FACT SHEET NO.: 6 / 6 **PERFORMED BY: PRO**

A GENERAL INFORMATION

A 1	**Category**	**Transport planning**
A 2	**Subcategory**	**Urban mobility - "zero/low emission" strategies**
A 3	**Transport policy measure (TPM)**	**Influencing demand for sustainable transport – promotion of cycling within urban / suburban areas**
A 4	**Description of TPM**	Congestion in urban areas has negative impacts on the economic, the society, the level of health, [and] the environmental and degrades the natural and built environment. In order to preserve and improve the quality of life within cities it is crucial to enhance and promote sustainable mobility. A demand-oriented approach to sustainable mobility is based on information, co-ordination and motivation. Besides, it complements traditional, infrastructure oriented transport planning, and it can be applied to a range of target groups. [1] [2] [7] There are different ways to positively influence and induce sustainable transport. As this TPM solely focuses on cycling as relevant transport mode, there are two ways to basically influence the demand for cycling: Through infrastructure improvements (1) or by so-called 'soft measures' (2): (1) (Local) authorities can improve the attractiveness of cycling by expanding their cycling infrastructure. There exist various methods to expand cycling infrastructure, like: introduction of fast cycling lanes, dedication of cycling lanes, designation / generation of bicycle parking's and introduction of cycling bridges / tunnels. These are 'traditional' and new infrastructure measures. [7] (2) Furthermore, cities, companies and schools can promote cycling, for example by introducing awareness campaigns, traffic games, road safety assessments, financial incentives (mostly within companies) or educational packages. This measures are often referred to as 'soft measures', which are designed to encourage people to use bicycles (in combination with public transport) for a journey that previously have been made by car. [7]
A 5	**Implementation examples**	The implementation examples follow the two methods as mentioned in the above description: 1. CIVITAS (City-Vitality-Sustainability) example Gent - Belgium: Sustainable mobility planning by the construction of bicycle tunnels and bridges; completion of the main bicycle routes; smaller improvements on bicycle routes (plateaus, cycling in one way streets, etc…). Goal: creating an integrated, sustainable mobility policy to reduce the number of cars and promote cycling and public transport. Results so far: 10% more bicycle use on average and a growing number of train commuters cycle between their home and the railway station (+10 % every year). [6] 2. ELTIS (The Urban Mobility Portal) example: Ocean's 11 - Promoting Active Travel in the East End of London. In order to promote a more active lifestyle for the local population, the "Get out Get Active" project was introduced. The project aimed to educate the residents on the rewards of travelling more actively (walking and cycling). Over 60 % of the 800 participants felt healthier at the end of the project than they did at the start (see www.eltis.org for further details). 3. The CIVITAS example of Graz: several infrastructure investments (new cycling zones, new safer junctions, bike & ride facilities) combined with promoting activities (a new electronic route planning that helps cyclists to plan fast and safe bicycle trips, a series of information campaigns, organised tours and other events organised together with professional bicycle retail shops) have led to an increased use of bicycles by 6 %. [7]
A 6	**Objectives of TPM**	The objective is clear: promote cycling and cycle-related multimodal transport and reducing road vehicle usage in order to achieve a more sustainable transport system within cities and urban areas. Promotion of cycling targets to improve the quality of life for citizens and reduce environmental impacts. [1]
A 7	**Key changes concerning:**	
A 7.1	- Choice of transport mode / Multimodality:	Cycling becomes more popular and private automobile usage will decrease. A modal shift occurs from road to slow modes. Moreover, public transport might increase due to increased multimodal transport options.
A 7.2	- Origin and/or destination of trip:	The accessability of city centres will become easier by slow modes and car trips will end up more often at the edge of cities. (P&R / B&R). It is unlikely that a change of origin/destination due to cycling policies occur, even in case of B&R applications, because the origin and final destination do not change, while the choice of route with different modes change.
A 7.3	- Trip frequency:	No key changes
A 7.4	- Choice of route:	Change from roads to cycling paths and railroads.
A 7.5	- Timing (day, hour):	No key changes
A 7.6	- Occupancy rate / Loading factor:	No key changes
A 7.7	- Energy efficiency / Energy usage:	Energy usage will decline as cycling requires far less energy (for instance no fuel/oil required) compared to passengers cars and even compared to public transport.
A 8	**Main source**	[1], [5]

