BALÁZS MÓR PLAN
BUDAPEST
MOBILITY PLAN

2014–2030

BMT

I. Volume 1
Objectives and Measures

BUDAPEST
BUDAPEST FŐVÁROS ÖNKORMÁNYZATA

BKK BUDAPESTI KÖZLEKEDÉSI KÖZPONT

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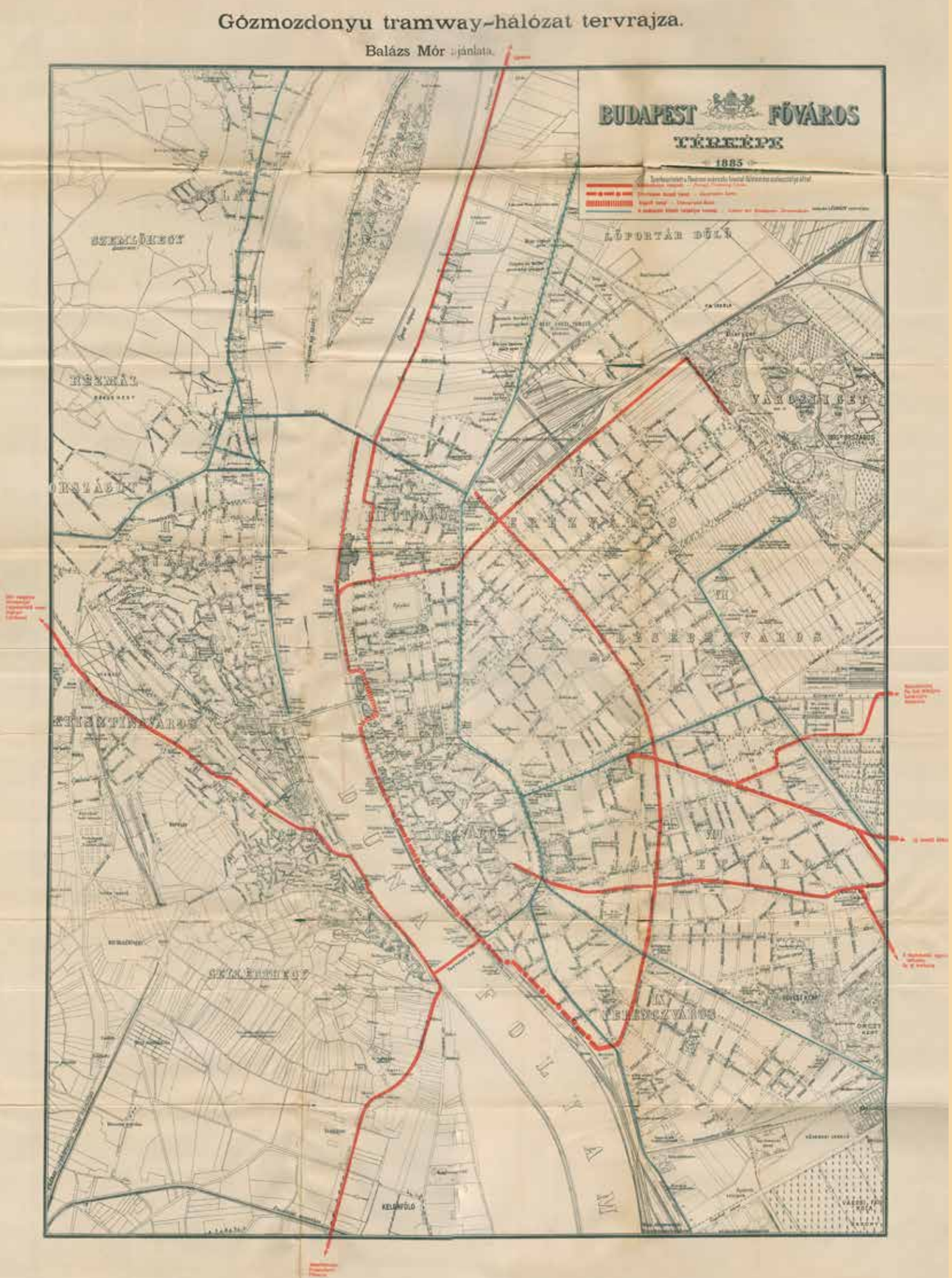
Text sections containing clarifications and additions resulting from the public consultation process are marked with vertical lines



MÓR BALÁZS, THE EPONYM OF THE PLAN

Mór Balázs (5 March 1849, Pest – 1 August 1897, Wauheim)

Mór Balázs was a prominent Hungarian transport engineer of the 19th century. His work still determines the transport and cityscape of Budapest. After studying in England, he returned to Hungary in 1884. In 1886, he developed a plan under the title of "Budapest Stream Tramway Network", in which he outlined the basis for an advanced track-based transport system. He was thinking of introducing an electric urban railway, which was a revolutionary idea at that time.

Balázs founded the Budapest Urban Tramway Company (BVVT) to break down the monopoly of the Budapest Iron Track Road Company (BKVT), which operated the horse-drawn carriage lines, and launched the first tram service in Budapest on the Grand Boulevard (Nagykörút) in 1887 with support of the management of the City. Based on its success, he started building other tramlines across the centre of Pest in 1889, in the current Baross, Király and Podmaniczky streets, on the Nagykörút and along the bank of the Danube, thereby making Budapest the eighth city of the world where electric transport was introduced.

The idea and implementation of the Millennium Underground Railway line is also associated with the name of Mór Balázs. With his contribution, the first metro line on the Continent was built in only 20 months by 1896 on a track length of 3.2 km served by the first cars on bogies in the world that were practically low-floor trams. Emperor Franz Joseph granted the title of a nobleman to Balázs for his achievements.

Mór Balázs contributed a great deal to turning Budapest into a world metropolis but, unfortunately, he had no opportunity to realise his other plans, as he lived only 48 years. His name is now also commemorated by an award, founded by the Budapest Transport Company (BKV Zrt.) in 1997, to be granted to its employees of outstanding achievements in public transport.

The source of archival pictures is the Budapest Collection of the Szabó Ervin Library of Budapest

PREFACE

The transport system is one of the most essential components of Budapest infrastructure: hence, its development fundamentally determines the future of the Hungarian capital. When we contemplate transportation, the starting point is the citizen, inhabiting and using the city. Compiling the new strategy for Budapest transport development, our ultimate aim is to offer citizens – residents and visitors alike – an attractive and competitive metropolis. A capital for the nation, whose friendly atmosphere, reliable public services, cleaner air, well-maintained green surfaces and appealing public spaces provide a liveable everyday environment – and an hub for enterprise, with appropriate, dependable and modern infrastructure in place to boost economic performance.

It is, thus, evident that transport does not only deserve constant attention and care from urban policy for its own sake, but also to ensure the environmental and economic sustainability of the city and its metropolitan region, as well as urban development. All of our tasks, including the assessment of the real mobility demands of the users of public spaces and transport services, the provision of quality services meeting those demands, as well as the constant renewal and development of the existing transport system – are equally important.

With the preparation of the Balázs Mór Plan, based on the Urban Development Concept approved by the General Assembly of the Municipality of Budapest in 2013, such a mobility plan has been created, incorporating clear goals and objectives – a 'compass'for sustainable transport development in Budapest. The transport related objectives of this mobility plan are in line with our overall urban development concept, and its chapters define the current development tasks concerning each transport mode. The transport development projects of the next two EU financing periods must serve the realisation of these objectives.

The Balázs Mór Plan is the worthy continuation of the development process commenced by the restructuring of the Capital's transport governance system. Keeping to the guidelines expressed in the Plan is indispensable for Budapest to successfully face the challenge of competition between European metropolises, offering attractive opportunities for residents, workers, entrepreneurs and visitors alike.

István Tarlós,
Mayor of Budapest

EXECUTIVE SUMMARY

ANTECEDENTS

Following the change of the political regime, the first complex transport development plan was prepared in Budapest in 2001 (BKRFT). This plan was reviewed in 2009 in the interest of regional integration and supplemented with an action plan valid until 2020. This system plan set progressive objectives; however, its calculations were based on overly ambitious developments. Following the review of the BKRFT, the Balázs Mór Plan (in Hungarian Balázs Mór-terv or BMT), the transport development strategy of Budapest for 2014-2030, was prepared. The Plan underwent public consultation and was then approved by the General Assembly of Budapest in the summer of 2014. The results of the wide institutional and public consultation that followed were integrated into the final version of the Balázs Mór Plan's objectives. The Plan was subsequently supplemented with three new measures and a total of sixteen measures were substantially amended. One of the most important results of the consultation was that the overwhelming majority of the individual and institutional respondents agreed with the most important strategic goals of the BMT.

The version of the Plan that had underwent public consultation was presented at the 61st UITP (International Association of Public Transport) World Congress & Exhibition was included amongst the six finalists in the Community Transportation Strategy category, thus winning Budapest recognition for the Plan.

THE SPIRIT OF THE BALÁZS MÓR PLAN

The Balázs Mór Plan is based on the idea of sustainable urban mobility planning. Relying on the transport development experience of the recent past, international best practices and the key problems of Budapest transport, this mobility plan, innovative in Hungarian practice, determines the role of Budapest transport in order to achieve the strategic development objectives of the Capital and to create a system for the most important transport improvements. Its state-of-the-art approach puts city-dwellers and their urban environment into the focus of planning. The new strategy is in line with the guidelines laid down in the White Paper issued by the European Commission in March 2011.

The completion of the Balázs Mór Plan opens a new chapter in the transport development of Budapest. Transport development projects that have a significant impact on the life of Budapest will be planned and implemented in this framework in line with urban development ideas, strengthening their synergy. We will introduce a strategic transport

development practice which gives priority to the improvement of the quality of urban life by satisfying, through its measures, and favourably influencing the mobility needs of the citizens and enterprises.

METHODOLOGY

The strategy was prepared in line with the EU requirements for the programming of development resources in order to be prepared for applying for EU funds supporting urban transport. However, EU funds may be used only in certain areas of development, therefore Hungarian (local government, public and private) funds will also have to be used efficiently per schedule for the implementation of the other measures.

The methodology uses a problem tree based on an analysis (of the existing situation), a vision, a hierarchy of goals and objectives (complex, strategic and operational objectives), as well as the areas of intervention (priorities) and measures assigned to the strategic objectives. Those measures may be broken down to development projects in a synergic relationship with each other.

Other indispensable factors of the methodology are partnership (also including a communication plan), a strategic environmental review and an ex-ante (independent) evaluation prior to implementation.

The mobility planning process does not end with the approval of the developed objectives and measures: the plan is subsequently supplemented with the transport development investment programme developed on the basis of the project evaluation. The Balázs Mór Plan's analysis of the current situation and its monitoring system will be prepared for the defined objectives and approved measures, by developing the appropriate indicators.

KEY ISSUES

The analysis of the current state of play reviews the deterioration of the transport conditions (both of the infrastructure and of the assets) that imposes a threat to operation, the significant network inadequacies, fragmented developments without being integrated into a system, an obsolete sector-based approach and outdated regulations.

The future vision is presented by urban development concept of Budapest: "Budapest is a liveable, attractive capital city with a unique character and is a respected member of the European network of cities as the innovative economic and cultural centre of the country and the region."

According to the general goal, the transport of Budapest must improve the competitiveness of the city and its region and must also contribute to establishing a sustainable, liveable, attractive and healthy urban environment. The operational goals required for achieving the strategic objectives (liveable urban environment, safe, predictable and dynamic transport services, cooperative regional relations) appear in four areas of intervention: infrastructure, vehicles, services and the governance system, i.e., more connections, attractive vehicles, better services and efficient governance.

The strategic objectives of the four areas of intervention are reflected in the following operational goals:

- implementation of liveable public spaces,
- integrated network development,
- interoperable systems and intermodal connections,
- environmentally friendly technologies,
- comfortable, passenger friendly vehicles,
- active and conscious awareness-raising,
- improving the quality of service,
- consistent regulation, and
- regional cooperation.

The approximately sixty measures (packages) that serve the operational objectives cover all urban modes of transport and sub-sectors (from walking through cycling and public transport to individual transport, also including parking, freight transportation, taxi services as well as technology- and IT-based developments) with a systematic, yet differentiated approach, and also manages complex issues such as the developments concerning the river Danube (bridges, waterborne transport), tourism needs and public space improvements.

In the practice of the European Union, the principle of partnership includes the dialogue between the EU, the Member States and the regions, as well as the cooperation between local communities, local governments, NGOs, professional organisations, enterprises, transport service operators, authorities and other institutions. In the course of the preparation of the Balázs Mór Plan, numerous professional and public consultation sessions were held with district, metropolitan area and county (local) governments, professional and non-governmental organisations, interest groups and authorities. The conditions of cooperation were defined in separate agreements with several NGOs. All comments and proposals were evaluated and utilised.

The essence of the Balázs Mór Plan may be summarised in the following three terms: integration, efficiency and overall quality. Based on these principles, the plan intends to contribute to the lively and liveable future of Budapest.

A

THE STARTING POINT

A.1 PROGRESS IN STRATEGIC PLANNING

The Municipality of Budapest approved a complex development plan for the transport system of Budapest (BKRFT) in 2001. The plan had introduced an – at the time – novel approach as it extended beyond the administrative boundaries of the city and included the idea of cooperation between transport sub-sectors, yet it lacked an impact analysis, the ranking of projects, and an adequate programme for funding. The plan was reviewed in 2009 in the spirit of regional integration and an action plan up to 2020 was also added. This system plan set progressive objectives, yet failed to take into account that only few development projects could be implemented due to the economic crisis emerging in 2008.

The BKRFT, prepared in 2009, already proposed the introduction of the 'mobility planning' approach, but it could not be fully incorporated into strategic planning practice prior to the Budapest transport governance reform. The review of 2013, based on a decision of the General Assembly of Budapest, was determined by the concept of mobility planning. The approach was applied to the review of the goals and objectives of transport development in Budapest, to the development of measures and to the selection and ranking of projects. The entire strategic planning process had to be revised. The thematic concept of the Budapest sustainable urban mobility plan was identified on the basis of the manual recommended by the EU Commission, based on which the Balázs Mór Plan (BMT) has been developed, relying on the previously approved transport development plans of Budapest, yet aiming at a more easy-to-understand though professional phrasing of strategic goals and measures.

Public participation and institutional consultation has become a very important process in planning sustainable mobility of Budapest, the success of which is reflected by the 1,300 comments provided to the consultation material. The comments have been individually evaluated and, after being approved by the General Assembly of Budapest, included in the plan in the course of finalizing the BMT objectives. We also used a questionnaire to survey the opinion of Budapest residents regarding the uncovered problems and the objectives. The most important result of the survey was that more than 87% of respondents agreed with the most important strategic goals defined by the BMT: that the number of environmentally conscious methods of transport should be increased by 2030.

The process of strategic planning does not stop at the completed Balázs Mór Plan, as in addition to the development strategy, project preparation and implementation, the applied methodology also contains an evaluation of the implemented projects and takes into account the experience and impacts of the capital investments in the course of the preparation of subsequent projects. The BMT reflects the principles of integrated transport development in cooperation and puts more emphasis on cost-effective fund absorption than previously.

In the urban context, a mixed strategy involving land-use planning, pricing schemes, efficient public transport services and infrastructure for non-motorised modes and charging/refuelling of clean vehicles is needed to reduce congestion and emissions. Cities above a certain size should be encouraged to develop Urban Mobility Plans, bringing all those elements together. Urban Mobility Plans should be fully aligned with integrated urban development plans.

EU *White Paper* (17.)

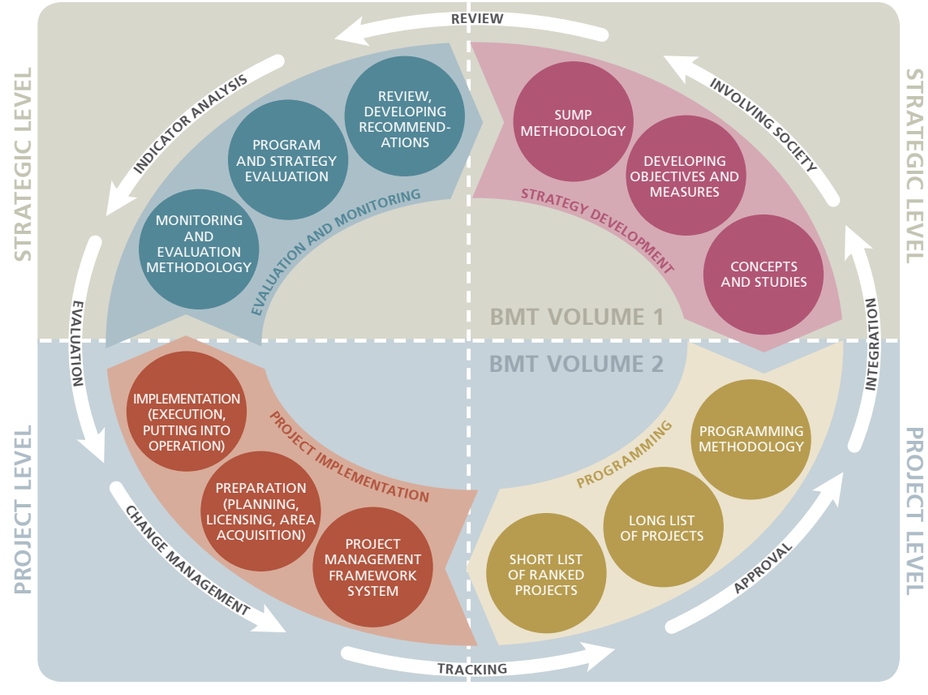
With sustainable urban mobility planning, a new chapter will be opened in the transport planning of Budapest, in which the major development projects will be prepared and implemented in line with the urban development concepts, strengthening each other's impacts. A strategic transport planning practice will be introduced, which is aimed at improving the quality of urban living, while at the same time the plan will satisfy and favourably influence the mobility needs of the population and also of businesses. Through strategic planning, Budapest has also been prepared for the next EU financing period and will thus be able to successfully apply for development funds improving urban transportation.

Based on the results of the public consultation of 2014, Volume I of the BMT was born: "Balázs Mór Plan 2014–2030, Budapest Mobility Plan, Volume I, Objectives and Measures," which is based on the transport developments previously approved by Budapest but does more to define the strategic objectives and measures in a professional but easily understandable manner.

The strategic planning process did not come to an end with the completion of Volume I of the BMT, since Sustainable Urban Mobility Planning (SUMP) is a process that also includes the evaluation of completed projects in addition to creating a development strategy and preparing and implementing projects: it also takes into account the experiences and effects of the investments when preparing subsequent projects. The next step of strategic planning is to link the indicator and monitoring system to all of the BMT's final measures and to work on project preparation by developing, evaluating, and scheduling the project packages that support the objectives. The monitoring system helps evaluate the implemented projects and takes into account the experiences and effects of the investments when preparing subsequent projects.

Accordingly, the BMT validates integrated transport development principles in public cooperation and lays greater emphasis on using resources more cost effectively than in previous practices.

THE PROCESS OF STRATEGIC PLANNING AND IMPLEMENTATION



A.2 TIME FRAME

THE BALÁZS MÓR PLAN LAYS DOWN THE STRATEGY OF SHORT- AND MEDIUM-TERM TRANSPORT DEVELOPMENT IN BUDAPEST FOR THE PERIOD BETWEEN 2014 AND 2030.

A.3 PARTNERSHIP

The Balázs Mór Plan underwent public and institutional consultation along the lines of a predetermined communication plan that defined the tools, scheduling, and tasks of maintaining contact with the affected social groups. During the course of the institutional and public consultation, the city's residents played an important role; in addition, the opinions of social and civil organizations, transport service providers, research and education institutions, and official bodies were also of prominent significance. During the course of planning, it was important to ensure that the affected parties be provided the possibility of participating in planning and receive information on its method. The information and the BMT consultation material was distributed for commenting to more than 200 institutions and organizations, and a website was then prepared to directly receive comments submitted by the public. Electronic publication played the part of calling attention to the possibility of participation, providing information on the importance of the objectives, providing a brief introduction to the project, and receiving comments made by the public. The information on the details of public consultation was made available on a continuously updated newsfeed on the Plan website.

In addition to written comments, several consultation forums and institutional consultations also served the purpose of gaining information on recommendations.

The success of the public consultation is proven by numbers: 1200 comments were submitted regarding the Plan and transportation of Budapest in a total of 272 written opinions. A technical workgroup evaluated the opinions. The majority of the opinions contained constructive, supplementary recommendations. The technical workgroup ordered and evaluated all comments, on the basis of which it defined recommendations for amending the Plan.

The main problems regarding transport and the acceptance of strategic and operative goals was also assessed with the use of a questionnaire. The results were published on the BMT website, resulting in a total of 516 valid questionnaires being filled out. Their evaluation shows that the strategic goals of the BMT receive a high level of support.

During the course of institutional consultation, separate meetings were held with each of the players affected by transport development in Budapest in the interest of consulting on the recommended changes. The General Assembly of Budapest decided on approving the recommendations and continuing planning. As a result of the recommendations that arose during public consultation, several measures were added to the BMT and numerous measures were supplemented or clarified.

The European Union supported the process of public consultation in the framework of the "CH4LLENGE" research and development cooperation in the Intelligent Energy Europe program.

A.4 ANALYSIS OF THE CURRENT SITUATION

For almost three decades starting from the 1960s, urban planning and development principles were determined by the prevailing modernisation approach and by the specific social and economic environment. The concept of autonomous individuals was not reflected at all in that coordinated, heavily organised and hierarchically technocratic system. The idea of functionality also determined the approach to public spaces: motorised transport was given priority at the expense of other aspects; a liveable environment was a secondary issue. The response to the trend of motorisation, which had already been questioned more and more frequently in international practice at the time, served primarily the spectacularly growing demand through continuous capacity enhancement. Towns were converted to serve passenger car transport. When wide footpaths, alleys and opportunities to stop began to disappear, people living in towns and the public spaces used by them fell victim to that idea. The urban planning practice, committed to motorisation, can also be witnessed in Budapest, although the number of passenger cars in Hungary has been lower than the West European average. As a result of the process, the preferences in choosing places of residence along with transport habits have changed.

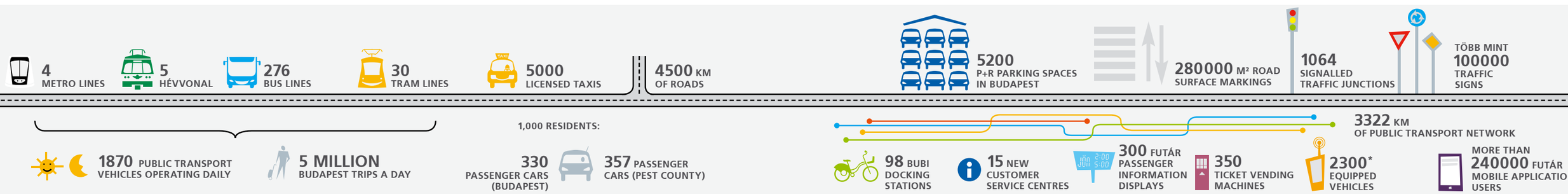
No transversal components were built in the ring-radial transport network, because it was believed that traffic, at a much smaller level than nowadays, could be managed by increasing the capacity of the roads leading across the city centre. All these aspects affected the development of urban spaces and the positioning of pedestrian crossings. Pedestrian underpasses were built in the inner city; trams disappeared from the most important avenues of Budapest and the thus freed surfaces were used by additional traffic lanes on Üllői, Rákóczi, Váci and Bajcsy-Zsilinszky ways.

