleet	• 0.49
ment System for Parking	
tion Enforcement	• 0.47

# Implementation Plan Roadmap

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The Implementation Plan Roadmap for the Istanbul SUMP was obtained as a result of the appraisals and priorities identified through the methods described in Chapter 5. Within the framework of the aforementioned roadmap, preparation, pilot study and implementation phases for the core projects until 2040 have been determined. On the other hand, SUMP is open to updates by its nature and is considered as a living document. In this context, the implementation of the SUMP must be monitored, evaluated and revised as necessary. Additionally, for some projects, detailed feasibility studies need to be carried out in advance of project implementation.

### Governance

This section outlines the basic principles regarding the governance of the Istanbul SUMP and discusses a proposed governance structure.

### **Governance Principles**

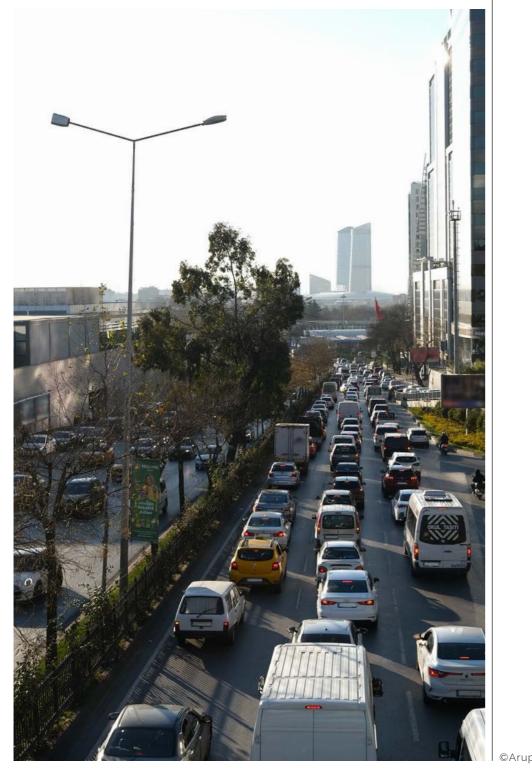
Even though the Istanbul SUMP represents a transport strategy for the city, it also contributes to national and regional level goals, improves the general quality of life of urban residents, supports economic development and reduces the impact of mobility on the environment. In addition, the transport strategy is directly related to other relevant policies, such as land use planning, the environment, security, health and energy. These policies are also governed at local, regional and national levels. Therefore, the proposed governance structure for the Istanbul SUMP should ensure effective cooperation between all relevant institutions, at all levels.

Another essential principle adopted for the Istanbul SUMP governance is participatory and inclusive planning. The Istanbul SUMP should be carried out in partnership with all key stakeholders, including metropolitan, regional and central governments, businesses and



professional organisations, NGOs and educational institutions, and the citizens of Istanbul. The Istanbul SUMP governance structure should create a political and technical framework for all authorities, from local to national levels, to encourage local cooperation, knowledge exchange and awareness raising across all public and private stakeholders.

The SUMP strategy and its implementation plan are ongoing and dynamic. Its development process is based on data representing the mobility patterns and behaviour of Istanbul citizens provided by different institutions and organisations. For this reason, data collection and management are an essential principle of the Istanbul SUMP. It should be ensured that the datasets required for SUMP planning and implementation are collected, processed and shared in a reliable, accurate and consistent manner.



### **Recommendations**

Recommendations for the Istanbul SUMP governance structure were defined by considering two different scenarios, which are described in the following sections.

### **SUMP Governance Structure Scenario 1: Do-Minimum**

For this scenario, it was assumed that the national and local governance processes in Turkey stay the same or are similar to the existing structure. In this scenario, there is strong central government, and authority and resources are shared between central and local governments.

governance

- A SUMP Governing Body
- A SUMP Coordination Board
- Ongoing stakeholder engagement
- Data collection and exchange
- Relations with the national legal framework

### SUMP Governing Body

The role of the SUMP Governing Body is to lead all planning, implementation and capacitybuilding processes for the SUMP. A SUMP, or similar transportation plan, has not yet been legally defined in Turkey. For this reason, the SUMP Governing Body is determined by analysing the current governance situation within IMM instead of using a legal regulation. An analysis of the current IMM governance structure indicated that the IMM Transportation Planning Directorate within the IMM Transportation Department is best positioned to become the Governing Body for the Istanbul SUMP under Scenario 1.

As the SUMP Governing Body, the IMM Transportation Planning Directorate will lead the identification of all activities and tasks necessary for SUMP planning and implementation, and will distribute roles and responsibilities between all involved parties. The Istanbul SUMP cannot be implemented by a single party, be it within IMM or outside. SUMP implementation typically requires a complex organisation structure involving several parties. Therefore, a clear distribution of roles and responsibilities between all relevant departments and institutions is critical. It is recommended that the SUMP Governing Body facilitates cooperation between different IMM units and strengthens communication and interaction channels between them.