B IMPACTS

B 1 OVERVIEW ON IMPACTS

		AFFECTED SEGMENTS															Geographical level		Source	
		Passengers					Transport operators													
		Road	Rail	Air	Public transport	Slow modes	Road	Rail	IWW	Air	Maritime	Public transport	Employees in transport	Residents	Economy	Public bodies	Society	1st level	2nd level	Source of assessment	Spatial level of source
B 1.1	**Summary**																	L	R	S	I
		- Although mobility plays a crucial role in contributing to the socio-economic growth of urban areas, its negative effects have been increased (partly because of increased mobility) extensively over the years. Promoting sustainable transport (example: cycling) will mostly have positive impacts on all road users (especially slow modes), public transport operators, residents and society. They will benefit from increased well-being (less passenger cars -> less air pollutants and noise emissions), increased physical activity (and expansion of the cycling network). - Road transport operators (car industry) will face negative impacts because of the initiated modal shift from road to slow modes and public transport. A reduced demand of passenger cars will lead to a decreased sale of cars which will implicate unemployment in the car industry. [5] - Public bodies will have to invest in cycling infrastructure, but will save part of the expenses (maintenance) because of a lower demand for road infrastructure. - The private income will increase due to less travel and transportation costs (e.g. commuting costs) and less investments for the infrastructure.																	
B 1.2	**Summary: Income groups**	- Cycling is an inexpensive way of transport within the financial reach of almost everyone. For each kilometre travelled, travel costs for the bicycle are lower than those of any other means of transport, except walking. Promotion of cycling will thus be beneficial for low income groups, because these depend on cycling when it comes to means to transportation (as other means are to expensive). [11]																		
B 1.3	**Summary: Age groups**																			
B 1.4	**Summary: Disabled people**																			
B 1.5	**Summary: Gender groups**																			
B 1.6	**Summary: Ethnic groups**																			

B 2 TRAFFIC IMPACTS

		AFFECTED SEGMENTS															Geographical level		Source	
		Passengers					Transport operators													
		Road	Rail	Air	Public transport	Slow modes	Road	Rail	IWW	Air	Maritime	Public transport	Employees in transport	Residents	Economy	Public bodies	Society	1st level	2nd level	Source of assessment	Spatial level of source
B 2.1	Travel or transport time	↘				↘												L	R	E/S	I
B 2.2	Risk of congestion	↘																L	R	E	
B 2.3	Vehicle mileage	↘	→		→	↗												L	R	S	I
B 2.4	Service and comfort					↑												L	R	E	
B 2.I	**Overall impacts on social groups**																				
B 2.II	**Implementation phase**																				
B 2.III	**Operation phase**																				
B 2.IV	**Summary / comments concerning the main impacts**	- Travel or transport time for slow modes will decline when additional cycling infrastructure is going to be built. Cycling paths and extensive cycling networks will reduce the number of stops and enable an efficient travel by bike [3]. - The risk of congestion for road users will decline when more people will switch from passenger cars to slow modes, which will slightly influence the road transport time positively. - Vehicle mileage of passenger cars will decrease and vehicle mileage of slow modes will increase. Fast cycling lanes, cycling lanes, cycling bridges and other cycling infrastructure investments will reduce travel time for slow modes and allow people using a bicycle to cover greater distances in a shorter period of time. Vehicle mileage for public transport (including rail transport) will stay the same, or notice a minor increase. The latter will only take place when multimodal transport is being promoted (for instance by introducing improved cycling facilities at rail/bus stations) [1] [7]. - Service and comfort will increase significantly for slow mode users (cyclists). User-friendlyness will increase by more parking facilities and improved hiring options.																		
B 2.V	**Quantification of impacts**	- A reduction of travel time by bicycle of 10 % will increase bicycle use by 3 % [10].																		

B 3	ECONOMIC IMPACTS	AFFECTED SEGMENTS															Geographical level		Source	
		Passengers					Transport operators													
		Road	Rail	Air	Public transport	Slow modes	Road	Rail	IWW	Air	Maritime	Public transport	Employees in transport	Residents	Economy	Public bodies	Society	1st level	2nd level	Source of assessment	Spatial level of source
B 3.1	Transport costs																				
B 3.2	Private income / commercial turn over														↘	→	↗	L	R	E/S	I
B 3.3	Revenues in the transport sector						↘											R	N	S	N
B 3.4	Sectoral competitiveness																				
B 3.5	Spatial competitiveness																				
B 3.6	Housing expenditures																				
B 3.7	Insurance costs																				
B 3.8	Health service costs																↘	N		S	N
B 3.9	Public authorities & adm. burdens on businesses															→		L	R	S	I
B 3.10	Public income (e.g.: taxes, charges)																				
B 3.11	Third countries and international relations																				

