

Sustainable **Shared Mobility**

Case study: Shared Mobility Roadmaps for Sofia

May 2021

















Sustainable shared mobility for Sofia

The Sustainable Shared Mobility (SuSMo) project aims to catalyse systemic change by instigating behaviour change, enabling connections and collaborations, and removing barriers through policy change. SuSMo brings together leading European cities with experts in the transport sector to provide decision-makers with tools and knowledge to maximise the benefits and mitigate the negative impacts of shared mobility modes. Funded by EIT Climate KIC, SuSMo was launched in 2019 and has worked with city representatives and private sector shared mobility providers to establish the key needs and priorities for the effective deployment of sustainable shared mobility.

The City of Sofia

Sofia, the capital of Bulgaria, is the most densely populated city in the country. In the past years, the city experienced a rapid population increase adding to the urban mobility challenges. The geography of the city, being positioned between mountains, sets limits on its expansion in terms of territory. This is one of the reasons the city struggles with excessive traffic, overloaded streets, limited space for pedestrians and the related health risks for the inhabitants.

As one of the SuSMo partner cities, Sofia has been involved since the project's start. Providing a wide geographical coverage and the Eastern-European perspective on shared mobility. This case study is an assessment of the city's first Sustainable Urban Mobility Plan (SUMP) using policy roadmaps on shared mobility in Europe developed under the SuSMo project.

Reviewing Sofia's SUMP from a shared mobility outlook

A review of Sofia's Sustainable Urban Mobility Plan (SUMP) was performed prior to a workshop organised in October 2020 by the SuSMo partners. Cenex looked at the role of shared mobility in the SUMP. Determining possible improvements using the trends outlined in the policy and technology roadmaps, to ensure that shared mobility was appropriately considered and resourced in the future.



Once this information was presented an open discussion on how this information should be applied to Sofia was held with the municipality. The workshop highlighted the positive start Sofia has made with implementing shared mobility, and where the focus should lie in order to build further on the work already performed.



Reflections on Sofia's SUMP

A review of the Sofia SUMP has prompted the municipality to re-look at the targets to be set out for shared mobility in the future.

Overall, shared mobility is underrepresented in Sofia's SUMP, meaning that the upcoming technologies are taken into account without the development of specific plans for deployment and placement of shared mobility in the city's transport masterplan. The measures envisaged in the SUMP are generally related to infrastructure changes and regulations and therefore the SUMP has been analysed against the City Plan roadmap.

At the heart of the SUMP lays the ambition to limit city centre private vehicle use through to 2024, followed by a reduction of privately owned vehicles via the utilization of 'push and pull' measures (increasing parking cost, reducing free parking spaces, reducing speed limits). The role of shared mobility for replacing private car usage is pinpointed. The SUMP envisages measures for bike infrastructure and introduction of speed limits. Most of these measures are presented in the Development and Enabling phase in the City Plan roadmap up until 2023, indicating that Sofia has the preconditions to lay the basis for setting up an operational shared mobility system.

In terms of funding, measures are envisaged to support development of infrastructure but there are some aspects missing such as funding for shared mobility services in low-income areas and passive funding for charging points and parking.

The aspect of supporting innovation through trials led by the cities in order to understand the impact of shared mobility on the transport network is missing in the SUMP. Pilot tests are mentioned but without specific focus on shared mobility.

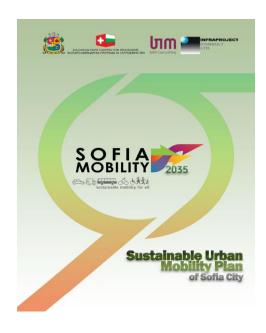
In terms of law and policy dimension, the SUMP of Sofia is detailed and foresees several 'push

and pull' measures enabling low emission alternatives and disincentivising car ownership.

The public perception will experience a shift from seeing shared mobility services as novelty (and not an alternative) to more widespread daily usage due to active communication campaigns. The SUMP of Sofia contains plans for campaigns and events to promote transport modes alternative to cars, however, the emphasis on shared mobility is missing.