The full SUMP cycle consists of four stages: three planning stages for preparation and analysis, strategy development and measure planning, and a final stage of implementation and monitoring<sup>14</sup>. For the successful implementation of a SUMP, the IMM Transportation Planning Directorate will have to coordinate and work with IMM departments and directorates during all four stages. It is recommended that the IMM SUMP Team, established at the beginning of the Istanbul SUMP project, support the IMM Transportation Planning Directorate in the development and implementation of the Istanbul SUMP. Awareness raising and promotion activities about the SUMP can be carried out by this unit.

<sup>14</sup> See Chapter1 for SUMP cycle

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In this scenario, the following structures and processes are proposed for the Istanbul SUMP

### **SUMP Coordination Board**

To support the work of the IMM Transportation Planning Directorate and the IMM SUMP Team, a dedicated SUMP Coordination Board should be established within IMM to serve as a coordination platform between all IMM departments and directorates involved in the SUMP planning and implementation processes.

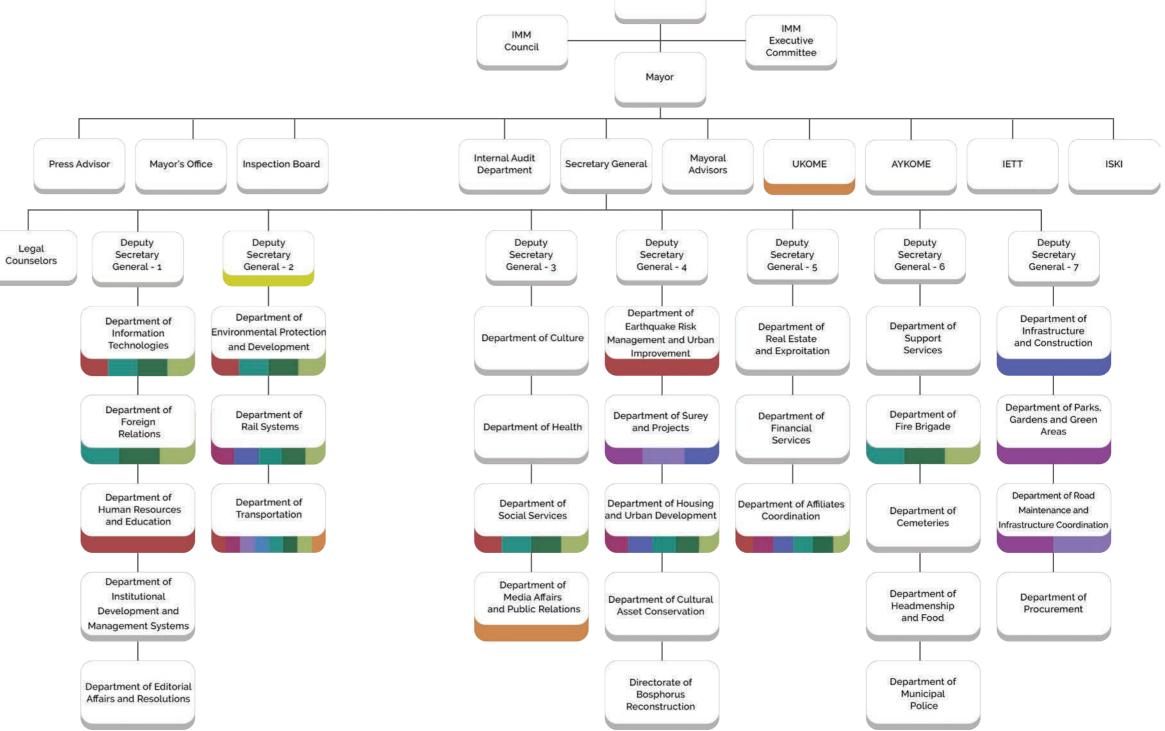
It is proposed that the SUMP Coordination Board is chaired by the Deputy Secretary General and includes representatives of all SUMP-related Departments and Directorates, as shown in Figure 39. Moreover, the IMM Transportation Planning Directorate should be the responsible body for preparing agendas for SUMP Coordination Board meetings. The Board will have the authority to make final decisions on SUMP projects. It is also recommended that the IMM Transport Planning Directorate and the SUMP Coordination Board receive support from the IMM Mayor for the development and implementation of the SUMP.

Figure 39: The Coordination Chart for SUMP Planning and Implementation for Internal Coordination within IMM

Deputy Secretary General-2 to whom SUMP Executive Board is affiliate

The diagram colours below show IMM Transportation Planning Directorate should cooperate with which Units, in projects related to which subjects and transportation types as a part of SUMP.