B 3.I	**Overall impacts on social groups**	
B 3.II	**Implementation phase**	- Public bodies will have to invest in cycling infrastructure (e.g. cycling lanes, cycling bridges, fast cycling lanes) during implementation phase. [See quantification for cost examples of cycling infrastructure measures.] - Administrative burdens for public bodies and participating companies will increase when starting awareness campaigns or introducing financial incentives to promote cycling.
B 3.III	**Operation phase**	- Public bodies will have less maintenance costs concerning road infrastructure (due to reduced vehicle mileage of passenger cars). [5]
B 3.IV	**Summary / comments concerning the main impacts**	- Public bodies, responsible for cycling infrastructure, will have to invest in new cycling infrastructure or promotion campaigns. But investments in bicycle infrastructure and maintenance are much cheaper than investments in car infrastructure. [5] This means, that investments of public bodies will increase during implementation and will decrease during operation. - Revenues in the car industry will decline when there is a demand shift from car to cycle. [5] - Health service costs for society will decline when more people decide to cycle instead using the car. Mainly, because physical activity (like cycling) leads to a longer and healthier life which will reduce health costs. [5] - Administrative burdens will rise when public bodies or companies start awareness campaigns, traffic games, road safety assessments, financial incentives (mostly within companies) or educational packages. [2] - The private income will increase due to less travel and transportation costs (e.g. commuting costs) and less investments for the infrastructure.
B 3.V	**Quantification of impacts**	- Each kilometer of travelling by cycled instead of car saves €0.97 of indirect costs (costs like time savings, air pollutants, noise, health problems, etc.). [2] - Within the CIVITAS II city of La Rochelle (France) the costs for one kilometre bicycle path was EUR 150.000 (in Poland one kilometre costs 250.000 EUR). [7] - Cycling promotion campaigns proven to be effective in Denmark. The "We bike to work" campaign led to about 10.000 new cyclists annually. [11] - The construction of a two-way cycle track (2.5 – 3.0 m wide) in Denmark cost DKK 2.5 – 6.0 millionen (within cities) and DKK 1.0 – 2.5 millionen (countryside) per kilometer. [11]

B 4	SOCIAL IMPACTS	AFFECTED SEGMENTS															Geographical level		Source	
		Passengers					Transport operators													
		Road	Rail	Air	Public transport	Slow modes	Road	Rail	IWW	Air	Maritime	Public transport	Employees in transport	Residents	Economy	Public bodies	Society	1st level	2nd level	Source of assessment	Spatial level of source
B 4.1	Health (incl. well-being)					↗								↗			↗	L	R	S	N
B 4.2	Safety	↗				↗												L	R	S/E	I
B 4.3	Crime, terrorism and security																				
B 4.4	Accessibility of transport systems					↗												L	R	E	
B 4.5	Social inclusion, equality & opportunities																				
B 4.6	Standards and rights (related to job quality)																				
B 4.7	Employment and labour markets						↘					→	→					R	N	S	N
B 4.8	Cultural heritage / culture																				

B 4.I	**Overall impacts on social groups**	
B 4.II	**Implementation phase**	
B 4.III	**Operation phase**	
B 4.IV	**Summary / comments concerning the main impacts**	- Health of slow mode users will increase due to a better physical condition e.g. less chance of cardiovascular diseases, less chance to become overweighed, etc. (see quantification of impacts). [9] - Well-being of residents and society will increase due to the modal shift from road to slow modes (and public transport). Air pollutants and noise emissions will decline substantially if more people will use bicycles instead of passengers cars, especially within congested urban areas. [1] - About 60 % of the accidents and 25 % of the road fatalities occur in urban areas and affect slow modes users as the most vulnerable road users. The risk of being killed in a road accident is six times higher for cyclists and pedestrians than for car users. A well designed infrastructure, especially at intersections, can increase the level of safety for cyclists significantly. [1] - Accessibility of slow modes will increase when promoting leads to more bike & ride areas, "rent a bike" stores and particularly if (local) authorities offer financial incentives to low-income groups. In other words, there will be more possibilities to hire and use bicycles. - A modal shift from road towards slow modes and public transport will have a negative impact on employment within the car industry. Still, more jobs can be expected in public transport (if cycling will lead to an increase of multimodal transport) [5], if the demand increases. - Road passenger safety level increases when there is less traffic.
B 4.V	**Quantification of impacts**	- Over 70 % of all cycle accidents resulting in lethal or serious injuries occur at intersections. [5] - Everyday cycling to work increases the level of fitness 13 % on average. [9] - The health effect of the individual cyclist (internalised benefits as optimised weight, less risk of a cardiovascular disease, etc.) are calculated to approximately DKK 3.80 per kilometer (compared to car based travelling). [11] - Employees which travel to work by bicycle everyday are approximately 2 days fewer ill (on average) than employees travelling by car. [9] - Society (residents, health sector and state) benefit by about DKK 1.81 per kilometer. The benefits include cost savings for medical treatments and increased work value due to less sick leave (compared to car based travelling). [11]

