



BULGARIAN-SWISS COOPERATION PROGRAMME  
БЪЛГАРО-ШВЕЙЦАРСКА ПРОГРАМА ЗА СЪТРУДНИЧЕСТВО



**лм**  
BIM Consulting



**INFRAPROJECT**  
CONSULT  
LTD

# SOFIA MOBILITY 2035



sustainable mobility for all

## **Sustainable Urban Mobility Plan** of Sofia City

*The Sustainable Urban Mobility Plan 2019 – 2035 for Sofia Municipality has been elaborated under the project “Modernized trams for the City of Sofia” co-financed by Switzerland in the framework of the Swiss Contribution to the enlarged European Union and was adopted by the Sofia Municipal Council with Decision No.379 at Session No.78 dated 27<sup>th</sup> June 2019.*



BULGARIAN-SWISS COOPERATION PROGRAMME  
БЪЛГАРО-ШВЕЙЦАРСКА ПРОГРАМА ЗА СЪТРУДНИЧЕСТВО

<http://swiss-contribution.bg/>

# Contents

Introduction .....	8
Spatial structure and demographic development of Sofia .....	15
1. Spatial structure .....	15
2. Population .....	17
Analysis of the current situation.....	19
Specialized survey .....	20
1. Pedestrian traffic .....	25
2. Bicycle traffic.....	31
3. Public transport .....	36
4. Street network and car traffic.....	57
5. Electric cars and shared mobility .....	65
6. Parking .....	69
7. Urban logistics .....	77
8. Intelligent Transport Systems .....	86
Vision, goals and concept of sustainable urban mobility .....	92
1. Vision for Sustainable Urban Mobility - Sofia 2035 .....	94
2. General objectives of SUMP .....	97
3. Concept for development and project proposals 2019 - 2035 .....	104
4. Policies and Measures for Development of Urban Mobility in Sofia.....	116
Major projects and initiatives .....	120
1. Pedestrian traffic .....	120
2. Bicycle traffic.....	128
3. Public transport and intermodality .....	146
4. Parking .....	186
5. Electric cars and shared mobility .....	198
6. Urban logistics .....	201
7. Intelligent Transport Systems .....	212
Concept of development.....	212
Projects and initiatives.....	216

8. Territorial integration of project proposals .....	220
Budget and financial and economic analysis of the Sustainable Urban Mobility Plan .....	236
1. Budget .....	236
2. Financial Analysis and Cost-Benefit Analysis of the Plan .....	241
1.1. Methodology and basic assumptions in financial analysis .....	241
1.2. Financial Efficiency of the Plan .....	242
1.2.1. Financial Net Present Value of Investment (FNPVI) .....	242
1.2.2. Financial Internal Rate of Return on Investment (FIRRI) .....	243
3. Economic analysis of SUMP .....	243
3.1. Methodology of economic analysis .....	243
3.2. Economic Benefits of the Plan .....	244
3.3. Economic Indicators of the Plan .....	245
Recommendations to the Urban Planning System .....	246
SUMP Monitoring and Evaluation Program .....	250
Focus groups and public participation .....	256
Legislation .....	258
List of applications to SUMP .....	262

## List of Figures

Figure 1 The structure of the city - an idealized model .....	<b>Error! Bookmark not defined.</b>
Figure 2 Population of Sofia Municipality (Thousand People) .....	17
Figure 3 Social demographic indicators of the sample .....	<b>Error! Bookmark not defined.</b>
Figure 4 Distribution of trips by type of transport in% .....	<b>Error! Bookmark not defined.</b>
Figure 5 Travel distribution by travel (%) in 2017 for all modes of transport .....	22
Figure 6 Types of transport commonly used on weekdays among different social groups (self-assessment) .....	<b>Error! Bookmark not defined.</b>
Figure 7 Levels of declared normal walking among the different groups .....	25
Figure 8 Distribution of trips by mode of transport in% .....	27
Figure 9 Which of the following problems make you restrain walking .....	<b>Error! Bookmark not defined.</b>
Figure 10 Reasons why walking is not used .....	28
Figure 11 Pedestrian traffic: key issues .....	29
Figure 12 Walkthrough: Potential and Challenges .....	29
Figure 13 Share of cycling in selected European cities .....	31
Figure 14 Levels of declared regular bicycle use among different groups .....	32
Figure 15 Reasons why bicycle is not used .....	33
Figure 16 Cycling: key issues .....	33
Figure 17 Cycling: Potential and Challenges .....	35
Figure 18 Scheme of the metro lines in Sofia .....	38
Figure 19 Diagram of the tram lines in Sofia .....	38



Figure 20 Trolleybus scheme in Sofia.....	40
Figure 21 Schematic of bus lines in Sofia.....	41
Figure 22 Walking accessibility to stops of MUT, isochrons 400, 800 and 1200 m. <b>Error! Bookmark not defined.</b>	
Figure 23 Underground passenger load (daily imbalance for April 11, 2013).....	44
Figure 24 Distribution of trips by type of urban transport in%.....	46
Figure 25 Improvements that would normally drive people traveling by car to use public transport .....	50
Figure 26 Public transport: key issues .....	48
Figure 27 Public transport: potentials and opportunities .....	48
Figure 28 Railway Node Sofia.....	<b>Error! Bookmark not defined.</b>
Figure 30 Street network and traffic organization: key issues.....	<b>Error! Bookmark not defined.</b>
Figure 31 Street network and traffic organization: potentials and challenges .....	63
Figure 32 Motorization level for Sofia-city (2006 - 2016).....	60
Figure 33 Distribution of trips by mode of transport.....	61
Figure 34 Automotive traffic: key issues.....	<b>Error! Bookmark not defined.</b>
Figure 35 Vehicle movement: Potential and Challenges.....	<b>Error! Bookmark not defined.</b>
Figure 36 Electric cars: key issues .....	66
Figure 37 What is your opinion on the use of electromobility.....	67
Figure 38 To what extent building a wider network of charging stations would influence your decision.....	<b>Error! Bookmark not defined.</b>
<b>Figure 39 Electromobility: Potential and Challenges.....</b>	<b>Error! Bookmark not defined.</b>
Figure 40 "Blue Zone" and "Green Zone" Part Time Parking Schedule (effective from 01.11.2018).....	70
Figure 41 Parking: key issues.....	<b>Error! Bookmark not defined.</b>
Figure 42 Capacity and occupancy of buffer parking spaces.....	75
Figure 43 Parking: Potential and Challenges .....	75
Figure 44 Location of larger logistics bases.....	80
Figure 45 Key urban logistics problems.....	<b>Error! Bookmark not defined.</b>
Figure 46 Logistics: Potential and Challenges.....	<b>Error! Bookmark not defined.</b>
Figure 47 Key Issues in Intelligent Transport Systems.....	<b>Error! Bookmark not defined.</b>
Figure 48 ITS: Potential and Challenges.....	<b>Error! Bookmark not defined.</b>
Figure 49 Turning the Pyramid of Mobility.....	92
Figure 50 Vision - Sofia 2035 .....	<b>Error! Bookmark not defined.</b>
Figure 51 Split modality - existing position and target values.....	<b>Error! Bookmark not defined.</b>
Figure 52 Spatial structure of Sofia - model.....	104
Figure 53 Concept of Sustainable Urban Mobility - Street Network and Road Traffic .....	111
Figure 54 Concept of Sustainable Urban Mobility - Parking.....	106
<b>FIGURE 55 CONCEPT OF SUSTAINABLE URBAN MOBILITY - LOGISTICS</b> <b>Error! Bookmark not defined.</b>	
<b>FIGURE 56 CONCEPT OF SUSTAINABLE URBAN MOBILITY - PUBLIC TRANSPORT.....</b>	<b>110</b>
Figure 57 Concept of Sustainable Urban Mobility - Bicycle Movement.....	112
Figure 58 Concept of Sustainable Urban Mobility - Pedestrian Movement.....	114
Figure 59 Sustainable Urban Mobility Policies.....	116
Figure 60 Major pedestrian traffic projects.....	121
Figure 61 Map of the main projects in the "Bicycle Movement" .....	129
Figure 62 Main bicycle network projects.....	132
Figure 63 Incoming Bicycle Network Projects .....	137
Figure 64 Recreational Cycle Network Projects .....	141
Figure 65 Main projects for the extension of the metro system .....	147
Figure 66 Load on route M3 (Ovcha Kupel) .....	151
Figure 67 Load on route M1 (Lyulin) .....	151
Figure 68 Daily daily workload forecast for urban transport passengers on route 1 - Ovcha Kupel - District Hospital, 2040.....	154
Figure 69 Daily daily system load forecast for continuation of the first line of the metro on Tsaritsa Yoana Blvd., 2040 .....	<b>Error! Bookmark not defined.</b>
Figure 70 Daily daily workload forecast for the Student City, 2020. ....	<b>Error! Bookmark not defined.</b>

Figure 71 Main projects for the development of the ground public transport system .....	160
Figure 72 Daily load with passengers at the final stage.....	166
Figure 73 Bus Stands and Autonomous / Shared Tramways.....	170
Figure 74 Main projects in the "Intermodality" direction".....	182
Figure 75 Map of the main projects in the "Parking" .....	187
Figure 76 Input and outflow potentials per zones from / to Buffet Parking Montevideo Blvd. daily.....	191
Figure 77 Input and output potentials by zone to /from Buffer parking Auto East daily .....	192
Figure 79 Preparation of the UGSL .....	209
Figure 80 Territorial integration of project proposals in the Lulin package.....	221
Figure 81 Territorial integration of the project proposals in the Ovcha Cupel package .....	224
Figure 82 Territorial integration of the project proposals in the Suha Reka - Hadji Dimitar package .....	227
Figure 83 Sustainable Urban Mobility Sustainable Urban Mobility Plan (million BGN.).....	236
Figure 84 Breakdown of budget by directions without metro (%) .....	236
Figure 85 Breakdown of budget by Periods.....	<b>Error! Bookmark not defined.</b>
Figure 86 Total budget allocation by funding sources (%) .....	<b>Error! Bookmark not defined.</b>
Figure 87 Breakdown of budget by funding sources and by Periods (million BGN).....	239
Figure 88 Economic and benefits.....	<b>Error! Bookmark not defined.</b>
Figure 89 Logical frame of the indicators .....	251

## List of tables

Table 1 Basic data on public transport by 2017 .....	41
Table 2 Public transport in figures .....	<b>Error! Bookmark not defined.</b>
Table 3 Key measures and policies .....	<b>Error! Bookmark not defined.</b>
Table 4 Forecast of urban passenger load on route realization 1 – "Ovcha kupel" - District Hospital, 2040 .....	<b>Error! Bookmark not defined.</b>
Table 5 Daily system load on continuation of the first subway line on Tsaritsa Yoana Blvd. - forecasts for 2020 and 2040.....	<b>Error! Bookmark not defined.</b>
Table 6 Daily workload of metro stations on the subway to "Studentski grad", 2020 .....	158
Table 7 Daily passenger load data on 2020 systems .....	164
Table 8 Load with passengers on the route operating on the new route.....	<b>Error! Bookmark not defined.</b>
Table 9 Renewal of the existing bus fleet by Periods .....	<b>Error! Bookmark not defined.</b>
Table 10 Renewal of rolling stock and specialized cars for the needs of electric transport ..	<b>Error! Bookmark not defined.</b>
Table 11 Number (%) of passengers by way of access to selected metro stations ...	<b>Error! Bookmark not defined.</b>



## Introduction

### A big and dynamic city

Sofia is the fastest growing city in Bulgaria. The dynamism and diversity of the capital make it one of the most attractive places for living and working in the country. Over the last 16 years the population of the capital has grown by more than 150,000 and continues to grow. Sofia is an attractive city for new companies offering qualified workforce, good connectivity and modern amenities. The number of tourists in the city has also increased in recent years. The continuous growth and development of the city, however, puts pressure on the transport infrastructure, the viability and the environment of the city. This challenge requires the adoption of a new mobility strategy based on innovative solutions. A strategy that will strengthen the future position of Sofia as a modern and sustainable city.

### Accessible and connected city

A key condition for further growth and development of Sofia is the accessibility and connectivity of the city. People need easy and safe access to jobs, schools, public spaces, parks, services and entertainment, regardless of age, gender, health and income. This can be achieved by creating the conditions for a more balanced distribution of travel between different modes of transport.

It is the transport network that makes Sofia the city that is - connecting communities, providing opportunities and creating conditions for the prosperity of the economy. At the same time, the transport system also determines the daily life of Sofia citizens - how physically active they are, how long and pleasant their daily trips to work, school and the surroundings of the city are, and even where they choose to live and work. Accessibility should benefit everyone. Careful planning can allow hundreds of individual solutions, projects and initiatives to work together in a way that creates a healthy and environmentally sustainable city.

### Change for the future

The way we move in the city influences the use of the public space, the environment, the safety and the health of the people. Nowadays it is widely acknowledged that the attractiveness of the city is largely determined by its transport system. That is why we must carefully design the transport system for the future of Sofia. Which modes of transport should be given priority, how do we distribute and design the public space, how can we reduce the impact of traffic on the environment? Despite the significant

## SUMP 2035

The Sustainable Urban Mobility Plan is a strategic document designed to meet the needs of people and business mobility based on the principles of sustainability.

investments in improving the urban transport system in Sofia, the degree of motorization has been increasing steadily over the last decade. This leads to increased congestion, pollution, greenhouse gas emissions, noise and a growing public space occupied by cars. Enhancing the capacity of streets is no longer an option due to the lack of space and the negative impact that this has on the environment and the public space. Keeping Sofia accessible and attractive in the future requires a new strategy - sustainable mobility.

### Sustainable mobility

Sustainable mobility is the ability to meet the transport needs of citizens in a way that is least harmful to the environment. Sustainable urban mobility requires a change in thinking and urban planning, where passenger car journeys give way to more active and massive modes of transport, such as walking, cycling, public transport and shared cars. Many European cities have successfully implemented sustainable mobility plans. They have helped cities become more attractive and vibrant without limiting accessibility by offering an integrated high-quality and sustainable transport system.

### Sustainable Urban Mobility Plan

The Sustainable Urban Mobility Plan is a strategic document designed to meet the mobility needs of people and businesses in cities and their surroundings for a better quality of life. It builds on existing planning practices, focusing on the principles of sustainability.

For a long time, each mode of transport has worked successfully apart from others, despite numerous projects and initiatives to promote sustainable mobility. The plan responds to the new challenges by offering an integrated vision and policies for all modes of transport and planning a transport system for people that is socially, environmentally and economically sustainable. This is achieved above all by embracing a holistic approach to the relationship between urban planning and sustainable mobility. The plan is an important key in the process of creating a well-connected Sofia, which provides a better quality of life for more residents and visitors. The plan is based on the principles of sustainability and takes into account the best international transport practices and future mobility trends.

The Sustainable Urban Mobility Plan must meet several requirements:

- To contribute to the achievement of the European climate

## Requirements for the measures in SUMP

- ✓ Eco-friendly
- ✓ Realistic
- ✓ Financially secured
- ✓ Measurable

and energy goals, the envisaged projects, measures and initiatives to reduce the harmful impact of transport on the environment and on human health.

- To be realistic, ie. the envisaged projects, measures and initiatives are feasible within the time constraints of the plan, including all concomitant activities (alienation procedures, geological surveys, etc.)
- To be financially secured, to have a realistic and enforceable budget for the envisaged projects, measures and initiatives.
- Provide a monitoring and evaluation program and a system of indicators to periodically measure progress on the implementation of the plan. SUMP should be updated at least every 5 years.

### [Link to other strategic documents](#)

The Sustainable Urban Mobility Plan is being prepared in parallel and in coordination with other strategic documents concerning the long-term development of Sofia and Sofia Municipality.

**„Vision for Sofia ”** is an initiative to create a shared and long-term development strategy for Sofia and the suburban territories with a horizon of 2050. The project has the ambition to describe the city in which we all want to live and improve urban planning, gathering, summarizing, analyzing and discussing all available information on all topics related to the development of Sofia. It is obvious that urban mobility will be one of the key topics in the discussion process for the future of the capital.

**„Green Sofia“** project aims to coordinate Sofia's policies related to the sustainable development of the city, to develop pilot projects and to prepare Sofia's bid for the European Commission's Green Capital Award. The initiative aims to encourage local authorities across Europe in their efforts to reduce the negative impact of the urban environment on residents' health and to apply high environmental standards in their governance. Transport is one of the main sources of harmful emissions in the city and the issues of air cleanliness and environmental protection are inextricably linked to sustainable urban mobility.

**„Sofia – a City for People“** is a project for research and analysis of public spaces in the center of the capital under the guidance and methodology of the Danish architect and urban designer Prof. Ian Geel. The project is focused on the policy of the Sofia Municipality to develop public spaces for pedestrians and cyclists, to limit the traffic and to turn Sofia into a city with a human scale. Sustainable urban mobility is directly related to the vibrancy of the city and the attractiveness of the urban environment.

All of these projects and initiatives are supported and supplemented, and all that connects them is precisely the topic of urban mobility. The Sustainable Urban Mobility Plan team is working in coordination with the other three teams, with some of the measures and proposed solutions in SUMP complementing or part of these initiatives.

## Structure of SUMP

The report is structured in several main sections. The analysis of the current situation points out the main trends in the individual urban mobility trends as well as the key issues in their development. This is the basis for defining the vision, objectives and concept of future development that are reflected in concrete projects and implementing measures.



### Legend:

*Introduction and essence of SUMP*

*Spatial and demographic development of Sofia*

*Analysis of the current situation*

*Directional analysis*

*Vision for Sustainable Urban Mobility*

*Overall objectives of SUMP*

*Concept for the Development of Sustainable Urban Mobility in Sofia*

*Policies and measures for the development of sustainable urban mobility in Sofia*

*Major projects and initiatives of SUMP*

*Territorial integration of project proposals*

*Budget of SUMP*

*Recommendations to the Urban Planning System*

*SUMP Evaluation and Monitoring Program*

*Public participation*

Due to the nature of its subject matter and the need for more in-depth research, some of the topics analyzed are discussed in more detail in further developments to the SUMP, namely:

1. Applicability analyzes with subject:
  - Opening new lines with a leading function in the Ovcha Kupel and Lyulin residential districts and rolling stock supply;
  - Rail transport for suburban and intra-urban trips;
  - Construction of a new tram route on "T. Kableshkov "and construction / extension of the necessary street network)
2. Parking management program
3. Financial and Economic Analysis (Cost-Benefit Analysis)



## Abbreviations

---

AM - motorway

RIA – Road Infrastructure Agency“

ATCS - Automated Tracking Control System

ASCP - The automated system for charging passengers

BDZ - Bulgarian State Railways

GD ISTS General Directorate "Inspection for State Technical Supervision"

GIS - Geographic Information Systems

UCC - Urban Consolidation Centers

PT - Public transport

ATR - Annual technical reviews

SAMTS - State Agency for Metrology and Technical Surveillance

VAT - Value added tax

EV - Electric Vehicles

EU - European Union

ExEA Executive Environment Agency

IURDP - Integrated Urban Recovery and Development Plan

IT - Information Technology

ITS - Intelligent Transport Systems

AAQ - Atmospheric air quality

TC - Traffic Control

LP - Logistic profile

MS - Metro Station

DAUD– Direction “Architecture and Urban Development”

SPA - Scientific and production area

NSA - National Sports Academy

NSI - National Statistical Institute

GSP General structural plan

PS - Parking spaces

RTA - Road Traffic Accidents

SULP - Sustainable Urban Logistics Plan

SUMP – Sustainable Urban Mobility Plan

PSN- Primary street network

PPP - Public-Private Partnership

RHI - Regional Health Inspection

RIE - Regional Inspectorate of Environment

AAR - Average annual rate

SDIA- Sofia Directorate of Internal Affairs

DAN - Daily average norm

SM - Sofia Municipality

CO<sub>2</sub> – Carbon dioxide

SMC - Sofia Municipal Council

NST Northern speed tangent

TR - Tram route

UMPHATEM - University Multi-Profile Hospital for Active Treatment and Emergency Medicine

FPP Fine particulate particles

UMC Urban Mobility Center

CUA - Central Urban Area

ANPR – Automatic Vehicle Identification System

IoT – The Internet of Things

MaaS – Mobility as a service

NO<sub>x</sub> – Nitrogen oxides

PLGS - Light pedestrian protection system

# Spatial structure and demographic development of Sofia

The capital of the Republic of Bulgaria Sofia is located in the western part of the country in the Sofia field, right next to the northern slope of the Vitosha Mountain. After being declared capital city in 1879, the city underwent rapid development and development and became the main administrative, industrial, transport, cultural and university center of the country. The structure of the street network of Sofia, preserved to this day - *a radial-circular main street network* and a predominantly *orthogonal* secondary network in the central city part, was formed from the Liberation to the beginning of the Balkan Wars (1879-1912).

## 1. Spatial structure

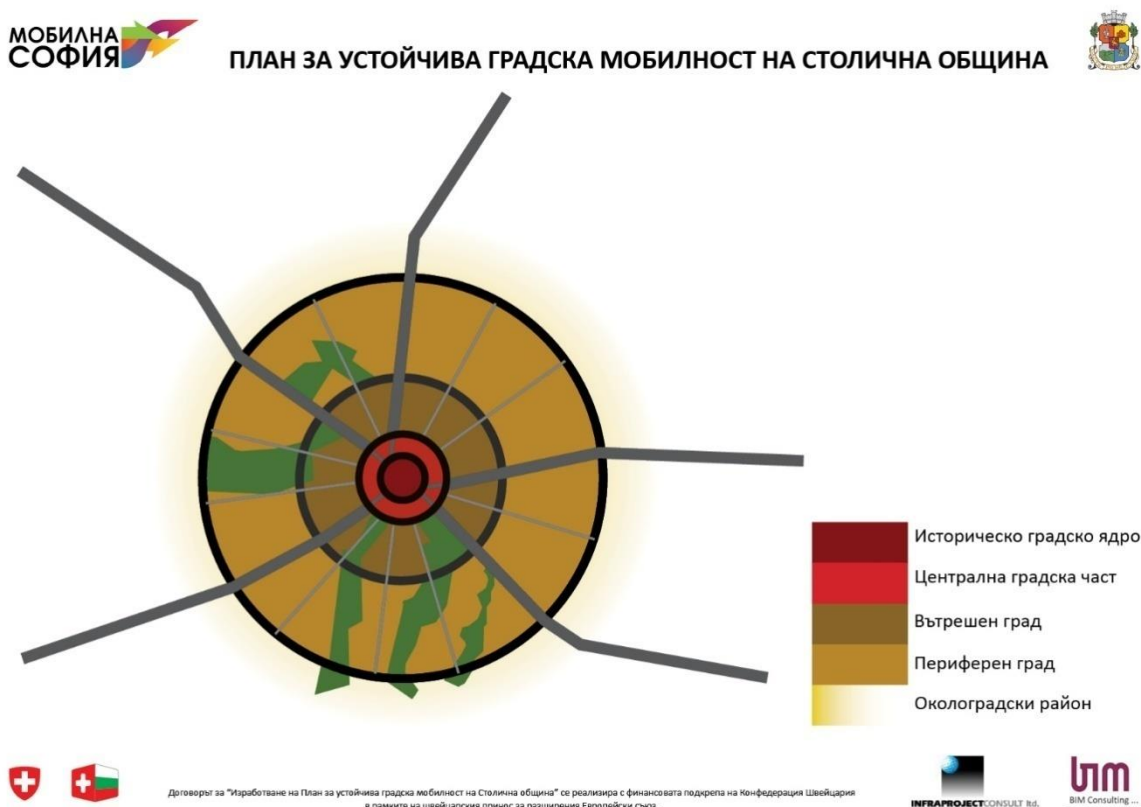
The macro structure of today's Sofia can be defined as *a compact city with a radial-circular structure*. In its stormy demographic and territorial development over the past 140 years the city has been growing concentrically around its historical core. The main development axes have followed the existing transport routes from the centuries - southeast, northwest, southwest, northeast, north. Along with the growth of the city along the main radial directions, there are planned and partially realized circular / ringing routes, connecting the different districts along the periphery.

In the spatial structure of today's Sofia, several concentric zones are clearly distinguishable, depending on the historical stage of the urbanization of the territory and the nature of the construction.

- **Central core** – the territory constrained by the first urban ring, which coincides with the historic city center. This zone is a sub-zone of the central city area.
- **Central city area** – the territory constrained by a second urban ring, concentrating administrative and managerial and representative functions of municipal and national significance, as well as a significant percentage of residential functions.
- **Inner city** – the territories around the central city area approximately to the old ring railway or third urban ring. These territories were joined to the city mainly during the period between the two world wars. In the inner city, there is a small proportion of industrial sites historically differentiated around the former railroad area, many of which have lost their industrial functions. Today, some of these former industrial sites are subject to intense restructuring and turning them into multifunctional residential and business areas because of their good location and infrastructure.
- **Peripheral city** – the territories located between the third urban ring and the ring road. This is the area where most of the large residential complexes built in the 70s and 80s of the last century - Lyulin, Mladost, Druzhba, Levski, Nadezhda, Ovcha Kupel and others. In the southern part of this area there are also recently unbuilt or underdeveloped territories, such as Manastirski livadi, Krastova vada, Vitosha, Malinova dolina, which in the years after 1989. are subject to strong housing construction in the absence of an adequate street network, infrastructure and public service.

- **Area around the city** – the territories in Sofia Municipality outside the compact part of the city, some of which have the status of urban neighborhoods and others represent independent settlements. The residential areas in the surrounding area have preserved to a large extent their characteristic appearance - free yard construction with low floors, as single buildings have built up higher ones. The southern territories in the surrounding area are subject to increased investment activity and construction with individual single-family buildings and residential complexes of closed type. Despite this trend, the suburbanization process in Sofia is not very pronounced and the vast majority of the population lives in the compact city.

**FIGURE 1 THE STRUCTURE OF THE CITY - AN IDEALIZED MODEL**



*Legend:*  
*Sustainable Urban Mobility Plan of Sofia Municipality*  
*Historical Urban Core*  
*Central Urban Area*  
*Inner city*  
*Peripheral city*  
*Surrounding area*

Despite the intentions and trends of development of secondary urban centers, Sofia is still a monocentric city. Many of the trips look for the center or transit through it. This also facilitates the structure of the existing street network, where the broad and relatively well-built radial routes predominate, while the ringing and tangential routes laid down in the development plans are under-built. In practice, only the innermost (the first urban ring around the historic city center) and the outer ring (the ring road) are completely finished. A second urban ring around the central city district is missing a major stretch - breakthrough "Danail Nikolaev".

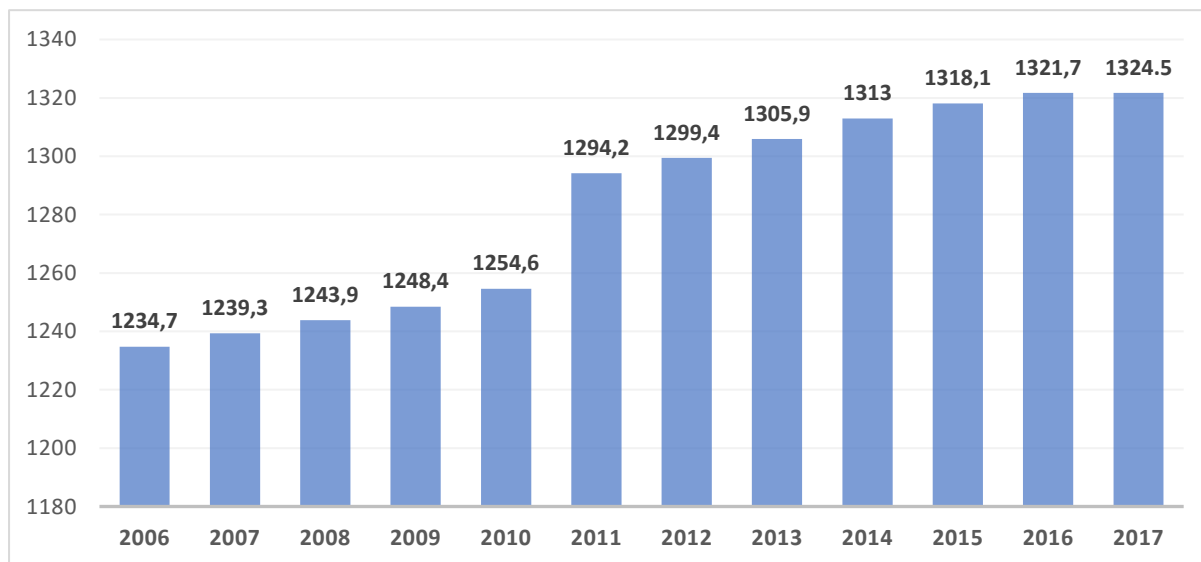
The most problematic is the third urban ring - only fragments of it are built (section of Todor Kableshkov Blvd., GM Dimitrov Blvd., Assen Yordanov Blvd.). The absence of an intermediate ring between the central city area and the ring road leads to the fact that much of the distant correspondence requires a passage through or near the center, which further adds to it with parasitic traffic.

## 2. Population

Sofia is the largest city on the territory of Bulgaria - every 5th Bulgarian lives in the capital. The following figure shows the population growth in the city (the number is shown in thousands).

According to the National Statistical Institute, despite the deteriorating demographic situation and the negative growth in the country as a result of the demographic and migration processes in the country, the population of Sofia is growing. According to NSI data at the end of 2017, the residents of Sofia are 1,266 thousand people.

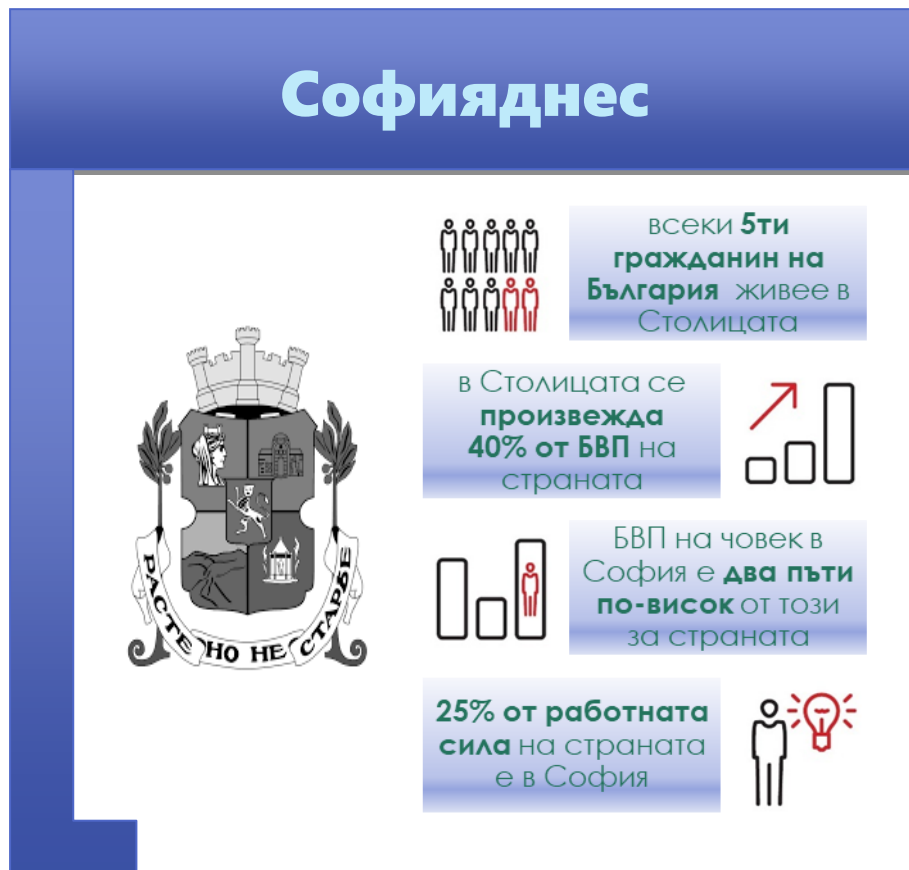
FIGURE 2 POPULATION OF SOFIA MUNICIPALITY (THOUSAND PEOPLE)



Source: NSI

Together with unregistered and temporary residents, seasonal workers and daily inhabitants of the adjoining settlements, the population of the capital exceeds 1.5 million people. As can be seen from the results, internal migration has a strong impact on the number and structure of the population in Sofia. This is explained by the fact that the capital is an attractive place to live because of the greater opportunities for work, education, health care, culture, etc. compared to other areas.

Sofia Municipality has a key role in the economic development of the country. One quarter of the country's workforce and 1/6 of industrial production in Bulgaria are concentrated in Sofia. Gross domestic product (GDP) produced is 40% of the country's total. On the GDP per capita indicator for Sofia, it is almost twice as much as the GDP per person in the country. There are still positive trends in the demographic and economic development of the capital.



*Legend:*

*Sofia Today*

*Every fifth citizen of Bulgaria lives in the capital*

*The capital is producing 40% of the country's GDP*

*The GDP per capita in Sofia is twice as high as that of the country*

*25% of the country's workforce is in Sofia*

## Analysis of the current situation

On average, every resident of the capital spends 64 minutes a day traveling, with the average number of trips per day being 2.67. Walking is selected in shorter distances, with 1 trip averaging 17 minutes. For car travelers one trip takes 26 minutes and for public transport passengers -29 minutes. By car, workers and Housewives travel mainly, while urban transport is a major tool for student mobility. The pensioners are mainly on the move<sup>1</sup>.

Since the 1960s almost three decades, the principles of urban planning and development have been determined by the predominant modernization approach and the specific socio-economic environment. The concept of functionality also determines the approach to public spaces: motorized transport is given priority over other aspects and the urban viability is put in the background. The response to the trend of increasing motorization through the continuous increase of the capacity of the street network leads to even greater demand.



*Legend:*

*The average resident of Sofia:*

*She is 41 years old*

*He travels 64 minutes every day*

*Uses the most public transport*

*Most often travels from work to work*

*It spends 8% of its income on transport*

<sup>1</sup>The data are the result of Specialized survey on transport behavior and attitudes of citizens of Sofia from 2017.

Cities are rapidly transforming to be adapted for a car journey without considering the harmful impact on citizens and the public spaces they inhabit. This urbanization practice was also observed in Sofia, although the number of passenger cars here was lower than the Western European. As a result of the process, preferences in the choice of place of residence and transport habits are changed. All these aspects have influenced the development of urban spaces and the positioning of pedestrian crossings. Unlike Western European cities, Sofia has a under-built street network that further deforms the overall picture.

Following the late Western European trends, this approach has gradually begun to change in Sofia, and the criteria for urban viability have also begun to be applied at a strategic level: pedestrian zones, bicycle infrastructure, traffic moderation, public transport priority.

However, a comprehensive concept is needed for the development of the various aspects of mobility, which will provide an integrated solution to the problems in the different directions.

### Specialized survey

For a more detailed study of the transport habits of the population of the Municipality of Sofia, a Specialized survey on the transport behavior and attitudes of the citizens of Sofia from 2017 was conducted (hereinafter referred to as survey / study).

A representative survey was conducted in the homes of 5,000 people between the ages of 14 and 80, in order to study some important indicators that characterize the ways of traveling the residents of Sofia. The survey period is 05.06 - 14.07.2017, with 78% of respondents surveyed in June. The questionnaire contains a total of 21 questions that provide information on the transport habits of respondents and their attitudes towards the use of different modes of transport<sup>2</sup>.

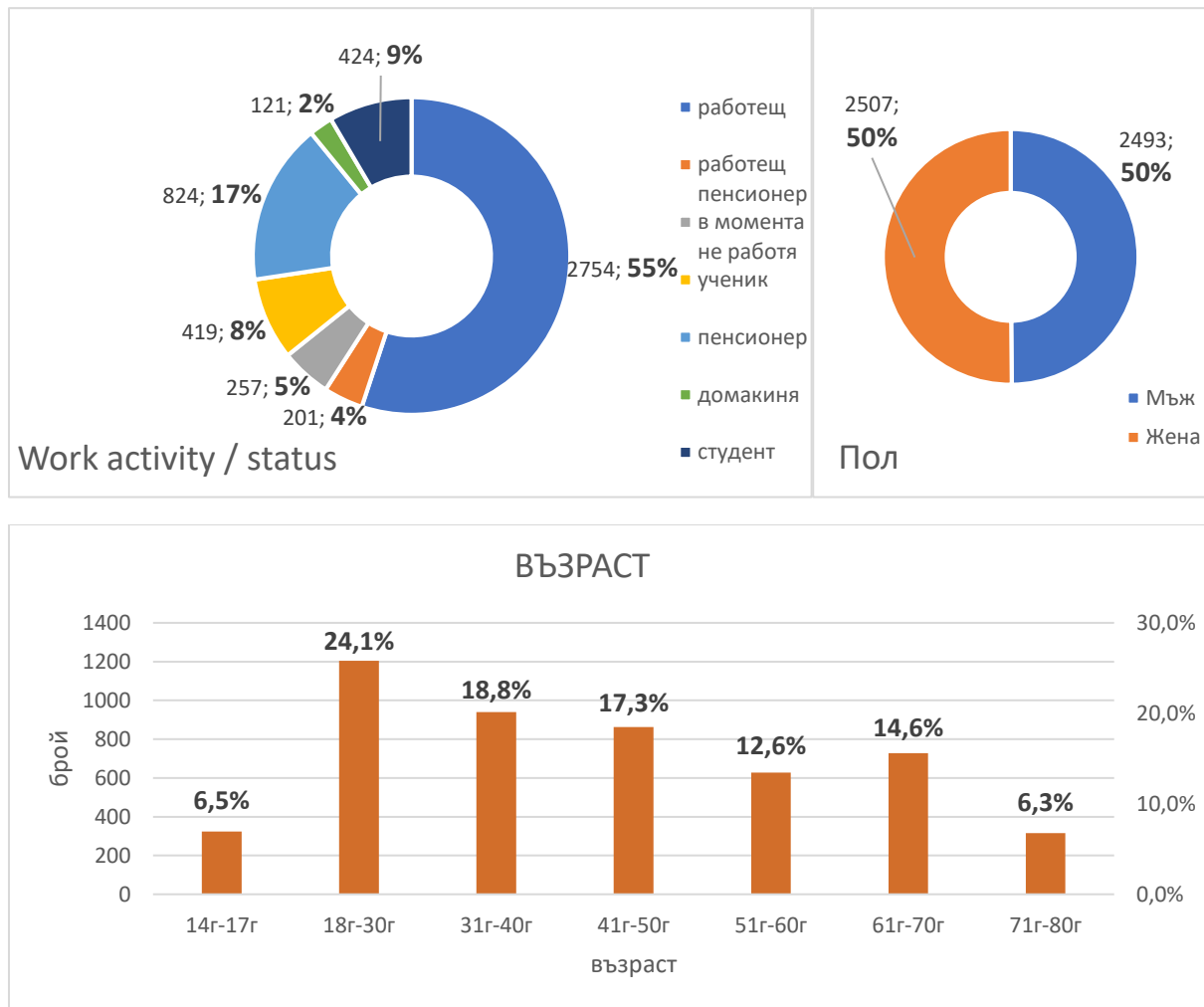
When comparing and interpreting the results of the two polls conducted in 2011 and 2017, account should be taken of the fact that the survey period in 2011 is February-March, which may have led to unpredictable differences in the way of movement, dictated by seasonality. In order to achieve better comparability of results in the section of major projects and initiatives in the Plan, it is envisaged to carry out specific surveys on the quality of service and the behavior of the traveling once every two years within the same period of the year.

---

<sup>2</sup>The questionnaire as well as the survey results are detailed in a separate report (Interim Report).



FIGURE 3 SOCIAL DEMOGRAPHIC INDICATORS OF THE SAMPLE



Source: investigation to SUMP

Legend:

Working

Working pensioner

I'm not working at the moment

Student

Retired

Housewife

Student

Paul

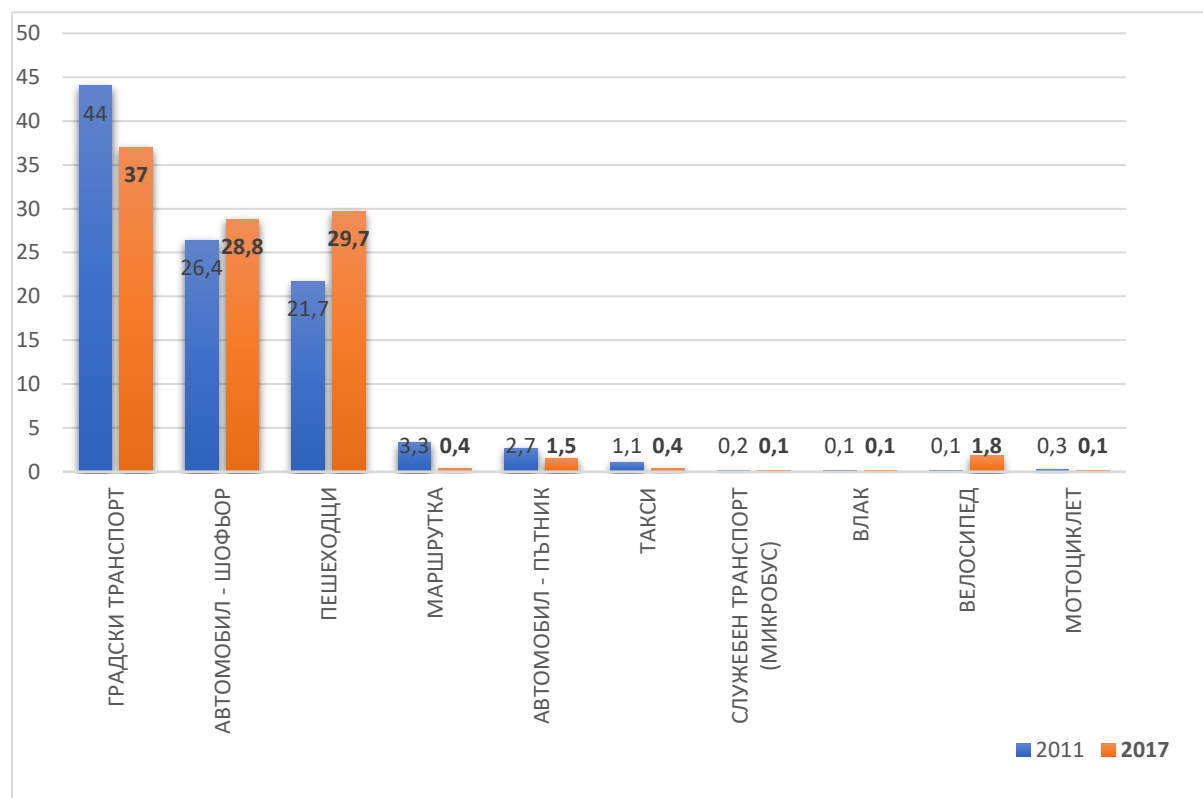
Man

Woman

Valuable information on how to travel, the goals of travel and travel time is obtained by processing the responses to the respondents' daily travel question "Please describe your travels yesterday" By analyzing the data obtained from this question, the most important parameters that are used in the modeling of the urban mobility processes are obtained. The first important indicator is the distribution of transport by type of transport for a particular day. The graph that is shown is comparative and shows how this indicator has changed since 2011 so far.

**FIGURE 4 DISTRIBUTION OF TRARAVELLINGS BY TYPE OF TRANSPORT IN%**

(Based on 14033 travellings in 2017 and 12900 travellings in 2011)



Source: investigation to SUMP

*Legend:**Public transport**Car - driver**Pedestrians**TrailCar - passenger**Taxi**Public transport / minibuss /**Train**Bicycle**Motorcycle*

Nearly 7% has dropped the use of public transport. This is against the background of the new metro stations built and put into operation. Surely the use of the metro creates comfort, security and fast mobility for a large number of residents and guests of the city. At the same time, the use of a car has increased by about 2.4%. The graph shows that there is a significant increase in walking.

This can also be explained by the time of the poll. The survey in 2011 was conducted in the period February-March, and the survey of 2017 - in the period June-July. There is also a growth for bicycle users. This height is tangible and can be seen on a daily basis but is still not high enough.

Despite the apparent efforts of Sofia Municipality to refurbish public transport vehicles.

And to create comfort and convenience in the journey, it can be seen that the light car remains a preferred vehicle especially for labor and business trips. Generating trips when using the four-speed demand pattern is crucial to know the percentage distribution of each pair of activity pairs.

When there is information on areas for population, workers, places in educational establishments, kindergartens, universities, shopping areas, etc., it is easy to generate the outgoing and incoming potential (passengers and cars) for each area for each destination pair of trips. That's why the next graph is very important in traffic modeling.

### FIGURE 5 TRAFFIC DISTRIBUTION BY TRAVEL PURPOSES IN (%) IN 2017 - FOR ALL TYPES OF TRANSPORT

(from 0 to 24 hours based on 13,209 trips)



Source: investigation to SUMP

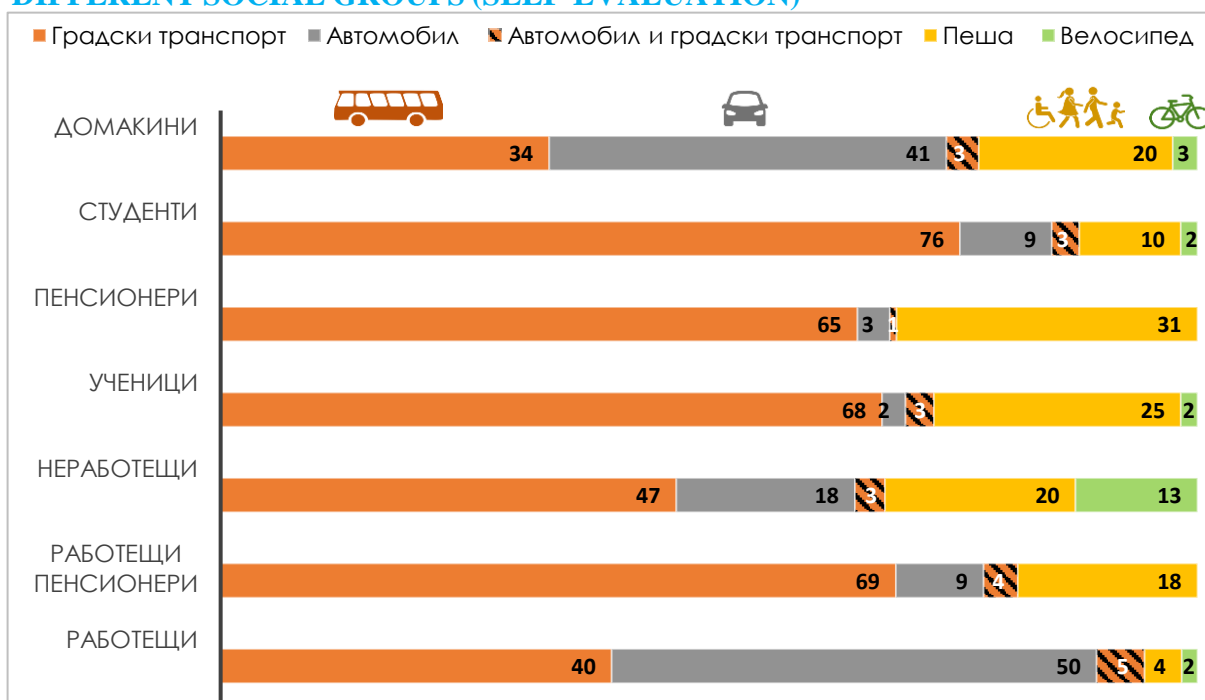
**Legend:**

Working place - school  
 Kindergarten - Targovishte  
 School - Trade  
 School - others  
 Trade - others  
 Trade - Trade  
 Workplace - another workspace  
 Workplace - others  
 Childcare facility - domicile  
 Place of residence - university  
 Place of residence - school  
 Workplace - the trade  
 Others - Domicile  
 Trade - Place of residence  
 Place of residence - workplace

The graph is indicative of the fact that most trips during the day are labor - about 39%. In the morning peak hours, 90% start home, with over 60% of the trips being home-to-work.

In addition to being the largest category, trips to work contribute most to increasing the share of cars. The figure below shows what kind of transport the different social groups use: the car is the main way of moving for workers and Housewives while urban transport is mostly used by students and Retirees and Scholars, choose to go mostly on foot, and the bicycle is mostly used among the non-working people.

**FIGURE 6 TYPE OF TRANSPORT USED DURING WEEKDAYS BETWEEN DIFFERENT SOCIAL GROUPS (SELF-EVALUATION)**



Source: investigation to SUMP

Legend:

Public transport

Car

Car and Public transport

On foot

Bicycle

.....

Housewives

Students

Pensioners

Scholar

Not working

Working pensioners

Working

Since one of the goals of the survey is to understand what would motivate particularly active people to use more alternative methods of transport such as public transport, bicycles and walking, several questions were asked in the questionnaire about the reasons for this not happening and the possible improvements that would encourage the residents of Sofia to change their way of traveling. The analysis of such issues makes it possible to take measures to improve infrastructure, charging and organizing traffic, making alternative ways of moving more attractive. The analysis of these questions is presented in the following directions.

## Pedestrians

More than 12% of Sofia residents go most often on foot on weekdays.

Less than 4% of workers walk in their normal travels.

Pensioners and scholars go mostly on foot.

## 1. Pedestrian traffic

Walking on foot is the most of traveling for most people some sick, elderly, disabled, often, pedestrian traffic is complementary to the basic transport - for example, walking public transport stop / next to the other cases, pedestrian traffic is a major means of moving, for example, from home to a nearby workstation, to the kindergarten and vice versa, to the park on weekends, to work at a nearby shop, etc.



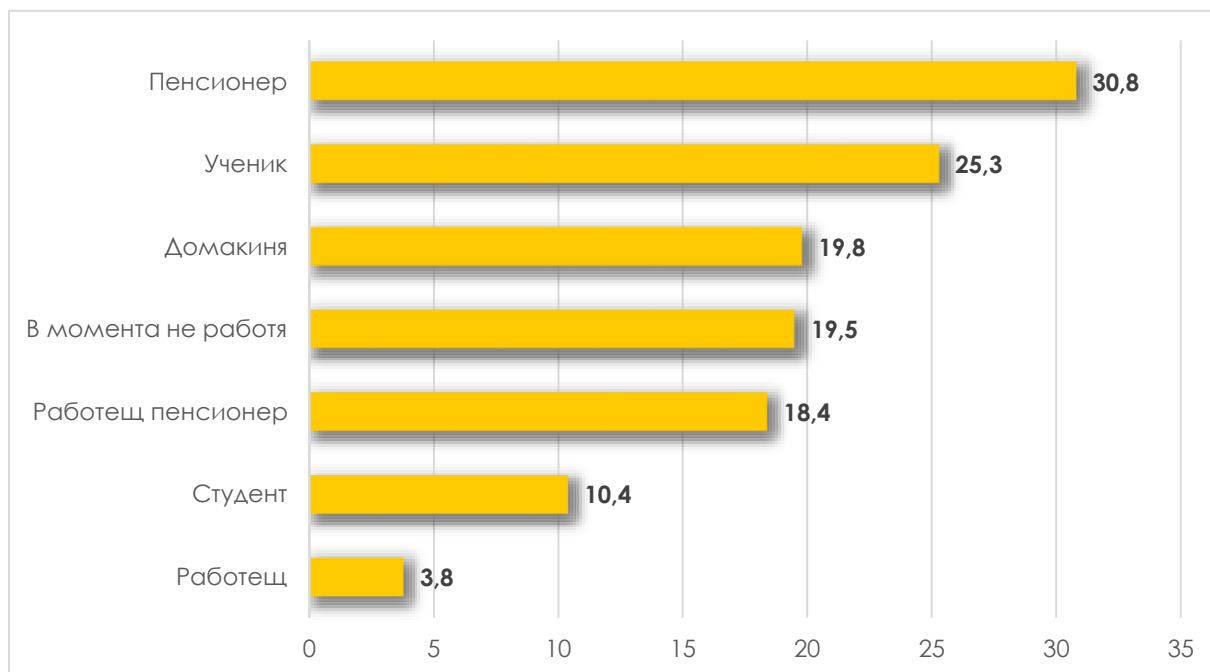
natural way (excluding etc.). Very

mode of to / from the car park. In

A significant part of everyday travels are at walking distances if the weather, age and health of a person allow it. Raising the share of pedestrian traffic would bring significant benefits for society as a whole. Walking on foot is extremely healthy, does not pollute the environment and, last but not least, enriches city life. According to the Danish architect-urbanist Ian Geel - consultant of Sofia Municipality and author of the Sofia report: Public spaces and public life - the pedestrian movement means much more than just walking - it allows for direct contact of people with the surrounding urban environment, for meetings and outdoor activities, diverse experiences and social contacts. Walking traffic plays a key role in creating a vibrant, safe and healthy urban environment.

In the survey conducted among the residents of Sofia, on the question "What transport do you use most often for weekdays?" More than 12% of all respondents respond that they are walking most often. The share of pedestrian traffic is unevenly distributed across the different groups. For those who are over half of the respondents, this mode of travel is less than 4%; for students - over 10%; for Housewives and non-workers - less than 20%; while for scholars and pensioners it exceeds 25% and 30%, respectively. This question does not take into account pedestrian traffic as a complement to the main mode of travel.

**FIGURE 7 LEVELS OF DECLARED COMMON MOVEMENT ON FOOT BETWEEN DIFFERENT GROUPS**



Source: investigation to SUMP

*Legend:*

*Pensioner*

*Scholar*

*Housewife*

*Currently not working*

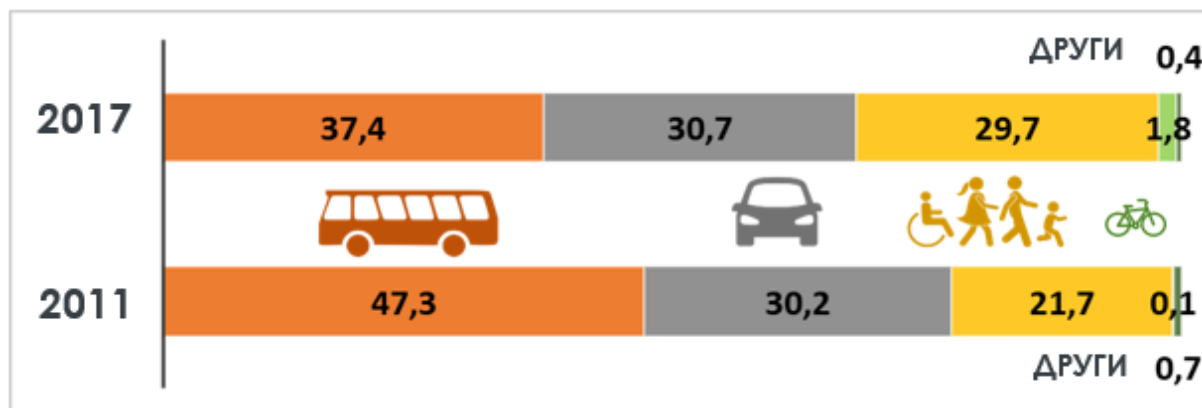
*Working pensioners*

*Students*

*Working*

Based on the results of the survey, travel modal distribution is shown ("modal split"). It takes better account of pedestrian traffic as it takes into account different types of day trips - to work, shopping, entertainment, and more. Compared to 2011, there is a significant increase in walking rates - from 21.7% to 29.7%, which can be explained by seasonal factors due to the different periods of the year in which the two surveys were made - February 2011 and June 2017).

**FIGURE 8 DISTRIBUTION OF TRAVELLINGS BY TYPE OF TRANSPORT IN%**



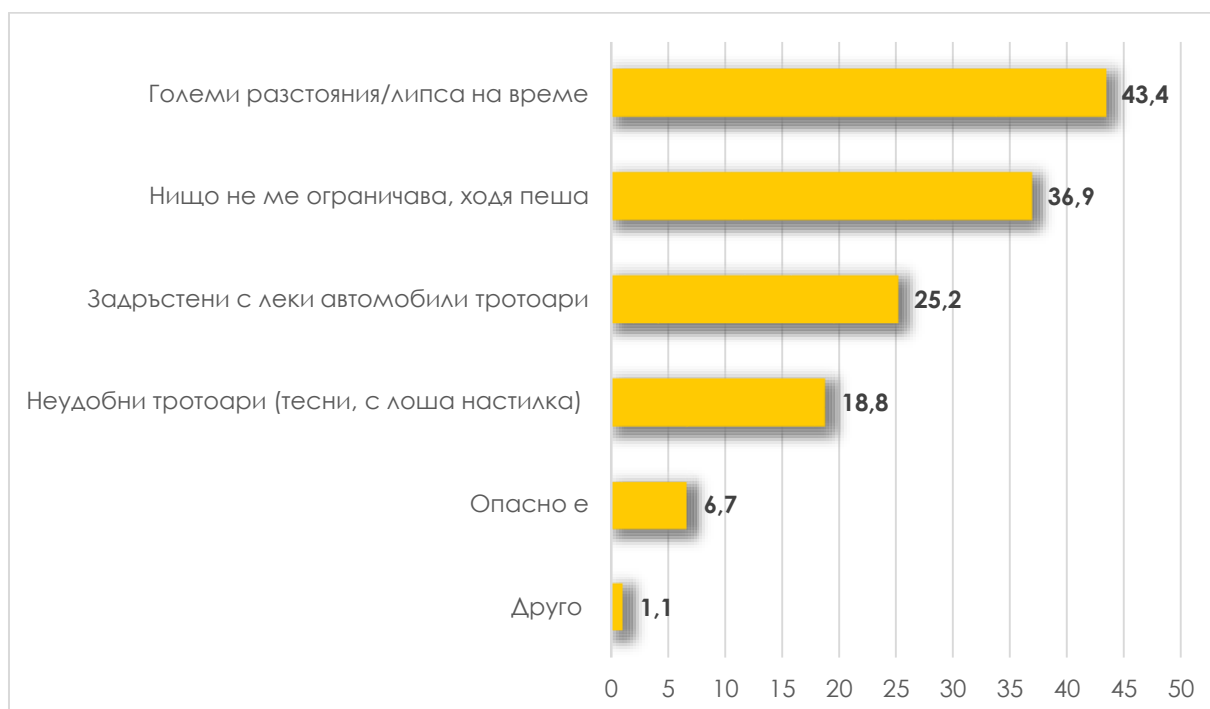
Source: investigation to SUMP

Legend:

others

**FIGURE 9 WHICH OF THE FOLLOWING PROBLEMS MAKE YOU RESTRAIN WALKING**

(base: all respondents. Respondents gave more than one answer)



Source: investigation to SUMP

Legend:

Big distances / lack of time

Nothing restricts me, I go on foot

Paveled sidewalks with cars

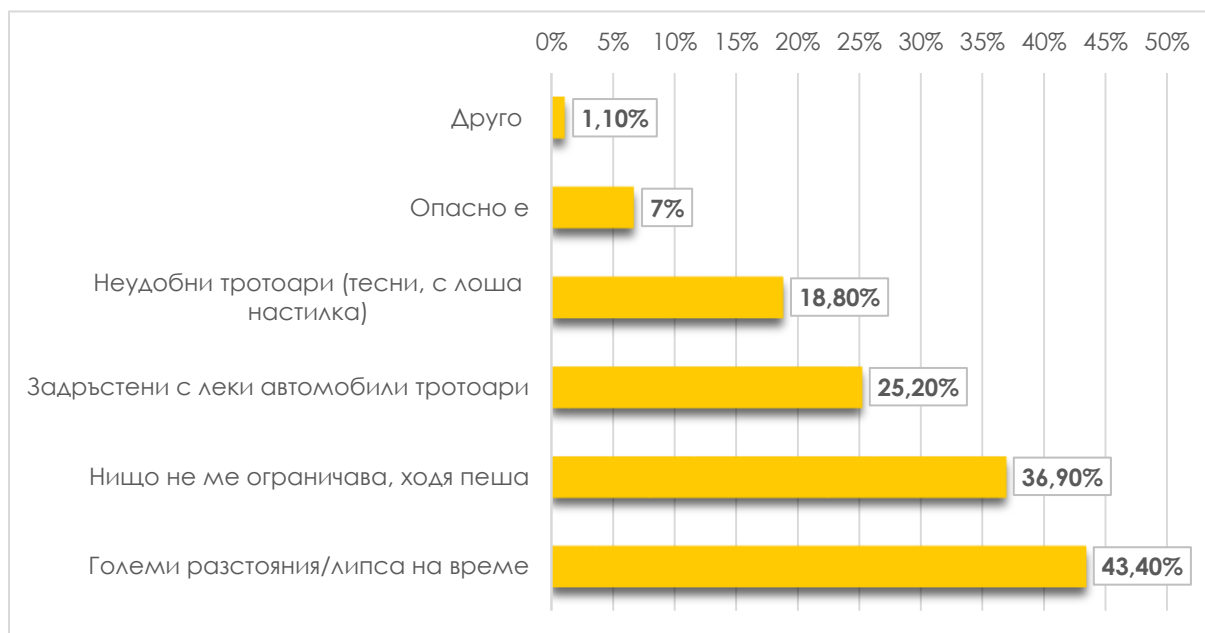
Inconspicuous sidewalks / narrow with poor pavement /

It is dangerous.

other

The main reasons for not using the pedestrian movement more widely for day-to-day movements are long distances / lack of time (43.4%) and sidewalks (25.2%) congested by cars. However, 36.9% have no problems walking. If the condition of pavements and public spaces improves, pedestrian zones are increased and there is better connectivity between them, walking comfort will greatly improve. Increasing pedestrian traffic in the city can help reduce congestion by cars, cleaner air and a healthier lifestyle.

**FIGURE 10 REASONS WHY WALKING IS NOT USED**



Source: investigation to SUMP

*Legend:*

*Other*

*It is dangerous.*

*Inconspicuous sidewalks / narrow with poor pavement /*

*Paveled sidewalks with cars*

*Nothing restricts me, I go on foot*

*Big distances / lack of time*

Several key pedestrian traffic problems summarized below can be outlined.



FIGURE 11 WALKING TRAFFIC: KEY PROBLEMS



Legend:

Obstacles on the sidewalks (parked cars, pubs, bins, pots)

Poor condition of the flooring, incl. shafts

Bus and tram stops with difficult access to people with disabilities

Missing walkways in some places

Insufficient interconnection between pedestrian zones

Undedanded and unprotected pedestrian and public spaces

Despite the obvious problems, pedestrian traffic has great potential for development in Sofia. The relatively high density and compactness of the city favors pedestrian traffic as it reduces travel distances. The city center is vibrant with active urban cultural and social life. It is necessary to strengthen and stimulate the efforts of Sofia Municipality to transform key urban spaces into pedestrian and shared and link them to a unified system.

FIGURE 12 PEDESTRIAN WALKING: POTENTIAL AND CHALLENGES



Legend:

Compact city with high density - suitable for pedestrian traffic

A vibrant city center with active urban culture

Expansion of pedestrian zones and spaces in the center of the city and networking

Development of pedestrian zones and spaces in residential neighborhoods

Improving pedestrian accessibility to city parks

At present, pedestrian and shared public spaces are being renovated in CENTRAL URBAN PARK - Zone 2 (Graf Ignatiev Street, Solunska Str., Ivan Shishman str., 6th September Str.) And Zone 4 (The area around the Nevski Cathedral, "Paris" Street, Crystal Garden). The main pedestrian zone along Vitosha BouLEVARD is extended to the area around the church "Sveta Nedelya". An international competition for the development of this space and its binding to the neighboring sign territories will be held. A new competition for the so-called Zone 3 of CENTRAL URBAN PART - City Garden and the space around the former Royal Palace and the Russian Church will be held. These competitions need to offer ideas and solutions for the missing pieces to link pedestrian spaces and areas in the center of Sofia to a common network:

- "Saborna" Str. - making connection between the space of "Sveta Nedelya" Square and the City Garden, "Alexander Battenberg Square", the space around the Ivan Vazov National Theater,
- "Ivan Vazov" Str., Slavyanska Str. And Aksakov Street - one of these three streets could be pedestrian / shared so as to make a connection with the Knyazhevo Garden
- Crossing Tsar Osvoboditel Blvd in front of the palace - connection between the City Garden and the palace area, the Russian Church, Moskovska Street, Malko Tarnovo Str., Dondukov Blvd.
- Intersection of the Largo - connection between "Sveta Nedelya" Square and the territory around the TsUM, the central mineral bath, the mosque
- Crossing Bull. "Maria Louisa" - a connection between the area around the Central Hall and the Central Mineral Bath with the Central Halls, Pirotka Street, George Washington Street, Western Gate of Serdica, Catholic Church, Synagogue. In this way, all the hallmarks will be housed in the center of Sofia and the ideas for the Tolerance Box - the connection between the temples of the four religions in the center of the capital.

In addition to pedestrian traffic in downtown Sofia, it is essential to improve pedestrian connections in residential neighborhoods (such as public transport stops, schools, kindergartens, etc.) as well as pedestrian access to city parks.

Within the framework of the Vision for Sofia Initiative, digitalisation of pedestrian links has been carried out throughout the city and several pilot spatial analyzes have been made using a geographic information system to draw interesting conclusions on the connectivity, integrity and accessibility of the pedestrian network in the capital. The database created as a result of the survey can be complemented and upgraded as a basis for a crowdsourcing platform through which citizens will themselves assess the state of the city's pedestrian infrastructure. This will allow for further research and analysis to provide a clear direction for action and implementation of specific policies related to improving pedestrian connectivity and the urban environment as a whole.

## Bicycle facts

Bicycle transport has a low share (1.8%) in the total number of trips in Sofia.

55.5 km is the total length of the bicycle network.

Long distances are the main reason that survey participants have indicated not to use a bicycle as a means of transport.

## 2. Bicycle traffic

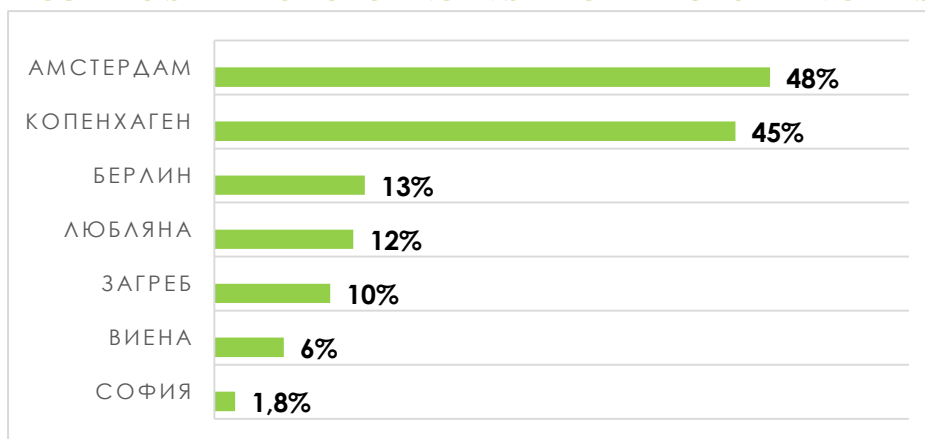
Cycling is a great alternative to urban mobility that should be promoted and stimulated - not just for sports and recreation, but as a major means of mobility for part of the active population of the city.



Cycling can contribute to reducing congestion and lowering levels of harmful emissions. Other benefits of cycling include flexibility and freedom of movement, significantly lower purchase and maintenance costs than a private car, much less parking space, and so on. At the same time, as well as the pedestrian movement, the bicycle movement is extremely healthy and contributes to the vitality of the cities.

For these reasons, many cities in the world prioritize the development of bicycle transport by building a network of safe, comfortable and interconnected bicycle routes, complementing bicycle infrastructure (bicycle stands and bicycle parking), public transport, shared bikes and more. In some European cities, the bicycle movement has become a major means of transport with the largest share in travel distribution. Leaders in this respect are Amsterdam with 48% of all trips and Copenhagen by 45% (Figure 13). These cities have had a specific bicycle culture where cycling has become a mass practice for (almost) all residents who have the physical opportunity to practice it from early childhood to a deep age.

FIGURE 13 SHARE OF CYCLING IN SELECTED EUROPEAN CITIES



*Legend:*

*Amsterdam*

*Copenhagen*

*Berlin*

*Ljubljana*

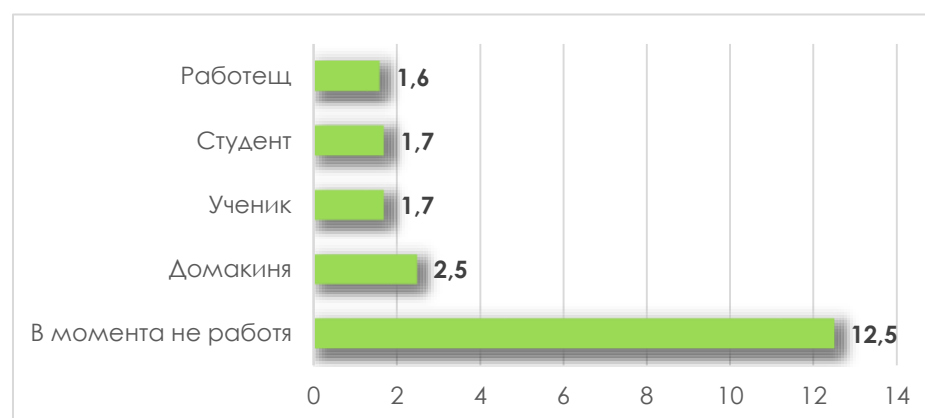
*Zagreb*

*Vienna*

*Sofia*

According to the latest survey among 5,000 Sofia citizens aged between 14 and 80 (2017) the share of cycling trips in Sofia is still very low - 1.8%. There is an increase in the share of cycling traffic compared to previous years' surveys (0.1% in 2011). There are no significant differences in the use of bicycle transport among workers, students and students. Somewhat higher is the use of bicycle transport among the Housewives (2.5%), and the highest among the people who do not currently work (12.5%), while among pensioners it is practically not used.

FIGURE 14 SHOWS THE LEVELS OF DECLARED REGULAR BICYCLE USE AMONG THE DIFFERENT GROUPS



Source: investigation to SUMP

*Legend:*

*Worker*

*Student*

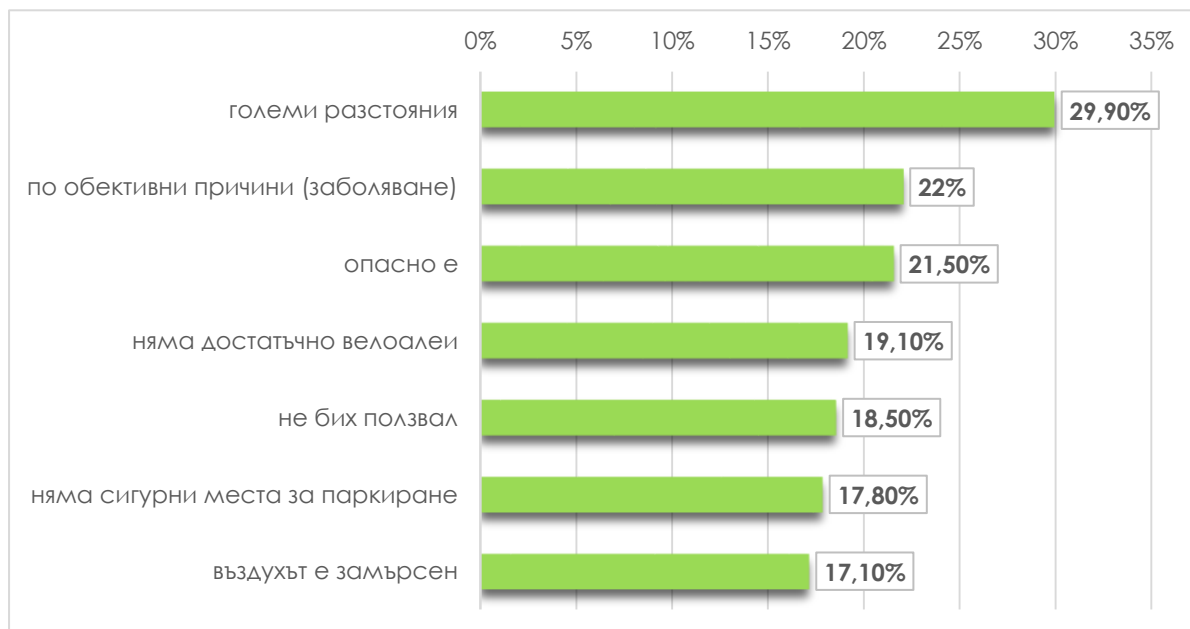
*Scholar*

*Housewife*

*I'm not working at the moment*

Interesting information gives the answers to the question "If you do not use a bicycle for your daytime work, what are the reasons?" It is seen that a large part does not want to use bicycles due to the fact that the distances are too large. 18.5% of the respondents, who would not use a bicycle at all, think like this.

**FIGURE 15 CAUSES BICYCLE NOT TO BE USED**



Source: investigation to SUMP

*Legend:*

*Big distances*

*For objective reasons (illness)*

*It's dangerous*

*There are not enough bicycle paths*

*I would not use it*

*There are no secure parking spaces*

*The air is polluted*

Many of them think cycling is too dangerous. About 22% think that it is not possible to ride a bicycle because it can not carry luggage, keep children in kindergarten or school, or for health reasons. To a lesser extent, reasons such as the lack of sufficient bicycles, secure bicycle parking places and polluted air - factors that can improve over time - have been assessed. This shows that the increase in the use of bicycles requires not only improved infrastructure and cycling conditions but also a serious information campaign to convince skeptics of the benefits of this mode of transport.

The total length of the bicycle network in Sofia by 2018 is 55.5 km. There are insufficient complementary elements of the bicycle infrastructure - bicycle stands and parking areas. Another problem with cycling is the lack of opportunities for getting in public transport. Bicycling in the subway is currently allowed under certain conditions - on Saturdays and Sundays and after 21

hours on weekdays and at the price of a regular ticket. The new regulation permits the boarding of bikes also in land transport, but only if there are conditions for it - the vehicles will be equipped with flatbeds or bicycles. As of the beginning of 2019, there are already 10 buses with lobes, serving the lines to Vitosha (numbers 63, 93, etc.).

In 2016 Sofia Municipality launched a concession procedure for the construction and management of a bicycle rental system. The assignment envisages the construction of 33 pcs. bicycle lanes mainly located in central city areas. Although there is a selected concessionaire, the procedure is appealed and towards the end of 2018. Sofia still does not have a functioning system for shared bikes.

The overall analysis can highlight some key problems with bicycle transport that need to be



addressed (Figure 16). **FIGURE 16 CYCLING: KEY ISSUES**

*Legend:*

*Restricted perception of the bicycle primarily for recreation and sport purposes*

*Lack of a comprehensive and connected bicycle network*

*Lack of complementary infrastructure - parking lots and parking spaces*

*Conflicting points with road traffic*

*Polluted air*

*Limited transport options in public transport*

*Lack of bicycle rental*

Despite the still low share, the bicycle movement in Sofia has great potential for development. The city is compact and densely populated, making distances relatively short and suitable for cycling..