In order to use metro lines more intensively, the previous long transport lines were segmented and turned into feeder lines for the metro network, thereby increasing the number of forced changes. The smaller number of tram lines deteriorated the degree of integration of the track-bound network and made changes cumbersome. Transport planning focused on technical-operational aspects and not on the comfort of passengers. At the most important traffic interchanges, priority was given to the possibility of turning round public transport vehicles, terminus functions and the storage of vehicles instead of passenger movements and the utilisation of urban development opportunities. Typical examples include Széll Kálmán Square, Baross Square, Örs vezér Square or Móricz Zsigmond Circus. These changes, however, did not distort the breakdown of transport modes immediately, because the majority of the residents of the city were compelled to use public transport.

Following Western European trends with a lag, the previous approach began to change gradually in Budapest as well after the turn of the century and the criteria of liveability began to be applied also at the strategic level: pedestrian zones, cycling infrastructure, traffic calming, public transport prioritisation, reinstatement of bus lanes and long bus routes. The demand emerged to regulate car and road freight traffic coming to Budapest and to form a public transport tariff community; a long-term plan was made for the integration of railway lines into city transport (S-Bahn concept) in order to reduce the number of forced changes and to cut back the further increase in car traffic.

A.5 PROBLEM TREE

A detailed status review and problem analysis were conducted in preparation for the BMT which identified the root and recurrence causes and mechanisms behind the disturbing factors that occur as symptoms. The concentrated result of the analysis is summarised in a problem tree.



PROBLEM TREE

PROBLEMS IDENTIFIED ON THE BASIS OF THE STATUS REVIEW

PROBLEMS APPEARING IN TRANSPORT

ROOT CAUSE

MAINTENANCE

- BADLY DESIGNED/ BAD QUALITY ROAD SURFACES
- WORN OUT TRACK-BOUND INFRASTRUCTURE
- HIGH EXPENSES
- DIFFICULTIES IN PLANNING TRIPS AND CHANGES
- POLLUTING, UNRELIABLE VEHICLES
- INCONVENIENT, BADLY PLANNED CHANGES
- BAD EFFICIENCY OF OPERATION
- SERVICE INTERRUPTIONS, MISSED CONNECTIONS
- UNNECESSARY WAITING TIMES BY VEHICLES, UNCOMPETITIVE JOURNEY TIMES

- OBSOLETE TRAFFIC CONTROL INFRASTRUCTURE
- GRADUAL DETERIORATION OF INFRASTRUCTURE AND THE ROLLING STOCK
- RESOURCE AND CAPACITY WASTING
- BAD INTERMODAL CONNECTIONS
- OBSOLETE CONTROL TECHNOLOGY, LACK OF TRAFFIC-DEPENDENT SYSTEM
- OBSOLETE, OFF-LINE PASSENGER INFORMATION SERVICES

- DEVELOPMENT-ORIENTED FUND ABSORPTION, NEGLECT OF OPERATION
- LACK OF INTELLIGENT SYSTEMS SUITABLE FOR SENSITIVE CONTROL

NETWORK

- LACK OF CROSS TRANSPORT RELATIONS
- MANY CHANGES/ FORCED CHANGES
- INADEQUATE SUBURBAN PUBLIC TRANSPORT SERVICES
- THE CYCLING TRANSPORT INFRASTRUCTURE IS NOT ATTRACTIVE
- LONG WALKING DISTANCES
- THE SEPARATION EFFECT OF TRANSPORT INFRASTRUCTURE
- DISABLED PEOPLE FIND IT IMPOSSIBLE OR DIFFICULT TO USE HIGH-CAPACITY
- LOW-QUALITY BUS SERVICE, EVEN IF IT IS FREQUENT
- CONGESTED CENTRE, FEW AND NEGLECTED PEDESTRIAN
- SPONTANEOUS SOLUTIONS INSTEAD OF BUILT B+R STORAGE FACILITIES, BICYCLES CANNOT BE TRANSPORTED ON MOST LINES
- DISABLED PEOPLE FIND IT IMPOSSIBLE OR DIFFICULT TO USE HIGH-CAPACITY LINES
- DIFFICULTY IN ACCESSING AIRPORT BY LAND

- UNREASONABLE ROUTES, FORCED PARALLEL SERVICES
- LACK OF NETWORK CONNECTIONS
- THE INFRASTRUCTURE IS NOT SUITABLE FOR BARRIER-FREE ACCESSIBILITY
- SUBSECTOR-BASED OBJECTIVES, COMPETITION WITH OTHER SUBSECTORS
- OBSOLETE FEEDER-TYPE NETWORK
- LACK OF CONNECTIONS BETWEEN VARIOUS NETWORKS
- LACK OF NETWORK COVERAGE

- DEVELOPMENTS DO NOT FORM A SYSTEM
- DOMINANCE OF SECTOR- AND SUBSECTOR-BASED APPROACH

TRAFFIC

- DECLINING PUBLIC SERVICE QUALITY
- DETERIORATING LIVING CONDITIONS IN URBAN
- CONGESTION, CONGESTED ROADS
- A LOT OF ROAD ACCIDENTS
- INCREASING JOURNEY TIME, TIME LOSS
- INADEQUACIES IN THE SUPPLY OF LESS DENSELY POPULATED AREAS
- AIR POLLUTION, NOISE POLLUTION, DETERIORATING ENVIRONMENTAL QUALITY
- INCREASING POLLUTANT EMISSION
- AREAS USED BY MOTORISED TRANSPORT

- LACK OF PUBLIC TRANSPORT SERVICES IN LOWER DENSITY AREAS
- INCREASED DEMAND FOR MOBILITY
- REDUCTION OF THE RATIO OF PUBLIC TRANSPORT
- INCREASE IN THE NUMBER OF PEOPLE USING PASSENGER CARS
- BUS ROUTES ON THE MAIN AXES OF THE TOWN WITH AN UNMANAGEABLY DENSE FREQUENCY OF SERVICES
- BAD TRANSPORT SAFETY
- EXCESSIVE DOMINANCE OF ROAD VEHICLE TRAFFIC, DISPROPORTIONATE USE OF PUBLIC SPACES

- CHANGES IN RESIDENTIAL LOCATION PREFERENCES, URBAN SPRAWL, SUBURBANISATION
- CHANGES IN LIFESTYLE AND IN SHOPPING HABITS
- DEVELOPMENTS CONCENTRATE TOO MUCH ON MOTORISED INDIVIDUAL TRANSPORT AND CAPACITY ENHANCEMENT
- PEDESTRIAN AND CYCLING TRANSPORT ARE NOT PRIORITIES
- TRANSPORT DEVELOPMENT NOT INTEGRATED PROPERLY INTO URBAN DEVELOPMENT PROCESS

REGULATION

- A LACK OF CALCULABLE NORMATIVE FINANCING
- A LACK OF A REGULATORY SYSTEM FOR URBAN FREIGHT TRAFFIC
- UNRELIABLE BOAT SERVICE DUE TO FREQUENT RESTRICTIONS
- THE DANUBE AS A TRANSPORT CORRIDOR IS NOT EXPLOITED
- UNFAVOURABLY POSITIONED STATIONS
- LACK OF COMPLEX PARKING REGULATION
- RAIL TRANSPORT HAS A NEGLIGIBLE ROLE IN URBAN TRANSPORT
- THE RAILWAYS, THE SUBURBAN RAILWAYS AND THE METRO SERVE SEPARATED AREAS
- FEW P+R FACILITIES

- SUBSECTORS, URBAN AND REGIONAL TRANSPORT ORGANISED IN FRAGMENTED SYSTEMS
- LACK OF AN INTEGRATED TRANSPORT APPROACH
- PIERS INCAPABLE OF ADJUSTING TO THE FLUCTUATION OF THE DANUBE'S WATER LEVEL
- LACK OF SYSTEM INTEGRATION

- FRAGMENTED REGULATION WHICH MAKE CONSISTENT SOLUTIONS MORE DIFFICULT
- SECTOR-CENTRED TRANSPORT PLANNING APPROACH
- FALLACIES OF THE GOVERNANCE SYSTEM (METROPOLITAN AREA/BUDAPEST/DISTRICTS; LOCAL/REGIONAL)
- INADEQUATE LEGISLATIVE BACKGROUND

PROBLEMS IDENTIFIED ON THE BASIS OF THE STATUS REVIEW

PROBLEMS APPEARING IN TRANSPORT

ROOT CAUSE

A.6 KEY PROBLEMS

The most important conclusions of the analysis are summarised in the following key problems:

1 Deterioration of conditions threatening the sustainability of operation.

The most striking historic debt which imposes a threat to everyday operation is the long-term neglect of maintenance both in infrastructure and the vehicles and the lack of periodic renewals.

2 Fragmented developments out of their urban context and implemented outside of a system.

Urban planning practice, focused on modernisation, has resulted in a transport network subservient to motorisation. Surplus movements are required in transport owing to the distorted urban structure, urban sprawl and bypassing of derelict brownfield areas. The use of urban space for purposes other than their original functions leads to increasing tensions.

3 Inappropriate responses to a changing lifestyle and polluting solutions.

Instead of the analysis of the actual situation, the development activities were either based on concepts that are now obsolete or on foreign examples, which are not adaptable in Budapest due to the specificities of the city (e.g.: extension of traffic lanes, design of a multi-storey car park in a zone designed for traffic calming). All these activities cause increasing and permanent problems primarily because of the acceleration of the suburbanisation processes.

4 Significant inadequacies in the network structure.

The overemphasising of developments did not result in the elimination of the key network inadequacies, which is a complex problem concerning approach and priorities. Radial transport network development was preferred to transversal development, car transport to public transport and the development of the bus network to tram services. Due to the construction of the metro network, surface public transport developments were postponed.

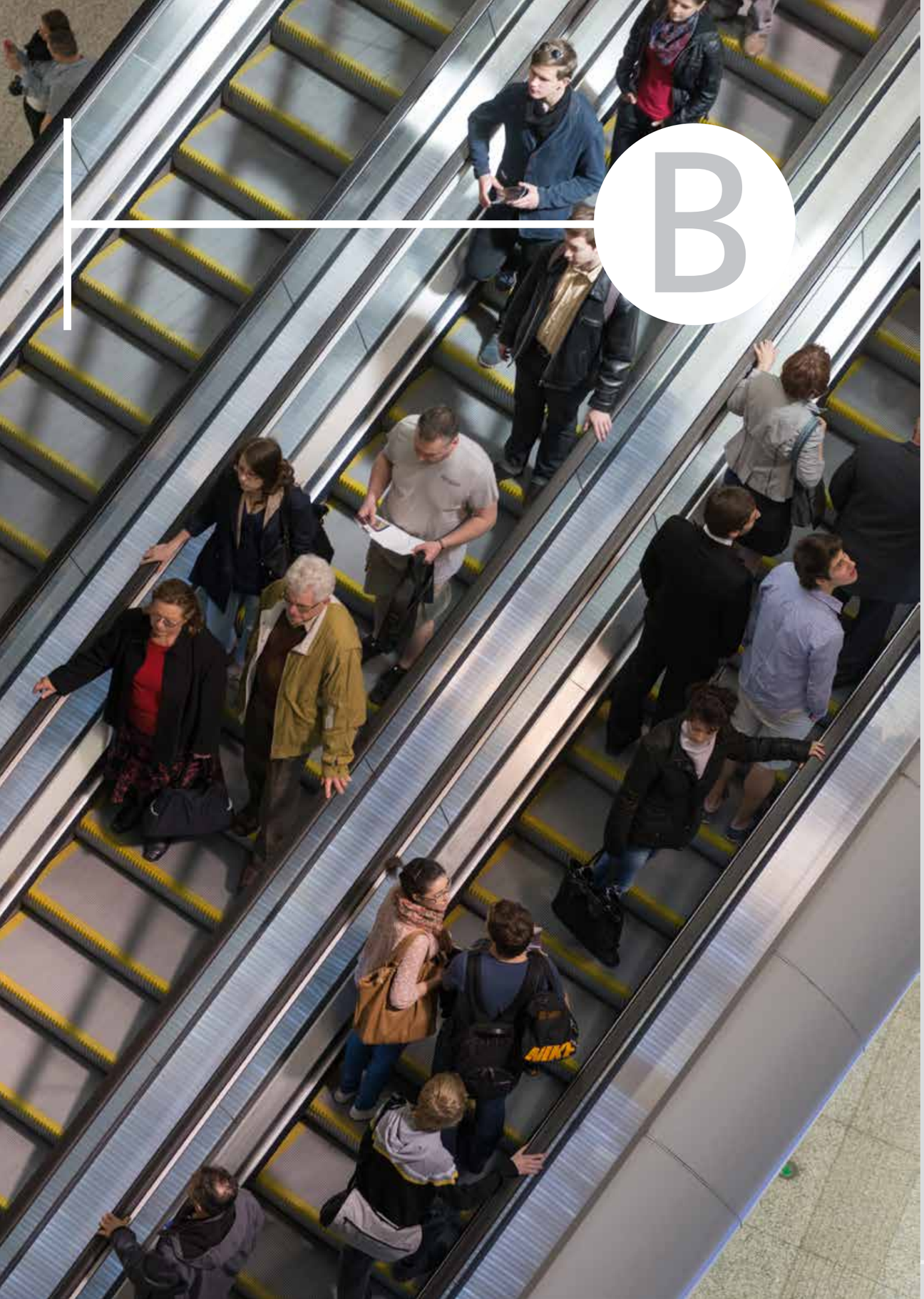
5 Fragmented regulations, impeding complex solutions.

The legal, governance and regulatory background affecting the overall planning environment impedes reasonable cooperation, which is reflected in discrimination within transport (e.g., in the rigid separation of local and regional transport) and also in the hindrance of multi-actor cooperation.

6 Continuation of sectoral and sub-sectoral approach, lack of cooperation.

The routines and habits within the sector have impeded advanced solutions for a long time. They include the exaggeration of technology and operational problems, and giving priority to the operator's approach to the service-providing role of transport. Thus each transport hub is determined by operational criteria and not by the comfort of passengers, the rigid separation of the track-based systems deteriorates the quality of services. This problem will be preserved for subsequent decades if only vehicles fitting into the existing network are purchased.

The most typical common characteristics of the identified key problems are the fragmentation and lack of cooperation, which may be resolved by applying an integrated approach. An integrated review of maintenance, operation and development is required for the optimal use of funds for the operation of the transport system with a calculable financing background. Sub-sectoral integration and a joint regional approach to transport and other sectoral policies are indispensable for defining the appropriate directions for transport development and for managing the identified problems. The main responsibility of the Balázs Mór Plan is to eliminate the lack of coordination and to introduce cooperation, which is in harmony with the described principles of advanced mobility planning and the requirements stemming from international experience and the need for an integrated urban approach.



B

WHERE ARE WE HEADING?

Transport is a major city-forming power, an economy-developing and environment-shaping factor, a part of urban policy, and therefore its impacts must be used to assist urban development. The objectives of the Budapest Mobility Plan must be identified by taking into account three fundamental aspects for effectively managing transport problems:

- the complex development goals of the capital city,
- tendencies and European and national objectives based on international transport development experience
- general and specific transport problems identified in the status review and the correlations of the problem tree.

Summary of the main EU transport policy objectives:

reduction of the burden on the environment,

reduction of greenhouse gas emissions and local pollution,

energy security, reduction of dependence on hydrocarbon-based fuels,

making the regions of Europe more competitive,

improving the quality of life for European citizens,

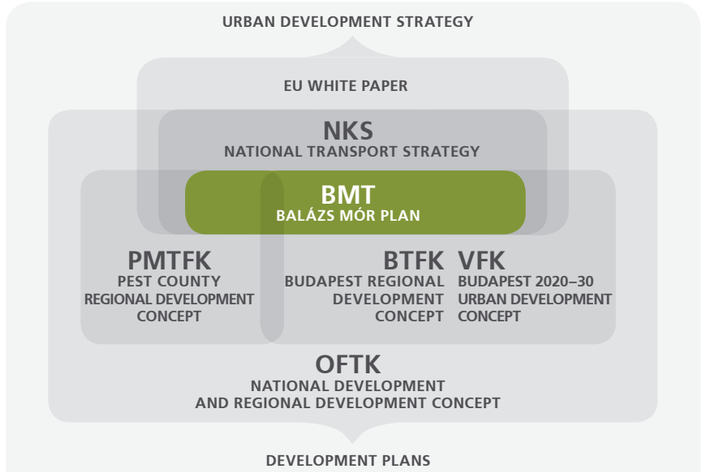
transport safety as a priority.

The objectives of the Balázs Mór Plan reflect the development of Budapest and its urban area in line with the approved urban development plans, and therefore individual measures may be implemented in a coordinated and comprehensive context and not in isolation. The social and transport development objectives of the following Budapest and national development documents, prepared at various levels, and often simultaneously, were taken into account in the Balázs Mór Plan:

- OFTK: Országos Fejlesztési és Területfejlesztési Koncepció (2014)
- OFTK: National Development and Regional Development Concept (2014)
- PMTFK: Pest County Regional Development Concept (2013)
- NKS: National Transport Strategy (2014)
- OVK: National Railway Development Concept (2014)
- NKP: National Environmental Protection Programme
- VFK: Budapest 2020–30 Urban Development Concept
- BTFK: Budapest Regional Development Concept
- FKP: Budapest Environmental Programme
- TSZT: Budapest Urban Structural Plan
- IVS: Budapest Integrated Urban Development Strategy
- TFP: Thematic Development Programmes
- Budapest Danube Area Utilisation Concept
- Budapest Tomorrow and the Day after Tomorrow (The Cultural Capital of the Danube)
- Budapest Track-Bound Vehicle Strategy 2013–2027 (2013)

Of the listed documents, the Budapest and Pest County Regional Development Concepts contained several joint proposals for the development of the capital city region, which are priorities among the objectives of the Balázs Mór Plan.

POSITIONING OF THE BALÁZS MÓR PLAN IN THE HIERARCHY OF NATIONAL AND BUDAPEST PLANS

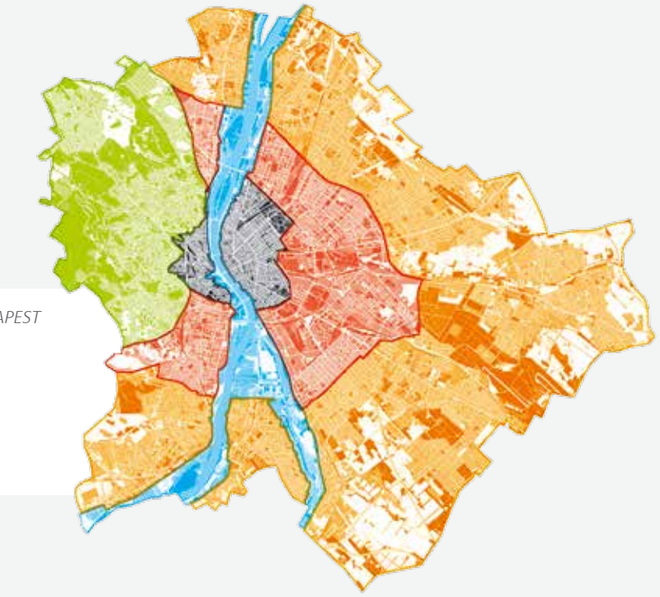


An important strategic task of transport policy is ensuring harmonisation with regional policies. For this purpose, transport conditions in the regions of Budapest have to be defined in the Budapest 2030 long term urban development concept and the Budapest Urban Planning Regulations in harmony with their functions. The BMT also differentiates between the following regional units:

- the inner urban zone, the Danube zone, and the city centre areas, where public transportation has an advantage and is of high quality; here, the goal is to limit private car use (environmentally sensitive and highly built-up areas),
- the suburban and hilly zones, where public transport provides a reliable basic service, although private car use is also quite significant (sparsely built-up areas), and
- the transitional zones, where a symbiotic relationship can be developed between the previous two zones and where the infrastructure for switching transport modes based on intermodality also plays a role in addition to the interoperable lines in the regions (transitional regions with development potential, where the intermodal poles of transportation development also have urban development potential).

Today, integration in its broadest sense has to pervade the paradigm shift in transportation strategy planning: transportation processes have to be developed in a way that is embedded in life of cities and in the lifestyles of their residents, based on positive impulses.

THE ZONE SYSTEM IN BUDAPEST



B.1 FUTURE VISION

The transport of Budapest must serve the implementation of the future vision laid down in the Budapest urban development concept:

"Budapest is a liveable attractive capital city with a unique character and is a respected member of the European network of cities as the innovative economic and cultural centre of the country and the city region."

B.2 GENERAL GOAL

The development of the city has a great effect on transport habits and mobility needs. Transport is a major city-forming power, a shaping factor of economic development and the environment, a part of urban policy. The Balázs Mór Plan is based on the future vision of urban development of Budapest, stating that the objectives laid down in the Budapest 2030 Urban Development Concept must be supported with the means of transport.

In line with the flagship initiative "Resource Efficient Europe" and the new Energy Efficiency Plan 2011, the paramount goal of European transport policy is to help establish a system that underpins European economic progress, enhances competitiveness and offers high-quality mobility services while using resources more efficiently. In practice, transport has to use less and cleaner energy, better exploit a modern infrastructure and reduce its negative impact on the environment and key natural assets like water, land and ecosystems.
EU *White Paper* (17.)

General goal of transport:

"The transport system of Budapest should improve the competitiveness of Budapest and its region and contribute to a sustainable, liveable, attractive and healthy urban environment."

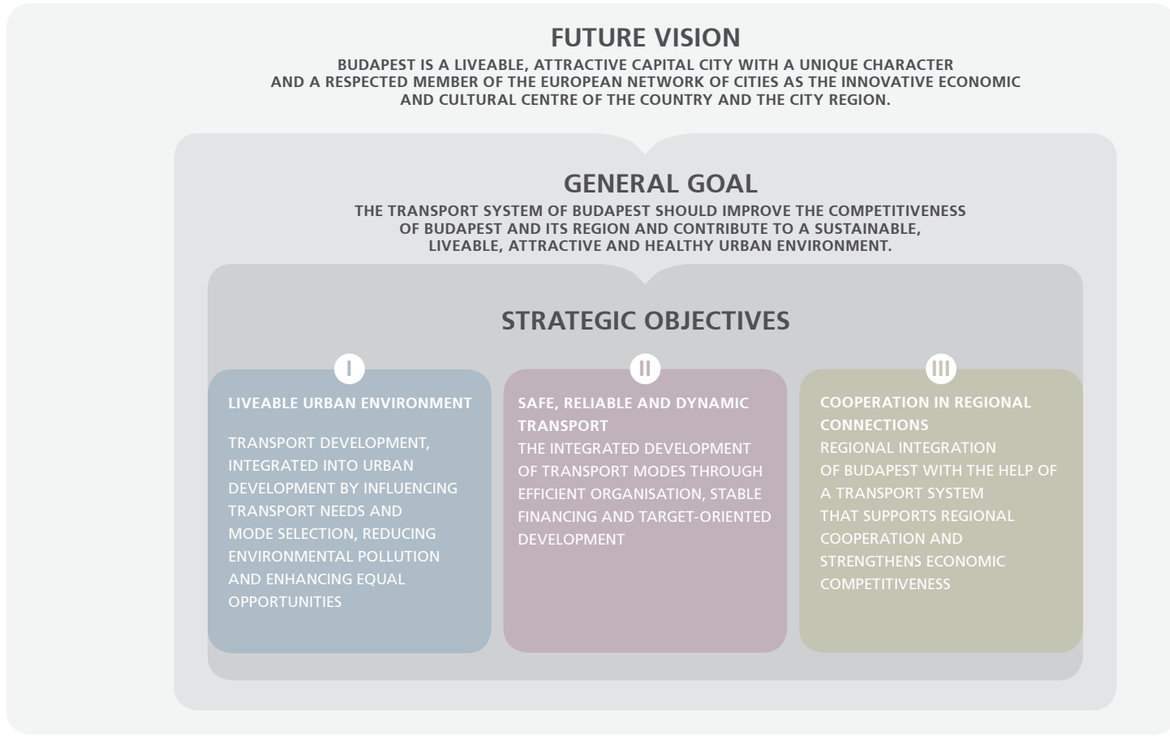
B.3 STRATEGIC OBJECTIVES

The EU transport policies conceived with an integrated approach (where the keywords are sustainability, competitiveness, integrated approach, involvement of the stakeholders in defining the objectives and the tasks, systematic monitoring of decisions and evaluation of implemented projects) focus on the healthy lifestyle of people and their communities and the liveability of cities.

