

Developing sustainable urban mobility policy: example from four municipalities in North Macedonia

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Abstract – Within this paper we will present general results from the process of validation of local capacities and resources to manage the process, status and existing condition of five local self-governments in terms of the activities taken and the possibilities for sustainable urban mobility planning, and our recommendations as well.

Keywords – SUMP, Sustainable urban mobility, Strategic planning, Assessment, Municipality.

I. INTRODUCTION

The originality of our results is one more product realised through the project “Support to the local self-government units of the Republic of North Macedonia in promotion of sustainable urban mobility”, implemented by the Association of local self-government units (ZELS) in cooperation with the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), and based on the assessment carried out in the period July-September 2019. Namely five pilot municipalities were examined: Municipality of Karposh, Municipality of Kumanovo, Municipality of Bitola, Municipality of Ohrid and Municipality of Kavadarci.

Before the start of the evaluation process, there were many procedures as part of the international project “Sustainable Urban Mobility in South-East European Countries II – SUMSEEC II - Open Regional Fund for South-East Europe – Energy Efficiency” and which were connected to the process of training, evaluation and selection of experts.

At the early beginning with the process of analysing the legal framework, we determined that the development of sustainable urban mobility on a local level is not regulated by existing legal regulation. Indirectly, the Law on Local Self-Government predicts that the jurisdiction of the local self-government will allow it to adopt programs and implement projects for local economic development, which is confirmation that the local self-government has the jurisdiction to adopt a traffic development programme, i.e. mobility, or a sustainable urban mobility planning process. This, more harmonized with European legislation and

regulation on sustainable urban mobility, gives clear directions on the future course of our country, municipalities and citizens, as well as many responsibilities on national and local level.

At the top of the European Agenda Sustainable Urban Mobility Plan (SUMP) is placed as highest local strategy document for planning the development of mobility of citizens which as a strategic document is essential in detecting the current state of traffic and urbanism and adopting suitable short-term and long-term (specific and strategic) measures to resolve and identify problems.

In other words, SUMP is the tool that will promote the capacity of the local self-government in the direction of providing condition for decent lives of citizens: health, safety, accessibility, good public transport and sustainable types of transport and overall resilience.

The preparation, adoption, implementation and monitoring of SUMP has a lot of benefits, for the local self-government, and for public institutions, the economy, the non-government sector and of course most of all for the citizens.

II. BASIC SUSTAINABLE URBAN MOBILITY PLANNING BENEFITS

Benefits listed below are part from the recently developed “White Paper on the Development and Planning of Sustainable Urban Mobility in the Republic of North Macedonia” [1], and are as follows:

- ✓ **Improving the quality of life in cities** - SUMP is a plan for the people, not cars! This alternative type of planning includes an emotional message, for instance increasing safety of children is one of the goals.
- ✓ **Better health and environment** - Improving air quality, reducing noise and mitigating the effects of climate change leads to positive benefits in terms of health and savings on healthcare;
- ✓ **Facilitating mobility and improving accessibility** - With people-oriented planning, mobility is improved and there is better access to both space and services.
- ✓ **A new political vision and integrated approach for the preparation of better plans and effective monitoring of legal obligations** - The politicians who accept the SUMP vision are politicians who look to the future and politicians who can safely say that they met certain legal obligations such as the Directive 2009/33/EC from 2009 to promote clean and energy-

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efficient transport vehicles- *The Clean Vehicles Directive*.

- ✓ **Increasing traffic safety and security on roads** - *One of the basic goals and components of SUMP is increasing the security and safety of all participants in traffic, especially children.*
- ✓ **Improving traffic culture** - *Mobility and safety are components for sustainable planning that must be developed and monitored at the same time. Namely, the Green book on urban mobility entitled "Towards a New Culture of Urban Mobility-2007" defines the following principles;*
- ✓ **Successful cities, successful local self-governments and access to funds** - *SUMP offers excellent opportunities for access to funds for the realization of new and innovative solutions, thus creating conditions for realistic competition between municipalities and/or local self-governments;*
- ✓ **Moving towards a new mobility culture** - *SUMP offers long-term strategic vision, and the planning culture is NEW because it integrates sectors, institutions and citizens;*