Additionally, the SUMP is ambitious about the deployment of intelligent mobility solutions in the city and mirrors the envisaged trends in the roadmap.

Finally, the SUMP covers some of the main trends related to city landscaping - city-wide bike lanes created, charging infrastructure, introduction of low emission zones, shared roads with speed limit but specifically in relation to low emission zones there is only an intention stated and no roadmap available.





Technology and policy roadmaps

Development of technology and policy roadmaps

Policy and technology roadmaps inform cities of upcoming technology developments, and the likely policy and strategy decisions cities need to take in order to accelerate the low carbon shared mobility agenda. The value of policy roadmaps for cities is twofold:

- They help city planners and urban mobility professionals to understand where their city stands in terms of shared mobility development compared to an EU-wide context.
- They give cities the context of future trends and support professionals in short- and mid-term decision making in relation to shared mobility services.

The roadmaps displayed on the next page were developed by Cenex in 2020. They serve to inform cities of upcoming technology developments in the shared mobility transport sector from 2020 through to 2030. The roadmaps are aimed at local authority transport decision makers, as well as regional and national policymakers in continental Europe and the UK.

The services covered are car clubs/car sharing, ebikes and e-scooters. To draw a full picture of the upcoming trends, each existing service is analyzed against several perspectives:

- Technologic developments
- Operations of the service provider
- Effects on the environment and emissions
- The areas and type of users that are covered
- The economic viability of the service

Besides the sustainable shared mobility services, a City Planning dimension is included. This incorporates the more policy-related areas that cities usually need to deal with when planning and deploying a new service.

These roadmaps were first disseminated in October 2020 in an online workshop with Sofia municipality workers. The session helped the municipal officials from Sofia to get a deeper understanding on the position of the city ahead or behind the general EU trend enabling them to establish what areas of shared mobility they need to work on. It also allowed the participants to understand what the future holds for shared mobility and what action the city needs to take now in order to be ready.

Integrating mobility trend roadmaps in SUMPs

The approach of analysing the city's SUMP using the trends outlined in the policy roadmaps represents a powerful tool for identification of the strengths and weaknesses in city planning. Starting from the current status with a 10 years time-frame.

The way of structuring the policy roadmaps around the perspectives of different shared mobility services on technology, operations, environment, coverage and economics gives a comprehensive overview of the expected trends for each service.

In the City Planning section, the scope is enlarged to policy related perspectives. This enables the policy roadmaps to be easily applicable to more advanced cities where the SUMPs already include shared mobility services as well as to cities whose SUMPs contain little or no information on these services as in the case of Sofia. No mater the use case, the roadmaps will support city planners and urban mobility professionals to better understand how valid their SUMP is in relation to the expected trends.





Shared Mobility Technology and Policy Roadmap



	Development and Enabling			T	Transition Phase			Scale-up and Realisation of Benefits				
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	
Technology		Limited deployme	nt of autonomous	vehicles. Continue	ed growth of EVs.	Expa	nded deployment	of autonomous ve	hicles. EVs preferre	ed over ICEs for ca	r shares.	
Operations	Small urban c	ars typical. Across E	U a mixture of free	floating, P2P and s	tation-based.	Full integration int	o MaaS systems di	rives operational ch	anges for data ma	nagement. Free-fl	oating preferred	
Environment	CO2e im	provements driven	by less individual	vehicle ownership	, improves as users	increase. Overall	pressure to impro	ve emissions standa	ards. Car share veh	icles are also less	polluting.	
Coverage	30 mil	lion users globally.		50 m	nillion users globally	v	100 - 40	0 million users glob	ally, dependant or	scale of autonom	nous acceptance.	
Economics	Cheaper	per mile for annua	Il mileages below a	verage, ideal for u	ırban	Cost pari	y with ownership	for average mileag	e 15	- 40% cheaper tha	n ownership	