The BMT also applies an integrated approach, where the goal becomes transport-specific at the level of transport measures.

With regard to transport-specific strategic objectives, the key concept of the Balázs Mór Plan is integration. Sustainable urban mobility planning achieves integration and terminates the unilaterally sectoral and transport-based approach, as well as the approach that does not go beyond the city's administrative boundaries, and it links three target areas:

- between the urban development and the transport development approach,
- between the methods of development and operation of the various transport modes, and
- between local, regional and macro-regional systems.



CORRELATION BETWEEN THE FUTURE VISION AND KEY STRATEGIC OBJECTIVES

Consequently, the specific objectives of transport development in Budapest from 2014 are as follows:

I. LIVEABLE URBAN ENVIRONMENT

– transport development, integrated into urban development by influencing transport needs and mode selection, reducing environmental pollution and enhancing equal opportunities

Transport solutions must be integrated into the objectives of urban planning in order to achieve one of the basic conditions of sustainable development of Budapest, which is the effective management of existing values, spaces and instruments. The surfaces used for transport must be integrated into the urban public spaces as their organic parts, taking the actual needs and spatial specificities into consideration. Liveable urban space utilisation and the desired shaping of mobility require not only balanced urban structural development that follows the principles of the 'compact city', but also the environmentally conscious use of the already built infrastructure. That is why less polluting transport modes such as walking, cycling and public transport must be made readily available and their self-evident, everyday use needs to be promoted.

II. SAFE, RELIABLE AND DYNAMIC TRANSPORT

– the integrated development of transport modes through efficient organisation, stable financing and target-oriented development

Safe transport spaces, predictable and reliable transport means, built on consistent principles, are required in order to enable residents to reach the sites of their everyday activities. If our intention is to operate our city predictably, stable financing has to be provided for transport that facilitates cost-effective development, maintenance and operation. The means of operation and development must be designed to facilitate interoperability between the transport modes, an increase in cooperation between services and service operators and the environment-specific division of labour between sub-sectors.

The improvement of transport safety is an important task. The improving tendency of the 2010s has been halted, therefore transport safety needs special focus in the course of developments.

III. COOPERATION IN REGIONAL CONNECTIONS

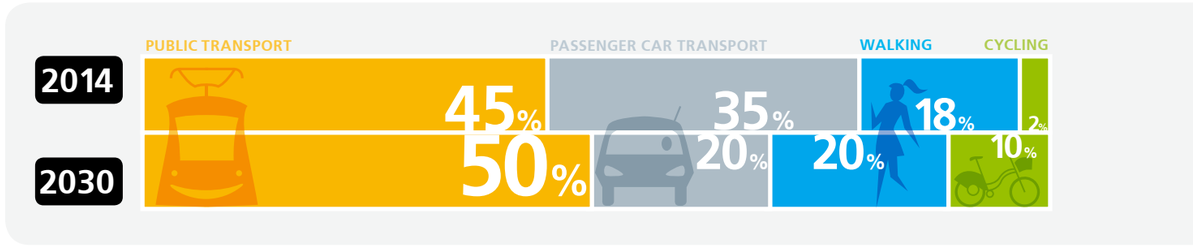
– regional integration of Budapest with the help of a transport system that supports regional cooperation and strengthens economic competitiveness

Budapest is situated at the intersection of international, national and regional transport networks. Taking advantage of the opportunities stemming from this location would result in the establishment of an economic area that is competitive also at a global level. Budapest and its surrounding area, forming a consistent region, can provide an environment for a wide range of activities. Well-coordinated economic cooperation requires, among others, an integrated system of transport networks and the optimisation of their connections.

The optimisation of macro-regional – international and national – transport systems requires the effective interconnection of railways, roads, waterways and air transport networks and the integration of those networks with the regional and local ones.

The optimisation of regional transport systems requires a complex network and regulatory structure which facilitates cooperation on a daily basis. A basic principle that is essential for achieving the development objectives of the capital city in line with the efforts of the European Union is to apply an integrated approach in transport policy that goes beyond administrative boundaries. The development of regional transport network connections, transferable (interoperable) systems and intermodal transfer points and the introduction of related services, governance and regulations are important tasks for Budapest.

MODALSPLIT
figures with the current and estimated values



B.4 INTERVENTION AREAS/PRIORITIES

The intervention areas link the transport development means with integrated strategic goals and determine the tasks for each traditional technical field of transport. The Balázs Mór Plan focuses on four transport intervention areas, i.e., infrastructure, vehicles, services and the system of institutions:

1 MORE CONNECTIONS

– THROUGH THE INTRODUCTION OF NEW CONNECTIONS, SAFE AND RELIABLE DEVELOPMENT OF EXISTING TRANSPORT NETWORKS, RE-DISTRIBUTION OF PUBLIC SPACES AND PASSENGER-CENTRED INTERMODAL CONNECTIONS

"Infrastructure shapes mobility. No major change in transport will be possible without the support of an adequate network and more intelligence in using it."
EU *White Paper* (10.)

An accessible, well-maintained, safe infrastructure, satisfying the requirements of our times, forms the scene of everyday transport in Budapest and an important component of the urban environment. The availability of that infrastructure must be ensured continuously in terms of operation, maintenance and development. Integrated infrastructure development leads to the revised use of public areas and the redistribution of urban spaces, which simultaneously remedies the disproportionalities of the transport network and creates an attractive, healthy and liveable urban environment. The development of the competitiveness of walking, cycling and public transport improves both the mobility and the environmental situation of the city. The objective of using the existing infrastructure more efficiently is to establish well-managed public spaces and community places where all transport modes are accessible and may be used safely.

2 ATTRACTIVE VEHICLES

– ACHIEVED THROUGH THE CREATION OF A COMFORTABLE AND PASSENGER-FRIENDLY VEHICLE FLEET AND THE ENCOURAGEMENT OF THE DISSEMINATION OF ENVIRONMENTALLY FRIENDLY TECHNOLOGIES

Urban transport is responsible for about a quarter of CO2 emissions from transport, and 69% of road accidents occur in cities. The gradual phasing out of 'conventionally-fuelled' vehicles from the urban environment is a major contribution to significantly reducing oil dependence, greenhouse gas emissions and local air and noise pollution. It will have to be complemented by the development of appropriate fuelling/charging infrastructure for new vehicles."
EU *White Paper* (30.)

As preventive maintenance and development have always been postponed, the technical standards of the vehicles and infrastructure of public transport in Budapest are significantly lower than required. The majority of the vehicle fleet is well beyond its economically and technically ideal active life, including also vehicles that have gone through value-adding refurbishment.

The commissioning and operation of advanced, comfortable and safe public transport vehicles gradually replacing the ageing vehicle fleet is an urgent task. A comfortable, accessible and clean vehicle running on time per schedule can make public transport more attractive in itself than passenger cars. An advanced service and maintenance background is also needed to ensure that vehicles of sufficient quality are available for the passengers every day.

In accordance with the EU guidelines, one of the objectives of future developments is to reduce the level of environmental pollution caused by public transport vehicles operating in Budapest. Apart from the renewal of the public transport vehicle fleet, the measures regulating the taxi and city logistics services also encourage the improvement of the environmental characteristics of the vehicles used in Budapest in order to make the air cleaner in the capital city.

3 BETTER SERVICES

– ACHIEVED THROUGH AN EFFECTIVELY ORGANISED AND INTELLIGENT, WIDELY ACCESSIBLE INTEGRATED TRANSPORT SYSTEM PROVIDING RELIABLE PASSENGER INFORMATION SERVICES

To promote more sustainable behaviour, better mobility planning has to be actively encouraged. Information on all modes of transport, both for travel and freight, on possibilities for their combined use and on their environmental impact, will need to be widely available.
EU *White Paper* (48.)

The availability, extent and quality of transport services are important parts of the quality of urban life. Public, real-time travel information, transparent and fair tariffs and advanced fee payment methods promote the use of the system and, simultaneously, facilitate more effective utilisation of the transport infrastructure and vehicles in both individual and public transport. In the public transport system of Budapest, more stress must be put on accessible informational technology applications that assist the movement of people and influence their needs and the usage, as well as on advanced traffic control and passenger information systems.

4 EFFICIENT GOVERNANCE

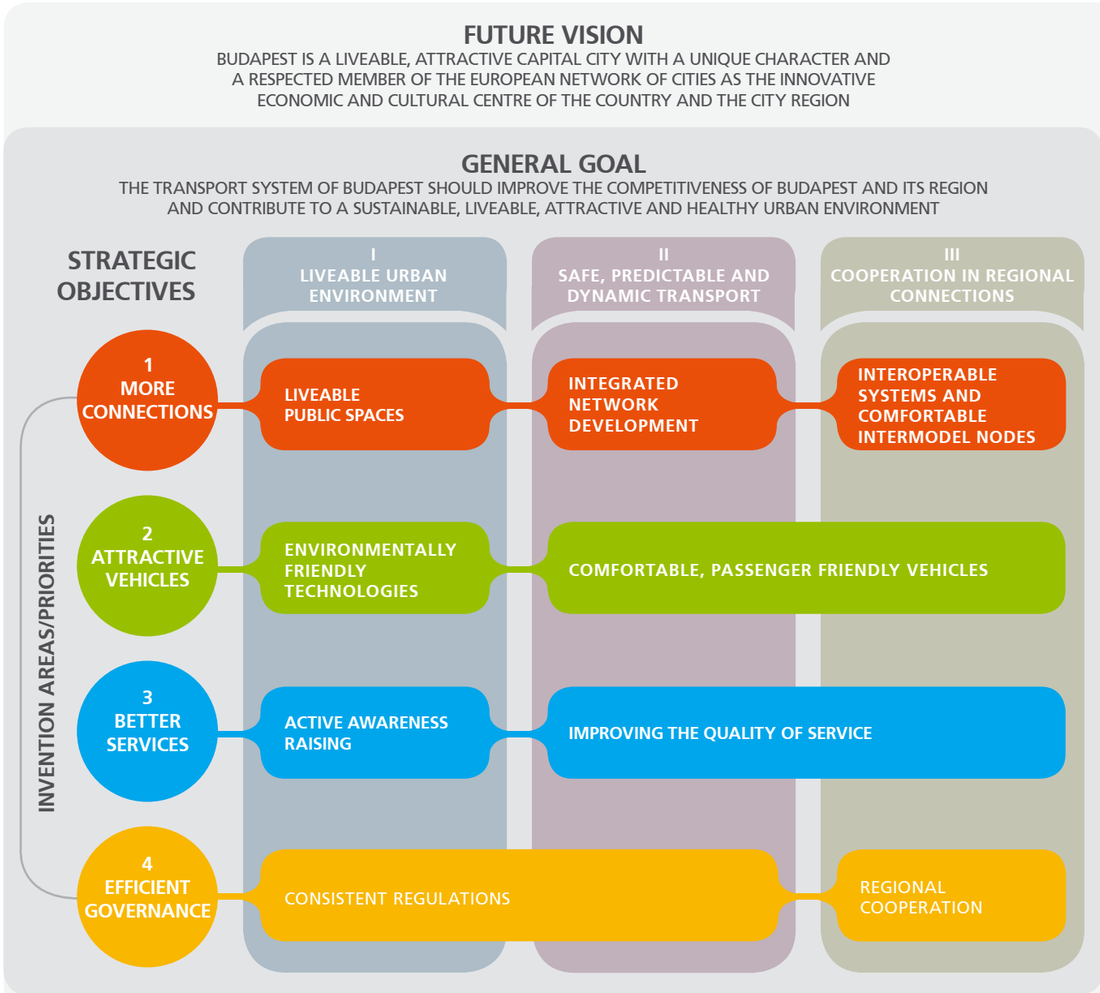
– ACHIEVED THROUGH CONSISTENT REGULATIONS, AND THE PASSENGER FRIENDLY DEVELOPMENT OF NATIONAL, REGIONAL AND LOCAL NETWORK CONNECTIONS

"The objective is to enable the residents, economic actors and various institutions to find high-quality homes in the city in an excellent infrastructure, sustainable natural and built environment under appropriate organisational and legal conditions."
Budapest *2030 VFK*

The transport governance system of Budapest must support the achievement of the set urban policy objectives. Since 2010, the transport matters of Budapest have been implemented in a consistent, well-coordinated form. The main task for the subsequent years will be to ensure operation as an integrated system of the currently separate public transport services, which operate within the city and on the metropolitan area networks. The formation of a consistent timetable, consistent tariffs and a consistent information system is conditional upon the needed governance background. The set of institutions of the consistent transport service system and the framework of cooperation of the participating organisations must be put in place. In addition, a stable, sustainable and predictable financing framework is required for an effective governance system that can function as the background of quality transport services.

B.5 OPERATIONAL OBJECTIVES AND MEASURES

The most important operational objectives have been defined for the four intervention areas of the Plan and a set of measures were assigned to each. The projects, developed and implemented on the basis of the presented measures, will be the instruments for implementation of the strategy.



OPERATIVE OBJECTIVES FITTING INTO STRATEGIC OBJECTIVES AND INTERVENTION AREAS

1

MORE CONNECTIONS

ACHIEVED BY INTRODUCING NEW CONNECTIONS AS WELL AS THROUGH THE SAFE AND RELIABLE DEVELOPMENT OF THE EXISTING TRANSPORT NETWORKS, THE REDISTRIBUTION OF PUBLIC AREAS AND THE DEVELOPMENT OF PASSENGER-CENTRED INTERMODAL CONNECTIONS

+50% THE NUMBER OF TRACK-BOUND CONNECTIONS CROSSING THE ADMINISTRATIVE BORDERS OF THE CITY AND REACHING THE CITY CENTRE WITHOUT ANY CHANGE WILL INCREASE BY 50%

+100% THE NUMBER OF AT LEAST 15 KILOMETRE-LONG, TRACK-BOUND AND DIRECT CONNECTIONS WILL BE DOUBLED BY 2030

2014

2030

Budapest has changed a great deal over the last three decades, but the development of urban transport could not flexibly follow the urban processes. All that is an especially great problem in suburbs and in the metropolitan area, where the most intensive changes took place encouraging car use. The problem stretches across the whole city increasing congestion of public roads also in areas that are well served by public transport.

The radial-circular main road network of Budapest has only been developed in the inner areas. The development of the spatial structure and the urban sprawl were not followed by any considerable road network development in the suburbs. The transversal road and rail connections were not put in place in full; the existing network components are incomplete and fragmented in certain parts of the city. There are no continuous high-capacity, transversal connections in suburban districts either by road or by public transport, and therefore an increasing share of road traffic, not headed to the city centre, also uses the historic, centuries-old narrow streets of the inner city and the centrally located Danube bridges. It will be a task for the forthcoming period to eliminate the fragmentation in the radial track-bound transport system and to introduce the transversal connections, primarily on the Pest side due to its topography.

Since the 1970s, the public transport system of Budapest has been mainly determined by public transport lines feeding to and from the metro lines. None of the existing four metro lines reach the suburbs, thus passengers need to transfer to the suburban railways, buses, trams or trolleybuses at the metro terminuses. Apart from a few exceptions, surface transport services operating in the inner parts of the city have not, until recently, had any connections with services operating in the outer parts of the metropolitan area. The connecting services were cut off at metro stations and, apart from the feeder function their role in the network was eliminated.

Although the capacity of the public transport network would permit adequate performance for the size and the needs of the city, the limitations on the track-bound network due to the obsolete infrastructure negatively impact not only travel time and reliability, but also the performance of the network. Therefore reconstruction is required.

Over the last few decades, urban and transport development ignored the importance of cycling and dealt with it separately from motorised transport as a weightless problem, which is also reflected in the shape of road network of Budapest today. The complex design and implementation projects aimed at infrastructure refurbishment and development to make public spaces more liveable have recently focused intensively on cycling.

Three operational objectives promoting integration with urban development, integration of transport modes and regional integration relate to infrastructure development:

- integrated network development
- liveable public spaces
- interoperable systems and comfortable mode-switching points.

1.1 INTEGRATED NETWORK DEVELOPMENT

THROUGH INTELLIGENT URBAN STRUCTURAL CONNECTIONS AND THROUGH NETWORK DEVELOPMENT REDUCING TRAFFIC DISPROPORTIONALITY

The basic infrastructure of urban transport comprises the rail, suburban rail, metro and bus network, as well as the main road network, providing various regional and long-distance connections and connecting the urban districts. The additional network elements of surface transport, including secondary roads, form the fine layers of the infrastructure. According to the underlying principle of the Plan, those systems need to be managed and developed with an integrated approach. The integrated approach is an overall requirement in network development; only development of such spirit should be implemented. This section summarises the measures according to the respective transport modes.

Mobility needs cannot be satisfied with quality services without developing the infrastructure. Traces of former, partially implemented road development may be seen primarily in suburban areas: important network components were not or only partially completed (e.g. Danube bridges, ring road network components on a single carriageway, intersection legs); elsewhere excessive multilane roads were constructed near residential areas with calmed traffic. The lack of network components of the track-bound infrastructure and the intersection of various, not interoperable track-bound networks force bus transport to replace track-bound services on a

permanent basis. That is why the number of buses on the roads is disproportionately high, which entails more environmental pollution than absolutely necessary and high operating costs compared to track-bound transport. In order to achieve basic level equal opportunities in transport, otherwise unnecessary parallel functions must be established and maintained in the network in the short run.

The fragmentation of the tram network many decades ago and the gradual reduction of its service area assumed the expansion of the metro network at an impossible rate and a much smaller increase in road traffic than what actually took place. By now it has become clear that the renewed tram service is a significantly cheaper, more effective and passenger friendly solution than the metro.

1.1.1 PUBLIC TRANSPORT ROUTES PROVIDING DIRECT CONNECTIONS

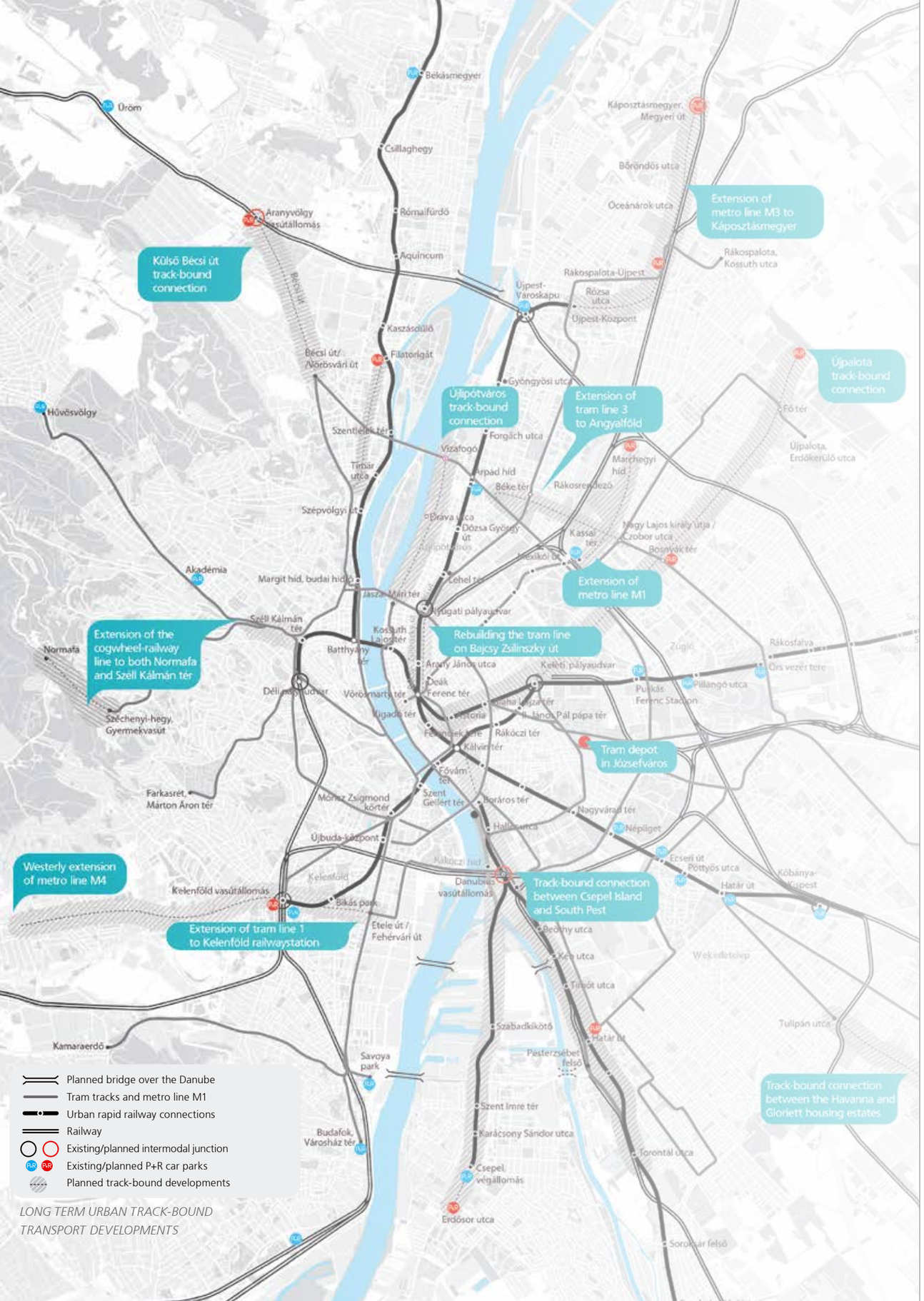
The connection of isolated components of various urban rail networks would allow for high-quality services, which are competitive with motorised individual transport both in capacity and in travel time in the long run. Apart from the establishment of specific connections and connecting elements and standardisation of the parameters of technical operation, a sufficient number of attractive P+R car parks and B+R storage facilities should also be established at the stations of the suburban sections.

The development of the public transport track network, as a unified system, requires the reconstruction of some of the previously terminated network connections and the introduction of a few new connections, as well.

Thus the continuous track network can eliminate the current insular operations: diverging and interconnecting line groups may be built that cover large impact areas, yet provide attractive services and sufficient capacity to passengers on shared sections. In addition to rapid railway (metro and suburban railways) and tram networks, this is also applicable to those elements of the national railway network that can be included in urban transportation. The connection points of multi-level track-bound transportation should be developed into high-quality intermodal junctions, and the possibility to create interoperable connections also has to be examined.

Main directions of development:

1. integration of urban and suburban track-bound networks,
2. building of the missing interconnections of the track-bound network in the city centre,
3. expansion of the track-bound network in densely built suburban zones,
4. establishment of transversal track-bound connections.
5. development of regional connections and regional coverage



LONG TERM URBAN TRACK-BOUND TRANSPORT DEVELOPMENTS

Vintegration of urban and suburban track-bound networks

A network is consistent when the city centre and important transport axes can be accessed from existing suburban lines without any discomfort in changing and any loss of time. In order to have integrated development, the existing suburban railway lines need to be reconstructed, barrier-free access has to be provided, the vehicles must be replaced and P+R components must also be constructed at several locations along the roads leading into town, both within and outside the administrative boundaries of Budapest. In relation to these developments, the total feeder and distribution bus network should be reviewed in order to ensure the optimal division of labour. Advanced, high-capacity suburban lines reaching the city centre without the need to transfer can significantly improve the quality of the connections of suburban districts and the metropolitan area.