III. STATE - OF - THE - ART OF SUSTAINABLE URBAN MOBILITY PLANNING CHALLENGES, VISIONS, AND OBJECTIVES FOR THE PILOT MUNICIPALITIES

To provide a strategic guidance for sustainable urban mobility, strategic objectives that indicate the type of desired change were defined together with the stakeholder's group during the exercises at the workshops in all of the pilot municipalities. Those objectives are: *better transport network efficiency, more liveable streets & social activities, better environment protection, better equity of all transport users & social inclusion of all people, better safety, better economic growth by optimizing commercial transport and more financial resources*. The importance of the objectives also vary from municipality to municipality, but the objectives such as: *more liveable streets & social activities, better environment protection and better safety* were indicated as the most important objectives by all municipalities.

Besides the above-stated strategic objectives, operational objectives relating to all modes of transport were also identified specifying what rate of usage of certain transport mode should be "reduced", "increased" or "maintained":

- Walking - Maintain the walking rate
- Cycling Increase bicycle use rate
- Public transport Increase public transport use rate
- Private car Reduce car use and ownership rate
- Freight transport Increase the rate of use of low emission vehicles for goods delivery

The above-stated draft visions are good base for visioning of the future urban mobility with citizens in the focus, for project Municipality's.

TABLE I
DRAFT COMMON VISION ON URBAN MOBILITY FOR THE PILOT MUNICIPALITIES

Municipality	Draft common vision
Municipality of Bitola	A CITY of high-quality and eco-friendly mobility, that will promote a safe city, made for people: safe streets, quality parking services, good urban logistics, and walking, cycling and public transport to be the citizens' first choice.
Municipality of Kavadarci	A sustainable and accessible city with liveable streets for social activities, quality environment and healthy and active citizens for whom walking, cycling and usage of public transport is the first choice for their daily trips within a city with efficient, safe and barrier-free transport system complemented with environmentally friendly urban logistic and freight transport.
Municipality of Karpos	Sustainable and integrated transport in the Municipality that would contribute to sustainable economic growth, equal possibilities for mobility and clean environment through the realization of alternative possibilities for transport to certain public destinations in the Municipality, better access to people with disabilities and reduced air pollution.
Municipality of Kumanovo	A sustainable, accessible and green city with attractive streets for social activities, quality environment and healthy and active citizens for whom walking, cycling and usage of public transport is the first choice for their daily trips within a city with efficient, safe and barrier-free transport system complemented with environmentally friendly urban logistic, freight transport and private cars.
Municipality of Ohrid	A CITY with high-quality tourism which is a symbol of culture for the citizens and tourists, as well as urban tissue, mobility, safety and a healthy and green environment.

Source: Prepared by the authors

The draft visions are based on analysis of the current mobility situation and addresses the identified problems and perceived opportunities. They consider all modes and forms of transport i.e. passenger and freight, motorized and non-motorized, public and private, moving and parking. The draft vision goes beyond transport and mobility and considers the health, quality of life and land use. The draft visions also places transport and mobility in the wider context of urban and social development and takes into account policy perspectives related to urban and spatial development, economic development, environment, health, safety and social inclusion.

As a result of the responses and comments from the survey on public opinion, and as a result of the realized GRID analysis of some of the stakeholders in the process and representatives of all Urban local communities, as well as the cooperation of the working group on SUMP, the following list of problems and quick-win measures was prepared, which

should be treated within SUMP and which refer to as in Table II,III.