FIGURE 17 CYCLING: POTENTIAL AND CHALLENGES



*Legend:*

*Compact city with high density - favorable for cycling*

*Bicycle infrastructure has begun, its networking is needed*

*A procedure for introducing a system for shared bikes has begun*

*It is necessary to introduce shared electric bicycles, scooters and more.*

Sofia Municipality is planning to build bicycle routes in the central city area and other areas of the city in order to link existing bike lanes and networking, especially in the city center where the bicycle rental system will be operational.

It is very important to quickly launch the system for shared bicycles. The practice in other cities shows that shared bicycle systems provide a major boost to the development of the bicycle movement - they provide the opportunity to move tourists and guests to the city, people who do not own their own bicycle, give impulsive solutions for cycling, n. The system should also include electric bicycles, scooters and other personal electric vehicles, making it even more attractive and further expanding its users.

### 3. Public transport



The public transport system in Sofia includes metro and tram, trolley and bus transport. Three municipal transport operators - Metropolitan Metropolitan, Metropolitan Electric Transport and Sofia Autotransport operate on the territory of Sofia, providing passenger services on the basis of fixed public service contracts.

There are a small number of private transport operators operating suburban services that are selected through a competition for a fixed period. Operators serve public transport lines on the basis of an annual mileage to be approved by the municipality on a yearly basis based on reasonable operating costs and route schedules. The companies carry out the exploitation and maintenance of the public municipal property provided for their use, and the investment activity for construction and reconstruction of such is an obligation of the municipality.

#### Organization of public urban transport

The public transport organization in Sofia is run by the Urban Mobility Center EAD (UMC). UMC is a sole-owned joint-stock company of Sofia Municipality. The Company carries out activities related to the analysis, planning, financing, operation, organization, coordination, management and control of the public transport system. UMC is also responsible for financing, construction, operation and maintenance of municipal parking lots, garages and parking spaces.

## Transportation systems

The public transport system in Sofia includes underground and tram, trolley and bus transport.

The underground is the fastest public transport at an average speed of 38 km / h.

Bus transport carries the most passengers (44%).



## UMC – basic activities

- analyzes for the development of public transport
- introducing ITS
- Organization, control and financing of public transport, incl. issuance of travel documents and revenue collection;
- Operation of the charging system
- Operation of the real-time passenger information system
- Operation and maintenance of municipal parking lots, garages and parking spaces

The services that UMC provides to the citizens of Sofia Municipality are related to the main passenger transport service and the company's ambition is to provide an integrated, comfortable and accessible transport service.

With the existing organizational structure of public transport and contract terms, the main responsibility for optimizing the public transport network is the UMC, with operators having basic operational functions. In order to do so, the UMC should have regular travel data on individual lines, stopwatch and other information related to congestion, speed, etc. With the introduction of a single electronic tolling system, passengers may be provided with data on the trips across the city network, as well as flexible pricing policies and incentives for transfers.

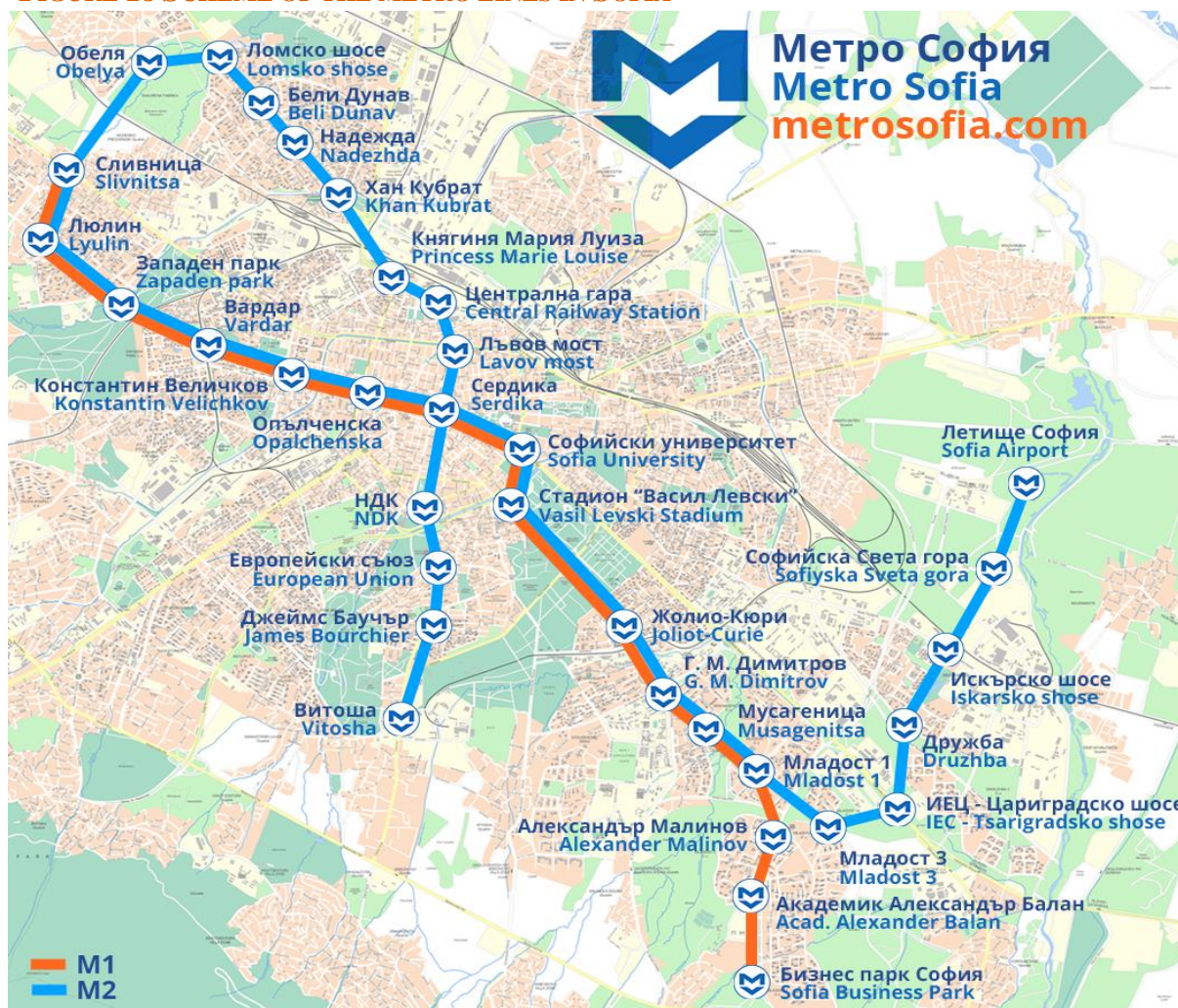
Centralizing revenue from ticket and card sales and compensation in the UMC makes it possible to allocate them among operators regardless of actual travel, which allows the implementation of a policy to stimulate poorly populated areas, ensuring equal and quality service to all citizens. The UMC's use of paid street parking areas allows revenue to be used to build new underground and ground car parks and finance public transport.

### Public transport system

The information in this subsection is based on data from 2017 (unless expressly stated otherwise in the text) provided by UMC.

On the territory of Sofia in the system of public transport operate four types of transport systems: metro, tram, trolleybus and buses.

FIGURE 18 SCHEME OF THE METRO LINES IN SOFIA



To date, the length of lines 1 and 2 is 45 km and the number of metro stations is 35 km.

The new Line 3 is being built with the support of the European Regional Development Fund and Local Co-financing. It will serve and connect important residential areas located southwest-northeast. At the end of 2019 a staging will be made on the line that will connect the Ovcha Kupel district with the center to the Chavdar Bridge.

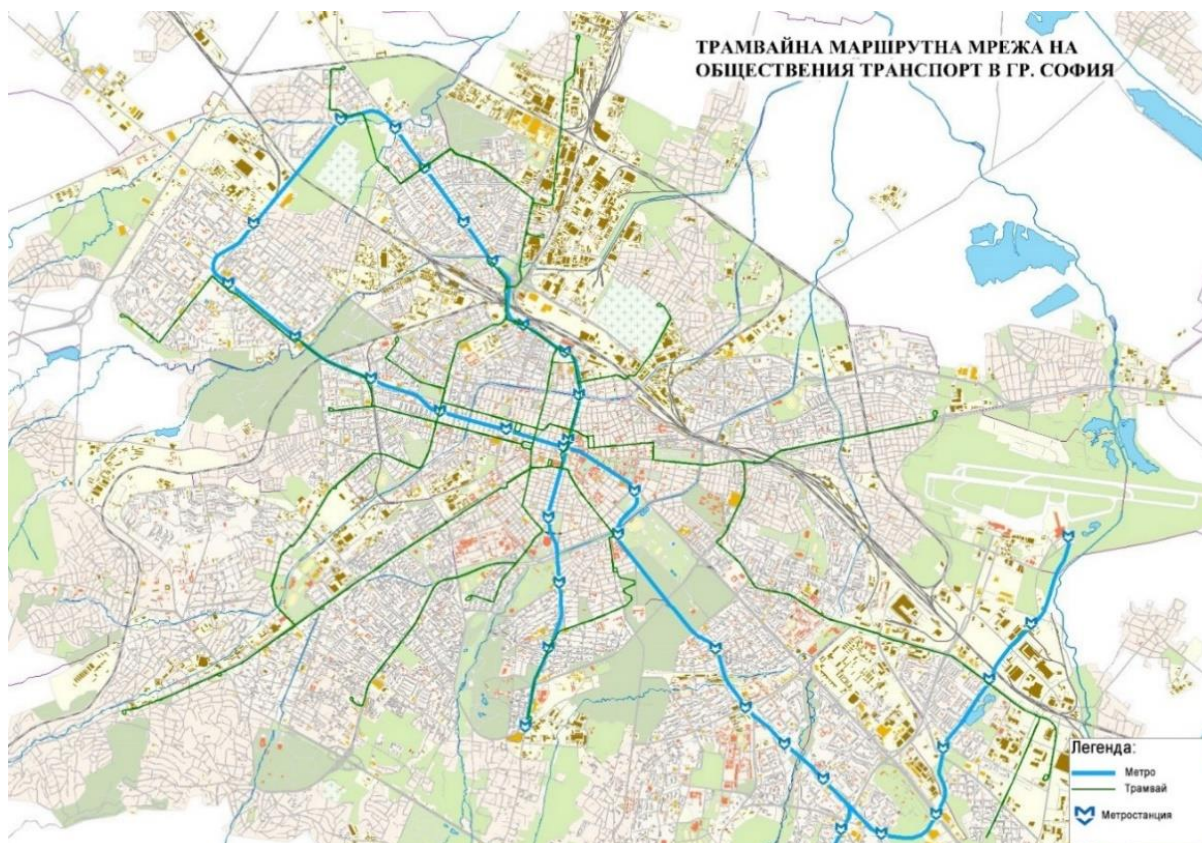
According to the approved general development plan of the capital, the prognosis for development of the General Line Development Plan of its lines should be three diameters with circumferential branches, with a total length of 75 km and 69 metro stations, with the possibility of long-term development up to 80 km. the final stage of implementation will carry over 1.2 million passengers daily:

**First Metro Diameter (Line 1)-** „r. c. Lyulin - Center - r. c. Mladost - r. c. Druzhba - Airport "has a length of 32 km and 26 stations.

**Second Metro Diameter (Line 2)-** "Lozenetsdistrict - Center –r. c. Nadejda–r.c. . Obelya "has a length of 22 km and 22 stations.

**Third Metro Diameter (Line 3)-** „district. Ovcha Kupel - Center - r. c. V. Levski "will have a length of 21 km and 21 metro stations.





**FIGURE 19 DIAGRAM OF THE TRAM LINES IN SOFIA**

*Legend:*

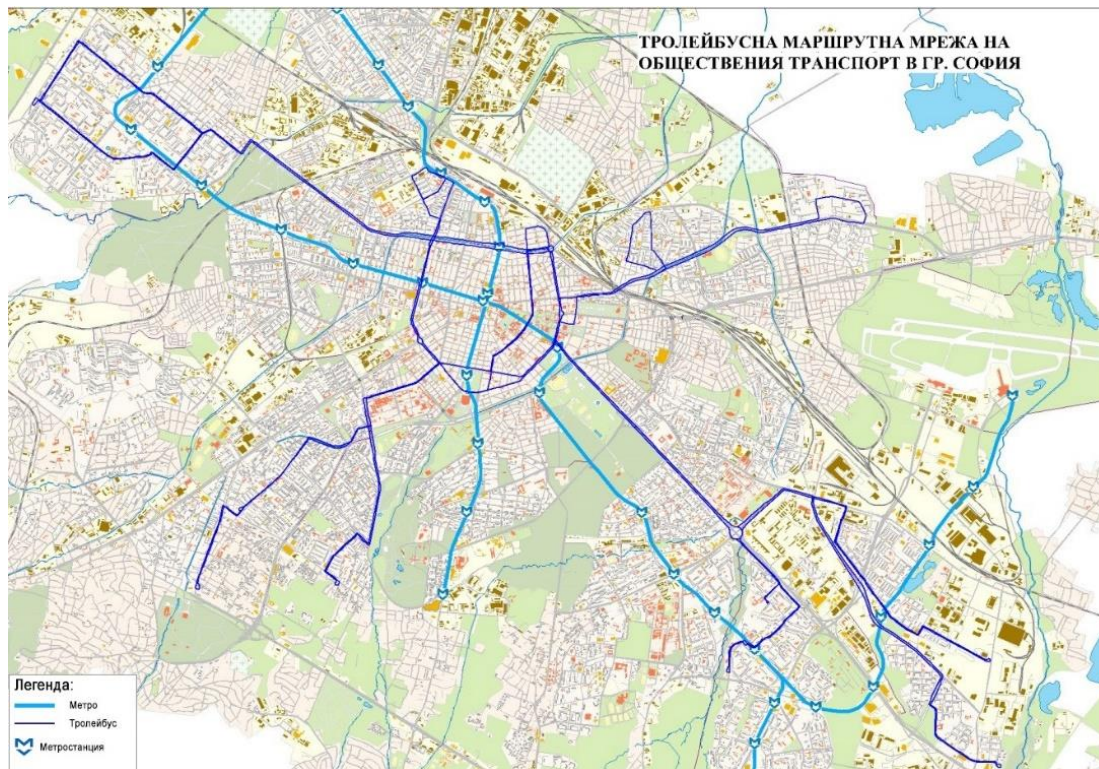
*Tramway network of public transport in Sofia*

*Underground*

*Tram*

*Metro station*

The length of the tram routes in Sofia is 286 km. Two types of lines are used - narrow gauge and normal gauge. Narrow gauge lines are 1009 mm wide and those on a normal track gauge have a width of 1435 mm. In order to ensure that there is no conflict and higher tram traffic, 32% of the trails are separate.

**FIGURE 20 TROLLEYBUS SCHEME IN SOFIA**

*Legend:*

*Trolleybus network of public transport in Sofia*

*Underground*

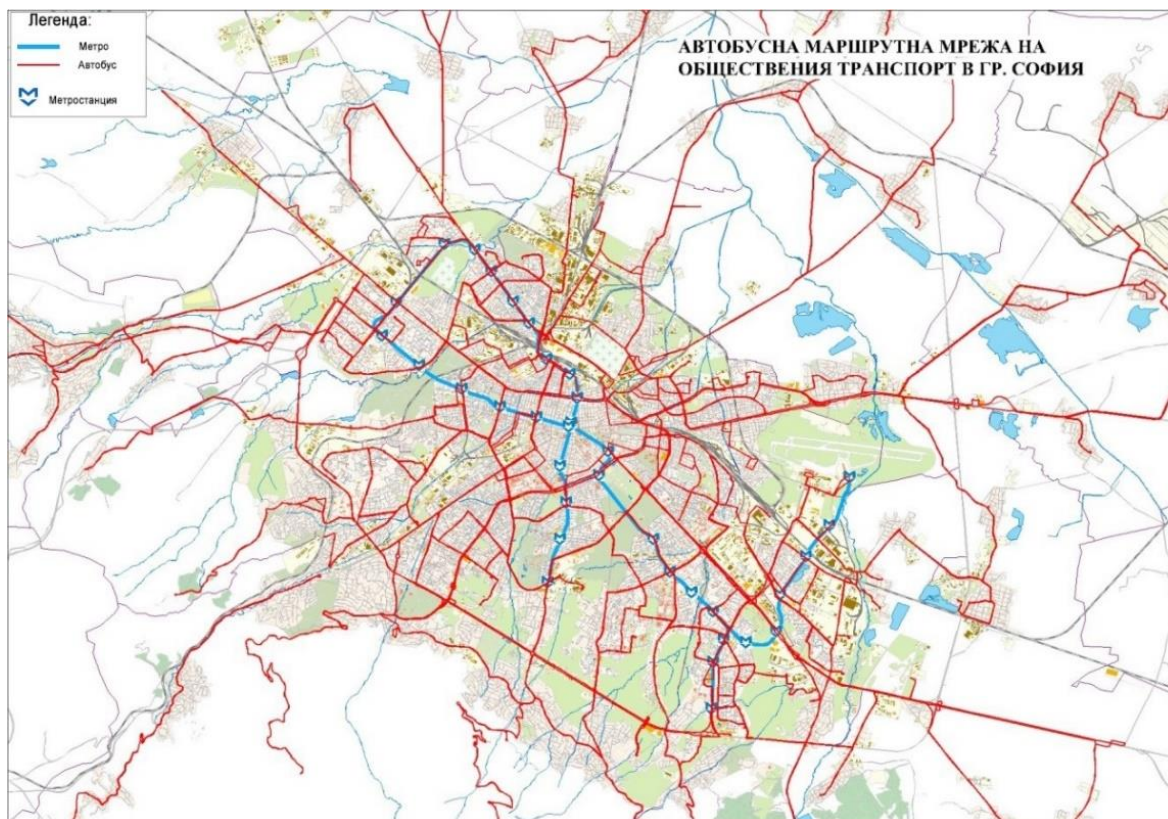
*trolleybus*

*Metro station*

The length of the trolley network is 112.5 km. The trolleybus network of Sofia consists of 9 routes with an average one-way length of 10.6 km. The length of the trolley network is 112.5 km.



**FIGURE 21 SCHEMATIC OF BUS LINES IN SOFIA**



Sofia's bus network consists of 95 lines with an average one-way length of 13.8 km. The entire coach and intercooler network and the metro network are shown in Figure 21.

Depending on the service areas, by 2019 the bus lines are divided into 47 urban with an average length of 11,65 km and 52 suburban routes with an average length of 15,5 km.

Table 1 gives important information on the state of the various types of public transport by 2017. It shows that bus transport has the highest share not only in the passengers carried, but also in the length of the route network and the number of lines. Bus transport is also the fastest of all land transport modes, but the greater difference is mainly due to the higher speeds in suburban areas. It should be noted that due to the consistent policy and efforts of Sofia Municipality for the gradual renewal of the rolling stock, by May 2019, the average age of transport vehicles in the road transport is 6 years.

Table 1 Basic data on public transport by 2017

	<b>Underground</b>	<b>TRam</b>	<b>Trolley</b>	<b>Bus</b>
Number of lines	3	14	9	95
Total length of lines	62 km	286 km	191 km	2 632 km
Age of rolling stock (years)	10	28	17	13
Intermediate Interval Distance (m)	1000	483	470	625
Average route speed (km / h)	38	14	14.5	18.28 15.35 (urban) 20,80 (suburban)
Time span interval (min)	6 <sup>3</sup>	11-12	7	13-14
Average vehicle distance (km)	7,00	2,13	2,38	3,12 (urban) 4,24 (suburban)
Number of passengers carried per year (million, 2017)	91,06	101,4	39,9	185,4
Share in the urban transport system	21,8	24,3	9,6	44,4

Source: UMC

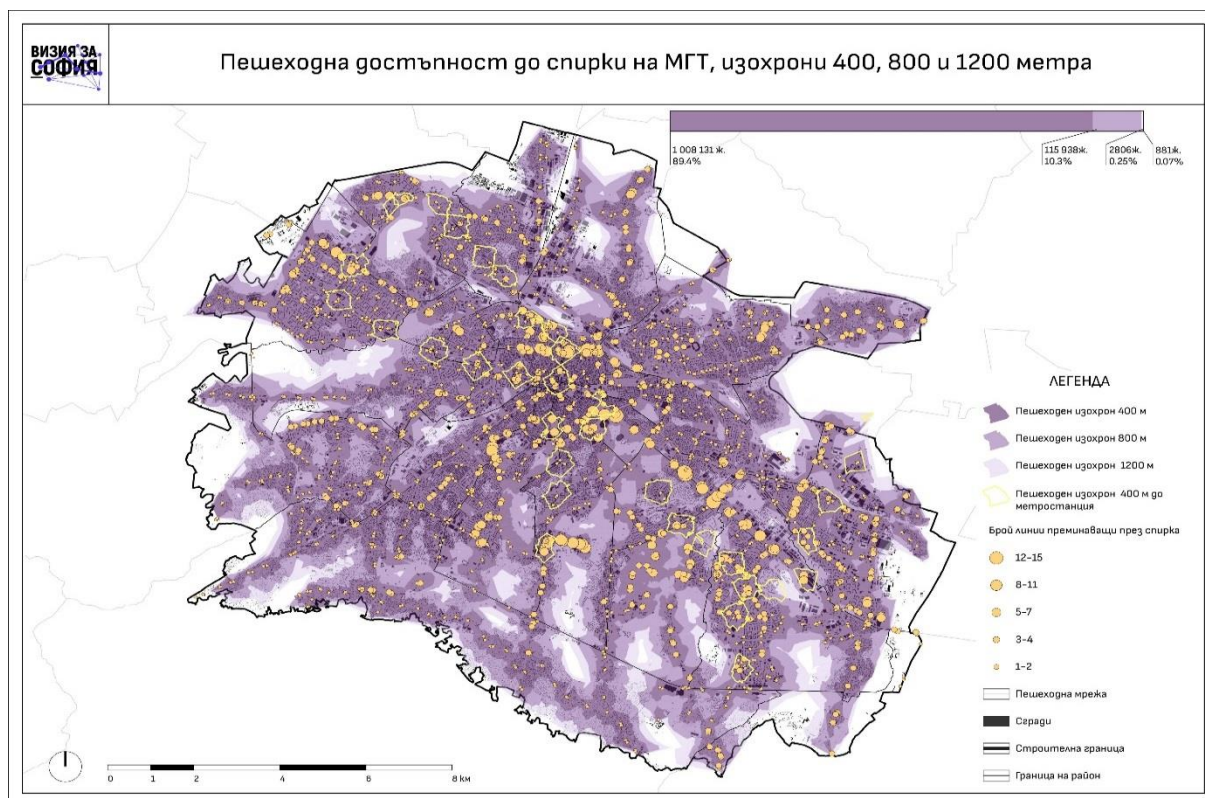
The public transport route plan of Sofia covers over 90% of the population within the pedestrian isochron. The large stretches of town with parks and industrial areas are secured by transport to their entrances. The electric transport is well developed in the central part of the city and the residential complexes, while the bus transport also serves the entire suburban area. In the organization of public stopstransport on the territory of the capital are in compliance with the requirements for accessibility - within the boundaries of the city there is provided the necessary minimum pedestrian access to a line stop of some of the transport modes.

The study on the pedestrian connectivity on the territory of Sofia, prepared by the team of Vision for Sofia aims at illustrating the spatial distribution of stops and the territorial and demographic coverage in isochrons of 400, 800 and 1200 m. As seen from the map developed within the study (below) the regions with a high concentration of population like "Mladost" (except "Mladost 1A") Lyulin, Nadezhda, Krasno selo and Drujba are apart from the periphery are extremely well served and internally for the territory of the regions - o to the number of stops and lines. However, this does not apply to the southern parts of Triaditsa, Lozenets and Studentski and in particular their southern parts. Although with a pronounced tendency for spatial development in recent years, these territories remain with more difficult access to stopovers ofMUT.

---

<sup>3</sup>The value is averaged. Intervals between trains range from 3:30 minutes to 8:00 minutes in peak hours on different lines and sections.

**FIGURE 22 WALKING ACCESSIBILITY TO STOPS OF MUT, ISOCHRONES 400, 800 AND 1200 M.**



Source: Study on the pedestrian connectivity on the territory of Sofia, prepared by the team of "Vision for Sofia"

Again under the "Vision for Sofia" initiative in 2018 a study was carried out on accessibility by public transport to workplaces with territorial coverage of Sofia Municipality. The main conclusions are related to the need to implement measures aimed at reducing travel time by public transport and waiting at stops. Poor or poorly serviced areas have been evacuated to which urban transport is not satisfactory and needs to be improved. The recommendations for measures made in the study are largely overlapping in terms of purpose and purpose with the projects and initiatives proposed in this Plan (Key Projects and Initiatives).

With regard to public transport stops, concessions and attraction of private companies, the municipality intends to improve the condition, management and maintenance of stops, as well as enriching the space and ensuring accessibility of the urban environment.

#### TABLE 2 PUBLIC TRANSPORT IN FIGURES

Number of stops	2606
Share stops without sheds (%)	58%
Crossing factor	1,67
Average driving range	8 minutes
Average speed	21,2 km/h
Share separate routes	5,5%
Average travel duration	29 minutes

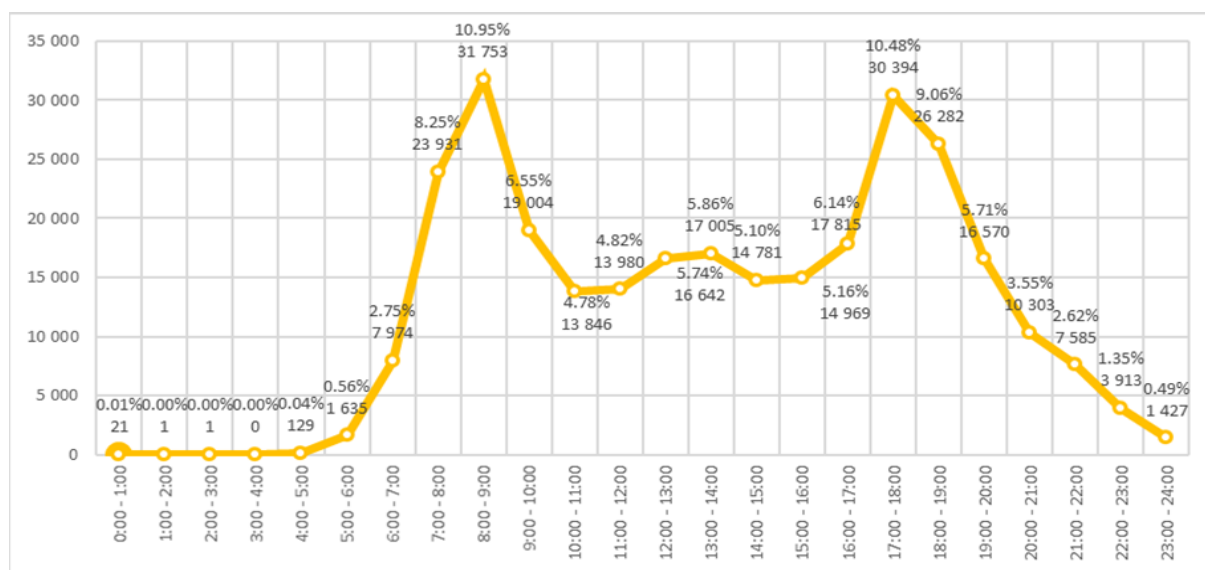
A Scheme for placement of objects and elements in the scope of the stops of mass public transport on the territory of Sofia Municipality has been prepared. In the scope of the study, all 2606 existing stops and the possibilities of placing different types of spur-cones were analyzed.

The study found that for 1018 of existing stops there is no possibility to place stopwalks (due to various limiting factors in urban space, regulatory boundaries, fences, existing building, etc.) or there is no need for such (eg stops for a given route without the possibility of coupling).

New 220 electronic data boards with a 4G sim card for public transport stops are installed by the end of February 2019. All electronic information boards are equipped with voice announcement devices. With them 1260 public transport stops on the territory of Sofia Municipality are equipped with electronic information boards. They provide additional information provided by the dispatcher to the benefit of citizens - congestion, closed streets, accidents and changes in the urban transport route.

The load on public transport during the day is very different. There are strong peaks and drops. This can be illustrated with the following graph, which illustrates the unevenness of the metro passengers on a typical business day. It is therefore appropriate that the number of cars per line in different periods be different.

**FIGURE 23 UNDERGROUND PASSENGER LOAD (DAILY IMBALANCE FOR APRIL 11, 2013)**



The average running time of all public transport in peak hours is 8 minutes and in non-peak hours about 14 minutes. Only for the metro they are respectively 6 minutes in peak and 8-9 minutes in non-convoy, and for public transport on the ground - respectively 11 minutes in the peak and 19 minutes in the unfinished hours. Nine percent of all people traveling with different modes of transport are traveling for up to 40 minutes. For public transport, this percentage is 88%.



In major cities, public transport travel often requires a link from one line to another. It is not possible and economically unreasonable to seek a door-to-door movement with a single line. For this reason, conditions must be created that do not hinder congestion, but on the contrary, assist them in congestion. According to Urban Mobility Center EAD for Sofia, the switching ratio is 1.67.

With the construction and extension of the subway, it takes a large share of the trips and some ground lines of public transport already play a leading role, which leads to an increase in the value of the crossing coefficient. Ensuring the unhindered transport of various public transport lines and modes in order to be accessible to all urban areas is a mandatory element of a good transport scheme.

Congestion for people who travel with tickets is always associated with a higher price. Tariff policy is an important tool to encourage these trips. The electronic billing system will allow the introduction of a more flexible tariff policy.

The figure below shows the internal distribution of trips by type of public transport. Most passengers are transported by bus (44%), followed by tramway (24%).

## Share of trips

The share of public transport trips has fallen by 7% since 2011. An increased number of subway journeys can not offset the reduced number of trips with ground public transport.

**FIGURE 24 DISTRIBUTION OF TRIPS BY TYPE OF URBAN TRANSPORT IN%**

Source: investigation to SUMP

By comparing the results of 2011 and 2017, there is a regular increase in metro transport. However, in the case of inland transport, there is a certain reduction, which can not be compensated by the increased number of subway journeys. The total reduction in the annual number of passengers carried by public transport in the period 2011-2017 was 8.6%. This confirms the tendency for a gradual reduction of public transport trips, regardless of the launch of the metro.

The main problem is the low average speed of public transport with the exception of the metro. For ground public transport it is between 14 and 15.3 km / h. The increase in population, the large number of cars, the high share of street parking, and the inadequate and narrow primary street network lead to a strong traffic increase and a reduction in the speed of movement, especially in peak hours. It is necessary to create conditions for the priority movement of public transport vehicles wherever possible.

The low speeds of inland transport are due to the fact that, with the exception of some tramways, all vehicles move in the traffic congested by cars and the separate routes are insufficient to make public transport competitive with the cars in terms of travel time. Out of a total of 3,171 km of a public transport network, only 5,5% are on separate routes and bus lanes, including 62 km of metro, 92,5 km of tramways, 21 km of bus and trolley bus buses.

The statistics obtained from the passenger surveys carried out in 2011 and 2014 allow the average distance to be determined for each mode of transport, which is an important indicator when developing a new tariff policy. Comparing the data from the two censuses, it can be seen that the average distance is reduced for all types of land transport, mainly due to the increased use of the metro at the expense of terrestrial transport, which acquires more concessional functions.

From the survey conducted, it was found that the highest percentage of urban transport is represented by scholars, students, pensioners and the unemployed. A light car is a preferred and more convenient means for active workers and Housewives. The questionnaire gives an answer to the question of what would normally drive people traveling by car to use public transport (Figure 25).

**FIGURE 25 IMPROVEMENTS THAT WOULD NORMALLY DRIVE PEOPLE TRAVELING BY CAR TO USE PUBLIC TRANSPORT**



(base: normally using car - 1558 persons, respondents have given more than one answer)

Source: investigation to SUMP

*Legend:*

*I would not use public transport*

*Cost per traveled distance*

*New vehicles*

*More convenient routes / links / stops*

*Schedule with shorter intervals*

*Price by traveled time*

*Busbars / autonomous routes*

*Better conditions at stops*

As can be seen from the results, most people want a fair and comfortable travel at the fair price of the tickets according to the distance / time traveled. More than 38% of car travelers say they would never use public transport. This in practice means that whatever measures are taken to encourage the use of public transport, a fairly high percentage of people prefer the convenience of the car, which to a certain extent is conditioned by the lack of constraints.

Based on all the data and observations, the key issues and challenges facing public transport are outlined.

**FIGURE 26 PUBLIC TRANSPORT: KEY ISSUES****FIGURE 27 PUBLIC TRANSPORT: POTENTIALS AND OPPORTUNITIES****Legend:**

*The road transport network of good transport has a good density and coverage of the population*

*Metro construction - fast and environmentally friendly public transport*

*Metro extension - Restructuring part of the existing route network*

*Expansion of the network of separate trails - tramways, bus lanes*

*The introduction of the ticker system will make charging more flexible and will encourage congestion*

*Data collection - an opportunity for analysis, optimization and adequate planning of public transport*

The analysis of the current situation and the data gathered are taken into account in the proposals for measures to improve infrastructure, rolling stock, charging and traffic organization, the establishment of public transport lanes and the prioritization of road traffic to make public transport more attractive .

However, for some types of travel, the lightweight car remains free. Such are movements for kindergarten, doctor, some business trips, etc. This has been taken into account when prescribing restrictive measures to limit road traffic.

## Railway transport

Sofia is the most important railway junction for the country and connects with the interior of the country in 5 directions. There are 8 stations - Central, Smirnenski, Sofia-North, Iliyantsi, Poduyane, Iskar, Sugar Factory, Gorna Banya and stops Nadejda, Obelya and Bakarena Factory.

The subject of the project "Development of the railway junction Sofia", implemented by the NRIC, is the preparation of feasibility studies, analysis of the existing state, technical projects and DDP for different sections of the unit. The main objective of the project is to ensure the modernization of the railway infrastructure of the railway junction Sofia, which will lead to improvement of the operational railway process in the area of Sofia City and its adjacent territory. According to the chosen development scenario, it is generally envisaged:

- Construction of a new track at 160 km / h between Kazichene Station and Stolnik Station via a new railway station Ravno Pole with a length of 19 237 m .;
- Reconstruction of the "Metro railway" in 3 places (Obelya, Central Railway Station and Iskarsko shose-built) as well as the possibility of connection between Sofia railway station and Poduyane station in the area of Chavdar Bridge;
- Establishing the connection "railway-bus" at two Sofia bus terminals in Obelya and Central Station;
- Construction of a new third parallel track from Voluyak to Kazichene with a length of 22 123 m;
- Destruction of passenger flows by introducing diametral traffic on the 1st line and opening of two Obelya and Kazichene terminals for passenger trains;
- Creating conditions for the realization of urban rail transport.

Voyuyak and Kazichene stations are reconstructed as nodes, taking into consideration the new solutions for higher speeds of double railway lines, which are included in them respectively from Pernik and Radomir, Stolnik and Plovdiv. It is perceived that the stations of the Voluyak-Kazichene should be prepared as firing developments and installations for the inclusion of a quadruple railway line. At this stage, the projects envisage the construction of a triple railway line with the possibility of building a fourth track after the capacity has been exhausted at a later stage.

New Voluyak and Obelya stations will be built, including new reception buildings, with a connection to the metropolitan and intercity bus transport at Obelya station. From Sofia Central Station to Voluyak, a third track will be built. New Obelya Station will function as an end train station for trains from the east and ending their way to Sofia. In this way, a diversification of the traffic flows and relieving the workload of Central Railway Station Sofia is achieved. The adjoining Obelya M stop serves the trains from and to Voluyak station (Sofia - Dragoman, Sofia - Bankya and Sofia - Radomir).

The Node Sofia project provides for the freight movement to be relocated from Sofia Central Station, which creates prerequisites for the development of a city railway by providing the possibility of diametrical traffic on the first line in the direction Obelya - Kazichene.



Проекти:

1. Развитие на железният възел София
2. Модернизация на железопътната линия София - Перник - Радомир в участъка София - Влада
3. Модернизация на железопътната линия София - Драгоман в участъка София - Костинброд

*Projects:*

- 50

The results of the Analysis of the Applicability for the Use of Rail Transport for Suburban and Inter-urban Travel as part of the Plan show:

- Although well-developed within the knot, railway infrastructure is depreciated and obsolete.
- In the overwhelming degree, the lines are operated at a speed lower than the design because of the worsened state of the track.
- Even the current capacity of the lines is not operated by the passenger carrier at more than 30%, except for the direction to Pernik.
- With the exception of Sofia Central Station and Iskarsko Shosse Station, the reception buildings and the surrounding areas of the stations and stops are in poor condition, with extremely difficult access for persons with reduced mobility.
- Diametral passenger movement through the city is now possible without a central railway station, given that according to the 2019 train running schedule, there are five trains a weekday that connect Kazichene to Bankya. This creates opportunities for the use of the railways for intra-urban transport and could make it an alternative to urban or road transport.
- Rail passenger transport has a strong development potential which is hampered by several major factors and reasons for the deterioration of rail transport quality and increased competition with road transport: poor traction and rolling stock quality, worsened state of rail infrastructure and low average train train speeds, train delays. In addition to addressing the above factors, opportunities for enhancing the competitiveness of rail transport should be sought in the direction of improving company management / liberalization of suburban passenger transport and the integration of rail transport with mass urban transport on the territory of the municipality.
- A study of the normative possibilities for issuing integrated transport documents as well as the possibilities for common (mutual) use of the existing documents for transport of passengers between Sofia Municipality and BDZ - Passenger Transports EOOD with rail and public urban transport have been established incompleteness and legal limitations in the current legislation related to the issuance and use of integrated transport documents. On the one hand, the regulatory framework does not provide for the possibility to unify or create a uniform tariff between BDZ - PP Ltd and another carrier other than the railway, as well as for recognition by BDZ - PP Ltd of transport documents for passenger transport on the territory of Sofia Municipality.

On the other hand, at present, an Ordinance on the terms and conditions of travel by public transport on the territory of Sofia Municipality does not allow for tariff integration because it does not provide for the possibility of recognition of transport documents issued by "BDZ - PP" EOOD, and does not include a tariff for integrated public transport (except for the integrated tariff of domestic operators).

The rail network is used for freight and passenger transport. Passenger transports mainly perform importing functions for workers and students in Sofia from the surrounding towns (Pernik, Svoge, Bozhurishte, Elin Pelin, Ihtiman, etc.). They are provided by the national passenger operator BDZ AD. Inter-city rail travel is minimal. The railway tracks pass mainly through industrial areas and sparsely populated areas, making them unattractive for intra-urban transport.

The busiest destinations for daily suburban trips to Sofia are Pernik, Ihtiman, Svoge, Dragoman. According to RIA, the most intense traffic is in Ihtiman (38%), Dragoman (32%) and Pernik (25%). The railway trips, according to BDZ data, are mostly in the direction of Ihtiman (39%), Pernik (38%) and Svoge (20%).

With the increasing importance of the capital as a preferred place of work, an increase in suburban traffic should be expected. This creates potential for use of the existing rail network.

Elin Pelin and Ihtiman direction has a significant potential for development and attraction of automobile traffic, which is currently 60% higher than that of Pernik, in the presence of a double line and the relocation of a central railway station from freight.

In the framework of the Analysis of the feasibility of using the railway transport for suburban and intra-urban trips, a financial analysis of investment in rolling stock for additional servicing of the Sofia-Ihtiman destination was made in peak hours by rail and the following conclusions were made:

- The investment is not redeemed and the supply of rolling stock should be financed by state, municipal or European funds.
- Despite the estimated increase in train travel, over 240,000 trips a year, there is a shortage to cover operating costs of about BGN 380,000 per year and a state or municipal subsidy is needed.
- At the same time, the project has the potential to improve financial sustainability, which could be achieved by:
  - Increase of single passenger revenue

The analysis of the operational cash flows of the project shows that it would be financially sustainable to increase the single revenue per passenger from BGN 1.04 to BGN 1.84. This may be partly due to an increase in the prices (and revenue) of tickets and cards.

- Carrying out the service by a regional carrier

A public service for the carriage of passengers on the suburban railway lines could be entrusted by Sofia Municipality to a licensed regional carrier. In this case, the railway carrier will operate on the basis of a Public Service Contract (PSC) with the municipality, similar to PSC, with carriers operating intra-urban transport. By virtue of this contract and in accordance with the requirements of the applicable legislation, the carrier will be entitled to additional compensation from the municipal budget to cover the difference between the operating revenues and the costs of the transport activity. The amount of the compensation is calculated at 6.38 BGN / km.

The Feasibility Analysis provides a review of the current regulatory framework for the licensing of railway carriers, the procedure for awarding public passenger transport services by rail and recommendations on the necessary amendments to the legislation to ensure the activity of the municipal regional carrier for the implementation of intra-urban and suburban rail transport on the territory of SM.

Regarding the Pernik direction, the opportunities for attracting more passengers are limited due to the limited capacity of the line (minimum interval of 20 minutes) and the limited speed from Sofia to Vladaya as a result of the lack of a double line between Zaharna fabrika and Vladaya and passing through residential neighborhoods. With the implementation of the NRIC project for the



modernization of the Sofia-Pernik-Radomir line, the line in Sofia - Zaharna Fabrika - Vladaya will be modernized on an existing route, without doubling between Zaharna Fabrika Station and Vladaya Park. After WW Vladaya will be doubled the line to Pernik on a new route at 160 km / h. With the implementation of the project, the design speed will be increased in the urbanized areas within 80 ÷ 100 km / h, and the design speed of the road outside them will be 160 km / h for passenger trains and 120 km / h for freight trains. As a whole, the project will contribute to improving the interconnection between neighborhoods and transport services in the areas through which the line passes, and in the longer term, and to improving intermodality, given the prospect of building a West Ring tangential tram line (from " Ovcha kupel "near Lyulin quarter).

It should be noted that there is a possibility to change the project by including the doubling of the line between Zaharna Fabrika and Vladaya Station and the construction of additional pedestrian and bicycle crossings to avoid division of the territory.- Doubling the whole line, and within Sofia Municipality, would have the need to wait for trains, increase the transport capacity and alleviate road traffic in the direction of Pernik - Sofia.

The project "Modernization of the Sofia-Pernik-Radomir Railway Line" is considered as part of the project Modernization of the Vidin-Sofia-Kulata railway line, which is on the list of priority projects for the Trans-European Rail Network and is part of the Eastern / Eastern Mediterranean Corridor Core / Core Med Corridor on the Core Network Corridors. The project is expected to be completed in the next programming period 2021-2027 with an indicative value of BGN 861 million

The investment project "Modernization of the railway line Sofia - Pernik - Radomir" envisages the construction of a railway highway to serve the population, domestic and international freight traffic. The project will ensure the interoperability of infrastructure, equipment, management, operation and safety systems, as well as connectivity to European rail networks through the application of uniform standards. The modernization of the Sofia-Pernik-Radomir railway line as part of the Vidin-Sofia-Kulata railway line will provide the necessary capacity, will allow the provision of railway services in accordance with the requirements of the Trans-European Transport Network and will allow the attraction of more international cargoes and development of passenger transport by rail.

At the same time under construction is the Ovcha Kupel metro station, situated 800 m above the Gorna Banya station on the existing route where a railway stop is planned to allow the transfer of the passenger flow directly upon entering the city of Sofia on a metro train without penetration in the central city area of the Central Railway Station area.

All this should lead to an improvement in the passenger service, including a reduction in travel time.

## Intermodal connections

The emphasis in modern urban transport planning is to increase the role of intermodality in meeting transport needs, namely the possibility of combining different modes of transport.

Main existing intermodal connections in Sofia are at the Central Railway Station connecting railway, metro, tram, trolleybus, bus and bus station; at Sofia Airport, connecting air, metro, bus and railway (via the Iskarsko Shosse stop on the same subway line).

With the construction of a third metro-diameter an intermodal connection is planned at the MS Ovcha Kupel metro station with the Pernik railway station in Sofia and two buffer parking lots. This new connection is expected to affect the way of travel to and from Pernik. At the other end of the Botevgradsko Shosse BouLEVArD there is a bus station and a parking lot.

When crossing the metro with the railway line at Obelya stop there is an opportunity for construction of a metro station and connection with the railway track. The GSP also envisages the development of a bus station in the immediate vicinity. It is possible to connect the railway network to the metro network at the 6th metro station on the 3 rd metro (at the Sofia Theater), where there is a possibility for a future railway stop "Chavdar".

The construction of the Vardar stop is not included in the project "Development of the railway junction Sofia". The stop would provide the opportunity for connection to the subway and for its realization an initiative by the municipality and Metropolitan EAD is needed, similar to the stop of Chavdar stop.

Combining different modes of transport for urban travel should lead to optimization of travel time and associated costs for carriers and passengers, which requires a flexible tariff system, convenient connections, high frequency of attendance, optimal and efficient public transport network.

## Bus stations

On the territory of Sofia there are several bus and coach stations serving interurban and suburban passenger services in the following directions: northeast - Poduyane bus stop - incoming and outgoing courses on Botevgradsko shosse Blvd; southwest - "West" ("Ovcha Kupel") - incoming and outgoing courses on Tsar Boris Blvd.; southeast - South station - incoming and outgoing courses on Tsarigradsko shosse Blvd. The Obelya bus stop serves the bus route to Kostinbrod and the region. Central Bus Station and Serdika Bus Station serve all directions, as Serdika Bus Station serves mainly international transports.

### CENTRAL BUS STATION

Central Bus Station - Sofia is located on "Knyaginya Maria-Luisa" Blvd. next to a central railway station.

The transport complex is built as a modern building in accordance with the contemporary requirements for public buildings of this type. The bus station has a covered area of 7,173 sq. M.

The ground floor of the bus station is the busiest part of the entire building. Approximately 2 250 passengers are traveling daily from the Central Bus Station. On the ground floor there is a waiting room with a total area of 1500 square meters, as well as 40 ticket boxes. Facilities for the disabled are also available. The carriers' offices are located on the next three levels. From Sofia Central Bus Station for both the country and abroad, between 47 and 50 buses from 50 sectors depart simultaneously.

### **Bus stop "PODUYANE"**

Avtospirka "Poduyane" is located in the square. "Gerena" at boundaries Street. "Veleka" street. "Teddy's dolls and market" Poduene. "

From there buses in direction south (Elin Pelin, Botevgrad, Pravets, Bulgaria Bulgaria, Gorna Malina, Etropole, Koprivshitsa, Ihtiman, Lower Kamartsi).

According to the current GSP current bus Poduyane is shifted to the last station of the line 3 of the underground, such as in this place is built intermodal node (subway, bus and buffer parking). This plan is in line with the GSP decision and proposes its shift, which is consistent with building a third subway line.

### **SERDIKABUS STATION**

The "Serdika" Auto Station is located on "Maria Luisa" Blvd. - Pregarzovo Square (next to the Central Bus Station and Central Railway Station).

From the bus station mainly international lines depart from Kostenets, Chavdar, Dushantsi, Pirdop, Zlatitsa, Mirkovo, Koprivshitsa, Anton, Dolna Dikania, Dren, Pernik, Dupnitsa, Kyustendil and Karlovo

### **Auto station "WEST" ("OVCHA KUPEL")**

"West" Auto Station is located in the Ovcha Kupel district, on "Ovcha Kupel" Blvd., near "Tsar Boris III" Blvd, opposite the Vocational School of Electrical and Automation (formerly Kirov). On the same square there is the Ovcha Kupel car station.

The buses departing from there are southwest (Pernik, Kyustendil, Blagoevgrad, Dupnitsa, Sandanski, Petrich, Bansko, Razlog, Gotse Delchev)

### **Auto station "SOUTH"(Yug)**

Sofia South Auto Station is located under the bridge area of the Darvenitsa overpass in Sofia. Izgrev, on "Dragan Tzankov" Blvd. №23, has been operating since 1986 and was built with the means of Autostart AD Samokov.

The buses departing from there are in the direction south, southeast (Elin Pelin, Panagyurishte, Velingrad). The South bus station operates the bus transport of passengers from and to small settlements to the south, southeast, east of the capital. After the opening of the Sofia Central Bus

Station, the functions of the South Bus Station are greatly reduced.

On weekdays from South Bus Station in the direction of Panagyurishte, Dospat, Devin and Velingrad, about 10 buses leave, about Pernik about 3, direction Elin Pelin, Novi Han, Ravno Pole and Musachevo about 27, and Samokov about 27 the bus.

Under the GSP, the current South Bus Station is closed and its function is taken over by the newly planned bus terminal at the last subway stop on the ring road. This newly planned bus station will take the routes in the south-eastern direction (direction Plovdiv, Stara Zagora, Burgas). There is currently no land for this new bus station. There is also an update of the extension of the existing subway, which is a prerequisite for the complex solution of the problem. Terrain for a new bus station can be found around the last stop of the future extension of line 1 of the metropolitan at the Simeonovski lift, combined with a buffer parking lot.

The location of the bus stations and the regulation of the routes within the city influence the traffic, the air and the noise. The shifting and dropping of bus terminals provided in GSP of Sofia is in view of their best performance and avoiding unnecessary network load.

## 4. Street network and car traffic

The historical development of Sofia has led to the formation of a central nucleus in the city with a huge functional potential, which characterizes the spatial-functional structure of the city as markedly monocentric. (PSN) - The Primary street network of Sofia has, with some small deviations, a non-built-in radial-radial configuration, ie. concentric, overlapping street rings around the central core of the city, and out-of-core streets-radii (rays from the kernel to the periphery) that cross the concentric street rings.

Rings (ring) streets serve as a dispenser for transport flows from radial directions. As transport flows go inward to the core, their intensity becomes higher until it collapses in the central core.

PSN is not built in its full scope and profile. There are no ring and tangential routes to pull the car out of the center to the city's periphery. These deficiencies hinder the creation of a structure to allow the development of secondary urban centers as envisaged by GSP.

The secondary street network in some areas of the capital city is also undeveloped, and where it is built is in poor condition. Network load, pavement quality, inadequate junction organization (insufficient number of bands in the throats and consequent inability to overshoot), inadequate control over compliance with traffic rules contribute to an increase in road traffic accidents (RTAs). The problems of road traffic are summarized in Figure 30.

### Street network

The PSN of Sofia has a ring-radial configuration, but it is not built in full scope, leading to UMC parasitic traffic and the automobile flows are not taken to the periphery.

**FIGURE 29 STREET NETWORK AND ORGANIZATION OF THE TRAFFIC: KEY PROBLEMS**


*Legend:*

*Underground street network*

*Poor state of sections of the secondary street network*

*Insufficient organization of work at crossroads and traffic lights*

*Insufficient control over compliance with traffic rules*

Key missing street paths under the current GSP are:

- • Breakthrough "Danail Nikolaev"
- • Bull. "T. Kableshev "
- • Eastern and Western tangents
- • The ring road in the sections between Mladost and Trakia Highway and between Buxton Blvd and Lyulin Motorway,
- • Connections of the North Speed Tangent with Sofia - Eastern Tangent, Rojen Blvd.
- • Connection of Sofia Airport with the Ring Road in Krivina in the eastern direction
- • Stephen's BouLEVArD
- • Copenhagen BouLEVArD
- • Reconstruction of Lomsko Shose from the Ring Road to Pancho Vladigerov Blvd.
- • Secondary street network in the neighborhoods of Manastirski livadi, Krastova vada, Malinova dolina and Vitosha

FIGURE 30 STREET NETWORK AND TRAFFIC ORGANIZATION: KEY ISSUES



*Legend:*

*Introduction of a new traffic organization in central city areas to create new pedestrian zones and shared streets*

*Transform existing streets to improve pedestrian accessibility and safety*

*Finishing of the ring and tangential routes from the primary street network*

*Construction of a secondary street network in the new residential neighborhoods*

*Effective Traffic Management and Control through the Development of ITS Systems*



## Degree of motorization

The degree of motorization in Sofia is higher than in Vienna and Berlin.

Every second resident of the capital owns a car.

## Automobile traffic

In recent years, the number of cars has increased steadily.

**FIGURE 1 DEGREE OF MOTORIZATION FOR SOFIA CITY (2006 – 2016)**



Legend:

Degree of motorization

Cars / 100 people

Population growth, new jobs, increased mobility and new car infrastructure lead to a rise in motoring rates (

Figure 31). According to data from the SDR in 2006, registered cars in Sofia are 360 per 1000 people. Until 2015, there has been a steady increase in motorcycling, reaching 528 cars per 1000 inhabitants. In 2016 there is a slight decrease of 2% to 515. It coincides with the introduction of the unified information system of the Traffic Police and the municipalities for the registration and deregistration of cars, which also contributes to more accurate statistics on motorization. For comparison, the motorization is significantly lower in Vienna - 370 (2016), in Berlin - 327 (2013).<sup>4</sup>).

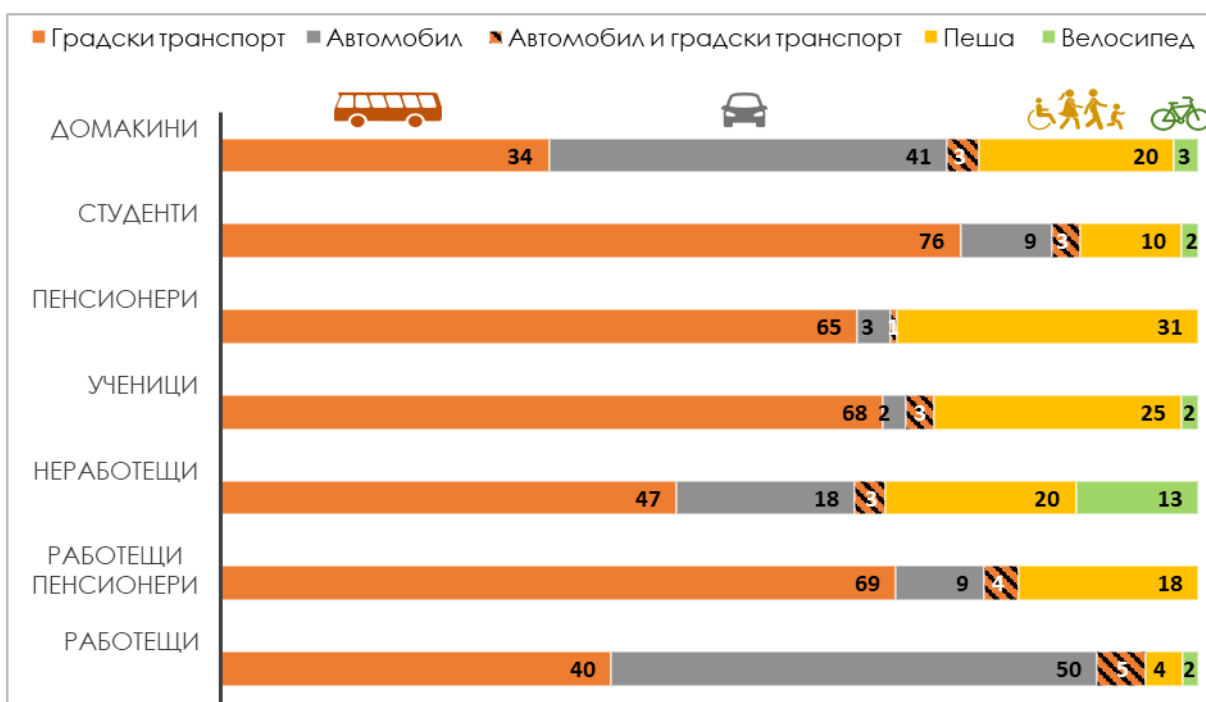
The results of the representative survey (2017) conducted during the development of the SUMP show that almost every 2nd working citizen of the capital is moving from / to car work (Figure 32). Close to these results were obtained also in the

<sup>4</sup><https://files.lsecities.net/files/2015/09/New-Urban-Mobility-London-and-Berlin.pdf>



framework of a pilot study of the municipal initiatives "Vision for Sofia" and "Green Sofia", which assesses the general situation of large companies in terms of type of transport used, way and duration of movement from and to workplace, as well as satisfaction or problems associated with it. According to interviewed managers, about 60% of employees are moving by cars, with some companies having a significantly higher share. Secondly, there are urban transport users, which are between 35% and 38% of the respondents. Walking and cycling have significantly lower stakes - up to 5%, especially in the autumn and winter season. A significant share, 68% of drivers admit traveling alone in their car to and from work, 27% share a trip with a family member or acquaintance, and only 5% with colleagues.

FIGURE 32 DISTRIBUTION OF TRIPS BY MODE OF TRANSPORT



(base: working - 2754 persons and base: Housewives - 121 persons)

Source: investigation to SUMP

Legend:

Public transport; Car; Car and public transport; On foot; Bicycle

Housewives

Students

Seniors

scholars

Non-working

Working pensioners

Working

The transport of children and students from / to schools, kindergartens and crèches creates considerable daily traffic in busy hours, which is mainly done by private cars. The municipality's policy on educational infrastructure by area and its functioning is a possible tool for influencing traffic. Another possible solution could be to find bus routes to transport scholars (up to 5 to 6) to school, and the effectiveness of such a measure is subject to further research. The need for such research is already recognized and at the moment, within the initiative "Green Sofia", input data from five schools located in the Center were collected, as well as a survey of the attitudes of the

## Fleet

A large part of our fleet consists of old gasoline and diesel cars.

Deliberately removing catalysts and particulate filters due to their high replacement cost.

parents of 450 children from 3 schools.

Vehicle dependence reduces the amount and quality of choosing a way to move. Increased road traffic makes walking and cycling more difficult, unpleasant and even dangerous. Similar is the situation with public transport: the demand for public transport is decreasing and accordingly the quality of the service is decreasing. More and more people are starting to rely on passenger cars, so sustainable alternatives lose political support.

Public policies influence the choice of mode of transport in different ways, for example, vehicle dependency is favored by building traffic-oriented streets, providing a parking space in the CUA, a favorable pricing policy for street parking and car-related planning. However, a number of studies have shown that excessive dependence on cars has a negative impact on economic development, increasing transport costs and consumption of resources by consumers, requiring significant financial resources and land for roads and parking facilities, increasing road congestion, travel time, risks for the participants in the movement and has a negative impact on the environment and health.

That's why air quality is a very topical issue in recent years, not only in Bulgaria but also in Europe and the world. Historically, air quality in Sofia has improved levels, mainly due to the introduction of cleaners in the industry, but remains a serious problem. It is determined by two main trends: the increase in the number of diesel cars and the use of fossil fuels and biomass for domestic heating.

The fleet in Bulgaria includes a significant share of old gasoline and diesel cars. Another problem is the deliberate removal of catalysts and particulate filters due to their high cost of replacement or their theft due to the precious metal content

It should be noted that the geographic location and local climatic characteristics of Sofia have a major role for AAQ. Temperature inversions and the associated mists are a very typical phenomenon for the Sofia field for the winter months, which makes it difficult to disperse pollutants in the air. This situation actually determines AAQ of Sofia as a very difficult problem.

AAQ data are analyzed in various annual reports by both state institutions (EXEA, RIE - Sofia, RZI - Sofia) and Sofia Municipality (in the AAQ program). As a source of pollution, the share of transport is not sufficiently defined precisely

because of the lack of data on the presence of catalysts in cars. The overall trend is that the AAR exceeds FPP10 in only a few points in recent years. However, when analyzing the DAN for 2016, it can be seen that there are no exceedances in the winter months alone. Data on hourly concentrations indicate that in some parts of Sofia the peak of pollution is even in the morning hours of the day when people go to work<sup>5</sup>.

Addressing the problem of air pollution requires a comprehensive approach in many areas and the active participation of citizens who are in fact the main stakeholders in the role of both pollutants and the effects of this pollution. Informing citizens about the sources of pollution, the effect on their health from their exposure to the various pollutants and the presentation of the life cycle of each pollutant is the approach to be followed. Non-involvement of citizens will lead to the impossibility of taking unpopular measures and delaying solving this so serious problem.

Sofia Municipality has a system for early signaling of high levels of pollutants in the air. The system has not yet been used and its role is yet to be solved. It can serve to take extreme measures in an aggravated situation.

Measures to be discussed include providing free public transport on days of severely polluted air, prohibiting the movement of even / odd numbered vehicles, tightening the control of vehicle technical inspections (including the purchase of pollutant meters car registration), special car stickers that pollute more. Sofia Municipality also has the commitment to replace the public transport fleet with electric buses and methane, as well as new trams (including the opening of new tram lines) that do not burden the air with pollutants.

The conditions and the order for carrying out the mandatory annual technical inspections of the vehicles are regulated in Ordinance No. H-32 of 16.12.2011 on the periodic roadworthiness tests for road vehicles. In this regard, the necessary additions to the text of the Ordinance could be made in terms of the regulation of specific indicators that PPPs should achieve by appropriately categorizing them. Consequently, it will be possible to determine the categories for which traffic in the Central City Area is allowed. When performing a mandatory technical review every subsequent year, it will be possible to

<sup>5</sup> Vision for Sofia, Report on the "Environment"

## Vehicle tax

At this stage, taxes on vehicles in Sofia do not take into account the degree of pollution caused by cars. They are calculated solely based on engine power and size.

monitor whether the particular PPP achieves the relevant indicators.

Penalties should also be provided for in the law with regard to motor vehicles with secondary catalysts removed. In this regard, amendments could be made to Chapter Seven "Administrative-Penal Liability" of the Road Traffic Act, which regulates specific legal sanctions for drivers of such motor vehicles.



**FIGURE 33 AUTOMOTIVE TRAFFIC: KEY ISSUES**

*Legend:*

*High degree of motorization*

*Old non-organic fleet*

*Policies that stimulate vehicle independence*

*Lack of infrastructure for the use of environmentally friendly vehicles*

**FIGURE 34 VEHICLE MOVEMENT: POTENTIAL AND CHALLENGES**



*Legend:*

*Restriction of transit through the Central Part of the city (reduction of parasitic traffic east-west)*

*Encourage shared use of cars*

*Introduction of an environmental component in the determination of the vehicle adapter*

*Renovation of the fleet and renewal of its ecology*

## 5. Electric cars and shared mobility

Air pollution and urban noise problems can be reduced by increasing the use of electric vehicles (EV). Electric cars are particularly suited to urban use - smaller distances, greater available charging infrastructure availability, frequent stops and departures make car use more efficient in urban conditions than intercity trips. On the other hand, it is precisely in cities that there is the strongest negative impact of the vehicles with internal combustion engines on the environment. For these reasons, many cities around the world are stimulating and encouraging the use of electric cars, through various tax breaks, purchase subsidies, free parking, building public charging systems, and more.

The sales and market share of electric vehicles have seen remarkable global gains in recent years, with the total number of plug-in vehicles (all-electric and plug-in hybrids) worldwide over 3 million in 2017. In some countries, EVs take a serious share of new car sales, with Norway's share reaching almost 40%. Electricity sales in the world are expected to grow to 11 million per year in 2025 and 30 million per year in 2030. Estimates are in 2040, EV to represent more than half of the sales of new cars and over 1/3 of the entire car fleet in the world.

Along with the introduction of electric vehicles, more and more widespread use of different vehicle sharing systems and services, using geolocation, mobile applications, social networks and more. The development of these services can completely change the pattern of ownership and use of cars - from owning a product (car) to a service (mobility). More and more urban residents perceive and prefer the car as a flexible service that can be ordered and used when and where it is needed instead of owning a car with its high maintenance, parking, taxes, and so on.

The Shared Car Model can address the essence of the problem of owning a car - its inefficiency. Typically, a passenger car is used in a very small part of the day (no more than 10%), while the rest of the time simply stays parked. The Shared Vehicle Model can increase vehicle performance by up to 10 times, with significantly less parking space needed. Studies and simulations of the International Transport Forum of the Organization for Economic Cooperation and Development for the cities of Lisbon, Helsinki and others. show that if the model of ownership of private cars with a mass system for shared stand-alone vehicles is replaced, the same or higher level of mobility can be ensured with 10-12% of the fleet. This would free up a huge amount of public and private parking space.

The distribution of electric cars in Sofia is still too low. As of November 2018, in Sofia there are about 350 electric vehicles registered with over 680,000 passenger cars in total. This is a very small share - in European countries it is considered a normal share of 0.5-1.0% of all cars. It should be noted that of the 350 electric vehicles registered, about 100 are registered in June-December 2018 or approximately 40% increase over the same period in 2017. In 2019 the electric vehicles in Sofia numbered 585, which confirms the positive growth trends of used electric vehicles, despite the higher price and poorly built charging infrastructure. At present, electric vehicles in Sofia enjoy privileges such as free parking in "blue" and "green" areas and exemption from annual vehicle tax. A major problem for the penetration and widespread use of electric cars, apart from their higher price for internal combustion engines, is the lack of developed charging infrastructure.

Given that the implementation of an accelerated electric vehicle policy in Sofia is an effective



means of improving air cleanliness and reducing road traffic noise, the creation of a network of charging stations is essential to promote the use of electric cars. To this end, and in order to stimulate the use of clean and energy-efficient vehicles, a tender procedure for the allocation of parts of public property owned by municipalities for the installation of charging stations for electric vehicles was announced at the beginning of 2019. There are 25 locations for charging stations or 50 charging points, as each location will provide two electric cars simultaneously. In the "Center" area, 16 locations or 32 charging points are located in the regions: Sredets, Vazrazhdane, Oborishte, Serdika, Krasno selo. Outside the Center zone, the areas where charging stations will be placed are: Ovcha kupel, Studentski Grad, Slatina, Iskar, Poduyane, Vrabnica, Izgrev, Mladost ", " Lyulin. " The minimum power to be charged at each charging point is at least 11kW, three-phase AC charging, and the type 2 connector, which provides significantly faster charging than the standard one at home (with a cable in the contact network). The Sofia Municipality will provide two parking lots for a location only for electromobility in the charging mode, with the refueling itself limited to 4 hours.

**FIGURE 35 ELECTRIC CARS: KEY ISSUES**



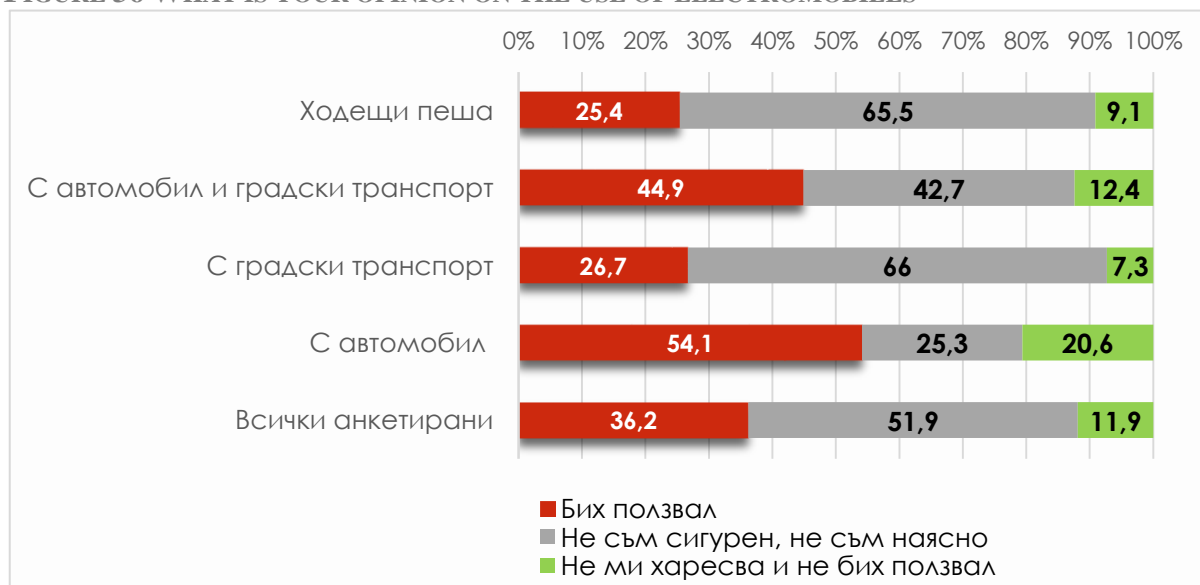
*Legend:*

*High cost of electric vehicles compared to the standard of living in the city*

*Lack of subsidies and financial incentives to buy an electric car*

*Insufficient well-developed network of charging stations*

FIGURE 36 WHAT IS YOUR OPINION ON THE USE OF ELECTROMOBILES



Source: investigation to SUMP

Legend:

Walking on foot

By car and public transport

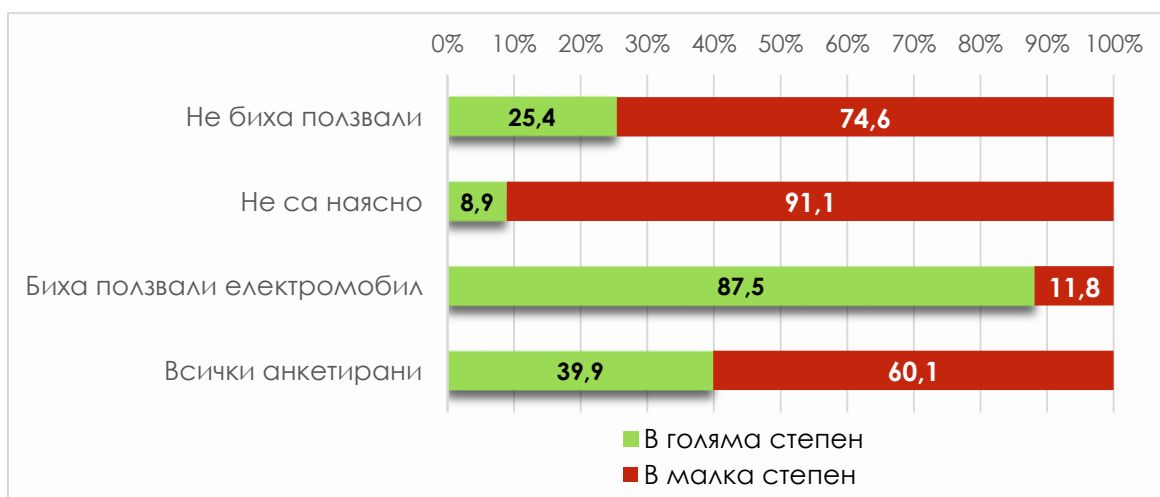
By public transport

By car

All respondents

I would not use it  
I'm not sure, I'm not clear  
I do not like and I would not use it

FIGURE 37 TO WHAT EXTENT BUILDING A WIDER NETWORK OF CHARGING STATIONS WOULD INFLUENCE YOUR DECISION



Source: investigation to SUMP

Legend:

They would not use it

They are not aware

They would use an electric car

All respondents

Largely  
To a lesser degree

This means that a large proportion of car users today could switch to electromobility with the right conditions and opportunity. The construction of a wide network of charging stations positively influences people's desire to use electric cars.

By 2018, there are about 60 public-access charging stations in Sofia, located mainly in shopping centers, large grocery stores, and the Eldrive platform, which offer a paid charge. Own free charging stations built by the importer of KIA Motors. Free charging stations offer "Kaufland" and "Lidl" chains in some of its stores. In September 2017, the Sofia Municipal Council approved the "General Scheme for the Installation of Charging Stations for Electric Vehicles - Stage I" on the territory of Sofia.

The scheme identifies 35 locations where charging stations for electric vehicles can be installed as a first stage of the development of the network of such facilities on the territory of the city. It is necessary to analyze which of the proposed locations will have the largest real market demand for such a service and where to begin their realization. It is also necessary to expand the network towards Studentski Grad (eg UNWE, TU and other universities), Mladost (eg Business Park), Sofia Airport and others.

Since the end of 2017, the first system for shared mobility in Sofia - SPARK has been operating. The service originally started with 25 electric cars, then increased to 60 in 2018. The service is used by a mobile application to help customers find, reserve and unlock the nearest available car. Once completed, customers are not required to return them to the place they have taken, but can leave them anywhere within certain areas, with parking in the "blue" and "green" areas free of charge.

For the first five months of the project, over 10,000 users are registered, about 150 individual sessions per day are being performed, and the car hire and clearance area is expanding. Companies providing this service also build and manage charging stations for electric vehicles. By the end of 2019, the number of electric vehicles in the SPARK system had to reach 250. In the process of preparation for implementation there are similar services for shared electromobility in Sofia.



Figure 38 Electromobility: Potential and Challenges

Legend:

*Electric cars are exempted from vehicle tax*

*Opportunity for free parking in the blue and green area*

*Introduced and functioning system for shared electric cars*

*Existing network of private EV chargers*

*Build a network of municipal charging stations for EV*



## 6. Parking



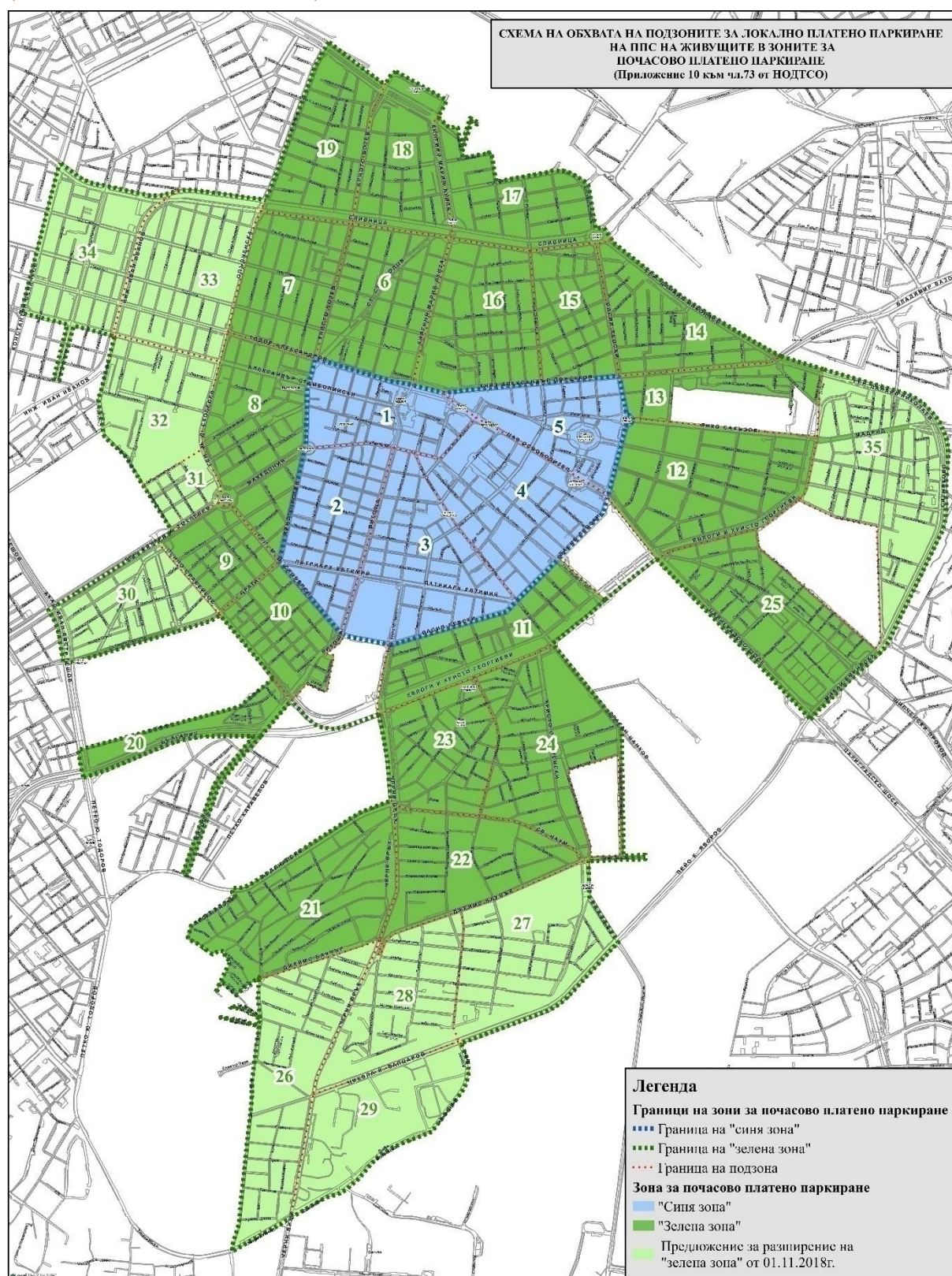
### Parking organization

The parking in the areas for paid hourly parking on the territory of the Sofia Municipality shall be performed only at the authorized places within the zones defined and signaled with road signs and signs. In the range of paid hourly parking there are two types of zones - blue and green areas.