By way of developing the east-west axis and connecting metro line M2 with the existing suburban railway network, the eastern city regions (including the only area in Budapest not served by urban track-bound transport) and the region's settlements would gain access to the metro. Travel times would be significantly reduced on these renewed lines, and the currently required changing between lines via the underpass at Örs vezér tér would also be done away with. A part of the ground-level crossings that separate these urban areas from each other could also be eliminated. As part of this development, a connection could be created at Törökőr, with connections to the regional railway lines leading to Monor, Cegléd and Lajosmizse, and at Rákosfalva, with a connection to the railway ring. High-capacity P+R car parks should be constructed at the connections with the motorways; at other locations, their size would be adjusted to local needs. The Rákoskeresztúr feeder line could connect to this line, which could serve the centre of District 17 and the brownfield areas along this road that are to be revitalized. The north-south regional rapid railway line - the future M5 - will connect the transportation axes of Szentendre with that of Csepel Islandt and Soroksári way with a new railway tunnel leading under the city centre in the interest of creating a unified urban rapid railway network that also provides connections to the existing four metro lines. The connected three suburban railway lines would provide a possibility for connecting lines from the agglomerations in the Danube Bend and in Southern Pest areas that today is only possible with several changes and detours. Travel times would significantly decrease in both directions, allowing daily commute distances to increase and the existing railway infrastructure that is in many locations underutilized would become more attractive as opposed to travel by bus or individual transportation. Connecting the southern part of Csepel Island is also envisaged in several of the variants. As far as possible, an intermodal intersection would be created with motorway M0. This investment would fill the need for a railway infrastructure in the Southern Pest agglomeration, which would revaluate this area, which has an increasing population but bad infrastructure. The development's new city centre tunnel connections would be implemented from the south over the midterm and from the north over the long term. The northern branch of the north-south regional rapid railway could provide a connection with the Esztergom railway line, the development of which already took into account interchangeability with Óbuda-Kaszásdűlő, and its southern branch could connect to the Soroksár railway line.

Over the long term, the western extension of metro line 4 should also be taken into account, and in a manner that allows the line to reach Budaörs, creating an attractive P+R connection for those arriving from motorways M1 and M7. Moreover, the connection shall not burden the settlement centres. The designation of the final terminal requires additional examinations.

The connections of the 11 railway lines that terminate in Budapest and of the urban transportation network have to be improved. In the interest of reducing distances between changes, stops have to be brought closer together, the routes required to change from one line to another have to be simplified, and more parking has to be provided.

The connection points of the railway and urban track-bound transportation networks:

- M1 Mexikói way station and the new Városliget stop on the Cegléd line,
- M2 new Törökőr station and the new Törökőr stop on the Cegléd line above Kerepesi way,
- The Üllői way connection point between the M3 Ecseri way station and Kelenföld – Keleti railway stations, as well as the railway ring on Pest.

An additional possibility is harmonizing the railway system to be developed in the Marcheggi Bridge area that crosses the Szob railway line with the extension of the M1. Based on the development plans, a number of railway - urban railway connections will be expanded by the new stations on the railway ring: Aranyvölgy (tram line 1), Aquincum (H5 suburban railway), Angyalföld (tram line 14), Pestújhely (tram on Erzsébet királyné way), Újpalota and Rákosfalva (M2 line extended to Gödöllő), Közvágóhíd (tram lines 2 and 24, metro M5) and Élessarok (tram lines 3, 28, and 37). Traffic on the railway ring should be used to meet any un-discovered travel needs within the city.

Developing the missing interconnections of the inner-city track-bound network

When the metro network was developed in the 1970s in its radial routes, surface transport lines were also truncated and several tram lines ceased service. Since the need has remained, long connecting bus lines have filled the role of these trams; however, in the case of trams, changes are still required after one or two stops even for short journeys. This decreases the appeal of public transport as opposed to individual transportation, and it holds back the positive revaluation of city centre areas. The environmentally detrimental effects of the multi-lane roads on the surface are also a contributing factor.

The new network connections aim at doing away with these deficiencies along the north-south axis in Pest on Váci way and Bajcsy-Zsilinszky way, and along the east-west axis on Thököly way - Rákóczi way - Kossuth Lajos street. In the case of the latter, the possibility of leading the line over Erzsébet Bridge towards Buda also has to be kept open for the long term.

The new city centre connections should be implemented in a diverging and interconnecting system that serves several lines. Diametric and overlapping relations are preferred on the network elements; terminals are to be developed accordingly. The new lines should be organised into a unified system in cooperation with the existing metro network, paying special attention to any traffic (for example, different station positioning) and economic (for example, it is uneconomical to transfer passengers to a metro) justifications.

The environmentally-friendly accessibility of Gellérthegy will improve with the construction of the Rác funicular. This would result in a positive change in the lives of those living in the affected environment, the area's tourism potential will increase, and bus and car traffic, together with inherent pollution and noise loads, will decrease.

The developments will restore the units of the city's track-bound network, which will improve accessibility in numerous directions, enabling reduction in traffic on the city centre's main roads.

Expanding the track-bound network in densely populated areas located in the suburbs

The network development did not follow the urban structural changes of the previous decades, therefore several housing estates constructed between 1970 and 1990 were not provided with

any sufficient track-bounded transport connection. Neither the new sections of the tram network have been implemented, nor the suburban railways have been connected to the network, nor the metro network has been extended with a few stations in the

vicinity of the new housing estates. By eliminating those deficiencies, the utilisation and economical operation of the existing network can be improved and the congested bus routes can also be relieved.

A fundamental task is to provide competitive track-bound services for the Havanna and Gloriett residential areas located in District 18, for the Újpalota residential area in District 15, for Újlipótváros in District 13, the hilly area in Buda in District 12 (Svábhegy, Széchenyi-hegy, Normafa region), and for Óbuda (Külső Bécsi út, Aranyvölgy). In the mid-term, it is necessary to create a north-south connection along the main axis of the residential area located in Óbuda, which would be practical to be linked via the Margit Bridge to the tram line running on the Pest Embankment or on Nagykörút (Grand Boulevard). With the expansion of the tram network and with the purchase of new vehicles that require more room, the construction of new depot places will also be required. It seems reasonable to place the above-mentioned depot stations at the former Józsefvárosi Railway Station (container terminal) located at the centre of the network.

It is of paramount importance to replace the special vehicle fleet of the 120 year-old Millennium Underground Railway, to make stops accessible and to extend the line in both directions. It is examined that the city centre terminal should be at Vigadó tér, while the other end terminal should be around Marcheggi Bridge, where the necessary suburban railway developments could be used to develop a significant intermodal hub. Furthermore, areas that would become freed up due to the transformation of the Rákosrendező station have significant development potentials. A terminal at Kassai tér is realistic in the first phase of the extension.

Extending metro line M3 towards the north would create connections in the midterm with the residential area in Újpest and with the one in Káposztásmegyer as well as with suburban railway lines; while it would also provide connections to the M0 and to the M2 motorways. In addition, the terminal would be ideal for P+R operations. This provides an indirect link to the first objective; to the integration of urban and suburban transportation. It is also similarly important to create connections between the previously-mentioned railway and metro lines at Ecseri way.

In addition to the urban track-bound systems, another significant task is to modernise suburban lines that have not been refurbished so far, to get rid of speed restrictions, to modernise and make stations accessible, and develop local public feeds in the metropolitan areas. Out of the above-mentioned tasks it is prominent to modernise the Budapest-Veresegyház-Vác and Budapest–Dabas-Lajosmizse lines that do not constitute part of the long distance national network. Out of the national lines, the refurbishment of the Budapest - Pusztaszabolcs - Pécs, Budapest - Kunszentmiklós - Tass - Kelebia, and the Budapest - Hatvan - Miskolc-Tiszai lines as well as the refurbishment of their suburban sections are also connected to objectives of the Budapest transport strategy.

Establishment of transversal track-bound connections

The lack of transversal (diagonal, avoiding the centre) lines is one of the serious disadvantages of the spatial structure of Budapest. That is why many trips are forced to use the radial routes and the city centre, even if their actual destinations lie elsewhere.

The main components of this measure include the construction of tramline 1 along the Hungária ring road all the way to the Kelenföld intermodal hub as well as the extension of the external Pest tram ring that is tram line 3 to Angyalföld through the brown-field site in Rákosrendező. Later on, the external ring may also be extended in several phases to Pesterzsébet, Csepel and,finally, through a new bridge across the Danube, to Albertfalva-Budafok. With suitable adaptation, the railway ring could become an integral part of the transversal track-bound connections. The developments must be made simultaneously with the construction of parallel transversal roads.

Regional connections and the development of regional coverage

A suitable division of labour between track-bound and bus services has to be created: at such areas where track-bound networks have been integrated, the freed bus performance resources have to be used in part to improve regional connections and coverage. Where integrated track-bound services are unavailable and if suitable needs arise in the field of travel, the bus sector is to create diametric and overlapping diverging and interconnecting network elements.

1.1.2 MODERNISATION OF THE EXISTING TRACK-BOUND NETWORK

The adequate interoperability of the integrated track-bound network is not only limited by the missing components, but also by the poor condition of a considerable part of the existing sections. Although this is an issue of operation within a consolidated framework of operation, at present the phenomenon is so extensive in Budapest that unless the issue is resolved, the usability and interoperability of the whole network is at risk.

In order to ensure the long-term capacity of the network, the modernisation and replacement of the deteriorated components of the existing infrastructure is an outstanding task on the whole track-bound network which must be performed at a pace that facilitates the gradual elimination of the backlog. The modernisation also requires a regulatory environment that can keep up with the development of the technical solutions. In the complex approach to the reconstruction of the transport networks, the reconstruction of the infrastructure (where connectible) involves the reconstruction of the entire cross-section of the public space.

Among the most important backbone network components, metro line M3 which carries the largest number of passengers even in national comparison requires reconstruction. The majority of the suburban railway lines are in a bad condition; the existing infrastructure must be aligned to the requirements of the 21st century and to the conditions of safe operation. New services must be introduced at the stations via the necessary technical interventions, the width of the platforms must be extended and accident-prone areas have to be eliminated. Speed is limited on a considerable part of the lines, which also decreases the quality of the service. Apart from the track and station infrastructure, the energy supply systems of the lines and some of the vehicle depots also require reconstruction. Simultaneously with those tasks, connections must be built for the metro network, the majority of the level crossings need to be eliminated, accessibility for the disabled will have to be provided and the capacity of parallel bus transport services will have to be reduced with an integrated approach.

Most tramlines have been refurbished since the 1990s, consequently the condition of the infrastructure has improved. Also these sections need to be gradually refurbished and reconstructed again according to their life cycles. In order to ensure sustainability, a continuous reconstruction financing system must be put in place on the tram-track network, which would help maintain the condition of the lines. These investments, implemented with an integrated approach, should be aligned in terms of timing and of financing with the construction of the new line sections and of accessible platforms as well as with vehicle procurements. In the course of reconstruction, noise and vibration

protection tasks and, wherever required, landscaping activities and the development of public areas must also be performed.

The main development tasks in the next period are the renovation of outdated power supply systems on trolleybus lines and the integration of high-speed switches and of intersections that do not require decreases in speed. Simultaneously with the procurement of vehicles capable of autonomous operation, the trolleybus network can also be supplemented with shorter sections without the need of construction of wires to make up for any missing sections.

1.1.3 CONNECTION OF SEPARATED PARTS OF THE CITY VIA NEW DANUBE BRIDGES AND VIA ROAD-RAIL CROSSINGS ON DIFFERENT LEVELS

In the inner parts of the city, traffic concentration may be eased, the transit private car use can be gradually eliminated, new connections may be established between external district centres and the traffic load of the central Danube bridges and the related road network can be substantially reduced by constructing new bridges across the Danube. By the construction of new bridges across the Danube and by the development of the surrounding areas, a more balanced and less centralised urban structure can be created. The Danube crossings, which are currently missing from the transport structure of Budapest (Csepel–Albertfalva, Újpest–Aquincum and Galvani street–Kén street) will also be the basic pillars of the city's ring-shaped transport connections. The cluster of open spaces and green areas and islands on the North Budapest Danube section, and along the Ráckeve-Danube branch could be organised into a permeable system with a few localised interventions, and the recreational network of the Danube corridor may be expanded significantly by the construction of smaller bridges for pedestrians and cyclists

across the side-branches of the Danube (Óbuda Island, Molnár Island). A feasibility study summarising the implementation options will be made for the construction of the next Danube bridge.

The road-rail level crossings of the main and collection road network of Budapest make the concerned parts of the town separated, reduce the capacity of the routes significantly, impede the continuous flow of road traffic and are also prone to accidents. They may be replaced primarily in relation to the reconstruction of railway lines, through the construction of grade separated crossings within the framework of certain railway projects.

1.1.4 CONSTRUCTION OF THE MISSING COMPONENTS OF THE ROAD NETWORK

The main ring-radial road network of Budapest is complete only in the inner parts of the city. The construction of the main road network was less and less capable of keeping up with the continuous extension of the city; mostly the transversal road connections are missing, while the existing network components are often incomplete or fragmented. Consequently, there are no continuous transversal road connections with sufficient capacity. By constructing transversal roads, the congested district centres can be bypassed and relieved of car traffic which must be achieved in parallel to the integrated development of public transport options. However, the former plans, focusing on extensive expansion of capacities to accommodate increasing traffic, could not be implemented, as revised developments that fit in with the Budapest transport development concept need to be identified. The most striking inadequacies may be observed on the Körvasút ring, the road connecting the districts in Southeast Pest, the backbone road in Csepel and in Nagy Lajos király way.

Körvasút ring

From the aspect of spatial and transport structure, the most important tool for making up for any deficiencies is the ring road along the railway ring and the construction of the connected bridges over the Danube. The significance of the urban strategy and many-faceted tasks of the ring road along the railway ring, which links the regional units of transitional zones of Budapest, are as follows: Its significance in the public road structure will be implemented by decreasing the concentration of traffic on the central road network. It will also create new connections, thereby freeing the environmentally sensitive city centre areas from transit traffic. It also has an important effect in the transportation structure, since the various regional units and switches in transport modes will be connected in the transitional zone (which is the main area of switches in transport modes). This helps to strengthen the compact nature of the transportation system. By opening new development lanes in the area of urban structure, it contributes to easing the burden of overburdened areas, to increasing the value of underutilized rustbelt areas, thus to forming the spatial structure in line with urban policy targets. The new connection has to ensure service to the railway passenger transport connection points planned for the railway ring and suitable parking.

1.1.5 ROAD RECONSTRUCTION WITH A COMPLEX APPROACH

Road reconstruction in Budapest (including the related bridges and infrastructure) should be prepared and designed with the basic principle of making complex changes based on the review of traffic alignment and traffic requirements instead of making condition-improving interventions (e.g., replacement of pavement) by maintaining traffic alignment. In the course of that development, the road surface will be reallocated according to the requirements of the age whereby, if necessary, the total cross-section will be redesigned, including surrounding pavements and green areas that impact walking and cycling.

Due to the road and transport infrastructure refurbishment, to be implemented in detail with a complex approach, the conditions of cycling and walking will be improved and, if required, traffic lights will also be reprogrammed. Within the framework of the refurbishment, public transport stops will also be made suitable for low-floor vehicles. The required traffic safety interventions can be made by using traffic and accident data.

Each bridge and infrastructure will be refurbished on the basis of an individual review. In addition to the structural reconstruction of the bridges, the connecting roads will also be reconstructed based on a complex, phased schedule, in line with urban development goals.

1.1.6 CONTINUOUS MAIN CYCLING NETWORK

Parallel with the development of the previously heavily fragmented cycling network, bicycle traffic has also been growing dynamically over the last few years, whereby cyclists have become natural participants in transport and public spaces. According to regular bicycle traffic count data, the number of people cycling on working days doubled between 2006 and 2010.

In order to ensure the accessibility of the city for cyclists, a new, continuous and safe main bicycle network will be built in the inner city within the Hungária ring road that can be used easily and well by cyclists, and connects parts of the city, facilitating a connection between the

Budapest network and regional bicycle routes, too. In the outer parts of the city, the development of local bicycle connections and connections among districts in the centres will assist commuters cycling to work and will also improve access to regional and tourist attractions for cyclists.

1.1.7 IMPROVING CYCLING ACCESSIBILITY, A BICYCLE-FRIENDLY SECONDARY ROAD NETWORK

The urban cycling infrastructure has not been able to satisfy the dynamically increasing demand for everyday cycling: the state of the existing network has been deteriorated, there are frequent route alignment errors, the route surfaces are in a bad condition, and there are frequent conflicts in relation to pedestrians and parking. The record, management and maintenance of the network are inconsistent, certain sections of the network are not properly interconnected and bicycles may be stored only at a few, low-capacity points.

The role of the local infrastructure components supplementing the main cycling network in Budapest is primarily to facilitate short, 1 to 5 km-long trips within districts by making the road network a bicycle-friendly network. The conditions of safe cycling can be ensured with the traffic engineering review of the current road network, with the redistribution of road surfaces and the introduction of zones with traffic calming. It involves numerous small interventions not only along a particular single route, but rather on an area-basis (speed limits, traffic calming in local areas, redesign of transport hubs, review of traffic lights used by cyclists, prioritisation measures, opening of one-way streets to two-way cycling, designation of bus and cycling lanes, designation of pedestrian and cycling zones, establishment of barrier-free environment for cyclists, creating comfortable surfaces, providing access of intermodal hubs by bicycle). Apart from improving the internal services of a particular area, these measures will also improve the bicycle connectionswith high-capacity public transport routes. The introduction of public transport vehicles, suitable for carrying bicycles, will also improve the accessibility for cyclists.

1.1.8 EXTENSION OF THE WATERBORNE TRANSPORT NETWORK AND SERVICE INFRASTRUCTURE DEVELOPMENT

New piers must be constructed both within and outside the administrative boundaries of Budapest that are able to support scheduled services and new, related routes must be created to meet the conditions of regional (metropolitan area) boat services in order to reach Szentendre (or even Visegrád and Vác) in the north and Százhalombatta in the south.

The quality of the pier infrastructure determines the attractiveness and capacity of the riverboat sector. An adequate pier can support a fast exchange of passengers regardless of the water level. On-shore facilities must be positioned at easily accessible locations, near public transport stops and quality transport mode switching options (P+R car parks and B+R storage facilities depending on the site). The construction of new inner city piers (Vigadó Square, Kossuth Lajos Square, Castle Garden Bazaar) should be coordinated with public space developments in the area, improving the conditions of pedestrian access. Tourist attractions on the river Danube should also be made accessible by boat, which requires better cooperation between commuter and tourist boat services. The Plan includes the development of infrastructure, suitable for river cruise-ships with cabins (supplementary services, connecting bus parking, well-arranged pedestrian areas) primarily on the central sections of the River Danube which do not have a World Heritage status.

1.2 LIVEABLE PUBLIC SPACES

THROUGH RELIABLE AND SAFE OPERATION AND MODERNISATION OF TRANSPORT NETWORKS, AND THE REDISTRIBUTION OF PUBLIC SPACES

Many people moving out of the city have ended up in areas insufficiently covered and hard-to-serve by public transport, while utilisation in concentrated residential areas, traditionally well served by infrastructure, has deteriorated. A similar process took place with regard to workplaces: more and more enterprises opted for sites of operation situated in the suburbs and outside the city. The lack of public transport in the suburbs increased the negative effects of motorisation in inner areas which otherwise had good public transport services. Urban development has been separated from the development of public transport: the end points of the

track-bound core transport network, which determines the main transport circulation of Budapest, do not reach the functional city borders and there are no adequate mode-switching points either. Consequently, people travelling from and to the outer areas of the city often opt for a private car use even despite traffic congestion.

The experience gained from urban development trends has revealed that the problems of private car use cannot be managed effectively by increasing road capacity; the solutions need to be defined with an integrated transport development approach.

The redistribution of surfaces used by transport services began in the city centre over the last few years, whereby the area used for motorised transport has been decreasing and the role of public and non-motorised individual transport (cycling and walking) has been increasing.

Facilitating walking and cycling should become an integral part of urban mobility and infrastructure design.
EU *White Paper* (31.)

1.2.1 DEVELOPING MAJOR PEDESTRIAN CONNECTIONS

The first steps of developing a pedestrian system (Váci street, Buda Castle and Margaret Island) have made contiguous parts of the city pedestrian-friendly. The development actions of the recent period, including the Heart of Budapest project and the reconstruction of the Millennáris Park in Buda, have introduced new architectural quality, gaining public support for further public space reconstruction projects.

The promotion of walking has by now been integrated into new developments taking place in the Hungarian capital and has become a general aspect of planning. Within the framework of the construction of metro line M4 and the Heart of Budapest project, several inner city public spaces and streets were reconstructed between 2007 and 2013 where, in addition to the transport requirements, those of the recreational, touristic and hospitality nature were also taken into consideration. Barrier-free pedestrian surfaces were provided extensively throughout the city.

The objective is to organise inner city areas and new pedestrian and cycling friendly public spaces into a single network within a liveable urban structure. For this purpose, feasibility studies have been commenced to identify the pedestrian-friendly development options along the Danube banks, the Kossuth Lajos street–Rákóczi way axis, the Nagykörút (Grand Boulevard) and the related inner city road network (Bajcsy-Zsilinszky way and Üllői way).

1.2.2 IMPROVING THE CONDITIONS OF WALKING

The often 30-40-year-old rundown pedestrian underpasses at the main city transport hubs will be reconstructed. Pedestrians are supposed to move along on the surface level; although it is not possible to fully replace the function of the underpasses, the pedestrian and bicycle crossing points to be established above the underpasses on the surface will reduce forced underpass use. Within the framework of the complex road reconstruction activities, pedestrian movements will also be assisted with construction of pavements and submerging kerbs also at places where there are no designated crossings. These measures and the designation of several pedestrian crossings will help to reduce the separating effect of certain road sections, while, at the same time the options for safe crossing will be improved.

1.2.3 EQUAL OPPORTUNITIES AND BARRIER-FREE ACCESSIBILITY

The poor condition of the transport infrastructure and of the equipment does not only cause problems in daily operation, it also fails to provide equal opportunities for passengers. Although it is prescribed by law, accessibility is by far not sufficient.

Comprehensive equal opportunities-related reviews will be conducted on the existing transport surfaces, public transport vehicles and facilities (stations, stops and terminals). Based on the reviews, accessibility will be implemented in compliance with a phased programme, helping not only the physically-impaired people, but also those passengers travelling with prams and with small children. The new and reconstructed infrastructure as well as the state-of-the-art vehicles must be designed to be accessible. Apart from the elimination of physical barriers, accessibility through information and communications technology, such as the renewal of the audio passenger information system and the introduction of visible and legible special signage will also contribute to equal opportunities.

1.2.4 ACCIDENT FREE 'FORGIVING' ENVIRONMENT

Poorly aligned road sections make accident free and safe transport more difficult while inadequately selected speeds, worn road surfaces, unclear road signs and the lack of a "forgiving environment" increase the risk of accidents.

As a result of road reconstruction planning with a complex approach, human-centred "forgiving" transport spaces can be created in Budapest where accidents caused by road conditions may be prevented and accidents caused by human and vehicle errors are less severe. Where accidents occur regularly and increasingly, proposals for traffic engineering modifications are prepared with the help of targeted road safety audits.

In the course of operation, reconstruction and development of road network of Budapest, the goal is to create clear order in traffic conditions and to make it safe: the 'self-explanatory' surfaces formed according to the road category automatically convey all the information required for safe driving such as for speed selection. Apart from the improvement of the condition of road surfaces indispensable for safe transport, road signs will also be renewed within the framework of the programme.

Within the category of accident prevention, special attention is paid to children: the traffic alignment and the condition of traffic signs are reviewed in the vicinity of schools in Budapest each year. Public transport vehicles must comply with the safety requirements on an ongoing basis. Stricter technical requirements applied to passenger transportation vehicles also contribute to transport safety.