TABLE II
GENERAL PROBLEMS AND SELECTED MEASURES RELATED TO URBAN MOBILITY ON THE CASE OF MUNICIPALITY OF KARPOS

Municipality of Karpos	
General Problems	<ul style="list-style-type: none"> • State of pedestrian infrastructure-poor quality • State of cycle infrastructure • The need to reduce speed of vehicles and reduce traffic near schools and day care-centres • More greenery • The need for parking of residents • Improving public transport
Quick-Win Measures	<ul style="list-style-type: none"> • Measure 1 New cycle and pedestrian lanes, connection to the existing network • Measure 2. Traffic calming “RAISED PEDESTRIAN CROSSING” is planned for the several locations in front of the primary schools, Orce Nikolov day care center. “MINI ROUNDABOUT” is planned for three intersections. • Measure 3. Pedestrian streets (Newly designed access street/branch of Varshavska St., Access streets in the residential area Bardovci, Interventions along Urban communities according to needs • Measure 4. Construction of new parking lots (Parking near Tinex market behind Bazaro in Karposh 3, Parking on a branch of Varshavska St., Parking on Ograzhden St., “Green” parking platforms

TABLE III
GENERAL PROBLEMS AND SELECTED MEASURES RELATED TO URBAN MOBILITY ON THE CASE OF MUNICIPALITY OF OHRID

Municipality of Ohrid	
General	Air pollution and congestion in the central city area, especially in the summer and on holidays, and as a result of the entrance of vehicles in the center and the Old Town, irritates the residents and degrades the environment and impacts reduced economic productivity and degradation of the environment, pollution and noise.
Quick-Win Measures	<ul style="list-style-type: none"> • Measure1.Establishing a traffic regime in which pedestrians and cyclists will have the priority • Measure2. Reconstruction of pedestrian lanes and pavements on:Jane Sandanski Street, Makedonski Prosvetiteli Boulevard, Taban Square, Makedonija bank , Pavements on parts of Dimitar Vlahov and Partizanska Street, ASNOM Street • Measure3. Construction of pedestrian lanes and pavements on: Parts of ASNOM Street by December 2019, 15-ti Korpus Street , Goce Delchev Street • Measure4. Reconstruction and construction of cycle lanes and routes. • Measure5. Modernizing public transport and introducing a uniform for public transport drivers and taxi drivers by June 2021 • Measure6. Auditing the public transport network and subsidizing public transport-gradually by 2021. • Measure7. Improving and modernizing parking-gradually. • Measure8. Construction of multi-storey car parks at the entrance to the central city area from 2020 to 2022 • Measure9. Modernizing the system for collection and treatment of communal waste, immediately.

IV. SUSTAINABILITY OF URBAN MOBILITY CHALLENGES ON THE CASE OF MUNICIPALITY OF KUMANOVO

Municipality of Kumanovo faces the following main challenges: *road traffic congestion, road accidents, air pollution & noise, poor accessibility & inequity, unliveable & unattractive streets and insufficient transport provision to support local economic growth.*

4.1.Road traffic congestion

It is most intensive in the city centre during the morning and afternoon peak hours. One of the reasons for road traffic congestion is the high level of car usage for daily trips. The most common purposes for car usage is work. The most common reasons for car usage for work purposes are: being a faster mode of transport than other modes, leaving/taking children from kindergarten/school, performing tasks at work.

4.2.Road accidents (fatalities and injuries)

Traffic accidents are also a challenge that the city of Kumanovo is faced with. In 2018, on the territory of the Municipality of Kumanovo, 524 road traffic accidents occurred, in which 8 persons were killed, 44 were seriously injured and 255 were slightly injured. The most common cause of traffic accidents in Kumanovo is the speed.

4.3. Air pollution and noise

Kumanovo is one of the most polluted city in the country. Air pollution is most intensive in the period from October to April. Results from measuring stations for PM10 in Kumanovo show that in the above-stated period, the allowed limit value for PM10 was exceeded for about 104 days, and reached up to 200 μm^3 . Currently there is no data on the share of urban transport in the total air pollution in Kumanovo. Regarding the noise, it is most intensive in summer as a result of the increased use of construction machinery and motorcycles.