Their capacity by 2018. is as follows: there are 4 894 parking spaces in the blue zone, in the "green zone" there are 23 980 seats. Urban Mobility Center EAD manages 14 car parks with a total capacity of 4,036 seats, of which 4 municipal parking parks at the metro stations with 2,606 parking spaces.

In recent years several studies have been carried out on the existing private parking lots on the territory of the Sofia Municipality, which have a capacity of more than 50 parking spaces. As of 2012, there were 46 with a total of 6,194 parking spaces, with most of these car parks covered by the paid parking area.

**FIGURE 39 "BLUE ZONE" AND "GREEN ZONE" PART TIME PARKING SCHEDULE (EFFECTIVE FROM 01.11.2018)**



Source: UMC

Legend:

*Schematic of the area of the locally paid parking area of the PPPs of the residents in the areas for paid parking*

## Ways of payment



### СМС

Таксуването на паркиране с един SMS е за един час в зоните за почасово платено паркиране "Синя зона" и "Зелена зона" за всички мобилни оператори на територията на страната



### Талони

0,50 лв - паркиране 30 минути в "Зелена зона"  
1,00 лв. - 1 час в "Зелена зона" или 30 минути в "Синя зона"  
2,00 лв. - 2 часа в "Синя зона"



### Служебен абонамент

Въвежда се на специално обозначени за това места. Редът и условията за определяне на местата се утвърждава със заповед на кмета на Столична община.



### Винетен стикер за локално платено паркиране

Издава се на собственици, наематели или членове на домакинството на собствениците/наемателите на жилищни имоти, попадащи в зоните за платено паркиране.



### Карта за преференциално паркиране за хора с трайни увреждания

Критериите за определяне на правоимащи лица са указани в чл. 91 от НОДТСО.

#### Legend:

*SMS - Parking with one SMS is one hour in the paid parking area. Blue Zone and Green Zone for all mobile operators on the territory of the country*

#### *Talents*

*0.50 BGN - parking 30 minutes in the Green Zone*

*1.00 BGN - 1 hour in the Green Zone or 30 minutes in the Blue Zone*

*LEVA 2,00 - 2 hours in the Blue Zone*

#### *Business subscription*

*It is placed in specially designated places. The terms and conditions for determining the seats shall be approved by an order of the mayor of Sofia Municipality*

#### *Visa sticker for locally paid parking*

*Issued to owners, tenants or members of the household of the owners / tenants of residential property falling within the paid parking area.*

#### *Preferential parking card for people with permanent disabilities*

*The criteria for determining eligible persons are specified in Art. 91 of the NDTTSO.*

The maximum duration of parking in "blue zone" is up to 2 hours, and in "green zone" - up to 4 hours. The zones are valid in working days from 08:30 to 19:30, and the "blue zone" and on Saturday from 08:30 to 18:00.

When parking outside the designated areas in the "blue" or "green zone", on green areas or in places with explicit parking ban, the vehicles in violation are forcibly removed. On the territory of the city of Sofia there are 3 criminal parking lots - "Poduyane" railway station, 57 "General Danail Nikolaev" blvd., Prewar space; "Christopher Columbus" Blvd. and 5030 Street; "691" Str., 128 Tsar Boris III Blvd. PPP, which is parked in violation of Art. 54 and Art. 55 of the Ordinance



on organization of the traffic on the territory of Sofia Municipality (NDTTSO) may be forcibly detained through the use of a technical means of brackets.

With regard to paid parking mode "Business Subscription", it applies to streets, squares, car parks and other parts of the road infrastructure - municipal property, in specially designated places. The regime is differentiated between day and night, with the daylight covering the areas in the blue and green areas, and the night-only parking zone "Blue Zone". The Daily Business Subscription mode is also valid on Saturdays from 08.00 to 18.00 - only for parking spaces in the "blue zone". The terms and conditions for determining the paid parking facilities "Business subscription" shall be approved by an order of kmeta of Sofia Municipality. The price for paid parking in the "Business Subscription" mode is determined and changed by decision of the Sofia Municipal Council. At the moment the price per month for a parking space in the Blue Zone is 650 BGN with VAT, in the Green Zone - 450 BGN with VAT, outside the zone - 264 BGN with VAT.

With the introduction of hourly parking in the "blue zone" and "green zone", the residents in the area have preferences for issuing a vignette sticker by place of residence, however, which does not guarantee a parking space. With the Ordinance for organization of the traffic on the territory of the Metropolitan Municipality (NDTTSO) are regulated specific sub-areas within which citizens can park their vehicles. This is done within the limits of a specific sub-area in the areas for paid parking paid by the address of the detached residential property. The boundaries of specific sub-areas falling within the scope of the Blue Zone and the Green Zone are described in Art. 73 of the Ordinance. At the moment, the price for an annual local parking ticket in the Blue Zone is 150 BGN per car, the second car is double and the third is in triple. Accordingly, the price for an annual sticker in the Green Zone is 100 BGN for the first car and for the second and third the regime is similar to the "Blue Zone".

## Key problems

The city center is filled with various activities that attract heavy traffic. From the increased demand in recent years, especially in CUA, the pressure from cars has increased. The occupancy of parking places in a blue zone is about 94%, in a green area - 82%, with almost full employment being reported between 11:00 and 17:00. In view of the day-to-day workload and occupancy of parking spaces in the paid areas, steps should be taken to increase the hourly parking cost in the areas.

Increased motoring, including those living in the center, leads to increased demand for parking spaces. At the same time, the number of blue vignette stickers issued (3964) is considerably closer to the remaining number of public parking spaces available - 4131.

This figure was obtained as 282 invalid seats were removed from the total number of seats in the area (4894) 22 pcs. 459 - "Business Subscriptions" places, but the 429 stickers for the electric cars which are currently parked free of charge in the area, as well as those of the Sofia Municipality and the embassies and administrative buildings located on the territory of the area, of the which are provided with service spaces for use. In this regard, amendments to the Ordinance have been made by providing maximum number of stickers - up to three, of a separate residential property. This is likely to result in a change in the above mentioned data, but other measures should be taken in this direction, such as:

- determination of the maximum percentage of parking spaces with a vignette sticker in the

## Traffic and Parking

The occupancy of parking places in a blue zone is about 94%, in a green area - 82%, with almost full employment being reported between 11:00 and 17:00.

Parking of prohibited or unregulated places outside the paid parking areas (sidewalks, green areas, near junctions or street lanes) makes it difficult for all road users.

specific type of area of the total number of parking spaces;

- further reduction of the number of stickers for a separate residential property.

- raising the price for a monthly, yearly and two-year vignette sticker.

With regard to paid parking "Business Subscription" in the legislation there are no restrictions on the number of places for which a legal entity can apply. This leads to certain streets with parking spaces occupied only by "office subscriptions", making it difficult for other participants in the traffic.

There are no conditions for short-term parking of service cars, including courier companies and suppliers, for loading and unloading activities, which creates traffic difficulties and additional traffic from these vehicles when searching for stopping points.

The high degree of motorization in recent years has led to crowding with cars both in the CUA and in the rest of the city. As a result, there are difficulties in finding free parking spaces and mass parking at unregulated sites (near junctions or on the street lane, on the pavements, because there are no pins, the dealers of the bicycle lanes, the walkways, the green areas and the parks ), mostly in non-CUA complex areas (outside of paid parking areas and as a result of low-cost parking).

A serious problem related to parking exists in the vicinity of medical establishments, cultural facilities, administrative sites, parks and other objects, representing mass burdens associated with mass access around which no parking lots are built for visitors.

Such a visible problem is in the South Park area where visitors to the park have difficulty finding a parking space and park or parked cars on nearby streets or parked unregulated on the green areas and sidewalks.

A similar problem with unauthorized parking in the green areas and sidewalks due to insufficient parking spaces exists in the residential complexes of the capital. The capacity of these areas in respect of parking areas is very limited.

It is extremely important to have strict control of improperly parked vehicles. The change of NDTTSO is focused on this problem, besides the road elements included the alleys in parks

and green areas. In this regard, the necessary control organization should be set up on Sunday days when paid parking areas are not working and the CUA has a mass parking on the street lanes and other unregulated locations

From the overall assessment of the streets bounded by the Green Zone, it is concluded that there are problems with parking due to the fact that an increasing number of car users are trying to park in free parking areas.

The survey of parking at CUA in Sofia found that demand exceeded the supply. The policy of limiting car access to this part of the city and car parking by residents is appropriate. It is recommended that access and street parking be severely restricted by the pricing policy of parking and stay in the area. The construction of paid parking spaces on the periphery of the CUA would result in a relaxation of the CUA traffic as well as parking. Accordingly, in order to withdraw part of the cars from the paid parking areas and to redirect to the paid parking lots, there should be changes in the pricing policy.

**FIGURE 41 PARKING: KEY ISSUES**



*Legend:*

*Buffer parking does not work at full capacity*

*Insufficient number of buffer parking lots*

*Lack of enough underground and floor parking*

*Trailed streets with cars stopped or parked*

*Insufficient information on available parking spaces and their availability*

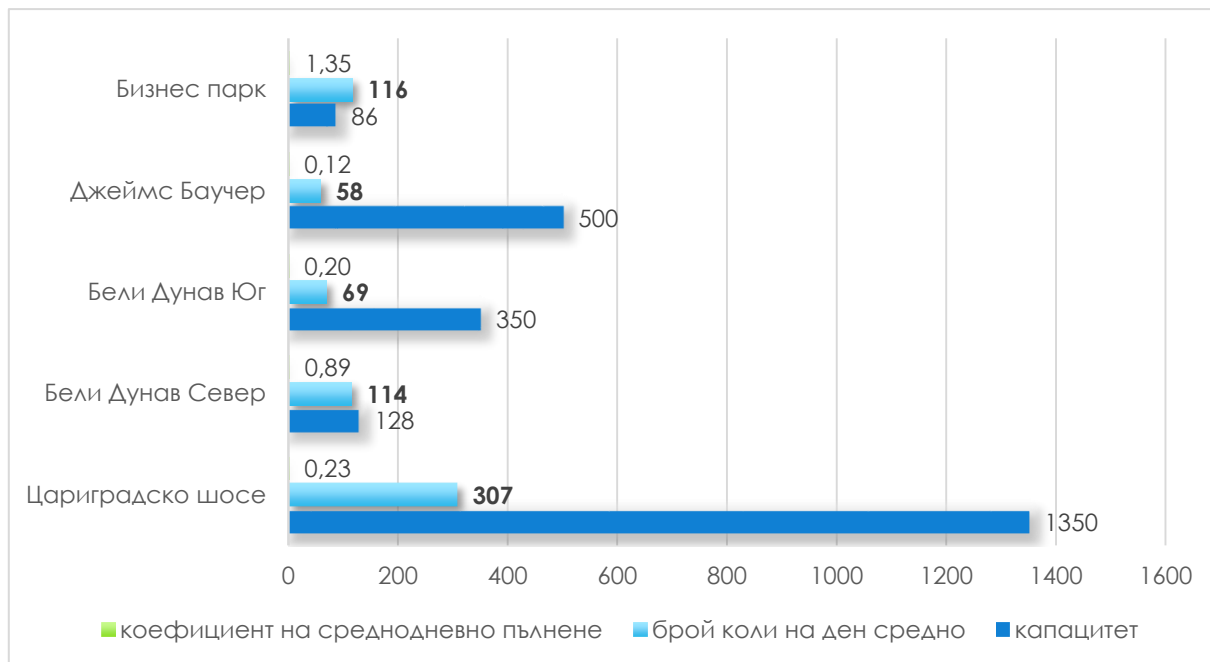
*Insufficient control over improper parking*

There are also problems with the parking spaces. At present, four buffer parking lots are in place and are in the immediate vicinity of metro stations of main entry-exit arteries. Parking data in them shows that much of their capacity remains free.

The availability of parking spaces in buffer parking spaces is linked to the cost of the hourly parking in the paid parking areas. Through an appropriate pricing policy, it would be possible to influence traffic and parking in the CUA and stimulate underground parking.



**FIGURE 41 CAPACITY AND OCCUPANCY OF BUFFER PARKING SPACES**



*Legend:*

*Business park*

*Djeims Baucher*

*Beli Dunav Jug*

*Beli Dunav Sever*

*Tsarigradsko Shose*

*Average Daily Fill Rate*

*Number of cars per day on average*

*Capacity*

Out of the existing parking parks with the most efficient parking is the Business Park. It is also the smallest size (only 86 places) and is filled quickly.

All car parks tend to increase filling.

The analysis leads to the conclusion that these car parks are not being used effectively and do not use their full capacity to buffer traffic to the city center.

The main reason not to use enough parking spaces is the fact that car travel is the preferred mode of transport in front of alternative ways. This is largely due to the lack of restrictions on ground parking in the areas around buffer parking lots, as well as on affordable parking rates in the center.

Measures to increase paid parking areas play a positive role in limiting traffic, but attention should be given to measures such as the construction of buffer parking lots and other underground and floor parking lots, as well as strict adherence to and amendment to the statutory instruments to ensure the necessary parking places for the construction of various residential and public buildings depending on the areas in which they are located.

Worldwide practice shows that in many of the buffer parking lots mixed parking is allowed and parking spaces are also available for general use (eg for residents and for free parking) and not only for the purpose of buffering traffic but at higher prices. In this way, more efficient mobility management is ensured: by changing the percentage of general use and, above all, by differentiating prices according to parking objectives, the use of parking lots with their main

buffering function is stimulated while at the same time regulating the full using their capacity.

It is necessary to change the model of payment for use of the buffer parking lots. Currently, a one-way ticket in the metro allows for a free 2-hour stay in a car park (respectively, a one-on-one card allows for a one-day stay). In some European cities, the reverse model is practiced - the parking lot is paid and all passengers in the car are entitled to free public transport.

In this way, one-way group travel is stimulated. At present, average vehicle fill data shows a 1.1 with a downward trend.

**FIGURE 42 PARKING: POTENTIAL AND CHALLENGES**



*Legend:*

*The blue and green zones work successfully and are welcomed by citizens*

*Opportunity to extend the territorial scope, time range and parking price in the Blue and Green Zone*

*Introducing adequate incentives to use the Buffer Parks and the Parking and Ride system*

*Construction of new buffer parking spaces for metro extension*

*Construction of underground and overground parking lots around the CUA and in the residential neighborhoods*

The Schedule Schedule is provided with a detailed Parking Management Program where the existing situation is presented, the policy and measures for street and off-road parking management.

## 7. Urban logistics



Optimizing urban logistics requires a comprehensive set of measures aimed at managing the entire chain of processes related to the movement of material flows from the primary source of raw materials to the final consumer of finished products to take into account operational, regulatory features of the urban environment. Given that the transport of different types of products and materials is mainly carried out by private companies that seek to minimize financial costs and energy consumption, regulatory measures and restrictions are taken in many European cities to take account of the impact of freight transport on the environment and quality of the urban environment.

Historically, urban freight problems have been neglected in urban and transport planning in European cities, with Sofia no exception to this trend. At European level, a more tangible change in the direction of research, legislation and pilot projects in the field of urban logistics has been observed over the last 10-15 years, and especially since the European Commission adopted the White Paper (Roadmap to a Single European transport space - towards a competitive resource-efficient transport system) where the aim is to achieve virtually urban dioxide-free urban logistics in major cities by 2030.

At present, Sofia Municipality does not have a comprehensive strategy for urban logistics. In the framework of urban transport planning, freight transport has not been thoroughly considered and the logistics requirements of private companies are not sufficiently covered. Moving towards more sustainable urban logistics requires change and innovation both in the public and private sectors.

### General Structure Plan of Sofia Municipality (adopted in 2006 and updated in 2009).

One of the main goals of the current GSP, driven by the downturn in industrial production and the rapid development of trade and services, is the exportation of production and warehousing activities in the periphery of the city. Part of the existing industrial zones in the compact city, especially located near the central parts of the city, cease to function as production sites and are subject to restructuring and change of purpose. The new zones for the development of production, warehouse and logistics activities are envisaged in the periphery of the compact city located on the outer ring of the city, near the main highways and the entry-exit arteries. The main directions for the development of these activities follow the main transport corridors in the southeast and northwest directions.

Regarding the territories of the Southeastern and Northwest high-tech and transport-warehouse complex, the concept of secondary sector development envisages the deployment of:

- intermodal transport terminals;
- cargo settlements;
- a clustered group of warehouses;
- Production bases for small and medium enterprises;
- public service facilities and services.

Regarding the territories of the northern arc of the ring road in the GSP, it is envisaged that

several types of production groups should be located along the ring road in the intersection zones with the main radial directions to the city:

- small and medium-sized enterprises for production and services;
- Wholesale warehouse bases and agricultural production markets;
- transport bases;
- construction and assembly bases;
- enterprises related to the gravitational to the ring roads settlements.

Markets should be located close to the two "Southeast" and "Northwest" agricultural production gates. The construction and transport bases are located at the main communication nodes connecting the central core to the national and international transport corridors. The production and service industries as well as the gravitates to the settlements are integrated with public service units and guarantee the viability of these territories.

Within the city center system, logistics centers and intermodal terminals are identified as a single group mainly for spatial reasons, as these centers are linked to the need for significant territorial resources and direct high-class transport services, mostly combined transport. From an economic point of view, they are key to the modern development of major cities. The development of large logistic bases is envisaged in the surrounding area in the southeast and northwest direction. Suitable for such functions are the territory of Kremikovtzi, having links to the Hemus, Trakia and Airport highways, and the terrain of the North Arc of the Ring Road.

Concerning freight traffic, the prediction is that there will be no market niche for intra-urban freight traffic. According to the GSP, freight traffic in the future should undergo an active "planned - market" reorientation of incoming and outgoing freight flows, and a qualitatively new picture should emerge by the end of the period up to 2030 - concentration of flows from and to:

- • Iliyantsi Station and Iskar Station with their well-developed network of industrial branches;
- • Sofia-cargo, Voluyak, Gorna Banya, Zaharna Fabrika and Kremikovtzi railway stations on the territory of the capital;
- • Universal terminal for combined transport (initially envisaged in the Kazichene station area, subsequently proposed in the area of Poduyane District - Eastern region);
- • Reservation of terrain for another terminal for combined transport - the exact location will be determined after a specialized study on one of the following sites: Voluyak, Iliyantsi or Kazichene.
- According to the Sofia node project, the number of railway tracks Zaharna Fabrika and Gorna Banya, At this stage, the projects for Zaharna Fabrika and Gorna Banya railway stations in the long run do not envisage carrying out loading and unloading activities. It is envisaged that Kazichene Station will be a technical train station for equipping and servicing train compositions. The variant for the modernization of the container terminal on the territory of Sofia-cargo station (Stochna Gara) drops due to the unprofitable nature of the idea of development of loading and unloading activities in the region of central Sofia. The issue of building an intermodal container terminal in the Sofia region remains unresolved.
- Much of GSP's projections for the development of production and storage areas and logistics have been in place over the last decade. Part of the more centrally located production and storage areas in the city of Sofia ceased to function as such, with new

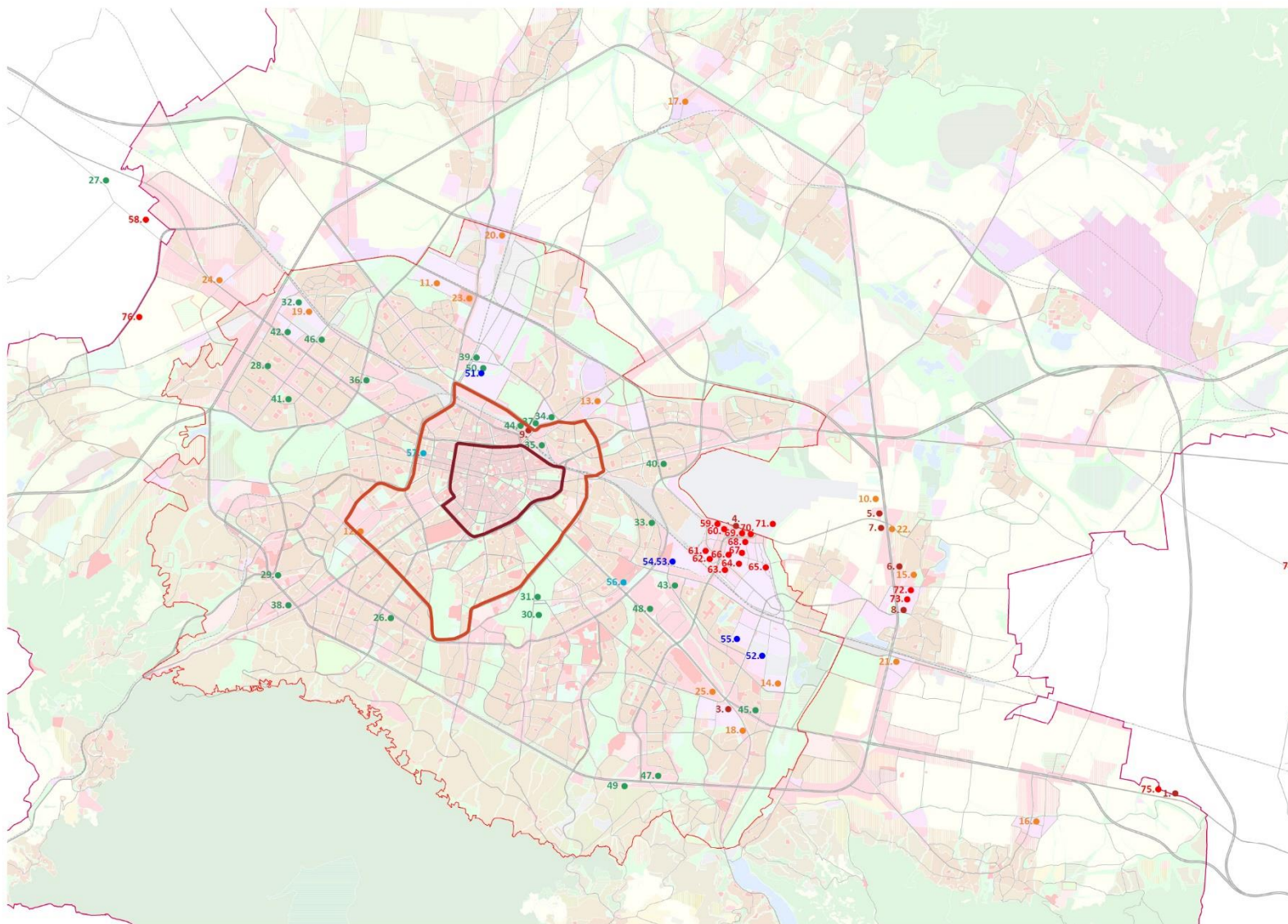
residential areas (Red Star - Dianabad) and business zones (East-Kuro) being located in their place. In the process of restructuring and building new multifunctional zones are NPP "Hladilnika Vitosha", Sredets NPP and others. Kremikovtzi MK ceased to function, although the future of its territory was still unclear. The new warehouse-production and logistics functions are located outside the compact city:

- in the southeast direction around Kazichene - Krivina and in the further direction Elin Pelin - Ravno pole;
- in the northwest direction around Voluyak - Bozhurishte and in the distant direction Kostinbrod - Slivnitsa.

The main logistic hub within the city of Sofia is developed in the Iskar North NPP and NP "Slatina Sever" near Sofia Airport. Besides these larger centers, there are still many dispersed warehouses, stock exchanges, vegetable exchanges, color exchange, etc. that have to find their optimal place for development on the outskirts of the city in order to the freight traffic they generate.



FIGURE 43 LOCATION OF LARGER LOGISTICS BASES



- Логистични паркове**
1. Логистичен парк "East Ring" - Землището на Нови Хан
  2. Логистична база "ФАНТАСТИКО" гара Елин Пелин
  3. ул. АБАГАР № 22 Сити Лоджистик парк
  4. ул. "Продан Таракчиев" 12
  5. ул. "Околовръстен път" 467
  6. ул. "Околовръстен път" 454Б
  7. Околовръстен път 467
  8. ул. "Околовръстен път" 440
  9. ул. Индустриална, Василев Бизнес Сити 11, 1202 НПЗ Хаджи Димитър
- Складови бази**
10. Нова Връждевна, ул. "Кривински път" Интрагруп
  11. ул. "Петър Панайотов" 18
  12. ул. "Житница", 1612 Нпз Стедец, София
  13. ул. "Резбарска" 9, 1510 НПЗ Хаджи Димитър
  14. НПЗ Искър Кермес номерс
  15. Кривина Хелкон
  16. с. Лозен Киприда
  17. с. Световрачене, ул. "Синец" 20
  18. ул. Самовско шосе 2А - складова база Армана
  19. Складово-производствена зона - Модерно предградие - Милицер и Мюнх
  20. жк. Илиянци, ул. Складова база 1, Химснб
  21. Казичене Складова База, Royal Salin
  22. ул. "Кривински път" Вергелс ООД
  23. бул. "Розен" 31 стокс базар Илиянци
  24. Метро: ул. "Сливница" 182
  25. Метро: бул. "Цариградско шосе" 7-11
- Борси за строителни материали**
26. ул. "Тодор Каблешков" 72
  27. бул. "Европа" 114
  28. бул. "Царица Йоанна" 144
  29. бул. "Никола Петков" 86
  30. бул. Симеоново шосе - гара Пионер 1
  31. товарна гара Пионер, ул. "Стоян Михайловски"
  32. ул. "Андрей Германов" 3
  33. ул. "Бом Магесние" 106
  34. ул. "Градинарска" 5
  35. ул. "Павлина Унфривева" 2
  36. ул. "Адам Мицкевич" 2
  37. ул. "Медицинска" 1
  38. бул. "Никола Петков" 69
  39. ул. "Първа българска армия" 1
  40. бул. "Ботевградско шосе" 80
  41. бул. "Джаскарпан Неру" 31
  42. бул. "Царица Йоанна" 144
  43. бул. "проф. Цветан Лазаров" 41
  44. ул. "Опска река" 5 Орландовци
  45. Практикер: бул. "Цариградско шосе" 323
  46. Практикер: бул. "Панчо Владигеров" 75
  47. Практикер: ул. "Околовръстен път" 265
  48. Моско Бриколаж: бул. "Цариградско шосе" 115
  49. Моско Бриколаж: ул. "Околовръстен път" 299
  50. Баумаркет: "проф. Иван Георгов" 44
- Зеленчукови борси**
51. "проф. Иван Георгов" 44
  52. ул. "Амстердам" 8
  53. бул. "проф. Цветан Лазаров" 13 "Слатина Булгарплад"
  54. бул. Проф. Цветан Лазаров № 13 Зеленчукова Борса "Роял Сторидж"
  55. НПЗ Искър Тържище София
- Борси за цветя**
56. ул. "акад. Георги Бончев" 3, 1113 БАН IV км
  57. ул. "Димитър Петков" пазар Димитър Петков
- Логистични бази**
58. ДБ Шенкер ЕООД, бул. Европа 1а
  59. Транспрес ООД, ул. "Мими Балканска" 140
  60. Ренус България, бул. Брюксел 1
  61. ДиЕйЕл Фрейт, бул. "Източна тангента" 94
  62. Флекс КАРГО, бул. "Източна тангента" 100
  63. Ойрошпед АД, бул. "Христофор Колумб" 56
  64. ДСВ Роуд ЕООД, ул. "Неделчо Бончев" 16
  65. Карго партнер, ул. "Подл. Васил Златарев" 44А
  66. Интерлогистика куриер ЕООД, бул. "Христофор Колумб" 58
  67. Екол Лоджистик, ул. "Подл. Васил Златарев" 152В
  68. Коне и Нател България, бул. "Христофор Колумб" 64
  69. Юнимастърс Лоджистикс Ес Си Ес ЕООД, ул. "Продан Таракчиев" 12
  70. Орбит, ул. "Продан Таракчиев" 16
  71. DHL Express Sofia, ул. "Мария Атанасова" 5, 1528 Летище София
  72. Александър Логистикс ООД, Казичене, ул. Трети Март №1
  73. Голет Логистикс, 1532 Казичене
  74. Гейбридер Байс ЕООД, 2139 Мусачево
  75. Карго партнер, Елин Пелин
  76. JYSK ДСВ, Божирище 222Б
- Логистични паркове  
● Складови бази  
● Борси за строителни материали  
● Зеленчукови борси  
● Борси за цветя  
● Логистични бази  
— Зона Център  
— Зона Първа



*Legend:*

*The Contract for the Development of a Sustainable Urban Mobility Plan of Sofia Municipality is implemented with the financial support of the Swiss Confederation as part of the Swiss contribution to the enlarged European Union*

## Legislation

### *Ordinance for organization of the movement on the territory of Sofia Municipality*

The Ordinance on organization of the traffic on the territory of Sofia Municipality lists the streets, which limit the traffic of road vehicles to certain areas of the city, all day or for certain hours:

- Entry of trucks and construction machines with a maximum mass exceeding 4 tons from 07.00 to 21.00 in the "Center" area.
- the entry of buses with more than 22 passenger seats from 07.00 to 21.00 in the "Center" area.
- Entry of trucks and construction machinery with a maximum permissible mass exceeding 15 tonnes in zone "First", except for the following streets and bouLEVArds in the area: Slivnitsa Blvd., Vladayska Reka Str., 3idarska Street, "Rezinarska" str., "Danail Nikolaev" Blvd., "Konstantin Stoilov" Blvd., "Kamenodelska" Str., "Vladimir Vazov" Blvd., "Chavdar" Bridge and "Shameful."
- the movement of other road vehicles, except motorcycles and mopeds, cars, trucks with maximum mass up to 4 tons, buses and trolley buses on Tsarigradsko shosse Blvd. in the section between "Orlov most" and "Dr. M. Dimitrov".

By decision of January 2018, it is forbidden to use trucks and construction machines with a maximum permissible mass up to and above 7.5 tonnes in the City Area on working days from 07:00 to 09:00 and from 17:00 to 19 : 00 hours.

The prohibitions do not apply to special-purpose vehicles, specialized vehicles of the concessionaire companies, as well as specialized cars on the approved kmeta list, specialized vehicles of the operating companies, social patronage and the cars of the security companies, serving signaling security systems, such as according to para. 3 exception to the prohibitions under para. 1 is allowed only against a pass.

In case of non-observance of the established order sanctions from 500 to 3 000 leva (Road Traffic Law) are envisaged.

### *Ordinance on Markets on the territory of Sofia Municipality*

The Ordinance regulates the terms and conditions for the organization and operation of the municipal markets on the territory of Sofia Municipality. "Municipal Markets" are the markets organized on municipal property plots or owned by sole proprietorships of Sofia Municipality, where commercial retail activities are carried out. The opening of the relevant market in the order of the kmeta of Sofia Municipality determines the working time for commercial activity, loading and cleaning - in accordance with the requirements for preserving the public order and the peace of the citizens.

Ordinance on the terms and conditions for carrying out commercial activities on the territory of Sofia Municipality

Regarding stationary commercial objective, urban territories in Art. 4a of the Ordinance stipulate that the trader offers working hours and loading hours between 06.00 and 23.00.

Law on protection against environmental noise

According to Article 16a of the Environmental Noise Protection Act, work and loading of production, storing and trading sites located in multi-family residential buildings are not allowed for the time between 23.00 and 7.00

## Key problems

The problems and challenges arising from logistics operations in the city include: deterioration of traffic conditions, conflicts with other vehicles and pedestrians, complexity of urban freight and freight transport patterns, difficult cooperation due to conflicting interests in some cases, low compliance with regulatory compliance, under-optimized use of vehicles.

In recent years, the share of transport related to e-commerce, courier services, home delivery has increased considerably. In major European cities, as a result of these shipments, logistics increased to 15% of the total. In Sofia, large courier companies are actively developing automatic post offices for sending and receiving shipments in shopping malls, retail chains, petrol stations.

The good combination of convenience of transport access to the site - public transport and parking, and the lower cost of service to users and companies - is the reason for this rapidly expanding practice, which is also beneficial for reducing traffic.

As a whole, there is no data and comprehensive study of urban logistics within Sofia Municipality. The measures and solutions that apply do not address the complex logistics processes, but rather their particular aspects.

Appropriate transport infrastructure and regulation of stopping points for carrying out loading and unloading activities are necessary. This is also the reason for the frequent disturbance of the traffic of street users when making deliveries. The lack of space for loading and unloading activities degrades efficiency, prolongs delivery times and distance traveled, and leads to the generation of additional quantities of harmful emissions. Incorrect parking or stopping traffic when a parking space is unavailable lead to congestion and increased travel time for other road users.

One of the main problems that the logistics companies themselves point out is the impossibility of speeding traffic between different parts of Sofia, due to the under construction of the street network and the lack of high-speed roads. For the logistics companies near Sofia airport the key projects are the construction of: the eastern tangent and the connection from NPP Iskar-Sever to the ring road at Kazichene, connection with Tsarigradsko Shose Blvd, connections to Lyulin, Boyana and Manastirski livadi. Connections on the territory of Iskar-Sever NPP with the ring road at Krivina and Kazichene are offered in the active GSP - the extension to "Mimi Balkanska" - "Prodan Taracchiev" street in the eastern direction to Krivina, as well as to the street "Nedelcho Bonchev" through the southern passage of Busmantsi village connection to the road junction at Kazichene. The construction of a high-quality road infrastructure would help to bring heavy goods traffic beyond the boundaries of the First Zone in Sofia and for the faster freight transport, given the reduced congestion levels (despite the longer distances). Another problem reported by the sector is the insufficient communication with the municipal structures, which results in the low level of awareness of the companies about the future plans for development of the basic transport-communication infrastructure and the intentions for amendments in the legal framework. This, in turn, hinders long-term planning and a gradual adaptation of business to changing conditions. Given the dynamics of the sector, predictability of the environment is a key factor in decision-making for new investments and expansion of activities, affecting both local and larger international forwarding companies offering logistics services on the territory of the municipality.

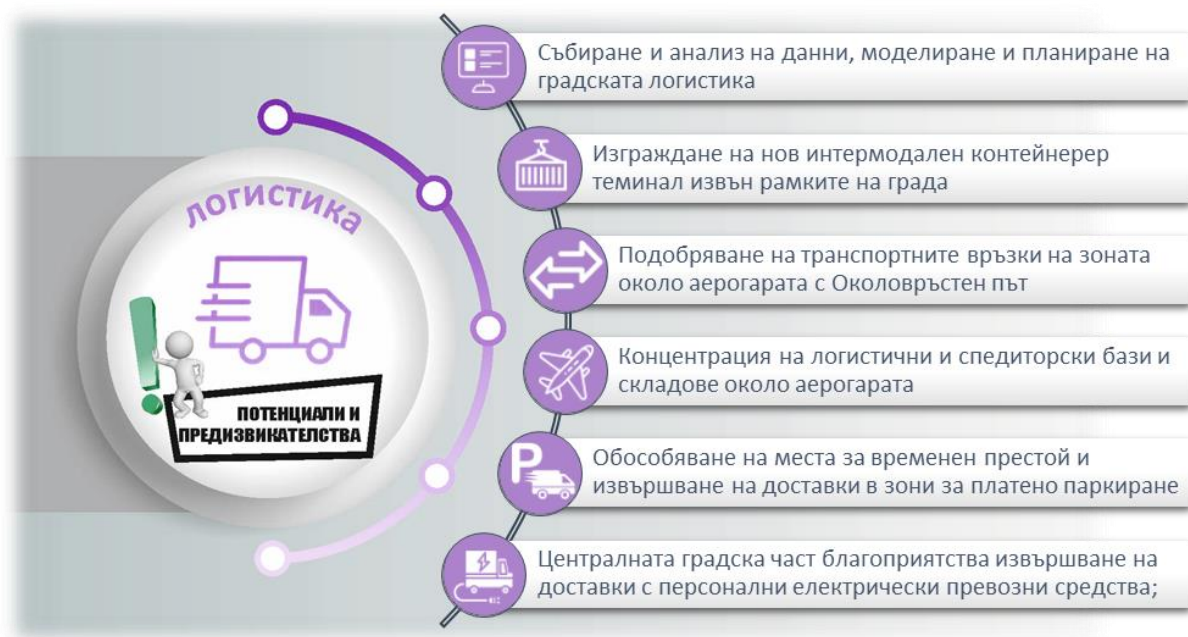
On the part of the logistics companies, the lack of railway connections with the specific users, in most cases, the last sections of a few kilometers of railway infrastructure ending up allowing the railway to enter directly into the warehouse bases are not built. Moreover, the business is currently not using rail transport because of the low speed, unsatisfactory level of carrier services and uncertainty related to the occurrence of breaks and incidents and failure to comply with the agreed transport timetable.

**FIGURE 44 KEY URBAN LOGISTICS PROBLEMS***Legend:**Incorrect parking or stopping of traffic when delivering**Lack of appropriate transport infrastructure**Harmful emissions and noise pollution**Lack of systematic research and data**Insufficient control over compliance with the applicable regulations*

A major problem of urban logistics regulation is the impact of freight transport on traffic and the environment. The consequences of the activity are borne by all the inhabitants of the city.

The task of the administration is, as far as possible, to regulate the processes so as to maximize the economic benefits of transport services and thus minimize adverse external impacts.

FIGURE 45 LOGISTICS: POTENTIAL AND CHALLENGES



*Legend:*

- Data collection and analysis, modeling and planning of urban logistics*
- Construction of a new intermodal container terminal outside of the city*
- Improving transport links around the Ring Road Airport area*
- Concentration of logistics and forwarding bases and warehouses around the airport*
- Establishing places for temporary stay and deliveries in paid parking areas*
- The central city area favors the supply of personal electric vehicles*

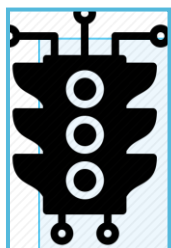
Freight transport by road is not a service in the sense of a public service, such as passenger transport and not a municipal duty. European practice shows that logistics should be cost effective to be sustainable. Much of the city's attempts to build and subsidize the operation of urban consolidation centers to reduce traffic are unsustainable and unsuccessful. The alleviation of these problems requires targeted studies and data on urban logistics, administrative regulation of freight transport and technological provision of logistics companies and control bodies.

## 8. Intelligent Transport Systems



At present, the Metropolitan Municipality has several information and communication technology based systems, which are used to solve some of the problems related to the organization and management of traffic and public transport, presented below:

**Adaptive Traffic Control System** is implemented with several separate projects and aims at driving traffic and giving priority to public transport vehicles. The



### Traffic control system

- 200 upgraded crossroads and a new traffic management center
- 1020 Electronic Dashboards
- a module giving priority to special-mode vehicles
- management of pedestrian flows

modernized traffic lights are located at the intersections of the entry and exit arteries and the ones in the center and the intersection of the junctions of the system along the route along Bulgaria Blvd is forthcoming. Most of the reconstructed junctions have replaced the traffic controllers and are installed on the flow sensors. Another very important feature is the ability to monitor the performance of the

traffic lights, which allows rapid response in the event of an accident. The necessary attention is also paid to the management of pedestrian flows by installing buttons for pedestrian crossing, audible alarm for blind and dyeing of the pillars of traffic lights in yellow.

For modernization, there are still traffic lights.



**Automated Tracking Control System(ATCS)** was created and implemented for the needs of the public transport management and especially for quantitative and qualitative valuation of the transport task of the transport operators. An essential element



#### Public transport management system

- quantitative and qualitative valuation of transport operators' performance of the transport task
- integration with other systems, such as information on stop-and-go passengers and on vehicles; voice alert; automatic traffic light control at a junction.
- 



#### Automated Passenger Charging System (APCS)

- operates for trolley and tram transport
- carrier - electronic contactless chip card
- charging - through validators in vehicles

in determining the transport task is to optimize the transport service according to the passenger flow and to synchronize the route and timetables with all types of public transport. The solution for the transport task is to draw up

an operational plan. Data on it is processed through another tool - "Schedule for Programming and Operational Planning"

**The automated system for charging passengers (ASCP)** is realized in the trolley and tram transport in Sofia. The basis of the system is a new type of information carrier - an electronic contactless chip card (the so-called smart card) that is issued once and then recharged repeatedly. The card is charged in vehicles on special devices - validators. All information for issuing, charging, charging and checking the electronic card, as well as the card issuance card issued by the ticket machine, is recorded at the central automated system of the Passenger Billing System. There are prepared automatic accounting records and reports needed to improve the organization of public transport. An analogous system is also used for charging in the metropolitan metropolitan area. A new electronic charging system, covering all public urban transport, is underway.

**SMS system to pay for parking** - through it the customers of the Bulgarian mobile operators can pay parking in a blue and green zone. The system is built with two modules - for controlling disadvantaged people as well as owners of vehicles whose properties fall in the areas for paid parking.



#### SMS system to pay for parking

- number 1302 - Blue Zone
- number 1303 - Green area

#### Geographic information systems for public transport management and parking

For the purpose of plotting and inventorying objects in the geographic space, separate GIS systems are built mainly in the UMC. They are used respectively to deploy the stops and routes of the vehicles and to apply the types of parking spaces to the individual areas and parking areas in Sofia. They serve mainly as a background for some of the information systems embedded in the company, as well as for spatial analysis and the undertaking of well-grounded management decisions.



### Information boards with variable content

#### 2 types of plates:

- **up-to-date travel planning travel information**
- **parking - show the number of free parking spaces**

Two types of information boards with variable content are installed in Sofia. The former show up-to-date road and weather information, recommended speed and other useful information to allow drivers to better plan their routes according to changes in the

traffic situation, thus reducing the distance traveled.

The latter are located in 15 locations mainly in the periphery of the paid parking area. They show the number of free parking spaces in 6 locations in the Blue Zone of the city. The purpose of the signs is to reduce the distance and time traveled in search of a parking space.

Demonstration "Intelligent Walking Trail" was installed next to Sofia University "St. Kliment Ohridski" - Rectorate at "Vasil Levski" Blvd. It was managed by a Pedestrian Protection Light System (PLGS). The system was built on the basis of microcontrollers, a network of infrared sensors for pedestrian detection (with crossing approaches) and a network of light modules embedded in the traffic lane on both sides of the pedestrian path. The system detected a pedestrian before it crossed and provided automatic control of a horizontal "lightning wave" light. The aim was to prevent pedestrian incidents.



### Intelligent Walkway

- Provides increased visibility of pedestrian paths through light modules embedded in the traffic lane
- controlled by the Pedestrian Light Guard System (PLGS)

All these systems have been deployed for several years to meet specific operational requirements, with no intent to integrate them, and different standards have been used to implement them.

Relatively new but highly profiled are the following systems:



### On-board video surveillance system

- factory-installed local video surveillance system in new vehicles
- Some systems also have built-in monitors in the driver's dashboard
- the driver can, through the "panic" button, inform the dispatcher in the control center in a timely manner



### [www.sofiatraffic.bg](http://www.sofiatraffic.bg) - Public Web Site of Urban Mobility Center EAD

- provides information and services in the field of public transport and parking
- comprehensive regulatory information, types of vehicle and parking documents, FAQs, descriptions of the implemented systems and realized projects
- planner of travel by public transport



### mobile apps

- applications with public transport schedule information
- parking applications with driver capabilities for locating the driver's location, deferred SMS, debit or credit card payment, single profile for multiple cars

## Key problems

The main problems with ITS in Sofia can be grouped into several main directions. A key problem with these systems is the lack of static data as well as information systems for collecting, analyzing and processing dynamic data for all road users and traffic accidents. At the key points in the city periphery, automatic counting points are installed and the information can be used to analyze the incoming and outgoing traffic in the city. However, there is no system for managing ongoing repairs, often affecting the transport infrastructure.

**FIGURE 46 KEY ISSUES IN INTELLIGENT TRANSPORT SYSTEMS***Legend:**Lack of static and dynamic data for traffic participants and incidents**Lack of sufficient ITS infrastructure (eg variable content plates)**Lack of integrated traffic management systems and incidents**Fragmental information systems for automation, analysis and modeling**Lack of coordination between institutions and poor institutional data exchange**Insufficient control over compliance with traffic rules*

Much of the infrastructure is planned and built 20 years and over, and ITS as a new technology has not yet been taken into account. Even now, IT infrastructure is not planned as part of the construction project, even when it comes to future road segments.

There are no automated telematics traffic management systems that often require day-to-day traffic management and specific road traffic accidents through traditional methods and human presence and intervention. There are no VMS systems that significantly increase the reaction time for accidents. The available ones, mainly for parking, are few or far away from the parking areas. There is currently no functioning GIS electronic system for analyzing day and hour traffic, road accidents and places with high accident rates and potentially dangerous places.

Problems should also be noted in the lack of coordination between the institutions. The reason for this is the highly fragmented and divided between many traffic management agencies, which together with the lack of interoperability leads to ineffective cooperation. The available data is not shared and is not used optimally between different organs.

The level of automation in the enforcement systems of the Road Traffic Act is low. Extremely small technological capabilities for automated tamper detection and alerting increase the incidence of accidents while minimizing the preventive effect of these measures.

**FIGURE 47 ITS: POTENTIAL AND CHALLENGES**



*Legend:*

*Extending the scope of the traffic control system and public transport control*

*Maintain and develop deployed ITS systems and integrate them into a single platform*

*Using the unified platform to collect and analyze data modeling and planning the transport system*

*Institutionalize the single platform to better integrate service and integration systems*

*Development of the integrated electronic charging system for all public transport*

## Vision, goals and concept of sustainable urban mobility

---

The analysis of the current situation shows that the city's transport system is under constant pressure from rising levels of motorization and excessive use of private cars at very high costs to the economy and citizens' health.

Automobile traffic accounts for over 30% of all intra-day trips for a declining share of public transport. An average of about 2% per year increases the car fleet, with the degree of motorization exceeding the average European levels. The car has become a symbol of social status, perceived by many as a means of freedom in mobility - with no restrictions on schedules, stops and working hours. The onslaught of cars leads to parking problems, air pollution, noise, road accidents, poor urban quality.

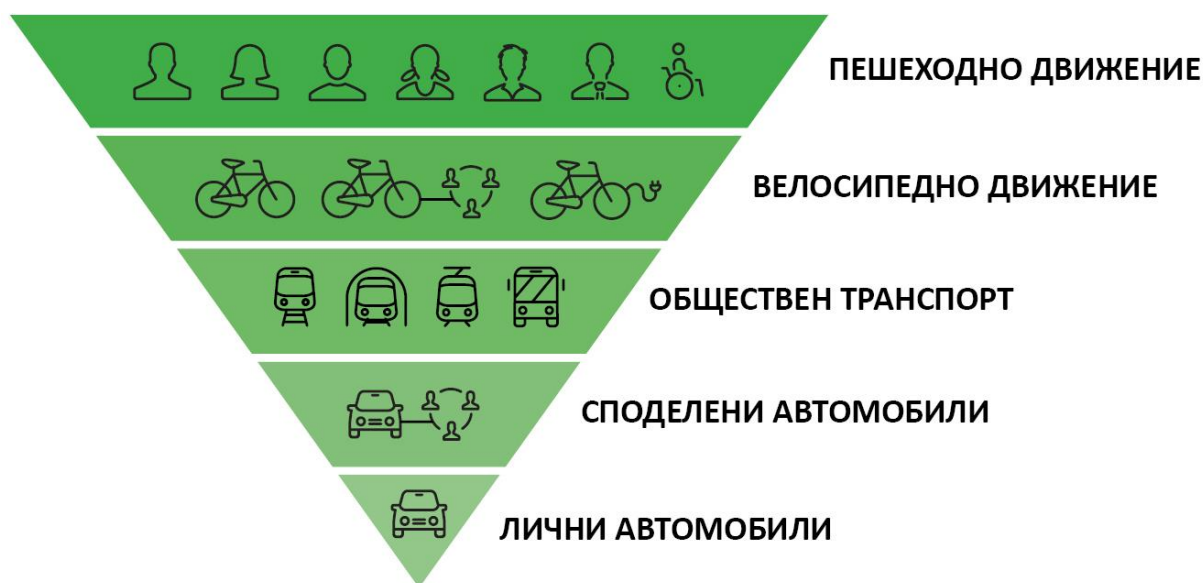
These trends and problems are not just typical of Sofia. A number of major cities in the world are facing or have faced similar challenges in the past. International forecasts show that if there is no radical change in transport habits, by 2050 urban residents will spend twice as much in congestion as at present, air pollution and noise pollution will increase significantly, urban mobility systems will use five times more resources than in 1990, and congested transport infrastructure will be a serious obstacle to economic growth.

Urban planning policies have so far been trying to meet the growing needs of road transport by building a new and expanding existing street infrastructure to help alleviate traffic and reduce congestion. The experience of many cities around the world has unequivocally demonstrated that investing in traffic-alleviating infrastructure (eg city highways, cross-roads, etc.) do not generally address traffic and congestion problems. Even if they temporarily relieve traffic in parts of the city, they encourage even more people to use their private cars, resulting in extra traffic and new traffic jams. The continuation of this vicious circle is not a sustainable model of urban planning in terms of the environment and quality of life in the city.

Cities that have successfully reduced road traffic and congestion and have built up efficient and sustainable urban mobility systems have taken a radically different approach - the "reversed pyramid" model, with the highest priority being given to pedestrian and bicycle traffic, public transport, shared mobility and finally is the private car.



FIGURE 48 TURNED PYRAMID OF MOBILITY



*Legend:*

*Pedestrian traffic*

*Bicycle traffic*

*Public transport*

*Shared cars*

*Personal cars*

In most cases, successful approaches include a combination of encouraging and restrictive measures and policies. On the one hand, they are investments and incentives in the development of integrated, fast and convenient public transport, bicycle and pedestrian traffic, systems for shared mobility and others. On the other hand, all successful models also include a variety of ways to limit traffic, especially in the central parts of the city - a "traffic jam" or pay when entering a car in certain areas, physical limitations, intentional delays in road traffic, a total ban for cars in certain parts of the city. Restrictive measures also apply through parking policy - through high street parking rates, reduced parking spaces, and more.

In addition to the challenges of environmental protection and climate change, the world today faces the threshold of a technological revolution that can radically change urban mobility. Electric cars, shared cars, stand-alone vehicles and other technological innovations change the way cars move, use and manage.

The widespread distribution of shared car systems will change the ownership and use of the car - from owning a product (own car) to a service (mobility). Mobility as a service (MaaS) represents a radical change in the traditional understanding and use of the car - it is increasingly perceived not as an individual vehicle but as an element of a comprehensive mobile service. Using a single application, the user will be able to use different combinations of ways of travel (eg, public transport, taxi, shared car, shared bicycle) provided by different public and private operators by paying the price of any service used with a smart card or based on a certain subscription plan.

Technologies will change the way urban mobility is used and planned. For example, in sparsely populated areas and / or at certain times of day when demand is poor, buses can run on a flexible

timetable and / or route according to user requests via a mobile application. Another area of significant innovation can be logistics - delivery of goods on demand, using drones, and so on.

To meet the challenges of time, Metropolitan Municipality should build a new model of urban mobility based on sustainable forms of transport and open to technological innovation. This requires the majority of citizens to unite behind a common vision for developing a new sustainable model of urban mobility in the capital.

## 1. Vision for Sustainable Urban Mobility - Sofia 2035

The vision synthesizes the shared idea of what it will represent and how the city should develop in the future. Sofia is currently developing and defining its long-term vision for development. Although Vision for Sofia has not yet been finalized, the Sustainable Urban Mobility Plan offers an insight into how the city's transport system should look like. The SUMP horizon until 2035 is long enough to define an ambitious vision and goals for the development of urban mobility in the capital.

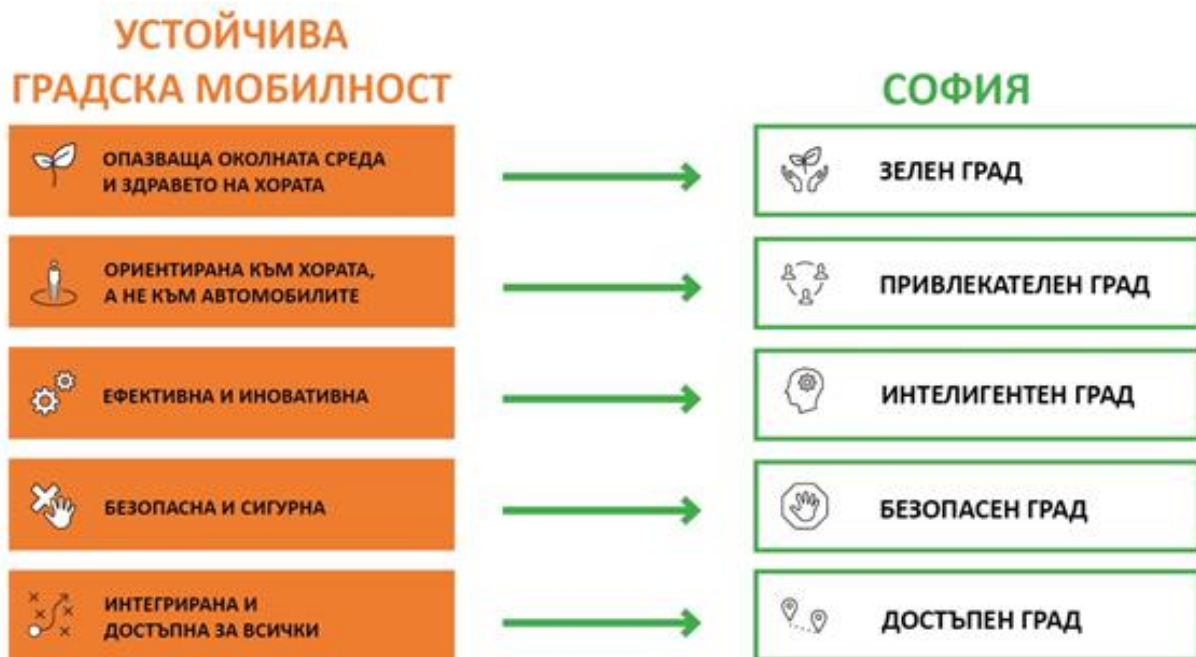
### VISION OF SUSTAINABLE URBAN MOBILITY - SOFIA 2035

**Sofia will develop sustainable urban mobility, which is:**

- ☐ **Protects the environment and human health**
- ☐ **Towards people, not cars**
- ☐ **Effective and innovative**
- ☐ **Safe and secure**
- ☐ **Integrated and accessible to all**

**and contributes to making the capital a green, attractive, intelligent, safe and affordable city.**

FIGURE 49 VISION - SOFIA 2035



Legend:

Sustainable Urban Mobility

Protecting the environment and human health

People-oriented, not car-like

Effective and innovative

Safe and secure

Integrated and accessible to all

Sofia

A green city

An attractive city

An intelligent city

A safe city

An accessible city

### A green city

In 2035 the transport system in Sofia is based mainly on ecological and healthy forms of mobility. Public transport is fast and reliable and the majority of citizens prefer it. Walking and cycling are part of everyday life for many of the city's residents.

The car fleet has been upgraded, with electric vehicles occupying much of it. A wide network of public and private electric vehicle charging stations operates throughout the city. Vehicle traffic is greatly reduced and much of the car travel is shared.

### An attractive city

In 2035 Sofia is a "city for people" with a vibrant and attractive urban environment. In the central city area, motor traffic is heavily restricted at the expense of interconnected pedestrian zones and shared streets with priority for pedestrian and bicycle traffic. Public spaces have been upgraded

and lively with people and activities.

A system of pedestrian and bicycle lanes binds the main sites of service and leisure in residential neighborhoods and city parks. Most of the cars are parked in newly built underground and overground floor parking lots, which frees streets and public spaces for a variety of outdoor and social activities.

### **An intelligent city**

In 2035, Sofia has an efficient and innovative transport system that introduced the latest technological advances in urban mobility. Several systems for shared cars, bicycles and personal electric vehicles offer a variety of opportunities for shared mobility.

A unified digital platform integrates the various public and private transport systems, allowing for door-to-door travel planning, booking and electronic charging via a single smart card. Intelligent Transport Systems manage traffic in real time, while collecting and analyzing data used to model and plan urban mobility. Data is open and used by developers and developers to provide a variety of mobile applications and services.

### **A safe city**

In 2035, transport in Sofia is a symbol of safety and security. The tranquil transport areas in the center of the city and the residential districts function well and residents feel safe walking and cycling. Bicycle lanes surround the entire city. Most major streets and junctions have been transformed for a safe and comfortable walking and cycling crossing with raised pedestrian and bicycle paths, intermediate islands and more. Road accidents have declined significantly. Compliance with road safety rules is controlled by intelligent transport systems, and tolerance is the guiding principle of all road users.

### **An accessible city**

In 2035 Sofia has an integrated transport system enabling all residents and guests of the city to move quickly and comfortably from and to every point of the city and region. The backbone of public transport is a well-developed network of metro and speed trams on autonomous routes.

Rail transport carries out regional, suburban and intra-urban transport, and links to other public transport are made via several intermodal terminals. Underground stations of the subway are provided with parking parks for cars and bikes offering parking and travel services. Transshipment between different modes is easy and convenient, with citywide traffic being made with a single transport document with different charging options - based on distance traveled, on time, through different types of subscription plans, and more.

## 2. General objectives of SUMP

Sofia's vision for sustainable urban mobility provides the direction in which the city's transport system should develop. To achieve the vision, SUMP defines 5 common goals, each goal corresponding to one of the elements of the vision:

A green city: Reducing the negative impact of transport on human health and the environment;

An attractive city: Improving the attractiveness of the urban environment and ensuring a better quality of life;

An intelligent city: Introducing transport innovations and enhancing local mobility and economy;

A safe city: Improving the safety and security of all participants;

An accessible city: An integrated and accessible for all transport system.



### General Objective 1: Green City

Decrease of the  
negative impact of  
transport on human  
health and the  
environment

**The first overall goal of SUMP is:**

#### **Reducing the negative impact of transport on human health and the environment**

One of the main problems of the capital is the high levels of harmful emissions and the high levels of noise pollution in the city. One of the reasons for this is road traffic, the large number of old cars, including a large number of diesel cars. At the same time, global emissions of greenhouse gases are steadily increasing and are the main cause of climate change. Continuous exposure to high concentrations of harmful emissions adversely affects the health of people in high traffic areas.

This objective is to support the provision of a healthy and clean environment for citizens and guests of the city to turn Sofia into

a green city. Developing the transport system by 2035 can contribute to improving the air and the environment in the capital by:

- ☐ Stimulating and popularizing pedestrian and bicycle movements;
- ☐ Stimulating the development and use of environmentally friendly public transport (metro, trams, trolley buses, electric cars, railway transport);
- ☐ Stimulating the purchase and use of electric vehicles, accelerated charging infrastructure;
- ☐ Reducing the use of private cars, stimulating shared mobility;
- ☐ Upgrading and enhancing the ecology of the fleet.



**The second overall goal of SUMP is:**

**Increasing the attractiveness of the urban environment and ensuring a better quality of life**

The negative impact of road transport is not limited to the environment alone. Excessive dependence on private cars causes a lot of damage to the urban environment and reduces the attractiveness of the city.

Traffic and congestion, the transformation of key public spaces into car parks, indiscriminate parking, worsen the city's quality of life. Walking traffic enriches the urban environment and enhances the vitality of public spaces.

This objective supports the chosen direction of development of the capital as "City for the People" and helps to make Sofia an appealing city for its residents and visitors. SUMP will contribute to improving the attractiveness of the city by:

- ☐ Link existing and new pedestrian zones and spaces to the central city part into a unified system;
- ☐ Improving pedestrian connectivity in and between residential districts, urban parks and work areas;
- ☐ Renovation of public spaces in Sofia and restriction of parking in public spaces, reduction of noise and visual pollution;
- ☐ Restriction of motor traffic in the central city area at the expense of pedestrian and bicycle traffic; increasing the cost of parking and reducing the time spent by car;
- ☐ Remove parking from key public spaces;
- ☐ To regulate and strengthen the control of parking throughout the city.



**General Objective  
2: Attractive City**

Increase the attractiveness of the urban environment and provide a better quality of life

**The third overall goal of SUMP is:****Introducing transport innovations to strengthen local mobility and economy.**

The perception of Sofia as a good place to live, invest and visit is vital for the local economy. Having an efficient and innovative transport system is a key factor for a city's competitiveness. Sofia is proving to be a regional leader in information technology and a very good place for start-up technology companies. In order to preserve and increase its role, the city must apply the latest developments in urban mobility.

This objective puts the efficient management of the transport system and the introduction of innovative solutions as a priority for the development of urban mobility and helps the development of Sofia as a smart city.

SUMP can contribute to the efficiency of the transport system and its development through:

- ☐ Introducing an integrated charging system with different types of public transport, combined time / distance charging;
- ☐ Applying a systematic approach to optimize the public transport route network;
- ☐ Optimization of the operating modes of traffic lights and improvement of traffic control and management;
- ☐ Supporting the routing of transport flows;
- ☐ Implementation of the Heavy Traffic Control System;
- ☐ Stimulating the entry and use of shared electric vehicle systems;
- ☐ Introduction of systems for shared bicycles and personal electric vehicles (electric bicycles, scooters, etc.).

**The fourth overall goal of SUMP is:**

**Improve the safety and security of all participants.**

- The main causes of traffic accidents are increased traffic, traffic on the street network and inefficient traffic organization. The sense of lack of safety hinders the increase in the share of those who choose to move on foot or by bicycle. Safety is also related to the quality of pedestrian and public spaces, pavement conditions, lighting, etc.
- The fulfillment of this goal will help to increase the confidence and comfort of all participants and will help to make Sofia a safe city. SUMP can contribute to the safety and security of the transport system by:
  - Extending the video surveillance and control system and introducing a road accident management system;
  - Increase of the transport-tranquil zone in the central part of the city and its introduction into the big residential districts;
  - Ensure cycling and separation from car and pedestrian traffic and adopt a bicycle infrastructure design standard reflecting the world's best practices in terms of the convenience and safety of cycling;
  - Introducing Urban Design and Urban Environment for Pedestrians and Cyclists.



**General Objective  
4: A Safe city**

Improve the safety  
and security of all  
participants



**The fifth overall goal of SUMP is:**

**An integrated and accessible for all transport system.**

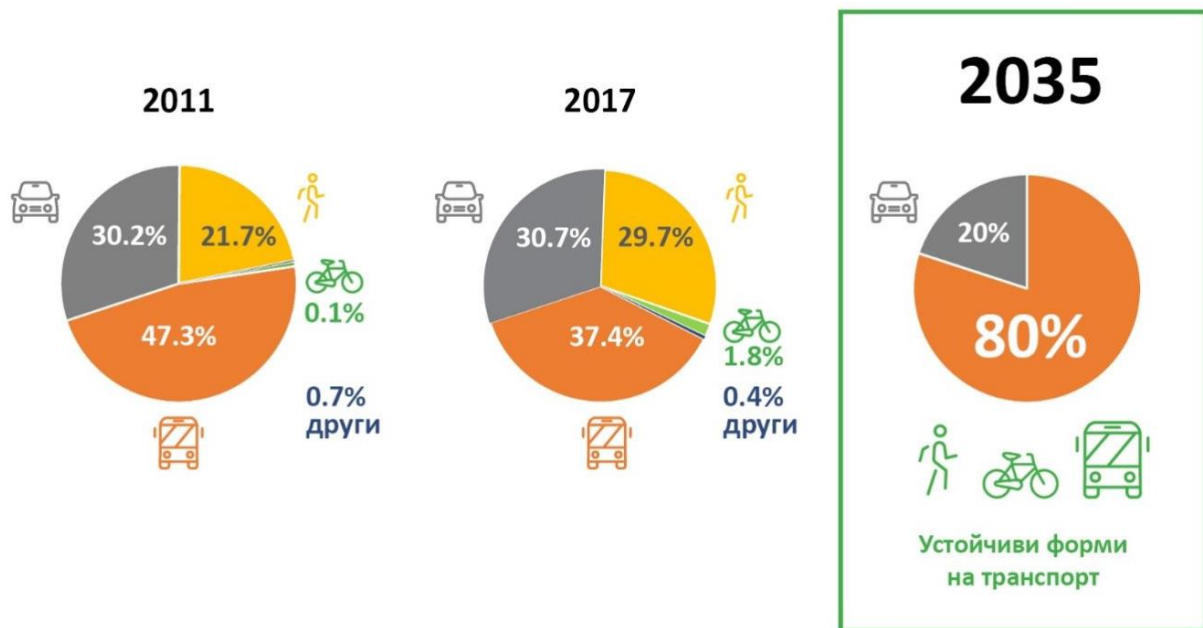
Sofia is an extremely dynamic city, where new areas for living, business, service and recreation are formed. The daily needs of people in mobility are getting bigger due to the increased dynamics of modern life, the need to balance work, leisure, family and the wide variety of social roles and contacts. The city's transport system has to meet the increased mobility needs of people, providing all citizens and guests with short, fast and convenient transport links to all parts of the city and region.

This objective requires the development of a transport system that integrates all possible modes of transport and which can be used by all residents of the city, thus helping to develop Sofia as an accessible city. SUMP can contribute to improving the accessibility and integrity of the city's transport system through:

- ☐ Extension of the territory, serviced by metro and speed trams;
- ☐ Introduction of combined charging of rail and public transport on the territory of Sofia Municipality for suburban and intra-urban transport;
- ☐ Improving intermodality by building new intermodal centers;
- ☐ Construction of new buffer parking lots for cars and bicycles around metro stations and public transport nodes;
- ☐ Development of a comprehensive and connected bicycle network by linking existing and creating new transit, incoming and recreational bicycle lanes and routes.

The set common objectives are complex and concern all aspects of urban mobility. Their implementation will change the way the citizens of the capital move. The main indicator for achieving the common goals is that 80% of all trips in 2035 should be implemented with sustainable forms of transport (walking, cycling, public transport) and only 20% with private cars

**FIGURE 50 SPLIT MODALITY - EXISTING POSITION AND TARGET VALUES**



Legend:

Sustainable forms of transport

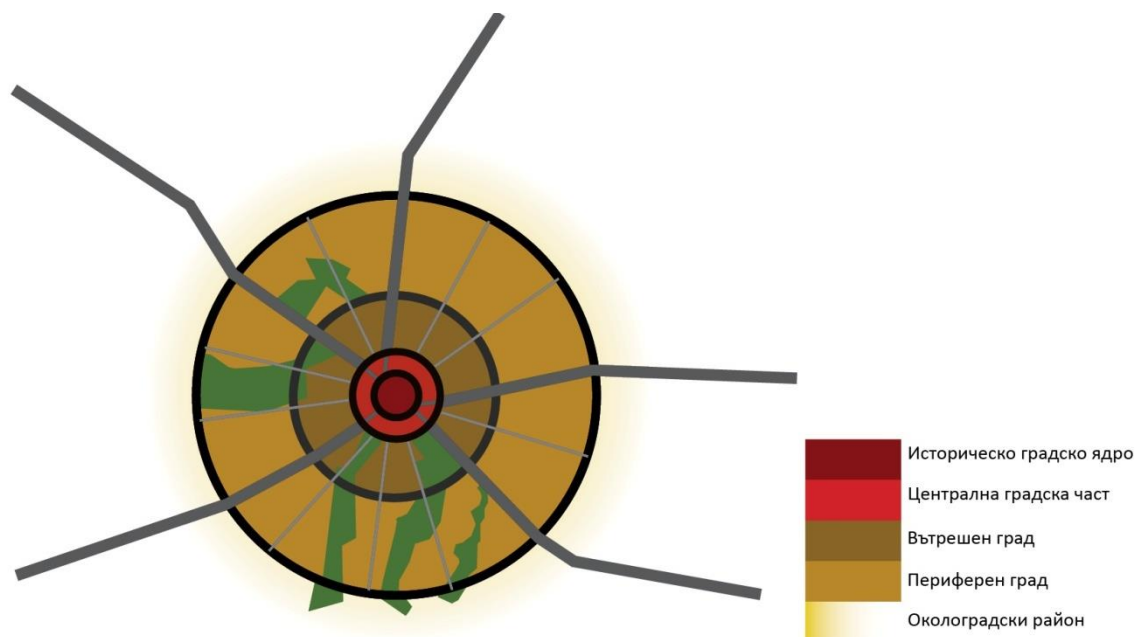
For the fulfillment of the proposed vision and goals, SUMP developed concept, principles and policies for the development of urban mobility of the city of Sofia.



### 3. Concept for development and project proposals 2019 - 2035

The concept of urban mobility development covers all major directions of the transport system of the capital - motorway and street network, parking, logistics, public transport, bicycle and pedestrian traffic. For each of them, a conceptual scheme is presented, illustrating the principles and approaches that apply to each type of movement. Schemes are based on an idealized model of the city's spatial structure.

**FIGURE 51 SPATIAL STRUCTURE OF SOFIA - MODEL**



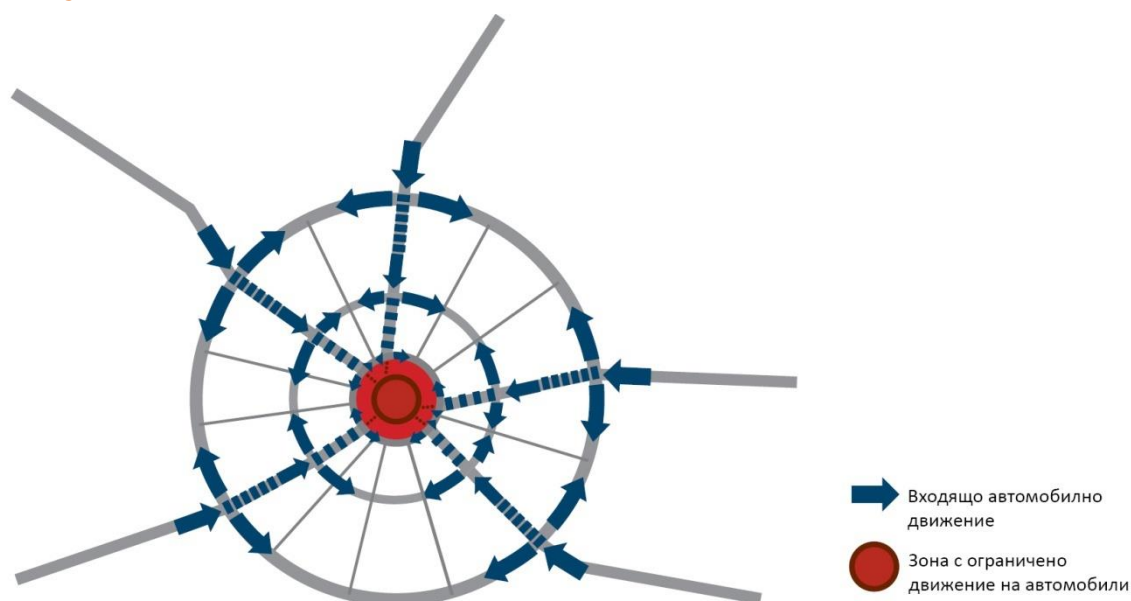
*Legend:*  
*Historic Urban Core*  
*Central city part*  
*Inner city*  
*Peripheral city*  
*Surrounding area*

#### Vehicle traffic and street network

Vehicle transport has brought many benefits to society, providing easy access to work, services and leisure. Its impact on the environment, however, has been shown to be negative. It is one of the main air pollutants in cities. The large number of cars leads to problems with traffic, congestion and deterioration of the urban environment. All successful examples of sustainable urban mobility development include measures to reduce and curb vehicle traffic.

The radial-circular structure of the street network in Sofia is under-built. There are no key elements of the city rings and tangents provided by the GSP. In practice, only the innermost (first urban ring) and partially incomplete project profile - the outermost ring (the ring road) are completely completed. Intermediate rings and tangents are almost entirely absent.

**FIGURE 52 CONCEPT OF SUSTAINABLE URBAN MOBILITY - STREET NETWORK AND ROAD TRAFFIC**



Legend:

Incoming car traffic

A limited-lift area

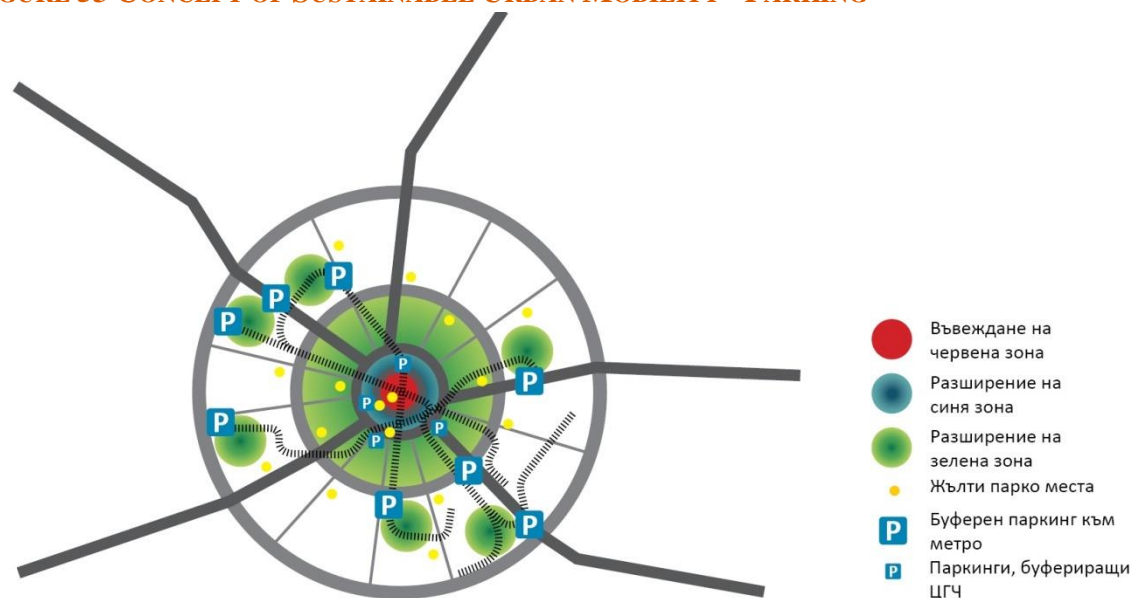
- The concept of sustainable urban mobility is based on the following principles in terms of road traffic:
- Incoming car traffic must be routed as a priority on the rings, with the approach to the center, traffic restrictions must be increased
- In the central part of the city, traffic must be hampered, and in certain parts of the historical core it may be completely limited.
- The transit of cars through the center should become impossible or inefficient in terms of cost / time for passing.
- The concept is achieved by applying the following approaches and measures:
- Accelerated completion and construction of the planned ring roads in the structure of the street network - especially the second and third ring. By implementing the ring and tangential routes provided by the GSP, real alternatives to transit through the city center will be provided.
- The design and construction of the street network and traffic organization should limit incoming traffic and stimulate movement along the rings - by reducing the number / width of car belts by approaching the central city area, priority at the junction junctions, green waves on the rings, etc.
- Limitation of the speed of traffic in the central city area, by increasing the transport-tranquil zone 30 km / h; car breakage through the center with traffic lights, pedestrian crossings, lying policemen and more.