Technology
Operations
Environment
Coverage
Economics

E-bikes

Development and Enabling			Tr	Transition Phase			Scale-up and Realisation of Benefits					
2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030		
Cargo e-bikes	developed further	and deployed for sh	naring Further	development of jo	ourney-specific mo	dels e.g. mountain	bikes La	arger batteries for t	ull day and weeke	nd use		
Pay-as-you-ric	le dominates mix of	docked & dockless sy	stems Subscri	ption services popu	ularise Full i	ntegration into Ma	aaS systems in citie	es drives operation	al changes for data	management		
CO ₂ footprin	t reductions prima	arily from battery pr	oduction M	ore control over e	nd-of-life and mair	ntenance to prever	nt unnecessary scr	appage, life-span li	kely to be upwards	of 5 years		
Major cities	and densely popu	lated areas continu	e to be focus	Small cities	within riding dista	nce of popular rura	al attractions targe	ted for specific jou	rneys e.g. mountai	in trails		
Profitable in la	arge cities >300,000	citizens & tourist des	tinations	Profitability in mos	st cities from rider	revenue income al	one (no public fun	ding or sponsorship	o/advertising nece	ssary)		



Technology Operations Environment Coverage Economics

E-scooters

Development and Enabling			Ti	Transition Phase			Scale-up and Realisation of Benefits						
2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030			
Increased du	rability of compor	nents Pavemer	nt & pedestrian de	etection systems, i	ntoxicated rider pr	evention	Solid-state battery	technology becom	es available increa	sing range			
Diesel vans p	rimary collection	method Move	to sustainable co	llection: EVs & carg	go bikes Full i	ntegration into Ma	aaS systems in citie	s drives operationa	al changes for data	management			
CO ₂ footprin	t reductions due t	o improved life	Large reduction	n in operational e	missions	>95% of vehicle	is recycled at end	of life, typical life-	span of vehicle is 4	8 months			
All major o	ities in Europe by	2022	Smaller citie	s targeted in city o	centre	Increase	ed provision in per	i-urban areas as ec	onomics become f	easible			
Operators no	t yet profitable but	investment continu	es Operat	ors may now be p	rofitable, this could	d potentially drive	further innovation	or result in increas	sed coverage by op	erators			



City Plan

	Development and Enabling			Ti	ransition Pha	se	S	Scale-up and Realisation of Benefits					
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030		
National Objectives	Reduction in	city centre private	vehicle use through	providing altern	ative transport	Stabilise and red	uce the total numl	ber of privately ow	ned vehicles and b	uild reliance on sh	ared mobility		
Funding	Subsidies re	quired for new sha	red mobility modes	Subsidisir	ng shared mobility m	ay be required in so	me areas, passive fu	nding may help incre	ase uptake i.e. park	ing infrastructure &	chargepoints		
pporting Innovation	Trial	s being run in citie	s to understand the	impact on the tr	ansport network		Private sector led trials, taking over from public sector						
Law and Policy	Policy centres	around reducing ca	r use through makin	g low emission alt	ernative modes mo	re appealing & wid	espread Polic	y shift to focus on o	lisincentives for pri	vate vehicle use in c	ity centres		
Public Perception	Public see s	hared mobility as i	novelty not an altern	native to private	car use	Positive	shift in public per	ception as shared i	mobility becomes i	more widespread			
Intelligent Transport	Early M	aaS systems trialle	d in a few cities	MaaS	deployed more wi	idely with multi-cit	y integration	Building of ini	tial infrastructure i	or future deploym	ent of CAV		
City Landscaping	Creation of c	ity wide bike lanes,	parking, and EV car	lub charging infra	structure	Major plans to re	allocate city road i	nfrastructure inclu	ding possible no di	rive zones in the cit	y centre		



How did SuSMo contribute to Sofia

The study provided valuable insights on the current role of shared mobility services have in the SUMP of Sofia while at the same time widened the perspective to an EU-wide context enabling urban mobility professionals from the municipality to get a deeper understanding on the strengths and weaknesses of the SUMP and what corrective actions should be taken to respond to the future development trends of shared mobility in Europe.





European Union