	General Strategy: Sustainable Urban Planing, Spatial Plans		Urban freight	
	Modes of Transport: Public Transport, Metrobus, Bus, Minibus, Ferries, Istanbulkart, Private services Modes of Transport: Active travel, Walking, Cycling, Streets		Resilience	
			Innovation, Data, Smart City	
			Gender Equality and Social Inclusion	
	Traffic flow, Roads		Environment, Sustainability	
	Parking		Stakeholder Engagement, Public Consultation	



IMM

### **Ongoing Stakeholder Engagement**

There are many activities that require stakeholder participation across the entire planning and implementation process of the Istanbul SUMP. The IMM Transportation Planning Directorate, as the SUMP Governing Body, will be responsible for ensuring and managing effective stakeholder engagement.

To achieve comprehensive stakeholder engagement in the planning and implementation of the Istanbul SUMP, many engagement activities were conducted with the participation of 134 stakeholders out of 255 which were defined. From the vision and scenario development to the implementation process, 134 stakeholders actively participated in the SUMP process. Apart from IMM units, district municipalities, public institutions and organisations, these stakeholders included mainly NGOs, professional chambers, transport operators and academics with expertise in urban planning, transport planning and architecture. This participatory approach will increasingly continue in the future.

### **Data Collection and Exchange**

Regular and high-quality data collection is critical to the success of the Istanbul SUMP. The wide range of data produced by IMM departments, subsidiaries and other institutions should be systematically managed for high-quality, comprehensive information. It is recommended that the IMM Transportation Planning Directorate serves as a coordination unit for SUMP data management.

Various data (mobility, environment, life, people, energy, governance, security, disaster management, economy, information and communication technologies) are collected by each unit of IMM within the scope of their duties and responsibilities. The data obtained from the units are published in the Open Data Portal, which is under the responsibility of the Information Technologies Department, in accordance with the provisions of the Personal Data Protection Law. Moreover, data from primary and secondary sources are compiled and analysed on a micro scale in the city by the Istanbul Statistics Office within the Istanbul Planning Agency (IPA). In addition to these, IMM Data Laboratory was established to develop projects in the field of data and artificial intelligence with universities, NGOs and other relevant institutions. As a result, with the contribution of all these important studies, the data management of Istanbul SUMP will be carried out quite effectively.

### **Relations with the National Legal Framework**

It is important for the future of our cities that local and central government work together to ensure that the SUMP is a legal and mandatory document. One way to achieve this is to develop a process of agreement and communication between the parties involved. In this scenario, cooperation in the management of SUMP and a process of consensus among interested parties are fundamental principles that need to be developed.

### **SUMP Governance Structure Scenario 2: Do-Maximum**

Scenario 2 assumes that transport master plans currently defined under national legislation are transformed into SUMPs that are acknowledged and defined within the national legal system. The do-maximum recommendations are developed in line with the principle of comanagement, in which national and local governance flows lead to mutual interaction and cooperation

For this scenario, the following key working structures and processes are proposed:

- SUMP Governing Body
- Stakeholder Engagement

• Data Collection and Exchange

National Legal Framework

### **SUMP Governing Body**

It is recommended that a dedicated Transport Authority is formed to govern the transport planning process within the Istanbul SUMP functional urban area and to coordinate all transport operators within the area.

the authority to:

Figure 40: Indicative

Organisational Chart

Coordination Between

Planning, Operational

and Communication

Transport Authority

Functions within a

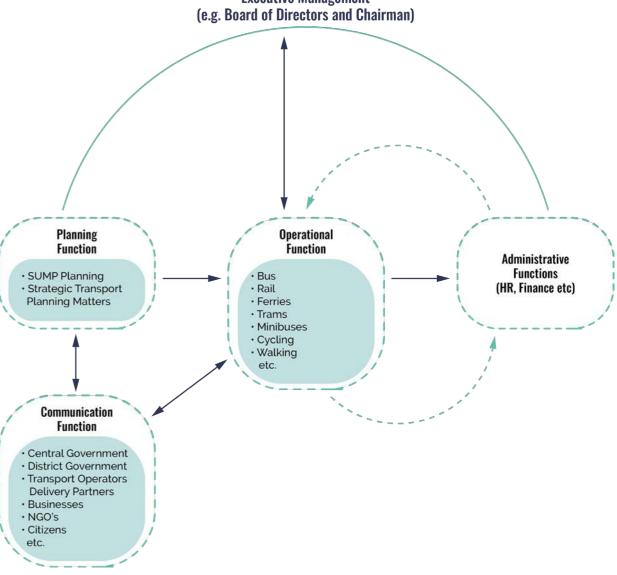
Demonstrating

the Importance of

- domain,

It is recommended that all transport operators - local, regional and national - are integrated under the umbrella of the dedicated Transport Authority, which will be in charge of defining services that need to be provided within the functional urban area. This structure will be managed by forming a Senior Management Team or Board of Directors, which will consist of the IMM Mayor and representatives of all parties. The indicative organisational chart of the Transport Authority is shown in Figure 40.