- Elimination of the transit possibilities through the center, initially by impeding the traffic, and then by interruption of the main east-west route (Tsar Osvoboditel Blvd. - Todor Alexandrov Blvd.).
- Increase pedestrian zones and shared traffic areas in the historic city center

Parking in an urban environment is not a right, but a service that occupies a public resource (public space) and must be fairly paid by the person using it. Space in the center of the city is limited and "expensive", respectively parking - also. Life in the city center has many advantages but also some disadvantages, one of which is the high cost of parking.

The cost of parking is an important component of the total cost of using the passenger car and can regulate its use. Cheap parking stimulates the use of private cars. Conversely, the high cost of parking makes the use of the vehicle relatively expensive compared to alternatives such as public transport, bicycles, etc.

**FIGURE 53 CONCEPT OF SUSTAINABLE URBAN MOBILITY - PARKING**



*Legend:*

*Enter a red zone*

*Blue Zone Extension*

*Greener Zone Extension*

*Yellow parking spaces*

*Buffer parking to the subway*

*Parks buffering CUA*

Based on these understandings, SUMP offers the following approaches and measures:

- Increase of paid street parking by expanding the area of paid street parking and the total number of paid parking spaces. Flexible zoning - Difference in employment (over 10%) between subareas is a condition for crossing the sub-area from one zone to another; a difference in employment (over 10%) within the sub-area is a condition for division of the sub-area.
- Introduction of more categories of zones and parking spaces, reflecting the different functionalities and characteristics of individual urban areas, namely:

- ☐ Introducing the Red Zone for parking in the city center with more restrictive conditions than the Blue Zone - higher price and maximum stay up to 1 hour. "Red Zone" covers the most representative part of the city center with the highest concentration of administrative, cultural and public sites.
- ☐ Extending the scope of the Blue Zone to Green Zone sub-areas where higher employment rates are observed.
- ☐ Expanding the scope of the Green Area for parking with neighboring areas and areas where there is an increased pressure from parked cars on the street lane.
- ☐ Addition of local Green Zones for paid parking outside the detached compact Green Zone - in residential complexes and areas with a concentration of business, commercial and public functions.
- ☐ Introduction of "Yellow spots" for paid short-term parking in and outside paid parking areas in the vicinity of health, public, cultural and other buildings and sites where it is necessary to provide parking spaces serving the needs of short-term parking without right of use a vignette sticker and a "Business Subscription". UMC has the capabilities and resources to control these locations, with the use of state-of-the-art technology (CCTV) or by deploying staff in these locations with a significant number of service locations.
- ☐ Increase in daytime pay-per-view parking for certain sub-areas or for specific sites where parking is needed between different users - residents and other road users.
- ☐ Limitation of stay in a central city area and stimulation of short parking.
- ☐ Reduce the density of street parking cars by reducing the number of parking spaces in the individual sub-areas as a result of building bicycle, bicycle and pedestrian parking spaces in creating out-of-door parking facilities, shared cars, convenient and accessible public transport, bicycle use . Staged provision and construction of bicycles within the paid parking areas up to 5 per cent of the total capacity of the respective area.
- ☐ Management of parking prices in the zones depending on their occupancy. Reaching over 85% is considered as an indicator of the need to increase the parking price.
- ☐ Increase prices of vignette stickers in the zones and limit them to 2 pieces of detached residential property in the short term and up to 1 issue in "Red zone".
- ☐ Limit the number of "Business subscription" places in the zones and increase their prices.
- ☐ Construction of underground and above ground parking lots, buffering the central city area. Parallel with the construction of additional parking spaces in the central part of the city is the same number of parking spaces than street parking.
- ☐ Construction of buffer parking lots at metro stations and speed tramways, around the second and third ring and radial arteries. This will indirectly limit the entry of cars into the city center by giving them opportunities to travel with more sustainable modes of transport.
- ☐ Stimulating the construction of multi-storey (underground and aboveground) car parks in residential complexes.
- ☐ Ensure strict and effective control and compliance with the parking rules throughout the city.
- ☐ Rethinking the norms for the necessary number of parking places in the construction of new buildings depending on their location.

## Logistics

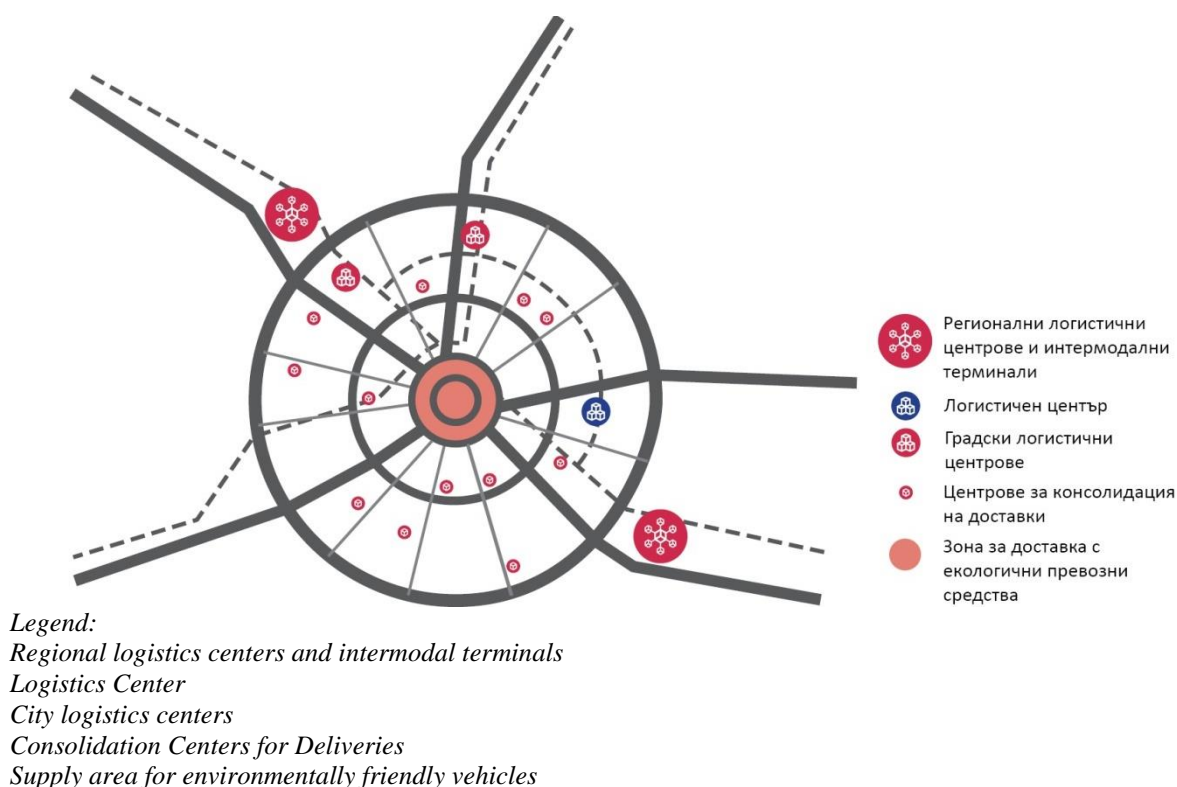
Urban logistics is the process of transporting, storing and delivering goods and goods in the city, which is a major traffic generator and its control and regulation is one of the main tasks of urban and transport planning.

Urban logistics includes a large number of participants and activities - logistics and transport operators, shipping and courier companies, retail chains, various companies, catering and catering services, home delivery and more. Most of the participants in the process are private companies, and the role of the municipality is the regulator who sets the rules and controls their compliance.

Several zones have been formed on the territory of Sofia Municipality with a concentration of logistic and warehouse bases, exchanges and others. - along the railway, along the ring road (especially in the area around Krivina-Kazichene) and in the area around the airport.

At regional level, large storage and logistics centers are being developed in the area of Elin Pelin-Novi Han and in the area of Bozhurishte-Kostinbrod. Although located outside the scope of Sofia Municipality, much of the activities and supplies of these regional centers concern Sofia City.

**FIGURE 54 CONCEPT OF SUSTAINABLE URBAN MOBILITY - LOGISTICS**



The concept of sustainable urban mobility offers the following approaches to regulating urban logistics:

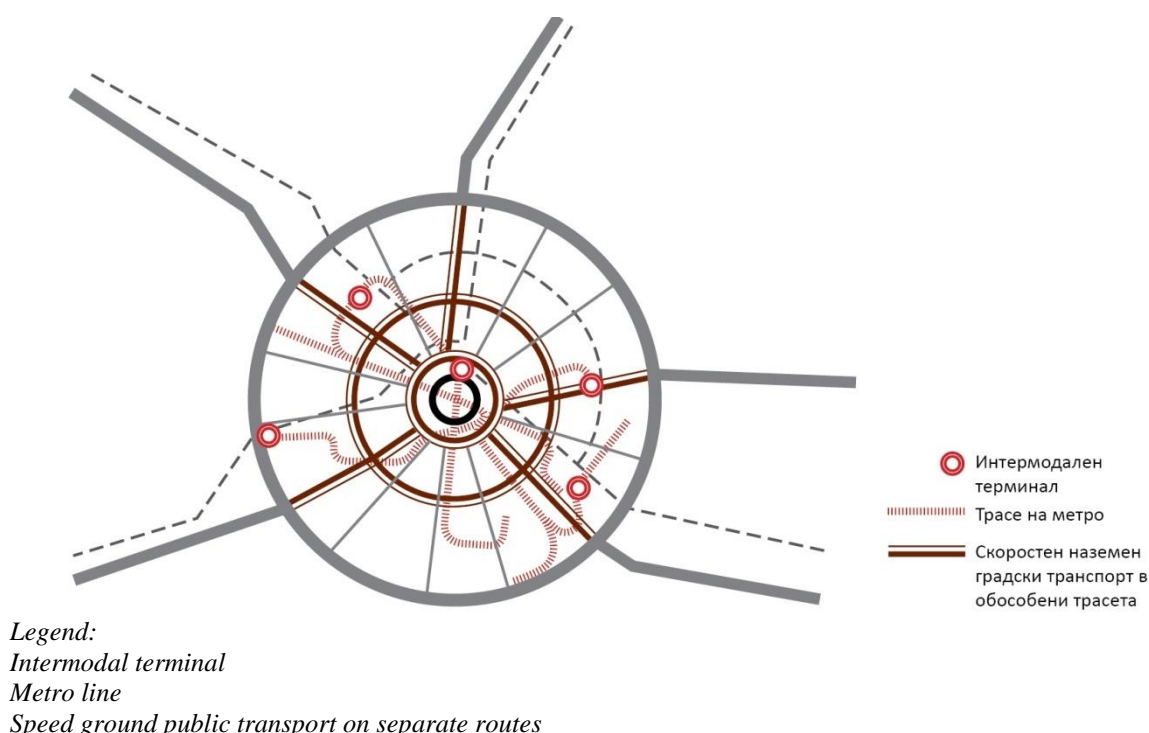
- The introduction of heavy goods transport in the city after the ring road is further limited by the extension of the restrictions beyond those specified in Art. 28 of the Ordinance on organization of traffic on the territory of the Sofia Municipality, the control over the observance of the restrictions being automated and technically secured. With regard to the admission regime, it is envisaged to optimize the process of requesting and issuing passes for heavy goods vehicles. The creation of a register of these traffic participants will allow the integration of these data with the CCTV system to control compliance with these permits. The level of transit heavy traffic is expected to decrease naturally after building the ring road in the future.
- Logistics operations in the city are mainly carried out by light transport with a clear regulation and strictly limited constraints in terms of delivery time, type of vehicle, etc .;
- Changes in the legal framework enabling local authorities and road owners to restrict traffic to the ecological norm;
- The deliveries in the zone "First" of the Ordinance for organization of the traffic on the territory of the Sofia Municipality are carried out mainly with ecological vehicles meeting the requirements of a minimum EURO 4 standard for exhaust gas in the short term and introduction of a low emission zone in the long run. Gradual upgrading of environmental requirements so that supplies in the city center will be carried out mainly with electric cars and mopeds, bicycles, scooters and more.
- Construction of urban logistics centers outside the "First" zone and close to the outer city ring to consolidate supplies to a particular region - only with proven interest from logistics companies and economic benefits.
- Construction of large warehouse and logistics bases, intermodal terminals and others. - only outside the ring ring: in the southeast direction in the area of Kazichene-Novi Han-Elin Pelin and in the northwest direction in the area of Voluyak-Bozhurishte-Kostinbrod. Possible location for construction of intermodal container terminal near Kazichene station.
- Building transport links to divert freight traffic from residential districts - for example, direct connection to the Sofia Airport Area with the Krivina ring road, connection from the Bojurishte industrial zone to the Lyulin ring road.
- Rethinking the role and function of the freight railway network within the city of Sofia.



## Public transport and intermodality

An efficient and accessible public transport network is an important element of the functional and sustainable city. Public transport offers an efficient low-emission way of travel for consumers of all ages and with different levels of income.

**FIGURE 56 CONCEPT OF SUSTAINABLE URBAN MOBILITY - PUBLIC TRANSPORT**



The backbone of public transport is the speed-gleaning rail transport linking large residential and business districts with each other and the city center. The priority development of the metropolitan and high-speed trams on separate routes is conditioned by their high transport capacity, reliability, reliability and independence from traffic.

The railway transport carries out regional, suburban and intra-urban transport, and its interconnection with other public transport is via intermodal terminals.

The other types of ground-based public transport complement and further develop the electric transport system. On the one hand, they perform short-lived correspondence to the rail transport stations in the residential neighborhoods, thus increasing the efficiency of the system. On the other hand, they perform medium and long conversations that can not be met efficiently by metro and trams, especially on the periphery, where the load on passengers is also weaker.

The main disadvantage of ground public transport - its dependence on road traffic - can be significantly eliminated by separating it in separate routes (bus lanes, shared trails, separating with tram stops) and by means of traffic organization (priority at intersections, control for violation, etc.).

All elements of public transport - train, metro, trams, trolleys, buses - should work together as a single system with the ability to easily and quickly move from one mode of transport to another and with a single charging system.

For the adequate planning and management of the system it is necessary to collect constant data, analyzes, forecasts, transport modeling.

The concept of the development of public transport offers the following approaches and measures:

- ☐ Expanding the metro system, serving new territories with a concentration of residential and business functions.
- ☐ Construction of speed ground public transport on separate routes along all main radial and circular / tangential urban arteries.
- ☐ Prioritizing public transport via bus and junctions on radial and tangential city arteries.
- ☐ Update of the route schedules after introduction of new bus lanes and autonomous traffic routes.
- ☐ Ensure strict control over compliance with traffic restrictions in buses and tramways.
- ☐ Introducing a uniform charging system for all public transport on a time and / or distance basis.
- ☐ Creating and maintaining an up-to-date transport model for the needs of urban transport planning and management.
- ☐ Development of intermodal centers and facilitating the crossing of one mode of transport to another and within the public transport network.

## Bicycletraffic

Cycling is one of the most environmentally friendly and healthiest ways of traveling. The development of bicycle transport is directly linked to the existence of a network of connected, safe and convenient bicycle routes.

Connectivity means that individual routes are tied into a unified network so as to allow unhindered connection to all parts of the city.

Safety means bicycle paths that are separated from road traffic and sufficiently wide so that the movement does not pose a threat to cyclists. Safety is also related to the design of junctions and traffic organization, which means that together with the construction of the bicycle, all the existing junctions through which it passes should be redesigned.

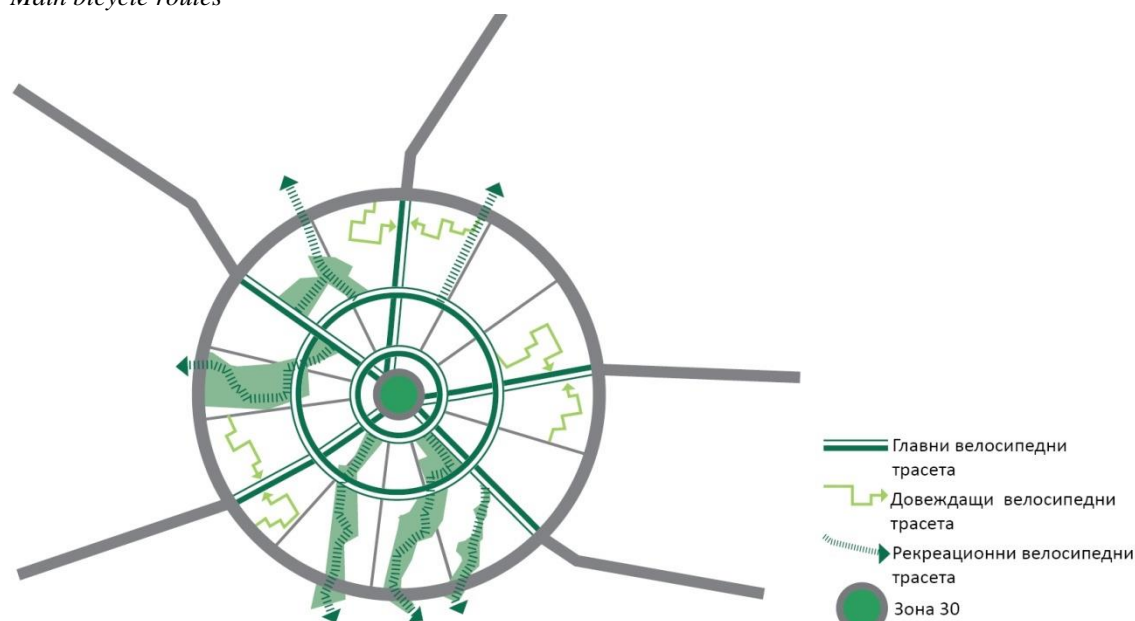
Convenience is related to the application of standards for the design and implementation of bicycle paths in terms of quality of pavements, slopes, markings and other factors that make them enjoyable and comfortable for cyclists. Factors that are related to convenience are still direct route and situation recognizability.

A complete change in attitudes and attitudes towards bicycle transport is needed. He must be seen as an equal participant in the street movement and get his adequate place in street space (along with car and pedestrian traffic).

**FIGURE 56 CONCEPT OF SUSTAINABLE URBAN MOBILITY - BICYCLE MOVEMENT**

*Legend:*

*Main bicycle routes*



*Incoming bicycle routes*

*Recreational bicycle routes*

*Zone 30*

- The concept of developing bicycle transport offers the following approaches:
- Completing a complete connected bicycle network of main, incoming and recreational routes on the territory of the city and the surrounding area.

- The main bicycle routes link the individual residential districts and the city center. They should be as direct as possible, indivisible and allow for higher speeds. The main bicycle routes may not pass through the busiest transport streets of the city but be conducted parallel to them in a more relaxed and safe environment.
- The incoming routes make connections between the different parts of the residential neighborhoods and the local facilities of service and recreation with the main bicycle routes. They are designed at lower travel speeds and can exceptionally be shared with pedestrian or car traffic (collecting and service streets with tranquil traffic).
- The recreation routes are mainly in the big city parks, but also create connections of Sofia with natural sights and settlements in the surrounding area. Apart from sports and recreation, they can also perform transit / delivery functions, in which case they are separated from the park alley (possibly at the periphery of the parks).
- In the center of the city and other areas with narrow streets and quiet traffic (zones 30 km / h), cycling can be conducted in a car-driven way, allowing bicycle movement in the opposite direction of the car movement (so- counterflow).
- To improve the safety and comfort of cycling traffic, changes in urban design and traffic organization in busy streets and junctions are required - geometric clearance of intersections to provide waiting areas, creation of a stop line for cyclists, visibility for cyclists in junctions, adding bicycle paths to pedestrian paths, shaping approaches to crossroads, continuing cycling paths across crossroads, creating crossings islands and more.
- Besides the development of a connected, safe and comfortable bicycle network, additional bicycle infrastructure is necessary - bicycle stands and bicycle parking places in public spaces, administrative, service, cultural and other facilities; bicycle parking at the main public transport stations, bicycle transport options in public transport and more.
- Introducing a system for shared bicycles that can be launched in the central city area and then quickly expand to large residential neighborhoods. The system may also include electric bikes, scooters and other personal electric vehicles - scooters.

- To promote bicycle transport, information campaigns and measures to stimulate cycling traffic, as well as the creation of appropriate legal regulation for the use of other personal electric vehicles such as electric scooters and scooters.

## Pedestrian traffic

Walking on foot is the most natural, eco-friendly and healthy way of traveling. Improving the conditions for pedestrian traffic increases the quality of the urban environment and contributes to the vitality of the city.

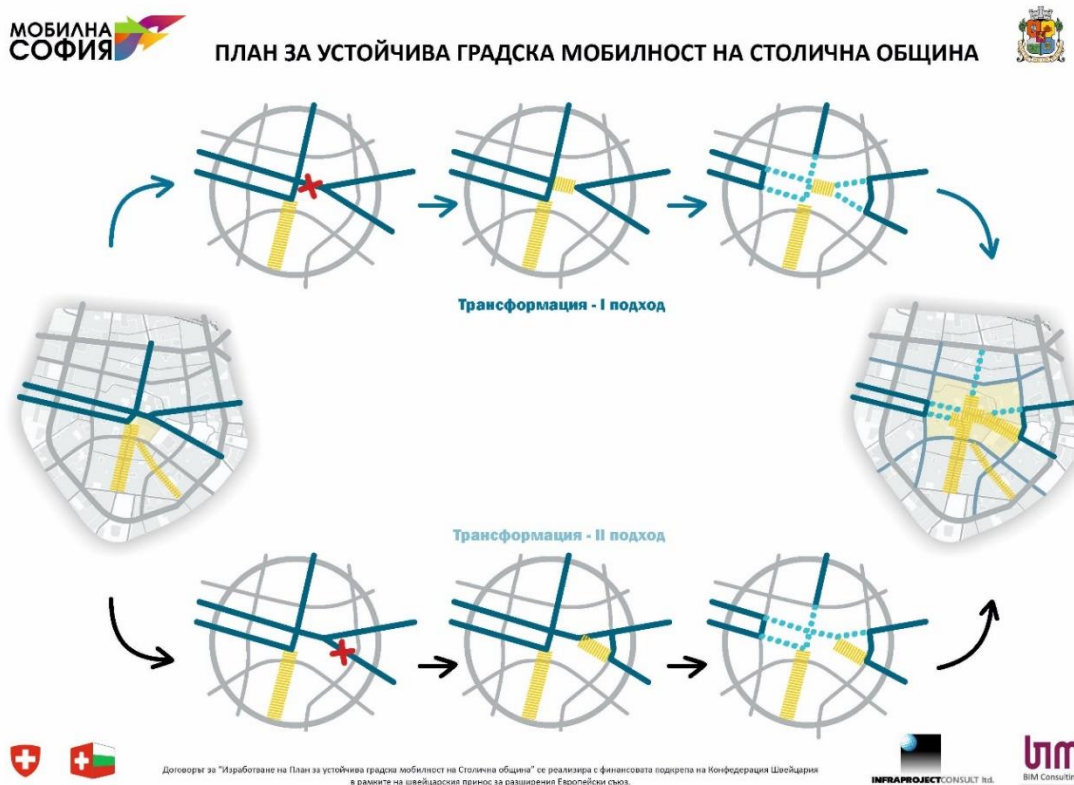
The central city part of Sofia is very suitable for pedestrian traffic - compact, human scale, with high density of habitation, concentration of social functions and social activities, public spaces and green areas, etc. The center of Sofia should be redefined with priority for pedestrians in front of road traffic and parking.

A key condition for the development of pedestrian traffic and the system of public pedestrian spaces in the center of Sofia is the abolition of transit traffic through the city center. Currently, much of the city's traffic passes through the center right east-west and back. There are two approaches to breaking it:

The first approach offers a direct physical disruption of the traffic in the area of Largo in the first stage - access by cars to the very center of the city remains possible but it is impossible to pass through it. Consequently, once traffic and citizens adapt to disrupted traffic, some of the streets are closed in the center of the city or become shared.

The second approach offers a gradual transformation, which begins with the interruption of traffic on Tsar Osvoboditel Blvd., the east-west transit is difficult, but it remains possible. Gradually, some of the streets are closed in the center of the city, or they become shared, with the possibility of transiting the Largo finally being removed.

**BOTH APPROACHES LEAD TO AN END RESULT - THE HEART OF SOFIA BECOMES MOSTLY PEDESTRIAN. FIGURE 57 CONCEPT OF SUSTAINABLE URBAN MOBILITY - PEDESTRIAN TRAFFIC**



**Legend**

*Transformation – first approach*

*Transformation – second approach*

- The concept of pedestrian traffic development offers the following approaches:
- Restriction and interruption of transit traffic through the city center.
- Reduce the speed of traffic in the center of the city by increasing the transport-comfort zone with a speed limit of up to 30 km / h, street transformation (narrowing or curving traffic lanes), lifting pedestrian paths, etc.
- Restrict and remove parking from key public spaces and pedestrian-friendly areas in the city center.
- Create a comprehensive pedestrian network in the central city area by linking existing and creating new pedestrian zones, public spaces and shared streets with pedestrian priority.
- Improve pedestrian connectivity in residential neighborhoods (to schools, kindergartens, public transport stops) and city parks.
- Increasing the safety and comfort of pedestrian traffic by improving the flooring and removing obstacles on the sidewalks, improving the possibilities for safe pedestrian crossing at the street level, measuring and analyzing passenger traffic and taking into account the specificities of individual junctions in decision making buttons for requesting a crossing, as well as reconsidering the locations of those already in place, etc.



- Complete renovation of the urban environment, improvement of street lighting, urban furniture, reduction of visual pollution, implementation of urban standards, the type and quality of pavements, the layout of facades, etc.

## 4. Policies and Measures for Development of Urban Mobility in Sofia

In support of the presented concept of sustainable urban mobility, this plan contains a series of specific policies and measures to be implemented to achieve the plan's objectives.

The main objective of SUMP is to achieve a lasting change in the behavior of travelers and the transition to sustainable forms of transport. All successful models rely on a combination of two basic types of measures - Pull (Encouraging) and Push (Restrictive). On the one hand, it is encouraging and stimulating pedestrian and bicycle traffic, public transport, shared mobility. On the other hand, there are restrictive measures in terms of automotive traffic, parking, logistics, etc.

**FIGURE 58 SUSTAINABLE URBAN MOBILITY POLICIES**



*Legend:*

*Attraction measures - PULL (encouraging)*

*Pedestrian traffic*

*Bicycle traffic*

*Public transport*

*repelling measures - PUSH (limiting)*

*Car traffic*

*Parking*

*Logistics*

*Integrated transport serviced*

*Promotion measures*

*Attractive urban environment*

- **Measures to attract** (“pull”): Incentive measures aimed at attracting and encouraging more people to use sustainable forms of transport such as walking, cycling, public transport, shared mobility.
- **Measures to repel** (“push”): Restrictive measures aimed at reducing the number of people using a private car, restrictions on parking, limiting certain types of freight transport in certain parts of the city, etc.

The plan includes the following specific mobility policies:

- **Support for environmentally friendly vehicles:** the automotive industry quickly introduces electric cars, and it is expected that by 2030 at least a third of all cars sold worldwide will be electric. This requires the availability of infrastructure for charging electric vehicles and incentives for switching to electric cars.
- **Innovation in mobility:** a number of new mobility opportunities such as bicycle and car sharing, mobility as a service, on-demand transport, mobile applications for travel, intelligent transport systems, autonomous vehicles, etc. are rapidly developing.
- **Urban planning, oriented towards public transport:** future construction must be located and designed to have convenient and quick access to public transport, and the use of private cars to be minimal. One of the possible mechanisms is to increase the density and intensity of construction near metro stations and to reduce them by departing from public transport.
- **Logistics:** the transport of goods has a steadily growing share in general traffic and should be organized in an efficient and sustainable way.

The plan includes restrictive and incentive measures and policies summarized in the following table:

**TABLE 3 MAIN MEASURES AND POLICIES**

	Repelling measures /PUSH/	Attraction measures /PULL/
<b>Regulatory economic measures:</b> /	<ul style="list-style-type: none"> <li>▪ <b>Restriction of motor traffic</b> <ul style="list-style-type: none"> <li>▪ Introduction of an environmental component in tax assessment</li> <li>▪ Tax increase for diesel cars after 2025</li> <li>▪ Increasing the territorial coverage of paid parking areas</li> <li>▪ Enter a red parking area in the city center</li> <li>▪ Increase of paid parking price;</li> <li>▪ Reduction of the maximum number of vignette stickers for a separate residential property in the paid parking areas - up to 2 and subsequently up to 1</li> <li>▪ Increase of 30 km / hour in the CUA and residential districts</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>▪ <b>Stimulate public transport</b> <ul style="list-style-type: none"> <li>▪ Introducing an integrated charging system for all public transport</li> <li>▪ Introducing a flexible tariff policy for charging in public transport</li> <li>▪ Obtaining a free public transport ticket when parking in a parking lot</li> </ul> </li> </ul>
<b>Physical Technical measures:</b> /	<ul style="list-style-type: none"> <li>▪ <b>Restriction of motor traffic</b> <ul style="list-style-type: none"> <li>▪ Reducing the number of parking spaces in the paid parking subareas;</li> <li>▪ Restart traffic in CUA</li> <li>▪ Transformation of streets - narrowing the street lane, creating shared streets</li> <li>▪ Increase of pedestrian zones and areas banned for cars</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>▪ <b>Stimulate public transport</b> <ul style="list-style-type: none"> <li>▪ Increase of the separate highways of the public transport;</li> <li>▪ Prioritizing public transport at intersections;</li> <li>▪ Improvement of the rolling stock of public transport;</li> <li>▪ Improvement of public transport stops;</li> <li>▪ Improvement of the travel information system;</li> </ul> </li> <li>▪ <b>Improve cycling infrastructure</b> <ul style="list-style-type: none"> <li>▪ Bicycle tracks and bicycle parking;</li> <li>▪ Construction of bicycle parking in the parking areas;</li> <li>▪ Route signaling and maps;</li> </ul> </li> <li>▪ <b>Improvement of pedestrian infrastructure</b> <ul style="list-style-type: none"> <li>▪ Safe sidewalks and junctions;</li> <li>▪ Increase and link to pedestrian zones;</li> </ul> </li> <li>▪ <b>Stimulating shared mobility</b> <ul style="list-style-type: none"> <li>▪ Stimulating and developing shared car services;</li> <li>▪ Introduction of services for shared bikes;</li> <li>▪ Introduction of services for shared electric bicycles, scooters and other personal electric vehicles</li> </ul> </li> </ul>
<b>Planning and</b>	<b>Urban planning limiting automotive</b>	<b>Urban design, oriented to pedestrians and cyclists</b>

<i>urban design</i>	<p><b>dependence</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Preparation of analyzes and simulations of traffic in the construction of large sites</li> <li><input type="checkbox"/> Reduction of the parameters for construction in the distance from urban transport</li> <li>▪ <input type="checkbox"/> Change of parking regulations</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Acceptance of urban environment standards</li> <li><input type="checkbox"/> Acceptance of a standard for cycling infrastructure design</li> </ul>
<i>Complementary measures</i>	<p><b>Control</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Fines for improper parking, forced displacement</li> <li>▪ <input type="checkbox"/> Control of compliance with traffic rules</li> </ul>	<p><b>Public Awareness</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Information campaign to change citizens' attitudes towards sustainable urban mobility</li> <li><input type="checkbox"/> "Walk to School" Initiative</li> <li><input type="checkbox"/> Creating "School Streets"</li> <li><input type="checkbox"/> Events: Day without cars</li> <li><input type="checkbox"/> Events: Day of cycling</li> <li><input type="checkbox"/> Issue a map of bicycle routes</li> <li>▪ <input type="checkbox"/> Creating a platform / mobile application for cyclists</li> </ul>

## Major projects and initiatives

The Sustainable Urban Mobility Plan offers a range of projects and initiatives that will help deliver the vision and objectives of SUMP to make Sofia a green, attractive, intelligent, safe and affordable city. The projects are unified for specific purposes in each direction - walking, cycling, public transport and intermodality, parking, electromobility, urban logistics and intelligent transport systems. Finally, the most important street finishing projects were identified, without which the concept proposed in this plan would not be implemented.

### 1. Pedestrian traffic

Improving the conditions, comfort and safety of pedestrian traffic is one of the main priorities of the Sustainable Urban Mobility Plan. Walking movement is at the top of the mobility pyramid. It is key to turning Sofia into a green, attractive, safe and affordable city.

#### Specific objective 1.1. Increase pedestrian network in a central city area

Existing pedestrian zones and downtown areas are not well connected and do not function as a network. They need to be expanded and tied so as to allow for a safe hiking in a significant part of the city center.

At present, in the center of Sofia are implemented projects for renovation of public spaces for the so-called Zone 2 and Zone 4 of IURDP. A competition for the future of the space around Sveta Nedelya Square is in the process of being coincided with the "Box of Tolerance" provided in the IURDP area, including the territory of the Sveta Nedelya Church, the Mosque, the Synagogue and the Catholic Church. A re-architectural competition for the so-called Zone 3 - the space around the City Garden, Al. Battenberg, the former palace, the garden around the Russian Church. An architectural competition for a secondary city center was held in the area of the Central Railway Station, which is also an IURDP area.

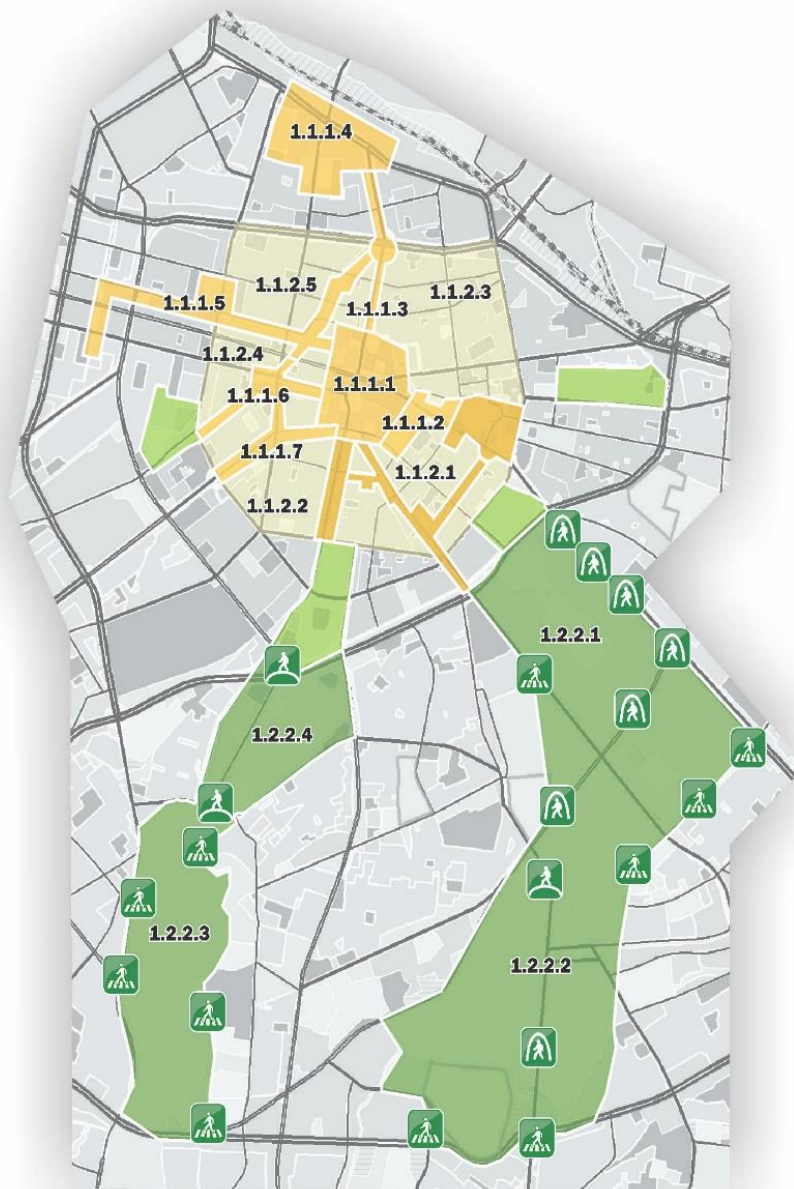
All these landmarks are tied to axes and cores ("generators" of renovation and development) in a public service area of high public importance O1-Center in IURDP.

The realization of the projects will link pedestrian areas and areas in the center of Sofia to a comprehensive and connected network:

- Ul. Saborna - makes connection between the space of "Sveta Nedelya" Square and the City Garden, "Alexander Battenberg Square", the space around the Ivan Vazov National Theater,
- Ul. "Ivan Vazov", Slavyanska Street and Aksakov Street - one of these three streets should be pedestrian or shared so as to make a connection with the Knyazhevo Garden
- Tsar Osvoboditel Blvd. in front of the palace - connection between the City Garden and the palace space, the Russian Church, Moskovska Street, Malko Tarnovo Str., Dondukov Blvd.
- Pedestrian Crossing of the Largo - connection between "Sveta Nedelya" Square and the territory around the TsUM, the central mineral bath, the mosque,
- Part of Maria Luiza Blvd. - connection between the space around the Central Hall and the Central Mineral Bath with the Central Halls, Pirotska Str., Georg Washington Street, West Gate of Serdica, Catholic Church, Synagogue

In this way, all the hallmarks will be housed in the center of Sofia and the ideas for the Tolerance Box - the connection between the temples of the four religions in the center of the capital.





**FIGURE 59 MAJOR PEDESTRIAN TRAFFIC PROJECTS**  
**Пешеходно движение**

**1.1.1. Изграждане, възстановяване и обновяване на публични пространства, пешеходни и споделени улици и създаване на достъпна среда в Централна градска част на гр.София:**

**1.1.1.1.** Зоната около пл.Св.Неделя – територията между ул.Алабин, ул.Княз Борис I, ул.Екзарх Йосиф, ул."Веслец, ул.Малко Търново, пл.Княз Александър I, ул.Княз Александър I

**1.1.1.2.** Зона 3 – Градската градина, градинката около Руската църка, пл. Александър I, пл. Н. Гяуров, бул. Цар Освободител, ул. Георги С. Раковски, ул. Княз Александър I, ул. Ген. Гурко, ул. Дякон Игнатий, ул. Московска

**1.1.1.3.** бул. Мария Луиза от ул. Екзарх Йосиф до бул. Сливница

**1.1.1.4.** Зонаа около Централна гара – бул.Мария Луиза, бул.Сливница, бул.Христо Ботев

**1.1.1.5.** Зоната по ул.Пиротска и прилежащите и територии от ул.Ст.Стамболов до бул.К.Величков, включително градина Св.Никола и пазар Димитър Петков

**1.1.1.6.** бул. Ал. Стамболийски, пл. „Възраждане, ул. Добруджански край, връзка с парк Възраждане

**1.1.1.7.** Бул.Македония, пл.Македония, бул.Христо Ботев, ул.Алабин

**1.1.2. Успокояване на трафика, намаляване на паркирането и трансформация на улици в ЦГЧ на София:**

**1.1.2.1.** Зоната между ул.Граф Игнатиев, ул.Дякон Игнатий, бул.Цар Освободител, бул.Васил Левски

**1.1.2.2.** Зоната между бул.Патриарх Евтимий, бул.Скобелев, бул.Македония, ул.Алабин, ул.Граф Игнатиев

**1.1.2.3.** Зоната между ул.Екзарх Йосиф, ул.Ст.Стамболов, бул.Сливница, бул.В.Левски, бул.Дондуков, ул.Веслец

**1.1.2.4.** Зоната между бул.Т.Александров, бул.Генерал Д.М.Скобелев, бул.Македония,ул.Алабин, ул.Княз Борис I

**1.1.2.5.** Зоната между бул.Т.Александров, бул.Опълченска, бул.Сливница,ул.Ст.Стамболов

**1.2.3. Подобряване на пешеходната достъпност до градските паркове, чрез реконструкция и обновяване на основни подходи и подобряване на възможностите за безопасно и комфортно пешеходно пресичане**

**1.2.2.1.** Парк Борисова градина - етап 1

- по бул.Драган Цанков – оформяне на повдигната пешеходна пътека на входа при ул.Цанко Церковски

- по бул. Цариградско шосе – обновяване на съществуващите подлезни 4 бр.

- по бул.П.Ю. Яворов – обновяване на съществуващите пешеходни и вело подлезни 2 бр.

- по ул.Незабравка - изграждане на повдигнати пешеходни пътеки при входовете – 3 бр.

**1.2.2.2.** Парк Борисова градина - етап 2

- по бул.Симеоновско шосе – изграждане на нов пешеходен/велосипеден подлез, изграждане на нов пешеходен/велосипеден надлез, изграждане на подвижната пешеходна пътека

- Изграждане на нови подходи към парка – от към главния вход на Зоопарка, от към НПЗ Хладилника – Витоша

**1.2.2.3.** Южен парк - етап 1

- Изграждане на подвижнати пешеходни пътеки при основните входовете към Южен парк: по бул. П.Ю.Тодоров, при ул.Козяк, при ул. Х.Ибсен

- Изграждане на нов подход от ул. Димитър Хаджикоцев до Късноантичния мавзолей в район Лозенец

**1.2.2.4.** Южен парк - етап 2

- Изграждане на втора пешеходна/велосипедна връзка между Южен парк I и II част (до ПРОНО)

- Изграждане на надлез на бул. Арсеналски – пешеходна и велосипедна връзка между Южен парк II и III част



*Legend:**Pedestrian traffic**1.1.1. It is not readable*

*1.1.1.1 The zone around Sveta Nedelia square – the territory between Alabin Str. , Kniaz Boris I str. , Ekzarh Josiv str., Veslets str., Malko Tarnovo str., Kniaz Alexander I square, Kniaz Alexander I str.*

*1.1.1.2 Zone 3 – the Urban garden, the garden around the Russian church, Alexander I square, N. Giaurov sq., blvd. Tsar Osoboditel, Sava Rakovski str., Kniaz Alexander I str., Gen. Gurko str., Diakon Ignatii str., Moskovska str*

*1.1.1.3 Maria Luiza blvd. from Exzarh Josiv str. To Slivnitsa blvd.*

*1.1.1.4 The zone around Central station .Maria Luiza blvd. Hristo Botev blvd., Slivnitsa blvd.*

*1.1.1.5 The zone along Pirotska str. And its belonging territories, from St. Stambolov str. to K. Velichkov blvd., including Sveti Nikola garden and Dimitar Petkov Market*

*1.1.1.6 Alexander Stamboliiski blvd., Vazrazhdane square, Dobrudjanski kraj str., connection with park Vazrazhdane.*

*1.1.1.7 Macedonia blvd., Macedonia sq., Hristo Botev blvd., str. Alabin*

*1.1.2 soothing traffic, reducing parking, and transforming streets into CUA of Sofia*

*1.1.2.1 The zone between Graf Ignatiev str., Diakon Ignatii str., Tsar Osoboditel blvd., Vasil Levski blvd.*

*1.1.2.2 The zone between Patriarh Evtimii blvd., Skobelev blvd., Macedonia blvd., Alabin str., Graf Ignatiev str.*

*1.1.2.3 The zone between Exzarh Josiv str., St. Stambolov str., Slivnitsa blvd. Vasil Levski blvd., Dondukov blvd., Veslets str.*

*1.1.2.4 The zone between. Todor Aleksandrov blvd., Gen Skobelev blvd, Macedonia blvd., Alabin str., Kniaz Boris I str.,*

*1.1.2.5 The zone between. Todor Aleksandrov blvd., Opalchenska blvd., Slivnitsa blvd., Stambolov str.*

*1.2.3 Improvement of pedestrian accessibility to urban parks through reconstruction and upgrading of basic approaches and improvement of the possibilities for safe and comfortable pedestrian crossing*

*1.2.2.1 Boris Garden Park - Stage 1*

*Along Dragan Tsankov blvd. - shaping the raised pedestrian walkway at Tsanko Tserkovsky Street*

*- On Tsarigradsko shosse Blvd. - renovation of the existing subways - 4 pieces*

*- On P. Yavorov Blvd. - Renovation of existing pedestrian underpasses and bicycle subways - 2*

*- On Nezabravka Str. - construction of raised pedestrian walkways at the entrances - 3*

*1.2.2.2 Park Borisova Garden - stage 2*

*- On Simeonovsko Shosse Blvd. - Construction of a new pedestrian / bicycle subway, construction of a new pedestrian / bicycle overpass, construction of raised pedestrian path*

*- Building new approaches to the park - from the main entrance of the Zoo, from the HZP Hladilnika - Vitosha*

*1.2.2.3 Juzhen Park- stage 1*

*- Emergence of raised pedestrian walkways at the main entrances to Juzhen Park on P. todorov blvd, Koziak str., Ibsen str.*

*- Building a new approach from Dimitar Hadjikotsev Str., Until the late antique mausoleum in Lozenets district,*

*1.2.2.4 Juzhen Park- stage 2*

*- Construction of a second pedestrian / bicycle connection between Juzhen Park I and II part*

*- Construction of overpass at Arsenalski Blvd., pedestrian / bicycle connection between Juzhen park I and II part*



**Introduction of a system of pedestrian areas, shared streets and areas with a speed limit of 30 km / h in large residential neighborhoods**

**№ 1.1.1**


	<i>Walking spaces</i>	<i>Period</i>
	Zone 2 - Graf Ignatiev Str. With Garibaldi Square, Slaveykov Square, Patriarch Evtimii Square, the "St. Sedmochislenitsi ", Ivan Shishman Str., 6th September Str., " Solunska "Str. - under construction	2020
	Zone 4 - the space around the Temple-monument "St. Al. Nevski ", National Assembly Square, Crystal Garden - under construction	2020
1.1.1.1.	The area around Sveti Nedelya Square / "Tolerance Box" / - the territory between "Alabin" Street, "Knyaz Boris I" Street, "Ekzarh Yosif" Street, Veslets Street, Malko Str. Turnovo Square, Knyaz Alexander I Square, "Knyaz Alexander I"	2025
1.1.1.2.	Zone 3 - The town garden, the garden around the Russian church, Alexander I Square, N. Tsar Osvoboditel Blvd., Georgi S. Rakovski Str., Knyaz Alexander I Str., Gen. Gyaurov str. Gurko ", " Dyakon Ignatiy "Str.," Moskovska "Str.	2025
1.1.1.3.	Maria Luiza Blvd. from "Ekzarh Yosif" Str., near Slivnitsa Blvd. "	2025
1.1.1.4.	The area around the Central Station - Maria Luiza Blvd., Slivnitsa Blvd., Hristo Botev Blvd. "	2025
1.1.1.5.	The area along Pirotska Str. And the adjacent and territories from St.Stambolov Str. To K.Velichkov Blvd., including the St.Nikola Garden and Dimitar Petkov Market";	2035
1.1.1.6.	Al. Stamboliyski "square," Vazrazhdane "square," Dobrudjanski kraj "Str., Connection with park" Vazrajthane "	2035
1.1.1.7.	Macedonia Blvd., Macedonia Square, Hristo Botev Blvd., Alabin Str.	2035

**Total area** 458 thousand square meters

**Indicative value** 94,8 million BGN

Along with the realization of CUA renovation projects, a gradual transformation of streets in the center of Sofia is needed to improve pedestrian accessibility - lifting at intersections, increasing sidewalks, removing or reducing parking spaces, creating shared streets, etc.

These transformations can occur under planned underground infrastructure repairs, in the contact areas of refurbishment areas, and so on.

	<b>Traffic calming, parking reduction and street transformation at the CUA of Sofia</b>	
	<b>№ 1.1.2</b>	
	<i>Zones / Streets</i>	<i>Period</i>
1.1.2.1.	The area between "Graf Ignatiev" Str., "Diakon Ignatij" Str., "Tsar Osvoboditel" Blvd., "Vasil Levski" Blvd.,	2025
1.1.2.2.	The area between Patriarh Evtimii Blvd., Skobelev Blvd., Macedonia Blvd., Alabin Str., Graf Ignatiev Str.	2025
1.1.2.3.	The area between "Ekzarh Yosif" Str., St.Stambolov Str., Slivnitsa Blvd., "V.Levski" Blvd., Dondukov Blvd., Veslets Str.	2025
1.1.2.4.	The zone between T. Aleksandrov Blvd., General D. Skobelev Blvd., Macedonia Blvd., Alabin Str., Knyaz Boris I Str.	2035
1.1.2.5.	The zone between T. Aleksandrov Blvd, Opalchenska Blvd., Slivnitsa Blvd., St.Stambolov Str.	2035
		<p><b>Total area</b> 263 thousand square. km</p> <p><b>Indicative value</b> 22,9 million BGN</p>

**Specific objective 1.2. Improving pedestrian connectivity in and between residential neighborhoods, urban parks and work areas**

Walking areas and spaces should not be restricted to the center of the city - large residential neighborhoods also have to develop their pedestrian networks, locally binding the most important sites for service, work and recreation. The digitization and analysis of the Vision for Sofia pedestrian network is a very good basis on which further detailed analyzes can be carried out locally to identify priorities for renovation and development of the pedestrian infrastructure of individual neighborhoods.



**Introduction of a system of pedestrian areas, shared streets and areas with a speed limit of up to 30 km / h in large residential neighborhoods**


**№ 1.2.1**

		<i>Period</i>
1.2.1.1.	Conduct 8 pilot studies "Public spaces and public life" in large residential neighborhoods to identify and implement a system of pedestrian spaces, shared streets and areas with a speed limit of 30 km / h	2020
1.2.2.2.	Reconstruction of pedestrian and public spaces, street network and creation of an accessible environment in Lyulin district	2025
1.2.2.3.	Reconstruction of pedestrian and public spaces, street network and creation of accessible environment in Mladost	2025
1.2.2.4.	Reconstruction of pedestrian and public spaces, street network and creation of accessible environment in Druzhba district	2035
1.2.2.5.	Reconstruction of pedestrian and public spaces, street network and creation of accessible environment in Ovcha Kupel	2025
1.2.2.6.	Reconstruction of pedestrian and public spaces, street network and creation of accessible environment in Nadezhda district	2035
1.2.2.7.	Reconstruction of pedestrian and public spaces, street network and creation of accessible environment in Obelya quarter	2035
1.2.2.8.	Reconstruction of pedestrian and public spaces, street network and creation of accessible environment in Hadji Dimitar quarter	2035
1.2.2.9.	Reconstruction of pedestrian and public spaces, street network and creation of accessible environment in Studentski grad	2025

**Total area 990 thousand square meters**

**Indicative value 83,4million BGN**

Improving pedestrian accessibility to city parks will be accomplished through the reconstruction and upgrading of basic approaches and improvement of the possibilities for safe and comfortable pedestrian crossing.

	<b>Improving pedestrian accessibility to city parks</b>	
	<b>№ 1.2.2</b>	
	<i>Park</i>	<i>Period</i>
1.2.2.1.	<ul style="list-style-type: none"> <li>• Borisova Garden Park - Stage 1</li> <li>- on "Dragan Tsankov" Blvd. - shaping of the raised pedestrian walkway at the entrance of "Tsanko Tserkovski"</li> <li>- on "Tsarigradsko Shosse" Blvd. - renovation of the existing subways 4 pcs.</li> <li>- on "YYYavorov" Blvd. - renovation of the existing pedestrian and bicycle subways 2 pcs.</li> <li>- on "Nezabravka" Str. - construction of raised walkways at the entrances - 3 pcs.</li> </ul>	2025
1.2.2.2.	<ul style="list-style-type: none"> <li>• Borisova Garden Park - Stage 2</li> <li>- on "Simeonovsko Shose" Blvd. - construction of a new pedestrian / bicycle subway, construction of a new pedestrian / bicycle overpass, construction of the subsurface pedestrian walkway</li> <li>- Building new approaches to the park - from the main entrance of the Zoo, from the "Hladilnika - Vitosha" NPP"</li> </ul>	2025
1.2.2.3.	<ul style="list-style-type: none"> <li>• South Park - Stage 1</li> <li>- Construction of pedestrianized footpaths at the main entrances to the South Park: on P.J.Todorov Blvd., near "Kozyak" Street, near "Hissen" Str.</li> <li>- Building a new approach from "Dimitar Hadjikitsev" Str. To the Late-Ancient Mausoleum in Lozenets region</li> </ul>	2025
1.2.2.4.	<ul style="list-style-type: none"> <li>• South Park - Stage 2</li> <li>- Construction of a second pedestrian / bicycle link between South Park I and Part II (up to the UNDP)</li> <li>- Construction of overpass on Arsenalski Blvd. - pedestrian and bicycle connection between South Park II and III part</li> </ul>	2035
	<i>Indicative value</i>	5,8 million BGN

### Specific objective 1.3. Improve the safety and comfort of pedestrian traffic

Safety is one of the key aspects of urban mobility. It is particularly important for pedestrian traffic, as pedestrians are the most vulnerable group in traffic. The creation of comfortable and secure streets and urban spaces is of the utmost importance for stimulating pedestrian traffic in the city. The change in priorities includes giving priority to pedestrian traffic in front of the car in the central city area.

- Increase of the transport-tranquil zone with a speed limit of up to 30 km / h in the whole central city part and the introduction of such zones in residential complexes.
- Transformation of streets - reduction of traffic lanes, construction of bicycle paths and increase of the sidewalks, restriction of parking in the corners of the junctions.
- Improvement of the possibilities for safe pedestrian crossing at the level of the streets, raising of the pedestrian paths where possible - construction of intermediate streets in the middle of the wide streets for safe crossing.
- Improvement of the pavement and maintenance of the streets and sidewalks, removal of obstacles to pedestrian traffic - parked cars, pins, pots, pillars, garbage cans, etc.
- Improvement of street lighting in pedestrian zones and public spaces

### Specific objective 1.4. Improving the quality of the urban environment

This specific objective focuses on the quality of the urban environment and is directly related to the quality of life in the city as a whole. High-quality cities give priority to pedestrian traffic as it enriches city life and enhances the quality of urban spaces. This objective implies the development of a tied network of public spaces with its own identity and human scale, allowing for meetings and outdoor activities, for diverse experiences and social contacts. Full renovation of public spaces in Sofia (flooring, lighting, urban furnishings), removal of parking in public spaces, reduction of noise and visual pollution (from advertisements, signs, etc.)

- Elaboration and adoption of guidelines / standards for the design of public spaces - pavements, urban furnishings, lighting, etc.
- Restrict advertising in the central city area and clear the city center from illegal advertising elements, signs and more.

### Specific objective 1.5. Promoting and stimulating pedestrian traffic

- The promotion of ecological mobility methods can be achieved through the use of permanent communication tools that, in addition to raising awareness, are also provoking interest in their use. Carrying out a broad campaign to promote the measures and benefits of using environmentally friendly and sustainable transport methods is also considered as one of the main tools for the promotion of SUMP after its preparation and approval. At the same time, such a campaign will prepare and inform the public about SUMP's proposals in promoting environmentally-friendly mobility.
- Annually marking the European Mobility Week as part of Sofia's Urban Mobility Policy.
- Periodic closure of parts of the city center for car traffic - for various events, outdoor festivals, etc. Gradually increasing the range of enclosed parts.
- Organize "Walk-and-Bike-to-School Day" events. Carry out campaigns to stimulate pedestrian and bicycle traffic
- Continue on a Walk to School initiative to stimulate walking to school by creating an accessible and safe pedestrian-friendly environment around schools, improving access to public transport stops, basic approaches to schools, and so on.



## 2. Bicycle traffic

Cycling is crucial to achieving the vision and goals of SUMP. Along with pedestrian traffic, it is environmentally friendly, healthy and helps the city's vitality. The development of cycling is largely determined by providing a network of convenient, safe and interconnected routes.

The existing cycle paths and routes in Sofia are not well-bound. They need to be linked and integrated into a network to allow for comfortable and safe cycling throughout the city.

Proposals for the completion and development of the system of bicycles of any kind are proposed:

### Specific objective 2.1. Completion and construction of the main bicycle network on the territory of Sofia

**The main bicycle routes provide fast connections** between individual residential districts and the city center. They should be as direct as possible, indivisible and allow for higher speeds. The main bicycle routes may not pass through the busiest transport streets of the city but be conducted parallel to them in a more relaxed and safe environment. The main cycle paths can not be walked on the sidewalks and can not be shared with pedestrian traffic.

### Specific objective 2.2. Finishing and building an incoming bicycle network

**Bringing bicycle routes link** the main sites of service, work and recreation to the residential neighborhoods and bring them to the main bicycles.

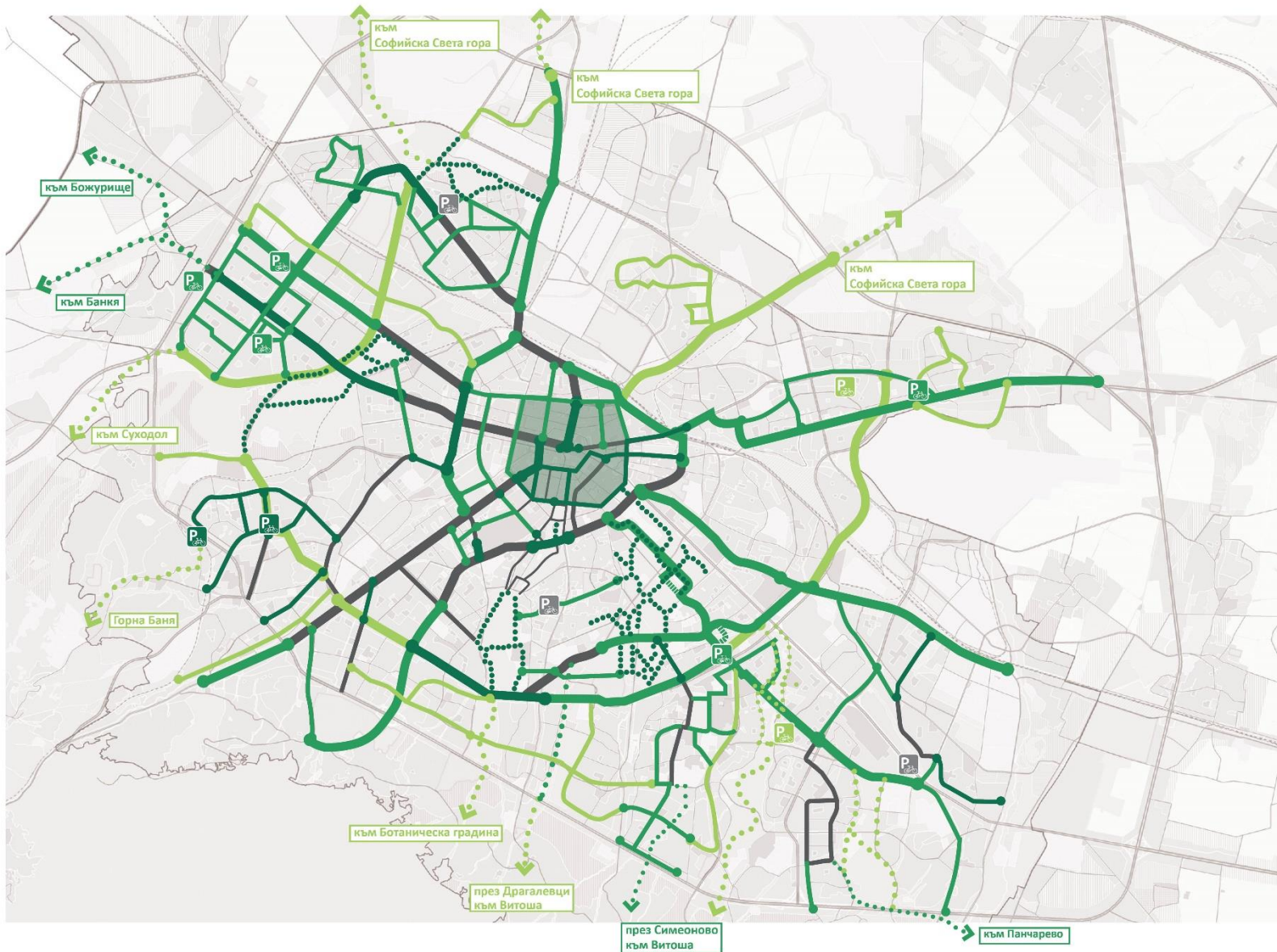
They are designed at lower speeds and can exceptionally be shared with pedestrian traffic. . In the center of the city and in other areas with narrow streets and quiet traffic (30 km / h), the incoming trails can be shared by car traffic, allowing a bicycle to move in the opposite direction of the traffic).

### Specific objective 2.3. Finishing and building the recreational bicycle network on the territory of the city and surrounding area

**Recreational bicycle routes and itineraries** form a specific network in urban parks and the surrounding area. Bicycle routes for sports, recreation and hiking can be any park lane and can be shared with pedestrians. A bicycle path is a space for cyclists and, if possible, only passes to the periphery of the parks. If, exceptionally, a bicycle route crosses a park, it must be separated from the pedestrian traffic and clearly marked.

FIGURE 60 MAP OF THE MAIN PROJECTS IN THE "BICYCLE TRAFFIC"

ВЕЛОСИПЕДНО ДВИЖЕНИЕ



- Вело паркинг към метро станция - съществуващ
- Bicycle parking to the subway station - existing
- Bicycle parking to a subway station - a project
- Stage 1: 2019-2020
- Stage 2: 2021-2025
- Stage 3: 2026-2035
- Existing bicycle lanes
- Main bicycle network
- Incoming Bicycle Network
- Recreational cycling network
- Zone 30



## Completion of the **main bicycle network** on the territory of Sofia

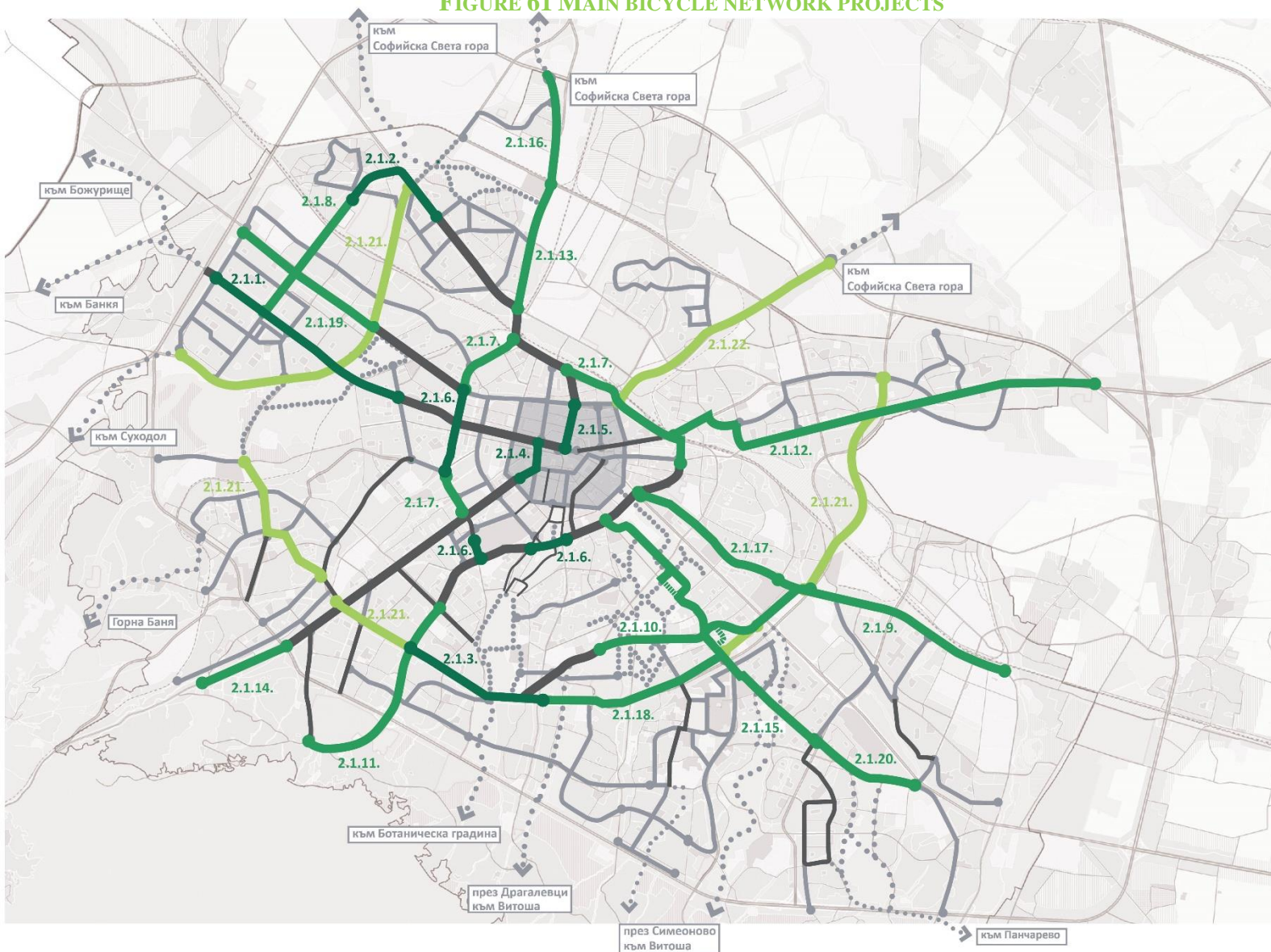
**№ 2.1**

	<i>Bicycle routes</i>	<i>km</i>	<i>Period</i>
2.1.1.	Connection of Todor Alexandrov Blvd., Vardar Blvd., Zapaden Park, Tsaritsa Yoana Blvd. to the intersection with "Pancho Vladigerov" Blvd.,	3,4	2020
2.1.2.	Continuation of the Velodrata from Beli Dunav Street on Lomsko Shosse Blvd and Obelsko Shose Blvd. / Pancho Vladigerov Blvd. Obella with CUA	1,8	2020
2.1.3.	Study and construction of bicycle routes on the third urban ring: on "Todor Kableshkov" Blvd. from "Bulgaria" BouLEVARD to Cherni Vruh Blvd.	2,6	2020
2.1.4.	Continuation of the cycle path from "Ruski pametnik" square to "Macedonia" square and exploration of the possibility to continue to "Vazrazhdane"	1,0	2020
2.1.5.	Construction of a bicycle path on "Knyaginya Maria Liusa" Blvd. from Slivnitsa Blvd. to Todor Alexandrov Blvd.	0,8	2020
2.1.6.	Exploration and construction of bicycle routes on the second city ring - I stage you	5,0	2020
2.1.7.	Study and construction of bicycle routes on the second ring of the city - II stage	3,0	2025
2.1.8.	Build a bicycle connection between the bc. Lyulin, ж.к. Modern suburb, hc. Obelya on "Pancho Vladigerov" Blvd.	3,8	2025
2.1.9.	Construction of a bicycle train along Shipchenski Prohod Blvd., Assen Yordanov Blvd., Iskarsko shose Blvd.	3,7	2025
2.1.10.	Construction of a bicycle along the route of the old railway line Slatina - Pioneer Station - Hladilnika	5,5	2025
2.1.11.	Construction of a bicycle along Bulgaria BouLEVARD from "Gotse Delchev" Blvd. to "Daskal Stoyan Poppanreev" Str.	3,4	2025
2.1.12.	Construction of a bicycle train from Chavdar Bridge to the crossing of Botevgradsko Shosse Blvd. and Letostruj Str. And Velotrassa on Botevgradsko shose Blvd. from Letostrue Street to SOP	8,9	2025
2.1.13.	Construction of a bicycle ride on Rojen Blvd. from overpass "Nadezhda" to bazaar Iliyantsi	2,2	2025
2.1.14.	Construction of a bicycle on "Tsar Boris III" bouLEVARD from "Nikola Petkov" Blvd. to Shipka stop	1,2	2025
2.1.15.	Study and construction of a route from Young to CUA	7,2	2025
2.1.16.	Construction of a bicycle ride on Rozhen Blvd from overpass over the railway line to the FST	2,0	2025
2.1.17.	Exploration and construction of a bicycle tram along "Tsar Ivan Asen II" Str. And "Shipchenski Prohod" Blvd. to "Ivan Dimitrov - Kuklata" Str.	3,1	2025
2.1.18.	Study and construction of bicycle routes on the third urban ring: on "Todor Kableshkov" Blvd. from "Cherni Vrah" Blvd. to "Simeonovsko shose" Blvd.	1,8	2025

2.1.19.	Exploration and construction of a bicycle along Slivnitsa blvd. Peter Dertliev "to" Dobrinova skala "	3,0	2025
2.1.20.	Exploration and construction of a bicycle train from Youtube on the future Copenhagen BouLEVArD	4,0	2035
2.1.21.	Study and construction of bicycle routes on the third urban ring (Todor Kableshkov Blvd., GM Dimitrov Blvd., Assen Yordanov Blvd., continuation of future Eastern and Western tangents)	19,5	2035
2.1.22.	Construction of a bicycle tram along "Kamenodelska" Str., Malashevskа Street and "Jacques Duklo" Str., "Chepinsko shose"	5,3	2035
<p><b>Total length</b> 92,2 km</p> <p><b>Indicative value</b> 40,6 million BGN</p>			



FIGURE 61 MAIN BICYCLE NETWORK PROJECTS



## 2. ВЕЛОСИПЕДНО ДВИЖЕНИЕ

### 2.1. ДОВЪРШВАНЕ И ИЗГРАЖДАНЕ НА ГЛАВНАТА ВЕЛОСИПЕДНА МРЕЖА НА ТЕРИТОРИЯТА НА ГРАД СОФИЯ

#### Етап 1: 2019 - 2020

- 2.1.1. Изграждане на връзка бул. „Тодор Александров“ – бул. „Вардар“ – Западен парк – бул. „Царица Йоана“ до пресичането ѝ с бул. „Панчо Владигеров“
- 2.1.2. Продължаване на велотрасе от ул. „Бели Дунав“ по бул. „Ломско шосе“ и бул. „Обелско шосе“ / бул. „Панчо Владигеров“ за свързване на ж.к. Обеля с ЦГЧ
- 2.1.3. Проучване и изграждане на велосипедни трасета по трети градски ринг: по бул. „Тодор Каблешков“ от бул. „България“ до бул. „Черни връх“
- 2.1.4. Продължаване на велоалеята от площад „Руски паметник“ до площад „Македония“ и изследване на възможността за продължаване до площад „Възраждане“
- 2.1.5. Изграждане на велоалея по бул. „Княгиня Мария Луиза“ от бул. „Сливница“ до бул. „Тодор Александров“
- 2.1.6. Проучване и изграждане на велосипедни трасета по втори градски ринг - I ви етап

#### Етап 2: 2021 - 2025

- 2.1.7. Проучване и изграждане на велосипедни трасета по втори градски ринг - II ви етап
- 2.1.8. Изграждане на велосипедна връзка между ж.к. Люлин, ж.к. Модерно предградие, ж.к. Обеля по бул. „Панчо Владигеров“
- 2.1.9. Изграждане на велотрасе по бул. „Шипченски проход“, бул. „Асен Йорданов“, бул. „Искърско шосе“
- 2.1.10. Изграждане на велоалея по трасето на старата железопътна линия Слатина – Гара ПIONEER – Хладилница
- 2.1.11. Изграждане на велотрасе по бул. „България“ от бул. „Гоце Делчев“ до ул. „Даскал Стоян Попандреев“
- 2.1.12. Изграждане на велотрасе от моста Чавдар до кръстовището на бул. „Ботевградско шосе“ до ул. „Летоструй“ и велотрасе по бул. „Ботевградско шосе“ от ул. „Летоструй“ до СОП
- 2.1.13. Изграждане на велотрасе по бул. „Рожен“ от надлез „Надежда“ до базар Илиянци
- 2.1.14. Изграждане на велотрасе по бул. „Цар Борис III“ от бул. „Никола Петков“ до спирка Шипка
- 2.1.15. Проучване и изграждане на трасе от ж.к. Младост до ЦГЧ
- 2.1.16. Изграждане на велотрасе по бул. „Рожен“ от надлез над жп линията до ССТ
- 2.1.17. Проучване и изграждане на велотрасе по ул. „Цар Иван Асен II“ и бул. „Шипченски проход“ до ул. „Иван Димитров - Куклата“
- 2.1.18. Проучване и изграждане на велосипедни трасета по трети градски ринг по бул. „Тодор Каблешков“ от бул. „Черни връх“ до бул. „Симеоновско шосе“
- 2.1.19. Проучване и изграждане на велотрасе по бул. „Сливница“ от бул. „док. Петър Дертлиев“ до „Добринова скала“
- 2.1.20. Проучване и изграждане на велотрасе от ж.к. Младост по бъдещия булевард „Копенхаген“

#### Етап 3: 2026 - 2035

- 2.1.21. Проучване и изграждане на велосипедни трасета по трети градски ринг (бул. „Тодор Каблешков“, бул. „Г. М. Димитров“, бул. „Асен Йорданов“, продължение по бъдещи Източна и Западна тангенти)
- 2.1.22. Изграждане на велотрасе по ул. „Каменоделска“, ул. „Малашевска“ и ул. „Жак Дюкло“, ул. „Чепинско шосе“

Етап 1: 2019-2020

Етап 2: 2021-2025

Етап 3: 2026-2035

Съществуващи велоалеи

Главна велосипедна мрежа

Довеждаща велосипедна мрежа

Рекреационна велосипедна мрежа

**Legend:**

## 2. Bicycle traffic

## 2.1 Completion and construction of the main bicycle network on the territory of Sofia

## Stage 1:2019-2020

2.1.1.	Connection of Todor Alexandrov Blvd., Vardar Blvd., Zapaden Park, Tsaritsa Yoana Blvd. to the intersection with "Pancho Vladigerov" Blvd.,
2.1.2.	Continuation of the bicycle route from Beli Dunav Street on Lomsko Shosse Blvd and Obelsko Shose Blvd. / Pancho Vladigerov Blvd. Obella with CUA
2.1.3.	Study and construction of bicycle routes on the third urban ring: on "Todor Kableshkov" Blvd. from "Bulgaria" Boulevard to Cherni Vruh Blvd.
2.1.4.	Continuation of the bicycle lane from "Ruski pametnik" square to "Macedonia" square and exploration of the possibility to continue to "Vazrazhdane"
2.1.5.	Construction of a bicycle lane on "Knyaginya Maria Liusa" Blvd. from Slivnitsa Blvd. to Todor Alexandrov Blvd.
2.1.6.	Exploration and construction of bicycle routes on the second city ring - I stage