1.2.5 DEVELOPING ZONES WITH TRAFFIC CALMING AND TRAFFIC RESTRICTIONS

Zones with reduced speed limits are being designated and the elements of the public road network are reconstructed accordingly in order to reduce the speed of road traffic and to increase the safety of pedestrians and cyclists in residential areas. The system extends to all locally important components of the road network in the inner urban zone.

The consistent development of the "self-explanatory" road system (reduction of superfluous, excessive capacities, construction of components increasing traffic safety) will assist motorists in the selection of adequate speeds. There should be no urban road sections left in densely populated areas where high speeds are allowed or possible.

1.2.6 DIFFERENTIATED DEVELOPMENT OF THE INNER ZONE OF BUDAPEST (WITHIN THE HUNGÁRIA RING)

The integrated development of the road network can lead to the elimination of territorial disparities, can ease the central focus and can create a proportionate and balanced network by traffic regulation-differentiated according to environmental characteristics-traffic calming, problem-free traffic management and by the reduction of congestion. The conditions of reducing transit traffic must be put in place in the inner zone, even by applying a total ban on certain critical sections (for instance no transit passenger traffic should enter parts of the city within the Nagykörút). Active modes of transport – cycling, walking and public transport – characteristic of a liveable city are provided more room in the city centre.

Public car-parking capacities for destination traffic must be reduced in the inner areas, introducing short-term public parking, priced and regulated according to the actual demand and supply. Vehicles should not be stored in public areas but in underground garages, multi-storey car parks and in existing private car parks, thus freeing further space.

1.2.7 LIFE AND PROPERTY SECURITY, CRIME PREVENTION

A liveable city is also safe, and therefore surveillance and security systems will be gradually introduced on board vehicles and at transport mode-switching points in Budapest.

In order to ensure the safety of passengers, the new vehicles purchased within the framework of the development of public transport vehicle of Budapest fleet are equipped with an effective camera system. Cameras will be installed at stops on busy route sections, such as on tramlines 1 and 3, where during the reconstruction, lifts operating between underpasses and the surface stops will be equipped with security cameras. Cameras will also be installed at the docking stations of the public bike-sharing system and advanced safety protection will be applied at new public transport customer centres.

The security-system recordings will be stored in a manner and for the period specified by law, thus ensuring access as well as justified and conditional control, yet preventing abuse.

1.3 INTEROPERABLE SYSTEMS AND CONVENIENT MODE-SWITCHING POINTS

INTEGRATED TRANSPORT NETWORKS WITH CONVENIENT MODE-SWITCHING POINTS, BY THE ESTABLISHMENT OF INTEROPERABLE SYSTEMS, BY PASSENGER-CENTRED DEVELOPMENT OF INTERMODAL CONNECTIONS AND BY IMPROVEMENT OF MODE SWITCHES AS WELL AS OF TOURISM-ORIENTED CONNECTIONS

The everyday mobility needs of a city are satisfied with the subsequent use of various transport modes and vehicles, by forming a so-called travel chain. The majority of people do not use only a single transport mode: there are no passengers who are exclusively pedestrians, cyclists, bus-, car- or taxi-users; each traveller combines those modes, optimising his/her trip in space and in time from departure to destination. Passenger comfort demands fewer transfers and the availability of advanced, fast and safe mode-switching points. In the past, traffic planning did not take those criteria into account.

1.3.1 INTEROPERABLE TRACK-BOUND SYSTEMS; URBAN AND SUBURBAN RAIL NETWORK

In order to ensure interoperability and smooth trips, the combination of the various rail tracks, currently operated separately, will result in an interoperable system; thus the vehicle and not the passengers will "transfer" from one line to another. This can reduce the number of transfers and travel time making travel more convenient. Fully interoperable transport modes will be developed along major urban structural axes with permanently large passenger flows.

The state railway lines crossing and often separating the Capital must have a significantly greater role within the city and in the traffic between the metropolitan area and the city, due to which not only the traffic parameters of the railway lines are required to be modified, but also the design of the stations need to be adjusted to meet the traffic demand of the city. In order to reduce the number of transfers, we will examine how the suburban railway lines can be integrated with the urban rapid railways (metro) and with state railways as well as we will examine the opportunities for future integrated interoperable cooperation. In the present situation, there are possibilities for direct transfers between the suburban railway lines and the railway network, among others at Aquincum (between perpendicular directions), in the Soroksári way area (between parallel directions), and in Gödöllő (there are several possibilities available by coordinating existing parallel capacities). Possibilities for transfers between tram lines and the railway network are available for example in Káposztásmegyer (and, in the future, by metro line M3), at Lőportárdűlő by tram line 1, and at the Kispest station in Dél-Pest. In case of the multiple units that have become predominant in suburban railway traffic, the purchasing of electric vehicles could also become necessary to provide for suitable interchangeability.

Our suburban railway network has very few features of an advanced suburban rapid railway system ("S-Bahn" according to the German terminology). Although in the recent years a phased timetable was introduced on all lines, the modernisation of the fleet is also progressing at a good pace and the tariffs are also partly consistent within Budapest, the system needs further development: the internal interoperability of the railway network must be enhanced by restructuring the current terminal station system to provide additional services, by using the transversal railway lines for passenger transportation and by introducing more and more services without any transfers. The urban transport connections also require improvement; new stops and new or better organised transfer connections need to be introduced.

Adding more stations to the railway network may cause a conflict on the current infrastructure due to mixed traffic; therefore, the track capacity

must be extended, traffic organising must be modernised to increase capacity, and access and other infrastructure need to be created by the construction of third and fourth tracks. The developments permit the desirable 10-15 minute- time headways between services in peak periods (even shorter headways on the merged sections), instead of the current 20-30 minute-long or even longer headways. The capacity of the terminal stations should be extended and reintegrated into the urban area, and new diametric connections should be established that bypass them and require no transfers.

Better modal choices will result from greater integration of the modal networks: airports, ports, railway, metro and bus stations should increasingly be linked and transformed into multimodal connection platforms for passengers. Online information and electronic booking and payment systems integrating all means of transport should facilitate multimodal travel. An appropriate set of passengers' rights has to accompany the wider use of collective modes.
EU *White Paper* (23.)

1.3.2 IMPROVING CONNECTIONS BETWEEN THE SUBURBAN RAILWAY NETWORK AND THE URBAN TRACK-BOUND NETWORK

Improving the network of transfer connections is the key to the cooperation between the suburban railway and the urban track-bound systems. As in Budapest the track-bound transport system was built independently from the railway network and currently connections exist only at some major transport hubs, the integration of the railways with urban transport and the simultaneous easement of urban traffic require the introduction of new transfer connections. These new connections are required at the intersections of the suburban railways

and the trunk lines of the urban track-bound network (primarily the metro lines and, secondarily, the major tramlines). The new hubs may be implemented in phases, together with the next scheduled development of the track-bound network components.

Thus, there are innumerable possibilities in the present network for developing new connections. After decades that have passed without any changes, the first positive steps have already been taken or are in progress in the direction of a comprehensive S-Bahn model. Regarding this process, a novel approach is required in the case of two factors. On one hand, in case of railway network stations: in line with the technological developments, utilizing expanding capacities (the possibility to provide more stops without increases in travel time, and more frequent headways), the number of stops have to be increased, while on the other hand: it is of paramount importance that urban transport has to be developed, by taking a fully integrated approach into account, to be more specific those stops and transfer points have to be established with the consent of all involved parties. This is the reason why, the modification or relocation of existing networks and stops is also necessary in certain cases to enable better connections.

1.3.3 INTEGRATION OF THE CITY ACCESS AND BYPASS SECTIONS OF THE NATIONAL ROAD NETWORK INTO THE ROAD NETWORK OF BUDAPEST

Apart from the Hungária ring, the primary objective of the road development measures is to put the missing connections of the ring-radial road network system in place. These connections are required to bypass congested district centres and to provide a relief of car traffic through the development of public transport options. The radial traffic capacity of roads leading to the Centre from various directions shouldn't be further increased and there is no point in letting traffic beyond mode-switching points. A review of the system of radial connections, planned earlier between Budapest and the surrounding settlements, has been commenced.

The purpose of the developments is to facilitate reasonable and geographically better balanced traffic on the road network, to remove any unnecessary traffic from residential and service roads, to create development potential in the transitional zone and to ease traffic on the congested main routes crossing district centres. Such sections include the northwest section of the M0 motorway, the Budapest section of main road No. 10, the the Körvasút ring, the road connecting the Southeast Pest districts, the Csepel trunk road, the Budapest section of main road No. 31, the access road to Liszt Ferenc International Airport and Nagy Lajos király way.

1.3.4 FACILITATING THE URBAN INTEGRATION OF LONG-DISTANCE PUBLIC TRANSPORT

By minimising walking distances and level differences at the transfer hubs of the long-distance rail and bus networks, by providing urban transport connections at the stations as well as accurate, comprehensive and complex passenger information system, we get a much more integrated and efficient system and fewer transfers are required. If the system of terminal stations is maintained over the long term, the transfers between various long-distance services may be assisted by providing high-capacity, track-bound, direct connections. Urban integration will also be enhanced by making long-distance trains stop at one or two busy urban railway stations, e.g., at the airport, before reaching the terminus.

1.3.5 INTEGRATION OF RIVERBOAT SERVICES INTO URBAN AND REGIONAL PUBLIC TRANSPORT

The Danube as a transport corridor across Budapest was practically not utilised for decades. Over the last twenty years, only event, tourist and leisure boats were involved in passenger boat transport in Budapest. Long-distance boat transport is still limited to seasonal tourist and event boat services operating from Budapest towards Szentendre and the Danube Bend. However, this transport option should not be left unused. Similarly to other riverside metropolises, scheduled waterborne public transport services need to be developed in Budapest and its surrounding area, too. The public transport boat services will widen the range of available public transport services only if they provide new direct connections to areas with poor transport coverage.

The urban side of the Danube bank must be made more easily accessible and ports need to be connected to the public transport network. By increasing the role of boat transport, road traffic in the city centre and on the embankments can be mitigated, and by improving connections to the ports, citizens can be encouraged to opt for public transport, walking, or cycling.

1.3.6 IMPROVING THE ACCESSIBILITY OF BUDAPEST LISZT FERENC INTERNATIONAL AIRPORT

Considering the passenger traffic of Budapest Liszt Ferenc International Airport, it would not have been economical to build a dedicated track-bound urban connection. It is practical to use the existing railway network to access the airport. The regular services of Ferihegy railway station, located at Terminal 1, is solved, while it is possible to build an airport railway (airport shuttle) or railway side track to Terminal 2. Accessibility of the Airport may be increased on road by the joint reconstruction of the Ferihegy expressway and the bordering Gyömrői road, by the reconstruction of the junctions and by offering frequent opportunities to drive up and down the expressway, preserving the original function of the road leading to Ferihegy Airport , yet a safer urban main road with higher capacity can be created that also serves the adjacent urban areas and provides attractive urban development options.

Railway services to Ferihegy Airport are only effective if the station is integrated into the long distance or suburban transport systems. The essence of the airport link is to provide accessibility from the entire country. The optimal solution is a track linked to the Cegléd railway line.

1.3.7 DEVELOPMENT OF LOGISTICS CENTRES, CONSOLIDATION CENTRES AND THEIR CONNECTIONS

Logistics centres host economic activities that have less burden on environment, yet attract considerable traffic. An important aspect of their establishment is to position them not only in the vicinity of Budapest but at the intersection of high capacity networks of several modes of transportation (air, water, rail and road) with the consideration of regional and national connections.

Additionally, it is also necessary to develop more, smaller transhipment facilities (consolidation centres) within the city's inner zone, which could provide for "last mile" and "last metre" shipments to protected zones, road sections, and pedestrian zones with the use of small, environmentally friendly (zero emissions) vehicles. In order to mitigate burden on the environment, environmentally friendly transport modes (railway, waterborne transport, electric-powered, and freight bicycles) have to be prioritised, on the basis of which new terminals and stores have to be served. Currently, Szabadkikötő in Csepel is involved in substantial freight traffic on the European transport corridor on the river Danube; therefore the transport of goods by ships has to be expanded along the city boundary of Budapest and Érd.

At busy public transport hubs, in P+R car parks, the services of goods delivery companies can be simplified and public transport services can be expanded by developing (in cooperation with consolidation centres) unified package points (goods receipt lockers).

1.3.8 DEVELOPMENT OF NATIONAL AND REGIONAL CYCLING TOURISM CONNECTIONS

Cycling has an increasing share in the tourism-generated traffic of Budapest, too: more and more people plan one-day excursions near

their homes furthermore weekend traffic by tourists and the number of non-Hungarian cycling tourists are also clearly rising.

Further pedestrian and cycling connections are needed along the Danube region because the islands along the North Budapest Danube section and along the Ráckeve Danube branch and the strips of the bank, still in their near original natural condition, are not easily accessible and therefore their green space potential cannot be utilised.

The Budapest sections of the national cycling tourist core network (the "Rivers Route" cycling route along the Danube, The Budapest–Balaton route and the Budapest sections of the Eurovelo route of the East Hungary cycling tracks, built as a priority government project) are integrated into the urban network.

1.3.9 DEVELOPMENT OF INTERMODAL CENTRES AND HUBS IN PASSENGER TRANSPORT

Changes (transfers) cannot be fully eliminated from the urban transport network. By developing intermodal centres and hubs that facilitate passenger friendly mode switches and perform functions other than transport as well, the non-individual motorised transport modes can be made more comfortable. One of the main objectives of urban development is to build intermodal hubs and renew their surrounding area, to create more liveable and loveable urban spaces for both local residents and visitors. Intermodal hubs vary according to their locations, sizes, functions and the number of existent transport modes. The consistent principles required for their development and operation should be identified on the basis of the results of the "NODES" research-and-development project, supported by the EU Research and Technology Development Seventh Framework Programme (FP7).

1.3.10 PROVIDING THE CONDITIONS FOR SWITCHING URBAN TRANSPORT MODES

Parallel with the reconstruction and development of the track-bound network in Budapest, the construction of P+R car parks and B+R storage facilities enabling convenient, safe and predictable switches between individual (motorised and non-motorised) and public transport modes will continue in the outer districts of the city, primarily along the high capacity track-bound public transport lines (metro, suburban railways, trams). The main purpose of the MOL Bubi public bike-sharing system is to mitigate the traffic congestion in the Centre, to provide easier access to the inner city and to facilitate short trips. Thus urban cycling will become more comfortable through the installation of bicycle racks and storage facilities..

CONSTRUCTION OF STATIONS WITH JOINT PLATFORMS

While developing the network, the reduction of the number of transfers in a trip is an important principle, but transfers should be expected even in a well-optimised public transport system owing to the reasonable cooperation between the various means of transport. Adequate transport organising can ensure that passengers lose the least amount in space, time, expenses and comfort through transfers. In order to reduce the losses in space caused by transfers, stations with joint platforms will be built. Following a complex overview of transfer hubs, we will be able to define further measures related to the network organisation and traffic, by which the disadvantages of transfers may be alleviated significantly (barrier-free accessibility and passenger comfort are always basic requirements in planning).

CONSTRUCTION OF SHARED PUBLIC TRANSPORT LANES

Shared public transport corridors used by trams, buses and trolleybuses along route sections will facilitate transfers on a shared platform and the common implementation of priority traffic arrangements. In addition, they will also reduce the road usage demand of public transport. Wherever traffic and the cross section of roads permit, shared bus-cycle lanes will also be established as part of the cycling infrastructure.

SHORT-TERM PARKING FACILITIES (K+R)

Short-term parking facilities (Kiss and Ride) will be established at the intersections of public transport trunk lines and main traffic routes of the road network to facilitate transfers from cars or private coaches to other vehicles.

These stops are similar to public transport stops and may be served as boarding and drop-off points. Thus passengers will not use public transport surface stops for this purpose - the current situation does not comply with the regulations, is disturbing, and is also accident-prone at the same time.

1.3.11 THE DEVELOPMENT OF P+R CAR PARKS AND B+R STORAGE FACILITIES

In line with European development directives, the need for creating a liveable urban environment requires traffic calming and private car traffic in the inner zones be mitigated and the ratio of public transport be increased. One of the possible means to reach this goal (which has worked well all over the world) is to promote combined transport modes and to connect private and public transport effectively, since in themselves, neither of the above transport modes are solely advantageous or disadvantageous: the essence of the P+R system is to combine the comfort and flexibility of private car use with the economical and space-saving operations of track-bound vehicles.

In 2014, a total of 3,900 P+R car parks were available in Budapest; this same number was 3,800 in the agglomerations, which were linked to suburban railway stations. These numbers do not meet the demands. In Western European cities of similar size (Vienna, Munich), about 9,000 car parks are available within the city, and the number of P+R car parks is close to 30,000 when combined with the agglomerations.

A twofold P+R strategy is worthwhile to be defined for traffic from agglomerations to the city. First, initial traffic should be collected as close as possible to where it originates. The system of small, decentralized P+R car parks serves this purpose, in the framework of which P+R car parks have to be developed at agglomeration suburban railway stations. However, a part of traffic cannot be

switched over to public transport, therefore it is practical to construct large capacity car parks near the city boundaries, at the edge of the congestion zone, along the track-bound transport network (primarily along the access motorways leading to the city).

The combined transport modes become appealing if they save time for passengers without an increase in costs, at an acceptable level of comfort. The ideal locations for P+R car parks and B+R storage facilities are connection points where passengers can use track-bound transport modes to directly access the typical commuter destination: the city centre; in addition, it should also be a "good urban location," equipped with the services and commercial applications required for commuters' daily needs. Travel time including average waiting times and costs have to be less compared to the travel time and costs spent by private car use. In addition, it is advantageous if passengers can make errands while switching transport modes, since it enhances their comfort and save their time.

The success of P+R car parks thus depends on two main factors:

- The car park has to be outside the congestion zone on the radial routes serving Budapest, otherwise it leads to significant time delays.
- The public transport modes have to have high-capacity, be reliable, and be frequent. Generally, track-bound vehicles (metro, suburban railway) or express buses running on segregated tracks (BRT) are able to meet these conditions.

For the success of P+R and B+R systems, car park, bicycle storage, and public transport services have to be operating on a high quality. These two pillars strengthen each other: the better the quality of the track-bound transport, the more appealing it is to private car users. Thus, the ideal location for creating P+R car parks is the stations of suburban (high-speed) railway lines, where transfer times are as short as possible, and can be done after private car use bypassing, as possible, the main roads. The construction of P+R car parks in Budapest will take place in several stages. In the short and mid-term, P+R car parks will be built along the existent high-speed rail network; while in the long term, along the high-speed rail network to be developed. The long term plans include approximately 20,000 car park spaces. As a result of the agglomeration developments, the number of P+R car park spaces in the area surrounding Budapest may reach 10,000 over the long term. A primary priority is to transfer passengers arriving in Budapest from their own cars to track-bound public transport as close to their homes as possible.

2

ATTRACTIVE VEHICLES

THROUGH A COMFORTABLE AND PASSENGER FRIENDLY VEHICLE FLEET AND THE DISSEMINATION OF ENVIRONMENTALLY FRIENDLY TECHNOLOGIES

ATTRACTIVE VEHICLE INDICATOR

25 YEARS

2014

15 YEARS

2030

BY 2030, THE AVERAGE AGE OF PUBLIC TRANSPORT VEHICLES SHOULD BE MAXIMUM 15 YEARS IN PROPORTION TO CAPACITIES

The purpose of developing the public transport vehicle fleet in Budapest is to make public transport an attractive option to travellers. There is a need for aesthetic vehicles that are in a good condition and provide high quality services and further improvement is also required in accessibility.

The main objective of our work is to reduce environment-related burden caused by the transport system. On one hand, the new vehicles will also be fuel efficient and less polluting, on the other hand, as they offer an attractive alternative, the ratio of the use of public transport compared to individual transport modes will increase, thus the indirect effect of vehicle improvements will also be a cleaner and more liveable environment.

2.1 COMFORTABLE AND PASSENGER FRIENDLY VEHICLES

THROUGH THE RENEWAL OF THE VEHICLE FLEET ACCORDING TO ENERGY EFFICIENCY AND ACCESSIBILITY AND RELIABLE MAINTENANCE

While the expectations of passengers were increasing gradually, the development of the vehicles of the Budapest public transport system lagged behind over the last few decades. Only part of the 20-30 year-old vehicles, still in adequate technical condition, went through aesthetic refurbishment. The situation may be improved by purchasing new and second-hand vehicles that are in a good condition and by refurbishing the vehicles which continue to be in service. The measures will also improve accessibility, the reliability of services and the ratio of barrier-free vehicles.

2.1.1 MODERNISATION OF THE PUBLIC TRANSPORT VEHICLE FLEET AND ITS MAINTENANCE CAPACITIES

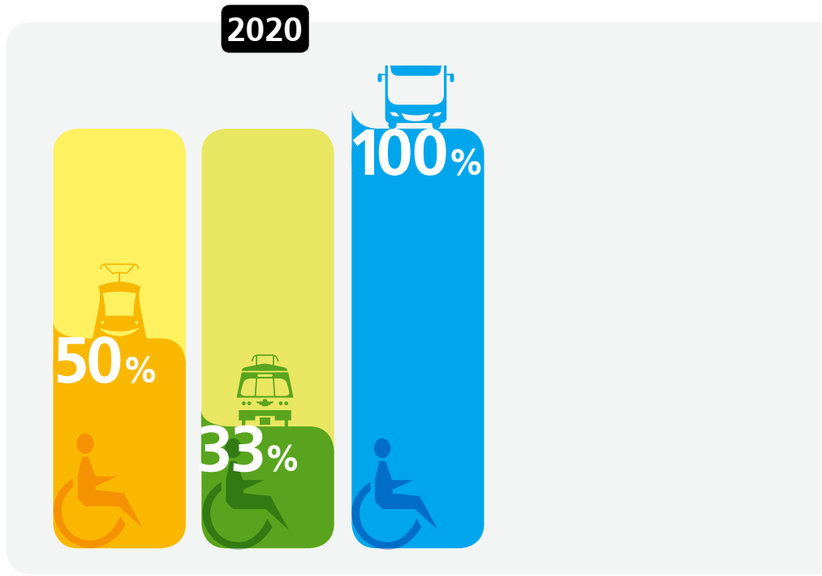
In order to catch up with the technical backlog of the last few decades, a continuous vehicle procurement and vehicle fleet reconstruction programme will be developed, in which barrier-free accessibility will play an important role.

In the bus sector, new vehicles will be purchased and, at the same time, high-quality services will be provided by subcontractors based on contracts granted on the basis of competitive tenders issued for the participants in the operators' market. To provide more effective operation and procure further vehicles and services, the objective is to select more homogeneous types The low-floor design is a key requirement for any new vehicles to be put into circulation.

The procurement and the measures of track-bound public transport services are defined in the vehicle strategy prepared by the Budapest Municipality for the period of 2013 - 2027. The purpose of this strategy is to put a comfortable, low-floor, energy-efficient and environmentally friendly vehicle fleet, consisting of advanced and reliable types, into service. The replacement of the more than 40-year-old cars of metro lines M1 and M3 and those of the suburban trains is yet another urgent task.

The modernisation of the fleet and the maintenance services of waterborne transport is also an important aspect of public transport, and the procurement of new boats can no longer be postponed either. The average age of the boats used in public services and long-distance public boat services is 30 years. They are not suitable for providing high-quality urban transport service in terms of operational dynamics or accessibility. Due to their technical handicaps, none of the types is suitable for suburban passenger boat service, used for commuting to work.

There is a need for a good quality fleet of boats that are flexibly adaptable to weather conditions and water flows, are suitable for higher speed, fast mooring and manoeuvring, are driven with an advanced mechanism, sustainable for decades and provide a degree of comfort, which is generally expected in public transport in order to sufficiently improve the performing capacity of that transport sector. Urban and suburban services demand different types of boats. The maintenance of more advanced boats requires significantly higher quality of operation, and therefore the maintenance facilities also need to be developed.