4.4. Poor accessibility and inequity

The people that live and work in Kumanovo may not be able to access important local services and activities, such as jobs, education, healthcare, grocery shopping or leisure as a result of lack of adequate transport. For example, some people may be restricted in their use of transport due to low incomes or because bus routes do not run to the desired places in the city. Problems with transport provision and the location of services can also reinforce social exclusion. The physically- and visually-impaired people in Kumanovo face unsmooth sidewalks edges at pedestrian crossings. Sidewalk surfaces that are unpaved, poorly maintained or crowded by vendors and urban equipment are common barriers for physically- and visually-impaired people. In addition, sidewalks without tactile surfaces and signalized pedestrian crossings that are not equipped with sound signals are also barriers for visually-impaired people. The public transport is not accessible for physically- and visually-impaired people due to lack of low floor busses with priority seats, lack of disability awareness

and training of bus drivers in assisting these category of people as well as overcrowding.

4.5. Unliveable and unattractive street environment

In general, Kumanovo's transport policy prioritises major road building and providing new car parks which means supporting and implementing pro-car policies. Also the road planning and design is car-based. The car-policies and car-based design lead to poor infrastructure for sustainable modes of transport and unliveable and unattractive street environment. Beside this Municipality of Kumanovo also takes minor activities for improvement of the walking and cycling infrastructure.

4.6. Insufficient transport provision to support local economic growth

There is no doubt that a relationship exists between the urban transport and the economic development. Traffic congestion, non-regulated urban freight transport and goods delivery services, and poor or unreliable public transport in Kumanovo can impose costs and inhibit the local economic development. Transport difficulties that exist in Kumanovo may be one of the major barriers to local economic growth. Improving sustainable transport options such as: walking, cycling, ridesharing and public transport together with rationalization of goods delivery services and more accessible land use can increase economic efficiency and provide particularly large economic benefits if they substitute for more costly modes such as car transport.

According to the results of the workshop in Kumanovo, the challenges such as: *road congestion and air pollution & noise* were considered as the most important challenges while *unliveable and unattractive streets* and *poor accessibility & inequity insufficient* were considered as the least important challenge. The challenges such as: *road accidents* and *transport provision to support local economic growth* were of medium importance.

Priority measures for sustainable urban mobility in Kumanovo are given in Table IV

TABLE IV
PRIORITY MEASURES RELATED TO URBAN MOBILITY ON THE CASE OF MUNICIPALITY OF KUMANOVO

No	Priority measure	Description of the measure
1	Temporary pedestrian streets in the city centre	Temporary closing of street/s in the city centre with access restriction of motor vehicles.
2	Intelligent pedestrian crossings	Using of an illumination system which is intended to alert vehicles about the presence of pedestrians in the street. The illumination system is used to highlight the crossing and its surroundings, warning vehicles about the presence of pedestrians and therefore enhancing their safety.
3	Increase accessibility for	Ensuring accessibility for elderly or disabled people in form of smooth and

	elderly or disabled people	submerged sidewalks edges at pedestrian crossings and using of tactile surfaces.
4	Comprehensive cycle network	Development of a plan for a comprehensive cycle network in the city that will include a network of cycle routes incorporating segregated cycle facilities (marked lanes, tracks, shoulders and paths), provision of cycle parking, bicycle pump and service stations.
5	Public pool bikes	Available bicycles in the city or at the workplace allowing people to have ready access to these shared bikes rather than rely on their own bikes.
6	Low emission zone in the city centre	Low Emission Zones (LEZs) are areas where there is restriction access to high-emission vehicles.
7	Promotion of walking, cycling and public transport as alternatives to car usage	Use of the media to improve public understanding of the problems caused by traffic growth and the impact of travel behaviour, as well as to convey what can be done to solve these problems, including changing one's own travel behaviour.
8	Safe routes to schools	Review of the school roads to find strengths and weaknesses and prioritise measures.
9	Traffic calming measures	Using of physical measures to reduce vehicle speed and acceleration such as: raised intersections (use of intersections as shared spaces), chicanes, and mini roundabouts.
10	Lorry routes and bans	Lorry routes are used to achieve routing by specifying the routes which lorries can take.
11	Regulation of delivery of goods in the city centre	Regulation of delivery of goods in the city centre by implementing time access restrictions, environmental restrictions, vehicle size/load access restrictions etc.
12	Optimization of traffic signals	Optimization of traffic signals by using actuated and/or semi-actuated traffic signals.
13	On-street parking charges in the city centre	Parking charges are fees paid by motorists for the use of parking spaces, either in dedicated car parks or in identified on-street parking bays.
14	"On demand" public transport service	Nowadays low density areas are covered by the private transport due to the lack of routes or to the limited spatial coverage of public transport. The main objective of the demand responsive transport is to provide a more effective response to low density mobility demand not satisfied by local public transport.
15	Extension of the public transport network with new lines served by low-floor vehicles	Developing of new transport lines for better coverage of the city with public transport.
16	Real time information app for passengers	The real time information app allows passengers to access real i.e. live departure information for public transport services via a variety of different sources.
17	Education of school children	Implement traffic safety education.