## Stage 2:2021-2025

2.1.7.	Study and construction of bicycle routes on the second ring of the city - II stage
2.1.8.	Build a bicycle connection between the r.c. Lyulin, r.c. Moderno predgradie, hr.c. Obelya on "Pancho Vladigerov" Blvd.
2.1.9.	Construction of a bicycle route along Shipchenski Prohod Blvd., Assen Yordanov Blvd., Iskarsko shose Blvd.
2.1.10.	Construction of a bicycle along the route of the old railway line Slatina - Pioneer Station - Hladilnika
2.1.11.	Construction of a bicycle along Bulgaria Boulevard from "Gotse Delchev" Blvd. to "Daskal Stoyan Poppanreev" Str.
2.1.12.	Construction of a bicycle route from the Chavdar Bridge to the crossing of Botevgradsko shosse Blvd. and Letostruy Str. And Velodrasse on Botevgradsko Shose Blvd. from Letostrue Street to SRR
2.1.13.	Construction of a bicycle route on Rojen Blvd. from overpass "Nadezhda" to bazaar Iliyantsi
2.1.14.	Construction of a bicycle route on "Tsar Boris III" boulevard from "Nikola Petkov" Blvd. to Shipka stop
2.1.15.	Study and construction of a route from r.c. Mladost to CUA
2.1.16.	Construction of a bicycle route along Rozhen Blvd from overpass over the railway line to NST
2.1.17.	Exploration and construction of a bicycle route along "Tsar Ivan Asen II" Str. And "Shipchenski Prohod" Blvd. to "Ivan Dimitrov - Kuklata" Str.
2.1.18.	Study and construction of bicycle routes on the third urban ring: on "Todor Kableshkov" Blvd. from "Cherni Vrah" Blvd. to "Simeonovsko shose" Blvd.
2.1.19.	Exploration and construction of a bicycle route along Slivnitsa blvd. Peter Dertliev "to" Dobrinova skala"
2.1.20.	Exploration and construction of a bicycle route from r.c.Mladost on the future Copenhagen Boulevard



## Stage 3:2026-2035

2.1.21.	Study and construction of bicycle routes on the third urban ring (Todor Kableshev Blvd., GM Dimitrov Blvd., Assen Yordanov Blvd., continuation of future Eastern and Western tangents)
2.1.22.	Construction of a bicycle route along "Kamenodelska" Str., Malashevsk Street and "Jacques Duklo" Str., "Chepinsko shose"

## Stage 1:2019-2020

## Stage 2:2021-2025

## Stage 3:2026-2035

Existing bicycle lanes

Main bicycle network

Incoming Bicycle Network

Recreational cycling network



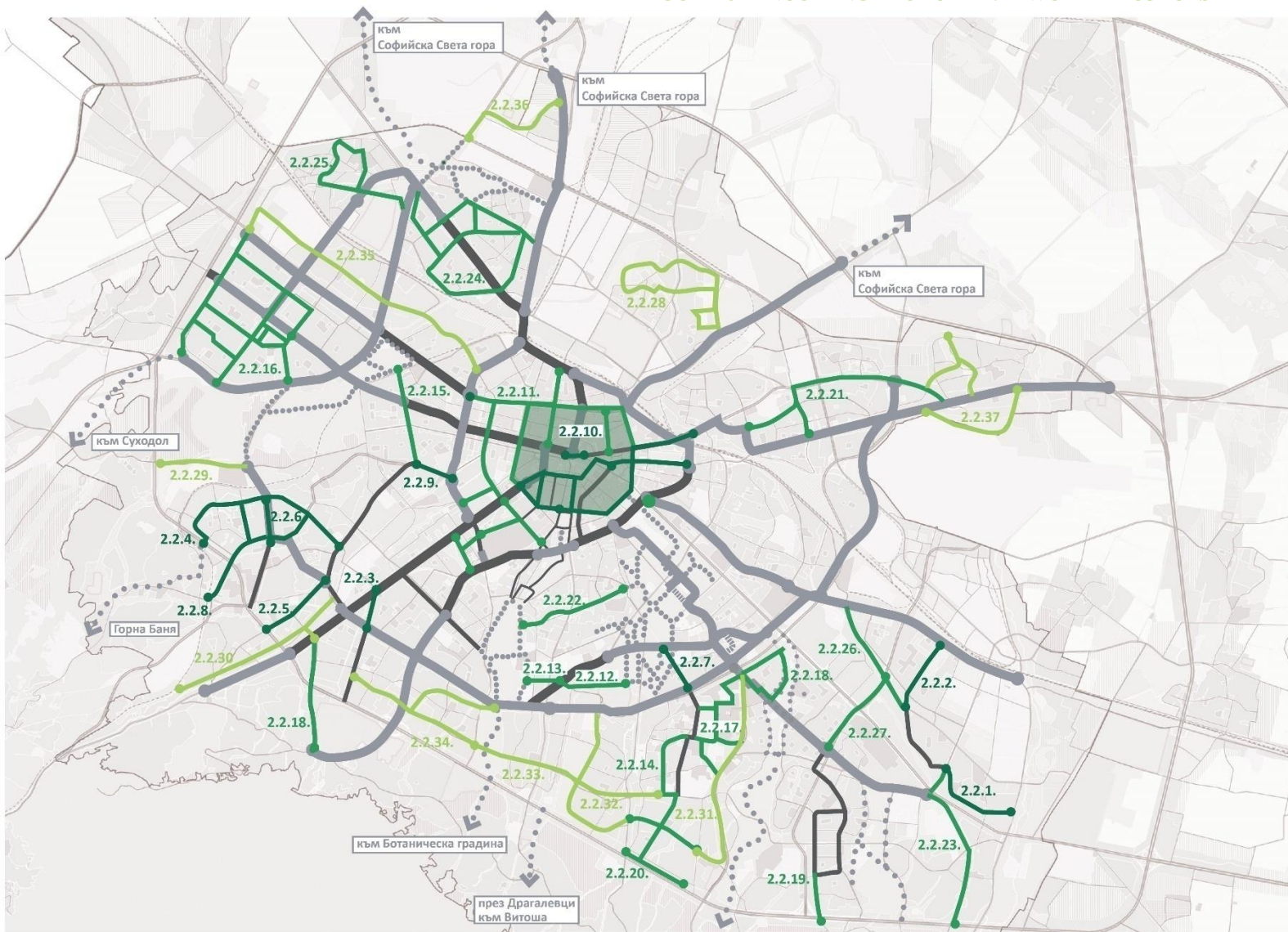
## Completion and construction of **incoming bicycle network** in residential neighborhoods

**№ 2.2**

	<i>Bicycle routes</i>	<i>км</i>	<i>Period</i>
2.2.1.	Construction of a bicycle train in Drujba: on Obikolna Str. Druzhba 2	1,1	2020
2.2.2.	Construction of a bicycle train in Drujba: on "Krastyo Pastuhov" Blvd. of "Prof. Tsvetan Lazarov "next to Iskarsko shose Blvd.	1,4	2020
2.2.3.	Construction of a bicycle train in Buxton: by "Bratya Bakston" Blvd. from "Todor Kableshkov" Blvd. to "Tsar Boris III" Blvd.	0,7	2020
2.2.4.	Construction of a bicycle train in Ovcha Kupel: by "President Lincoln" Blvd. from Ovcha Kupel Blvd. to SOP and metro station	4,5	2020
2.2.5.	Construction of a bicycle train in Ovcha Kupel junction: along Ljubljana Street to SOP	1,5	2020
2.2.6.	Construction of a bicycle train in Ovcha Kupel: on "Montevideo" Str. From "Nikola Petkov" Blvd. to "President Lincoln" Blvd.	2,7	2020
2.2.7.	Construction of a bicycle path on "Nikola Gabrovski"	0,7	2020
2.2.8.	Study and construction of a bicycle route between Ovcha Kupel and Gorna Banya	2,8	2020
2.2.9.	Study and construction of a bicycle route on "Resurrection"	2,0	2020
2.2.10.	Exploration and construction of bicycle and shared routes at the CUA stage	11,5	2020
2.2.11.	Study and construction of bicycle and shared routes in CUA - 2nd stage	4,0	2025
2.2.12.	Construction of a bicycle lane in Hladilnika: from Vitosha Mountain to Zoo through the territory of NPP Hladilnika	1,0	2025
2.2.13.	Construction of a bicycle connection in Hladilnika: from "Luba Velichkova" Blvd to the entrance of the South Park near "Kozyak"	0,4	2025
2.2.14.	Exploration and construction of a bicycle train in Studentski grad: from GM GM Dimitrov to Studentski grad	1,0	2025
2.2.15.	Exploration and construction of a bicycle train: in Krasna Polyana, along the railway line of Vardar Blvd. from Stadion Septemvri to West Park	1,9	2025
2.2.16.	Study and construction of bicycles in Lyulin Lyulin	6,2	2025
2.2.17.	Exploration and construction of a bicycle train in Musagenitsa district	2,6	2025
2.2.18.	Construction of a bicycle route along "Alexander Pushkin" Blvd.	2,1	2025
2.2.19.	Exploration and construction of a bicycle in Mladost 4 to SOP	1,3	2025
2.2.20.	Construction of bicycle trails in Malinova dolina	3,1	2025
2.2.21.	Exploration and construction of bicycles in Hadzhi Dimitar, Suhata Reka and Levski	4,0	2025
2.2.22.	Design and construction of a bicycle along James Bouchier Blvd.	2,0	2025
2.2.23.	Survey and construction of a bicycle tram along Samokovsko Shosse Str. And connection with "Obikolna"	3,1	2025
2.2.24.	Exploration and construction of bicycles in Nadezhda district	5,5	2025
2.2.25.	Exploration and construction of bicycles in Obelya district	3,4	2025
2.2.26.	Exploration and construction of a bicycle train in Drujba: on "Prof. Tsvetan Lazarov "from" Krastyo Pastuhov "Blvd. to" Asen Yordanov "Blvd.,	2,1	2025
2.2.27.	Construction of a bicycle route between Mladost and Drujba Square from Andrei Sakharov BouLEVARD to Tsvetan Lazarov Blvd.	1,8	2025

2.2.28.	Exploration and construction of bicycles in Orlandovtsi	5,3	2035
2.2.29.	Exploration and construction of a bicycle along the "Suhodolska"	2,4	2035
2.2.30.	Exploration and construction of a bicycle along the Vladayska River	2,7	2035
2.2.31.	Exploration and construction of a bicycle along Kliment Ohridski Blvd.	4,0	2035
2.2.32.	Study and construction of bicycle paths in Vitosha district	5,0	2035
2.2.33.	Study and construction of bicycles in Krastova vada	2,5	2035
2.2.34.	Study and construction of bicycle lanes in Manastirski livadi district	4,0	2035
2.2.35.	Exploration and construction of a bicycle trail on the future "Vrch Mancho"	5,8	2035
2.2.36.	Study and construction of bicycle paths in Iliyantzi quarter	2,1	2035
2.2.37.	Study and construction of bicycle paths in Vrajdebna district	3,7	2035
		<b>Total length</b>	111,9 km
		<b>Indicative value</b>	46,7 million BGN

FIGURE 62 INCOMING BICYCLE NETWORK PROJECTS



## 2. ВЕЛОСИПЕДНО ДВИЖЕНИЕ

### 2.2. ДОВЪРШВАНЕ И ИЗГРАЖДАНЕ НА ДОВЕЖДАЩА ВЕЛОСИПЕДНА МРЕЖА

#### Етап 1: 2019 - 2020

- 2.2.1. Изграждане на велотрасе в жк Дружба: по ул. „Обиколна“ в жк Дружба 2
- 2.2.2. Изграждане на велотрасе в жк Дружба: по бул. „Кръстьо Пастухов“ от бул. „Проф. Цветан Лазаров“ до бул. „Искърско шосе“
- 2.2.3. Изграждане на велотрасе в жк Бъкстон: по бул. „Братя Бъкстон“ от бул. „Тодор Каблешков“ до бул. „Цар Борис III“
- 2.2.4. Изграждане на велотрасе в жк Овча Купел: по бул. „Президент Линкълн“ от бул. „Овча купел“ до СОП и метростанция
- 2.2.5. Изграждане на велотрасе в жк Овча Купел: по ул. „Любляна“ до СОП
- 2.2.6. Изграждане на велотрасе в жк Овча Купел: по ул. „Монтевидео“ от бул. „Никола Петков“ до бул. „Президент Линкълн“
- 2.2.7. Изграждане на вело алея по ул. „Никола Габровски“
- 2.2.8. Проучване и изграждане на вело трасе между кв. Овча Купел и Горна баня
- 2.2.9. Проучване и изграждане на вело трасе по бул. „Възкресение“
- 2.2.10. Проучване и изграждане на велосипедни и споделени трасета в ЦГЧ - I-ви етап

#### Етап 2: 2021 - 2025

- 2.2.11. Проучване и изграждане на велосипедни и споделени трасета в ЦГЧ - II-ри етап
- 2.2.12. Изграждане на вело алея в жк Хладилника: от МС Витоша до Зоопарк през територията на НГЗ Хладилника
- 2.2.13. Изграждане на велосипедна връзка в жк Хладилника: от бул. „Люба Величкова“ до входа на Южния парк при ул. „Козяк“
- 2.2.14. Проучване и изграждане на велотрасе в жк Студентски град: от МС Г. М. Димитров до Студентски град
- 2.2.15. Проучване и изграждане на велотрасе: в жк Красна поляна по трасето на жп линията на бул. „Бардар“ от Стадион Септември до Западен парк
- 2.2.16. Проучване и изграждане на велотрасета в жк Люлин
- 2.2.17. Проучване и изграждане на велотрасе в Мусгеница
- 2.2.18. Изграждане на вело трасе по бул. „Александър Пушкин“
- 2.2.19. Проучване и изграждане на велотрасе в жк Младост 4 до СОП
- 2.2.20. Изграждане на вело трасета в жк Малинова долина
- 2.2.21. Проучване и изграждане на велотрасета в жк Хаджи Димитър, жк Сухата река и жк Левски
- 2.2.22. Проектиране и изграждане на велотрасе по бул. „Джеймс Баучер“
- 2.2.23. Проучване и изграждане на велотрасе по ул. „Самоковско шосе“ и връзка с ул. „Обиколна“
- 2.2.24. Проучване и изграждане на велотрасета в жк Надежда
- 2.2.25. Проучване и изграждане на велотрасета в жк Обеля
- 2.2.26. Проучване и изграждане на велотрасе в жк Дружба: по бул. „проф. Цветан Лазаров“ от бул. „Кръстьо Пастухов“ до бул. „Асен Йорданов“
- 2.2.27. Изграждане на вело трасе връзка между жк Младост и жк Дружба от бул. „Андрей Сахаров“ до бул. „Цветан Лазаров“

#### Етап 3: 2026 - 2035

- 2.2.28. Проучване и изграждане на велотрасета в жк Орландовци
- 2.2.29. Проучване и изграждане на велотрасе по ул. „Суходолска“
- 2.2.30. Проучване и изграждане на велотрасе покрай река Владайска
- 2.2.31. Проучване и изграждане на велотрасе по бул. „Климент Охридски“
- 2.2.32. Проучване и изграждане на велоалеи в кв. Витоша
- 2.2.33. Проучване и изграждане на велоалеи в кв. Кръстова вада
- 2.2.34. Проучване и изграждане на велоалеи в кв. Манастирски ливади
- 2.2.35. Проучване и изграждане на велотрасе по бъдещия бул. „Врх Манчо“
- 2.2.36. Проучване и изграждане на велоалеи в кв. Илиянци
- 2.2.37. Проучване и изграждане на велоалеи в кв. Враждебна

Етап 1: 2019-2020	Съществуващи велоалеи
Етап 2: 2021-2025	Главна велосипедна мрежа
Етап 3: 2026-2035	Довеждаща велосипедна мрежа
	Рекреационна велосипедна мрежа
	Зона 30



**Legend:**

## 2. Bicycle traffic

## 2.2 Finishing and building an incoming bicycle network

## Stage 1:2019-2020

2.2.1.	Construction of a bicycle route in Drujba: on Obikolna Str. r.c. Druzha 2
2.2.2.	Construction of a bicycle route in Drujba: on "Krastyo Pastuhov" Blvd. from "Prof. Tsvetan Lazarov "next to Iskarsko shose Blvd.
2.2.3.	Construction of a bicycle route in Buxton: on "Bratya Bakston" Blvd. from "Todor Kableshev" Blvd. to "Tsar Boris III" Blvd.
2.2.4.	Construction of a bicycle route in Ovcha Kupel: on "President Lincoln" Blvd. from "Ovcha Kupel" Blvd to SRR and metro station
2.2.5.	Construction of a bicycle route in Ovcha Kupel: on Ljubljana Street to SRR
2.2.6.	Construction of a bicycle route in Ovcha Kupel: on "Montevideo" Str. From "Nikola Petkov" Blvd. to "President Lincoln" Blvd.
2.2.7.	Construction of a bicycle lane on "Nikola Gabrovski" str.
2.2.8.	Study and construction of a bicycle route between Ovcha Kupel and Gorna Banya
2.2.9.	Study and construction of a bicycle route on "Vazkresenie" blvd
2.2.10.	Study and construction of bicycle and shared routes in the CUA - I stage

## Stage 2:2021-2025

2.2.11.	Study and construction of bicycle and shared routes in CUA - 2nd stage
2.2.12.	Construction of a bicycle lane in Hladilnika: from MS Vitosha to Zoo through the territory of SIZ Hladilnika
2.2.13.	Construction of a bicycle connection in Hladilnika: from "Luba Velichkova" Blvd to the entrance of the South Park near "Kozyak"str.
2.2.14.	Exploration and construction of a bicycle route in Studentski Grad: from MS GM Dimitrov to Studentski Grad
2.2.15.	Exploration and construction of a bicycle route: in Krasna Polyana, along the railway line of Vardar Blvd. from Stadion Septemvri to West Park
2.2.16.	Study and construction of bicycle routes in r.c. Lyulin
2.2.17.	Exploration and construction of a bicycle route in Musagenitsa district
2.2.18.	Construction of a bicycle route along "Alexander Pushkin" Blvd.
2.2.19.	Exploration and construction of a bicycle route in Mladost 4 to SRR
2.2.20.	Construction of bicycle routes in r. c. Malinova dolina
2.2.21.	Exploration and construction of bicycle routes in r. c. Hadzhi Dimitar, r. c. Suhata Reka and r. c. Levski
2.2.22.	Design and construction of a bicycle route along James Bourchier Blvd.
2.2.23.	Survey and construction of a bicycle route along Samokovsko Shosse Str. and connection with "Obikolna" str.
2.2.24.	Exploration and construction of bicycle routes in r.c. Nadezhda



2.2.25.	Exploration and construction of bicycle routess in r.c. Obelya
2.2.26.	Exploration and construction of a bicycle route in r. c. Drujba: along "Prof. Tsvetan Lazarov "from" Krastyo Pastuhov "Blvd. to" Asen Yordanov "Blvd.,
2.2.27.	Construction of a bicycle route between r. c. Mladost and r. c. Drujba from Andrei Sakharov Boulevard to Tsvetan Lazarov Blvd.

Stage 3:2026-2035

2.2.28.	Exploration and construction of bicycle routes in r. c. Orlandovtsi
2.2.29.	Exploration and construction of a bicycle route along "Suhodolska" str.
2.2.30.	Exploration and construction of a bicycle route along Vladayska River
2.2.31.	Exploration and construction of a bicycle route along Kliment Ohridski Blvd.
2.2.32.	Study and construction of bicycle lanes in Vitosha district
2.2.33.	Study and construction of bicycle lanes in Krastova vada district
2.2.34.	Study and construction of bicycle lanes in Manastirski livadi district
2.2.35.	Exploration and construction of a bicycle route on the future "Vrah Mancho" Blvd.
2.2.36.	Study and construction of bicycle lanes in Iliyantzi quarter
2.2.37.	Study and construction of bicycle lanes in Vrajdebna district

Stage 1:2019-2020

Stage 2:2021-2025

Stage 3:2026-2035

Existing bicycle lanes

Main bicycle network

Incoming Bicycle Network

Recreational cycling network

Zone 30



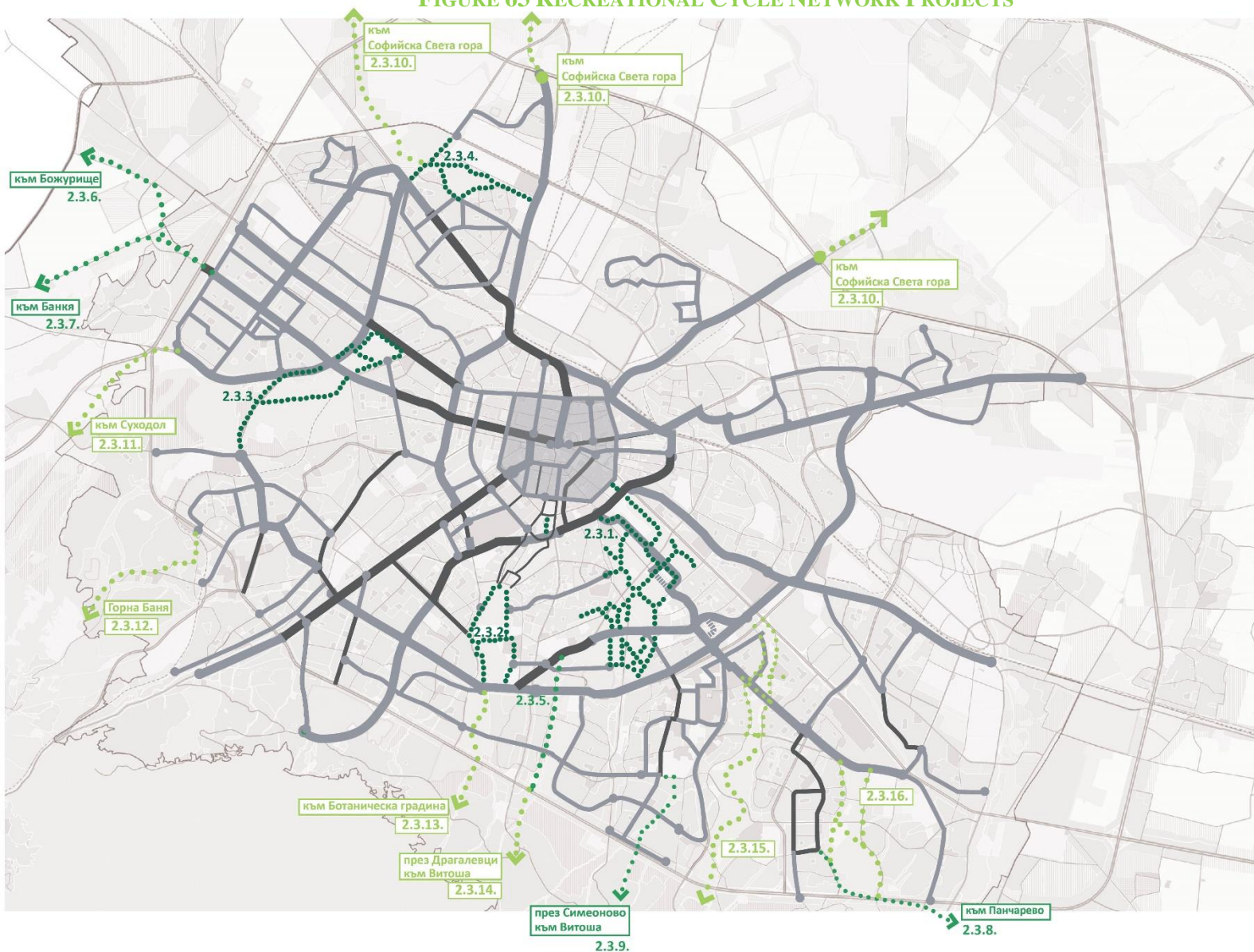
## Finishing and building the **recreational bicycle network** on the territory of the city and surrounding area

**№ 2.3**

	<i><b>Bicycle routes</b></i>	<i><b>km</b></i>	<i><b>Period</b></i>
2.3.1.	Construction of bicycle routes in the Borisov garden	9,0	2020
2.3.2.	Rehabilitation and completion of bicycle routes in South Park	2,7	2020
2.3.3.	Construction of bicycle routes in West Park	4,1	2020
2.3.4.	Construction of bicycle routes in North Park	2,6	2020
2.3.5.	Construction of a bicycle train from Luba Velichkova Str. To SOP along the Dragalevska River	2,3	2025
2.3.6.	Construction of a bicycle lane from the bc. Lyulin to Bozhurishte	5,6	2025
2.3.7.	Construction of a bicycle lane from the bc. Lyulin to Bankya	8,8	2025
2.3.8.	Exploration and construction of a bicycle lane from the bc. Mladost to Pancharevo Lake	9,9	2025
2.3.9.	Study and construction of a bicycle path from the National Sports Academy through the Malinova Dolina Quarter to the Simeonovo lift station	4,0	2025
2.3.10.	Exploration and construction of bicycles connecting the city of Sofia with the settlements and the sites of Sofia Forest	15,0	2035
2.3.11.	Exploration and construction of a bicycle train from Lyulin quarter to Suhodol quarter	2,5	2035
2.3.12.	Study and construction of a bicycle path through the Gorna banya to the railway station. station / MS Gorna Bania	3,0	2025
2.3.13.	Exploration and construction of a bicycle through Krastova vada to the Botanical Garden	2,0	2035
2.3.14.	Exploration and construction of a bicycle through Dragalevtzi to Vitosha	2,0	2035
2.3.15.	Exploration and construction of a bicycle through Vartopo Park to Simeonovo and Vitosha	6,0	2035
2.3.16.	Study and construction of bicycle paths in the East Park with links to German and Pancharevo	4,0	2035
2.3.17.	Creation of bicycle routes binding the sites and settlements of Sofiyska Sveta Gora: Dobroslavci village - Katina village, Mirovyane village - Novi Iskar village, Voyniagovtsi village - Lokorsko village, Gniliane village - Podgumer village	8,0	2035

<i><b>Total length</b></i>	91,5 km
<i><b>Indicative value</b></i>	41,1million BGN

FIGURE 63 RECREATIONAL CYCLE NETWORK PROJECTS



## 2. ВЕЛОСИПЕДНО ДВИЖЕНИЕ

### 2.3. ДОВЪРШВАНЕ И ИЗГРАЖДАНЕ НА РЕКРЕАЦИОННАТА ВЕЛОСИПЕДНА МРЕЖА НА ТЕРИТОРИЯТА НА ГРАДА И ОКОЛОГРАДСКИЯ РЕГИОН

#### Етап 1: 2019 - 2020

- 2.3.1. Изграждане на вело маршрути в Борисовата градина
- 2.3.2. Рехабилитация и доизграждане на вело маршрути в Южен парк
- 2.3.3. Изграждане на вело маршрути в Западен парк
- 2.3.4. Изграждане на вело маршрути в Северен парк

#### Етап 2: 2021 - 2025

- 2.3.5. Изграждане на велотрасе от ул. „Люба Величкова“ до СОП покрай река Драгалевска
- 2.3.6. Изграждане на велосипедна алея от ж.к. Люлин до Божурище
- 2.3.7. Изграждане на велосипедна алея от ж.к. Люлин до гр. Баня
- 2.3.8. Проучване и изграждане на велосипедна алея от ж.к. Младост до езерото Панчарево
- 2.3.9. Проучване и изграждане на велоалея от Национална спортна академия през кв. Малинова до лифтова станция Симеоново

#### Етап 3: 2026 - 2035

- 2.3.10. Проучване и изграждане на велотрасета свързващи гр. София с населените места и обектите на Софийска Света гора
- 2.3.11. Проучване и изграждане на велотрасе от жк Люлин към кв. Суходол
- 2.3.12. Проучване и изграждане на велоалея през кв. Горна баня до ж.п. гара/МС Горна баня
- 2.3.13. Проучване и изграждане на велотрасе през кв Кръстова вада към Ботаническа градина
- 2.3.14. Проучване и изграждане на велотрасе през кв Драгалевци към Витоша
- 2.3.15. Проучване и изграждане на велотрасе през парк Въртоло към Симеоново и Витоша
- 2.3.16. Проучване и изграждане на велоалеи в Източен парк с връзка към Герман и Панчарево
- 2.3.17. Създаване на велосипедни маршрути, обхващащи обектите и населените места от „Софийска Света Гора“: с. Доброславци – с. Кътина, с. Мирояне – гр. Нови Искър, с. Войняговци – с. Локорско, с. Гниляне – с. Подгумер

Етап 1: 2019-2020

Етап 2: 2021-2025

Етап 3: 2026-2035

— Съществуващи велоалеи

— Главна велосипедна мрежа

— Довеждаща велосипедна мрежа

..... Рекреационна велосипедна мрежа

**Legend:**

## 2. Bicycle traffic

## 2.3 Finishing and building the recreational bicycle network on the territory of the city and surrounding area

## Stage 1:2019-2020

2.3.1.	Construction of bicycle routes in the Borisova garden
2.3.2.	Rehabilitation and completion of bicycle routes in South Park
2.3.3.	Construction of bicycle routes in West Park
2.3.4.	Construction of bicycle routes in North Park

## Stage 2:2021-2025

2.3.5.	Construction of a bicycle route from Luba Velichkova Str. To SRR along Dragalevska River
2.3.6.	Construction of a bicycle lane from r. c. Lyulin to Bozhurishte
2.3.7.	Construction of a bicycle lane from the r.c. Lyulin to Bankya
2.3.8.	Exploration and construction of a bicycle lane from r. c. Mladost to Pancharevo Lake
2.3.9.	Study and construction of a bicycle lane from the National Sports Academy through Malinova Dolina Quarter to Simeonovo lift station

## Stage 3:2026-2035

2.3.10.	Exploration and construction of bicycle routes connecting the city of Sofia with the settlements and the sites of Sveta Gora Sofia
2.3.11.	Exploration and construction of a bicycle route from Lyulin quarter to Suhodol quarter
2.3.12.	Study and construction of a bicycle lane through Gorna banya to the railway station. / MS Gorna Bania
2.3.13.	Exploration and construction of a bicycle route through Krastova vada quarter to the Botanical Garden
2.3.14.	Exploration and construction of a bicycle route through Dragalevtsi to Vitosha
2.3.15.	Exploration and construction of a bicycle route through Vartopo Park to Simeonovo and Vitosha
2.3.16.	Study and construction of bicycle lanes in the East Park with links to German and Pancharevo
2.3.17.	Creation of bicycle routes binding the sites and settlements of Sveta Gora Sofia: Dobroslavci village - Katina village, Mirovyane village - Novi Iskar village, Voyniagovtsi village - Lokorsko village, Gniliane village - Podgumer village

## Stage 1:2019-2020

## Stage 2:2021-2025

## Stage 3:2026-2035

## Existing bicycle lanes

## Main bicycle network

## Incoming Bicycle Network

## Recreational cycling network



## Specific objective 2.4. Development of complementary bicycle infrastructure and services

The development of cycling in one city depends not only on a well-connected network of safe cycling routes but also on the availability of complementary bicycle infrastructure and services. This includes opportunities for convenient and safe parking, opportunities for public transport, opportunities for short-term rental of bicycles, etc.

□ Improve the possibilities for bicycle parking and parking of personal electric vehicles, such as trotting.

- Construction of bicycle parking lots and bicycles in public buildings, school and children's establishments, cultural sites, sports facilities, health establishments, markets, railway and bus stations and other sites with wide public access

- Stimulation of commercial and business centers, office and residential buildings to build bicycle parking

- Installation of bicycle stands and repairs and reconstructions of sidewalks and public spaces (squares, pedestrian zones, parks, etc.)

- Installation of antiparking pins with a design that allows to lock bicycles

□ Integrating bicycle transport with mass city transport

- Construction of bicycle parking facilities at subway stations

- Introduction of the opportunity to transport bicycles in the subway

- Enhance bicycle access to public transport stops

- Construction of intermodal centers with the ability to park and lock bicycles at:

- Central Railway Station / Central Bus Station,

- Obelya Intermodal Terminal

- intermodal connection Gorna Banya / Ovcha Kupel and others.

- Introducing systems for shared bicycles





## Introduction of **a system for shared bikes** on the territory of Sofia

**№ 2.4**

The introduction of a short-term bicycle hire system will give a strong impetus and popularization of the use of the bicycle to the city. The system will attract new users of bicycle transport - tourists and guests of the city, people who do not own their own bicycle, etc. For many people the use of the system may be the first step to buying your own bicycle later on.

It is recommended to start with a fourth-generation shared bicycle system. Subsequently, the system can be supplemented with electric bikes, scooters and other personal electric vehicles - trunks.

The system can be launched in the Central City District but must be as flexible as possible and allow for rapid expansion into new territories. The experience of other cities shows that the second year after the introduction of the system, there is a need for its expansion with new territories. Possible areas for expansion are the large residential complexes serviced by metro (Lyulin, Mladost, Nadezhda, etc.) where the system can play the role of subway transport. It is recommended that the project be implemented in stages:

	<i>Steps of introducing a system for shared bicycles :</i>	<i>Bicycles (number)</i>	<i>bicycle stands (number)</i>	<i>Period</i>
2.4.1	в CUA	800	80	2020
2.4.2	in Lyulin quarter	400	40	2020
2.4.3	in Ovcha Kupel quarter	200	20	2025
2.4.4	in Druzhba quarter	200	20	2025
2.4.5	in Mladost quarter	400	40	2025
2.4.6	in Nadezhda district	200	20	2025
2.4.7	in Obelya district	200	20	2025
2.4.8	in Hadzhi Dimitar quarter	200	20	2025
2.4.9	in Student Town	200	20	2025

<i>Bicycle stands</i>	280
<i>Bicycles</i>	2800
<i>Indicative value</i>	3,4 million BGN
<i>Period of realization</i>	2020/2025

### Specific objective 2.5. Improve the comfort and safety of cycling

Comfort and safety are two of the most important factors stimulating (or repelling) potential cyclists. The implementation of the bicycle infrastructure must meet certain design standards for width, slope and pavement quality. It is important to minimize the dangers for cyclists and to provide a sense of security that is also related to the organization of traffic and the design of crossroads. It is necessary to re-design the crossroads where the route passes during the construction of a route. It is important to create and apply a standard signaling and tracking standard to apply everywhere as this creates recognition and a security and convenience factor.

- Increase of the transport zone with a speed limit of up to 30 km / h in the Central Urban Area and introduction of such areas in the residential districts;
- Reconstruction of existing bicycle lanes and routes that do not meet the requirements of comfort and safety, including extending existing cycling routes, securing them and separating them from car and pedestrian traffic;
- Improvements to dangerous junctions and intersections - creation of waiting zones and exported stoplines for cyclists; improving visibility for cyclists at crossroads, shaping approaches to crossroads, continuing cycling paths at intersections, adding cycling paths to pedestrian paths; creation of intermediate islands and outposts at intersection; curvature of the traffic lane and reduction of the radius of curvature curves.
- Improve the patentability of existing bicycle routes through improvements and interventions in tight places:
  - - Improvement of bicycle crossings on major bouLEVArds and streets - for example Ring Road, Simeonovsko shose Blvd. (2 intersections), Yavorov Alley and others.
  - - Opportunities for crossings over railway lines, rivers and other linear limiters;
  - - possibility of cycling through restricted areas - e.g. the territories of the Bulgarian Academy of Sciences in Mladost, Slatina and others.
- Creating "school streets" - a temporary organization of traffic such as streets in front of school entrances is forbidden to move cars in the hours around the beginning and end of school hours. Provide opportunities for bicycle parking to schools, kindergartens, etc.
- Drafting and adopting a standard for cycling infrastructure design, reflecting the best world practices in terms of the convenience and safety of cycling
- Drafting and adopting a signaling and marking standard for bicycle routes to be applied everywhere.

### Specific objective 2.6. Promoting and stimulating cycling

A change in thinking and attitude towards this mode of transport is necessary to develop the bicycle movement. In countries and cities where cycling is highly developed, it is perceived as a modern and prestigious way to travel in the city, unlike the use of a car. This change in thinking must also take place in Sofia, which requires targeted efforts in education, including from a young age, as well as in promotion campaigns.

- Training and education for road safety and bicycle or trotting in urban conditions, including at school; building traffic gardens in urban parks;
- Organization of "Walk-and-Bike-to-School Day" events;
- Events and campaigns to promote bicycle transport involving celebrities, Campaigns with employers to encourage the use of bicycle transport by their employees (for example: Bike-to-work day);
- Creating a platform / mobile application for sharing bicycle routes and other information useful to cyclists;
- Issuance of a map for cycling routes in Sofia;
- Creating a platform / mobile application for sharing bicycle routes and other information useful to cyclists.

### 3. Public transport and intermodality

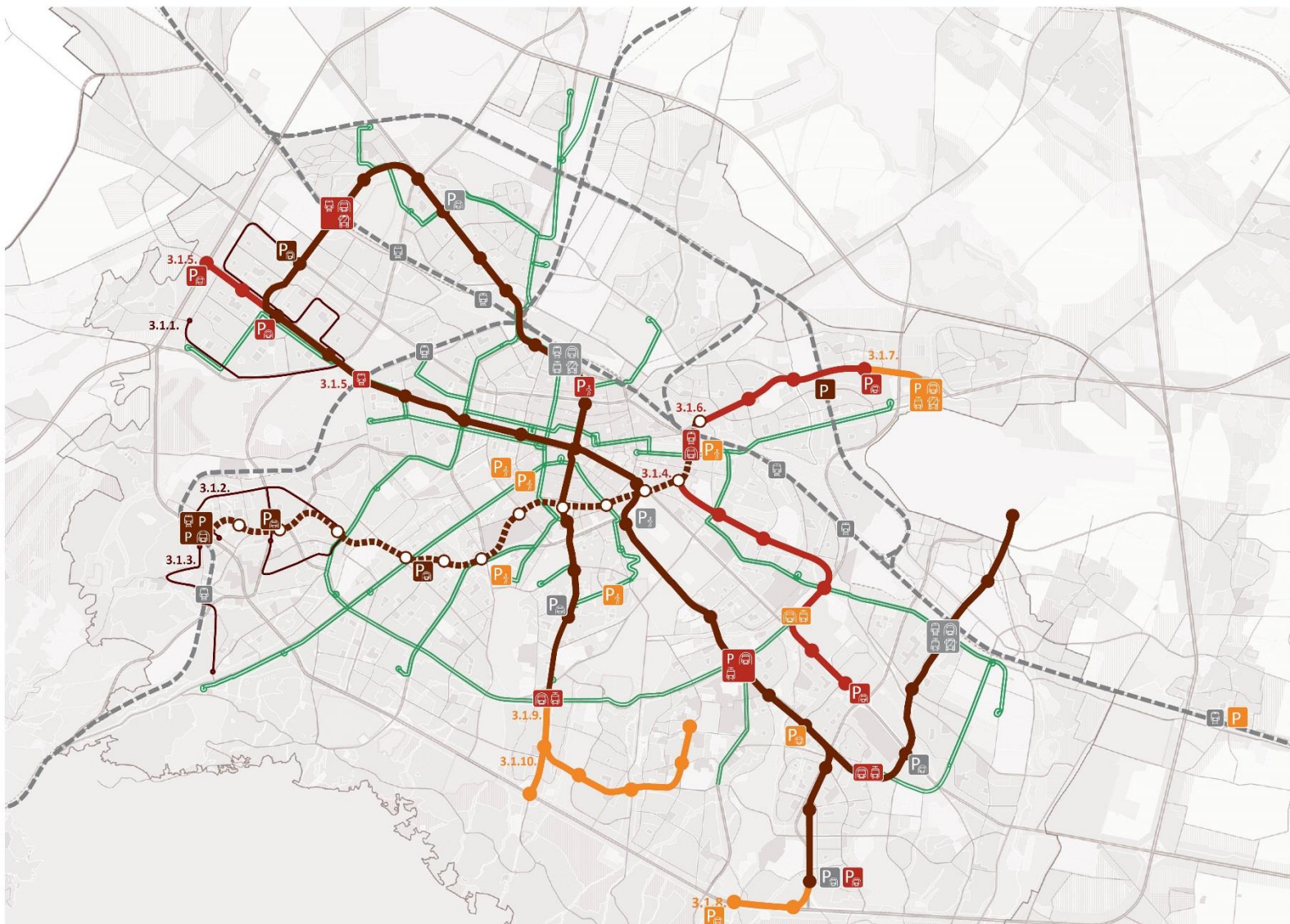
Under the concept, SUMP sets the following goals and projects to them:

#### Specific objective 3.1. Expansion of the territory, serviced by metro

Expansion of the subway and tramway network is obviously the most important action, which helps to increase the speed of public transport.

With the extension of the metro and tram network, coverage of an increasing part of the city's territory with fast public transport is achieved on the one hand, and on the other hand it starts to operate as a system and foundation of the public transport network. An increasing effect on public transport travel should be expected, as the extension of trams and especially metro will have the greatest impact on travel time factor.

FIGURE 64 MAIN PROJECTS FOR THE EXTENSION OF THE METRO SYSTEM



## 3. ОБЩЕСТВЕН ТРАНСПОРТ И ИНТЕРМОДАЛНОСТ

### 3.1. РАЗШИРЯВАНЕ НА ТЕРИТОРИЯТА, ОБСЛУЖЕНА С МЕТРО

#### Eran 1: 2019 - 2020

- 3.1.1. Откриване на нови линии с довеждаща функция в жилищните квартали и доставка на подвижен състав - пилотен проект в жк Люлин
- 3.1.2. Откриване на нови линии с довеждаща функция в жилищните квартали и доставка на подвижен състав - пилотен проект в жк Овча купел
- 3.1.3. Откриване на нови линии с довеждаща функция в жилищните квартали и доставка на подвижен състав - пилотен проект в кв Горна баня

#### Eran 2: 2021-2025

- 3.1.4. Отклонение от трета линия на метрото от бул. „Евлоги и Христо Георгиеви“ при Военна академия, по ул. „Гео Милев“, бул. „Асен Йорданов“ покрай МФСЗ „Арена Армеец“, бул. „Цариградско шосе“ до Окръжна болница с 6 МС и Доставка на подвижен състав за удължаване на трета линия
- 3.1.5. Продължение на първа линия на метрото от МС Люлин в западна посока (СОП) по бул. Царица Йоана с 2 МС и Доставка на подвижен състав за първа линия на метрото
- 3.1.6. Продължение на трета линия на метрото между МС ул. „Панайот Хитов“ (МС5) и МС ул. „Станислав Доспевски“ (МС2) с 3 МС

#### Eran 3: 2026-2035

- 3.1.7. Продължение на трета линия на метрото между МС ул. „Станислав Доспевски“ (МС2) и МС бул. „Владимир Вазов“ (МС1) с 1 МС
- 3.1.8. Продължение на първа линия на метрото след МС „Бизнес парк“ до СОП с 2 МС
- 3.1.9. Продължение на втора метролинния до „Студентски град“ с 5 МС
- 3.1.10. Продължение на втора линия на метрото в южна посока (СОП) с 1 МС

- Eran 1: 2019-2020
- Eran 2: 2021-2025
- Eran 3: 2026-2035
- Съществуващи метро трасета и станции
- Метро трасета и станции в строеж
- Нови метро трасета и станции
- Съществуващи трамвайни трасета
- Нови линии с довеждащи функции
- Съществуващ/ Нов интермодален възел
- Съществуваща/ Нова жп гара
- Връзка метро и трамвай
- Връзка метро и жп
- Съществуващ/ Нов буферен паркинг към метрото
- Съществуващ/Нов паркинг към ЦГЧ



**Legend:****3. PUBLIC URBAN TRANSPORT AND INTERMODALITY****3.1 Expansion of the territory, serviced by underground****Stage 1:2019-2020**

3.1.1.	Opening of new lines with a leading function in the residential quarters and delivery of rolling stock - a pilot project in r. c. Lyulin
3.1.2.	Opening of new lines with a leading function in the residential neighborhoods and delivery of rolling stock - a pilot project in r. c. Ovcha Kupel
3.1.3.	Opening of new lines with incoming function in the residential neighborhoods and delivery of rolling stock - pilot project in Gorna Banya quarter

**Stage 2:2021-2025**

3.1.4.	Deviation from the third line of the metro from "Evlogi Georgiev" Blvd. at the Military Academy - "Geo Milev" - "Asen Yordanov" Blvd. via SH Arena Armeec - Tsarigradsko Shose Blvd with 6 MS
3.1.5.	Continuation of the first line of the subway line from Liulin in the west direction (SRR) on Tsaritsa Yoana Blvd. with 2 MS
3.1.6.	Continuation of the third line of the subway between MS Panayot Hitov Str. (MS5) and MS Stanislav Dospevski MS (MS2) with 3 MS

**Stage 3:2026-2035**

3.1.7.	Continuation of the third line of the subway between MS Stanislav Dospevski MS (MS2) and MS Vladimir Vazov Blvd. (MS1) with 1 MS
3.1.8.	Continuation of the first line of the subway after the Business Park MC to the SRR with 2 MS
3.1.9.	Continuation of the second metro line to "Studentski Grad" with 5 MS
3.1.10.	Continuation of the southern second subway line (SRR) with 1 MS

**Stage 1:2019-2020****Stage 2:2021-2025****Stage 3:2026-2035**

Existing metroroutes and stations

metroroutes and stations under construction

new metroroutes and stations

existing tramways

new lines with incoming functions





Existing / new intermodal node  
Existing / new train station  
Metro and tram connection  
Metro and railway connection  
Existing / new underground parking  
Existing / new parking for CUA

## MAJOR PROJECTS AND INITIATIVES



### Opening of new lines with **a leading function in the residential neighborhoods** - pilot project in bc. Ovcha kupel, ж.к. Lyulin and Gorna Banya

**№ 3.1.1 – 3.1.3**

New, environmentally friendly vehicles will be purchased that will run with a short interval of study. The project will contribute to:

- reducing pollution in these areas
- Improving PT service quality and metro integration
- • reducing the use of cars

Number of vehicles	46
Indicative value	49,7million BGN
Conversion period	till 2020

This pilot project will provide a better connection to the residents of the. Lyulin and the bc. Ovcha Kupel under the subway. The study showed good results, especially in bc. "Lyulin."

For the realization of the project in Ovcha Kupel it is necessary to prohibit the parking on Narodno Horo Street as it is narrow and the presence of parked cars will make it extremely difficult for the buses of the urban transport.

A study will be conducted to investigate the effectiveness of similar routes for subway lines in other districts. One of the studied quarters will be the bc. "Hadzhi Dimitar" in connection with the construction of the last stop from Metro III to Chavdar Bridge. Potential areas for the realization of incoming transport can be seen as Vitosha, Malinova Dolina and Manastirski Livadi.

The characteristics of the routes in Lyulin and the bc. Ovcha coupe in length, transported passengers and others. are shown in the table below. The forecast is for the year 2020. Adopted driving intervals at peak hours are extremely small - 4 min. Therefore, the required number of vehicles is large.

	Length of the route in both directions / km /	Car in ARC /pcs /	Passengers daily	Spent time [m, h] daily	Car hours a day	Passenger kilometers a day	Car miles a day
M1 (Lyulin)	19,25	19	37 584	3 800	215	69 483	3 619
M3 (Ovcha Kupel)	9,862	9	9 650	617	90	12 895	1 864

The route and the load on passengers by section are illustrated in the following diagrams.

FIGURE 65 LOAD ON ROUTE M3 (OVCHA KUPEL)

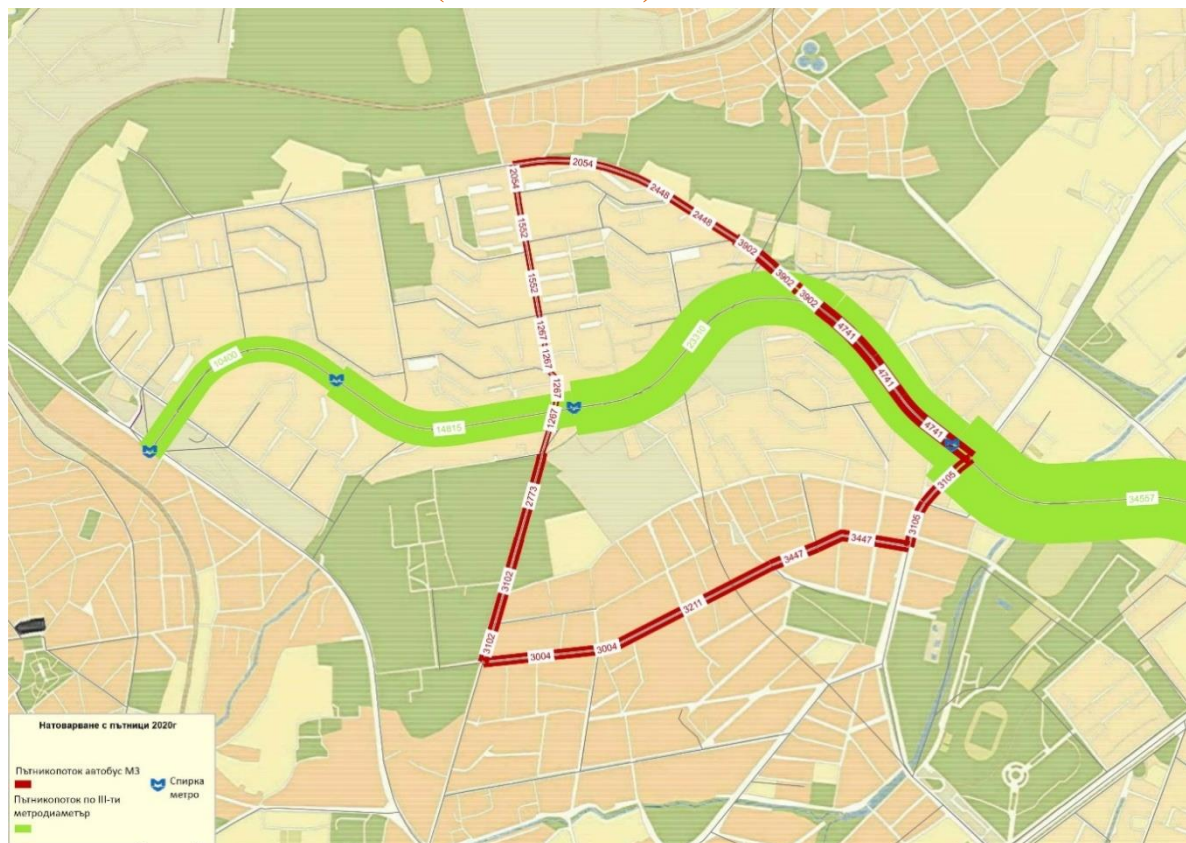
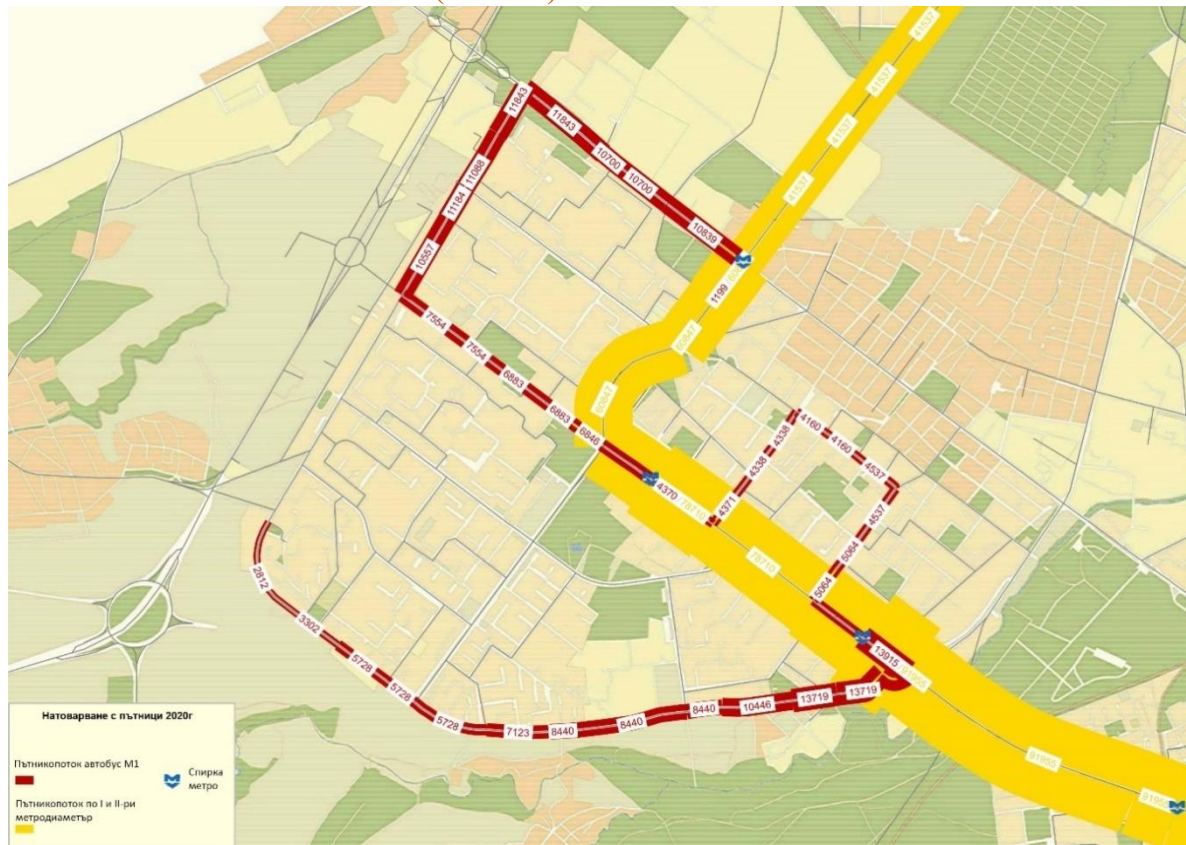




FIGURE 66 LOAD ON ROUTE M1 (LYULIN)



	<b>Deviation from the <i>third line of the underground</i> from "Evlogi Georgiev" Blvd. at the Military Academy to the Regional Hospital</b>																
	<b>№ 3.1.4</b>																
<p>The deviation is at the Military Academy - "Geo Milev" - "Asen Yordanov" Blvd. along SH "Arena Armeec" - Tsarigradsko Shose Blvd. to the Regional Hospital. The project also includes the supply of rolling stock. It will lead to:</p> <ul style="list-style-type: none"> <li>• Greater metro coverage</li> <li>• links to first and second metro lines</li> <li>• Improving territorial connectivity, safety and security of travel</li> <li>• protecting the environment and the urban environment</li> <li>• Increasing the speed of movement</li> <li>• attracting passengers to urban transport.</li> </ul>	<table> <tr> <td><i>Track length</i></td><td>6,4 km</td></tr> <tr> <td><i>Metro trains</i></td><td>6pcs.</td></tr> <tr> <td><i>Number of metro stations</i></td><td>6 pcs.</td></tr> <tr> <td><i>Indicative value</i></td><td>792 million BGN</td></tr> <tr> <td><i>Passengers transported</i></td><td>214 000 per day * (forecast -2040)</td></tr> <tr> <td><i>Project readiness</i></td><td>Conceptual design</td></tr> <tr> <td><i>Expropriation procedures</i></td><td>Yes</td></tr> <tr> <td><i>Conversion period</i></td><td>till 2025</td></tr> </table> <p>* 214 000 passengers daily the total load on the two routes on the third subway line (projects 3.1.4, 3.1.6 and 3.1.7)</p>	<i>Track length</i>	6,4 km	<i>Metro trains</i>	6pcs.	<i>Number of metro stations</i>	6 pcs.	<i>Indicative value</i>	792 million BGN	<i>Passengers transported</i>	214 000 per day * (forecast -2040)	<i>Project readiness</i>	Conceptual design	<i>Expropriation procedures</i>	Yes	<i>Conversion period</i>	till 2025
<i>Track length</i>	6,4 km																
<i>Metro trains</i>	6pcs.																
<i>Number of metro stations</i>	6 pcs.																
<i>Indicative value</i>	792 million BGN																
<i>Passengers transported</i>	214 000 per day * (forecast -2040)																
<i>Project readiness</i>	Conceptual design																
<i>Expropriation procedures</i>	Yes																
<i>Conversion period</i>	till 2025																

	<b>Continuation of the <i>third subway line</i> between MS Panayot Hitov (MS5) and MS Blvd. Vladimir Vazov (MS1)</b>														
	<b>№ 3.1.6 and 3.1.7</b>														
<p>Connects the southwestern part of Sofia with the northeast, while making connections to the first and second metro lines. This will lead to:</p> <ul style="list-style-type: none"> <li>• Improving territorial connectivity, safety and security of travel</li> <li>• protecting the environment and the urban environment</li> <li>• Significant increase in travel speed</li> <li>• attracting passengers to PT</li> </ul>	<table> <tr> <td><i>Track length</i></td><td>4 km</td></tr> <tr> <td><i>Number of metro stations</i></td><td>4 pcs.</td></tr> <tr> <td><i>Indicative value</i></td><td>300 million BGN</td></tr> <tr> <td><i>Passengers transported</i></td><td>214 000 per day*</td></tr> <tr> <td><i>Project readiness</i></td><td>Conceptual design</td></tr> <tr> <td><i>Expropriation procedures</i></td><td>Yes</td></tr> <tr> <td><i>Conversion period</i></td><td>Yes 2025</td></tr> </table> <p>* 214,000 passengers daily is the total load on the two routes on the third subway line (projects 3.1.4, 3.1.6 and 3.1.7)</p>	<i>Track length</i>	4 km	<i>Number of metro stations</i>	4 pcs.	<i>Indicative value</i>	300 million BGN	<i>Passengers transported</i>	214 000 per day*	<i>Project readiness</i>	Conceptual design	<i>Expropriation procedures</i>	Yes	<i>Conversion period</i>	Yes 2025
<i>Track length</i>	4 km														
<i>Number of metro stations</i>	4 pcs.														
<i>Indicative value</i>	300 million BGN														
<i>Passengers transported</i>	214 000 per day*														
<i>Project readiness</i>	Conceptual design														
<i>Expropriation procedures</i>	Yes														
<i>Conversion period</i>	Yes 2025														



The daily subway load forecast for 2040 is based on the model used so far in VISUM, with which all metro forecasts have been made. So far, for predicted year 2020, predictions have been made with great precision in respect of passengers transported.

A standard four-step model of demand-side journey-by-trip search is used in the third step. In this way the effect of the implementation of the project was taken into account.

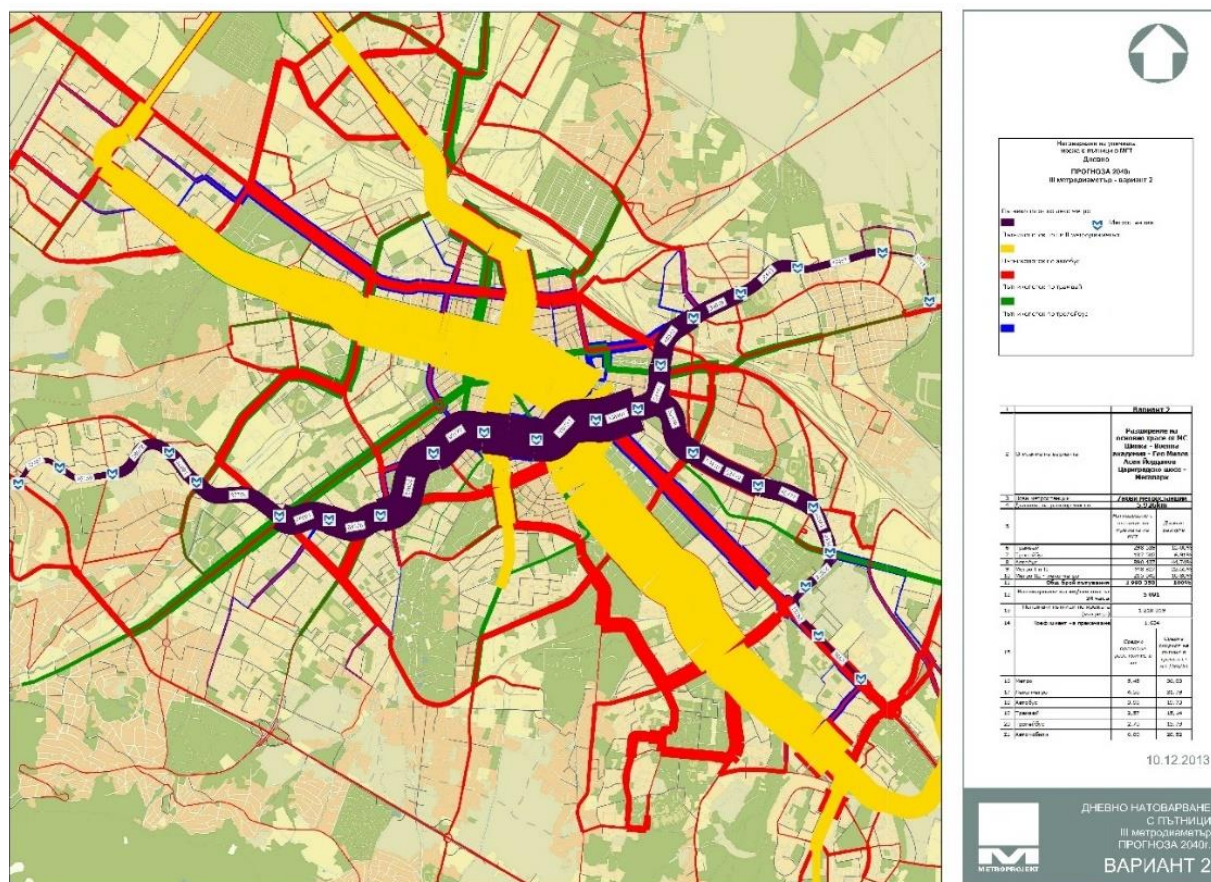
Table 4 lists all the parameters describing the mass transport system for the variant under consideration. The table also shows the average passenger speeds in each of the public transport systems. The total load on the two routes on the third subway line is over 214,000 passengers per day, which is 10.8% of all passengers transported by public transport.

**TABLE 4 FORECAST OF URBAN PASSENGER LOAD ON ROUTE REALIZATION 1 – "OVCHA KUPEL" - DISTRICT HOSPITAL, 2040**

<i>Description of the variant</i>	<b>Extension of the main route by MS Shipka - Military Academy - Geo Milev - Asen Yordanov - Tsarigradsko Shose - District Hospital</b>	
<i>New underground stations</i>	<b>7 new metro stations</b>	
<i>Length of the extension</i>	<b>6,056km</b>	
	<i>Load with passengers on the MUT</i>	<i>Share distribution</i>
<i>Trampl</i>	297 229	14.99%
<i>Trolleybus</i>	132 640	6.69%
<i>Bus</i>	893 079	45.05%
<i>underground I and II</i>	445 304	22.46%
<i>underground III</i>	214 233	10.81%
<b>Total number of trips</b>	<b>1 982 485</b>	<b>100%</b>
<b>Load in km / direction for 24 hours</b>	<b>5 084</b>	
<i>Passengers on the net (matrix)</i>	1 218 019	
<i>Crossing factor</i>	1.628	
	<i>Average vehicle distance in km</i>	<i>Average passenger speed in a transport system [km / h]</i>
<i>underground</i>	5.47	36.83
<i>Lightly underground</i>	4.50	31.73
<i>Bus</i>	3.94	19.72
<i>Trampl</i>	2.57	15.13
<i>Trolleybus</i>	2.69	15.73
<i>Cars</i>	6.80	28.52



**FIGURE 67 DAILY DAILY WORKLOAD FORECAST FOR URBAN TRANSPORT PASSENGERS ON ROUTE 1 - OVCHA KUPEL - DISTRICT HOSPITAL, 2040**





Continuation of the **first line of the underground** from MS Liulin in the west direction (direction SRR) on Tsaritsa Yoana Blvd with two more stations

**№ 3.1.5**

In addition to infrastructure, the project also includes rolling stock delivery. The sequel to the first line will lead to the inclusion of more population serviced by the subway:

- attraction of P & R trips with the provided buffered parking, which is a prerequisite for reducing the pressure of cars to parts of the city with increased traffic
  - protecting the environment and the urban environment
  - speed and safety of travel
- attracting passengers to public transport.

Track length	1,3 km
Number of metro stations	2 pcs.
Metro trains	4 pcs.
Indicative value	102million BGN
Passengers transported	27 700 per day
Project readiness	A draft project is forthcoming
Expropriation procedures	No
Conversion period	Till 2025

The forecast for this metro section is estimated at two forecast years - 2020 and 2040. The forecasts for these years are based on relevant scenarios for increasing population and jobs, retail space, and so on. in different parts of the city according to the parameters laid down in the GSP.

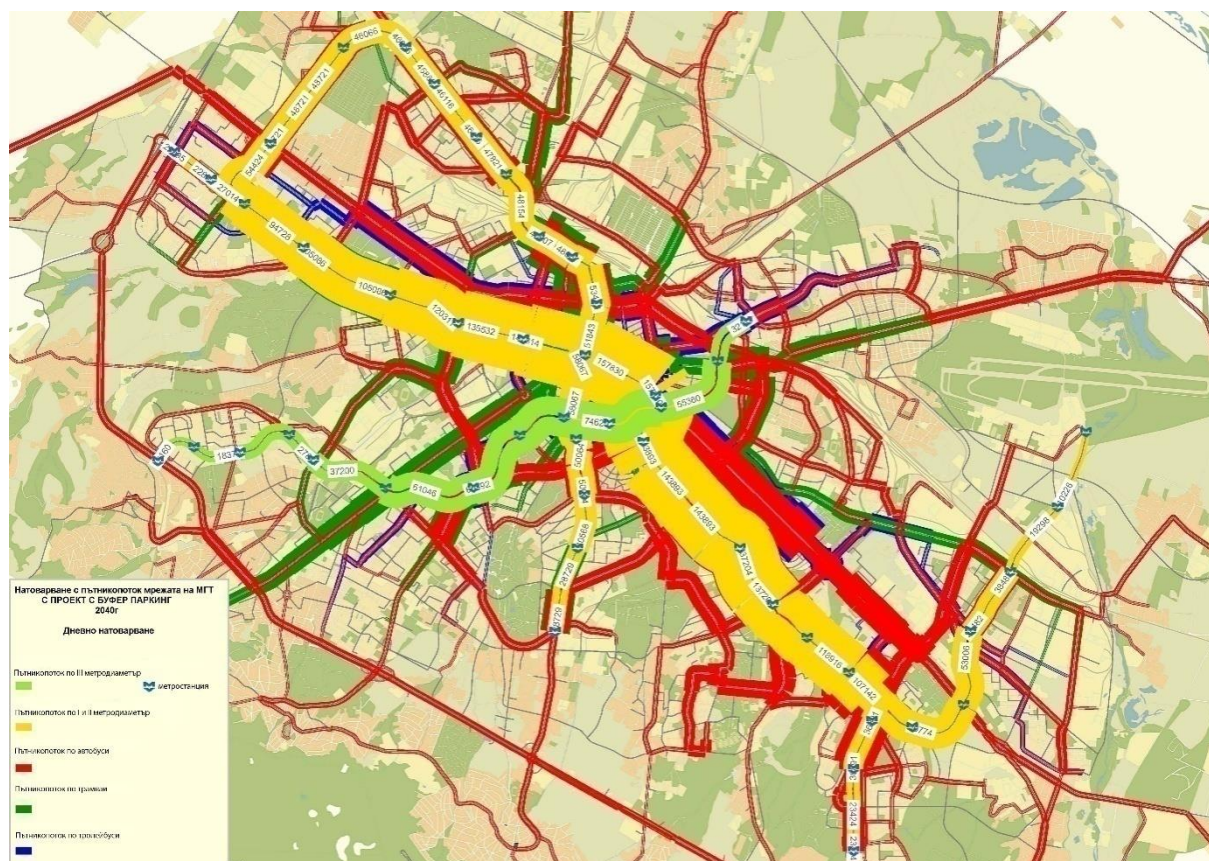
The comparison of the indicators is done by simulations of the so-called "no project" and "project" scenarios. No project is a forecast in which the planned construction is not realized, but "with a project" - a simulation of the movement in a realized project. In these cases, it is monitored how the two matrices are changed: the road traffic and that of the public transport passengers. Time saved, system load, and other parameters are reported. Part of the data is shown below.

Especially in this variant is simulated the use of a buffer parking lot in immediate proximity to the initial station on "Tsaritsa Yoana" Blvd. with easy access to the parking lot by the ring road.



**TABLE 5 DAILY SYSTEM LOAD ON CONTINUATION OF THE FIRST SUBWAY LINE ON TSARITSA YOANA BLVD. - FORECASTS FOR 2020 AND 2040**

	2020					2040				
	Without a project		With a project (with a buffer parking)			Without a project		With a project (with a buffer parking)		
	Travellings	%	Travellings	%		Travellings	%	Travellings	%	
Transport system										
Tram	334 735	21.32%	332 739	21.13%	-1 996	401 491	21.36%	399 165	21.18%	-2 326
Bus	639 590	40.74%	638 391	40.54%	-1 199	778 065	41.40%	776 482	41.20%	-1 583
Trolleybus	160 357	10.22%	161 489	10.26%	1 132	190 436	10.13%	191 764	10.17%	1 328
III metrodiameter	104 835	6.68%	104 734	6.65%	-101	123 710	6.58%	123 574	6.56%	-136
I and II metrodiameter	330 273	21.04%	337 214	21.42%	6 941	385 738	20.52%	393 814	20.89%	8 076
Total travellings	1 569 790	100%	1 574 567	100%	4 777	1 879 440	100%	1 884 799	100%	5 359
Matrix cars	756 432		755 702			812 460		811 653		
Matrix MT	979 245		980 451			1 176 585		1 177 919		
Coefficient of transshipment	1.603		1.606			1.597		1.600		
Attracted cars			1 206					1 334		

**FIGURE 68 DAILY DAILY SYSTEM LOAD FORECAST FOR CONTINUATION OF THE FIRST LINE OF THE METRO ON TSARITSA YOANA BLVD., 2040**




## Continuation of **first metro diameter** after MS Business Park to SRR

**№ 3.1.8**

The sequel to the first line will lead to:

- improved metro service
- Improving territorial connectivity, safety and security of travel
- protecting the environment and the urban environment
- speed and safety of travel
- attracting business and travel trips.
- • Increase in the number of retail outlets

Track length	2,2 km
Number of metro stations	2pcs.
Indicative value	152,6 million BGN
Passengers transported	26 000 per day
Project readiness	Conceptual design
Expropriation procedures	Yes
Conversion period	Till 2035



## Continuation of the **second metro diameter** in direction "Studentski grad

**№ 3.1.9 и 3.1.10**

The continuation of the metro will be on the following routes:

1. MS Vitosha - MS1 Cherni vrah (near "Dimitar Manchev" Str.) - MS2 (Vitosha Vitosha St. Stefan Savov) - MS 3 (Simeonovsko Shose Blvd. -Prof. Ivan Stranski ) - MS4 Sports Complex NSA (Academic Stefan Mladenov Str. - "Prof. Atanas Ishirkov" Str. - MS5 Studentski Grad (Students' Polyclinic)
1. 2. MS1 Cherni Vrah - 1 MS in the southern direction (SRR)

Track length	4,8 km
Number of metro stations	6 pcs.
Indicative value	558 million BGN
Passengers transported	32 877per day
Project readiness	track and load survey
Expropriation procedures	Yes
Conversion period	Till 2035

An estimate of the load on this route with passengers was made. Table 6 shows the data for the estimated upward and downward passengers on the new metro stations for 2020.

**TABLE 6 DAILY WORKLOAD OF METRO STATIONS ON THE SUBWAY TO "STUDENSKI GRAD", 2020**

*"got on / got off on metro stations of II metro;*

*daily; forecast 2020th option 2*

*direction airport sofia - student city*

NAME OF METRO STATION	GOT ON	GOT OFF	LOAD
MS VITOSHA (EXISTING)	2238	8498	12 829
MS 1_II CHERNI VRAH	516	3228	10 117
MS 2_II R.D.. VITOSHA	371	411	10 077
MS 3_II SIMEONOVSKO SHOSE	751	2393	8 435
MS 4_II NSA	232	3084	5 583
MS 5_II STUDENSKI GRAD	0	5583	0
<b>TOTAL</b>	<b>4 108</b>	<b>14 699</b>	

*"got on / got off on metro stations of II metro;*

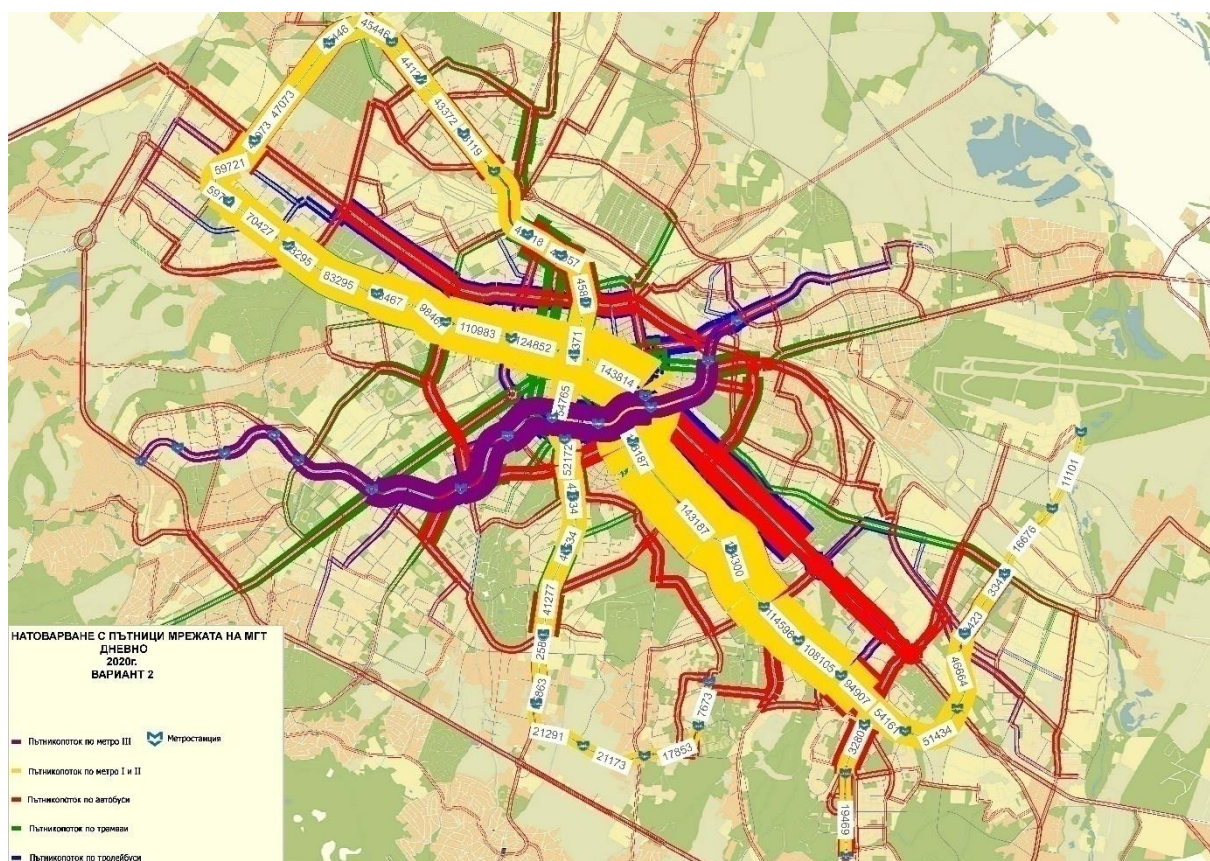
*daily; forecast 2020th option 2*

*direction - student cityairport sofia*

NAME OF METRO STATION	GOT ON	GOT OFF	LOAD
MS 5_II STUDENSKI GRAD	2090	0	2 090
MS 4_II NSA	7328	0	9 418
MS 3_II SIMEONOVSKO SHOSE	2068	390	11 096
MS 2_II R.D.. VITOSHA	79	1	11 174
MS 1_II CHERNI VRAH	1987	127	13 034
<b>TOTAL</b>	<b>13 552</b>	<b>518</b>	
<b>total transit passengers new metro stations</b>	<b>17 660</b>	<b>15 217</b>	



**FIGURE 69 DAILY DAILY WORKLOAD FORECAST FOR THE STUDENT CITY, 2020**



### Specific objective 3.2. Developing the ground public transport system and reducing travel time

One of the most important measures to attract passengers to urban transport is the measure aimed at increasing its speed and regularity. Increasing the speed of public transport can be achieved by improving it in several directions - building autonomous shared routes for different types of public transport, reconstructing the track and the contact network, busbuses, and prioritizing public transport at junctions with proven efficiency.