As the Governing Body of the Istanbul SUMP, the dedicated Transport Authority will have

• Drive planning and implementation processes,

• Introduce and legally enforce local rules and regulations on transport within its

• Encourage coordination of transport enterprises within its domain.

### **Executive Management**

### Stakeholder Engagement

It is recommended that both planning and operational institutions be strongly represented and interconnected within the dedicated Transport Authority. As shown in Figure 39 which consist of organisation chart of IMM, a dedicated communication function can be established within the Transportation Authority, with teams responsible for communication with different stakeholders.

#### **Data Collection and Exchange**

The dedicated Transport Authority should introduce a mandatory regulation for open datasharing between all parties that are a part of, or a partner with, the Authority, in particular all local, regional and national transport service providers.

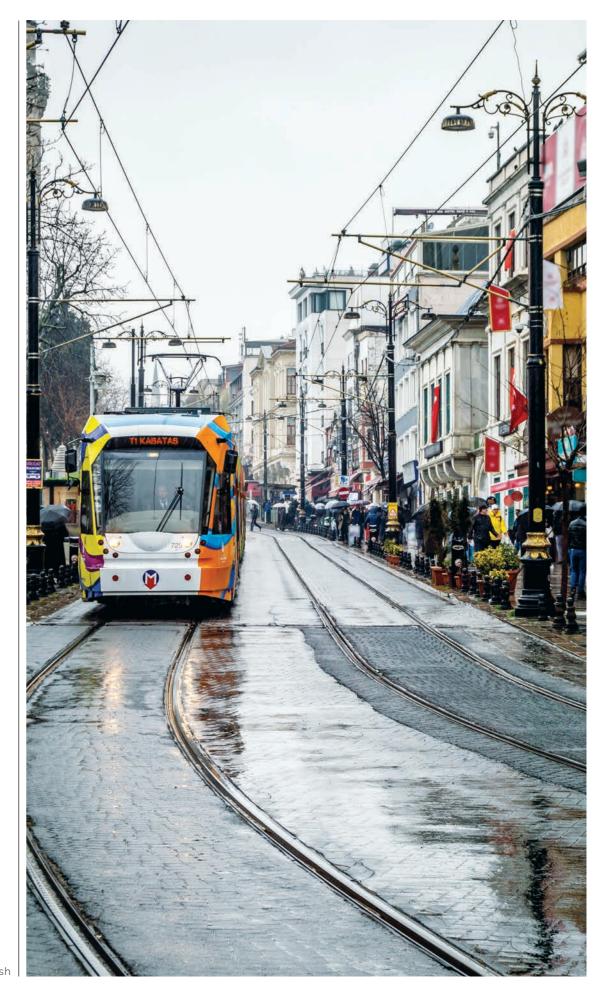
#### National Legal Framework

It is recommended that central government play a strategic role in land use and transport planning by developing a national legal framework that outlines the principles and priorities to be followed by regional and local authorities, and provides them with mechanisms and tools to implement those principles and priorities. The national legal framework should allow local authorities to be responsible for land use and transport planning within the territorial areas they govern. The national legal framework should also allow for regional/ metropolitan authorities and/or partnerships to be formed where there is a strong need for coordination between multiple local authorities and delivery partners. The legal framework should legally establish and promote a culture of cooperation, ownership, transparency and continuity:

- Various parties cooperate and do not disengage from dialogue, even if their agendas and views are not always the same,
- Local governments and their leaders report on their proposals, their implementation and associated spending,
- Local governments and their leaders establish clear responsibilities and are held accountable for the delivery of the developed proposals,
- Planning for land use and transport is organised so that their structure and proposals cannot be dramatically impacted by political changes in local or central government.



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## **Funding & Timeline**

The projects of Istanbul SUMP were broken down into short (2022-2024), medium (2025–2032) and long (2033–2040) term projects, based on their descriptions and discussions.

Table 12 shows the implementation plan and gross costs of the main projects, Costs are divided into three main groups:

- Low cost 0-10 million TL
- Medium cost 10-100 million TL
- High cost Above 100 million TL