RATIO OF SERVICES PROVIDED WITH ACCESSIBLE VEHICLES IN THE TRANSPORT NETWORK OF BUDAPEST (2020)

2.1.2 ACCESSIBLE VEHICLES

Due to the poor vehicle fleet and infrastructure, the majority of the transport system is not accessible. In addition, this problem is the gravest on the high-capacity metro and tramlines, which form the backbone of the network.

The development of the infrastructure is an important step in providing equal opportunities in access to transport, too, furthermore the development of the vehicle fleet will make transport more human-focused and will create the technical conditions for equal opportunities. Owing to the accessible vehicles, public transport services will become a real alternative to people with disabilities and public transport will be an easier, safer and more attractive option also for groups with limited capacity to use public transport services (the elderly, parents with children and prams).

There are still few advanced and accessible vehicles in the bus network of Budapest, which reduces the comfort of trips and the accessibility for certain groups of society. As a result of vehicle development, the number of low-floor buses will increase, according to our plans will soon reach 100%, as a consequence of which the mobility of physically-impaired people may be improved.

2.1.3 CONDITIONS OF OPERATION OF THE VEHICLES, DEPOT DEVELOPMENTS

The operation of vehicles with higher technical standards and the modernisation of depots are also parts of the development of the vehicles and assets used in transport. In relation to the network enlargement projects, we shall review the location of the depots and their longer-term roles and will also make proposals for the establishment of new depots in line with urban planning.

2.1.4 INCREASING PUBLIC TRANSPORT VEHICLES SUITABLE FOR CARRYING BICYCLES

Enhancing the opportunities of transporting bicycles will extend the effective range of cycling, assist people living on hills to use bicycles, support tourist traffic, and enhance the safety, reliability and attraction of cycling. The longer-term objective is to put conditions for the transportation of bicycles combined with reliable public transport in place. As the first step in that process, the transportation of bicycles will be made possible on suitable vehicles in less busy periods, which may be expanded further, depending on the degree of utilisation of the system. Besides the gradual refurbishment of the existing vehicle fleet (cogwheel and suburban train carriages) providing bicycle-carrying capacity and more comforts, the option of carrying bicycles will be an important requirement when any new bus, tram, trolleybus or metro is procured.

2.2 ENVIRONMENTALLY FRIENDLY TECHNOLOGIES

THROUGH THE ENCOURAGEMENT OF THE DISSEMINATION OF VEHICLE TECHNOLOGY SOLUTIONS THAT SUPPORT THE CLIMATE POLICY

A main objective of the European Union is to reduce by 2030 the emission of transport-related greenhouse gases by approximately 20% below the level reported for 2008. The new technologies applied in vehicle development and in traffic control will have a key role in this aspect. An improvement in the energy efficiency of vehicles, the support of the introduction of sustainably produced fuels and propulsion systems will reduce the harmful emission of transport.

Innovative, environmentally friendly development is encouraged in both public and private car transport.

2.2.1 PROCUREMENT OF ZERO EMISSION VEHICLES

Obsolete buses equipped with diesel-engine cause severe environmental-related burden in Budapest, deteriorating the quality of life, especially in densely populated central areas, which can be significantly mitigated by vehicles equipped with new propulsion technologies. The applicability in Budapest of these zero emission vehicles as well as vehicles equipped with renewable energy propulsion is examined within the framework of a research-and-development partnership.

In order to expand the environmentally friendly trolleybus network, the isolated parts should be connected and the overhead wire system must be installed in new areas, too. The service can be made even more flexible by increasing the ratio of vehicles with off-wire capability. The existing trolleybus infrastructure provides a background for the installation and extension of electronically driven buses. With technology development, the borderline between the still different sub-sectors may be faded, i.e., the bus and trolleybus services can be developed into an optimised transport mode, in which the vehicles use overhead wires at the terminals and on the intensively used sections while they are battery-operated on the branching-off parts of the network.

2.2.2 SUPPORT OF ENVIRONMENTALLY FRIENDLY PUBLIC TRANSPORT TECHNOLOGIES

One of the main factors that negatively affects the quality of urban life is air pollution; therefore it is an objective to mitigate it not only when the vehicle fleet used in public transport is replaced, but also in private car use. Replacing fossil fuels with renewable energy sources and with alternative fuels is one of the greatest challenges faced by the transportation sector; as a result, the European Commission drafted legally binding provisions to promote the spread of environmentally friendly fuels. By supporting the spread of alternative modes of propulsion and by promoting the installation of refilling stations that are in line with EU standards to be laid down by 2016, the present competitive handicap of environmentally friendly vehicles can be mitigated.

The spread of environmentally friendly fuels and zero emissions transportation can be promoted with the introduction of tax and fee discounts that are part of the financial measures aiming at making an impact on transport modes, with the mitigation of the access restrictions imposed for environmental protection reasons, and with the development of a wide coverage of electric charging stations.

2.2.3 MORE STRINGENT ENVIRONMENTAL REQUIREMENTS FOR TAXI SERVICES

In order to make the city more liveable and to reduce the environmental burden even now, regulations specify a requirement that taxi services may be provided in the Capital only by vehicles that meet the requirements of the EURO4 environmental category. Our objective is to make that requirement even more stringent and to make the EURO5 category a mandatory requirement. In order to further encourage the mitigation of air pollution, hybrid, purely electric and compressed natural gas (CNG) powered taxis are granted a 20% reduction in fees payable for the use of taxi stations. Electric vehicles may not become widespread without the required infrastructure, thus the installation of integrated electric charging stations at more and more taxi stations is another objective.

2.2.4 ENVIRONMENTALLY FRIENDLY TECHNOLOGIES IN FREIGHT TRANSPORT

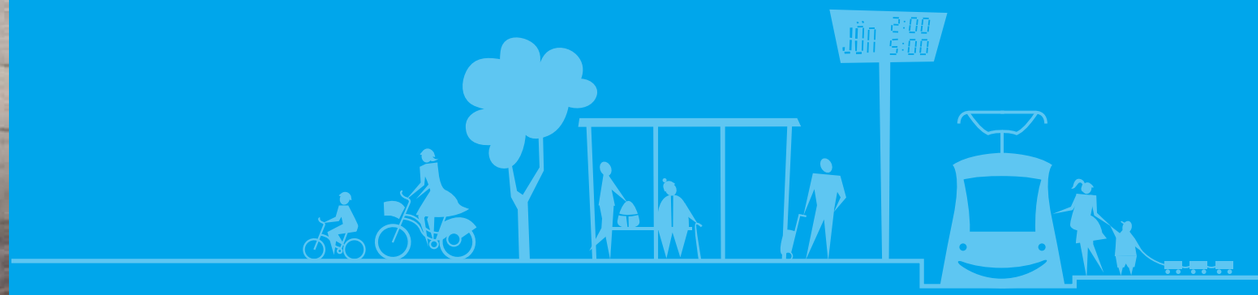
The current Freight Transport Strategy for Budapest specifies the measures until 2018 for promoting environmentally friendly vehicles and for gradually limiting polluting vehicles. Simultaneously to the restrictions related to environmental categories, the support of environmentally friendly vehicles with alternative modes of propulsion can also be gradually strengthened (electric, hydrogen and hybrid technologies, human-powered transport, freight bicycles). By spreading and applying intelligent systems and providing real-time information services, traffic congestions can be significantly mitigated and the efficiency of city logistics can be further enhanced.

3

BETTER SERVICES

THROUGH AN EFFECTIVELY ORGANISED AND INTELLIGENT,
WIDELY AVAILABLE, INTEGRATED TRANSPORT SYSTEM
THAT PROVIDES ESSENTIAL INFORMATION

THE RATIO OF ENVIRONMENT-CONSCIOUS TRANSPORT MODES (WALKING, CYCLING AND PUBLIC TRANSPORT TOGETHER) WILL INCREASE 15 PERCENTAGE POINTS BY 2030.



"Growing out of oil" will not be possible relying on a single technological solution. It requires a new concept of mobility, supported by a cluster of new technologies as well as more sustainable behaviour.
EU *White Paper* (43.)

User friendly and people-oriented services are needed in order to increase the popularity of walking and cycling and the competitiveness of public transport. In Budapest, there are still many options of influencing transport mode selection which have not yet been used: the shaping of demands with administrative regulatory tools, with the introduction of alternative mobility options, with campaigns and with awareness raising is able to supplement the traditional, supply-based infrastructural transport development endeavours.

3.1 IMPROVING THE QUALITY OF SERVICE LEVEL

THROUGH NORMATIVE FINANCING, UNIFORM PASSENGER INFORMATION, HARMONISED TIMETABLES AND EXPANDING INTELLIGENT SERVICES

The quality, accessibility and reliability of transport services will gain increasing importance in the coming years, inter alia due to the ageing of the population and the need to promote public transport. Attractive frequencies, comfort, easy access, reliability of services and intermodal integration are the main characteristics of service quality. The availability of information over travelling time and routing alternatives is equally relevant to ensure seamless door-to-door mobility, both for passengers and for freight.
EU *White Paper* (41.)

Traffic engineering solutions introduced some decades ago, favouring the private car use, have been maintained on numerous routes in Budapest, where the criteria of public transport are not taken into account at all or only to a small extent. Any service where the majority of the travel time is spent waiting deteriorates the overall competitiveness and attractiveness of public transport in general. Passenger transfers and changes are badly organised at several interchanges of various transport modes forcing irregular, accident-prone and ad hoc solutions to become permanent.

The currently applied tariff and ticketing system of Budapest is a uniquely out-of-date system in Europe. Due to the obsolete technology, no well-tried and popular ticket types available in other cities may be introduced, in addition to single tickets and passes. urban transport fare system of Budapest is one of Europe's most obsolete systems while passenger information and transport

information services are still not consistent, despite the development projects of the last few years.

Passenger friendly transport measures will make public transport more attractive and improve the conditions of the use of the various transport modes. By expanding the services, the travel chain will become more predictable and individual requirements can be handled flexibly.

3.1.1 CONSISTENT PASSENGER INFORMATION AND OTHER INFORMATION SERVICES

Providing continuous information to passengers and real-time updates on individual and public transport options are one of the key priorities for high-quality transport services in Budapest. The information and communications technology revolution of the new millennium is also taking place in the transport of Budapest: the most advanced technological innovations assist passengers in reaching their destinations as fast as possible. The integrated passenger information system, currently under development, will provide real-time and accurate traffic information minute by minute on online interfaces, accessible at the most important mode-switching points of Budapest and through mobile devices as well. With the introduction of high-quality information surfaces, the image of the transport system that determines the Budapest cityscape will also change considerably: all details of the static orientation systems will be modernised and a uniform design will be applied on internal surfaces of vehicles, on displayed orientation signs, on timetables and maps. Public transport stops will be reconstructed, the old and outdated signs will be replaced by informative and decorative information, and tourist information will be enhanced with the help of interactive signage and way-finding columns enabling Wi-Fi connection at busy surface transport hubs. Participants in transport will turn from helpless travellers into conscious passengers and from customers into partners. They can make their decisions on trips on the basis of accurate and real-time

information, available before commencing their trips. Those decisions may also be assisted by personalised online and interactive on-site information, developed for modern communications tools.

3.1.2 AUTOMATED FARE-COLLECTION (AFC) SYSTEM

The fare system is an important factor in the attractiveness and competitiveness of public transport, including pricing, fare structure and access to tickets and passes, i.e., the sales system.

The introduction of a new, time-based electronic fare-collection system is a complex transport and IT development: as part of a modern system focusing on the requirements of the travelling community, the tariff system will be renewed and the paper-based system will be replaced by contactless card technology, which requires the installation of electronic ticket validating devices on vehicles and access gates will need to be installed at busy stations. Parallel with the development, the sales channels will also be expanded (internet, telephone, ATM purchase options, etc.). Within the framework of the system, the P+R car parks in Budapest will also be available for use with electronic tickets.

The time-based electronic fare-collection system will automatically track the transfers included in the fare as part of the service, and thus the system will treat each passenger as the user of a multi-component travel chain. The electronic fare system improves service quality, increases the competitiveness and attractiveness of public transport and reduces fare evasion, thereby contributing to sustainable financing.

The AFC system provides up-to-date usage data which is important for the development of the quantity and quality of the service.

3.1.3 INTEROPERABLE FARE SYSTEM AND TARIFF COMMUNITY

An integrated timetable and fare system will have to be introduced in the overall Budapest fare system in order to make public transport modes competitive with individual transport. It is especially important in regional transport, therefore the suburban services of MÁV (Hungarian State Railways) and VOLÁNBUSZ must also become parts of the integrated system.

An integrated fare system that includes both tickets and passes is an important prerequisite of a full-value “S-Bahn” rapid railway system.

3.1.4 HARMONISATION OF URBAN AND SUBURBAN TIMETABLES AND COORDINATION OF SERVICES

It is impossible to eliminate all transfers, but all development must be aimed at improving the comfort of changes and minimising time loss.

The coordination of timetables is an important aspect of that progress. An integrated timetable means that various lines meet at intersection points in a coordinated manner, which can effectively reduce time lost in changes especially on services operated with less-frequent headways. By coordinating suburban and urban timetables and strengthening the service capacity of the lines, the urban sections of the regional rail services may have a more active role in the transport of Budapest. This type of integration will involve primarily feeder bus services; the operating times must also be coordinated with transfer options adjusted to the first and last train services.

The new route signalling system of regional trains and their line numbering also contribute to the development of an integrated system. The first step of timetable integration is to establish a common timetable interface.

3.1.5 USE OF INTELLIGENT SYSTEMS IN PUBLIC TRANSPORT ORGANISATION

Providing real-time information for route selection, influencing traffic with billboards with changeable displays, parking management, coordinated and demand-driven traffic control, consistent administration and the extensive use of the databank and operation database will all contribute to a predictable and effective road transport organisation.

Modern route organisation, traffic-dependent systems

The traffic review of public transport routes will identify and eliminate the factors causing idle time for vehicles and optimises the utilisation, in space and time, of road surfaces shared with individual transport. The application of traffic-dependent regulation technology solutions will give priority to public transport at due times flexibly, without any losses, and will provide a predictable and reliable service to passengers.

Modern traffic surveillance system

An advanced traffic control system ensures connections specified in the timetable even in the case of delays, in addition to effectively managing service disturbances, and provides ongoing data updates to the real-time passenger information system on current traffic conditions. If there is any service disturbance, disruption, the system informs the concerned passengers of the situation, on the measures taken for the elimination of the error and on transport options to avoid the route section involved.

Extension of solutions prioritising public transport vehicles

In order to mitigate the level of daily car use, public transport must be given real priority continuously. Instead of limitations and surcharges, the

increased use of public transport will be encouraged by efficient services that are apparent and convincing on their own (direct services, bus corridors, high-speed, separated tram tracks and bus lanes, priority in traffic).

INTEGRATED DATA SYSTEMS

Wireless technologies, especially the spread of intelligent mobile tools, open up new doors in transportation planning and organisation: there are possibilities for tracking passengers individually but anonymously, for becoming familiar with their travel habits, and for providing dynamic information to passengers. The following new development-related directions and trends are becoming apparent:

- the "predict and provide" traditional transport planning method based on forecasts and estimations is being replaced by the "aim and manage" approach, which focuses on influencing transport needs,
- a shift is taking place from physical infrastructure developments to the application of intelligent information and communication technological solutions (promoting the more efficient utilisation of existing infrastructures),
- the spread and development of personal mobile devices provides new opportunities for transport organising,
- standardisation policies of the European Union target the spread of open data, intelligent transportation systems (ITS), and multi-modal route planning (urban information and communication technologies directive).

Those corporate data systems have been developed by which the previous corporate culture-based primarily subsequent analyses and traditional controlling have been replaced with nearly real-time process tracking, quick yet in-depth preliminary studies, and data-based decision making.

The collection of real-time network data is extremely important for the transportation traffic control and providing those to traffic control centres in the form of feedback. If a suitable number of and adequately reliable traffic data collection equipment are available and used, traffic signal programs can be optimized on a network level and traffic-dependant control strategies can be developed.

The next step is forecasting, which involves dynamic estimation with adequate probability of expected traffic situations based on data received from various sources. Measures taken in the interest of preventing future traffic situations that should be avoided are only possible after the previous steps. Integrated, cooperative transportation systems are the peak of the development curve and represent the most advanced technology that is currently technically available. In the course of transport organising, the use of information and communication technologies thus provides the possibility of offering new services to passengers that allow the effectiveness of both public transport and individual transport methods to increase, making it possible to better utilise the existing infrastructure systems.

INTEGRATED SERVICES

By collecting, handling, and analysing large amounts of urban transportation data in a unified manner, continuously monitoring the transport infrastructure and its services, and getting to know the needs of passengers better, a data-driven transportation system can be developed and operated that is overall more reliable, safer, more environmentally friendly, and more effective than currently. Information technology developments also enable the provision of numerous modern, integrated services in urban transport organising:

- Unified internet (Wi-Fi) service on transport vehicles of Budapest and in public areas
- Intelligent traffic control, coordination of traffic signals (“green wave”)
- Simplified sales channels (mobile payment, on integrated surface)
- Developed traffic monitoring, disturbance monitoring and elimination, more effective checks
- Dynamic traffic information services
- Mitigating traffic in inner city zones, regulation-based protection (freight traffic, smog warning)
- Dynamic parking system
- Dynamic traffic control ("SMART ROAD")

3.1.6 OPERATION AND DEVELOPMENT OF THE PUBLIC BICYCLE-SHARING SYSTEM, EXTENSION OF CYCLING SERVICES

MOL Bubi, the public bicycle-sharing service introduced in Budapest, is a new, alternative public transport service with affordable public bicycles, easily accessible for everyone in the inner, most densely populated

parts of Budapest, encouraging individual cycling. The system will be expanded on the basis of the actual experience of its operation.

A public cycle-parking installation programme will be launched in order to encourage everyday cycling and to improve its conditions by taking into account the requirements of local land uses and layouts, in order to make bicycle storing facilities, suitable for daily use, accessible in the vicinity of each home in Budapest and to make sure that the bicycles can be fixed conveniently and safely at the respective cycle-parking facility at any destination. That is why bicycle-parking facilities will be installed at a distance of at least 200 metres in the Centre and district centres, on office, service and work sites and in the vicinity of municipally-owned public institutions.

Supplementary services directly related to the cycling infrastructure will make the urban use of bicycles reliable and attractive. Market players may also be involved in the development of full services (rent-a-bike, fast self-service repair stations, servicing, rest areas for cyclists, cycling tour management, tour guiding, cycling centre).

3.1.7 EXTENSION OF ON-DEMAND PASSENGER TRANSPORTATION SERVICES

Not all urban transport needs can be served effectively by scheduled services, especially in new residential areas with low population densities. In such places, the alternative for individual motorised transport is a demand-driven passenger transportation public service (Telebus) or the extension of the existing scheduled transport services in space or time (extended travel time or route length of the line). The current service is reviewed and extended on an ongoing basis, according to programme.

3.1.8 DEVELOPMENT OF CONSISTENT TAXI SERVICES IN BUDAPEST

The purpose of taxi service regulation in Budapest is to facilitate a predictable, transparent, consistent and reliable service for passengers with a simple tariff system. A set of conditions are required to enhance the comfort and safety of passengers that may be achieved through regular quality control by inspection. Setting a limit for taxi age is another factor contributing to reliable urban transport.

3.1.9 CAR SHARING

Schemes aimed at boosting the occupancy level of cars in the city may ease congestion in the inner parts of the city, traffic on public roads and in car parks, as well as the resulting environmental pollution. With the help of the car sharing system, the same magnitude of vehicle usage may be achieved with fewer vehicles requiring fewer parking spaces enabling users to satisfy their mobility needs at less cost (at first 3 to 5, but later even 10 private cars might be replaced by one shared vehicle). A concept is being developed to support the dissemination of shared passenger cars with complex and specific proposals and regulatory options.

3.1.10 URBAN TRANSPORTATION SANITATION AND PUBLIC HEALTH TASKS

In the 2014-2030 period, it is essential to improve the hygiene conditions of transport systems and to solve the hygiene deficiencies related to the main wastes in transportation.

Both residents of Budapest and visitors can be motivated to use community transportation if the hygiene conditions of vehicles and routes are improved in addition to their being modern. Especial attention has to be devoted to public areas, the modes of local community transportation and their stops, and keeping long-distance bus and train stations clean. The hygiene conditions of public areas and station restrooms have to be improved; furthermore, the number of well-equipped, free, and clean restrooms providing proper hygiene conditions and accessible to the disabled should also be increased.

3.2 ACTIVE AWARENESS RAISING

THROUGH FACILITATING CONSCIOUS MODE SELECTION BY PROVIDING UP-TO-DATE INFORMATION AND CLIENT-CENTRED COMMUNICATION

Our objective is to assist reaching a sustainable balance of transport modes and to enable people to find the optimal transport solutions for their everyday trips.

3.2.1 CONSCIOUS MOBILITY AND SAFE TRANSPORT EDUCATION

The transport development of the Capital is focused on people living and travelling in the city. The gradually increasing information supply, targeted campaigns and research-and-development cooperation all contribute to the enhancement of transport-related knowledge and people's decisions about their own mobility. Budapest continues to organise the European Mobility Week and Car-free Weekend between 16-22 September each year, calling attention to the current trends in urban and transport development, the European directives and the impacts of transport on the quality of urban life and environment. The aim of the STARS research-and-development project, conducted with the involvement of Budapest Municipality and the support Intelligent Energy Europe (IEE) of the European Union is to reduce the number of pupils arriving to school by car, with the help of an accreditation programme focusing on the active involvement of primary school communities (pupils, teachers and parents) and promotion campaigns.

In order to gradually reduce the number and the severity of accidents, the standard of transport culture is increased, besides providing adequate infrastructure, through targeted campaigns and educational changes at local and national levels (e.g. the integration of the Highway Code into the National Curriculum)

3.2.2 AWARENESS CAMPAIGNS AND COMMUNICATION

In order to ensure safe transport, compliant conduct is supported by the provision of information, continuous attitude forming campaigns and active communication, which focuses on setting an example and on creating awareness of social advantages. Easily understandable information with feedback opportunities is conveyed on an electronic portal, in publications, through the information centre, and with the help of maps, route planners and newsletters.

Along with an increase in the number of cyclists, the number of less experienced and uninformed users has also increased, resulting in more demand for the supply and transfer of information and targeted campaigns among cyclists to promote their compliance with the rules.

3.2.3 CUSTOMER SERVICE CENTRES

It is not only the attitude of travellers that has to change, but also the approach of the service provider organising transport. In order to maximise customer satisfaction and the user experience, sales channels need to be reconsidered and a new, customer-centred approach has to be introduced.

In order to satisfy the changed demand and to improve the quality of services, customer centres will be established at the main public transport hubs and at locations with intensive passenger traffic where all transport-related requests can be managed. Apart from the AFC system, other matters relating to the integrated public transport services and, in individual cases, to the Municipality, Budapest districts and service providing partners (MÁV-Start, VOLÁNBUSZ), can also be handled there (e.g.: MOL Bubi, surcharge payment, general information, etc.). Traditional ticket offices will gradually be phased out parallel with the introduction of the new customer centres and the continuous installation of intelligent ticket vending machines.

Types of customer service centres

Based on passenger flows, two types of accessible customer centres may be introduced:

- **Customer point:** where the current ticket offices can satisfy the general sales requirements, however, the quality of service should be increased and the request management relating to new functions should also be made possible.
- **Customer centre:** at main interchanges, where large passenger flow demands a customer service office with several customer counters.

The services and ticket sales implemented with the new approach, as well as the closely related high capacity customer centres and reliable automated ticket machines combined together are capable of serving Budapest passengers and tourists. The high-quality design and operation of the customer centres can significantly improve the general image of Budapest.