B 5	ENVIRONMENTAL IMPACTS	AFFECTED SEGMENTS															Geographical level		Source	
		Passengers					Transport operators													
		Road	Rail	Air	Public transport	Slow modes	Road	Rail	IWW	Air	Maritime	Public transport	Employees in transport	Residents	Economy	Public bodies	Society	1st level	2nd level	Source of assessment	Spatial level of source
B 5.1	Air pollutants													↓			↘	L	R	S	I
B 5.2	Noise emissions													↓			↘	L	R	S	I
B 5.3	Visual quality of the landscape																↘	L	R	E	
B 5.4	Land use																↘	L	R	S	N
B 5.5	Climate																↘	N		S	N
B 5.6	Renewable or non-renewable resources																↘	N		S	I

B 5.I	**Overall impacts on social groups**	
B 5.II	**Implementation phase**	
B 5.III	**Operation phase**	
B 5.IV	**Summary / comments concerning the main impacts**	- Short-distance trips (< 10 km) by passengers cars are the most fuel - inefficient car trips and generate the most pollution per kilometre compared to long-distance trips. These short-distance trips can be replaced by cycling, which will lead to a strong decrease in air pollutants on a local scale. [2], [8] - If road vehicle transportation is being reduced; noise emissions will decline (see quantification). [2] - A modal shift from cars to bicycles will save land use. Cycling will require less space for parking and travelling. [4] [5] [9] - The visual quality of urban areas will increase when less space is needed for parking and roads. - Climate will benefit from less greenhouse gases produced by passenger cars. [5] [9] - A reduction of vehicle mileage of passengers cars will lead to a decreased demand for oil (non-renewable resource). In other words, a modal shift from passenger cars to slow modes will decrease the amount of non-renewable resources used. [1]
B 5.V	**Quantification of impacts**	- If road vehicle transportation on an urban road is being halved; noise emissions will decline with 3 db(a). [2] - If all trips up to 7.5 kilometres by passengers cars will be replaced by trips on bicycles than this will save about 300-900 ton NOx, 20-60 ton PM and 100-300 ton SO2 annually [9]. - The space need for a parked bicycle has been calculated to be only 8 % of the space needed to park a car. [5]

C REFERENCES

C 1	**Other TPMs of this subcategory**	
C 2	**References**	**International** [1] European Commission (2007): Green Paper - Towards a new culture for urban mobility, COM (2007) 551 final, Brussels [2] European Cyclists' Federation (2011): Call for an integrated European Cycling Policy - ECF Position on the European Commission's White Paper on Transport, Brussels: ECF Publications [3] PRESTO consortium (2010): Promoting Cycling for Everyone as a Daily Transport Mode - Cycling Policy Guide - Cycling Infrastructure [4] PRESTO consortium (2010): Promoting Cycling for Everyone as a Daily Transport Mode - Cycling Policy Guide - Promotion of Cycling [7] Gualdi, M., Proietti, S. (2007): CIVITAS in Europe - A proven framework for progress in urban mobility, Rome: ISIS [8] European Parliament (2010): Directorate general for internal policies, Policy department B: Structural and cohesion policies: The promotion of cycling, Brussels: European Parliament **National** [5] Hout, K. van (2008): Annex I: Literature search bicycle use and influencing factors in Europe. Instituut voor Mobiliteit (IMOB): University of Hasselt [9] Hendriksen, I. Gijlswijk, R. van (2010): Fietsen is groen, gezond en voordelig - Onderbouwing van 10 argumenten om te fietsen, TNO: Leiden (in dutch) [10] Nijland, H., Wee, B. van (2006): De baten van fietsen en de mogelijkheden van fietsbeleid, Bijdrage aan het Colloquium Vervoersplanologisch Speurwerk 2006, Amsterdam (in dutch) [11] Andersen, T., et al. (2012): Collection of Cycle Concepts 2012, Copenhagen: Cycling Embassy of Denmark **Regional** [6] Bekeart, V. (2011): Cycling policy in Ghent, City of Ghent: Mobility Department