Table 1: Linear in the internation of the set of the	ine		2022 - 2024	2025 - 2032	2033 - 2040
Bask and gross social of the main       East whom here       Image and hand of East <t< td=""><td>broken down into short (2022–2024),</td><td>Rail Network Extension</td><td></td><td></td><td>•</td></t<>	broken down into short (2022–2024),	Rail Network Extension			•
	3–2040) term projects, based on their	Extension of Transfer Centres		-	•
		Low Emission Zones	-		•
Markan       Receil		Cycle Feeder Routes			•
Hillon TL   bising kines (Monogenet) o <td>illion TL</td> <td></td> <td></td> <td></td> <td>•</td>	illion TL				•
Tate 2 index on blacks       Note in the blacks       Note in the black of the black o	illion TL	Istanbul Network Management	_		•
Takes of finite finguistion       Image of the finite		Bus Lanes			•
Twick clamage       Implementation of Inditicational implementation of Inditicational individing Managementation Protections and Cystats       Implementation of Inditicational individing Managementation Protections and Cystats       Implementation of Inditicational individing Managementation Protections and Cystats       Implementation of Inditicational individing Managementation Protections and Cystats       Implementation of Inditicational individing Managementation Protections       Implementation of Inditicational individing Managementation indindinding Managementation individing Managementation indi		Pedestrian Routes			•
Table 12 implementation of instantional Models from and cyclists       Implementational Models from and cyclists       Implementational Models from and cyclists       Implementational Models from and cyclists       Implementational Models from and cyclists       Implementational Models from and cyclists       Implementational Models from and cyclists       Implementational Models from and cyclists       Implementational Models from and cyclists       Implementation Models from and cyclists       Impl		Extension of Parking Regulation			•
Media Managament       Amedia Improvements for Predication and Option Samp       Amedia Improvements for Predication Amedia Improvements for Predication Amedia Improvements for Improvements for Predication Amedia Improvements for Pre		Traffic Calming			•
Packations and Cyclists			_		•
Service Centres       Service Centres		Junction Improvements for Pedestrians and Cyclists	_		•
Extension of Nation and Speen Data       Improvement					•
Bus Sprice Improvement       Park and Ride Factoria to include       Park and Ride Factorinclude       Park and Ride Factoria		Extension of Real Time Passenger	_		•
Minibus Operations       Image: Section 10 include         Minibus Special Discrete       Image: Section 10 include         Minibus Special Discrete       Image: Section 10 include         Minibus Special Discrete       Image: Section 10 include         Minibus Special Discrete       Image: Section 10 include         Minibus Special Discrete       Image: Section 10 include         Congestion Charging       Image: Section 10 include         E-Biles and F-Scotters       Image: Section 10 include         Construction Materials       Image: Section 10 include         Construction Materials       Image: Section 10 include         Construction Materials       Image: Section 10 include         Decarbonisation of the Public       Image: Section 10 include         Decarbonisation of Materials       Image: Section 10 include         Decarbonisation of Materials       Image: Section 10 include         Decarbonisation of Materials       Image: Section 10 include         Decarbonisation of Materials       Image: Section 10 include         Payment System       Image: Section 10 include         Payment System for Parking       Image: Section 10 include         Payment System for Parking       Image: Section 10 include         Payment System for Parking       Image: Sectin 10 include         Payment System for		Bus Service Improvement			•
Park and Ride Facilities   Minitus Feder Routes:   Anawuldy District   Congestion Charging   E-Bikes and E-Scooters   Construction Materials   Regulation Of Matrions   Payment System   Payment System Or Parking   Regulation Enforcement		Istanbulkart Extension to Include			•
Anavutköy District Congestion Charging E-Bikes and E-Scoolers Construction Materials Concentration Centres (CCCs) Residents' Parking Permit System Decarbonication of the Public Transport Bus Fleet Decarbonication of Marbous Introduction of an Automated Payment System for Parking Reorganisation of Parking Reorganisation of Parking Reorganisation of Parking Regulation Enforcement					-•
E-Bikes and E-Scoters       Image: Construction Materials <t< td=""><td rowspan="5"></td><td></td><td>_</td><td></td><td>•</td></t<>			_		•
Construction Materials       Concentration Centres (CCCs)         Residents' Parking Permit System       Decarbonisation of the Public         Transport Bus Fleet       Decarbonisation of Metrobus         Decarbonisation of Metrobus       Introduction of an Automated         Payment System for Parking       Reorganisation of Parking         Reorganisation of Parking       Reorganisation of Parking         Reorganisation of Parking       Reorganisation of Parking         Reorganisation of Parking       Reorganisation of Parking         Reorganisation of Parking       Reorganisation of Parking         Regulation Enforcement       Preparation         Medium Cost       Pitot		Congestion Charging	-		•
Concentration Centres (CCCs)   Residents' Parking Permit System   Decarbonisation of the Public   Transport Bus Fleet   Decarbonisation of Metrobus   Introduction of an Automated   Payment System for Parking   Reorganisation of Parking		E-Bikes and E-Scooters			•
Decarbonisation of the Public   Transport Bus Fleet      Decarbonisation of Metrobus   Introduction of an Automated   Payment System for Parking   Reorganisation of Parking   Regulation Enforcement   Low Cost Preparation Preparation Piot					•
Transport Bus Fleet   Decarbonisation of Metrobus   Introduction of an Automated   Payment System for Parking   Reorganisation of Parking   Regulation Enforcement    Low Cost Preparation Piot		Residents' Parking Permit System			•
Table 12: Implementation Plan of Core Projects     Acorganisation of Parking   Regulation Enforcement     Low Cost   Medium Cost   Pilot					•
Table 12: Implementation Plan of Core Projects       Reorganisation of Parking Regulation Enforcement         Low Cost       Preparation         Medium Cost       Pilot		Decarbonisation of Metrobus	_		•
Table 12: Implementation Plan of Core Projects       Regulation Enforcement         Low Cost       Preparation         Medium Cost       Pilot					•
Low Cost Preparation Medium Cost Pilot	Table 12: Implementation Plan of Core Projects	Reorganisation of Parking			•
Medium Cost Pilot		- 3			