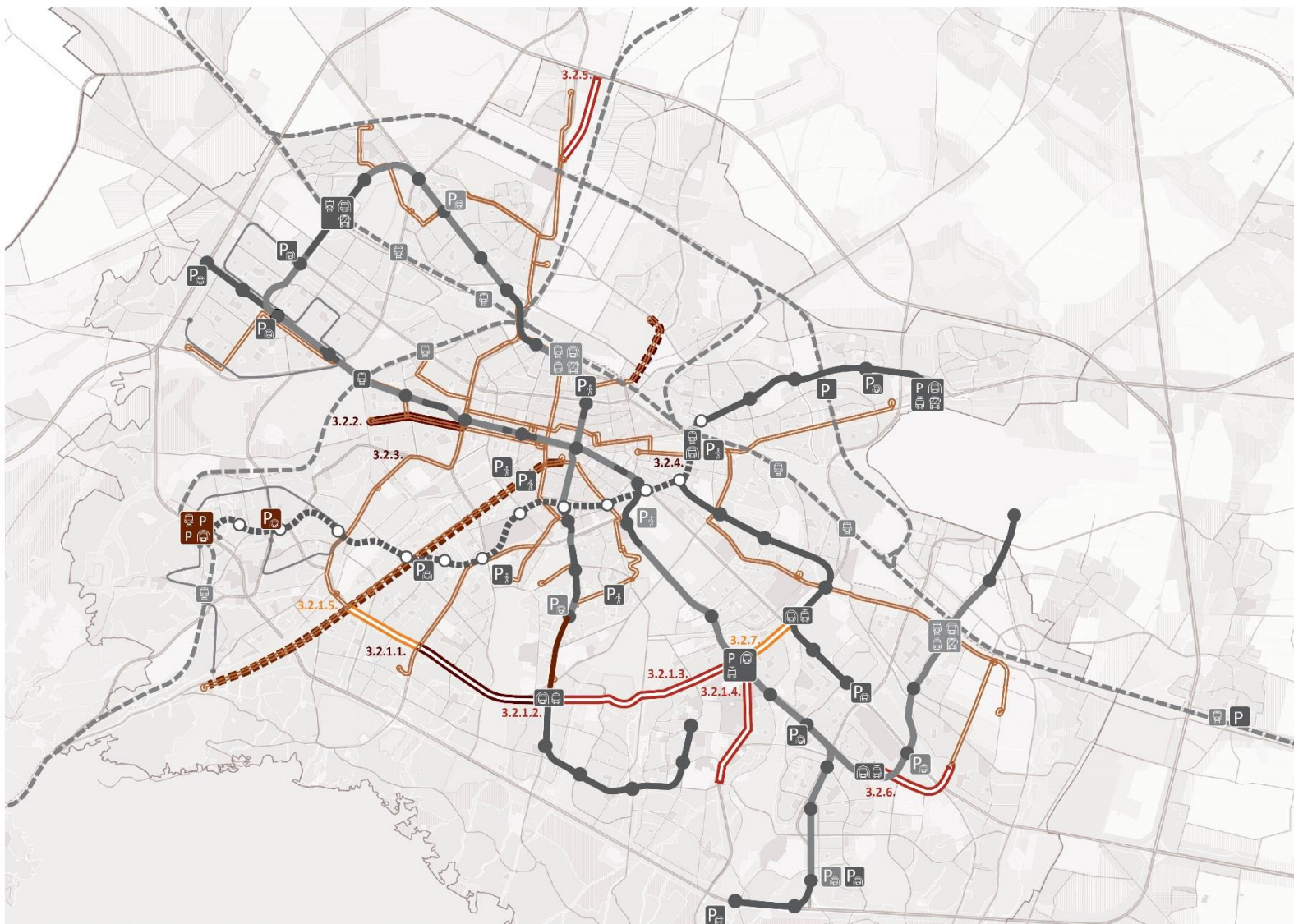
The plan recommends the gradual construction of high-speed ground-based urban transport on separate routes along all major radial and circular / tangential urban arteries. Particular attention should be paid to trams running on separate routes.

With the purchase of new modern trams and after the reconstruction of the trails it is possible to achieve a higher speed of movement. Combined with appropriate cross-country regulation, where trams have priority over the passage, preconditions are created to increase the attractiveness of this mode of transport.

The main projects to achieve this goal, providing for physical interventions, are presented in Figure 70.



FIGURE 70 MAIN PROJECTS FOR THE DEVELOPMENT OF THE GROUND PUBLIC TRANSPORT SYSTEM



## 3. ОБЩЕСТВЕН ТРАНСПОРТ И ИНТЕРМОДАЛНОСТ

### 3.2. РАЗВИТИЕ НА СИСТЕМАТА НА НАЗЕМНИЯ ОБЩЕСТВЕН ТРАНСПОРТ И НАМАЛЯВАНЕ НА ВРЕМЕПЪТУВАНЕТО

3.2.1. Изграждане на ново трамвайно трасе по бул. „Тодор Каблешков“ и изграждане/разширение на необходимата улична мрежа

#### Етап 1: 2019-2020

- 3.2.1.1. Изграждане на ново трамвайно трасе по бул. „Тодор Каблешков“ от бул. „България“ до бул. „Черни връх“
- 3.2.2. Реконструкция на трамваен релсов път по бул. „Александър Стамболийски“ от бул. „Константин Величков“ до трамвайно ухото Западен парк
- 3.2.3. Осигуряване на споделено автономно трасе между трамвай и автобус по бул. „Възкресение“ от бул. „Константин Величков“ до бул. „Никола Мушанов“
- 3.2.4. Осигуряване на споделено автономно трасе между трамвай и автобус по бул. „Мадрид“ от бул. „Евлоги и Христо Георгиеви“ до бул. „Ситняково“

#### Етап 2: 2021-2025

- 3.2.1.2. Изграждане на ново трамвайно трасе по бул. „Тодор Каблешков“ от бул. „Черни връх“ до бул. „Симеоновско шосе“
- 3.2.1.3. Проектиране и изграждане на ново трамвайно трасе по бул. „Г. М. Димитров“ от ул. „Симеоновско шосе“ до бул. „Климент Охридски“
- 3.2.1.4. Реконструкция на трамваен релсов път по бул. „Климент Охридски“ от бул. „Г. М. Димитров“ до съществуващо трамвайно ухото
- 3.2.5. Изместване на съществуващо трамвайно трасе и изграждане на бул. „Рожан“ от надлез над жп линията до Северна скоростна тангента (ССТ)
- 3.2.6. Изграждане на нов трамваен релсов път и контактно-кабелна мрежа по бул. „Копенхаген“ от ул. „Обиколна“ в ж. к. Дружба до Метростанция № 18 в ж. к. Младост 1

#### Етап 3: 2026-2035

- 3.2.1.5. Изграждане на ново трамвайно трасе по бул. „Тодор Каблешков“ от бул. „Цар Борис III“ до бул. „България“
- 3.2.7. Изграждане на нов трамваен релсов път по бул. „Г. М. Димитров“ от бул. „Св. Климент Охридски“ до бул. „Асен Йорданов“

- Етап 1: 2019-2020
- Етап 2: 2021-2025
- Етап 3: 2026-2035
- Съществуващи метро трасета и станции
- Метро трасета и станции в строеж
- Нови метро трасета и станции
- Съществуващи трамвайни трасета
- Изграждане на ново трамвайно трасе
- Реконструкция на трамвайни трасета - в строеж
- Реконструкция на трамвайни трасета - проект
- Споделени платна за движение на градския транспорт
- Интермодален възел
- Жп гара
- Връзка метро и трамвай
- Връзка метро и жп
- Буферен паркинг към метрото
- Паркинг към ЦГЧ

**Legend:**

## 3. PUBLIC URBAN TRANSPORT AND INTERMODALITY

## 3.2 Developing the ground public transport system and reducing travel time

**3.2.1. Construction of a new tram route on "T. Kableshkov" and construction / extension of the necessary street network**

## Stage 1:2019-2020

3.2.1.1.	Construction of a new tram route on "T. Kableshkov" - from Bulgaria Blvd to Cherni Vruh Blvd.
3.2.2.	Reconstruction of a tram rail track on Aleksandar Stamboliyski Blvd. from Konstantin Velichkov Blvd. to a Tramway West Park
3.2.3.	Providing a shared autonomous route between the tram and bus on "Vazkresenie" Blvd. from "Konstantin Velichkov" Blvd. to Nikola Mushanov Blvd.
3.2.4.	Providing a shared autonomous route between the tram and bus on Madrid Boulevard from "Evlogi and Hristo Georgievi" Blvd. to "Sitnyakovo" Blvd.

## Stage 2:2021-2025

3.2.1.2.	Construction of a new tram route on "T. Kableshkov" - from Cherni vruh Blvd. to Simeonovsko shose Blvd.
3.2.1.3.	Design and construction of a new tram route on "G. M. Dimitrov" - from Simeonovsko Shose Street to Kliment Ohridski Blvd.
3.2.1.4.	Reconstruction of a tram rail track on Kliment Ohridski blvd. From G. M. Dimitrov blvd. to an existing tramway ear
3.2.5.	Displacement of an existing tram route and construction of Rozhen Boulevard from overpass over a North Speed Tangent (NST)
3.2.6.	Construction of a new tramway track and a contact-cable network on "Copenhagen" Blvd. from Obikolna Str. inr. c. "Druzhiba" to Metro Station № 18 in the railway station inr. c. "Mladost 1"

## Stage 3:2026-2035

3.2.1.5.	Construction of a new tram route on "T. Kableshkov" Blvd. - from Tsar Boris Blvd to Bulgaria Blvd.
3.2.7.	Construction of a new tram rail track on Blvd. G.M. Dimitrov from "St. Kliment Ohridski" Blvd. to "Asen Yordanov" Blvd.

## Stage 1:2019-2020

## Stage 2:2021-2025

## Stage 3:2026-2035

## Existing metroroutes and stations

## MAJOR PROJECTS AND INITIATIVES



metroroutes and stations under construction  
new metroroutes and stations  
existing tramways  
Construction of a new tramway  
Reconstruction of tramways under construction  
Reconstruction of tramways - project  
Shared lanes for public transport  
Intermodal node  
Train station  
Metro and tram connection  
Metro and railway connection  
Buffer parking to the subway  
Parking at the CUA



## Reconstruction of the **tram rail track** on "Tsar Boris III" Blvd. from Knyazhevo to the Court of Justice

**in progress**

The reconstruction will cover the tram rail track on Tzar Boris III Blvd. from the Court Court to the tram door "Knyazhev", without the stretch of Ruski pametnik square with total length 16 152 m single track, of which approximately 7 km of separate route. Reconstruction will contribute to:

- increase of the tram speed by 15%
  - increasing the number of passengers
  - Reduce running maintenance costs
  - reduction of noise and vibration
- improving safety and affordability

Track length	16 152 m s. track
Indicative value	49 million BGN
Expropriation procedures	no
Conversion period	Till 2020



## Reconstruction of a **tram rail track** along Kamenodelska Str. From Isidora to Orlandovtsi

**in progress**

*Reconstruction of a tram rail track on "Kamenodelska" street - from the crossroad with K. Stoilov Blvd. / Isis Bridge to the Orlandovtsi street with Total length of the tram line 3 288 m single track with track gauge 1009 mm. Reconstruction will contribute to:*

- Reduce running maintenance costs
  - increase of the average speed of the trams
- increasing the attractiveness and respectively the number of public transport passengers.*

Track length	3 288 m s. track
Indicative value	8 million BGN
Passengers transported	204 extra per day
Project readiness	Technical project
Expropriation procedures	no
Conversion period	till 2020





## Construction of **a new tram route** on "T. Kableshekov" and construction / extension of the necessary street network

**№ 3.2.1**

The project is divided into several sections, which will be implemented in stages and includes the construction of 8700 m new tramway and reconstruction and completion of street lanes.

With the construction of the tangential tram is served the adjoining area, which has not yet been served with public transport and is connected with the subway.

The implementation is planned to take place in three stages. Each of the stages is consistent with the construction of the necessary street network. The first stage is the construction of a tram route between Bulgaria Blvd and Cherni Vrah Blvd. The second stage is the continuation of the route to Simeonovsko shose Blvd. The last stage is next to Kliment Ohridski Blvd.“.

Track length	8 700 m s. track
Width of street canvas	10,5/12,5 m indifferent tracks
Indicative value	74,7 million BGN
Passengers transported	55 389 per day
Project readiness	Conceptual design
Expropriation procedures	Yes
Conversion period	Till 2035

For each stage of the implementation of the project a simulation of the load with passengers was made.

The first stage includes the construction of a tram between Bulgaria Blvd and Cherni Vrah Blvd. At this stage the forecasts were made by extending the route TM 10 from the ear of Cherni Vrah Blvd to the ear of TM 7 on Bulgaria Blvd. In Table 7, all parameters are marked with + by adding extra length or additional cars per line. For this projected year 2020 there are an additional 5,400 passengers a day.

In the second stage a separate route is set between the ear of Bulgaria Blvd and Simeonovsko shose. The whole route in both directions is relatively short (10 km) and is not effective enough to be launched in this way. It rides a little over 7,000 passengers / day. In the absence of the opportunity to set up a turning ear at Simeonovsko shose Blvd, the route will be serviced by a tramway.

At the final stage, when the entire tangential tram route from Tzar Boris III Blvd. to Kliment Ohridski Blvd. is built and the autonomous route along Kliment Ohridski Blvd. is upgraded to the existing tramway, things are radically changing. A route from the Gornompanski Path stop is on the Tzar Boris III Blvd. - "T. Kableshekov" - "G. M. Dimitrov" - "Kliment Ohridski" Blvd. with a length in both directions of 21.6 km. Study intervals are 6 minutes in peak hours and 12 minutes outside peak.

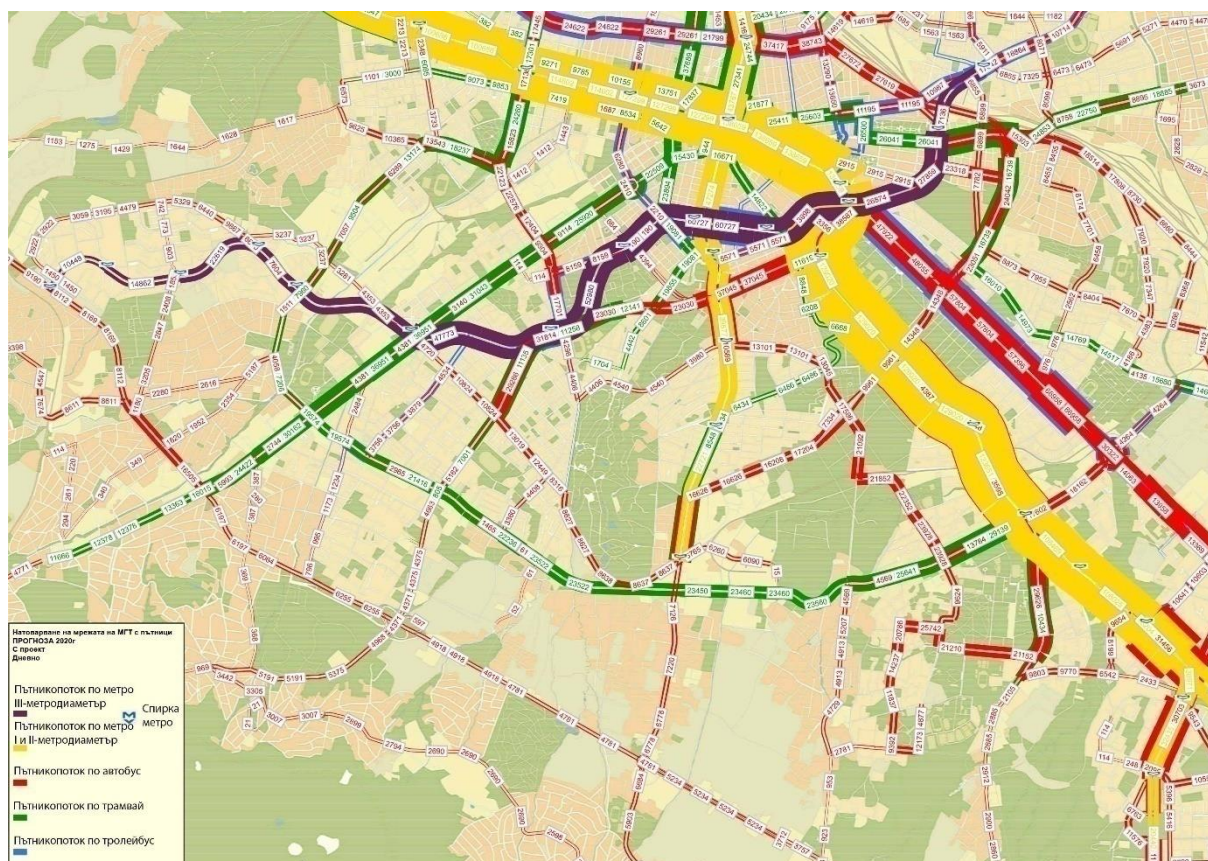
The load on this route is 55,000 passengers daily. For all three stages, a model with the same set parameters was used.

**TABLE 7 DAILY PASSENGER LOAD DATA ON 2020 SYSTEMS**

1		Without a project	Share distributi on	With a project Irst stage бул."България" - бул."Черни връх"	Share distribu tion	With a project IInd stage бул."България" - бул."Симеоновско шоце"	Share distrib ution	With a project final stage бул."Цар Борис III"- Студентски град	Share distrib ution
2	Tram	334 735	14.39%	336 159	14.46%	336 409	14.46%	359 915	15.50%
3	Trolleybus	160 357	6.89%	159 606	6.86%	159 305	6.85%	151 169	6.51%
4	Bus	639 590	27.49%	637 519	27.42%	634 725	27.29%	614 141	26.44%
5	I and II metro diameter	330 273	14.20%	329 184	14.16%	329 394	14.16%	337 536	14.53%
6	III metro diameter	104 835	4.51%	104 040	4.47%	104 063	4.47%	100 098	4.31%
7	cars	756 432	32.52%	758 577	32.63%	761 879	32.76%	759 746	32.71%
8	Total number of travelers by MGT	<b>1 569 790</b>	<b>67%</b>	<b>1 566 508</b>	<b>67%</b>	<b>1 563 896</b>	<b>67%</b>	<b>1 562 859</b>	<b>67%</b>
9	Total number of travelers including by car	<b>2 326 222</b>	<b>100%</b>	<b>2 325 085</b>	<b>100%</b>	<b>2 325 775</b>	<b>100%</b>	<b>2 322 604</b>	<b>100%</b>
10	Total change of the travelers by MGT	-3 282		-5 894		-6 931			
12	Layed cars on the network (matrix)	<b>756 432</b>		<b>758 577</b>		<b>761 879</b>		<b>759 746</b>	
13	Layed travellings on MGT network (matrix)	<b>979 245</b>		<b>977 099</b>		<b>973 797</b>		<b>975 932</b>	
14	Attracted travellings by cars	-		-2 146		-5 448		-3 313	
15	Coefficient of getting over	1.603		1.603		1.606		1.601	
16	Attracted travelliers by cars	-		-2 146		-5 448		-3 313	

**TABLE 8 LOAD WITH PASSENGERS ON THE ROUTE OPERATING ON THE NEW ROUTE**

	Lenth of the route in both directions /km/	Cars in PIK pcs.	Travellers dayly	Time spent m./h. daily	Car hours daily	Travelers kilometers daily	Car km. daily
TM "Т.Каблешков"/I-ви етап/	+ 7,08	+ 5	+ 5 395	+ 1 049	+ 31	+ 21 126	+ 638
TM "Т.Каблешков"/II-ри етап/	10.06	9	7 051	771	63	16 994	1 368
TM "Т.Каблешков"/Краен етап/	21.60	17	55 389	9 213	132	204 670	2 938

**FIGURE 72 DAILY LOAD WITH PASSENGERS AT THE FINAL STAGE**

### Reconstruction of a tram rail track on "Alexander Stamboliyski" Blvd. from Konstantin Velichkov Blvd. to a tramway West Park

**№ 3.2.2**

Reconstruction of a track, street canvas and adjoining sidewalks from the crossroad with "K. Velichkov "through the intersection with Vardar Blvd. to the end tramway" West Park ". The section has a gauge of 1009 mm. Reconstruction will contribute to:

- Reduction of current maintenance costs
- increase of the average speed of the trams and decrease of the travel time

Track length	3587 m s. track
Indicative value	8,9 million BGN
Passengers transported	331 extra per day
Project readiness	Technical project
Expropriation procedures	no
Conversion period	till 2020



## Provide **shared and autonomous tram and bus routes**

**№ 3.2.3 and  
3.2.4**

The project will provide a single route for urban transport. Its implementation will help to increase safety, improve the organization of the movement and increase the speed of travel on the bus lines. Shared routes between the tram and bus will be realized on the following routes:

- on "Resurrection" Blvd. from "Konstantin Velichkov" Blvd. to "Nikola Mushanov" Blvd.
- on Madrid BouLEVARD from "Evlogi and Hristo Georgievi" Blvd. to "Sitnyakovo" Blvd.

Track length	1,83 KM
Indicative value	0,2 million BGN
Project readiness	Preparation of technical design
Expropriation procedures	no
Conversion period	till 2020; 2025



## **Displacement of existing tram route and construction of Rozhen BouLEVARD from overpass over railway line to NST**

**№ 3.2.5**

The aim of the new route is to circumnavigate the eastern quarter of Iliyantsi and to connect with the North speed tangent. The connection / access to the northern territories of Sofia through the NST is being improved. This is particularly true for the incoming and outgoing streams of the Hemus and Trakia highways and from Dragoman and Petrohan.

Tramway offset

From the Nadejda overpass to the North Speed Tangent, the cross-street link is at the ground level with traffic-light crossings. In the northern part of the bouLEVARD, in the eastern direction of Frescia Street, opposite the old tramway, a new one is planned.

Track length	1900 m
Canvas (2 pcs.)	2 x 7,5 m
Width Dist. stripe	3 m
Sidewalks	1 x 1,5 m; 1 x 2,7 m
Average gauge	22.2 m
Tramway offset	Levels are 40 cm above the pitch
Indicative value	14,6 million BGN.
Expropriation procedures	Are being conducted
Conversion period	till 2025





### Construction of a **new tramway track** and contact-cable network on "Copenhagen" Blvd.

**№ 3.2.6**

The project envisages the construction of a bouLEVArD, with the railroad road passing in the middle of the bouLEVArD. The new section has a gauge of 1435 mm. The construction of this tram route will improve the link between the "Druzhba 2" and bc. "Mladost". Additional access is provided to MC18 subway station "Mladost 1". The tram rail track and the contact network will be constructed from "Obikolna" Str. "Druzhba" to the Council of Ministers №18 in the bc. "Mladost 1".

Track length	2 400 m s. track
Indicative value	32,7 million BGN
Passengers transported	369 additionally per day
Project readiness	Regulation plan
Expropriation procedures	Yes
Conversion period	till 2025



### Construction of a **new tramway railroad** on GM Dimitrov Blvd. from "St. Kliment Ohridski" Blvd. to "Asen Yordanov" Blvd.

**№ 3.2.7**

The proposed tram route on "G. M. Dimitrov" and "Asen Yordanov" Blvd between "Kliment Ohridski" and "Shipchenski prohod" is a continuation of the new tangential tram on "T. Kableskov". The realization of the entire route will improve the service of a large part of the population in the southern territories of Sofia. The expected volume of passengers transported along the entire route from Iskar to Gorno Banyan Road is over 30 thousand. There are connections with third and second lines of the subway. Together with the route Gornompanski Path - Studentski grad, the passengers are doubled. The simulations are made for an autonomous tramway with the advantage of running.

Track length	2 km
Indicative value	11,9 million BGN
Conversion period	Till 2035




<div>  <b>Separation of BUS lanes</b> </div>			
<b>№ 3.2.8 to 3.2.18</b>			
	Route of bus lane	<i>length (km)</i>	<i>Period</i>
3.2.8.	Emblem of the First Ring Ring - "Opalchenska" Street - Patriarh Evtimii Blvd. - "V. Levski" Blvd.	4,00	2020
3.2.9.	Extension of "Opalchenska" Street from "Todor Alexandrov" Blvd. to "Slivnitsa" Blvd.	0,65	2025
3.2.10.	Separation of BUS Bands on "Evlogi and Hristo Georgievi" Blvd. from "Graf Ignatiev" Str. To Tsarigradsko shose Blvd.	0,69	2025
3.2.11.	Establishment of BOS stripes on "Alexander Malinov" Blvd. from "Andrey Sakharov" Str. To Tsarigradsko shose Blvd.	1,00	2025
3.2.12.	Separation of BSS strips on Slivnitsa Blvd. from Konstantin Velichkov Blvd. to Melnik Str.	0,65	2025
3.2.13.	Establishment of a BOU tape on "Akademik Ivan Evstratiev Geshov" Blvd. from "Vazkresenie" Blvd. to Bulgaria Blvd.	1,69	2025
3.2.14.	Establishment of BRS stripes on "Evlogi and Hristo Georgievi" Blvd. from "Tsarigradsko shose" Blvd. to "Madrid" Blvd.	1,00	2035
3.2.15.	Establishment of BUS strips on Slivnitsa Blvd and Evropa Blvd from "Petar Dertliev" Blvd. to "Dobrinova Skala" Blvd.	2,90	2035
3.1.16.	Separation of the ABS band in the construction of a breakthrough "Danail Nikolaev"	1,00	2035
3.2.17.	Separation of the BSS strips in the construction of the Eastern tangent	4,00	2035
3.2.18.	Separation of BSS strips in the construction of the Western tangent	10,00	2035
		<i>Total length</i>	28 km
		<i>Indicative value</i>	7,5 million BGN

FIGURE 72 BUS STANDS AND AUTONOMOUS / SHARED TRAMWAYS



## 3. ОБЩЕСТВЕН ТРАНСПОРТ И ИНТЕРМОДАЛНОСТ

### 3.2. РАЗВИТИЕ НА СИСТЕМАТА НА НАЗЕМНИЯ ОБЩЕСТВЕН ТРАНСПОРТ И НАМАЛЯВАНЕ НА ВРЕМЕПЪТУВАНЕТО

#### Етап 1: 2019-2020

- 3.2.8. Обособяване на БУС ленти по Първи ринг; ул. „Опълченска“, бул. „Патриарх Евтимий“ и бул. „Васил Левски“

#### Етап 2: 2021-2025

- 3.2.9. Разширение на ул. „Опълченска“ от бул. „Тодор Александров“ до бул. „Сливница“ и обособяване на БУС лента  
3.2.10. Обособяване на БУС ленти по бул. „Евлоги и Христо Георгиеви“ от ул. „Граф Игнатиев“ до бул. „Цариградско шосе“  
3.2.11. Обособяване на БУС ленти по бул. „Александър Малинов“ от ул. „Андрей Сахаров“ до бул. „Цариградско шосе“  
3.2.12. Обособяване на БУС ленти по бул. „Сливница“ от бул. „Константин Величков“ до ул. „Мелник“  
3.2.13. Обособяване на БУС лента на бул. „Академик Иван Евстратиев Гешов“ от бул. „Възкресение“ до бул. „България“

#### Етап 3: 2026-2035

- 3.2.14. Обособяване на БУС ленти по бул. „Евлоги и Христо Георгиеви“ от бул. „Цариградско шосе“ до бул. „Мадрид“  
3.2.15. Обособяване на БУС ленти по бул. „Сливница“ и бул. „Европа“ от бул. „Петър Бертелс“ до бул. „Добринова скала“  
3.2.16. Обособяване на БУС лента при изграждане на пробив „Данаил Николаев“  
3.2.17. Обособяване на БУС ленти при изграждането на Източна тангента  
3.2.18. Обособяване на БУС ленти при изграждането на Западна тангента



**Legend:**
**3. PUBLIC TRANSPORT AND INTERMODALITY**
**3.2 Developing the ground public transport system and reducing travel time**
**Stage 1:2019-2020**

3.2.8.	Establishment of bus lanes on the first ring - "Opalchenska" Str. "Patriarch Evtimii" - "V. Levski" Blvd.
--------	---

**Stage 2:2021-2025**

3.2.9.	Extension of "Opalchenska" Street from "Todor Alexandrov" Blvd. to "Slivnitsa" Blvd.
3.2.10.	Separation of BUS lane on "Evlogi and Hristo Georgievi" Blvd. from "Graf Ignatiev" Str. To Tsarigradsko shose Blvd.
3.2.11.	Establishment of BUS lane on "Alexander Malinov" Blvd. from "Andrey Sakharov" Str. To Tsarigradsko shose Blvd.
3.2.12.	Separation of BUS lane on Slivnitsa Blvd. from Konstantin Velichkov Blvd. to Melnik Str.
3.2.13.	Establishment of a BUS lane on "Akademik Ivan Evstratiev Geshov" Blvd. from "Vazkresenie" Blvd. to Bulgaria Blvd.

**Stage 3:2026-2035**

3.2.14.	Establishment of BUS lanes on "Evlogi and Hristo Georgievi" Blvd. from "Tsarigradsko shose" Blvd. to "Madrid" Blvd.
3.2.15.	Establishment of BUS lanes on Slivnitsa Blvd and Evropa Blvd from "Petar Dertliev" Blvd. to "Dobrinova Skala" Blvd.
3.1.16.	Separation of the BUS lane in the construction of a breakthrough "Danail Nikolaev"
3.2.17.	Separation of the BUS lanes in the construction of the Eastern tangent
3.2.18.	Separation of BUS lanes in the construction of the Western tangent

**Stage 1:2019-2020**
**Stage 2:2021-2025**
**Stage 3:2026-2035**

Existing street network

Street network projects

Existing bus lane

Bus lane+street network – projects

Shared trace – projects

Separated tram route - existing

Separated tram route - project



### Expansion of the **trolley network** on Tsvetan Lazarov Blvd. Druzhba-2

**№ 3.2.19**

The proposed new trolley bus route Druzhba 2 increases the population covered by electric transport. Helps to get to the subway .

Track length	1,5 km
Indicative value	2,3 million BGN
Conversion period	Till 2020



### Study of the possibility to build an autonomous tram route along Vardar Blvd.

**№ 3.2.20**

The project includes the preparation of a study on the feasibility and the possibility to construct and design in a conceptual phase an autonomous tram route along Vardar Blvd. on Vardar Blvd. (between "Vazkresenie" Blvd and "Bojurishte" Str. Sider "), connecting to the existing tram along Haidut Sider Street. The realization of such a tram route would contribute to the better service of the residents in the area by providing a connection with the metro at the Vardar station and created the precondition that the existing bus lines with numbers 45 and 77 will move along this tramway, lead to an increase in their speed.

Track length	1660 m s. track
Indicative value	0,05 million BGN
Conversion period	till 2025

## Specific objective 3.3. Improving the comfort and quality of public transport travel

The public transport network and infrastructure play a major role in redirecting demand from private cars towards more efficient modes of transport and reducing congestion. Better public transport can reduce congestion, promote social inclusion and reduce pollution in the city. Despite improvements in public transport in recent years, it is often perceived as a poor alternative to a

private car. The choice of mode of transport for passengers depends on several factors, such as travel time, need to travel, total cost, travel comfort and reliability.

Although it is one of the most important determinants of public transport demand, convenience is often overlooked when planning public transport systems and assessing their operating results. Amortized public transport vehicles are often referred to by travelers as the disadvantage of this mode of transport. Indeed, the results of the poll conducted among residents of Sofia show that new vehicles are second (after tariffs) among the improvements that would normally drive people traveling by car to use public transport.

Since high-speed public transport is at the heart of the concept of urban mobility, improving the quality and comfort of traveling with such transport is an important step towards attracting more passengers. Undoubtedly, replacing old, damp and polluting vehicles with new, more comfortable and less polluting vehicles is a step that not only attracts passengers but also helps protect the environment.





## Delivery of **rolling stock** for public transport

### № 3.3.1 to 3.3.4

	<i><b>Rolling stock</b></i>	<i><b>pieces</b></i>	<i><b>Period</b></i>
3.3.1.	Delivery of 18 low-articulated 1009 mm track tramcars in connection with the construction of a tram route on "Todor Kableshkov" Blvd.	18,0	2025
3.3.2.	Supply of 20 low-articulated tramcars for track gauge 1435 mm in connection with the construction of a tram route along Copenhagen BouLEVArD	20	2035
3.3.3.	Delivery of new rolling stock (trams, trolley buses, electric cars, specialized cars) for the needs of "Stolichno Elektrotransport" EAD in Period 2021 - 2025	118	2025
3.3.3.	Delivery of new rolling stock (trams, trolley buses, electric cars, specialized cars) for the needs of "Stolichny Elektrotransport" EAD in Period 2026 - 2035	346,0	2035
3.3.4.	Delivery of new single buses with hybrid or alternative fuel sources for the needs of "Stolichny autotransport" EAD in the period 2019 - 2020	20,0	2020
3.3.4.	Delivery of new buses (12 and 18 m) for the needs of "Stolichny autotransport" EAD in period 2021 - 2025	210	2025
3.3.4.	Delivery of new buses (12 and 18 m) for the needs of "Stolichny autotransport" EAD in period 2026 - 2035	405,0	2035
		<i>Total vehicles</i>	1 137 pcs.
		<i>Indicative value</i>	1 619million BGN

The calculation of the need for new buses was made for the first period 2019 - 2020 from the data submitted by Sofia Motor Vehicle. For the following Periods, the calculation is based on an annual transport task of 36 million km. per year. The operating period of a bus under Directive 2000/93/EC / 29.04.2009 is 800 thousand km. According to the so-called account, about 45 buses will be amortized every year.

The distribution of Periods for the renewal of the existing bus fleet is presented in the following table.

**TABLE 9 RENEWAL OF THE EXISTING BUS FLEET BY PERIODS**

	<i>TimePeriod</i>		
	2019 – 2020.	2021- 2025	2026 – 2035
12-meter buses (pcs.)	20	110	223
18-meter buses (pcs.)		100	182

The required type and number of trams and trolley buses, specialized cars and machines for maintenance of the contact-cable network and the track are presented in the following table.

**TABLE 10 RENEWAL OF ROLLING STOCK AND SPECIALIZED CARS FOR THE NEEDS OF ELECTRIC TRANSPORT**

<b>Rolling stock and machinery</b>	<b>Quantity</b>	<b>Value</b>
Supply of articulated low-floor trams (24 m) for track gauge 1009 mm	58	204 188 652
Supply of articulated low-floor trams (30 m) for track gauge 1009 mm	14	54 763 240
Supply of articulated low-floor trams for gauge 1435 mm	50	205 362 150
Low floor trolley delivery	130	139 841 845
Electrics (with required number of chargers)	200	195 583 000
Supply of specialized vehicles for the maintenance of a contact-cable network and rail track for track gauge 1009 mm / 1435 mm	10	9 779 150
Delivery of traversing machine for track gauge 1009 mm / 1435 mm	1	6 845 405
Delivery of rail grinding machine on rail track 1009 mm / 1435 mm	1	2 933 745
<b>Total:</b>	<b>464</b>	<b>819 297 187</b>

### Specific objective 3.4. Optimizing public transport management

The deployment and development of ITS solutions in the field of transport planning and organization is of particular importance for the normal functioning of the metropolitan city. The ability to collect diverse information sources from multiple sources and in real time, coupled with rich processing and analysis capabilities, provide a powerful tool in the hands of the government and the responsible institutions to serve one of the most important services for the city. Without the collection of Periodic and Accurate Measurements accompanied by analyzes, it is not possible to take the appropriate administrative decisions for the realization of the provided service. The control of the entire transport activity, including transport operators, the preparation of traffic schedules and operational plans and the realization of all accountability, is an essential part of the management of public transport. The synergy of the use of specific and heterogeneous software tools forms the main elements of the unified information system for management of urban transport in Sofia. For example, the creation of convenient and functional timetables for overlapping links will ensure the continuity of travel, using the appropriate technical means. Ensuring synchronization between modes of transport will lead to a smooth running of the travel process. Reliable travel time will reduce the disappointment and increase the satisfaction of the users of the service. When planning their journey, people prefer the time needed to reach the destination, be constant on different days and not change.


On the other hand, information is the key to providing residents and city guests with a convenient tool to select a mode of transport or a route to travel. Along with improving the efficiency and efficiency of the transport of people, providing better information will allow consumers to choose the most convenient, fast or cheap way to travel. Providing permanent passenger information and real-time updating of the opportunities for individual and public transport are one of the key priorities for the realization of high-quality transport services in the metropolitan city. By integrating all data and applications into an integrated system to manage mobility as a service (MaaS), it is intended to create a single site (platform) that provides easy and clear information on travel options before and during the trip for its users (passengers, drivers, cyclists, pedestrians). It should also include:

- Simplified sales channels - via mobile payment or through a platform-integrated payment system
- Integrated Traffic Monitoring from Traffic Management to Eliminate or Prevent Congestion
- Dynamic traffic information services - variable content characters, setting recommended speed, weather information incl. smog warnings, etc.
- Dynamic parking system that allows you to point to parking spaces (buffers or public car parks, parking areas).

Another essential objective of the platform is to promote modal shift from passenger car to public transport and to redirect residents and visitors to the city using environmentally-friendly modes of transport. In the long run, the development of a regional portal providing information for a wider range of consumers is envisaged, due to the fact that the capital city is a major attraction center in the country and subject to a huge number of daily labor migrations to it. The regional portal should include information, ways and opportunities for travel with other transport operators in the region - bus and route, railways and others. In addition to the advanced features listed above, this portal should also be tasked with performing a number of marketing goals and tasks, such as

processing user preference information, targeting specific services, or changing travel by providing better bundled rates and services by using public transport and others.

Last but not least, the optimization of public transport is also aimed at reducing emissions to the atmosphere and improving living conditions in the city.



### Implement an integrated automated e-billing system

**№ 3.4.1**

<p>This will improve the quality of service and facilitate citizens. It will provide additional options for selecting a transport document and will drive more than one vehicle. It will allow much more information to be provided on how to travel by public transport, which in turn is a prerequisite for its optimization and development.</p>	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="border-right: 1px solid black; padding: 5px;"><i>Indicative value</i></td> <td style="padding: 5px;">87,8million BGN</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 5px;">Project readiness</td> <td style="padding: 5px;">Selected contractor</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 5px;">Conversion period</td> <td style="padding: 5px;">Till 2025</td> </tr> </table>	<i>Indicative value</i>	87,8million BGN	Project readiness	Selected contractor	Conversion period	Till 2025
<i>Indicative value</i>	87,8million BGN						
Project readiness	Selected contractor						
Conversion period	Till 2025						

To implement an information intermodal mobility management system as a service (MaaS) it is necessary to aggregate the information through the creation of appropriate interfaces from the following systems, which are currently being implemented in Sofia public transport or in the city itself, namely:

- a single tolling system and video surveillance system in MUT cars;
- GPS tracking system for public transport vehicles;
- adaptive traffic management system;
- Bicycle rental system;
- Car rental system ("Spark");
- taxi transport management system;
- the BDZ system for the sale of transport documents and the timetable of trains.

In the medium term (by 2025), the above systems should be completed and some of them fully built and put into real operation. The project envisages linking them to a single platform as part of the UMC site (as a Journey Planner service) to enable users to plan their travel with different vehicles according to the time and cost of travel, also provides up-to-date information in real time at all stages of the trip.



## Implementing an information intermodal **mobility management system as a service (MaaS)**

**№ 3.4.2**

The main purpose of this project is to aggregate all information about public transport services, parking, bicycle or car rental and all other transport services. The result of the collection will be the creation of a separate platform as part of the UMC site or a regional specialty designed to provide travel planning with different vehicles, providing up-to-date information in real time to users at all stages of their journey.

*Indicative value*

32 million  
BGN

*Conversion period*

till 2025

Regarding the Mobility Management Center and the Regional Portal, in the short term it is proposed to institute the establishment of a traffic control and regulation center to monitor and manage events, ongoing (scheduled) and emergency repairs in the city, rallies, processions and other events, exploit traffic regulation systems and provide data to other agencies and agencies. At present, there is a traffic control center at the Traffic Management Directorate of the Metropolitan Municipality, the Public Transport Control Center in the CCCTB Department of the Public Transport Directorate of UMC EAD. Separately, the Metropolitan Directorate of Internal Affairs operates such as the latter, together with the Sofia Municipality, operate a security control center.

In the long term (up to 2035), a project is proposed to integrate all mobility functions into a single center to take over all aspects of mobility, parking and security regardless of the type of vehicle used, creating a unified and coordinated structure with the appropriate infrastructure.

The single traffic control center should have access to video and traffic information collection and processing systems, free or available parking spaces, ways of targeting those places, bicycle rental, car rental, shared cars, taxis incl. and route, rail, etc., with real-time information about their condition (availability of free bikes on the stands, vacancies in route taxis, etc.). Information from the center should be provided through the appropriate means and forms of citizens through the media, electronic VMS, Internet, mobile sites and applications. Its information will build on the MaaS platform with new functionalities and services (through a regional portal and / or mobile application).

The main objective will remain the management of the complex mobility system in the metropolitan city with a focus on the security and the provision of mobility, incl. and in crisis situations. An example of such a system, which will be developed during this Period, will be the incident management system.





## Mobility Management Center and Regional Portal

**№ 3.4.3**

<i>PROJECTS AND SYSTEMS</i>	<i>Amount (million BGN)</i>	<i>Implementation of technologies:</i>
A single traffic control center, for collecting, processing and delivering traffic information, managing the information, intermodal platform, and providing feedback to citizens.	18	<i>Implementation of technologies:</i> - Specialized software and hardware - Web based forms for individual service requesting, visualization techniques, GIS functionalities, travel planning upgrade algorithms, dynamic web portal for dissemination of information and public transport services.
Regional Internet Portal - includes other channels - mobile applications, VMS, kiosk devices and other media .	14	
		<i>Indicative value</i> 32 million BGN <i>Conversion period</i> till 2035

Although the public transport system also has social functions and aims to deliver the service to as many people as possible, it needs to be analyzed and optimized periodically. Optimization consists of closing, changing and opening new routes to adapt the system to new subway sections, expanding the city and concentrating the construction of new residential and business buildings in certain areas of the city and other urbanization factors. A change in the traffic intervals of individual lines must also be added to the optimization. Low-frequency lines are practically unattractive for passengers, work inefficiently and can not be an alternative to private cars. On the other hand, public transport coverage must be at a good enough level to make it a real alternative to cars.

Applying a system approach requires the use of appropriate process modeling tools. Measure included in NIP and RURME-2012.



## Creating a **complete transport model** and implementing a system approach to optimize the route network

### № 3.4.4

The project consists of three main activities and is expected to cover Period 2021 - 2035 (except for the last one-time activity):

<i>Indicative value</i>	1,6million BGN
-------------------------	----------------

<i>Conversion period</i>	till 2035
--------------------------	-----------

- Creating and maintaining a comprehensive transport model involving all transport networks and modes and modeling demand - the model will serve as a basis for the development of forecast models for different future horizons
- Tracking the workload of passengers at stops and lines and conducting specialized survey surveys on the quality of service and the behavior of travelers (once every two years within the same Period of the Year for the purpose of comparability of results)
- Drawing up a study on the effectiveness of opening bus lines to transport pupils (up to 5 to 6) to school to alleviate road traffic and parking problems - including holding parental polls, collecting, summarizing and analyzing data and suggestions for test routes for which data shows a high load, as well as a ban on parking or completely closing streets in the immediate perimeter around schools at certain times

### Specific objective 3.5 Improving intermodality

The construction of new intermodal centers will stimulate the use of public transport and will improve travel time.

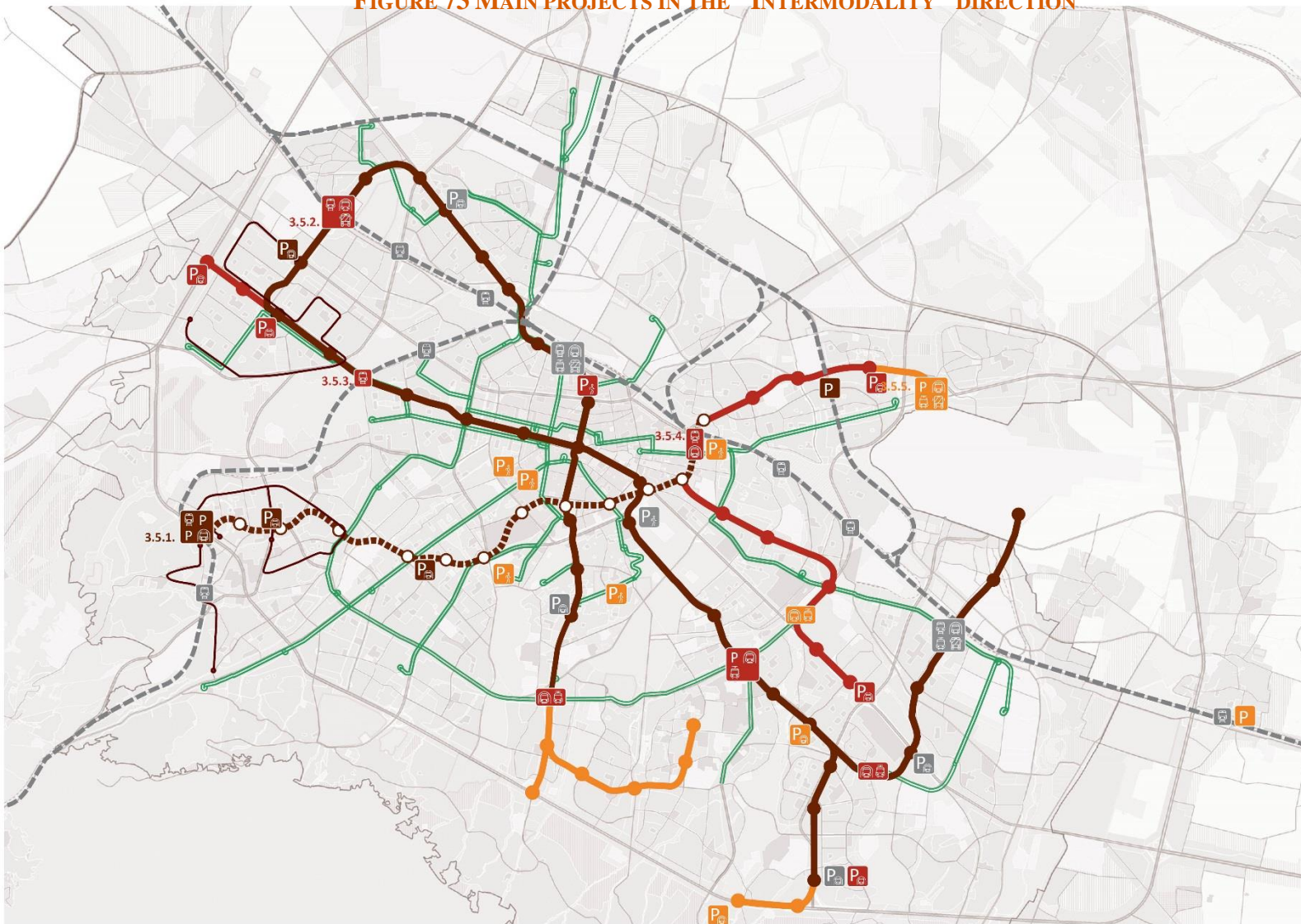


## Exploration and construction of intermodal nodes

#### № 3.5.1 to 3.5.6

	Intermodal node	Amount (million BGN)	Period
3.5.1.	Building a new railway Ovcha Kupel stop (with pedestrian underpass under the railway line and pedestrian tunnel at MS 18, built within the 3 rd metro diameter building project)	0,36	2020
3.5.2.	Construction of the Obelya intermodal junction, consisting of a new metro station, railway station. station, bus station and bicycle parking	37,25	2025
3.5.3.	Construction of a new railway station Vardar	0,36	2025
3.5.4.	Building a new railway Chavdar stop with a pedestrian underpass under the railway line and a pedestrian tunnel connected to MS 6 on the 3rd metro	2,16	2025
3.5.5.	Feasibility study and construction of the Botevgradsko shosse intermodal junction, consisting of a metro station, a bus station and a buffer parking lot	43,56	2035
3.5.6.	Structure study exploring possible locations for a new bus station	0,042	2025
		<i>Total number</i>	5 pcs.
		<i>Indicative value</i>	83,7million BGN

FIGURE 73 MAIN PROJECTS IN THE "INTERMODALITY" DIRECTION"



## 3. ОБЩЕСТВЕН ТРАНСПОРТ И ИНТЕРМОДАЛНОСТ

### 3.5. ПОДОБРЯВАНЕ НА ИНТЕРМОДАЛНОСТТА

#### Етап 1: 2019-2020

- 3.5.1. Изграждане на нова ж.п. спирка Овча купел (с пешеходен подлез под жп линията и пешеходен тунел при МС 18 на 3-ти метродиаметър)

#### Етап 2: 2021-2025

- 3.5.2. Изграждане на интермодален възел „Обеля“, състоящ се от нова метростанция, ж.п. гара, автогара и велосипеден паркинг  
3.5.3. Изграждане на нова ж.п. спирка Вардар  
3.5.4. Изграждане на нова ж.п. спирка Чавдар с пешеходен подлез под жп линията и пешеходен тунел, свързан с МС 6 на 3-ти метродиаметър

#### Етап 3: 2026-2035

- 3.5.5. Предпроектно проучване и изграждане на интермодален възел „Ботевградско шосе“, състоящ се от метростанция, автогара и буферен паркинг



**Legend:**
**3. PUBLIC URBAN TRANSPORT AND INTERMODALITY**
**3.5 Improving intermodality**
**Stage 1:2019-2020**

- |        |  |
|--------|--|
| 3.5.1. | Building a new railway Ovcha Kupel stop (with pedestrian underpass under the railway line and pedestrian tunnel at MS 18, built within the 3 rd metro diameter building project) |
|--------|--|

**Stage 2:2021-2025**

- |        |   |
|--------|---|
| 3.5.2. | Construction of the Obelya intermodal junction, consisting of a new metro station, railway station. station, bus station and bicycle parking      |
| 3.5.3. | Construction of a new railway station Vardar  |
| 3.5.4. | Building a new railway Chavdar stop with a pedestrian underpass under the railway line and a pedestrian tunnel connected to MS 6 on the 3rd metro |

**Stage 3:2026-2035**

- |        |  |
|--------|--|
| 3.5.5. | Feasibility study and construction of Botevgradsko shosse intermodal junction, consisting of a metro station, a bus station and a buffer parking lot |
|--------|--|

**Stage 1:2019-2020**
**Stage 2:2021-2025**
**Stage 3:2026-2035**
**Existing metroroutes and stations**
**metroroutes and stations under construction**
**new metroroutes and stations**
**existing tramways**
**new lines with incoming functions**
**Existing / new intermodal node**
**Existing / new train station**
**Metro and tram connection**
**Metro and railway connection**
**Existing / new buffer parking to the underground**
**Existing / new parking for CUA**



### Specific objective 3.6 Introducing integrated charging for rail and public transport

The integration of the railway transport with the mass urban transport on the territory of the municipality allows the use of public transport within a certain region (city, suburban area, etc.) regardless of the different modes of transport, tariffs, fees, schedules, ticket systems and others. From the point of view of passengers, integrated transport is a more attractive service because public transport is represented by the vision of a single service with one timetable, one ticket and one tariff. In connection with the integration of the tariffs of "BDZ - PP" EOOD with those of Sofia Municipality, provision should be made for changes in the legal framework:

- Ordinance No 43/2001, providing for:
  - the possibility of recognizing transport documents (within one trip or one route) for the carriage of passengers on the territory of the Sofia Municipality and / or
  - the offering of general terms and prices from BDZ - PP Ltd and other carriers (which are not railway undertakings) in case of consecutive provision of public transport to passengers.
- Ordinance on the terms and conditions of travel by public transport on the territory of Sofia Municipality, provided:
  - recognition of transport documents issued by BDZ - PP Ltd (within one trip or one route), and / or
  - the offering of common conditions and prices with BDZ - PP EOOD in the cases of providing integrated public transport of passengers.

The next step after the implementation of the above changes is the creation of an integrated document for the transport of passengers by rail and public transport on the territory of Sofia Municipality. In view of the regulation of the integrated transport document, additional amendments should be made to the regulatory framework (Ordinance on the terms and conditions of travel by public transport on the territory of Sofia Municipality and Ordinance No. 43/2001), by providing and regulating:

- the order for issuing the integrated transport document;
- Models of the integrated transport documents for joint public transport of passengers with "BDZ - PP" EOOD;
- sanctions for infringements related to integrated transport documents.

It is of particular importance to envisage the structure and functions of the transport organization (new entity or UMC), which should undertake the tasks related to the integration of public transport:

- General transport planning, including general route planning and route schedules, to ensure connections between modes of transport;
- providing for rules and procedures for mutual recognition of tickets within a single route and mutual recognition of tickets within the same transport network;
- introduction and development of an integrated tariff system and pricing;

- distribution of revenue from the sale of integrated transport documents and receipts from subsidized and compensated shipments;
- quality management and service level planning;
- control over the execution of the transport task and the regularity of the passengers.
- customer service and public information, marketing and public relations.

## 4. Parking

### Specific objective 4.1. Stimulate parking in storey and underground parking spaces at the expense of street parking

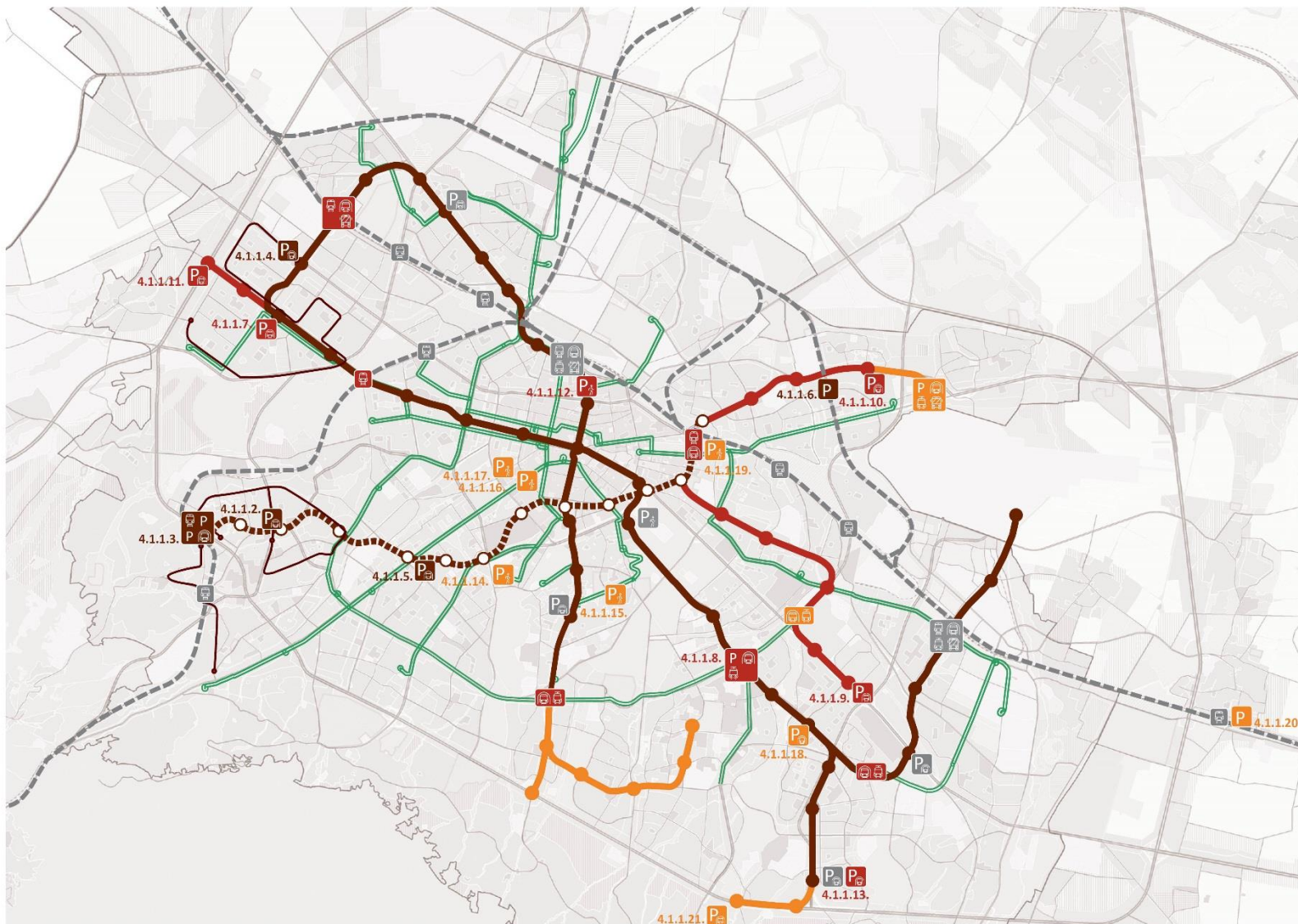
The analysis shows that parking is a problem not only in the center of Sofia but also in other parts of the city. This is especially true for the new residential quarters in the southern territories of Sofia. Street cars are becoming more and more obstructed by the normal bandwidth of the network. At the same time, motorization continues to grow and by the end of 2016 it is 515 per 1000 inhabitants. The incentive to park in underground and storey car parks as well as the expansion of the buffer parking system around the metro stations and the CUA is an important prerequisite for releasing the streets from parked cars.

The center of Sofia is an area full of diverse activities, which naturally attracts a lot of traffic. At the same time, the movement and parking in the center is very difficult due to the loading of cars. To ease the movement without worsening the service, it is proposed to build parking lots in the immediate vicinity of the CUA.

Attracting new passengers to urban transport is one of the objectives of this plan. This can only be done by creating the right conditions for doing so. At present, some of the areas around the metro stations are saturated with parked (often incorrect) cars.

Buffer parking lots have proven track record to reduce travel by car. They are located on the outskirts of the city near such public transport stops that provide direct, convenient and quick connection to the city center.

FIGURE 74 MAP OF THE MAIN PROJECTS IN THE "PARKING"



## 4. ПАРКИРАНЕ

### 4.1. РАЗШИРЯВАНЕ НА СИСТЕМАТА ОТ БУФЕРНИ ПАРКИНГИ ОКОЛО МЕТРОСТАНЦИИ И ТАКИВА БУФЕРИРАЩИ ЦГЧ

4.1.1. Изграждане на нови буферни паркинги (включително изграждане на велосипедни паркинги)

#### Етап 1: 2019-2020

4.1.1.1. Проучване на възможности за изграждане на наземни многоетажни паркинги и подземни паркинги (в т.ч. изграждане на велосипедни паркинги), буфериращи ЦГЧ и жилищните квартали

4.1.1.2. Изграждане на паркинг на МС Овча купел 2 с подходящ капацитет до 400 ПМ

4.1.1.3. Изграждане на паркинг на МС Горна баня с подходящ капацитет до 150 ПМ

4.1.1.4. Довършване на паркинг на МС Сливница капацитет 300 ПМ

4.1.1.5. Изграждане на буферен паркинг на МС 14 Красно село с капацитет до 200 ПМ

4.1.1.6. Изграждане на наземен паркинг на ул. „Рилска обител“ под естакадата на бул. „Владимир Вазов“

#### Етап 2: 2021-2025

4.1.1.7. Изграждане на паркинг на МС Люлин с подходящ капацитет до 400 ПМ

4.1.1.8. Изграждане на паркинг на МС Г.М. Димитров с подходящ капацитет до 500 ПМ

4.1.1.9. Изграждане на паркинг до Окръжна болница (последна станция на трета линия на метрото)

4.1.1.10. Изграждане на паркинг на МС 2 на трета линия на метрото (ул. „Станислав Доспевски“)

4.1.1.11. Изграждане на буферен паркинг на СОП и бул. „Царица Йоана“

4.1.1.12. Изграждане на подземен паркинг под бул. „Мария Луиза“ от бул. „Сливница“ в посока централна гара

4.1.1.13. Развитие на съществуващия буферен паркинг при МС Бизнес парк

#### Етап 3: 2026-2035

4.1.1.14. Изграждане на подземен паркинг под Стадион Раковски

4.1.1.15. Изграждане на подземен паркинг под бул. „Джеймс Баучър“

4.1.1.16. Изграждане на подземен паркинг под бул. „Македония“

4.1.1.17. Изграждане на подземен паркинг под ул. „Добруджански край“

4.1.1.18. Изграждане на паркинг на МС Младост I с подходящ капацитет до 300ПМ

4.1.1.19. Изграждане на паркинг до пазар Подуене

4.1.1.20. Изграждане на паркинг при гара Казичене

4.1.1.21. Изграждане на буферен паркинг в близост до последната спирка на бъдещото продължение на първа линия на метрополитена при Симеоновския лифт

#### Етап 1: 2019-2020

#### Етап 2: 2021-2025

#### Етап 3: 2026-2035

Съществуващи метро трасета и станции

Метро трасета и станции в строеж

Нови метро трасета и станции

Съществуващи трамвайни трасета

Нови линии с довеждащи функции

Съществуващ/ Нов интермодален възел

Съществуваща/ Нова жп гара

Връзка метро и трамвай

Връзка метро и жп

Съществуващ/ Нов буферен паркинг към метрото

Съществуващ/Нов паркинг към ЦГЧ



**Legend:****4. PARKING****4.1 Expansion of the system of buffer parks around subway stations and such buffering CUAs****4.1.1. Construction of new buffer parking lots (including the construction of bicycle parking lots)****Stage 1:2019-2020**

4.1.1.1.	Exploration of options for the construction of ground multi-storey car parks and underground parking lots (including the construction of bicycle parking lots) buffering the central city area and the residential neighborhoods
4.1.1.2.	Build a parking lot of the Ovcha Kupel 2 MS with an adequate capacity of up to 400 PS
4.1.1.3.	Build a parking lot on the MSGorna bathroom with an adequate capacity of up to 150 PS
4.1.1.4.	Finishing a parking lot at MS Slivnitsa with a capacity of 300 PS
4.1.1.5.	Construction of a parking lot of MS 14 Krasno selo with capacity up to 200 PS
4.1.1.6.	Construction of an underground parking lot on the Rilska Obitel Str. under the stack of "Vladimir Vazov" Blvd.

**Stage 2:2021-2025**

4.1.1.7	Construction of parking lot at MS Lyulin with an adequate capacity up to 400 PS
4.1.1.8.	Building a parking lot at MS GM Dimitrov with an appropriate capacity of up to 500 PS
4.1.1.9.	Building a parking lot next to the Regional Hospital (last station on the third line of the metro)
4.1.1.10.	Construction of MS 2 parking lot on the third line of the metro (Stanislav Dospevski Str.)
4.1.1.11.	Construction of a buffer parking lot of SRR and "Tsaritsa Yoana" Blvd.
4.1.1.12.	Construction of underground parking lot under "Maria Luiza" Blvd. from Slivnitsa Blvd. in the direction of the central station
4.1.1.13.	Development of the existing parking lot at MS Business Park

**Stage 3:2026-2035**

4.1.1.14.	Construction of an underground parking lot under the Rakovski Stadium
4.1.1.15.	Construction of an underground parking lot under James Boucher Blvd.
4.1.1.16.	Construction of an underground parking lot under "Macedonia" Blvd.
4.1.1.17.	Construction of Underground Parking under "Dobrudjanskikrai" str.
4.1.1.18.	Construction of a parking lot of MS "Mladost I" with an adequate capacity of up to 300 PS
4.1.1.19.	Build a parking lot next to Poduene market
4.1.1.20.	Construction of a parking lot at Kazichene Station
4.1.1.21.	Construction of a buffer parking lot near the last stop of the future extension of the first line of the metropolitan at Simeonovski lift



Stage 1:2019-2020

Stage 2:2021-2025

Stage 3:2026-2035

Existing metroroutes and stations

metroroutes and stations under construction

new metroroutes and stations

existing tramways

new lines with incoming functions

Existing / new intermodal node

Existing / new train station

Metro and tram connection

Metro and railway connection

Existing / new buffer parking to the underground

Existing / new parking for CUA

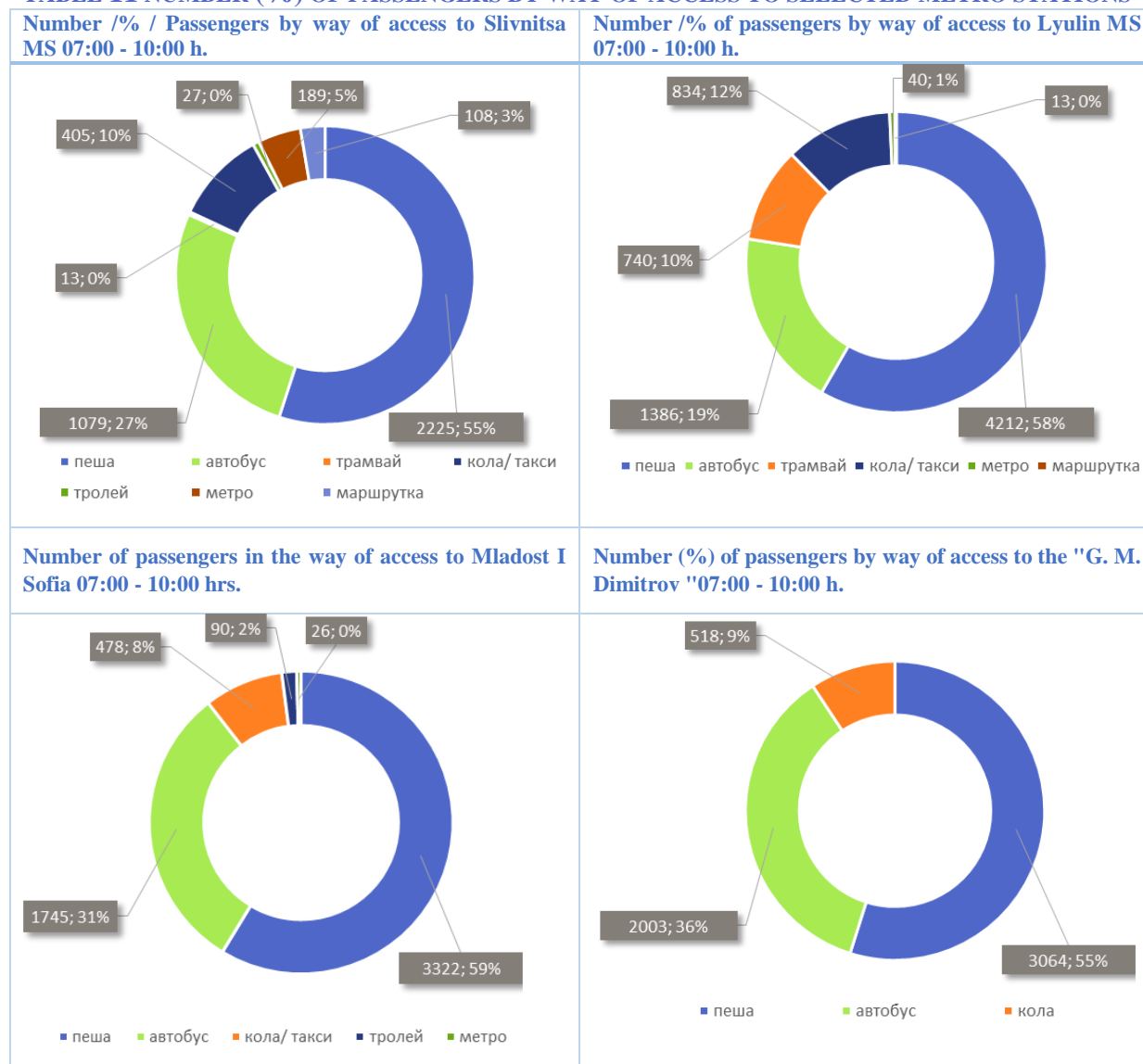
P	Construction of new <b>buffer parks</b> and such buffering CUAs		
	№ 4.1.1.1 to 4.1.1.22		
	Buffer parks	Parking spaces	Period
4.1.1.1	Exploration of options for the construction of ground multi-storey car parks and underground parking lots (including the construction of bicycle parking lots) buffering the central city area and the residential neighborhoods	N/A	2020
4.1.1.2	Build a parking lot of the Ovcha Kupel 2 MS with an adequate capacity of up to 400 PS	400	2020
4.1.1.3	Construction of a parking lot at MS Gorna Bania with an adequate capacity of up to 150 PS	150	2020
4.1.1.4	Finishing the parking of MS Slivnica capacity 300 PS	300	2020
4.1.1.5	Construction of a parking lot of MS 14 Krasno selo with capacity up to 200 PS	200	2020
4.1.1.6	Construction of an underground parking lot on the Rilska Obitel Str. Under the bulwark of "Vladimir Vazov" Blvd.	150	2020
4.1.1.7	Construction of parking lot at MS Lyulin with an adequate capacity up to 400 PS	400	2025
4.1.1.8	Building a parking lot at MS GM Dimitrov with an adequate capacity up to 500 PS	500	2025
4.1.1.9	Building a parking lot next to the Regional Hospital (last station on the third line of the metro)	300	2025
4.1.1.10	Construction of MS 2 parking lot on the third line of the metro (Stanislav Dospevski Str.)	200	2025
4.1.1.11	Construction of a buffer parking lot of SRR and "Tsaritsa Yoana" Blvd.	250	2025
4.1.1.12	Construction of underground parking lot under "Maria Luiza" Blvd. from Slivnitsa Blvd. in the direction of the central station	500	2025
4.1.1.13	Development of the existing parking lot at MS Business Park	150	2025
4.1.1.14	Construction of an underground parking lot under the Rakovski Stadium	400	2035
4.1.1.15	Construction of Underground Parking under "JMSM Boucher" Blvd.	300	2035
4.1.1.16	Construction of an underground parking lot under "Macedonia" Blvd.	740	2035
4.1.1.17	Construction of Underground Parking under "Dobrudjanski"	100	2035
4.1.1.18	Construction of a parking lot of MS "Mladost I" with an adequate capacity of up to 300 PS	300	2035
4.1.1.19	Construction of a parking lot next to Poduyane market	200	2035
4.1.1.20	Construction of a parking lot at Kazichene Station	200	2035
4.1.1.21	Construction of a buffer parking lot near the last stop of the future extension of the first line of the metropolitan at Simeonovski lift	200	2035
4.1.1.22	Construction of car parks in residential quarters through PPP	1 000	
4.1.1.22.1	Construction of car parks in residential quarters through PPP in the period 2021 - 2025	400	2025
4.1.1.22.2	Construction of car parks in residential neighborhoods through PPP in period 2026 - 2035	600	2035
Total parking places Indicative value		6940 pcs. 82,6 million BGN	

### Buffer parking lots around metro stations

The choice of metro stations for a more detailed study is based on a poll conducted to metro passengers, with metro stations accommodating the concept of traffic congestion in the city center presented in this plan. The purpose of the survey is to find out how metro passengers have reached the station and how the journey will continue after the trip. Thus, in practice, a travel matrix is created for all who have used the metro within the time interval of the survey itself.

Data analysis shows that in some metro stations a large portion of the morning peak is using a car to reach the metro station. This supports the idea of building new buffer parks around metro stations where there is such demand.