	on traffic safety	
18	Design of safe roads for cyclists and pedestrians	Ensure roads with sufficient width and proper winter road maintenance. Prioritization of walking and cycling in road planning and design.
19	Road space relocation in favour of sustainable modes of transport	Redistribution of road space to walking and cycling.
20	Space protection for walking and cycling	Physical protection of walking and cycling areas by urban equipment.

V. CURRENT POLITICAL, TECHNICAL AND OPERATIONAL CHALLENGES RELATED TO SUSTAINABLE URBAN MOBILITY

The current political, technical and operational challenges facing the municipalities are presented below.

A. Political challenges

Based on the review of the programs of the mayors of the municipalities for the period 2017 - 2021, it can be noted that regarding the mobility, most of the measures are related to improving conditions for car travelling and encouraging car usage for daily trips, there are some measures for improving of walking and cycling but almost there are no measures for improving and promotion of the public transport in the cities.

B. Technical challenges

The current human resource capacity in the municipalities is focused on planning for movement of vehicles instead of planning for movement of people. Increasing the human resources capacity focused on planning for movement of people and liveability (e.g. including urban planners, transport experts) is a key to supporting a transition towards sustainable urban mobility. These people should reflect a diverse range of disciplines and should have an appropriate level of technical expertise.

Integrated planning between transport and land-use planning is crucial to avoiding unsustainable car-oriented development leading to high traffic levels and congestion. The sustainable urban mobility plan should be a prerequisite for any urban development.

C. Operational challenges

The effects of the implemented measures are not assessed in any municipality, so there is no evidence of the contribution of these measures in achieving the aim of a certain measure. The municipality needs to build a strong evidence-based policy-making and analysis process, and to see whether a progress is or is not being made in relation to the priorities. The municipalities should use wider indicators of urban

mobility performance and should ensure that data is carefully collected and measured.

There is a need to anticipate the transport related problems in municipalities. In order to anticipate the road traffic congestion problems, the municipalities implement measures for increasing road capacity, such as widening the streets, while in order to anticipate the air pollution from transport, the municipality implements measures for restriction of car usage. These problems should be anticipated by providing attractive and efficient alternatives to car use, in particular collective transport and active travel. The infrastructure is primarily built for vehicle movement instead of movement of people and for making of leisure places. The investments are focused on road infrastructure solutions that support further car use instead of focusing on sustainable urban mobility solutions, including public transport, cycling and walking. Pupils who rely on public transport are already used to using it which means if alternative mobility options are provided to them in the future, they will be less likely to rely on car use.

Once alternatives to car use are in place, the municipality can discourage car use and encourage a shift to more active and sustainable modes by making car travel more expensive, slower and less convenient than the alternatives (e.g. by taxing private vehicles or their use, by increasing parking fees, by decreasing the space allocated to car use).

VI. CONCLUSION AND RECOMMENDATIONS

Mobility is a key urban priority. It is central to how a city operates and has a significant impact on the quality of life, the local environment and resource consumption. Effective urban mobility systems can be enabled by accommodating all modes of transport. The system can be further optimised by integrating mobility planning with the spatial planning while considering how products and services are produced and accessed.