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### Keeping Track: Monitoring and Evaluation

### Importance of Monitoring and Evaluation

One of the key elements in the SUMP implementation process is the monitoring and evaluation of all activities and projects. Monitoring is the systematic collection of data on specified indicators to provide authorities and stakeholders with an indication of the extent of progress in the achievement of objectives for an ongoing plan. Monitoring provides information for potential adjustments and re-planning during the course of SUMP implementation to improve the final result. Monitoring of all projects and of the SUMP overall will be carried out every six months. Evaluation is the systematic and objective assessment of an ongoing or completed plan, policy or measure. The aim of evaluation is to determine the relevance and fulfilment of specified objectives and targets, that is, an evaluation reveals how well a plan, policy or measure has performed. The evaluation can be carried out before (pre-implementation evaluation) and after (post-implementation evaluation) project implementation. The evaluation of projects and of the SUMP overall will be carried out every 3–5 years, subject to the nature and length of specific projects.

Monitoring should be a regular and ongoing process, as its main role is to inform authorities and stakeholders about the progress and achievement of SUMP objectives. Key steps in the monitoring process that should be followed are summarised in the flowchart in Figure 41. As shown in Figure 41, the process should start with ensuring that preparatory work has been completed for each indicator. This step must be completed before the start of any monitoring activities. Once preparation work has been completed, the monitoring process can start. If targets are not met, then it is important to understand the underlying reasons. All projects that are relevant for the indicator should be checked.

The monitoring and evaluation process is essential for the success of the SUMP implementation for the following reasons:

- It helps to identify probl implementation,
- It helps keep track of progress towards achieving targets and objectives,
- It anables clear and tran
- It helps uncover success stakeholders.

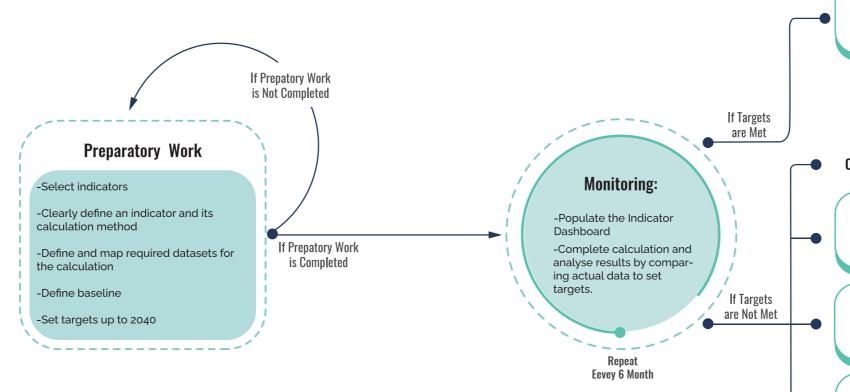


Figure 41: Key Steps of the SUMP Monitoring Process

• It helps to identify problems, bottlenecks and other challenges for on-time

- It indicates whether corrective actions (adaptations) need to be taken,
- It provides a systematic approach to SUMP implementation,
- It enables clear and transparent reporting on SUMP progress,
- It helps uncover success stories that can be shared with the public and



Continue implementation of relevant projects

### **Check Relevant Projects**



**Check data,** including but not limited to (check your data is valid, reliable, up-to-date; check your assumptions are robust; check calculations are correct)



**Check internal issues**, including but not limited to (programme issues, delays, budget, design, technology, project management, staff and resources etc)



**Check external issues**, including but not limited to (stakeholders, public, gover-nance, legal and regulatory)



Check need for additional interventions, including but not limited to (synergetic measures, complementary measures, collaboration opportunities)



### Responsibilities

Defining responsibilities is important for a successful and effective monitoring and evaluation process. The IMM Transportation Planning Directorate will be the SUMP Governing Body and will serve as a coordination unit for the monitoring and evaluation of the Istanbul SUMP, to include the following responsibilities:

- Informing project owners about relevant indicators, targets and interventions, enabling their understanding of these targets and interventions/projects, adjusting their activities so that interventions can be implemented and targets met,
- Coordinating data and information from different project owners (who are responsible for data collection in relation to their projects),
- Keeping track of implementation activities through structured processes for collaboration across related departments and directorates in IMM,

• Regularly measuring all SUMP indicators, which includes ensuring that relevant data collection methods are in place and that data is collected and analysed as planned,