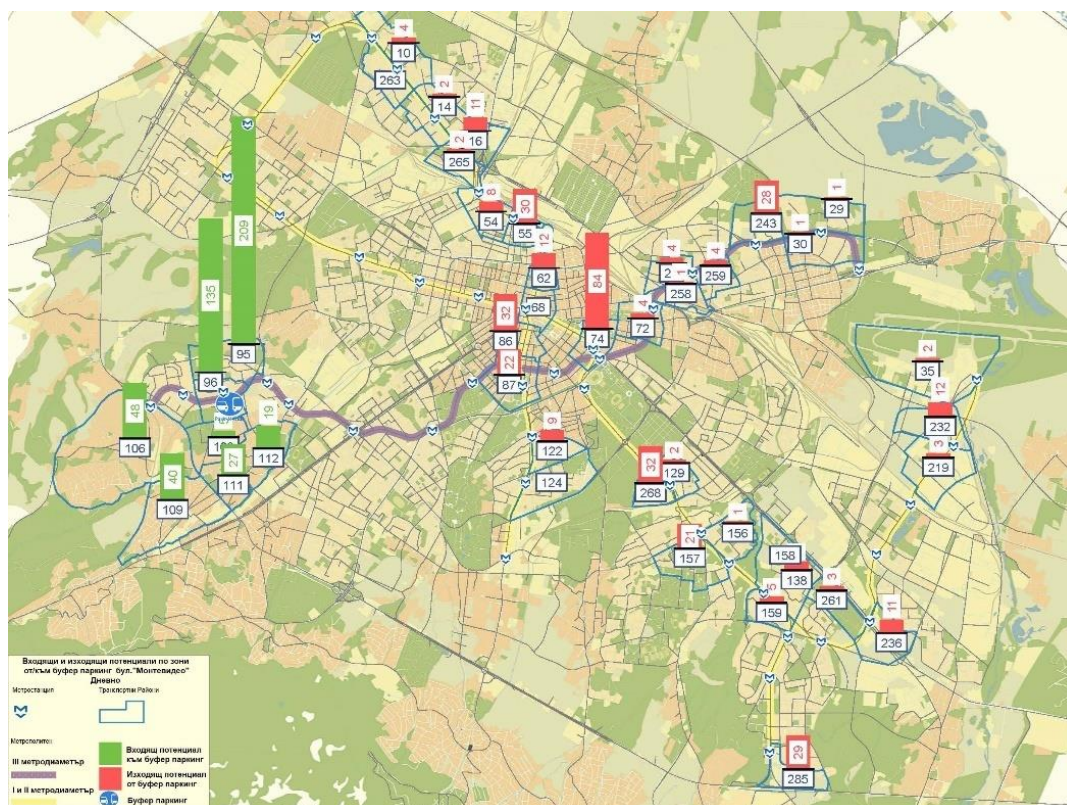
**TABLE 11 NUMBER (%) OF PASSENGERS BY WAY OF ACCESS TO SELECTED METRO STATIONS**



The search for car parks around metro stations is based on simulation of P & R journeys. The illustrated schematic illustrations illustrate the O / D matrix of travelers who left by car, stopped at a parking lot at the metro station and then continued on a subway. With an appropriate tariff policy, it is advisable to build such car parks in:

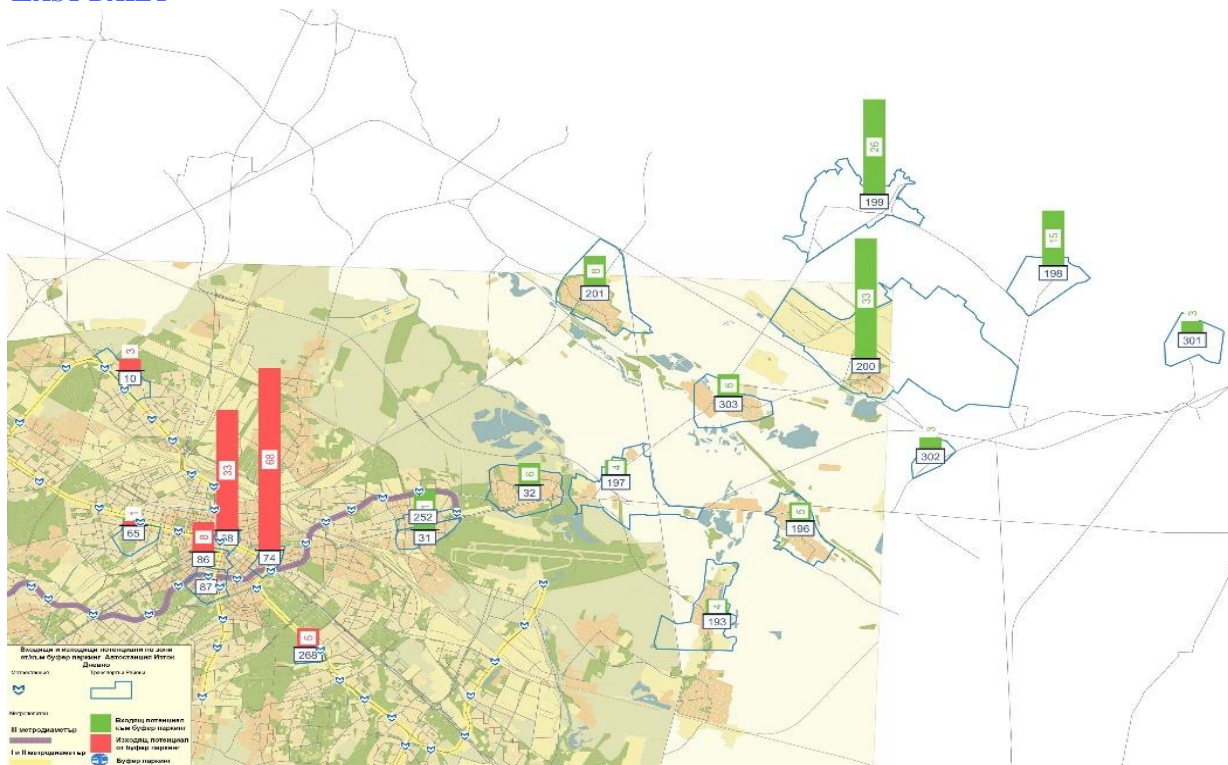
- MS "Montevideo"

**FIGURE 75 INPUT AND OUTFLOW POTENTIALS PER ZONES FROM / TO BUFFER PARKING MONTEVIDEO BLVD. DAILY**



- Demand for this car park at the most favorable financial terms for stays and low reported "cost savings" in simulations amounts to more than 450 vehicles.
- - MS "Botevgradsko shose"

**FIGURE 77 INPUT AND OUTPUT POTENTIALS BY ZONE TO / FROM BUFFER PARKING AUTO EAST DAILY**





The simulation shows a search of 126 vehicles, but the number of cars from more distant destinations has not been reported. Simultaneously, only work trips were taken into account in the simulations.

### Parks buffering CUA

For the CUA-buffering car parks, research has also been made on potential locations for their construction. The main conclusions are presented below:

*Construction of underground parking on two levels under Macedonia Blvd between "Hristo Botev" Blvd. and "Ruski Pametnik" Square for about 740 cars*

Parking rates could be cheaper than those in the blue zone, while downtime - extended. With the realization of this parking lot will be released parking lots at the level of terrain in the area around the parking lot. It is included in the IURDP program by 2020. It is valued at 11,156 million BGN. The purpose of the parking lot is to pedestrize the Central City Area and provide parking spaces for the residents of the area. This is the role of the next proposed parking lot.

*Design and construction of underground parking levels on "Maria Luisa" Blvd between Central Railway Station and "Slivnitsa" Blvd.*

After the breakthrough "E. Nikolaev" is a reassessment and reassurance of the function of Maria Luisa Blvd. In the context of the concept of a reduction plan for parking in the CUA and its buffering with underground parking lots, it is expedient to draw up a project that is fully in line with the existing metro route.

*Parking at the Rakovski Stadium*

*Construction of an underground parking lot under James Boucher Blvd.*

For these two car parks, there is still a need to study the way of access and the appropriate size. Their construction also implies the release of parked vehicles at terrain level in the area.

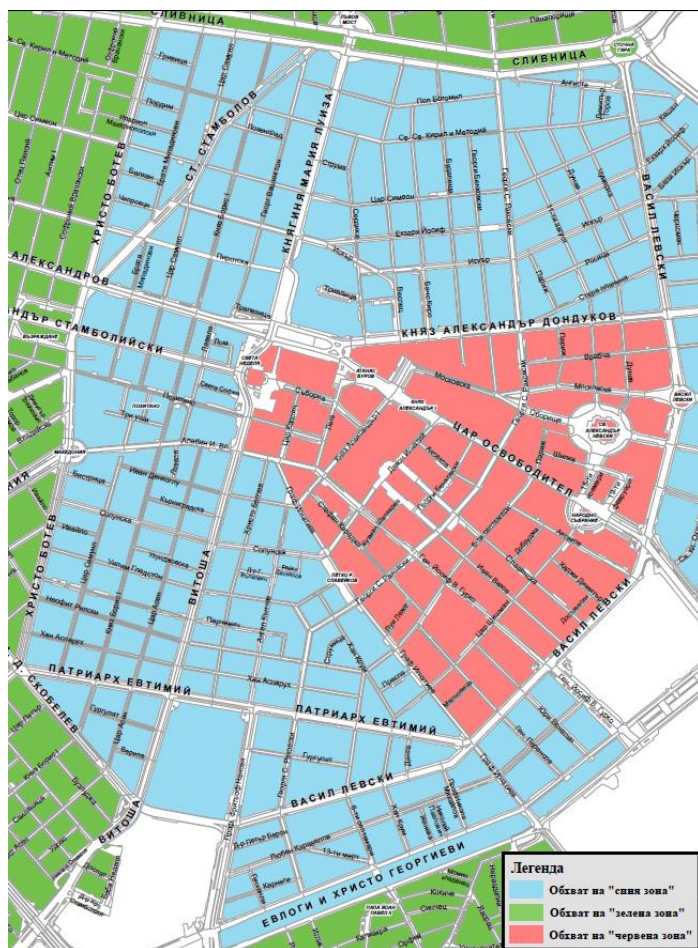
*Construction of Underground Parking under "Dobrudjanski"*

Parking can take about 100 PMs on one level. The construction of this parking lot and parking lot

## Specific objective 4.2. Improve the management and regulation of parking in the areas

In the context of improving the management and regulation of parking, a parking management program, which is part of the current Plan, has been developed. The proposed parking policy and measures can be grouped as follows:





□ Measures with regard to paid parking areas:

o In the medium term - by 2025:

□ Establishing a new Red Zone for paid parking in the ideal tourist center of the city, with the option of being identified as an area with a minimum quantity of PPPs. It is proposed that the area be from Vassil Levski blvd through Alexander Dondukov Blvd to Vitosha Blvd., then through Alabin Street and Graf Ignatiev Street - back to Vassil Levski Blvd.

□ Extending the scope of the Blue Zone and the Green Zone. The creation of the new "Red Zone" implies a change in the Blue Zone, mainly in the north and east, mainly at the expense of the existing "Green Zone" due to the greater pressure exerted by the cars to

be displaced from the historic center. Similarly, such extension is also required for the "Green Zone", mainly in the north, as shown in the scheme.

- Separation of separate "Green Zones" outside the compact "Green Zone", for example, in the area of "Business Park" in the district. Mladost 4 and in the district Lyulin in the area of Pancho Vladigerov Blvd. The Ordinance for organizing the movement on the territory of Sofia Municipality allows the introduction of Green Zones outside the boundaries defined in Art. 55 in case of problems with parking or under other conditions such as:
  - • Traffic organization problems;
  - • A large number of violations of the TDCA;
  - • Proposal by the district administration, municipal councilors, citizens, business entities, etc.
- This concerns zones that have developed in recent years as mixed-zone zones - with increased business, commercial or public functions where it is necessary to balance the needs of different users where traffic organization problems arise and there is unauthorized parking in green areas and on the sidewalks.
- Introducing "Yellow spots" for paid parking around public buildings, public buildings, hospitals, tourist and other sites. These places can only be used for locally paid parking - up to 1 hour in the Red Zone and the Blue Zone and up to 2 hours in the Green Zone and beyond, without parking from residents with vignettes stickers, electric cars or service subscribers. Tariff policy should be in line with the pricing policy for the respective paid parking area, and the "Yellow spots" outside the zones should be aligned with the Green Zone price levels.
- in the long run until 2035 - a gradual expansion of the green zone.

Measures aimed at regulating local paid parking by residents:

- o limiting the number of personal PPCs that can be parked in the paid parking area for a certain fee - up to one vignette sticker of a separate residential property in the Red Zone and two in the Blue Zone and Green Zone, ;
- o limiting the right to PNR to physical persons who manage PPPs and live in the property when applying strict control when issuing the vignette sticker;
- o monitoring and analyzing the abuses used to obtain the right to PTA and initiating regulatory changes to limit them.

Measures targeting the category of users of "Business Subscription":

- o limiting the number of seats given through the Service subscription service on certain streets or sections thereof so that mandatory parking space and / or turn into "yellow spots" must be left open;
- o defining discounts when replacing the fleet with smaller and / or environmentally friendly PPPs - electric cars, hybrids, etc .;
- o to encourage the use of public or alternative transport by issuing free maps for the use of public transport, organizing combined transport at the expense of the individual, etc. similar;
- o discounts on building a bicycle parking lot, shared services, etc.
- o Optimizing the transports carried out by the specialized automobiles of Sofia Municipality in order to reduce their total number.
- ☐ Measures aimed at preferential parking for disabled persons for the transport of persons with disabilities
- o strict control over the validation of the rights of people with disabilities;
- ☐ Measures targeting the category of users - guests of the capital
- o determining a form of control (stopping, stopping and parking) and driving buses (issuing permits, as well as identifying parking and waiting areas), which enter mainly in a central city area;
- o creating flexible packages - tariff and time plans for tourists visiting the city with personal / rented road transport in the areas;
- o Introduction of parking control on weekends (mainly Sunday) and at night hours to allow normal access to tourist and leisure facilities.

Achieving this specific goal involves implementing the following measures and projects:

Achieving any desired goal is possible only if the measures taken are strictly followed, and this is done with increased control. Increasing control of parking by the authorities responsible for it is an important condition for regulating urban order, with particular attention being paid to parking

in green areas, sidewalks and several rows.

Where parking is controlled, it must be ensured that the latter does not obstruct the flow of traffic and does not cause safety problems. The plan is for the implementation of a pilot project for the locations and areas of the CUA where CCTV cameras allow the automatic identification of the ID numbers. By creating an appropriate information system for this purpose, entry and exit vehicles can be registered and checked in public car parks or in the parking areas ("Blue and Red Zone"). It can control the length of stay of the vehicle in the car park or in the area calculated on the basis of the paid time of stay. The pilot project proposed for implementation has a tremendous potential as it would be able to control all road users, starting with CUA - parked vehicles, home, taxi, freight and tourist vehicles, etc. When demonstrating its effectiveness and efficiency, the system should be built and exploited in the post-2025 period.

For the technical implementation of the parking reporting system, the available radio networks built by the different operators can be used to register mounted sensors in parking spaces in each parking space. Possible upgrades after 2025 can be achieved by increasing the number of sensors in areas of areas not covered by them, as well as upgrading the system towards setting up a reservation service on site, booking parking time, etc. . These services will support the planned occupancy of the parking lots, the introduction of flexible tariffs, the effective management of the built areas and the comfort of the citizens on the territory of Sofia Municipality.

### **Specific objective 4.3. Conducting a flexible pricing policy to regulate parking in areas**

Pricing policy is a means of regulating parking. Continuous analysis and monitoring of filling and price changes will result in the regulation of vehicle pressure. Measures in the field of pricing policy include:

- ☐ Increase in street parking charges to stimulate off-road parking. An average occupancy of over 85% of the parking space is a condition for increasing the price in the area. At present, the blue zone parking space occupancy exceeds 85%, which signals a change in the cost of stay in the area. A first-step 50% price increase is offered in the area.
- ☐ Change in Paid Parking Tariff, stimulating short-term parking, such as increasing the parking price for the second hour in the Blue Zone and the Green Zone for the third and fourth hour. Introducing a flexible pay-per-hour parking model of the Start-Stop example to introduce a floating (dynamically increasing) parking rate with increased time. Payment through modern forms of ICT - mobile applications with or without an electronic wallet, with attached credit / debit card, via SMS or via the internet available to every mobile plan (GPRS).
- ☐ Limit the number of "Business subscription" places in the zones and increase their prices in line with the increase of the prices in the zones.
- ☐ Increasing the prices in the paid parking areas in the price increase for the LPP - for a monthly, yearly and two-year vignette sticker.

**P** **Measures to control and regulate parking in areas**

**№ 4.2.1 to 4.2.5**

Measure		Amount(milli on BGN)	Period
4.2.1.	Conduct a study on the employment of paid parking areas and the areas around them	0,08	2020
4.2.2.	Implementation of an integrated CCTV control system and parking recording system		
4.2.2.1.	Implementation of an integrated CCTV system and occupancy accounting system for a parking space in the "blue" and "red" areas	8,6	2025
4.2.2.2.	Implementation of integrated CCTV control system and occupancy accounting system of a parking space in the green zone	18,6	2035
4.2.2.3.	Supply of specialized vehicles for forced displacement	3,0	2025
4.2.3.	Supporting the routing of transport flows:		
4.2.3.1.	Changing the location of existing information signs showing free parking spaces	0,12	2020
4.2.3.2.	Supporting the routing of transport flows	12,0	2025
4.2.4.	Extension of Paid Parking Areas:		
4.2.4.1.	Change and extension of the scope of paid parking areas in the period 2021 - 2025	5,0	2025
4.2.4.2.	Change and extension of the paid parking areas in the period 2026 - 2035	5,3	2035
4.2.5.	Information campaign to change citizens' attitudes about mobility and street parking	0,24	2020
		<i>Indicative value</i>	52,9million BGN

## 5. Electric cars and shared mobility

### Specific objective 5.1. Accelerated construction of charging infrastructure for EV in Sofia Municipality

- In the short term, the efforts of Sofia Municipality should be aimed at expanding the charging infrastructure in public municipal property and the installation of fast charging stations (with power  $\geq 50$  kW DC) at the entrances / exits of the main roads in the city and near the main Republican roads, which will greatly speed up the process of refueling electric vehicles and, moreover, connect with intercity transport corridors / roads. The need for significant energy resources to ensure electricity consumption for fast charging infrastructure and the actual state of the power distribution network and depleted power in the CUA are a good prerequisite for the charging stations to be located on the periphery of the city. The charging infrastructure in the CUA as well as in the business / office areas only remains for pop-up, and only a charging infrastructure with normal power can be developed there.
- For the development of fast charging infrastructure, it is necessary to develop a model (for types, locations, etc.) in cooperation between the municipality, the energy supplier and the private sector. Appropriate locations in neighborhoods and large retail outlets will be a good option given the affordability and wide range of potential users for full or partial quick refill.
- With the establishment of a regulatory framework regulating the possibility for a specific structure / unit in the municipality to be responsible for the permitting regime for the installation and operation of the charging infrastructure, the process of subsequent organization, management and control of the established network of charging stations in public spaces. To this end, it is also necessary to develop software that connects all (municipal and / or private) charging infrastructure operators on an online platform by providing information to all stakeholders about:
  - geographic location of charging stations;
  - Power of the charging station;
  - type of charging station;
  - connector type;
  - real-time information about the charging station mode (whether the charging station is free / busy);
  - cost of service;
  - Payment options for the service.





## Construction of **charging infrastructure for EV in Sofia Municipality**

**№ 5.1.1 и 5.1.2**

The project includes:

- Establishment of a network of municipal fast-charging stations for EV on the territory of the city - in public buildings, public buildings, regional administrations, at the entrances / exits of the main roads in the city and near the main republic roads, around the big commercial sites .n.
- Establishment of a network of charging stations for EV on the territory of the city with private financing

Municipal charging stations

70 pcs.

Private charging stations

300 pcs.

Indicative value

3,1million BGN

Conversion period

till 2025

**Specific objective 5.2. Promoting and stimulating entry and use of EV**

- Development of systems for shared electric cars
- ☐ Introduction of incentives for entry and use of EV:
  - Continue free parking in blue and green zone for EV
  - Introduction of tax incentives for EV - for individuals, small and medium enterprises, taxi companies, carriers etc.
  - Gradual introduction of restrictions on the use of commercial vehicles with internal combustion engines
- ☐ Promote EV
  - Creating a mobile application for electromobility with useful information, a map of charging stations, services and more.
- Recommendations:
  - Introduce, together with the state, a program to subsidize the purchase of EV from private individuals and legal entities (small and medium-sized enterprises).

## 6. Urban logistics

### *Principles*

The approach to improving urban logistics in Sofia is based on the following principles:

- spatial planning - improved planning and adequate location of logistic bases in order to better integrate and interact with the surrounding environment; improved planning of areas around logistic bases.
- infrastructure - providing adequate transport infrastructure to enable the necessary transport activities, provision of suitable stopping and stopping places, etc .; provision of the possibility of combined transport of goods (road and rail) by means of an intermodal terminal outside the city;
- operation - introduction of extended working hours so that the transportation takes place at non-hours; appropriate deployment of distribution centers;
- technologies - implementing systems that give drivers real-time traffic information so that the route can be optimized; vehicle tracking and management systems (fleet management); systems for optimizing warehouse processes; use of newer vehicles that emit less emissions;
- administrative regulation - limiting supplies to non-time periods of the day - between 11:00 and 15:00, so as to reduce congestion; internalisation of external economic costs for the provision of transport services through fees; tightening the mode of limiting truck traffic;
- a concept for the development of rail freight within the city

Providing adequate transport infrastructure and quality spatial planning is a task for the municipality to be conducted in dialogue with logistics companies and the public. For example, the logistics companies located around Sofia Airport point to the need to improve the transport links of the area. One of the solutions is to build a link from Sofia Airport to the Krivina Ring Road, set in the GSP, thus eliminating the need to build the so-called "Riverside BouLEVArD", which passes by the railway station. Drujba and provoked discontent among the residents.

Another option is the construction of the planned street network around the Sofia World Forest subway station, thus stimulating the development of the part of NPP "Iskar Sever" which is suitable for warehousing and logistics activities.

The operational aspects of transport activities and the planning of the logistics bases themselves are, to a large extent, a problem for transport operators and users. Within the city, there is a need to optimize transport activities through the use of intelligent technologies. The observation of multiple vehicles equipped with GPS would allow a reliable determination of average traffic speeds on the street network at different times of the day and could serve to improve the routing of vehicles.

### *Changes in the legal framework*

- Like many other European cities, the logistics development strategy in Sofia is based on changes in the legal framework related to the gradual expansion of the restrictions, both on a territorial level (within the city) and in terms of their gradual introduction maximum degree of transparency and dialogue with stakeholders in the sector.
- The changes in the normative regulations as a method of optimizing the transport activities should be decided by the municipality in the direction of:
  - Limiting supplies in certain areas (usually central) to unfinished hours so as to reduce the difficulty for other travelers;
  - prohibiting carriers from accessing certain critical areas or limiting the range of operators who have access to these areas on the basis of emissions and / or permissible maximum mass;
  - provision of overpasses of heavy vehicles and easy access to logistics centers on the outskirts of the city;
  - internalisation of the external costs caused by transport activities, introducing fees for access to certain areas of the city (for example, zone "First").
- Changes in the legal framework (Road Traffic Law) should be made at national level, allowing local authorities and road owners to restrict traffic under the environmental norm.
- Regulating access to the city center as well as to other urban areas should be based on clear and common rules in terms of objectives such as traffic reduction, pollutant emissions or incentives for other more sustainable modes of transport. In the short term, and following changes to the TBT, the following restrictions may be introduced, prohibiting:
  - the entry of trucks and construction machinery with a maximum mass exceeding 4 tonnes in the "First" area which do not meet the requirements of EURO 4 - European exhaust standard;
  - Entry of PPPs with a permissible maximum mass up to 3.5 tonnes in the "Center" area, which do not meet the requirements of EURO 3 - European exhaust standard.
- In the long run, regulatory changes at municipal level should include:
  - Expansion of restrictions beyond those specified in Art. 28 tonne originally in the Center area, later in the First Zone, which tends to cover the entire city by 2035; a gradual extension after 2025 of the territorial scope of the Center zone and the First zone;
  - introducing a requirement for the gradual renewal of the available commercial vehicles with environmentally friendly vehicles meeting the minimum requirements of EURO 5 (European standard for exhaust gases) and electric cars in the First zone after 2025 -

introduction of a low-emission zone;

- • introducing incentives to carry goods with electric scooters, freight bikes and walking;
- • Complementing the measures prescribed for the implementation of controls to ensure compliance with the existing restrictions on lorries in the legislation;
- • reviewing the criteria for gaps and strict control based on a time control system in which the exclusion applies;
- • Obligation to prove that the places of loading and unloading provided in the immediate vicinity of opening new retail outlets. They can be designed for one or more freight vehicles and should be tailored to the size of the vehicles that will use them.
- • Entering the permitting mode for time and place for loading of the commercial premises; regulation of places for loading / unloading activities for existing commercial premises and / or introduction of reserved places in the paid areas for a limited period of time against payment; if for both an object and both options are not feasible - use a charging time window (for example, after 20 pm and overnight before morning morning peak). If commercial premises are located in residential buildings - using a charging time window (for example, only in the Period 20-22 hours) and regulating standards for silent vehicles, mainly electrical.

### *Make control of compliance with the restrictions*

The European Commission's White Paper on European Transport Policy for 2010 describes ITS as the use of information and communication technologies to facilitate the smooth transport of people and goods (European Commission 2001). In the SUMP Medium Term, several projects have been proposed - to extend the scope of the CCTV system and expand its functionality, particularly in terms of ANPR / LPR (Automatic Number Plate Recognition / License Plate Recognition) control technology of vehicles. The proposed project aims to provide regulatory and operational control of the flow of trucks that enter the city center by using these technologies. The objective is to introduce, in the medium or long term, additional measures based on the polluter pays principle (or the creation of an electronic system for fair reporting - street traffic load charges by individual suppliers), depending on the maximum allowable mass, meeting the requirements a specific European exhaust emission standard or another criterion.

Apart from calculating the charge for each vehicle, the introduction of the Controlled Access System will allow for the implementation of a number of secondary measures, such as flexible charging for truck stops at their separate locations and loading / unloading areas. The system will automatically calculate the stays of the vehicles and charge the respective owners. Payment may be made in a fully electronic way without the use of parking tickets, SMS shortcuts or mobile payment applications.

By coordinating the interests of participants in the logistics chain, existing urban freight transport practices along with ICT and ITS technologies can become organized urban logistics. One of the most important elements of the concept of urban logistics refers to certain cargo areas (bundles, consolidation centers) in connection with an increase in their number and the need for their balanced use and access to them. Together with the regulatory environment and the increase of control, a number of measures can be implemented to improve access through the information support system, such as on-site reservation, to carry out the necessary activities. For this purpose,



this functionality should also be available as a service in parking systems. The introduction of an IT system to manage the use of designated loading areas can reduce the congestion caused by truck drivers seeking or making unlawful braking and parking as a hindrance to traffic. At the same time, this system will also contribute to reducing delivery times, congestion and the consequences for the urban environment.

Last but not least, in the long term, the system will allow integration with long-distance freight transport systems, ITS rail, air and land transport systems respectively, so that the overall activity is organized more efficiently in order to reduce -the short separate delivery (ie, the least effective phase of freight transport).

### *Portfolio of solutions*

Some of the organizational measures may include incentives for companies to replace used vehicles with clean vehicles or technical measures - a significant increase in the number of electric charging stations. Urban development measures should offer the creation of various logistics centers in different parts of the city, with large warehouses located on the periphery, thus limiting the entry of large vehicles into the city. In case of proven necessity and following a private initiative in the vicinity of the outer ring, small logistic centers (warehouses or bases) from which the goods are distributed (sent and received) to and from the offices in the city. In the final segment (the so-called "last mile"), a set of measures can be implemented - from the choice of mode of transport and the way of delivery, through fixed hours of delivery outside off peak intervals to consolidation of deliveries (incl. different suppliers) so as to ensure a fair distribution of vehicles on transport infrastructure and guaranteeing environmental parameters. In order to select and take adequate measures, first of all, it is necessary to identify all participants in urban logistics and to observe the regulated rules of movement.

After the implementation of data collection and Sulp development projects, pilot projects can be launched after 2020 to meet ATR needs in Sofia. Such projects are:

1. The introduction of "green vehicles", in particular electric and hybrid, for urban logistics operations, is becoming a good solution for local administrations and logistics providers, aiming at the real implementation of sustainable development policies. Freight delivery bikes are increasingly used (for example in the Petite Reine scheme in Rouen, France or in the Gnewt Cargo scheme in London, UK). Environmentally friendly vehicles can also be used for sustainable own transport (for shops, businesses and citizens), for example through truck sharing schemes. Best practice research has shown that environmentally friendly vehicles have clear benefits in terms of reducing emissions and noise. In addition, they are easily accepted by the public and create a positive image that can be an important factor in helping to introduce new sustainable logistics services. Specifically, deliveries in Sofia should be carried out by limiting the city's rings. The outermost ring reaches the largest vehicles and unloads into logistic bases. From there in the city's interior, supplies continue with smaller vehicles, supplying electric mopeds, motorcycles and bicycles to the central city area.
2. The introduction of time constraints for freight transport is also a common practice in Europe. The loading of sites in Sofia may be limited to the time of the day (at certain times or at night) and during the stay.
3. ITS and technology have taken a crucial role in implementing modern solutions for urban

logistics. Most of the best practices examined include the use of ITS and other technical means - from cargo planning software to fleet monitoring systems, tracking, load measurement and vehicle occupancy solutions, automated vehicle identification (for example, registration number retention), monitoring and control systems. The introduction of services with advanced intelligent systems and information and communication technologies to optimize logistics processes, fleet management and supply planning is recognized as a major technological requirement by many cities.

4. The importance of integration between new urban logistics measures and urban planning and mobility is clearly outlined in the European best practices surveyed. The most common relationships relate to:
  - Location of urban consolidation and intermodal centers and their integration into the common urban (and regional) transport network;
  - The location of other urban logistics infrastructure, such as parking places for freight vehicles, places for loading and unloading, etc .;
  - Integrating sustainable urban logistics plans into the wider context of urban planning is a strategic issue both in designing and implementing a sustainable logistical measure.
5. Urban Consolidation Centers (UCC) - one of the measures implemented in European cities such as Vicenza, Lucca, Padua, Parma and Modena in Italy, La Rochelle in France, Thun in Switzerland, Bristol and Southampton in the UK and the Netherlands. UCC is a logistics facility located in close proximity to the geographic area it serves (eg the city center), from where consolidated supplies are made in the area. Generally speaking, the main purpose of UCC is to avoid the need for vehicles to deliver partly to the center of the city. In these facilities, supplies can be consolidated for subsequent delivery in the area via an appropriate vehicle in order to achieve a high level of freight efficiency. In Sofia, such centers could be built outside the central core on the initiative of the private sector.
- 6. The construction of low-emission zones is also a relatively new measure in European cities (eg Bologna, London, Maastricht, Prague, Randstad, Rotterdam, Utrecht, etc.). Access to and transit through areas may be controlled by barriers equipped with appropriate systems or simply labeled without special control technology. Charging systems can also be applied, for example by installing fixed and mobile cameras. The positive impacts and benefits of introducing low emission areas are significant, resulting in improved air quality due to reduced emissions from traffic. On the other hand, some challenges can be encountered before and during their introduction: stakeholder consultation can be long (and often contradictory), implementation costs may be high, etc.

## Rail transport for freight

The transport sector accounts for about 25% of the carbon dioxide emissions emitted in the EU. Cars are the biggest polluters, with car freight being expected to increase almost doubled by 2030. Multimodal transport provides an opportunity to mitigate the problem, as intermodal terminals, by making an important link in a logistics chain, are designed to deliver the most efficient and environmentally-friendly combination of different modes of transport for freight transport. They are traditionally located on key international transport corridors, highways or main roads. The idea of intermodal terminals is that the goods remain unmanaged during transport, ie, she travels, packed in containers or directly into so-called swap bodies (replace the trailer of the lorry) that are easy to transfer from one mode to another. Long distances are traversed by trains, and trucks are provided to and from the intermodal terminal, which collects and distributes goods within a radius of about 150 km.

Heavy goods (especially those over 24 t) are extremely suitable for intermodal transport. This applies to both large-scale massive cargoes and dangerous goods for which it is much safer to travel by rail than by road. Given the advantages of the environmental and techno-economic characteristics at European level for the transition from road to rail in the regular carriage of large cargoes, the proximity to the main railways (in order to enter with the intermodal terminal) one maneuver), the availability of road links and appropriate infrastructure to the facility with more approaches to it (to minimize delays), the amount of free space available for site deployment re-unloading operations with a sufficient number of tracks of the required length, storage areas for empty containers and stacked containers. The main criterion for determining the required dimensions of the loading platforms, the number and length of the tracks and the capacity of the loading / unloading machinery is the expected volume of the transport work, expressed in number of unloaded units processed per day. The terminal should serve all companies that need to overload goods, and from the point of view of operating it, the most effective scheme would be to be entrusted to an independent operator offering the same conditions to all companies.

As a global trend, it is worth noting the high growth and the mass orientation towards the transport and consolidation of loads in the form of containers. In Sofia, near Yana railway station, a multifunctional intermodal terminal with large storage capacities was opened in 2011 and with the functions of an inner container railway port and a commodity buffer hub for overloading from a railroad, but which does not operate regularly. There is an idea to build a concession for an intermodal terminal in the economic zone "Bozhurishte". A private initiative for the construction of the Voluyak Intermodal Terminal (next to Voluyak Station) is in the process of realization (phase of designing, with the financing of the construction). Several larger forwarding companies

have railway tracks in their bases. However, compared with the share of road transport, the use of rail freight transport remains limited.

The intermodal terminal Iliyantsi is located in the beginning of the action near the northern speed tangent. Iliyantsi railway station is in the design stage for reconstruction, it is planned that the station will remain with 12 track. About 50 km north-west is a Dragoman Intermodal Terminal, which is currently not operational due to lack of investor interest. From a strategic point of view, the proximity of the two terminals located to the north and northwest necessitates the idea of finding a more optimal location for the construction of an intermodal facility with a larger capacity so that the loading and unloading activity is taken out of the city.

There is a project for a detailed development plan for the regulation of a ground container terminal located in the territory of Poduyane-distribution station in the Hristo Botev locality and the Slatina-North area. According to the project for the initial phase with an area of 100-110 decares there are 4 track - two pairs from the north and from the south with 750 m long each of them. Phase III provides for the construction of warehouses and offices for companies to be positioned directly in the terminal area (an extension of 500-600 decares). Decision No 1112 of 30.12.2016 of the Council of Ministers repealed a decision from 2006 - with the last one for a site of national significance the intermodal terminal in the area of Poduyane railway station - distributor was announced. The project for the Podouane intermodal terminal has dropped out of the ideas for development of this type of transport on the territory of the Sofia railway junction at the Conceptual design phase and is therefore not considered in the scope of the technical project for Node Sofia.

At present there is no functioning intermodal terminal with the function of a transport / logistics center of regional / national scale on the territory of Sofia Municipality. In view of the factors determining the location of such a facility and the heavy traffic it is expected to generate, the most suitable location should be sought outside the ring road, but in close proximity to the large city and major motorways and rail directions in the interior of the country. In this connection, and in order to cover the trading axes in the eastern direction, the most logical and justified despite the necessity of the expropriation procedures remains the original intention to build such a terminal in the Kazichene station area, and its realization there should be further investigated . Alternatively, the area of Kremikovtzi, where there are suitable terrains, could be considered. Given the nature of such a facility and the experience already gained with DMT Dragoman, the decision to separate the IMT (regardless of its specific location) should carefully take into consideration the private interests, the expected volume of cargo, the possibility of attracting operator and the financial efficiency.

## Projects and initiatives

ПЛАН



### **Data collection for commercial traffic and development of a Sustainable Urban Logistics Plan**

**№ 6.1.1**

Expected result	SULP
Indicative value	0,6million BGN
Conversion period	till 2020

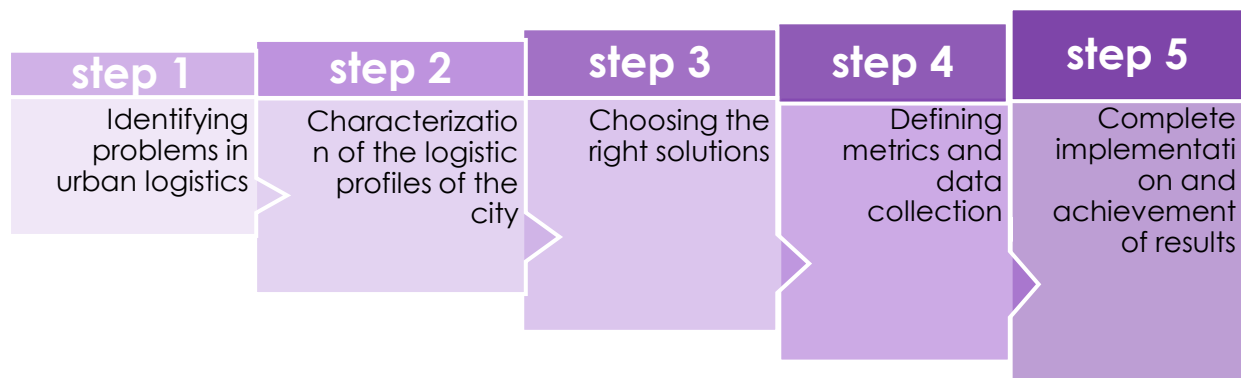
Carrying out a survey to collect traffic data should cover the whole logistics process - collecting and structuring (in and through GIS) details of available commercial and logistics centers, warehouses, markets, markets, larger commercial objects.

- 
- 
- The data collected will allow the development of a comprehensive strategy (Sustainable Urban Logistics Plan), which should propose measures to optimize logistics operations and lead to efficiency and sustainability of load-sharing processes based on cooperation between different actors. Sulp should include:
  - • Specialized study for data collection on freight;
  - • Comprehensive analysis of freight transport, covering all logistic processes at local and regional level, problems and opportunities related to logistics on the territory of Sofia Municipality;
  - • Development of scenarios for future improvement;
  - • Defining priorities and measurable goals;
  - • Developing pilot projects and an effective package of sustainable measures to improve urban logistics, tailored to the problems of freight distribution in Sofia Municipality.

Within the Novelog project (part of the CIVITAS network), guidelines for Sustainable Urban Logistics Plans were developed in July 2018. The SUMP development cycle remains valid when planning a city logistics plan. However, some of the steps are difficult to implement in the context of urban freight transport due to the lack of experience and limited access to data and the complexity of the problems stemming from the many stakeholders in the sector and their fragmented operating environment. It is recommended that Sulp be drawn up separately from SUMP and that its development process should start after the general vision for sustainable mobility of the city. In this way, Sulp's sustainable approach to freight transport will be in line with the SUMP vision and will contribute to the same overall objectives. Sulp will cover the five steps presented in the following figure.



FIGURE 77 PREPARATION OFSULP



### *Step 1 - Collecting data and identifying problems in urban logistics*

The main problems in Sofia are described in the analysis of the current situation. In order to be able to develop relevant measures with specific parameters, more extensive research is needed to collect data on key issues. Like most European cities, freight transport in Sofia is overlooked in many studies and is not included in urban transport modeling. There is no comprehensive study of urban logistics problems within Sofia Municipality. The measures and solutions that are usually applied do not address complex logistical processes, but rather their separate aspects. Particularly, parameters such as volumes and type of processed goods and freight, frequency of delivery, class of the most commonly used vehicles, number of workers and others needed to assess the real load situation in the city are missing in statistics. For this reason, the systematisation of the problems is incomplete. Additional issues and problem areas can be identified in the data collection process as well as stakeholder discussions. In this connection, step 1 also includes exploring the existing problems in and around the logistic sites under consideration, and by field investigations, on site in and around objects, monitoring for problems such as traffic obstruction due to stopping freight vehicles, difficult maneuver due to large vehicle and cargo gauges and the like. Secondly, surveys should be made to staff at the centers to clarify what problems they find in their day-to-day work. The reasons for their occurrence may be the poor location of the logistics site, poor traffic organization in the surrounding street network, non-compliance with the organization of the movement (both by the logistical processors and the other traffic participants), poor organization traffic within the logistics site itself, and so on.

### *Step 2 - Characterize the logistics profiles of the city*

The second step involves the identification and isolation of homogeneous groups of logistical needs in some well-defined areas of the city. Such a homogeneous group is called Logistics Profile (LP). The LV in Sofia should be determined by the interaction of three key aspects: (1) the urban development characteristics of the area; (2) the requirements of the logistics agents (ie the type of delivery requirements); and (3) the characteristics of the products traded.

Based on previous research in other EU cities six logistics profiles have been identified, most of which exist in the territory of Sofia:

- Profile A: A group of stores specializing in a particular type of service / product (for example, a neighborhood known for furniture, craft or arts, technology);
- Profile B: hotels, restaurants, small grocery stores, small neighborhood markets;
- Profile C: business center (courier, small supplies, consumer services);
- Profile D: large retail outlets (shopping centers, distribution warehouses);
- Profile E: residential areas with local trade;
- Profile F: e-commerce in residential areas.

These profiles can be combined with product characteristics and load processes, stakeholders and supply properties (urgency, frequency, volume, planned / unplanned), which can then be used to provide guidance on what solutions will be most -Effective. The added value of this approach is that a solution can be applied after identifying areas with similar profiles.

### *Step 3 - Choose the right solutions and test through pilot projects*

The data gathered in the previous steps will provide a good basis for selection and launch of pilot projects after 2020. When choosing them, account will be taken of the logistics profiles in Sofia, the nature and scale of the challenges, the cost-benefit ratio, the various participants and other essential features.

### *Step 4 - Defining metrics and collecting data*

By defining key indicators, the most important aspects of the urban logistics system can be observed. The collection of data after the implementation of the selected measures allows an assessment of the measures implemented and allows future measures / decisions taken in Sofia to be corrected at a later stage.

### *Step 5 - Complete implementation and achievement*

Although the expected impacts of a given measure will be evident in the previous steps, a flexible approach is recommended in implementing the chosen measures, namely gradual implementation after pilot tests. This provides an opportunity to solve problems that have arisen in the pilot phase and to address them before a wider application of the measure. Pilot projects are an approach that has proven useful to increase support both from public sector decision-makers and from the private sector and city residents.



## Automate the process of applying for and issuing permits for entry into the CUA and First Truck Zone

**№ 6.1.2**

The project is aimed at optimizing the process of requesting and issuing passes for heavy goods vehicles on the territory of Sofia. Creating a register of these traffic participants will allow the integration of these data with the CCTV system, for example, to monitor compliance with these permits.

### Application of technologies :

Information system with GIS functionalities, database management systems (DBMS) and CCTV interface

<i>Indicative value</i>	1,8million BGN
-------------------------	----------------

<i>Conversion period</i>	Till 2025
--------------------------	-----------



## Heavy traffic control system in the city

**№ 6.1.3**

The project aims to provide regulatory and operational control of trucks entering the city center by using ANPR technologies based on the advanced functionality of the CCTV system.

### Application of technologies :

ANPR / LPR CCTV control technologies

<i>Indicative value</i>	4,2 million BGN
-------------------------	-----------------

<i>Conversion period</i>	till 2025
--------------------------	-----------

A possible approach is the installation of real-time weighing equipment for vehicles moving on the city's territory, which will make it possible to control heavy goods vehicles in terms of their weight in order to reduce the negative impact on road surfaces of heavy goods vehicles with a weight exceeding the maximum permissible area. In the medium to long term, additional "polluter-pays" or traffic-based charges could be introduced depending on the mass of the lorry, meeting the requirements of a European exhaust emission standard or another criterion. In addition to calculating the charge for each vehicle, the introduction of the Controlled Access System will allow for a number of secondary measures such as flexible charging for the lorries to stay at their separate locations and landing areas.

## 7. Intelligent Transport Systems

### Concept of development



In the short term, Sofia Municipality should implement a wide range of ITS systems and set up an institutional and operational model to achieve greater integration of data, systems and services. In this way, the city will achieve full and unified transport management and will allow the implementation of long-term projects. The latter can only be achieved by improving municipal policies and practices to achieve a socially acceptable, cost-effective and sustainable governance model in the field of urban public transport and traffic, ensuring balanced territorial connectivity and full integrity with other forms of mobility. It is of paramount importance to investigate data sources (mostly static and subsequently dynamic) as well as how to obtain them so as to ensure their successful use for the implementation of information systems in the

medium and long term. This will allow the digitization of all traffic control activities, aggregation of data for all road users and individual institutions to provide management through modeling and the provision of a wider range of electronic services.

Information gathered from different sources, except for use as a mobility management tool, should be made available to the public through appropriate methods to allow each participant to plan its travel, time, route, price, etc. Along with providing better information through traditional media channels and the Internet, the concept also envisions real-time information in other ways, such as mobile applications. To that end, however, rules should be laid down for the provision of this information to third parties by defining the relevant rights so as to guarantee the integrity and security of the data.

In the medium term, it is intended to integrate all data and applications into an integrated system to manage mobility as a service (MaaS). The aim is to create a unified platform to provide easy and clear information about travel options before and during the trip for its users (passengers, drivers, cyclists, pedestrians). The platform will also include payment options; monitoring traffic and avoiding congestion; dynamic traffic and parking information services. In the long run, the project builds on a regional portal providing information to a wider range of consumers due to the fact that the capital city is a major attraction center for a huge number of daily labor migrations. The regional portal will include information, ways and opportunities for travel with the other transport operators in the region - bus and itineraries, railways and others. An integrated project also looks at a system for navigation and management of freight and urban logistics.

For the overall realization of the mobility management as a service, a number of activities are envisaged, grouped according to priority specific objectives:

- collecting, storing and processing all traffic information and providing it for use installation of sensors and sensors of different uses.
- Increase in number of meteorological monitoring stations and integration with the passenger information system

### Data



- Automated Registration and Permission for entry into the Central and Eastern European Heavy Vehicles
- integrating authorization data with the CCTV system
- An analogous project for taxi services

### Logistics and Taxi





- microprocessor controllers of traffic lights
- optimized controller programming
- a street planning and management system for streets
- equipment for special purpose vehicles for priority crossing
- reporting on the occupancy of seats in paid parking areas

## Traffic control and regulation



- upgrading of the transport control and management system
- Automated system for charging passengers
- creating a single transport document

## Public transport



- Automatically penalizing speeding drivers, passing a red signal and driving in bus lanes
- a single system for automatic detection, recording and incident management, and for automatically determining the routes of special-mode vehicles
- extension of video surveillance systems

## Road safety



- a single data storage and processing center
- a single dedicated mobility control center
- ensuring data security, ensuring interoperability and rules for the use of shared data by citizens and third parties

## Infrastructure



- Periodic analysis of projected and implemented projects, whether they are sufficient to achieve the objectives and whether there is a need for new, innovative measures or research
- programs and projects to explore specific mobility issues or to implement pilot projects to demonstrate their effectiveness and efficiency

## Research and technological development



- project register
- adaptation of the legal framework
- to promote projects and to involve the public in achieving the objectives of the SUMP
- share aggregated mobility information on social networks to get feedback
- modern forms of information service - newsletter, online consultant and interactive voting

## Organizational initiatives



The measures proposed in the short term are rather organizational in nature to determine the conditions and parameters for realizing the actual measures in the medium and long term, providing conditions for:

- identification of all road users;
- Increasing control over compliance with traffic rules;
- Increasing the control of over-polluting vehicles and encouraging the use of greener ones;
- Improving service quality and consumer awareness, which should increase overall satisfaction;
- road safety measures to promote better road behavior and hence reduce the number of accidents;

At the end of the Medium Term in Sofia, an ITS system should be integrated, implementing a wide range of communication, control, sensor and electronic technologies to help monitor and manage traffic, reduce congestion, provide optimal routes through new information sources and modern payment methods, increase system productivity and save lives, save significant cash. The system will be much more user-friendly, providing more affordable, more reliable and more efficient ground transport and better awareness.

In the long term, the concept accurately outlines a reliable functional process of introducing ITS solutions for all aspects of mobility within Sofia, consistent with the best international practices. The implementation of the ITS technologies will help to achieve the results expected from SUMP:


- Increasing the use of public transport and ensuring reliable travel time with the necessary level of comfort and safety to ensure seamless access to jobs and services for all.
- Improving road safety and security for all types of travel
- Reduction of environmental pollution, greenhouse effect and energy consumption
- Improving the attractiveness and quality of the urban environment.

Each of these objectives is related to concrete and measurable projects and initiatives set for implementation in the individual Periods. If necessary, the action plan may be updated to ensure synchronization with emerging new technologies and the necessary legal framework for implementing certain initiatives and projects.

## Projects and initiatives

### Specific objective 7.1 Optimize the operation of traffic lights and improve the control and management of road traffic

Reducing congestion on the Sofia road network has significant benefits for improving the quality of life of residents and those who regularly travel to the city's workplace. In addition to all other benefits, reducing congestion in Sofia will improve the productivity of the city's workforce and stress drivers. Increased use of public transport is one of the important ways to reduce by promoting the modal shift from public transport to carriage. In Sofia there is a strive for residents and regular travelers to the city to use a car rather than rely on public transport. In order to encourage people to leave their cars at home and use public transport, they need to be aware of the benefits of alternative ways of traveling. One of the key ways to encourage modal shift is to make public transport more accessible, inexpensive and faster to use than a private car. Improving the management of the road network in Sofia can reduce travel time by public transport. Therefore, the main tools and measures are aimed at enabling the smooth movement of public transport vehicles that fall into the general traffic.



# Optimizing Traffic Control Mode and Improving Traffic Control and Management

№ 7.1

PROJECTS AND SYSTEMS	Camout (million BGN)	<u>Application of technologies :</u>	
Extension of ITS traffic management in Sofia	9,5	Supply and installation of inductive frames, connecting them to the traffic controllers and to additional data transfer hardware to the Traffic Control and Control Center. Supply of software and hardware for the collection and processing of this data.	
System for automatic tracking of the success of the implemented measures according to the set indicators and digitization of the traffic management activities	4,5		
Upgrading the existing CCTV system with additional functionalities	7,6		
Establishment and maintenance of a unified communication infrastructure	2,5	Indicative value	27,5million BGN
Planning system for street works	3.4	Conversion period	till 2025

## Specific objective 7.2 Ensure modern, enhanced vehicle control and incidents

CCTV systems, in addition to traditional Pan / Tilt / Zoom, also have a number of new features that can be skillfully used for vehicle control. One of these features was the reviewed technology and the Automated Automobile Recognition System (ANPR). Through it, the captured optical image is automatically processed to read the vehicle number (DKN). Infrared light is often used to allow systems to be used in low light conditions. This technology is the proposed next projects.



### **Increasing safety through modern vehicle and accident control**

**№ 7.2**

<b>PROJECTS AND SYSTEMS</b>	<b>Amount (million BGN)</b>	<b><u>Application of technologies :</u></b>	
Expansion of the CCTV system, incl. and public transport stops	27	<ul style="list-style-type: none"> <li>- - CCTV</li> <li>- - Information systems with interface</li> <li>- - Network of infrared sensors, light modules, controllers</li> <li>- - Information systems with GIS functionalities, database management systems (DBMS)</li> </ul>	
Automatic sanctioning at overdrive and / or instantaneous speeds, passing a red signal to the traffic lights, moving in bus lanes, etc.	12		
Intelligent hiking trails	2		
Automatic Incident Detection System	5		
Traffic incident management system	12	<i>Indicative value</i>	58million BGN
		<i>Conversion period</i>	till 2035

## Specific objective 7.3. Improving consumer awareness

Information is the key to providing residents and city guests with a convenient tool to choose a mode of transport or a route to travel. The same should include the whole set of information they need before and during their journey. Sofia has already established traditions in providing road information for residents and guests of the city through the public website of UMC - [www.sofiatraffic.bg](http://www.sofiatraffic.bg). Many electronic services such as virtual boards for public transport and parking, schedules and routes, for night transport and metro, interactive map, route changes. The "Travel Planning" functionality is extremely convenient. In the short term, this trend needs to be maintained and further developed by adding new services and improving the way the information is presented (using TMC, mobile device, etc.).



## Providing information to consumers

**№ 7.3**

<b>PROJECTS AND SYSTEMS</b>	<i>Amount( million BGN)</i>	<i>Application of technologies :</i>
Unified system of alerts and complaints	7,5	Web based service request forms, visualization techniques, GIS functionalities, travel planning upgrade algorithms, databases, API interfaces to other systems, a dynamic web portal for disseminating information and for public transport services and other channels for information spreading.
Updating data and expanding the number of electronic services provided on public information sites - <a href="http://www.sofia.bg">www.sofia.bg</a> , <a href="http://www.sofiatraffic.bg">www.sofiatraffic.bg</a> , <a href="http://www.visitsofia.bg">www.visitsofia.bg</a>	7,2	
Improving the way electronic services are presented through public sites and mobile applications for traffic and the city	6,3	
Creating "smart" schedules	1,8	
Installation of "smart" terminal devices	3,2	
		<i>Indicative value</i> 26million BGN <i>Conversion period</i> till 2025

Providing permanent passenger information and real-time updating of the opportunities for individual and public transport are one of the key priorities for the realization of high-quality transport services in the metropolitan city. The revolution in the area of information and communication technologies helps passengers to reach their destinations as quickly as possible. The measure addresses the creation of an integrated passenger information system to provide real-time traffic information and travel time in minutes through all possible information channels. Priority is the development of new information channels - from dynamic public, interactive websites to highly specialized mobile applications. Due to the fact that the Municipality's efforts are mainly aimed at reducing the share of the use of cars and increasing the share of public transport, the proposed measures for the first group aim to make the trip safer, safer and more informed. The main part of the measures are aimed at changing the means of transport, choosing the best way to travel at different times of the day, convenience of the information received and simplifying the whole journey process and related activities, so the measures on both systems are united in one.

To this end, a measure should be implemented to include the replacement of all the details of the transport system to be upgraded by applying a uniform design to the vehicles, stops, signs, timetables and maps for facilitated guidance. Approved standards should be used to make it accessible to tourists in the city.



### Specific objective 7.4. Contemporary control of all road users

Long-term optimization of the movement, control, or provision of services in this area will be accomplished by advanced technologies based on large data processing (Big Data). The data itself will come from a new type of sensors and sensors permanently connected to the Internet using the Internet of Things (IoT) technology and providing up-to-date information and real-time reporting on the status they are reporting. This data will be located in Cloud Space, and significant processing resources will be used for processing. Artificial Intelligence (AI).

The proposed project examines the selection and delivery of sensors to allow monitoring of all road users. Initially, this process will involve the step-by-step replacement of public transit car technology. In this way, much more accurate data will be obtained, which will significantly improve the management of public transport and will help the city authorities to plan the transport needs of the city's residents. Subsequently all other participants should be covered, incl. persons with disabilities or with reduced mobility.

Cloud based system will receive and process data to ensure optimal city traffic through improved cross-network management that will also be connected in real time with this system and Internet-based technology



### Contemporary control of all road users

**№ 7.4**

<i><b>PROJECTS AND SYSTEMS</b></i>	<i>Amount (million BGN)</i>	<u><i>Application of technologies:</i></u>	
IoT for public transport management	12	<ul style="list-style-type: none"><li>- Information system with GIS functionalities, DBMS and interfaces for connection to other systems</li><li>- Cloud based system using IoT technology</li><li>- Expansion of the CCTV system</li><li>- automatic measuring stations for environmental monitoring</li></ul>	
IoT for urban logistics management	8		
IoT for managing disadvantaged people	6		
IoT for managing the other participants	14		
Intelligent Traffic Management System	28		
Cloud Data Center	12		
Communication connectivity	5		
		<i>Indicative value</i>	85million BGN
		<i>Conversion period</i>	Till 2035

## 8. Territorial integration of project proposals

The proposed projects and measures to stimulate pedestrian and bicycle traffic, improve public transport, intermodality and parking are mutually interconnected and territorially integrated. The construction of a subway in a given neighborhood should be accompanied by the introduction of electric transport to subway stations, improvement of pedestrian areas and access to public transport stops; building incoming bicycles and introducing a system of shared bikes; building buffer parks near metro stations and regulating parking in other parts of the neighborhood, etc. All these measures should be implemented in a complex way in order to maximize the benefits of the synergic effect between the interventions. In order to demonstrate the territorial integrity of the projects, the individual projects are grouped into integrated territorial packages for different parts of the city. The accent is on the territories in which new metro lines are being constructed or are to be built - Lyulin, Ovcha Kupel, Hadji Dimitar-Suhata Reka and others. In these neighborhoods, improvement in pedestrian and bicycle accessibility, inbound transport and other concomitant investments must take place prior to or parallel to metro construction, so that the incoming infrastructure is fully operational at its start-up.



Legend:

Pedestrian traffic

1.2.1.2 Introduction of a system of pedestrian areas, shared streets and speed limit zones to 30km/h in Lulin

Bicycle traffic

2.1.1 Connection of Todor Alexandrov Blvd., Vardar Blvd., Zapaden Park, Tsaritsa Yoana Blvd. to the intersection with "Pancho Vladigerov" Blvd.,

2.1.2 Continuation of the Velodrata from Beli Dunav Street on Lomsko Shosse Blvd and Obelsko Shose Blvd. / Pancho Vladigerov Blvd. Obelya with CUA

2.1.8 Build a bicycle connection between the r.c. Lyulin, r. c.. Modern suburb, r. c. Obelya on "Pancho Vladigerov" Blvd.

2.1.21 Study and construction of bicycle routes on the third urban ring (Todor Kableshev Blvd., GM Dimitrov Blvd., Assen Yordanov Blvd., continuation of future Eastern and Western tangents)

2.2.16 Study and construction of bicycle routes in Lyulin

2.2.25 Exploration and construction of bicycle routes in Obelya district

2.2.35 Exploration and construction of a bicycle trail on the future "Vrch Mancho"

2.3.3 Construction of bicycle routes in West Park

2.3.6 Construction of a bicycle lane from the r.c.. Lyulin to Bozhurishte

2.3.7 Construction of a bicycle lane from the r.c. Lyulin to Bankya

2.3.11 Exploration and construction of a bicycle route from Lyulin quarter to Suhodol quarter

2.4.2 Introduction of a system for shared bicycles in Lyulin district

Public transport and Intermodality

3.1.1 Opening of new lines with a leading function in the residential quarters and delivery of rolling stock - a pilot project in Lyulin district

3.1.5 Continuation of the first line of the subway from Lyulin to the west (SRR) on Tsaritsa Yoana Blvd with 2 MS

3.5.2 Construction of the Obelya intermodal junction, consisting of a new metro station, railway station. station, bus station and bicycle parking

3.5.3 Construction of a new railway station Vardar

Parking

4.1.1 Making new buffer parkings:

4.1.1.4 Slivnitsa with a capacity of 300 PS

4.1.1.7. Lyulin with an adequate capacity of up to 400 PS

4.1.1.11 Future MS on SRR and "Tsaritsa Yoana" Blvd.

Railway line, railway station

Underground and underground stations

New subway tracks and stations

Incoming power lines

Tram line  
Existing bicycle lanes  
Secondary bicycle network  
Recreational bicycle lanes  
Street network for rebuilding  
Buffer parking at a metro station  
Bicycle parking  
New Intermodal Connection Ovcha Kupel / Gorna Banya  
Walking spaces



FIGURE 79 TERRITORIAL INTEGRATION OF THE PROJECT PROPOSALS IN THE OVCHA CUPEL PACKAGE



### Пешеходно движение

**1.2.1.5.** Въвеждане на система от пешеходни пространства, споделени улици и зони с ограничение на скоростта до 30 км/ч в кв. Овча купел

### Велодвижение

**2.1.14.** Изграждане на велотрасе по бул. Цар Борис III от бул. Никола Петков до спирка Шипка

**2.1.21.** Проучване и изграждане на велотрасета по Западната тангента

**2.2.3.** Изграждане на велотрасе в жк Бъкстон по бул. Братя Бъкстон

**2.2.4.** Изграждане на велотрасе в жк Овча Купел по бул. Президент Линкълн

**2.2.5.** Изграждане на велотрасе в жк Овча Купел по ул. Любляна

**2.2.6.** Изграждане на велотрасе в жк Овча Купел по ул. Монтевидео

**2.2.8.** Проучване и изграждане на велотрасе между кв. Овча Купел и Горна Баня

**2.2.18.** Изграждане на велотрасе по бул. Александър Пушкин

**2.2.29.** Проучване и изграждане на велотрасе по ул. Суходолска

**2.2.30.** Проучване и изграждане на велотрасе покрай р. Владайска

**2.3.12.** Проучване и изграждане на велоалея през кв. Горна Баня до ЖП гара/МС Горна баня

**2.4.3.** Въвеждане на система за споделени велосипеди в кв. Овча Купел

### Обществен транспорт и интермодалност

Откриване на нови автобусни линии с довеждаща функция в:

**3.1.2.** жк. Овча Купел

**3.1.3.** кв. Горна баня

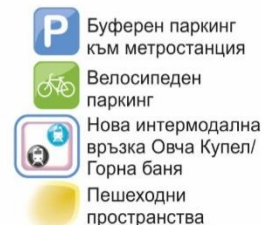
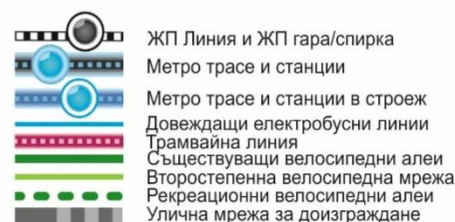
**3.2.1.1.** Изграждане на ново трамвайно трасе по бул. Т. Каблешков - от бул. Цар Борис III до бул. България

**3.5.1.** Изграждане на интермодален връзка Овча Купел/Горна Баня

### Паркиране

**4.1.1.2.** Изграждане на буферпаркинг към МС Овча Купел 2 - 400 ПМ

**4.1.1.3.** Изграждане на буферпаркинг към МС Горна Баня - 150 ПМ



Договорът за "Изработване на План за устойчива градска мобилност на Столична община" се реализира с финансовата подкрепа на Конфедерация Швейцария в рамките на швейцарския принос за разширения Европейски съюз.



## Legend:

### Pedestrian traffic

---

1.2.1.5 Introduction of a system of pedestrian areas, shared streets and speed limit zones to 30km/h in Ovcha Kupel

### Bicycle traffic

2.1.14 Construction of a bicycle route on "Tsar Boris III" boulevard from "Nikola Petkov" Blvd. to Shipka stop

2.1.21 Study and construction of bicycle routes on the third urban ring (Todor Kableshkov Blvd., GM Dimitrov Blvd., Assen Yordanov Blvd., continuation of future Eastern and Western tangents)

2.2.3 Construction of a bicycle route in Bakston: on "Bratya Bakston" Blvd. from "Todor Kableshkov" Blvd. to "Tsar Boris III" Blvd.

2.2.4 Construction of a bicycle route in Ovcha Kupel: on "President Lincoln" Blvd. from Ovcha Kupel Blvd. to SOP and metro station

2.2.5 Construction of a bicycle route in Ovcha Kupel junction: along Ljubljana Street to SRR

2.2.6 Construction of a bicycle route in Ovcha Kupel: on "Montevideo" Str. From "Nikola Petkov" Blvd. to "President Lincoln" Blvd.

2.2.8 Study and construction of a bicycle route between Ovcha Kupel and Gorna Banya

2.2.18 Construction of a bicycle route along "Alexander Pushkin" Blvd.

2.2.29 Exploration and construction of a bicycle route along "Suhodolska" str.

2.2.30 Exploration and construction of a bicycle along the Vladayska River

2.3.12 Study and construction of a bicycle path through the Gorna banya to the railway station. station / MS Gorna Bania

2.4.3 Introduction of a system for shared bikes in Ovcha Kupel

### Public transport and Intermodality

Opening of new lines with an incoming function in:

3.1.2 Ovcha Kupel

3.1.3 Gorna Bania

3.2.1.1 Construction of a new tram route on "T. Kableshkov" - from Bulgaria Blvd to Cherni Vruh Blvd.

3.5.1 Building a new railway Ovcha Kupel stop (with pedestrian underpass under the railway line and pedestrian tunnel at MS 18, built within the 3rd metro diameter building project)

### Parking

4.1.1.2 Construction of parking lot of Ovcha Kupel 2 MS with an adequate capacity of up to 400 PS

4.1.1.3 Construction of a parking lot at MS Gorna Bania with an appropriate capacity of up to 150 PS

### Railway line, railway station

### Underground and underground stations

### New subway tracks and stations

### Incoming power lines

### Tram line

### Existing bicycle lanes

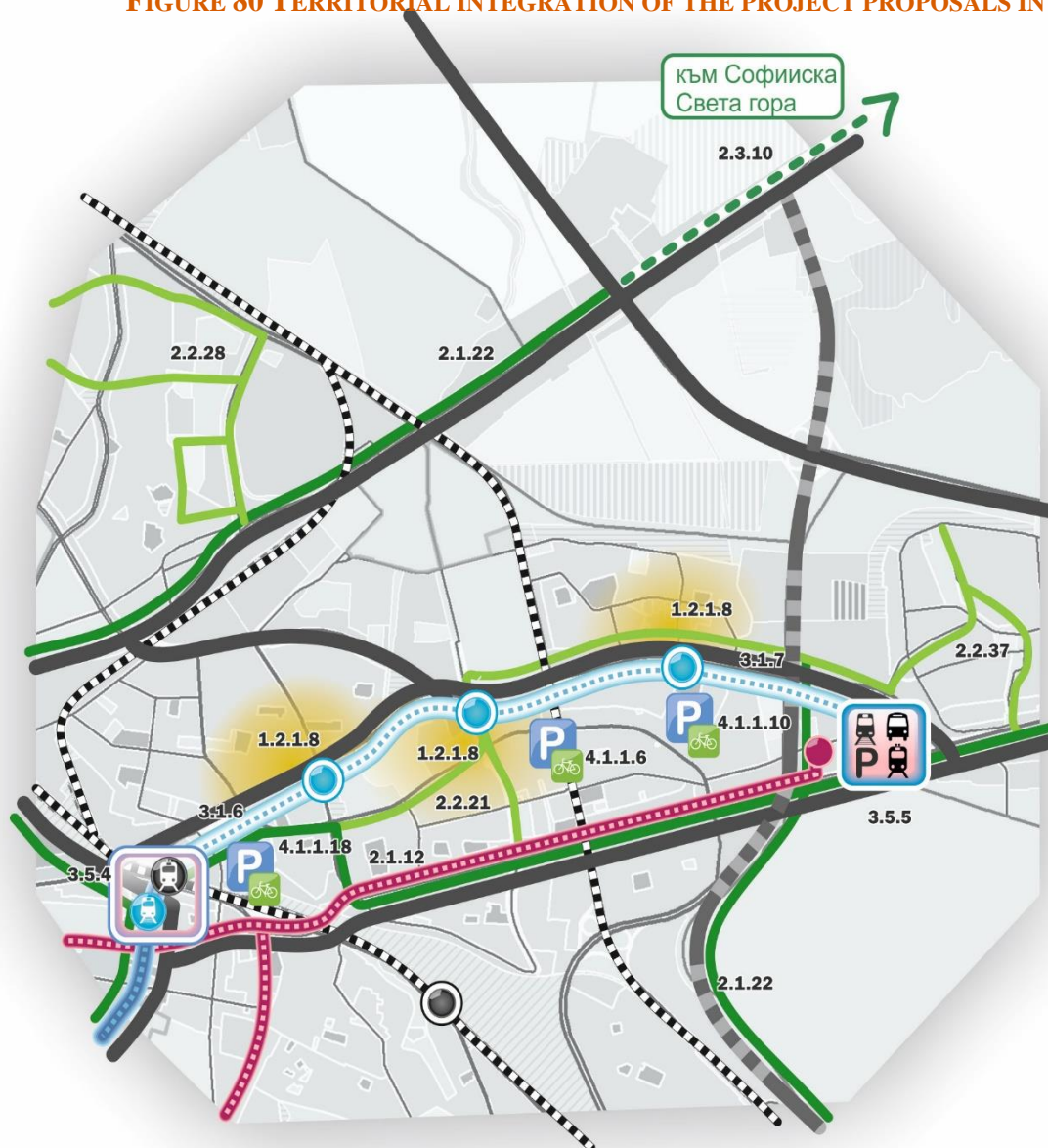
### Secondary bicycle network

Recreational bicycle lanes  
Street network for rebuilding  
Buffer parking at a metro station  
Bicycle parking  
New Intermodal Connection Ovcha Kupel / Gorna Banya  
Walking spaces

---



FIGURE 80 TERRITORIAL INTEGRATION OF THE PROJECT PROPOSALS IN THE SUHA REKA - HADJI DIMITAR PACKAGE



## Пешеходно движение

**1.2.1.8.** Въвеждане на система от пешеходни пространства, споделени улици и зони с ограничение на скоростта до 30 км/ч в кв. Хаджи Димитър, кв. Сухата река, кв. Левски Г

## Велодвижение

**2.1.12.** Изграждане на велотрасе от моста Чавдар до кръстовището на бул. „Ботевградско шосе“ до ул. „Летоструй“ и велотрасе по бул. „Ботевградско шосе“ от ул. „Летоструй“ до СОП

**2.1.21.** Проучване и изграждане на велосипедни трасета по трети градски ринг - Източна тангента

**2.1.22.** Изграждане на велотрасе по ул. „Каменоделска“, ул. „Малашевска“ и ул. „Жак Дюкло“, ул. „Чеписко шосе“

**2.2.21.** Проучване и изграждане на велотраса в жк Хаджи Димитър, жк Сухата река и жк Левски

**2.2.28.** Проучване и изграждане на велотраса в кв. Орландовци

**2.2.37.** Проучване и изграждане на велотраса в кв. Враждебна

**2.3.10.** Проучване и изграждане на велотрасета свързващи, гр. София с населените места и обектите на Софийска Света гора

## Обществен транспорт и интермодалност

**3.1.6.** Продължение на трета линия на метрото между МС (МС5) и МС ул. Станислав Доспевски (МС2)

**3.1.7.** Продължение на трета линия на метрото между МС (МС2) и МС бул. Владимир Вазов (МС1) с една МС

**3.5.4.** Изграждане на нова ЖП спирка Чавдар с пешеходна подлез по жп линията и пешеходен тунел, свързан с МС 6, III метродиаметър

**3.5.5.** Предпроектно проучване и изграждане на интермодална връзка „Ботевградско шосе“

## Паркиране

**4.1.1.6.** Проучване и реализация на нансемен паркин под естакадата на бул. Владимир Вазов над ул. Рилска обител

**4.1.1.10.** Изграждане на буферпаркинг към МС 2, III метродиаметър

**4.1.1.18.** Изграждане на паркинг до пазар Подуене

- |  |                                 |  |  |
|--|---------------------------------|--|--|
|  | ЖП Линия ЖП гара                |  | Буферен паркинг към метростанция               |
|  | Метро трасе и станции в строеж  |  | Велосипеден паркинг                            |
|  | Нови метро трасе и станции      |  | Нова интермодална връзка Овча Купел/Горна баня |
|  | Довеждащи електробусни линии    |  | Пешеходни пространства                         |
|  | Трамвайна линия                 |  |  |
|  | Съществуващи велосипедни алеи   |  |  |
|  | Второстепенна велосипедна мрежа |  |  |
|  | Рекреационни велосипедни алеи   |  |  |
|  | Улична мрежа за доизграждане    |  |  |

## Legend:

## Pedestrian traffic

- 1.2.1.8 Introduction of a system of pedestrian areas, shared streets and speed limit zones to 30km/h in Hadji Dimitar quarter, Suhata reka quarter and Levski G quarter.

## Bicycle traffic

- 2.1.12 Construction of a bicycle route from Chavdar Bridge to the crossing of Botevgradsko Shosse Blvd. and Letostruj Str. And Velotrassa on Botevgradsko shose Blvd. from Letostrui Street to SRR
- 2.1.21 Study and construction of bicycle routes on the third urban ring (Todor Kableshev Blvd., GM Dimitrov Blvd., Assen Yordanov Blvd., continuation of future Eastern and Western tangents)
- 2.1.22 Construction of a bicycle route along "Kamenodelska" Str., Malashevsk Street and "Jacques Duklo" Str., "Chepinsko shose"
- 2.2.21 Exploration and construction of bicycle routes in Hadzhi Dimitar, Suhata Reka and Levski
- 2.2.28 Exploration and construction of bicycle routes in Orlandovtsi
- 2.2.37 Study and construction of bicycle lanes in Vrajdebna district
- 2.3.10 Exploration and construction of bicycles connecting the city of Sofia with the settlements and the sites of Sofia Forest

## Public transport and Intermodality

- 3.1.6 Continuation of the third line of the subway between the "Panayot Hitov" (MS5) and the "Stanislav Dospevski" MS (MS2) with 3 MS
- 3.1.7 Continuation of the third line of the subway between the "Stanislav Dospevski" (MS2) and the "Vladimir Vazov" Blvd. (MS1) with 1 MS
- 3.5.4 Building a new railway Chavdar stop with a pedestrian underpass under the railway line and a pedestrian tunnel connected to MS 6 on the 3rd metro
- 3.5.5 Feasibility study and construction of the Botevgradsko shosse intermodal junction, consisting of a metro station, a bus station and a buffer parking lot

## Parking

- 4.1.1.6 Construction of an underground parking lot on the Rilska Obitel Str. Under the bulwark of "Vladimir Vazov" Blvd.
- 4.1.1.10 Construction of parking lot of MS 2 on the third line of the metro (Stanislav Dospevski Str.)
- 4.1.1.18 Construction of a parking lot to Poduene market

## Railway line, railway station

## Underground and underground stations



New subway tracks and stations

Incoming power lines

Tram line

Existing bicycle lanes

Secondary bicycle network

Recreational bicycle lanes

Street network for rebuilding

Buffer parking at a metro station

Bicycle parking

New Intermodal Connection Ovcha Kupel / Gorna Banya

Walking spaces

---

## Street network

---

Unlike most Western European cities, where the street network is structured and gauged almost 100%, this is not the case in Sofia. The existing primary street network (PSN) as a structure is incomplete. There are no important ring paths to take the flow of cars and move them further than the CUA. The uncompleted structure leads to huge inhibitions and overloading of separate sections of the network. Under congestion, the volume of car emissions is significantly increased, resulting in severe air pollution.

This plan proposes measures for the gradual reduction and disruption of transit through the center as well as for its alleviation and reduction of street parking while emphasizing pedestrian and bicycle traffic.

Although the main purpose of the plan is to reduce the use of cars, this should not prevent the improvement of interconnection between territories. The unfinished PSN structure, and especially the unfinished ring and tangential links, interferes with good interconnection between territories and generates parasitic traffic and overload of separate sections of the network that we are currently seeing. For this reason, we propose to build some important connections within the city. Their construction and improvement of network performance will also have a positive effect on the reduction of crashes. At the same time, the construction of these routes will allow for the introduction of autonomous public transport at high speed.

### Reconstruction and extension of SRR from "Bratya Bakston" Blvd to Lyulin Motorway "

Due to the high traffic intensity in this part, the existing variable narrow gauge is not sufficient to omit it. Reconstruction will help reduce congestion in this area. The project is one of the most important for realization.

A very important road artery that will pull extra streams to the periphery. Reduced travel time for long conversations. The main benefit is to alleviate intra-urban traffic and reduce the saturation of the flow in heavily loaded segments.

Length	8.363 km with a three-meters dimensional dividing strip
Canvas (2 pcs.)	2 x 10.50 m
Width dividing strips	3 m
Width locals	2 x 6.00 m
Wide sidewalks	2 m
Indicative value	-
Expropriation procedures	yes
Project readiness	An investment project is needed
Conversion period	2025

The division is divided into four subdivisions:

1. Tunnel passage from Bratya Buxton Blvd to Tsar Boris III Blvd. - the length of the tunnel is about 1.1 km, two lanes with 2 x 3.75 and a technical sidewalk on both sides with a width of 1.2 m.
2. An off-road solution for the direct direction from km 52 + 175 to 53 + 900km, with an approximate length of about 1,725km, on the node with Nikola Petkov Blvd is provided a circular crossroad at the level of terrain with a radius of the internal curvature of 26,5m. The third west-tangent knot at km 54 + 440km is solved with a staggered solution for the direct route. A circular intersection with a radius of the inner curb 28 m, 2 x 6 m and pavements of 3 m is provided at the level of terrain.
3. If the railway line Sofia-Pernik exceeds, a gauge of the facility is envisaged to ensure the future extension of the railway line. There are pedestrian crossings, consistent with the stops of the public transport. Where crossings are impossible, pedestrian passages are provided.
4. From the railway line Sofia - Pernik to AM Lyulin has a knot over Suhodolska Str. The project has also developed a reconstruction of the dam wall.

Justification: The project significantly improves territorial connectivity. An opportunity to improve the speed of A111 is created. It downloads traffic to the periphery by reducing the saturation of part of the PSN.