3.2.4 PRESENTATION OF TRANSPORT HERITAGE, TEACHING TRANSPORT CULTURE

The history of Budapest transport is marked by numerous world-standard innovations that greatly determined the identity of the Capital. Therefore, access to the preserved values by the general public will be extended. Owing to the cooperation of interested individuals and professionals, significant development has taken place in that field over the last few years, and the presentation and reconstruction of the historic technical equipment and the operation of vintage vehicles will continue. Similarly to other large cities, the vintage vehicle organization in Budapest is also to extend its touristic offers, contributing to the expansion of local and technical history knowledge in a playful and enjoyable form and increasing the transport awareness of new generations.

In addition to holding open days, this task requires a permanent location within Budapest that is easily accessible with public transportation. This location can be used to collect the numerous collections as well as museum and nostalgia vehicles; it could also create a training location where the transportation awareness of the younger generation can be developed by deepening their knowledge of local and technical history with the help of educational and fun activities.

4

EFFICIENT GOVERNANCE

THROUGH CONSISTENT REGULATION AND
THE PASSENGER FRIENDLY DEVELOPMENT OF NATIONAL,
REGIONAL AND LOCAL NETWORK CONNECTIONS

4.1 CONSISTENT REGULATION

THROUGH A SET OF INSTITUTIONS AND REGULATIONS THAT SUPPORT TRANSPORT OBJECTIVES

For the renewal and continuous development of Budapest transport it is an indispensable condition to have a system of competent institutions representing the system of objectives and operating in line with them to support the changes. The creation of an adequate governance system and its stable maintenance will facilitate the implementation of the set targets and the longer-term sustainability of the system.

The regulatory environment of transport must be consistent with the complex objectives, assisting their implementation both in Budapest and in its metropolitan area.

4.1.1 FURTHER TASKS IN THE TRANSFORMATION OF TRANSPORT GOVERNANCE, NORMATIVE AND PREDICTABLE FINANCING OF PUBLIC TRANSPORT

Based on the transformation of the transport governance system of Budapest which began in 2010, all transport development actions will take place in a consistent, well-coordinated form, separated from the owner, control and service operator levels, within the framework of the Centre for Budapest Transport. Apart from the further development and improvement of that model, there will be two main tasks relating to the governance system in the subsequent period.

On the one hand, metropolitan area transport, which currently operates separately, but as part of transport of Budapest, and the public transport services provided on urban networks, not yet integrated into urban transport, need to be integrated. A consistent timetable, tariffs and passenger information system are key features of any modern metropolis and are also a prerequisite for a high-quality and competitive transport system in Budapest. However, it may be achieved only with an adequate set of institutions.

An effective set of institutions requires a stable, sustainable and predictable financing framework. The financing of public transport must be made calculable and be based on normative support to provide a framework for effective management. This financing model will facilitate efficient operation, eliminate wasteful practices and put conditions of effective development in place.

Apart from the governance tasks to organise transport, strategic planning based project development and project management practices must be enhanced, as they are prerequisites of effective fund absorption and implementation.

4.1.2 ECONOMIC AND ADMINISTRATIVE INCENTIVES

The operation and development of transportation system of Budapest can be influenced not only with technical, but also with financial, economical, and regulatory tools. To implement the city's vision for the future and achieve its strategic goals, regulatory measures pertaining to traffic on public roads have to be examined and restructured, including they system of parking (the order or parking and storing vehicles, parking zones and fees) and the order of using and accessing public roads and public areas (access regulations, licensing, and fees, discounts, "intrinsic" free parking for residents). By applying the term environmental load in a wider spectrum, the use of public roads and public areas for short periods of time and technologies resulting in smaller environmental loads (electric, renewable, or hybrid technologies) are to be promoted with the help of financial regulations.

Road pricing and the removal of distortions in taxation can also assist in encouraging the use of public transport and the gradual introduction of alternative propulsion.
EU *White Paper* (32.)

In order to effectively serve real estate developments in Budapest with environmentally friendly transportation services, a financial motivator system has to be developed that promotes the activity of private capital in areas deemed to be appealing to urban development, and that creates a calculable development environment that supersedes ad hoc agreements. The joint application of financial and administrative rules are to be used to ensure that urban development ideas that result in large amounts of traffic will only be implemented with the use of track-bound lines and by taking into account transportation services (if a real estate development project that requires a large degree of mobility is taking place in an area not served by an existing high-capacity (primarily track-bound) network, a suitable high-capacity line is obligatorily to be developed, or the required funds are to be submitted to the public sector).

Move towards full application of “user pays” and “polluter pays” principles and private sector engagement to eliminate distortions, including harmful subsidies, generate revenues and ensure financing for future transport investments.
EU *White Paper* (2.5.)

4.1.3 REGULATION OF PARKING

Storing vehicles that are not participating in traffic is an increasing problem. Vehicle parking causes the greatest problem in the centuries-old historic, densely populated parts of the city because office buildings and homes rarely offer on-site parking while surrounding public space is scarce and roads are narrow. In order to offset that, public parking is charged in inner districts, however, the regulatory effect cannot be felt due to the large number of local parking licences, issued free of charge or for a symbolic fee. While in the inner city vehicles go round and round while seeking a parking space, almost 10,000 parking spaces in underground garages and multi-storey car parks are left unused. Public parking management is fragmented with no consistency in the designation of waiting zones, in fees and in the maximum length of the parking period.

The multi-storey car parks and underground garages in the city centre should primarily be used by local residents for storing their vehicles rather than by visitors to the city centre in order to free up the public parking facilities to implement various forms of urban community life through the reorganisation of their environment. With adequate transport supply and information in the inner districts and with economic incentives, more and more residents will realise that owning a vehicle is not a primary requirement for them as they can satisfy their transport needs in other ways, too. Comprehensive parking regulation must also support the planned measures concerning the other transport modes, including the establishment of a consistent institutional and financing system for parking and a review of the parking norms associated with developments, i.e. the improvement of the regulations for on-site office and residential parking. A consistent parking system can be established on the basis of a new concept elaborated jointly with the districts on the basis of complex surveys.

As part of transportation policies, parking policy (including parking management) is a strategic tool for developing mobility processes in the desired direction, for influencing transport methods, and for improving the quality of public areas. This requires the creation of parking management conditions that handle the entire city as a unit, in the framework of which residential, P+R, and parking at target locations can be handled on each other's basis, in a unified system. Within the framework of a unified parking management system, the regulatory conditions are to help the functional cooperation of parking in public areas and outside of public areas, increase the popularity of P+R parking, and the normatives of residential parking. A desirable parking policy cannot be validated without including the latter segment, which is the largest source of income (and today is exempt from under influence).

The targets of parking management to be implemented on a system-based approach:

- environment-oriented influencing of selecting transport modes and promoting changes in methods,
- improving the quality of public areas; decreasing and ordering parking on roads,
- moving long-term parking to establishments outside of public areas,
- keeping commuter vehicle traffic away from inner city areas,
- providing a normative scheduled solution to residential parking that also provides advantages to users.

In the interest of reaching the above objectives, the following tasks have to be executed:

- creation of the necessary institutional, legal, and regulatory background,
- providing the financing background with the use of regulatory tools,
- creating a parking management organization and parking fund,
- having the parking management business sector serve community goals,
- expanding the areas subjected to parking regulations,
- decreasing parking on streets and increasing turnaround times,
- differentiated regulations for residential parking, removing long-term parking from public areas,
- making P+R car parks desirable and significantly increasing their capacities,
- creating the necessary information and management technology background.

4.1.4 AREGULATION OF SIGHTSEEING VEHICLES AND TOURIST COACHES

Budapest transport also comprises the vehicles, routes, departure points and stops of the sightseeing tours presenting the touristic attractions of the Capital. The detailed measures of the concept must be identified, the stops need to be designated, and parking and storage facilities have to be developed with the involvement of the respective professional organisations (tourism industry, operators, and transport companies) and on the basis of recent surveys. Their implementation will contribute to a more regulated use of the infrastructure and a smoother overall transport system.

The criteria of tourism should be given priority in the course of the development of navigation services, too. The balance between commuter traffic and leisure-related navigation can ensure the profitability of the system. Boat services must be aligned with the routing of touristic sightseeing trips, for which the conditions and a business plan for cooperation with the interested private service providers will be developed.

4.1.5 INTEGRATED TRANSPORT SAFETY DATABASE

Simultaneously with the Budapest transport governance reform, a separate organisational unit was created within BKK tasked with the contribution to the preservation of already improving transport safety trends. Its instruments include regulations that promote the prevention of accidents, accident records and analyses, as well as proposals and the review of development ideas on the basis of transport safety.

The first step of accident prevention is to identify the root causes of accidents. The actual tasks can be defined on the basis of the review and evaluation of the occurred events. BKK began to develop its own accident database in order to assist the exact evaluation of accidents, where significantly more accurate and detailed data than that of the Central Statistical Office are transferred directly from Budapest Police Headquarters and from the organisation responsible for public space management in Budapest. Instead of manual data collection, information is received continuously through electronic connections, and the thus created database facilitates planning activities. In line with the accident trends, accidents involving financial damage can also be recorded more and more accurately.

4.2 REGIONAL COOPERATION

BY FACILITATING THE INTEGRATION OF REGIONAL AND LARGE REGIONAL SYSTEMS

4.2.1 ESTABLISHMENT OF INSTITUTIONAL RELATIONS TO ENSURE AN ADEQUATE DEGREE OF INTEGRATION OF TRANSPORT SERVICES WITHIN THE BUDAPEST REGION

Although the transport governance reform of Budapest represents great progress, the institutional framework of cooperation has shrunk in urban and suburban transport services. The bureau of the Budapest Transport Association (BKSZ), formed in 2005 and responsible for preparation and implementation was closed by the owners in 2011. Cooperation in urban and suburban passenger transportation public services between the Ministry of National Development and the Municipality of Budapest is continuous, but it is not formalised. As a result of the professional dialogue, a long-term agreement between the Ministry of National Development and BKK ensures further commissioning of BKV services leaving Budapest and their integrated operation with Budapest public transport (network, scheduling, passenger information services, traffic control and fare system). As a result, municipal transport organising has not been excluded from the metropolitan area, but significant differences have remained in the services provided for various settlements. There is a consistent ticket and pass system for the use of urban and suburban public transport services, but its development has stopped at the local and suburban pass-based tariff community level.

The current two-tier administration system of Budapest and the fragmentation of the responsibility for service provision do not favour transport integration. Daily commuting trips originating in the surrounding settlements could be supported by a regional transport organiser coordinating urban and suburban transport more intensively as a cooperation of the parties involved (Municipality of Budapest and the competent ministry).

4.2.2 ELABORATION OF AN INTEGRATED TRAFFIC MODEL

The last representative, large-sample survey was conducted in Budapest in 2004. There are only expert estimates for the impact of the societal and economic changes on transport habits of the last ten years and there are no regular surveys. A decade-long deficit will be eliminated by the new integrated traffic model, prepared with the support of the European Union for Budapest and its metropolitan area to analyse the impacts of certain transport development projects and to compare development options in Budapest according to uniform criteria. During

the elaboration of the model to be owned by the municipality, complex traffic surveys covering the whole region will also be conducted, for the first time in ten years, to define travel habits, mobility decision- making mechanisms and Budapest traffic volumes.

The integrated traffic model and the related continuous traffic monitoring will assist the review of the development concepts of Budapest and the surrounding area as well as the evaluation of new projects. We will be able to analyse traffic accurately, which will make the model a practical tool for up-to-date transport planning by supporting the preparations of cost-effective transport development projects and their efficient implementation in time and in space.

4.2.3 MORE STRINGENT REGULATIONS FOR THE ZONING SYSTEM, BASED ON THE TOTAL WEIGHT OF VEHICLES AND TRAFFIC RESTRICTIONS BASED ON ENVIRONMENTAL CHARACTERISTICS

Nowadays the goods supply of Budapest is heterogeneous: some trading and service companies have warehouses in the logistics zone surrounding Budapest where transportation vehicles can offload their freight and transfer them to vehicles suitable for distributing commodities within the city. However, the majority of the deliveries are still made traditionally, directly from the producers, mainly in the framework of freight distribution services. New trends have been introduced in freight transportation recently and the role of courier services and direct home deliveries has also increased due to online shopping.

The access of freight transport to inner city locations is incidental: limited parking and stopping, limited designated loading zones, and the bad utilization of public road capacities often hinder public traffic and community transportation. Freight traffic is concentrated in both time and space, and there are no regulations or practices to avoid the morning rush hour or to have rules complied with.

Freight traffic in the city should be provided by low emissions freight vehicles; for example, the application of electric, hydrogen, and hybrid technologies or the use of human-powered transport will decrease not only pollutant emissions, but also noise pollution.

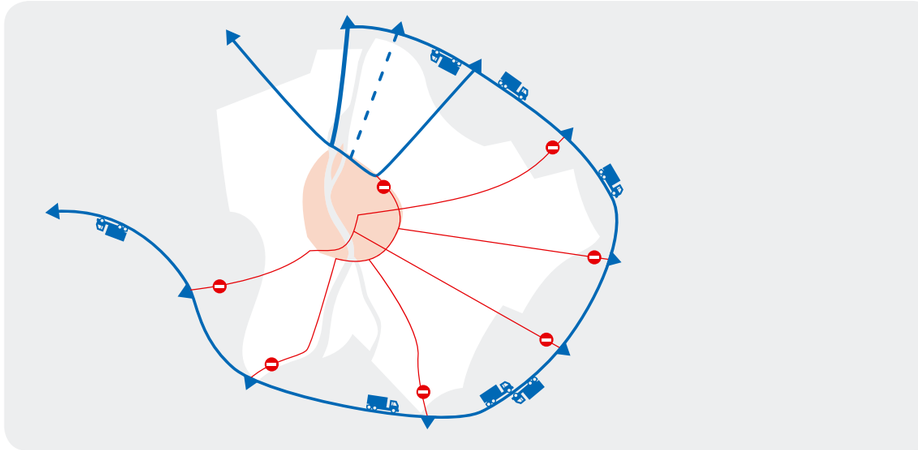
In freight transport, a more effective solution is required for linking long-distance shipping and the last section of transport (the "last mile"). The objective is to have individual deliveries or the "least effective" section of shipping to be as short as possible. The use of real-time traffic control supported with intelligent transportation systems can be used to shorten delivery times and decrease congestion in the last section of the delivery. This solution can be provided with the use of low emissions urban trucks. The use of electric, hydrogen, and hybrid technologies decreases not only pollutants that contaminate the air, but also noise pollution, allowing a greater portion of urban freight traffic to take place at night. This would alleviate the problem of congestion on public roads during morning and afternoon rush hour.

In freight transportation, the interface between long-distance transport and the last phase of transport (last-mile) should be organised more efficiently. The aim is to limit individual deliveries, the most "inefficient" part of the journey, to the shortest possible route. The use of intelligent transport systems contributes to real-time traffic management, reducing delivery times and congestion for last-mile distribution. This could be performed by low-emission urban trucks. The use of electric, hydrogen and hybrid technologies would not only reduce the emission of pollutants into the air, but also noise, allowing a greater portion of freight transport within the urban areas to take place at night time. This would ease the problem of road congestion during morning and afternoon peak hours.
EU *White Paper* (33.)

4.2.4 OPERATION AND DEVELOPMENT OF THE FREIGHT TRANSPORT ACCESS REGULATION SYSTEM

Freight traffic demand on the territory of Budapest can be divided into three main categories:

- transit freight traffic (without any destination in Budapest)
- destination freight traffic (with a destination in Budapest)
- internal urban freight traffic (deliveries between points within Budapest)



INFLUENCING TRANSIT FREIGHT TRAFFIC

The economic processes of the last few decades have significantly changed the functions within Budapest: manufacturing plants were closed down and industrial sites abandoned in the so-called 'brown zones' and were replaced by logistics enterprises using the existing infrastructure; a process that had been continuously getting stronger until 2008 and only the total weight limitations, introduced on the whole territory of Budapest, have brought significant changes in the freight transport of the Capital. With the help of these measures and through the opening of the eastern sector of the M0 motorway the exclusion of all transit freight traffic from the territory of Budapest (with the exception of the main road no. 10 and M0 connection) has become possible. Logistics developments have also started along the city borders and in the vicinity of the M0 motorway, on sites designated for such purposes in the settlements of the metropolitan area, partly as a result of the introduced restrictions and partly due to the access charges. Development was broken by the economic decline of the previous years, but logistics and warehousing activities are still performed intensively.

Through the Budapest Freight Traffic Strategy a system has been developed that keeps transit shipments away from the city, but makes accessing the city's manufacturing and logistics sites easier. Transit freight traffic is successfully regulated by limited traffic zones (freight traffic zones). In certain zones, internal freight transportation, i.e. delivery movements between sectors may only be conducted with licensed vehicles in possession of entry permits.

The purpose of the measures to be introduced between 2014 and 2018 is to regulate and influence the route selection and the period of freight transportation in Budapest. By reducing the number and length of the radial routes serving destination traffic served by

mainly 40-ton shipments, the relocation of sites operating on inner urban logistics areas, but not serving the city per se, should be encouraged. This process may also be promoted by the increase of supply along the outer logistics ring and by growing real-estate developments in the 'brown zone'.

In the freight traffic access system, the continuous development of controlling through inspections is another indispensable factor apart from complex regulations. Inspection through stopping vehicles is inadequate and obsolete; improved controlling must be applied with the help of an intelligent technology-based system connected to the – only partially – implemented national road-toll system, and also by using countrywide experience.

4.2.5 TERRITORIAL AND TIME-BASED REGULATIONS OF LOGISTICS SERVICES, CITY LOGISTICS TASKS

By coordinating the interests of the players in the logistics chain, present urban freight traffic practices can be developed into organized city logistics, which is a prioritized task of the next programming period of 2014-2030. An important part of the urban logistics system are the terminals (designated loading areas) that serve retail stores, the increasing use of which is an increasing problem in the urban structure. The designated loading network and the connected regulatory background (for example, the issuance of permits) serving the city's logistics tasks has been operating for decades and has barely changed in recent years. Meanwhile, the development of public areas in certain parts of the city has been dynamic and new functions have appeared that require a significant logistics background. Especial attention should be devoted to the IT-based organization and supervision of urban freight traffic and to optimizing the use of designated loading areas in public areas (which primarily serve basic functions). A comprehensive city logistics concept has to be defined in order to create the institutional and services background, to create urban service connections, and to regulate logistics services in both time and space.

One of the most important elements of the city logistics concept pertains to designated loading areas:

- increasing their number
- balancing their utilization
- developing an unequivocal and unified system of signals, making the legislative environment unequivocal
- making access easier

- unifying checks, making checks more stringent, and clarifying the competency of performing checks
- establishing stores and clarifying the conditions and regulations for their subsequent operations (including the goods supply approach into the licensing process)
- introducing an IT support system (reserving times and providing information).

The introduction of an IT system that supports the use of the designated loading areas can decrease the congestions caused by freight vehicles searching for parking and parking illegally or by impeding traffic; this also allows safe loading with smaller distances. By providing IT support to loading areas (with the installation of intelligent posts), a possibility opens up for reserving the loading area beforehand, ensuring the submission of information on expected vacancy and available times, and, integrated with other systems, defining travel times and routes based on current traffic conditions, which can help registered freight vehicles to plan their shipping routes and calculate their arrivals. By registering freight vehicles, more information can be attained on even those vehicles that are not subject to restrictions on total weight.

In freight transportation, the interface between long-distance transport and the last phase of transport (last-mile) should be organised more efficiently to cut individual delivery, (i.e. the least effective phase of freight transportation) shorter. The use of intelligent transport systems contributes to the reduction of delivery times and congestion. The purpose of regulating the timing of city logistics services is to make sure that most of the urban freight deliveries are made at night in order to ease the problem of road congestion during the morning and afternoon peak hours.

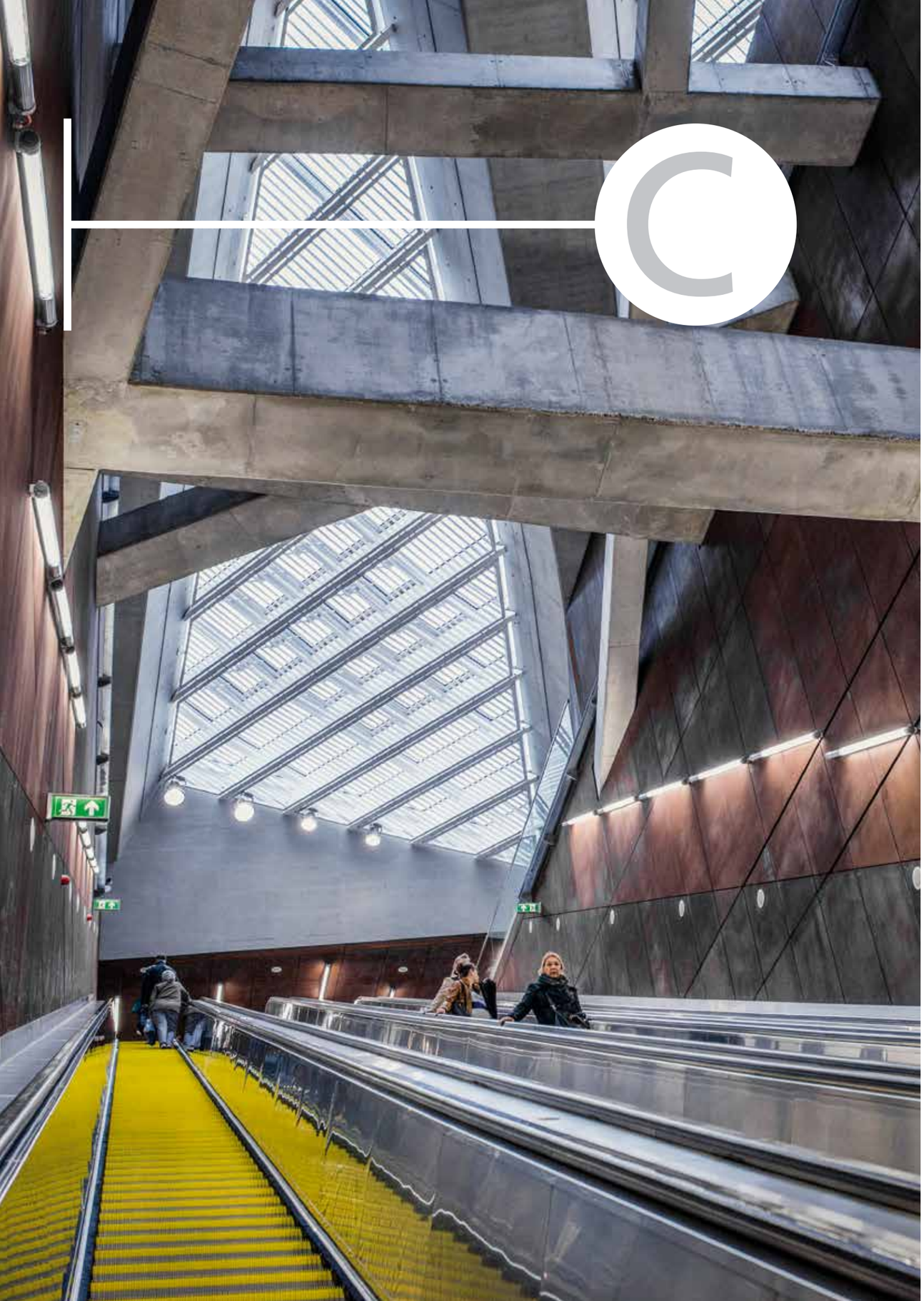
To make night-time freight transport more appealing, surfaces suitable for loading can be expanded and new areas can be included or used in combination (i.e. night bus lanes, taxi stations, etc.).