The sustainable urban mobility planning concept implies application of the existing planning practices by incorporating the principles of integration, participation and evaluation, i.e. integrated development of all modes of transport, full involvement of all stakeholders and citizens in the planning process from the beginning and demonstrating a clear link between objectives and measures due to assessing the achieved results in relation to the objectives.

To address the current challenges related to sustainable urban mobility, priority measures i.e. quick wins measures which are low-cost, justified and easily implementable were identified together with the stakeholder's group during the exercises at the workshops which was held in the municipalities. The measures are related to: strategic policy; capacity building activities; traffic safety; collective transport; Infrastructure for active modes of transport (walking and cycling); promotion of sustainable modes of transport and awareness campaigns; traffic management; and parking management.

Namely, the Municipality of Bitola for example is facing real problem of exaggerated street profiles in the plans, fast main roads, all of which is contrary to the existing situation in the field. This indicates that during the construction stage, design solutions were not followed and that the urban design

documentation was not harmonized with regulation plans. Therefore, there is a real need to find an appropriate approach to overcome this problem, and currently that is the design of urban project documentation on current situation (infrastructural projects) and strategically the preparation of a new General Urban Plan, with new categorization of street network that would be based on the Sustainable Urban Mobility Plan.

With this process of previous evaluation by the local self-government, positive recommendations are provided for the pilot municipalities to continue with the process of activities for sustainable urban mobility planning.

Furthermore, expected short-term benefits are:

- ✓ Established cooperation procedure between the actors on local level;
- ✓ Raising public awareness through information and inclusion of the public in issues related to mobility, traffic and urbanism;
- ✓ Created conditions and capacities on local self-government level for the use of existing resources, good management and awareness of the need for coordinated solution of problems in the area of mobility and traffic in the municipalities.

Planning for the future of the city must take the citizens as its focus. Unlike the traditional approach, when planning for sustainable urban mobility, the focus is on walking, cycling and public city transport in front of passenger cars and trucks.

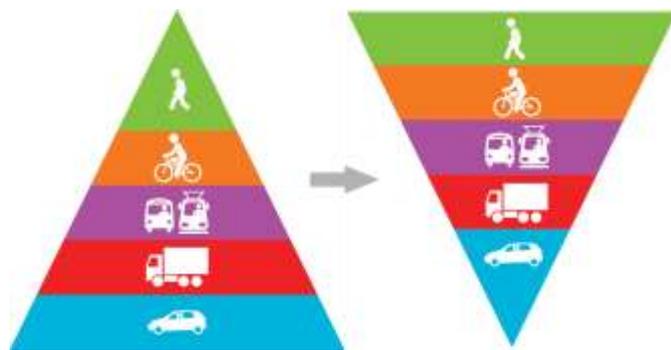


Fig. 1: The Pyramid of Urban Mobility - Before - After
Source: [8]

Citizens as travellers, as business people, as consumers, as costumers or whatever role one may assume must be part of the solution because preparing of the sustainable urban mobility means planning for the people.

In fact, pilot Municipalitys needs this process of sustainable planning of urban mobility and the local self-government and the coordination body should use this opportunity provided through the project “Support to local self-government units of the Republic of North Macedonia to promote sustainable urban mobility”, in the direction of further realization of the process:

- ✓ Strengthening of inter-institutional-vertical cooperation,
- ✓ Strengthening of inter-sector-horizontal cooperation,

- ✓ Expanding the Department with experts from the area of traffic engineering and design;
- ✓ Promotion of development of a sustainable urban environment with higher quality and rational use of the urban area and street space;
- ✓ Preparation of an ACTION PLAN with a TIME FRAME with actionable measures, indicators and targets;
- ✓ Continuing initiated activities for sustainable urban mobility planning with the additional participation of citizens in order to examine the modular distribution of trips;
- ✓ Additional training of the working group to apply the measures for Sustainable Urban Mobility.
- ✓ Additional training to apply the software tool for solving of issues related to Urban Mobility.
- ✓ Managing the implementation of measures;
- ✓ Promotion of measures;
- ✓ Monitoring an analysis of results;
- ✓ Information.

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