## Reconstruction of the SRR from bc. "Mladost IV", "Prof. Alexander Tanev" Str. To AM "Trakia"

The reconstruction of SRR from Mladost IV to Thrace is aimed at increasing the throughput of the route. Due to the high traffic intensity in this part, the existing 7-meter gauge is not enough to be missed, so reconstruction is needed to help reduce congestion, pull traffic from the interior of the city to the periphery, and reduce travel time for long conversations. The section of the southern arc of the ring road from Trakia Motorway to Lyulin Motorway will be completed. The project is one of the most important for realization. The construction should begin by the end of 2018, and API procedures are currently being prepared.

The total length of the route is about 5.6 km. There are five intersections in the section, four of which are shaped like a "diamond seam" and the intersection with the "Riverside BouLEVard" is shaped like "“".

Length	6.080 km
Circular junctions	5 pcs.
Canvas (2 pcs.)	2 x 10.5 m
Width dividing strips	3 m
Separation strip to the locals	3 m
Width locals	2 x 6 m
Wide sidewalks	2 m
Indicative value	-
Expropriation procedures	Yes
Project readiness	An investment project is needed. There is a PUP. Regulatory covered by a decision of the SOC №145 / 28.01.16.
Conversion period	till 2020

For the Sofia ring road in the section from km 35 + 260 to km 41 + 340 / from Tsarigradsko Shosse junction to Mladost junction, there is a Conceptual design, engineering is to be done. The project is financed from the Republican budget.

The length of the stretch is 6,080 km, it is envisaged reconstruction and construction of new facilities. The beginning of the project area is at km 35 + 260, which is shortly after the end of the road junction at the crossing of Tsarigradsko shosse Blvd. and the Sofia Ring Road. The end is at km 41 + 340, where the segment will be linked to the reconstructed in 2012 section of the SOP. The section will be two lanes with 3 lanes for movement in the direction, middle dividing strip, dividing strips between the locals and the direct route, 2 local lanes and sidewalks. The intersection of the Sofia ring road with the major road arteries in the area will be realized through 4 road junctions - "Star Lozenski Path" newspaper, p. Patriarch German newspaper ", p. Samokovsko shose newspaper, p. "Mladost" newspaper. Three pedestrian overpasses and bridges over the Iskar River and the Kalia River will be built. Reconstruction of water mains, sewerage and gas distribution network, as well as displacement of engineering facilities, telecommunications, etc. are envisaged.

There are five traffic junctions on the route, which are designed as circular crossroads (on "Star Lozenski Path" Str., "Patriarch German" Blvd., "Krayrechen" Blvd. (it will not be fulfilled because the bouLEVArD itself will be performed in the future) , Samokovsko shosse Blvd. and 406 (diversion to Mladost IV) All pedestrian crossings are solved at the level of terrain where there are no passages where there is no possibility for it There are five intersections in the section from four of which are shaped like a "diamond stuck," and the crossing of the "Riverside BouLEVArD" is shaped like "Gender wise ".

Execution period is 910 calendar days, of which 180 days for design and 730 days for construction.

The implementation of the project will facilitate the transit traffic and the connection between the Struma and Trakia motorways.

Justification: The project significantly improves territorial connectivity. An opportunity is created to improve the speed of bus transport. Downloads traffic to the periphery. Reduces the saturation of part of PSN.

## Construction of transport station "Stochna Gara" along with breakthrough "Danail Nikolaev"

Danail Nikolaev's breakthrough project remains important from the point of view of unloading Maria Luisa Blvd in the section between Slivnitsa Blvd and Sofia Central Railway Station. By building the breakthrough, the structure of the transport network will be improved and will allow for a rethinking of the function of the section for which the current plan offers transport tranquility and the construction of an underground parking buffer center.

Node variants have been developed. Research and simulation of the flows is necessary in order to select the best configuration of the node for confronting the strong tangential flows. The site is included in the short-term budget forecast of Sofia Municipality. In order to undertake construction work on the breakthrough "Danail Nikolaev", it is necessary to complete all expropriation procedures, the process is still ongoing.

Length	530 m
Lanes (2 pcs.)	2 x 10.25 m
Width dividing strip	1,5 m
Sidewalks (2 pcs.)	2 x 3 m
Average gauge	28 m
Length	300 m
Lane plus tramway	25,12 m
Sidewalks (2 pcs.)	2 x 3 m
Average gauge	31,12 m
Length	250m
Lane (2 pcs.)	2 x 10.25 m
Width dividing strip	1.5 m
Pavement	3 m
Pavement + road junction Freight station	4 m
Average gauge	29 m
<i>Indicative value</i>	10,665 million BGNfor the track 17,775 million BGNfor the node
Expropriation procedures	Yes
Project readiness	a project for a breakthrough without a Freight Station node
Conversion period	till 2025.



## Construction of East Tangent Blvd from NST to Shipchenski Prohod Blvd. / Asen Yordanov“

The Eastern Tangent is a class II artery according to GSP of Sofia. The bouLEVArD is part of the ring road "T. Kableshkov "-" GM "blvd. Dimitrov "-" Asen Yordanov "Blvd. - Eastern tangent and makes connections in the western direction between the northeastern and southeastern parts of the city. The concept of the plan is to construct ring and ring-tangential routes to bring out parasitic traffic that enters the center. It is envisaged to run public transport on an autonomous route, a bus or a segregated lane on these routes. The construction of the Eastern Tangent in its entirety will result in the pulling of flows to the periphery, while improving the travel time, especially the longer conversations carried out in this part of the city. Realizing urban transport on the new artery will greatly improve connections in this area. The plan proposes to run urban transport on an autonomous route, a bus or a segregated lane on newly built routes.

The entire Eastern Tangent project includes different levels of readiness. In the area of the North Speed Tangent to Botevgradsko shosse Blvd, an investment project has been prepared, divided into two stages. The first one is from the North speed tangent to Vladimir Vazov Blvd. and the second is from Vladimir Vazov BouLEVArD to Botevgradsko Shosse Blvd. For the rest of the route to Tsarigradsko Shosse Blvd there is a detailed transport-communication project.

Length	5020 m
Lane	2x7,5m. plus west local lane 6m.
Width dividing strip	2m.
Sidewalks	yes
Average gauge	-
Indicative value	-
Expropriation procedures	yes
Project readiness	Different level of readiness
Conversion period	2025
Length	400 m + 1 п. node
Road junction	Diamond type
A jet-cross junction	yes
Indicative value	0.5 million BGN.
Expropriation procedures	yes
Project readiness	Conceptual design
Conversion period	till 2020.
Length	500 m
Indicative value	-
Expropriation procedures	yes
Project readiness	Conceptual design
Conversion period	till 2020 .
Length	4121 m + 2 road junctions and one junction. Along with local lanes the total length is 4956 m.
Indicative value	LEVA 49.87 mln.
Expropriation procedures	Yes; 16.3 million BGN
Project readiness	Preparing a Detailed Development Plan
Conversion period	By 2025

Territorial Integrity and Accessibility: Improves territorial connectivity, especially between northern and southern territories in the eastern part of the city. Downloads traffic to the periphery.

### Breakthrough "Dr. Peter Dertliev" Blvd.–SRR

The breakthrough is an element of the GSP PSN of Sofia. Through it there are better connections of the bc. "Lyulin" with the other territories and Lyulin Motorway through the Ring Road of Sofia. The street serves as a southern gateway to the residential complex. In the GSP of Sofia and SM it is envisaged as a second class artery. Through Adam Mickiewicz Street it is planned to make connections in the north direction with Lomsko Shose, Load Tangent and NST. Through Rozhen Blvd., it makes a connection in the north direction with the SRR. In the southern direction is made connection with the Western tangent. There is an opportunity to realize a public transport route.

### Blvd. Rozhen - a new route from NST to the railway line

The purpose of the new route is to circumnavigate the eastern quarter of Iliyantsi and connect with the North Speed Tangent. Improves connection / access to the northern territories of Sofia via NST. The project also includes the displacement of the tram route on Rozhen Blvd.”

### Connection Sofia Airport – SRR

The connection between Sofia Airport and the Sofia Ring Road is set in the GSP as the IIIA class. They represent a continuation of "Mimi Balkanska" Street and "Prodan Taracchiev" Street in the eastern direction to the connection of SRR in Krivina. This project will provide a direct transport link to the logistic zone that has formed in the area of the Airport and NPP "Iskar - North", with the ring road. This will avoid the passage of freight traffic through residential areas.

### Blvd. "Stefanoson" from SRR to "P. Vladigerov "

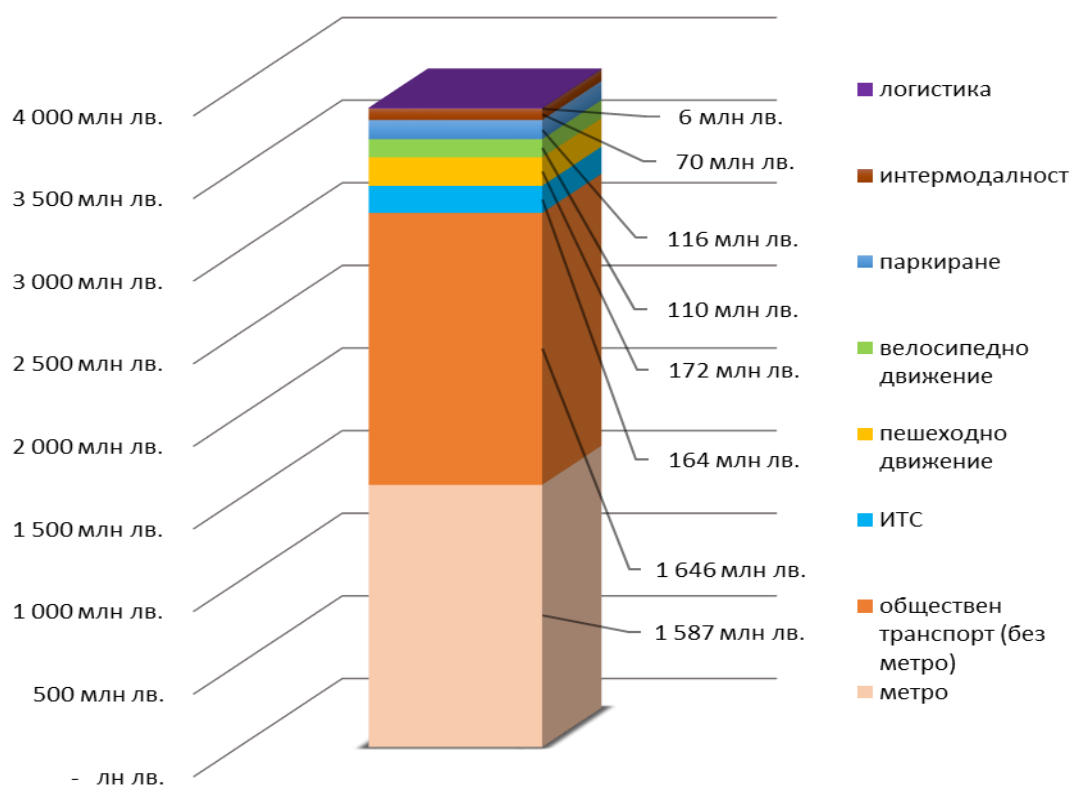
This missing link, which is embedded in the GSP as a Class III arctic artery, will significantly improve the service of the northern side of the Moderno predgradie.

# Budget and financial and economic analysis of the Sustainable Urban Mobility Plan

## 1. Budget

The total budget of the Sustainable Urban Mobility Plan amounts to BGN 3,869 milliard excluding VAT. Its distribution by direction is presented in Figure 81. In order for public transport to be a real alternative to the vehicle, it is necessary to allocate sufficient funds for the development and modernization of the separate public transport so that it offers a higher speed of travel. For this reason, the focus of the efforts is directed at the realization of the large-scale priority investment projects for the development of the metro system in Sofia.

**FIGURE 81 SUSTAINABLE URBAN MOBILITY SUSTAINABLE URBAN MOBILITY PLAN (MILLION BGN.)**



Legend:

Logistics

Intermodality

Parking

Bicycle traffic

Pedestrian traffic

ITS

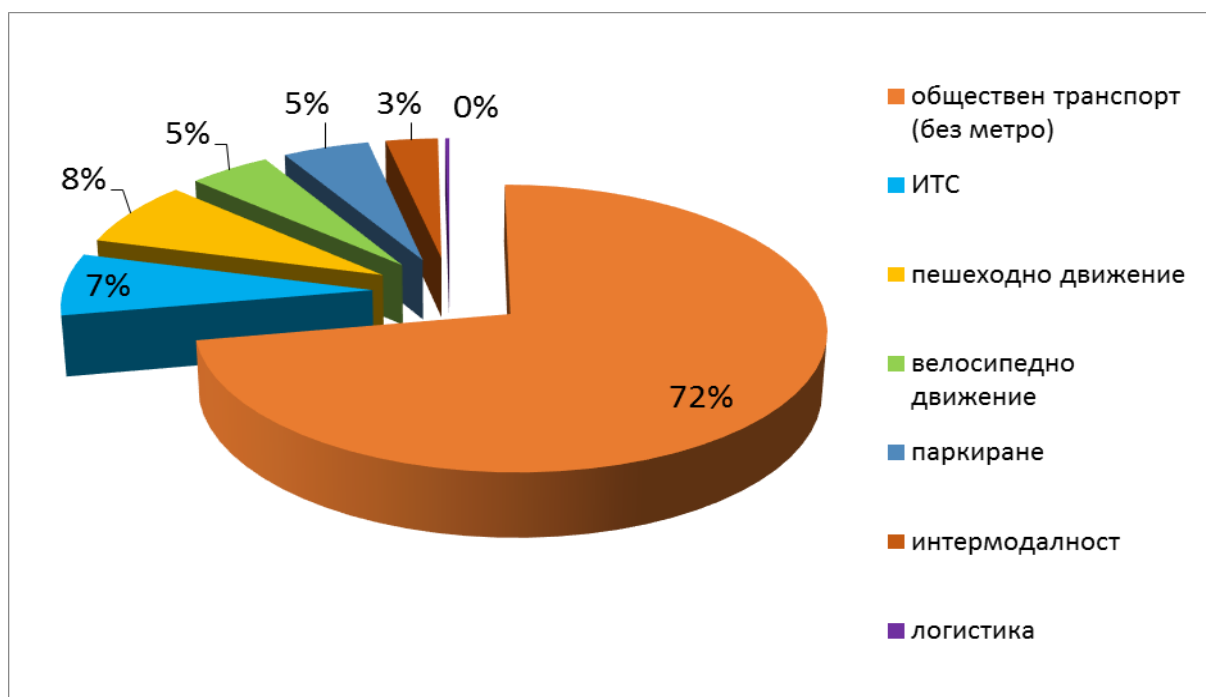
Public transport (without underground)

Underground

Metro projects include building underground infrastructure and rolling stock supplies that are costly. This explains the fact that BGN 1.6 billion or 41% of the total budget is allocated for investment. For the gradual renewal of the rolling stock of the transport operators "Stolichny Autotransport" EAD and "Stolichny Elektrotransport" EAD are allocated BGN 1.3 billion for the period of the Plan until 2035

In order to obtain a more objective view of the distribution of the budget in the different directions, the lower figure (Figure 82) excludes subway projects. The allocation of funds is fully in line with the priorities set for the development of sustainable urban mobility. The highest share (72%) of the financial resources is dedicated to the development of the public transport system. The second place is the investment in pedestrian traffic. Undoubtedly, intelligent technologies should be more widely used and account for 7% of the total budget. Bicycle traffic is immediately down 6%.

**FIGURE 82 BREAKDOWN OF BUDGET BY DIRECTIONS WITHOUT METRO (%)**



*Legend:*

*Public transport (without underground)*

*ITS*

*Pedestrian traffic*

*Bicycle traffic*

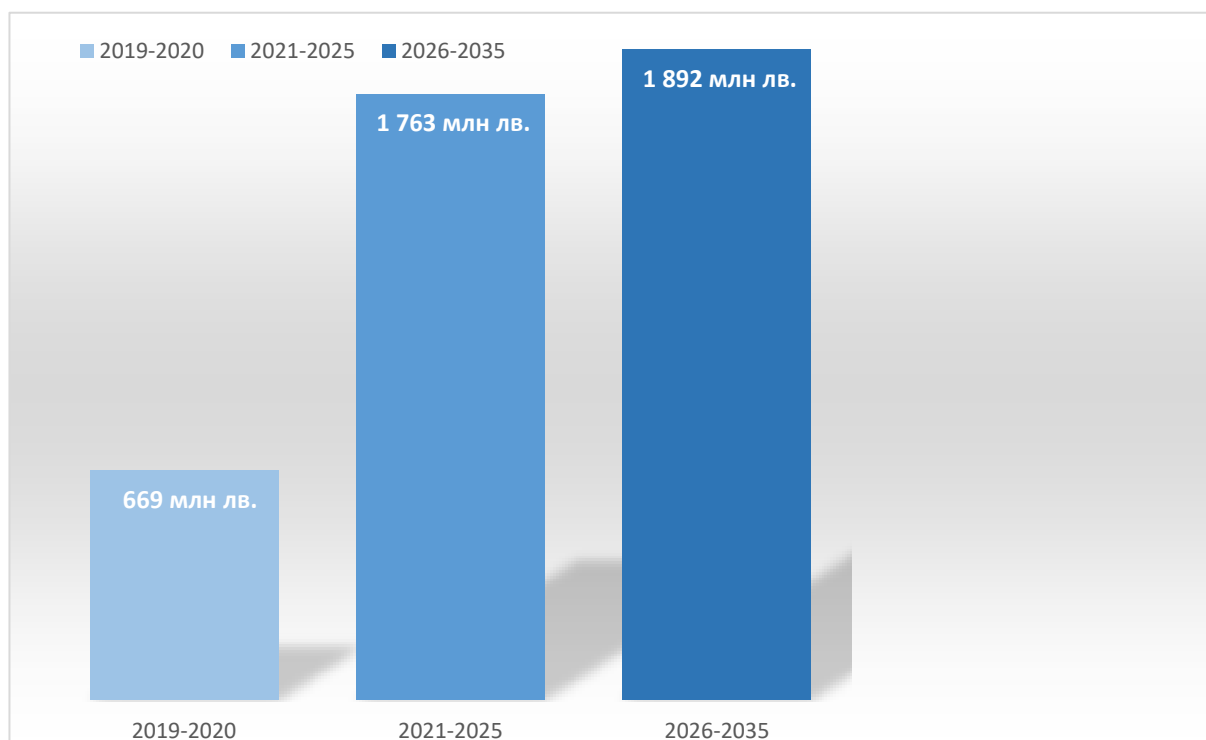
*Parking*

*Intermodality*

*Logistics*

According to the Sofia Municipality, the Plan is divided into the following 3 Periods: 2019-2020, 2021-2025 and 2026-2035, which are not relevant for duration (2 years, 5 years and 10 years respectively). The budget allocation by Periods largely depends on the project readiness of the respective project proposals that are included for implementation. For projects that are still at the planning stage, a balanced cost allocation over time has been adopted so as to avoid overburdening the financial burden on the municipality.

**FIGURE 83 BREAKDOWN OF BUDGET BY PERIODS**

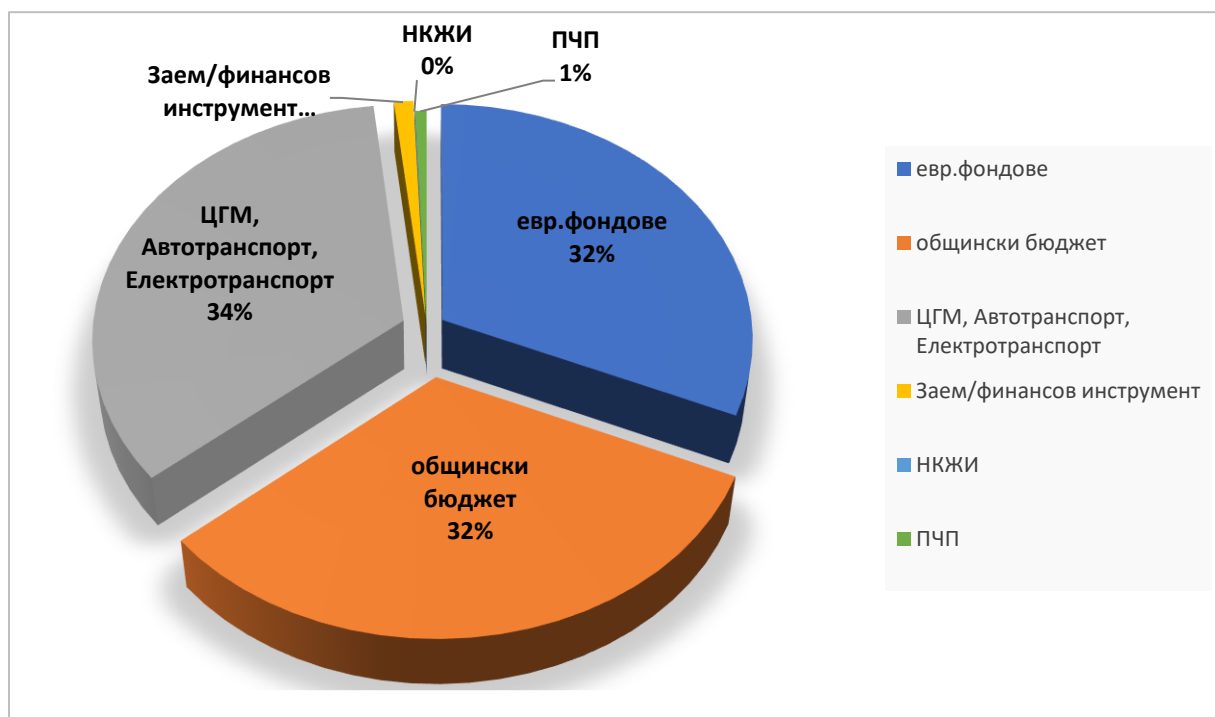


The first period covers only 2 years, which means that only those already in the process of implementation and for which funding is available can be implemented in practice by infrastructure projects by 2020. Until the end of the current programming period (2014-2020) under implementation and financed by the Operational Program "Transport and Transport Infrastructure" and OP "Regions in Growth" are the projects for the third metro-diameter, integrated urban transport (Phase 2) and renovation of public spaces in the Central City District not included in the budget of the Plan. The distribution of funding by sources of funding is shown in the figures below.

Projects that are currently unpopulated require time for preparatory activities related to data collection, research, design, expropriation, and tender procedures, and are therefore left to be realized in subsequent Periods.



**FIGURE 84 TOTAL BUDGET ALLOCATION BY FUNDING SOURCES (%)**



**LEGEND**

European funds

Municipality budget

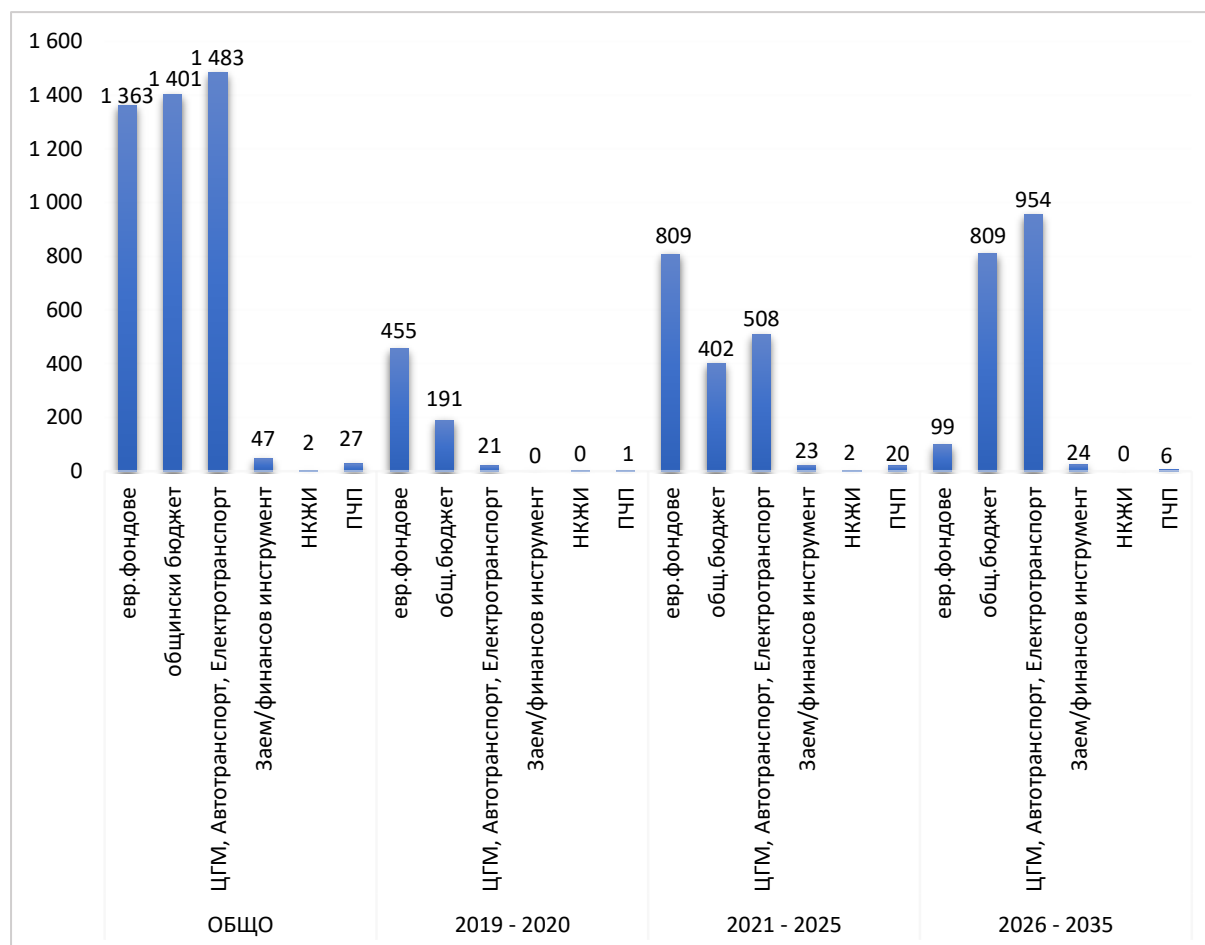
UMC, autotransport, electric transport

Loan /financial instrument

NRIC

PPP

**FIGURE 87 BREAKDOWN OF BUDGET BY FUNDING SOURCES AND BY PERIODS (MILLION BGN)**



**LEGEND**

European funds  
Municipality budget  
UMC, autotransport, electric transport  
Loan /financial instrument  
NRIC  
PPP  
Total  
European funds  
Municipality budget  
UMC, autotransport, electric transport  
Loan /financial instrument  
NRIC  
PPP  
2019-2020  
European funds  
Municipality budget  
UMC, autotransport, electric transport  
Loan /financial instrument  
NRIC  
PPP  
2021-2025  
European funds  
Municipality budget  
UMC, autotransport, electric transport  
Loan /financial instrument  
NRIC  
PPP  
2026-2035

In the period from 2021 to 2025 the financing from European funds under the Operational Programs within the next programming period is expected to be 46% of the budget of the Plan. These are mainly projects for the extension of the metro, the construction of a new tram line along Todor Kableshkov Blvd, bicycles and intelligent solutions and services.

In the period 2026 - 2035, 43% of municipal funding (93% together with transport companies) is foreseen due to the EU's policy of gradually increasing the participation of member states in the implementation of EU joint policies and the ambiguity at this stage for the future EU financial support policy.

## 2. Financial Analysis and Cost-Benefit Analysis of the Plan

The Cost-Benefit Analysis (CBA) is designed to assess the financial and economic efficiency of investment initiatives and projects in the Sustainable Urban Mobility Plan, set in the period 2019-2035. Compared to the Financial Analysis (FA), the CBA provides - a complete idea of the expected results of a project, in the SUMP case. FA considers only financial efficiency while the CBA considers both the financial and socio-economic efficiency of SUMP.

Given the lack of specific guidance on the applicable rules for ERDF funding under the European Structural and Inclusive Funds (ESF) beyond 2020, a policy approach to the continuation of the regional and transport policy pursued under the 2014-2020 programming period is adopted the form of grant schemes. In this regard, the FA and the CBA were prepared by allowing the financing of the Plan from the municipal budget and the ESIS, with a decreasing share of the latter in the long-term horizon. In preparing the FA and CBA of SUMP, the main methodology that is followed is set out in the December 2014 Handbook on Cost-Benefit Analysis (DG Regional and Urban Policy).

Below are the main lessons related to the financial and economic evaluation of the Plan. More details on FA and CBA are given in a separate development of the Plan ("Financial Analysis and Cost-Benefit Analysis" of the Sustainable Urban Mobility Plan).

### 1.1. Methodology and basic assumptions in financial analysis

The main methodology for calculating the financial performance of the plan is the discounted cash flow method. The essence of the method is to determine future earnings and operating expenses and to bring the net cash flows to the date of the analysis using the appropriate discount rate. In this case, all cash flows are calculated using the current values in the base year 2017

For the purpose of calculating the effectiveness, only real money income and costs are taken. All non-cash cash flows (such as depreciation or revenue for future periods) are not taken into account. According to the European Commission's recommendation, for the purposes of comparing European projects, specific national costs, such as profit tax, are not taken into account.

The following assumptions were made when preparing the analysis:

- The developed financial model of the plan covers all projects in the Plan (over 210) that are priced by aggregated indicators, including their impact after their implementation on

the revenue and expenditure side of transport operators, UMC and CO budget.

- All cash flows generated by the Plan during the Reference Period are in BGN (LEVA).
- Only the actual cash flows are taken into account in the analysis. Accounting non-cash income and expenses are not included.
- The analysis was prepared using an incremental approach, ie. by looking at the existing situation with and without a Plan. The "no plan" scenario means maintaining the state of the transport infrastructure and the rolling stock of public transport as it is at present.
- The analysis period considered includes the investment and operational phases of the Plan. The investment phase covers the period from 2019 to 2030. The start-up year of the operational phase of the Plan is 2020, and for the individual projects it differs with respect to the extended investment period. For each particular project, the first year of operation occurs after completion of the construction / delivery / implementation activities, etc.
- The financial model covers a time horizon up to 2043
- Financial projections are calculated in real terms, based on 2017, excluding inflation, and are shown in nominal (current) inflation figures.
- A discount rate of 4% was used to calculate the financial performance of the Plan.
- Data are presented by years.

## 1.2. Financial Efficiency of the Plan

The following incremental cash inflows and outflows are taken into account for the calculation of the financial performance indicators of the investments in the Plan:

Outgoing cash flows:

- project investment costs;
- operating and maintenance costs.

Incoming cash flows:

- Income from operating activities
- residual value of investments

### 1.2.1. Financial Net Present Value of Investment (FNPVI)

One of the most important cost-effectiveness indicators of the project (the plan) is the financial net present value (FNPVI). It is a quantitative expression of the cumulative effect of the investments made over the entire horizon of the Plan. Since the discount rate is an alternative investment opportunity, the net present value expresses the net increase of the invested capital over the increase that would be provided by this alternative investment. Positive value of net present value means that discounted revenue earnings for the entire scheduled Period will exceed total costs.

The Financial Net Present Value of Investments (FNPVI) is negative (LEVA -2,482,542,783), which means that the Plan can not be implemented without public funding. This result is characteristic of projects / plans providing for investment in transport infrastructure. Given that the tariffs for the use of this infrastructure should be socially acceptable, investments in them are not financially profitable. Apart from the fact that the financing of the initial investment requires

large amounts of resources whose sources could be EU grants, grant schemes, municipal / state budget, loans, financial instruments and PPPs, the provision of financial sustainability over time of the already built infrastructure implies the granting of additional municipal and / or state subsidies.

### 1.2.2. Financial Internal Rate of Return on Investment (FIRRI)

The Financial Internal Rate of Return (FIRRI) is the second key indicator to determine the effectiveness of the plan's investments. It integrates the effect as an average rate of return on funds for the entire Plan Period. The FIRRI value obtained in the analysis shows the degree of financial attractiveness of the Plan by comparing it with the financially-based rate for the investor.

The financial model shows a negative return on investment (FIRRI) -7.48%. The financial indicators for investment efficiency are negative and indicate that the Plan can not be implemented without a grant - mainly EU financial assistance.

## 3. Economic analysis of SUMP

The economic analysis evaluates the benefits and costs associated with the Plan from the point of view of consumers and society as a whole, not just direct beneficiaries. The aim is to check whether the Plan has made a positive contribution to society and, therefore, the justification for investing public funding for its funding. This implies testing whether the estimated value of economic benefits exceeds the projected value of economic costs - investment and operating costs. In practical terms, this is expressed as a positive net present value (NAV) and a benefit / cost ratio greater than 1 or when the economic ROI of the Plan exceeds the discount rate for the calculation of the UANS .

### 3.1. Methodology of economic analysis

The cash flows that are included in the economic analysis need to be adjusted, compared to those used in the financial analysis, to take into account shadow prices (price distortion by market factors), ie. external factors that result in benefits and social costs that are not taken into account in the financial analysis as they do not generate actual cash or revenue flows as well as transfer flows related to redistribution in society.

Economic analysis differs from financial under the following basic principles:

- The market prices for materials and services used in the financial analysis are corrected by the actual costs that will not be returned in the form of taxes, duties and excise duties to the state budget;
- Labor costs are adjusted to the actual inputs for workers and staff by taking into account the reimbursed costs of the social security and the shadow labor costs;
- Recognizes the additional effects of the realization of the investments as benefits or costs to society and consumers.

Similar to financial indicators, the analysis was carried out in accordance with the incremental method by comparing the "plan" scenario with the "no plan" scenario.



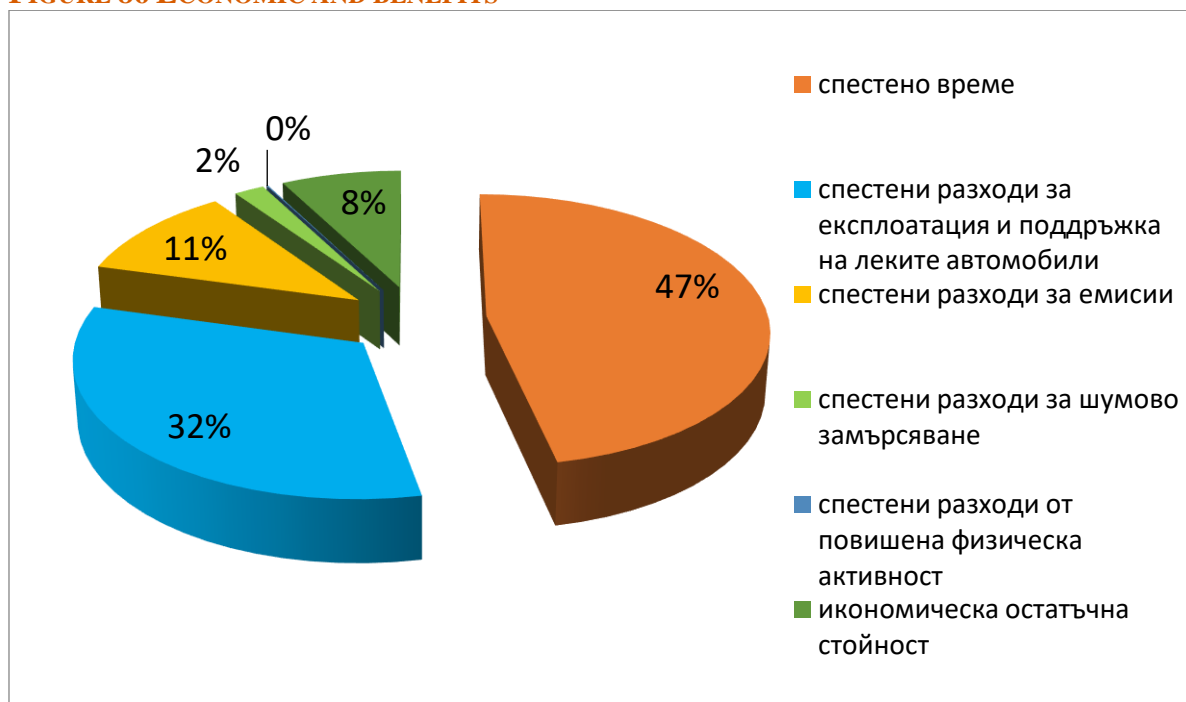
### 3.2. Economic Benefits of the Plan

As a result of the implementation of the projects and measures envisaged in the SUMP, the following socio-economic effects are expected to be valued within the CBA:

- Time Saved (VoT);
- Spending on Car Operations and Maintenance (VOC) costs;
- Emission savings saved;
- Cost savings for noise pollution.

The figure below shows the shares of the main economic benefits identified in the CBA.

**FIGURE 86 ECONOMIC AND BENEFITS**



*Legend:*

*Saved time*

*Costs incurred for the operation and maintenance of light motor vehicles*

*Emission cost savings*

*Cost savings for noise pollution*

*Cost savings from increased physical activity*

*Economic residual value*

Nearly half of the benefits (46.8%) for the entire SUMP result from time travel savings. The time in the "Plan" scenario is determined by taking into account two main sets of factors that are changing man-hours:

- change in the number of journeys on an annual basis due to a change in modal split - the Plan includes a number of projects and interventions aimed at limiting the growth of road traffic at the expense of public transport trips, by bicycle and on foot. However, it should be made clear that as a result of the implementation of the Plan and the increase of the share of sustainable transport movements, there is an increase in the travel time in hours in the "plan" option as, based on average speed, carriage by car takes less time than cycling

and walking. In order to avoid distortion of the final result and reduce the benefits of the Plan (increased travel time in the "Plan" option due to the increased number of bicycle and pedestrian movements), the calculation of the incremental time value took into account the traffic and the public urban transport, ie. pedestrian and bicycle traffic are excluded in this case.

- • a change in travel time due in general to improving the quality and reliability of transport services as well as the possibility of optimal travel planning. For this purpose, the impact of projects such as the introduction of buses, the implementation of an information intermodal mobility management system as a service (MaaS), the support of the routing of transport flows, the introduction of an integrated automated electronic billing system, etc. are monetized.
- Typically, only socio-economic analyzes produce monetarisation of some of the benefits realized, and there are also benefits that are difficult to quantify and whose share is negligible in the light of all the benefits of the project. This approach is conservative because it leads to underestimation of the benefits but is in favor of the security of the end results. The following benefits are not monetized in the produced CBA:
  - • the benefits of increasing traffic safety, given the reduced share of car traffic and improved cycling and pedestrian traffic conditions as well as increased vehicle and incident control;
  - • health benefits (excluding cyclists);
  - • Benefits of reduced heavy traffic in the city;
  - • Benefits of improved pedestrian accessibility in connection with the construction of intermodal connections;
- the benefits of increased travel comfort in new public transport vehicles.

### 3.3. Economic Indicators of the Plan

The Positive Impact of the Plan is measured by the Economic Net Present Value (ENPV), the Economic Rate of Return (ERR), and the Cost-to-Cost (B / C) ratio. Their calculation is possible after the economic benefits and costs have been determined and the corresponding conversion factors applied. The social discount rate for calculating the economic performance of the Plan is 5%.

The calculated economic indicators show that the Plan leads to an increase in public welfare:

- The economic present value of the Plan is positive and shows the discounted net economic benefits of the Plan and their high current value.
- The economic rate of return is above the minimum set for a social discount rate of 5% and is 11.6%.

The cost-benefit ratio is the present value of the benefits of the Plans, divided by the current cost of project costs. If  $B / C > 1$ , then the plan is economically feasible, as the benefits measured by the present value of the total benefits are greater than the economic costs measured by their present value. The cost-benefit ratio of the Plan shows that benefits outweigh the costs by about 47%.

## Recommendations to the Urban Planning System

---

Sofia Municipality plans to launch a procedure for updating the current General Structure Plan. One of the most important elements that will be the subject of the amendment is the transport-communication system of the city.

The General Urban Plan of Sofia Municipality has been in force since the end of 2006 with the adoption of the Law on Structure and Building of the Sofia Municipality. In 2009, it was mainly updated and in 2017 a change was adopted by decision of the Council of Ministers, related to the change of the third metro-diameter track.

### Database and information provision

One of the most important studies to be made in connection with the future update of GSP is the preparation of a support plan and the collection of up-to-date baseline information on the current state of the city. It is not just a snapshot, but a mechanism for constantly setting, maintaining and analyzing information on all systems and processes in the city. Regarding the planning and modeling of the transport system, it is important to have complete and up-to-date information on:

- Population - number, structure, age
- Work places
- Kindergartens and places in them
- Schools, number of scholars
- Higher education institutions, number of students
- Public service - health, administrative services, etc.
- Commercial sites - area, number of occupied, visitors.

This information should be geographically referenced and collected at the lowest possible territorial level - transport areas, census areas, urban development units.

It is necessary to create a mechanism for collecting information on daily trips to and from Sofia (incoming and outgoing passengers arriving in Sofia via stations and bus stations). The same applies to car traffic and public transport.

This information will enable the maintenance of a constantly updated transport model of the city to enable simulations, analyzes, scenario testing, and so on.

### Street network

With regard to the street network, the GSP amendment should more strongly support the development of the northern parts of Sofia. To this end, the GSP needs to propose solutions for better transport links between the territories on both sides of the railway area through breakthroughs at the Central Station, Stochna gara and others. It is possible to offer sinking (underground) to the railway area in the area of the central railway station, thus liberating the territory for the development of the city center in the north direction.

The GSP update should investigate and determine the route of a third urban ring in the west. The Western Tangent proposed in the current GSP route is unconvincing and poorly explored, especially in its crossing West Park. It is necessary to investigate and justify the need for the so-Freight tangent - Ring road in the northern part of the city between the second urban ring and the North speed tangent.

The GSP update should analyze the need for the two-level intersections provided for in the current GSP, and also with an unmistakable need to propose new ones. One of the projects to be analyzed is the need for the roundabout on "P. Todorov "-bul. "Acad. Yves. Geshov "over Bulgaria Blvd.

After specifying the structure and configuration of the PSN, the GSP should explicitly justify an action plan for the completion of the PSN, which, as stated, is unfinished and this creates problems in the overall functioning of the city's transport system.

### Railway network

The GSP should analyze the prospects and the development potential of the Sofia railway junction in terms of the needs and problems of Sofia Municipality.

It is necessary to analyze the necessity and refine the location of new railway stations and stops within Sofia Municipality so as to improve intermodal connections with public transport and stimulate the development of urban, suburban and regional passenger rail transport.

Concerning freight rail transport, it is necessary to analyze and eventually reconsider some of the freight railway tracks crossing the city territory (for example, on Rilska Obitel Str.).

It is necessary to define a terrain for the development of an intermodal terminal in the Kazichene area.

## Bus stations

The future GSP should indicate the location of a new bus terminal to replace the existing South Bus Station. In the existing GSP a new bus station is planned near the ring road at Business Park Sofia, where there is no free municipal terrain. It is appropriate to look for the location of a new bus station near Tsarigradsko shosse Blvd., as it will be able to serve the South-East direction. Another possible location for a new bus station can be found around the last stop of the future extension of line 1 of the metropolitan at the Simeonovski lift, and it is also combined with a buffer parking lot. In any case, the new bus station must be in close proximity to a metro station.

## Metro and tram network

The GSP should analyze and propose a scheme for continuing the territorial development of the metropolitan area - a study of the need for new metro-diameters or deviations within the city - in what direction and where.

As far as the tramway network is concerned, it is necessary to study and analyze the actuality of the tramways in the existing GSP (eg tram on "Vrch Mancho" Str., "Second stop") and proposals for new tramways. One possible proposal that has potential for development is the tram route on "Ivan Geshov" boulevard in the section from Bulgaria Blvd to "Resurrection" Blvd. Such a possibility will provide a good tram link in the North-South direction and will bind the existing separate tram routes along Bulgaria Blvd and Konstantin Velichkov Blvd. It is possible that the newly planned route will function as a buses shared. Another alternative is the tram route along Vardar Blvd.

Another interesting idea that can be explored is the possibility for trams to run on railway rails, as examples exist in some cities abroad (eg in Karlsruhe, Germany). Such a possibility would be, for example, the tram from the railway station. Lyulin, continuing along Pancho Vladigerov Blvd., to climb to the Obelya railway station. line and move at a much faster rate using the existing rail infrastructure. Another possibility that could be considered is the continuation of the metro as an overground railway in the surrounding area using the existing rail network.

## Bicycle movement

As far as cycling traffic is concerned, the update of the GSP should include a plan for the development of the whole bicycle network in Sofia Municipality.

Bicycle routes must also be reflected in detailed development plans with their exact route, gauge,



and so on.

The transport modeling and planning system should also include cycling movements such as analyzes, forecasts, loads, and so on. It is necessary to introduce automated bicycle counters - stationary and mobile stations for monitoring cycling traffic on key routes.

#### Recommendations for the application of the GSP of CO in the context of SUMP

It is necessary in the future GSP and in the legislation on spatial planning to provide mechanisms that will not allow the development of a newly-built territory before it is provided with basic transport, engineering and social infrastructure. When planning new urbanization areas, do not allow construction in private properties:

- before providing the necessary means to expropriate and build the necessary engineering infrastructure, incl. streets of sufficient gauge to carry out the foreseen pedestrian, bicycle and road traffic according to the projected population of the territory;
- before a need study is carried out and the necessary resources (material and financial) for public transport services in the territory are secured;
- before the establishment of a program for the implementation of the General and Detailed Development Plans, in which to plan the necessary public investments for the development of a territory;
- before creating stability of the plans and clearly defined conditions for their change, which will allow tracking of the load on the territory according to the planned technical infrastructure;

Such territories should be classified and viewed as far-infra-red (and currently the GSP has a requirement in the territories defined as long-term prospects, the cost of building infrastructure to be covered by the investors) until analyzes and assumptions to provide the necessary social (schools, health establishments, etc.) and technical (underground engineering networks and streets) infrastructure and public transport to create prerequisites for the use of sustainable modes of transport walking, cycling or public transport and to provide basic day-to-day service within urban units to reduce the number of forced car journeys to neighboring territories or other parts of the city.

## SUMP Monitoring and Evaluation Program

---

The SUMP Monitoring and Evaluation Program is, by its very nature, permanent monitoring, regularly and systematically collecting, processing and analyzing information that will serve to better manage the specific projects within the scope of the Plan and will be used to assess the progress made towards the objectives set. Progress in the implementation of the SUMP will be reported at the level of implementation of a separate project and the reporting will be carried out by experts in Sofia Municipality with the assistance of the municipal enterprises implementing the specific projects.

An integral part of the Plan's monitoring system is the project-level indicators discussed below. They are used to measure the progress of each project. In this respect, it is important to measure the baseline values of the indicators (or use older data where available) before starting the implementation of the projects set out in the Plan, in 2019, which will allow objective and fair reporting of the incremental their impact. The current and annual evaluation of a large number of indicators can also be done automatically using appropriate technical and hardware tools and application software. This will ensure continuous monitoring of key parameters and the ability to quickly respond to a strong deviation of any of the parameters. In view of this, the monitoring in the medium and long term is planned to be carried out through the establishment of an automatic tracking system for the success of the implemented measures in accordance with the set indicators, general and specific objectives set for realization within the framework of the Plan. It should be noted that according to the "Guide to the Development and Implementation of Sustainable Urban Mobility Plans", based on the evaluation of the results achieved and the new challenges, the SUMP is subject to regular review and updating at least once every five years in order to its effectiveness and timeliness are guaranteed.

The use of ITS solutions and traffic management tools and transport networks provided within the SUMP will allow and facilitate the collection and analysis of the data needed to monitor the indicators. Research and innovation will play a key role in achieving the ambitious mobility targets set for the entire SUMP implementation period. In this respect, significant financial resources and opportunities for integrating knowledge and innovation into the mobility sector are planned.

### Types of indicators

Each public financial intervention is based on the identification of certain problems or needs. These needs can be measured by financial and physical means. Physical indicators serve to account for the physical performance of the project goals. They are divided into: indicators for input indicators, output indicators, result indicators and impact indicators.

- Input indicator - Indicates what means: financial, human, material or organizational are set to achieve the specific goal;
- Output indicators - determine what is the final result of the implementation of a specific project activity. Measured by physical units (eg: number of new vehicles serving public transport, km

built / rehabilitated tram network).

- Result indicators - related to the direct immediate effect (physical or financial) for the benefit of the population as a result of the implementation of a project. For example, if the specific objective is to develop the ground transport system and reduce travel time, the performance indicator may be a "length of tram network" and a result indicator may be "population serviced by the newly built tram network".

- Impact indicators - refer to the impact of project implementation beyond immediate effects / outcomes. Two types of influence are distinguished: specific impact - these are effects that occur after a certain period of time that are directly related to the action taken and the population directly affected, and global influence - takes into account the long-term effects affecting a wide range of populations.

The different types of indicators are linked in a logical framework consistent with the objectives to be achieved in the implementation of the SUMP. The implementation of the projects and the achievement of the performance indicators lead to the achievement of immediate specific objectives (results), which lead to the achievement of the common goal (influence). Figure 1 shows (in ascending order) the logical framework of the indicators as well as the relationship between them and the individual, specific and common objectives.

## 89 LOGICAL FRAME OF THE INDICATOR



*Legend:*

*Influence (long-term effects)*

*General Objectives*

*Result from (direct and immediate effects)*

*Specific goals*

*Invested money*

*fulfilment*

Each indicator is characterized by a definition (indicator name), a unit of measure, a baseline (at startup) and a target value (after execution).

The baseline of the indicator corresponds to the initially measured value of the indicator concerned before the progress is started.

The target value of the indicator reflects the goal to which the implementation of a project is directed.

Indicators should be:

- specific / relevant for the project;

Measurable;

- achievable within a certain time period.

### Indicators for the implementation of the Sustainable Urban Mobility Plan of Sofia Municipality

In connection with the implementation of the Plan, a selection of possible indicators was made in order to ensure the possibility of real, qualitative and quantitative measurement of the results so that they correspond to the concept and objectives of the Sustainable Urban Mobility Plan.

Future expectations are that an increasing amount of mobility data in Sofia will be readily available for post-processing and analysis to investigate the effectiveness of the measures and to identify the areas where they should be undertaken actions. Given that the projects will be completed in different time periods, it is not possible to use a single reference year.

The goal for SUMP is to ensure economic, environmental and socially sustainable mobility for Sofia. "Sustainability" in this context means ensuring the mobility of people and goods with zero (or minimal) long-term damage to people and the environment. The purpose of traffic planning in Sofia is to stimulate the use of environmentally friendly modes of transport (walking, cycling and public transport).

To achieve a more accurate traceability of the effect of the implementation of the selected measures, specific measurable indicators are defined to be monitored over time. The process of collecting and analyzing data should be carried out by experts in Sofia Municipality, as it defines the development policy, the control mechanisms incl. and the implementation itself. The directorates, municipal companies and enterprises included in it should regularly report indicators of the indicators that are relevant to their scope of activity or service. An appropriate form would be to automate the collection and / or replenishment of the values themselves to give a clear idea of trends and a smooth presentation of the change. This will allow timely adjustments to be made to the implementation of priority solutions, dropping some or introducing entirely new ones. The following indicators have been selected for SUMP:

**TABLE 11 NUMBER (%) OF PASSENGERS BY WAY OF ACCESS TO SELECTED METRO STATIONS**

№	Indicator	Aim
<b>PUBLIC TRANSPORT</b>		
1	New metro - km lines	20
2	Newly built tram lines - km	12
3	Reconstructed tram lines - km	6
4	New low-floor tramway compositions - pcs.	160
5	New low-floor trolley buses - pcs.	130
6	New Electrics - pcs.	200
7	New buses - pcs.	681
8	Bus strips - km	28
<b>BICYCLE TRAFFIC</b>		
9	Newly built bicycles - km	296
10	Bicycles for short-term rental - pcs.	2,800
11	New built bicycle stands - pcs.	280
<b>PEDESTRIAN TRAFFIC</b>		
12	Construction of pedestrian zones and public spaces - thousand square meters	458
13	Renovated pedestrian and public spaces - thousand square meters	990
<b>PARKING</b>		
14	Reducing the number of vignette stickers in "Blue Zone" - pcs.	2,000
15	Reducing the number of vignette stickers in "Green Zone" - pcs.	10,000
16	Reducing the number of seats allocated through the "Subscription" service in "Blue Zone" - pcs.	300
17	Parking spaces in newly built buffer and buffering CUA car parks - pcs.	6,940
<b>SHARED TRAVELLINGS AND EV</b>		
18	Cars for shared travel - pcs.	1,000
19	Charging stations - pcs.	370



**TABLE 12 RESULT INDICATORS (2035)**

№	Indicator	aim	Target value	Target change
<b>TRAVELLING (% OF THE GENERAL NUMBER OF TRIPS)</b>				
1	Public Urban Transport	Increase	39%	
2	Pedestrian traffic	Increase	28%	
3	Bicycle traffic	Increase	10%	
4	Cars	Decrease	23%	
5	Taxi, shared cars and more	Increase		
<b>MOBILITY</b>				
6	Average travel duration	Decrease		
<b>PUBLIC TRANSPORT</b>				
7	Number of trips per 1 citizen	Increase		
8	Number of passengers	Increase		
9	Number of trips per vehicle per inhabitant	Increase		
10	Vehicle mileage in km	Increase		
11	Average speed in km / h	Increase		+20%
<b>TRAVELLING BY CAR</b>				
12	Number of cars per 1 000 inhabitants	Decrease		-10%
13	Number of passengers in 1 car	Increase	2,25	
14	Annual mileage in km	Decrease		-10%
15	Entering a city center car (daily)	Decrease		-30%
16	Average speed km / h	Unchanged		
17	Electric Cars - pcs. of 1,000 inhabitants	Increase		-
<b>INCIDENTS OF 1 MILLION KM (ROAD SAFETY)</b>				
18	Public Urban Transport	Decrease		-15%
19	Walking movement	Decrease		-20%
20	Bicycles	Decrease		-30%
21	Cars	Decrease		-15%
22	Zones with a speed limit of 30 km / h, length in km	Increase		-
23	Number of hiking trails and crossings	Increase		
<b>SHARED VEHICLES AND BICYCLES</b>				

№	Indicator	aim	Target value	Target change
24	Shared Bikes, num. trips of a citizen	Increase		-
25	Shared vehicles, no. trips of a citizen	Increase		-
<b>ENVIRONMENT</b>				
26	Total emissions	Decrease		-25%
27	Powder Pollution	Decrease		-25%
28	Greenhouse gases	Decrease		-25%
29	Noise pollution	Decrease		-10%
<b>PHYSICAL ACTIVITY</b>				
30	Cycling / walking	Increase		
<b>CITIZENS ' SATISFACTION<sup>6</sup></b>				
31	Public transport	Increase	75%	
32	Bicycle infrastructure and facilities	Increase	75%	
33	Public spaces	Increase	80%	
34	Air quality	Increase	60%	

---

<sup>6</sup>Through Periodic Surveys to Find Satisfaction Levels (Scale: Poor, Average, Good, Excellent on a scale of 1 to 10)

## Focus groups and public participation

The decision-making process is complex, protracted and often takes place in a dynamic environment. Effective sectoral policies for sustainable urban development and transport are based exclusively on the input of stakeholders from which the various institutions (local, regional and central) and non-governmental organizations play a key role. The active involvement in the decision-making process of the various actors leads to effective results and, above all, reflects the attitudes and expectations of citizens towards community development. It allows a clear and broad consensus to be reached on the definition of objectives and measures for the implementation of relevant policies.

In order to achieve the goals of the Sofia City Plan for Sustainable Urban Mobility, focus groups were divided, according to the overall strategic objectives (five in number) defined in the Plan and the specific objectives covered by them.

Concerning the implementation of the focus groups, the following stakeholders were discussed and identified:

- Municipal administration - directorates
- Chairmen of commissions in the SEA (transport, environment, spatial planning, economy)
- UMC
- NAG
- Sofproekt / Vision for Sofia
- Metropolitan Electric Transport
- Metropolitan Autotransport
- Metropolitan
- BDZ
- NRIC
- Union of Architects
- Chamber of Architects
- Union of Urban Planners
- The National Association of Bulgarian Forwarders
- Branch Chamber of Taxi Drivers and Carriers
- API
- Independent experts
- Traffic Police, SDR
- NGOs

Stakeholders were allocated according to the general objectives - topics of focus group discussions, with a large number of them taking part in more than one focus group. The topics of discussion were as follows:

- Focus group in relation to the realization of a common objective "Increasing the attractiveness of

the urban environment and ensuring a better quality of life";

- Focus group on the implementation of a common objective "An integrated and accessible for all transport system";
- Focus group in relation to the realization of a common objective "Decrease of the negative impact of the transport on human health and the environment";
- Focus group in connection with the implementation of a common objective "Improving the safety and security of all participants";
- Focus group on the implementation of a common objective "Implementing transport innovations and enhancing local mobility and economy";

As a result of the focus groups carried out as a form of public consultations, the specific objectives identified in the Plan were prioritized, and new project proposals and initiatives were set up.

The consultant established contacts with the regional tribes on the territory of the Sofia Municipality, where a meeting was held with their representatives, showing the progress in the implementation of the service contract, the identified objectives and discussed specific problems on the territory of each region as well as possible project proposals, which would help to resolve them. The main topics of discussion were urban mobility and urban development in the regions and project proposals related to them, which would help to achieve the goals identified in the SUMP of Sofia Municipality. As a result of the meetings it was achieved:

- collected and analyzed information and data on problems identified by them;
- programs and plans developed in the field of urban mobility;
- identifying project ideas for SUMP purposes of Metropolitan Municipality.

A website has been developed - <https://www.sofiamobility.bg/>, which offers citizens (users) different functionalities, information about the project and its partners as well as the opportunity to make specific project proposals when using an interactive map of Sofia Municipality. The main goal is to reach the widest possible audience and to enable the citizens to participate actively in the SUMP process of Sofia Municipality. The site presents the main steps for the citizens when submitting project proposals, and for the purposes of the plan, the proposals are submitted in specific categories, which users select by means of a drop-down menu, and with the help of the interactive map mark the right place for realization of their initiative.

The ultimate goal is to develop a sustainable and effective SUMP to put in practice a durable model of public participation, in which citizens, non-governmental organizations and other identified actors are actively involved from the outset of the plan. It is for this reason that the Consultant has established effective links and tools to enable interested parties to establish a quick and effective communication with the competent bodies of Sofia Municipality. This in turn contributed to their empathy and identification with the plan and proposed measures, increasing the chances of successful realization and achievement of the goals of SUMP of Sofia Municipality.

## Legislation

- • **Ordinance No. H-32 of 16.12.2011 on the Periodic roadworthiness tests for road vehicles** Issued by the Minister of Transport, Information Technology and Communications, prom., SG, no. 104 of 27.12.2011, in force as of 01.01.2012, amend. and supplements, num. 99 of 14.12.2012, no. 73 of 2.09.2014, in force from 01.09.2014, no. 40 of 27.05.2016, in force from 27.05.2016, no. 38 of 8.05.2018, in force as of 20.05.2018
- **Ordinance for organizing the movement on the territory of Sofia Municipality** - Adopted by Decision No 332 of Protocol No. 48 of 19 May 2005, Am. by Decision No. 3 of Protocol No. 67 of 12 January 2006, by Decision No 515 of Protocol No. 83 of 13.07.2006, amended. and dop. by Decision No 709 of Protocol No. 88 of 28.09.2006, amended. and dop. with Decision No 250 on Protocol No. 105 of 12 April 2007, Decision No 364 of Protocol No. 107 of 26 April 2007, Decision No 502 of Protocol No. 110 of 31 May 2007, by Decision No 645 of Protocol No. 113 of 12.07.2007, amended. and dop. by Decision No 82 of Protocol No 7 of 28 February 2008 (repealed by Decision No 378 of Protocol No 16 of 10 July 2008), Decision No 301 of Protocol No 14 of 12 June 2008, Decision No 378 on Protocol No 16 of 10 July 2008, Decision No 460 of Protocol No 17 of 24 July 2008, Decision No 630 of Protocol No 23 of 23 October 2008, the application of which was suspended by Decision No 153 of Protocol No 35 from 12.03.2009, supplemented. with Ordinance No. 1 on the Public Order on the territory of Sofia Municipality - adopted by Decision No 152 on Protocol No. 35 of 12.03.2009, amended. and dop. - Decision No 494 of Protocol No 45 of 29 July 2009, Decision No 419 of Protocol No 70 of 22 July 2010, Decision No 108 of Protocol No 84 of 24 February 2011, Decision No 148 on Protocol No 12 from 22.03.2012, Decision No 320 on Protocol No. 19 of 28.06.2012, Decision No 457 on Protocol No. 22 of 13.09.2012, Decision No 480 on Protocol No. 24 of 20.09.2012, Decision No 634 on Protocol No. 32 of 20.12.2012, Decision No 521 on Protocol No. 48 of 26.09.2013, amended. - Decision No. 4224 of 24.06.2014 of Adm. court Sofia-city, am. - Ordinance on Movable Objects, on Advertising, Information and Monument-Decorative Elements and on Advertising on the territory of Sofia Municipality, adopted by Decision No. 717 on Protocol No. 71 of 6.11.2014, amended. - Decision No. 9045 of 24.07.2015 of the Supreme Administrative Court under administrative procedure. Case No 11689/2014, Am. - Decision No. 12473 of 23.11.2015 of the SAC on administrative Case No 4919/2015, Am. and dop. - Decision No 440 on Protocol No. 37 of 20.07.2017, in force since 1.10.2017, amended. and dop. - Decision No 8 on Protocol No. 46 of 25.01.2018, Decision No 511 on Protocol No. 58 of 26.07.2018
- **Ordinance on the markets on the territory of Sofia Municipality**, Adopted by Decision No 3 of Protocol No. 27 of 27.07.2001 of the SMC, amend. and dop. by Decision No 516 of Protocol No 83 of 13 July 2006, Decision No 756 of Protocol No 26 of 11 December 2008, Decision No 542 of Protocol No 45 of 29 July 2009, Decision No 322 of Protocol No 54 of 31.05.2018
- **Road Traffic Act**, in force since 01.09.1999, reflected in the denomination of 05.07.1999, Prom. SG. No. 20 of 5 March 1999, amend. SG. issue 1 of 4 January 2000, amend. SG. No. 43 of 26 April 2002, amend. SG. issue 76 of August 6, 2002, supplemented. SG. issue 16 of February 18, 2003, supplemented. SG. No. 22 of March 11, 2003, amend. SG. No. 6 of 23 January 2004, amend. SG. issue 70 of August 10, 2004, am. SG. No. 85 of 28 September 2004, amend. SG. issue 115 of December 30, 2004, am. SG. No. 79 of 4 October 2005, Am. SG. No. 92 of November 18, 2005, amend. SG. 99 from December 9, 2005, amend. SG. No. 102 of December 20, 2005, am. SG. No. 103 of 23 December 2005, amend. SG. No. 105 of December 29, 2005, am. SG. No. 30 of 11 April 2006, amend. SG. 34 of 25 April 2006, amend. SG. No. 61 of 28 July 2006, Am. SG. No. 64 of August 8, 2006, am. SG. No. 82 of October 10, 2006, amend. SG. No. 85 of 20 October 2006, Am. SG. No. 102 of December 19,



2006, Am. SG. No. 22 of March 13, 2007, am. SG. issue 51 of June 26, 2007, am. SG. 97 of November 23, 2007, amend. SG. issue 109 of December 20, 2007, am. SG. issue 36 of 4 April 2008, amend. SG. No. 43 of 29 April 2008, amend. SG. No. 69 of 5 August 2008, amend. SG. No.88 of 10 October 2008, am. SG. No. 102 of 28 November 2008, amend. SG. 74 of September 15, 2009, amend. SG. No. 75 of 18 September 2009, Am. SG. No. 82 of 16 October 2009, Am. SG. No. 93 of November 24, 2009, amend. SG. No. 54 of 16 July 2010, am. SG. No. 98 of December 14, 2010, amend. SG. issue 100 of December 21, 2010, am. SG. issue 10 of February 1, 2011, am. SG. March 19, March 8, 2011, am. SG. No. 39 of May 20, 2011, am. SG. No. 48 of 24 June 2011, Am. SG. No. 20 of March 9, 2012, am. and dop. SG. issue 47 of June 22, 2012, amend. SG. No. 53 from 13 July 2012, amend. SG. issue 54 of July 17, 2012, am. and dop. SG. issue 60 of 7 August 2012, amend. and dop. SG. No. 75 of October 2, 2012, supplemented. SG. issue 15 of February 15, 2013, am. SG. No. 68 of 2 August 2013, amend. and dop. SG. issue 53 of June 27, 2014, am. SG. issue 107 of December 24, 2014, amend. SG. issue 14 of February 20, 2015, am. and dop. SG. No. 19 of 13 March 2015, amend. and dop. SG. issue 37 of 22 May 2015, amend. SG. issue 79 of October 13, 2015, supplemented. SG. issue 92 of November 27, 2015, am. SG. Issue 95 of December 8, 2015, Am. and dop. SG. issue 101 of December 22, 2015, am. SG. 102 of December 29, 2015, Am. SG. issue 13 of February 16, 2016, amend. SG. 50 from 1 July 2016, amend. and dop. SG. No. 81 of October 14, 2016, supplemented. SG. issue 86 of 1 November 2016, amend. SG. No. 98 of 9 December 2016, Am. and dop. SG. issue 101 of December 20, 2016, am. and dop. SG. issue 9 of 26 January 2017, amend. and dop. SG. issue 11 of 31 January 2017, amend. SG. issue 54 of 5 July 2017, am. SG. issue 58 of July 18, 2017, amend. and dop. SG. issue 77 of September 26, 2017, amend. and dop. SG. issue 97 of 5 December 2017, am. and dop. SG. No. 2 of January 3, 2018, supplemented. SG. issue 7 of 19 January 2018, amend. SG. issue 17 of 23 February 2018, supplemented. SG. No. 55 of 3 July 2018, Am. SG. issue 59 of July 17, 2018, supplemented. SG. No. 62 of July 27, 2018

- **Regulations for the enforcement of the road traffic law**, in force since 01.06.1996, adopted by Council of Ministers Decree No. 36 of 05.03.1996, Prom. SG. No. 25 of March 22, 1996; SG. No. 72 of 23 August 1996, amend. SG. No. 32 of 18 April 2006, amend. SG. issue 46 of June 12, 2007, am. SG. issue 34 of 1 April 2008, amend. SG. No. 44 of May 9, 2008, am. SG. issue 53 of June 10, 2008, am. SG. issue 45 of June 16, 2009, am. SG. No. 63 of 16 August 2011, amend. SG. issue 60 of 7 August 2012, amend. and dop. SG. No. 13 of February 17, 2015
- **Territorial Development Act**, in force since 31.03.2001, Prom. SG. issue 1 of 2 January 2001, amend. SG. issue 41 of April 24, 2001, amend. SG. issue 111 of December 28, 2001, am. SG. No. 43 of 26 April 2002, amend. SG. No. 20 of March 4, 2003, am. SG. No. 65 of July 22, 2003, am. SG. No. 107 of 9 December 2003, Am. SG. issue 36 of 30 April 2004, amend. SG. No. 65 of July 27, 2004, Am. SG. No. 28 of 1 April 2005, amend. SG. issue 76 of 20 September 2005, amend. SG. issue 77 of September 27, 2005, amend. SG. No.88 of 4 November 2005, Am. SG. No. 94 of November 25, 2005, am. SG. 95 of November 29, 2005, amend. SG. No. 103 of 23 December 2005, amend. SG. No. 105 of December 29, 2005, am. SG. issue 29 of April 7, 2006, amend. SG. No. 30 of 11 April 2006, amend. SG. 34 of 25 April 2006, amend. SG. issue 37 of May 5, 2006, am. SG. No. 65 of 11 August 2006, amend. SG. No. 76 of September 15, 2006, amend. SG. No. 79 of 29 September 2006, amended. SG. No. 82 of October 10, 2006, amend. SG. No. 106 of 27 December 2006, amended. SG. No. 108 of 29 December 2006, amend. SG. issue 41 of May 22, 2007, am. SG. No. 61 of July 27, 2007, amend. SG. No. 33 of March 28, 2008, am. SG. No. 43 of 29 April 2008, amend. SG.

issue 54 of June 13, 2008, am. SG. No. 69 of 5 August 2008, amend. SG. No. 98 of November 14, 2008, am. SG. No. 102 of 28 November 2008, amend. SG. issue 6 of 23 January 2009, am. SG. issue 17 of 6 March 2009, amend. SG. No. 19 of March 13, 2009, am. SG. issue 80 of 9 October 2009, amend. SG. No. 92 of November 20, 2009, am. SG. No. 93 of November 24, 2009, amend. SG. issue 15 of February 23, 2010, amend. SG. issue 41 of June 1, 2010, am. SG. 50 from July 2, 2010, am. SG. No. 54 of 16 July 2010, am. SG. issue 87 of November 5, 2010, amend. SG. March 19, March 8, 2011, am. SG. No. 35 of May 3, 2011, am. SG. issue 54 of July 15, 2011, am. SG. 80 from October 14, 2011, supplemented. SG. issue 29 of April 10, 2012, suppl. SG. issue 32 of April 24, 2012, am. SG. No. 38 of May 18, 2012, Am. and dop. SG. No. 45 of June 15, 2012, supplemented. SG. issue 47 of June 22, 2012, amend. and dop. SG. No. 53 from 13 July 2012, amend. SG. issue 77 of October 9, 2012, am. and dop. SG. No. 82 of 26 October 2012, Am. SG. issue 99 of December 14, 2012, am. SG. issue 15 of February 15, 2013, am. SG. issue 24 of March 12, 2013, suppl. SG. issue 27 of March 15, 2013, amend. and dop. SG. issue 28 of March 19, 2013, am. and dop. SG. issue 66 of July 26, 2013, am. SG. issue 109 of December 20, 2013, am. and dop. SG. No. 49 of June 13, 2014, am. and dop. SG. issue 53 of June 27, 2014, am. and dop. SG. No. 98 of November 28, 2014, am. SG. No. 105 of December 19, 2014, Am. SG. issue 35 of 15 May 2015, amend. SG. issue 61 of August 11, 2015; SG. issue 62 of August 14, 2015, amend. and dop. SG. issue 79 of October 13, 2015, am. and dop. SG. issue 101 of December 22, 2015, am. SG. issue 15 of 23 February 2016, amend. and dop. SG. issue 51 of July 5, 2016, am. and dop. SG. Issue 13 of 7 February 2017, Am. and dop. SG. No. 63 of 4 August 2017, amend. SG. issue 92 of 17 November 2017, amend. and dop. SG. No. 96 of 1 December 2017, amend. and dop. SG. No. 103 of December 28, 2017, Am. and dop. SG. No. 21 of March 9, 2018, Am. and dop. SG. issue 28 of March 29, 2018, am. SG. No. 55 of 3 July 2018

- **Concessions Act**, in force since 01.07.2006, Prom. SG. issue 36 of 2 May 2006, amend. SG. No. 53 of 30 June 2006, amend. SG. No. 65 of 11 August 2006, amend. SG. No. 105 of 22 December 2006, amended. SG. issue 41 of May 22, 2007, am. SG. 59 of July 20, 2007, amend. SG. issue 109 of December 20, 2007, am. SG. 50 from May 30, 2008, amend. SG. issue 67 of July 29, 2008, amend. SG. No. 102 of 28 November 2008, amend. SG. issue 47 of June 23, 2009, am. SG. 99 from December 15, 2009, am. SG. No. 103 of 29 December 2009, amend. SG. No. 52 of 9 July 2010, am. SG. No. 54 of 16 July 2010, am. SG. 50 from July 1, 2011, am. SG. No. 73 of 20 September 2011, amend. and dop. SG. No. 45 of June 15, 2012, supplemented. SG. No. 82 of 26 October 2012, supplemented. SG. No. 102 of December 21st, 2012, am. SG. issue 15 of February 15, 2013, am. and dop. SG. issue 24 of March 12, 2013, am. SG. issue 66 of July 26, 2013, am. SG. No. 98 of November 28, 2014, am. SG. issue 107 of December 24, 2014, amend. SG. issue 14 of February 20, 2015, am. SG. issue 13 of February 16, 2016, amend. SG. No. 43 of 7 June 2016, rev. SG. No. 96 of 1 December 2017
- **Municipal Property Act**, in force since 01.06.1996, reflected the denomination of 05.07.1999, Prom. SG. No. 44 of 21 May 1996, Am. SG. No. 104 of December 6, 1996, Am. SG. issue 55 of July 11, 1997, am. SG. issue 22 of February 24, 1998, am. SG. 93 of 11 August 1998, amend. SG. No. 23 of 12 March 1999, amend. SG. issue 56 of 22 June 1999, amend. SG. No. 64 of July 16, 1999, am. SG. No. 67 of 27 July 1999, amend. SG. No. 69 of 3 August 1999, amend. SG. No. 96 of 5 November 1999, amend. SG. issue 26 of March 29, 2000, supplemented. SG. issue 34 of 6 April 2001, amend. SG. No. 120 of December 29, 2002, am. SG. issue 101 of November 16, 2004, amend. SG. issue 29 of April 7, 2006, amend. SG. No. 30 of 11 April 2006, amend. SG. issue 36 of 2 May 2006, amend. SG. 59 of July 20, 2007, amend. SG. No. 63 of August 3, 2007, am. SG. issue 92 of November 13, 2007, amend. SG. issue 54 of June 13, 2008, am. SG. issue 70 of August 8, 2008, am. SG. issue 100 of November 21, 2008, am. SG. issue 10 of 6 February 2009, amend. SG. issue 17 of 6 March 2009, amend. SG. No. 19 of March 13, 2009, am. SG. issue 41 of June 2, 2009, am. SG. issue

87 of November 5, 2010, amend. SG. issue 15 of February 18, 2011, am. SG. March 19, March 8, 2011, am. and dop. SG. No. 45 of June 15, 2012, am. and dop. SG. issue 91 of November 20, 2012, am. SG. issue 15 of February 15, 2013, am. SG. issue 65 of July 23, 2013, am. SG. issue 66 of July 26, 2013, am. SG. issue 109 of December 20, 2013, am. SG. No. 98 of November 28, 2014, am. SG. No. 105 of December 19, 2014, Am. SG. issue 13 of February 16, 2016, amend. SG. No. 43 of 7 June 2016, amend. and dop. SG. Issue 13 of 7 February 2017, Am. and dop. SG. No. 96 of 1 December 2017

- Ordinance on the Rules and Procedures for Traveling with Public Urban Transport on the Territory of Sofia Municipality, Adopted by Decision No 178 on Protocol No. 51 of April 5, 2018, effective as of the day of its announcement by announcing the site of the Sofia Municipal Council
- Ordinance No ПД-02-20-2 of 20 December 2017 for Planning and Design of the Communication and Transport System of Urbanized Territories issued by the Minister of Regional Development and Public Works

## List of applications to SUMP

---

1. List of Investment Offerings for the Period 2019 - 2035
2. Maps of the main project proposals
3. Action Plan 2019 - 2020