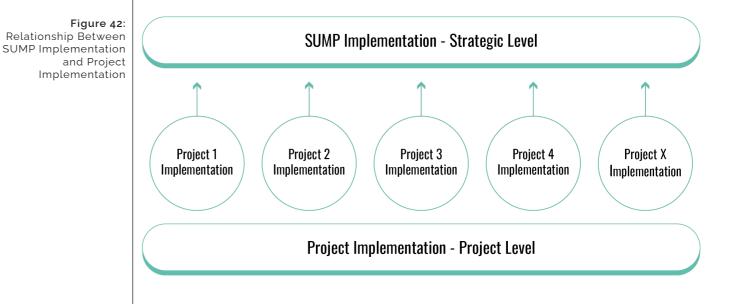
• Using indicators to monitor progress of individual projects towards their targets and the overall SUMP progress towards its objectives; this should be carried out in collaboration with project owners,

- Evaluating projects to establish and measure their outputs, impacts and effects,
- Assessing how trends, such as changes in national regulations, technologies, funding sources or local political environments, are likely to affect SUMP activities and projects,
- Ensuring flexibility to guarantee that new developments and insights are taken into account when updating SUMP projects and interventions,
- Cooperating with project owners and stakeholders to make changes in the implementation programme, if needed,
- Ensuring transparency to clarify changes in SUMP projects and to seek formal approval for the most important changes at a political level,
- Regularly reporting on the progress of all projects, which includes producing reports both internally within IMM and externally for other stakeholders.

Implementation of the SUMP projects will be carried out by the respective project owners, in coordination with the IMM Transportation Planning Directorate who will lead and coordinate the overall SUMP implementation. Project owners and the IMM Transportation Planning Directorate will regularly communicate and engage to ensure that responsibilities are clear, that there is work for everyone and that desired outcomes are delivered as part of the monitoring and evaluation process. ©Arup

### Strategic and Project Level Monitoring and Evaluation

Implementation and monitoring of the Istanbul SUMP as a whole depends on the implementation and monitoring of the proposed projects. For this reason, monitoring and evaluation will be carried out at two levels: project level and strategic level (Figure 42).





The difference between these levels is important. Project level monitoring is the responsibility of the assigned project managers, while strategic level monitoring will be carried out by the IMM Transportation Planning Directorate, which is the SUMP Governing Body. Project managers and the IMM Transportation Planning Directorate will constantly engage and work together on the implementation and monitoring processes.

At project level, the following components will be monitored:

- Resources invested in the project (for example, how much money, how many other resources, etc.),
- Outputs delivered by the project during and after implementation (for example, infrastructural indicators such as kilometres built, number of stations improved, number of streets upgraded, percentage of project completed, amount of cycle parking provided, etc.; and performance indicators such as carbon emissions or air pollution, and accident reduction in the project area, etc.).

Monitoring these elements will help to keep track of resources allocated and spent and to understand how efficiently they are used. It can be difficult to capture the actual impact and outcome of some projects at project level, because they are implemented with other measures and interventions. This is why overall impacts and outcomes should be measured at strategic level.

At strategic level, the following elements need to be constantly monitored:

- Changes in travel demand characteristics as a result of the implementation of different projects (for example, change in modal split, kilometres cycled, number of people walking, trip length distribution, etc.),
- Changes to other aspects of life as a result of changes in transport activity (for example, change in air quality, accessibility, social inclusion levels, etc.).

### Reporting

Regular and transparent reporting is an important result of the monitoring and evaluation process and activities. Some reports will be for internal IMM use only, some will be external for other stakeholders. Two main types of report will be produced for the Istanbul SUMP:

- Monitoring reports will be produced regularly, every time indicators are reviewed and/or every six months. These are likely to be primarily internal, for use by IMM departments and executives to help them understand the status of SUMP implementation. They may be external if stakeholders are interested in being updated on progress.
- Evaluation reports will be produced after projects and their impacts are evaluated. The recommended frequency for evaluation reports is every three to five years. These are for both internal and external use so that IMM and other stakeholders can make informed decisions on whether projects are effective enough and whether they should be continued.

All reports will provide updates on progress towards the Istanbul SUMP objectives and targets. The IMM Transportation Planning Directorate (coordination unit) will be in charge of producing all reports in relation to the SUMP. All project owners and departments will support the process by sharing data and information on project performance.



## **Next Steps**



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15 https://www.eltis. org/resources/

tools/sumps-

manuals-sump

measure-selection

Even though the EU has strongly supported opportunities for SUMPs, the take up has been relatively slow. In a 2017 survey conducted across 328 cities in Europe, 44% stated they had no SUMP activities at all, were considering their first SUMP or were in the process of developing their first SUMP<sup>15</sup>. The wide range of cities with differing characteristics and mobility landscapes in Europe implies that the challenges to select the right kind of measures and actions is dependent on a wide range of factors, including how mature a city is in terms of sustainable urban mobility planning. The Istanbul SUMP is the first in Turkey. Other Turkish cities would like to commence SUMP development in the near future. These cities typically want to go from conventional transport planning to more strategic and inclusive planning for sustainable mobility.