4.2.6 DEVELOPING AN INTELLIGENT CITY-LOGISTIC NETWORK

By collecting, handling, and analysing the data of urban transportation in a unified manner, continuously monitoring the transport infrastructure and its services, and getting to know the needs of passengers better, a transportation system can be developed and operated that is overall more reliable, safer, more environmentally friendly, and more effective than presently. The various means of transport connected to urban freight traffic and infrastructure elements, including the railway infrastructure, can be integrated into this system. The spread of intelligent systems can also contribute to the development of an advanced, environmentally friendly city-logistic network.

Regarding the regulatory background, the introduction of a qualified freight background is justified, just as it is justified to develop in detail the criteria for meeting regulated requirements in the future. To this end, the appearance of the city logistics network in the city has to be examined along the following lines:

- connecting the public road transport chain to the final terminal ("last mile," "last metre")
- optimal vehicle parameter and low harmful emission solutions
- the use of electric vehicles and the plannable placing into use of alternative freight vehicles (freight bicycles, electric methods of transport)
- supporting deliveries outside main congestion periods
- designating package points and consolidation centres
- introducing intelligent posts that indicate loading areas and the supporting IT systems



C

EVALUATION

C.1 SUMMARY OF THE STRATEGIC ENVIRONMENTAL ASSESSMENT

Government Decree 2/2005 (I.11.) on Environmental Assessment sets a requirement for a Strategic Environmental Assessment (SEA) for transport development plans. No SEA was prepared for the former BKRFT prepared in 2009 and therefore, to make up for it the assessment was prepared for the whole plan. In the course of preparation of the Balázs Mór Plan, the assessment had to be performed for the final plan, as well, due to the modifications made during the review the strategic goals.

The SEA consists of two main parts. The first one is the environmental assessment of the components of the reviewed project list, where 36 projects were analysed by environmental experts. The outcome of the first part of the SEA is a recommendation, summarised in 15 points and detailed proposals in 19 points for each project and environmental component. These proposals point to the aspects that require extra attention in the course of the design, implementation and operation of each project. Those tasks are stated also in the regulations that set out the framework for detailed planning, and have no effect on strategic planning.

In terms of the Balázs Mór Plan, the second part of SEA is of greater importance, within the framework of which experts analysed to what extent the goals and objectives of BKRFT and the BMT fit in with the aims specified in the environmental policy plans of the Capital, more specifically, to what extent they are consistent with the nine environmental objectives of the thematic target programmes. The SEA refers to this comparison presented in a table as a 'conformity matrix'. The purpose of the matrix is to present the degree of conformity between the two sets of objectives and whether or not the transport objectives serve the environmental strategic goals of the metropolis, and if there are any contradictions to the environmental objectives.

Scoring system:	
2 points	if the intervention clearly, directly and significantly supports the achievement of the objective
1 point	if the intervention weakly or indirectly supports the achievement of the objective
0 point	if the intervention has an overall neutral effect on the achievement of the objective
NR	if the intervention does not affect the achievement of the objective
?	if the effect of the intervention cannot be judged
PR	"potential risk", if the indirect effects of the intervention represent environmental, ecological risks
-1 point	if the intervention imposes a weak or indirect threat to the achievement of the objective
-2 point	if the intervention imposes a clear, direct and significant risk on the achievement of the objective

ENVIRONMENTAL GOALS – TRANSPORT DEVELOPMENT TRENDS CONFORMITY MATRIX

FKP (BUDAPEST ENVIRONMENTAL PROGRAMME) ENVIRONMENTAL THEMATIC TARGET PROGRAMMES 1–9 BMT STRATEGIC OBJECTIVES I–III AND INTERVENTION AREAS 1–4	Environment-conscious approach to production and consumption and to the use of natural resources	Reduction of any emission that contributes to climate change, adaptation to changing environmental conditions	Environment and health – reduction of noise and air pollution	Environmental quality of Budapest – land use and the protection of the built environment	Preservation of biological diversity, nature and landscape protection	Environmental goals, relating to sustainable land use in regional development and urban planning	Protection and sustainable use of our water resources	Enhancing the efficiency of waste management in line with environmental objectives	Environmental safety – prevention and elimination of extraordinary environmental and disaster situations
I. LIVEABLE URBAN ENVIRONMENT – transport development, integrated into urban development by influencing transport needs and mode selection, reducing environmental pollution and enhancing equal opportunities	**2**	**2**	**2**	**2**	**1**	**2**	**1**	**2**	**2**
II. SAFE, RELIABLE AND DYNAMIC TRANSPORT – the integrated development of transport modes through efficient organisation, stable financing and target-oriented development	**1**	**1**	**2**	**2**	**1**	**1**	**1**	**1**	**2**
III. COOPERATION IN REGIONAL CONNECTIONS – regional integration of Budapest with the help of a transport system that supports regional cooperation and strengthens economic competitiveness	**1**	**1**	**2**	**2**	**1**	**1**	**0**	**1**	**1**
1. MORE CONNECTIONS achieved by introducing new connections as well as through the safe and reliable development of the existing transport networks, the redistribution of public areas and the development of passenger-oriented intermodal connections	**1**	**1**	**1**	**2**	**0**	**1**	**0**	**1**	**2**
2. ATTRACTIVE VEHICLES through a comfortable and passenger friendly vehicle fleet and the dissemination of environmentally friendly technologies	**2**	**2**	**2**	**2**	**0**	**1**	**1**	**2**	**2**
3. BETTER SERVICES through an effectively organised and intelligent, widely available, integrated transport system that provides essential information	**1**	**1**	**1**	**2**	**1**	**1**	**0**	**0**	**1**
4. EFFICIENT GOVERNANCE through consistent regulation, and passenger friendly development of national, regional and local network connections	**2**	**1**	**1**	**1**	**0**	**1**	**1**	**1**	**2**

The completion of the table also shows whether the goals are defined specifically enough to assess the estimated environmental aspects of the steps to be taken to achieve the particular goal.

ENVIRONMENTAL GOALS – OPERATIONAL OBJECTIVES CONFORMITY MATRIX

FKP (BUDAPEST ENVIRONMENTAL PROGRAMME) ENVIRONMENTAL THEMATIC TARGET PROGRAMMES 1–9 BMT OPERATIONAL OBJECTIVES 1–9	Environment-conscious approach to production and consumption and to the use of natural resources.	Reduction of any emission that contributes to climate change, adaptation to changing environmental conditions	Environment and health – reduction of noise and air pollution	Environmental quality of Budapest – land use and the protection of the built environment	Preservation of biodiversity, nature and landscape protection	Environmental goals, relating to sustainable land use in regional development and urban planning	Protection and sustainable use of our water resources	Enhancing the efficiency of waste management in line with environmental objectives	Environmental safety – prevention and elimination of extraordinary environmental and disaster situations
1.1 INTEGRATED NETWORK DEVELOPMENT through intelligent urban structural connections and through network development reducing traffic disproportionality	1	1	1	2	0	1	0	1	2
1.2 LIVEABLE PUBLIC SPACES through the reliable and safe operation and modernisation of transport networks, and the redistribution of public spaces	2	2	2	2	1	2	1	2	2
1.3 INTEROPERABLE SYSTEMS AND COMFORTABLE INTERMODAL NODES through the introduction of comfortable intermodal nodes on the integrated transport networks, the establishment of interoperable systems, the passenger oriented development of intermodal connections and mode switches as well as the improvement of tourist-oriented connections	1	1	1	2	0	1	0	1	2
2.1 COMFORTABLE AND PASSENGER FRIENDLY VEHICLES through the renewal of the vehicle fleet according to energy efficiency, accessibility aspect and reliable maintenance	2	2	2	2	0	1	1	2	2
2.2 ENVIRONMENTALLY FRIENDLY TECHNOLOGIES through the encouragement of the dissemination of vehicle technology solutions that support the climate policy	1	2	1	2	1	1	1	1	0
3.1 IMPROVING THE QUALITY OF SERVICE through normative financing, uniform passenger information, harmonised timetables and expanding intelligent services	1	1	2	2	0	1	0	1	1
3.2 ACTIVE AWARENESS RAISING through facilitating conscious mode selection by providing up-to-date information and customer-centred communication	2	1	1	2	1	1	1	2	1
4.1 CONSISTENT REGULATION through a set of institutions and regulations that supports transport objectives	1	1	1	2	1	2	1	1	2
4.2 REGIONAL COOPERATION by facilitating the integration of regional and large regional systems	1	1	1	1	0	1	1	1	1

C.2 SUMMARY OF THE EX-ANTE EVALUATION

The ex-ante evaluation of the Balázs Mór Plan followed the development of the plan from the BKRFT review process in 2009 to its completion, then to the establishment of revised goals and objectives. The current objectives of the Balázs Mór Plan were identified gradually, and rely on the previously completed professional studies, their lessons, international experience and recommendations, and mostly on the special and unique geographic, social, institutional, etc. conditions of Budapest.

The ex-ante evaluation reflects international experience according to which, although an evaluation process has important key points, it is not practical to complete the whole procedure by rigidly sticking to a particular procedure. Instead, the evaluation must be adapted to the type and conditions of the particular plan. The analysis of the existing situation in the BMT also pointed out that even though transport and its current status in Hungary and, more specifically, in Budapest depend a great deal on external circumstances, the extent to which the specific framework conditions were assessed and taken into account in the previous planning processes and their efficiency within the available room for manoeuvre are at least equally as important. With the key problems identified on the basis of the analysis of the existing situation, the authors of the BMT pointed out fragmentation, regulatory inadequacies and distorted fund allocation, the alteration of which is mainly in the hands of the professionals and can be eliminated by improving their approach and their work while, as a paradox, the essence of those steps is cooperation with others, the abandoning of a unilateral professional approach, the understanding and acknowledgement of more complex objectives and the serving of common inter-professional objectives.

Consequently, on the basis of the analysis of the existing situation, the BMT determined the objectives of the transport-specific strategy as three integration endeavours focusing on the urban development objectives of the Capital. The ex-ante evaluation showed that the three types of integration, i.e., integration within transport, integration with urban development and integration of the Budapest region, can provide effective responses to the set of key problems relating to fragmentation and isolation. The BMT defines clear objectives for each integration area, always aiming at a liveable urban environment, safe and reliable transport services, and cooperation-based regional connections.

Transport development is required in four intervention areas, i.e., infrastructure, vehicles, services and governance, in order to achieve the three transport-specific objectives. In that respect, the internal consistency of the target system did not have to be revealed separately in the framework of the ex-ante evaluation, because the BMT itself contains its explanation when it defines the nine operational objectives of the plan in connection with the four intervention areas. The document lists the nine operational transport objectives based on the four intervention areas and attaches the measures to them.

The author of the ex-ante evaluation had regular consultations with the authors of the plan and had already prepared a preliminary ex-ante evaluation at an earlier phase. The majority of the remarks made during the process have been integrated into the BMT. The three issues that triggered professional disputes and led to conflicts of opinion are included in the detailed ex-ante evaluation.

While both the plan and its strategic environmental review went through extensive public consultation in the course of the previous plan-review, the period of preparation of the BMT between November 2013 and May 2014 was determined more by structure development, more specifically by the work processes of strategy development. As soon as the draft plan for discussion is complete, another period of extensive involvement will follow.

In its current form, the BMT determines indicators only for the intervention areas. According to the author of the ex-ante evaluation, defining good indicators for the complex goals is an important and urgent practical task and such indicators are definitely required.

The completion and the spirit of the BMT represent a major progress in strategic transport planning for Budapest, yet it will have a real impact only if the approach and the consequential principles will be applied in the subsequent phases of programming, too. The projects will also be implemented in that spirit instead of building false strategic ideologies around definite project ideas.

SUMMARY OF THE MEASURES

1. MORE CONNECTIONS

1.1 Integrated network development
- **1.1.1** Public transport routes providing direct connections
- **1.1.2** Modernisation of the existing track-bound network
- **1.1.3** Connection of the separated parts of the city with new Danube bridges and grade-separated road-rail crossings
- **1.1.4** Construction of the missing components of the road network
- **1.1.5** Road reconstruction with a complex approach
- **1.1.6** Continuous main cycling network
- **1.1.7** Improving cycling interoperability, a cyclist-friendly secondary road network
- **1.1.8** Extension of the waterborne transport network and service infrastructure
- **1.1.9** Development of an intelligent city logistics network

1.2 Liveable public spaces
- **1.2.1** Developing major pedestrian connections
- **1.2.2** Improving the conditions of walking
- **1.2.3** Equal opportunities and accessibility
- **1.2.4** Accident free ‘forgiving’ environment
- **1.2.5** Developing zones with traffic calming and traffic restrictions
- **1.2.6** Differentiated development of the inner zone of Budapest (within the Hungária ring)
- **1.2.7** Safety and security, crime prevention

1.3 Interoperable systems and comfortable mode-switching points
- **1.3.1** Interoperable track-bound systems; urban and suburban rail network
- **1.3.2** Improving connections between the regional rail network and the urban track-bound network
- **1.3.3** Integration of the urban sections and the bypass sections of the national road network into the road network of Budapest
- **1.3.4** Facilitation of the urban integration of long-distance public transport
- **1.3.5** Integration of navigation into the public transport of the metropolitan area

1.3.6 Improving the accessibility of Budapest Liszt Ferenc International Airport
1.3.7 Development of logistics centres, consolidation centres, and their connections
1.3.8 Development of national and regional cycling tourism connections
1.3.9 Development of intermodal centres and hubs in passenger transport
1.3.10 Providing the conditions for urban transport mode-switching
1.3.11 Development of P+R car parks and B+R storage facilities

2 ATTRACTIVE VEHICLES

2.1. Comfortable, passenger friendly vehicles
2.1.1. Modernisation of the public transport vehicle fleet and its maintenance capacities
2.1.2. Accessible vehicles
2.1.3. Conditions of operation of the vehicles, depot developments
2.1.2. More public transport vehicles, suitable for carrying bicycles

2.2. Environmentally friendly technologies
2.2.1 Procurement of zero emission vehicles
2.2.2 Support of environmentally friendly public transport technologies
2.2.3 More stringent environmental requirements for taxi transport services
2.2.4. Environmentally-friendly technologies in freight traffic

3 BETTER SERVICES

3.1 Improving the quality of service
3.1.1. Consistent passenger information and other information services
3.1.2. Automated fare-collection system (AFC system)
3.1.3. Interoperable fare system and tariff community
3.1.4. Harmonisation of urban and suburban timetables and coordination of services
3.1.5 Use of intelligent systems in public transport organising
3.1.6 Operation and development of a public bicycle-sharing system, extension of cycling services
3.1.7 Extension of on-demand passenger transportation services
3.1.8 Development of consistent taxi services in Budapest
3.1.9 Car-sharing
3.1.10 Urban transportation sanitation and public health tasks

3.2 Active awareness-raising
3.2.1. Conscious mobility and transport safety education
3.2.2 Awareness-raising campaigns and communication
3.2.3 Customer service centres
3.2.4 Presentation of transport heritage

4. EFFECTIVE GOVERNANCE

4.1. Consistent regulations
4.1.1. Further tasks in the transformation of the transport institutions, normative and predictable financing of public transport
4.1.2. Economic and administrative incentives
4.1.3. Regulation of parking
4.1.4. Regulation of sightseeing vehicles and tourist buses
4.1.5. Integrated transport safety database

4.2. Regional cooperation
4.2.1. Establishment of institutional relations to ensure an adequate degree of integration of transport services within the Budapest region
4.2.2. Elaboration of an integrated traffic model
4.2.3. More stringent regulations for the zoning system which is based on the total weight of vehicles and traffic restrictions based on environmental characteristics
4.2.4. Operation and development of the freight transport access regulation system
4.2.5. Territorial and time-based regulations for logistics services, city logistics tasks

DEFINITIONS, LIST OF ABBREVIATIONS

ABBREVIATIONS:

BKK Centre for Budapest Transport

BKSZ Budapest Transport Association (the cooperation of regional public transport)

BKRFT Development Plan for the Budapest Transport System

MOL Bubi Budapest Bicycle –the public bicycle-sharing system

SKV Strategic Environmental Assessment

SUMP Sustainable Urban Mobility Plan

DEFINITIONS AND EXPRESSIONS (IN THE CONTEXT OF THE BALÁZS MÓR PLAN):

Accessibility Deliberate establishment or transformation of the environment in view of people with reducedmobility in order to assist them in any activity in which they are impeded.

Backbone route One route of a public transport network that serves one territory and has the highest proportional capacity.

Bus corridor A traffic lane dedicated for the exclusive use by buses taking part in scheduled public transport.

Brown zone Abandoned industrial and other worksites.

B+R parking Bike and Ride. A bicycle storage facility with an option to transfer to other public transport means.

Carsharing A telematically controlled passenger car rental service, flexible in time and space, providing shared access to a particular fleet for registered users.

City logistics Urban freight delivery management, organisation of commercial traffic in order to reduce environmental pollution.

Commuter traffic Traffic generated during journeys to work and/or an educational institution and back and during work and/or school.

Congestion charge Traffic regulation tool which entails an obligation to pay a fee for entering or driving across a particular territory.

Consolidation centre (distribution centre) A logistics establishment that is relatively close to the served area and from where permanent goods shipping is performed. The target of consolidation centres is to centrally reorganize certain activities related to freight traffic that affect urban transport in the interest of ensuring that the goods shipping to be implemented burden the city and its residents to the smallest possible degree regarding both traffic flow and negative environmental effects.

Diagonal service A public transport service that crosses the town centre and has its terminuses outside the central zone.

EURO environmental categories The acceptable limit of emission levels by new vehicles sold in the Member States of the European Union is expressed by limit values, stated in legal regulations. Since 1992, the limit values for emission have become stricter and stricter, and are established separately for diesel and petrol vehicles.

EuroVelo The network of 14 planned cycling touring routes across Europe, defined by the European Cycling Federation (ECF). The routes serve cycling tourism and daily cycling traffic. The EuroVelo routes must have a specific consistent service quality and uniform signs. The routes of the Hungarian sections are specified also in the Act on National Spatial Planning. Route No. 6 crosses Budapest (Rivers route).

Feeder service A public transport service which was designed to provide further travel options through transferring to another, generally backbone fixed-rail line

Freight distribution Freight transportation, logistics: a freight transportation vehicle is loaded at the loading site and distributes goods to various sites.

Freight transport access fee Traffic regulation tool which entails an obligation to pay a fee for entering or driving across a particular territory with a lorry/truck. (At present, it equals the fee payable for the operation of a truck with a total weight greater than the total weight limitation, indicated with a sign, as authorised by the road management agency.)

Indicator An index or measure defined for indicating effects and processes.

Integrated network organisation Organisation of the transport network in a way where the aspects of various subsectors and service providers are taken into account together.

Intermodal hub An intersection of various transport modes providing change/reloading options, coordinated in space.

Intermodal transport Combination of various transport modes in an ideal travel chain in terms of environment, finances and travel time.

Interoperability, interoperable transport Problem-free inter-operability between various systems. The various solutions providing interoperability of vehicle systems include, e.g., different gauge, signalling, voltage level and pantograph systems, etc. The essence of such transport is the ability of the vehicle used by passengers to use different track and infrastructure systems instead of the passenger changing vehicles.

K+R station "Kiss and Ride" – a passenger car stopping place, available for use for a short period, which is constructed in the vicinity of a public transport stop in order to enable the passenger of the car to change directly to a public transport vehicle.

Limited traffic zone Any zone where trucks, trailers, agricultural trailers and slow vehicles exceeding the permitted largest total weight indicated on the sign may not operate.

Line The scheduled route and stops of a service specified in the timetable.

Line indicator system A consistent system of the combination of numbers and/or letters to distinguish the services specified in the timetable.

Measure The set of tasks ordered to the strategic goals that helps in attaining the given target. Certain measures can also help the implementation of more than one project. From the aspect of operative targets, a tool for realizing the target; from the aspect of the project, the target.

Metropolitan area Metropolitan area is a co-habiting, urbanised system of settlements, in which the centre and the surrounding settlements have close economic and infrastructural connections. The largest metropolitan area in Hungary is Budapest and its region.

Mobility needs People's needs to change places.

Mode switch Changing from one mode of transport to another.

Motorised transport mode A collective concept for travel options where the vehicle is driven by an installed power machine.

Non-motorised transport mode Collective concept for walking and cycling.

P+R car park The abbreviation comes from the English "Park & Ride" expression, which means exactly that.

It is a parking site that offers long-term parking and has been constructed specifically for enabling the users to change from a passenger car to public transport.

No parking charge may be applied in any car park, marked with the P+R sign, unless the car park is guarded as an additional service. The guarding fee that may be collected for that additional service between 6 a.m. and 10 p.m. on each calendar day cannot be higher than the lowest fare applied in public transport available in the particular settlement.

Protected zone A zone delineated in the manner set forth by Article 14 (1) n) of the KRESZ (with 'entry prohibited' signs from both directions) where access and parking is conditional.

Public transport A transport system, which may be used by anyone who complies with the terms and conditions of travel. Generally known branches:

– **individual public transport** e.g., taxi, carsharing, public bicycles.

– **collective public transport** transport mode which is conducted by public transport vehicles (e.g., buses with a capacity to carry more than nine passengers).

Priority Focus or intervention area of EU development.

Railcars on bogies Railcar, the chassis and driving units of which are formed in a turning framework structure.

Rail route Part of the state railway network.

Rolling stock The general definition used for iron-wheel vehicles involved in track-bound transport.

Running dynamics A feature reflecting the movement, acceleration and deceleration capacities of a vehicle.

S-Bahn concept A concept for the development of an integrated rapid rail network for Budapest and its surrounding area, prepared in 2009.

Suburbanisation The process during which the residents and then the businesses and services move out from the city into surrounding smaller settlements.

Sub-sectoral objectives The objectives of the various branches of transport (individual, public and road, rail, waterborne and air transport).

Tariff community Common fare payment system of various subsectors and service providers designed on the basis of integrated principles.

Terminal station A station from where vehicles can move on only if they change direction.

Time-based ticket A fare product which is priced according to the time spent in travelling.

Track-bound infrastructure All transport means that require tracks, cables and/or overhead wires for operation, and where the vehicles may move only along the longitudinal axis or slightly departing from it.

Traffic calming Reduction of the volume and speed of road traffic and influencing its composition with traffic control tools.

Traffic model Transport development planning tool. Due to the complexity of transport networks, each transport development project has an effect on the social, economic and environmental features of the city. Traffic modelling is a tool for analysing those effects.

Traffic modelling is the phase of presentation of transport effects in which the decisions stemming from social and economic environment, leading to the daily movements of people, are modelled. Thus the analysis focuses on the quantity of movements within a particular area (zone) and the volume of traffic from one zone to another and its distribution by route and transport mode and where the expected effects of transport measures are forecasted.

Traffic planning Conscious shaping of transport means, infrastructure and their use, strategic and detailed planning of future transport services based on professional methodology.

Traffic surveillance Operational control of road and public transport in order to facilitate problem -free traffic and to eliminate problems as quickly as possible.

Transport corridor The scene of transport movements.

Transport mode The means for mobility (walking, cycling, public transport, passenger car, truck, etc.).

Travel chain Consecutive use of transport modes from departure point to the destination.

Walking distance to public transport stop The distance between the departure point of the trip and the closest stop of the used public transport means.

White Paper A strategic document adopted by the European Commission in 2011 with the subtitle "Road Map to a Single European Transport Area – Towards a Competitive and Resource Efficient Transport System". (In general: the final version of the strategic documents of the EU Commission)

Zero emission Operation without the emission of any harmful substances.

BALÁZS MÓR PLAN 2014–2030
Budapest Mobility Plan, Volume I: Objectives and Measures

The plan was prepared for Municipality of Budapest by BKK Centre for Budapest Transport based on the authorisation and programme of Mayor István Tarlós.

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