The Istanbul SUMP has set ambitious targets to achieve its objectives through projects that will improve overall accessibility and create more equal access for all citizens. They will also reduce the negative impacts of the transport system in terms of the environment (carbon emissions, air and noise pollution), reduce time lost in congestion and improve mobility-related safety across the city. For cities just commencing the SUMP process, it is important to find a balance between their ambitions and the capacity of the city's administration to deliver. A focus on finding a solid foundation of cost effective and feasible measures and actions can help cities like Istanbul to take a big step towards solving prioritised challenges.

The projects of the Istanbul SUMP were determined with the engagement of a broad range of stakeholders and citizens who represented the interests of different groups. This was created with a shared view and the projects gained approval among the stakeholders and political ownership within IMM.

Two projects have significant roles in improving accessibility and inclusiveness and in reducing car use: Rail Network Extension and the Extension of Parking Regulation. These projects account for a high level of benefits measured by quantitative and qualitative appraisal methods. Rail Network Extension in fact consists of several rail projects, and priorities need to be based on a detailed analysis of each to select the most cost effective rail projects to be funded. Extension of Parking Regulation and related parking management projects also need thorough preparation, including developing a proper legal framework.

In an age of rapid economic, social and demographic changes and technological developments, along with the uncertainties the world going through, it is extremely difficult to foresee how cities will evolve. There are many unpredictable factors that shape cities. As one of the largest metropolitan cities in the world, located in a unique geography, Istanbul also faces a number of specific challenges, such as density, internal and external migration,



earthquakes, large city transformation projects, rapid growth of built environment, and economic problems. To address these uncertainties in the Istanbul SUMP, two key factors were selected to develop the scenarios: economic prosperity and governance structure. A prosperous economy will make it easier to implement projects that need substantial investment, such as rail projects. Governance aspects also play an important role in the SUMP implementation process. The creation of a proper legal framework, a prerequisite for the Extension of Parking Regulation, would be much easier if local municipalities had stronger decision-making powers. A truly sustainable transport system will only develop with a certain level of density around existing and new centres with high-quality public transport connections. Projects proposed in the context of Istanbul SUMP are defined and designed around the framework of possible futures depending on these two key factors.

To face the global climate change crisis, decarbonising the transport system is a general trend that is not only guided by the Turkish authorities. The production of electric vehicles has been adopted by the worldwide automotive industry and the question is whether local authorities will be able to create the conditions for the electrification of their vehicle fleets. Considering these, the Istanbul SUMP adopted this approach and two projects related with decarbonasing buses used in both metrobus system and public transport system were proposed. In this sense, these trends will be followed and steps will be taken towards decarbonisation of publis transport bus fleet.

Istanbul already has a remarkably high share of walking trips (about 40% of daily trips), but this most sustainable mode of transport is under pressure, as walking is often not a pleasant experience in the city. The Istanbul SUMP presents a range of projects that promote walking and improve the way citizens can safely enjoy public space. This is also connected to the promotion of cycling, which is an attractive mode of transport in many cities throughout the world. The Istanbul SUMP focuses on cycling as a mode that will play an important role as feeder to public transport for first/last kilometre trips. In the Istanbul SUMP, projects were proposed to promote walking and cycling, such as Junction Improvements for Pedestrians and Cyclists, Low Emission Zones, Congestion Charging, Traffic Calming and the Extension of Transfer Centres.

Developing the Istanbul transport system for a more sustainable future also means innovating. Not only in terms of technology, but also in the way the city takes advantage of emerging new lifestyles among sections of the population. The Istanbul SUMP addresses the promotion of new services that will enable life without a personal car. These initiatives are all ranked under a broad concept of mobility management.

Implementation is an obvious next step for the first Istanbul SUMP. However, implementation has many steps, as previously indicated. A few concrete preparatory initiatives need to be undertaken:

- **1.** Prepare the internal organisation in IMM and assign specific tasks related to projects.
- The Istanbul SUMP suggests an organisation within IMM that takes implementation tasks on board. Within this (partly new) setting, officials will have assigned projects.
- **2.** Select the rail network extension projects as having the most potential to improve inclusiveness and accessibility and to increase the share of public transport.
- The availability of the ITM, integrated with detailed feasibility studies, will help support this selection process considerably.
- **3.** Consider how governance issues can be solved, taking advantage of existing institutional structures under existing governing principles.

Finally, it should be noted that IMM has been awarded an EU fund to carry out a complementary SUMP that will be built upon the new perspective set by the first Istanbul SUMP. That project will, among others, focus on detailed analyses with the ITM, which will be updated with new data to be obtained from household surveys and smart data sources. This tool will help detail and implement many of the projects in this first SUMP. In this context, it will be possible to detail existing SUMP studies and to move them to the next stage and preserve the dynamic structure of the study.









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