

FACT SHEET NO.: 6 / 2 PERFORMED BY: PRO

A GENERAL INFORMATION		
A 1	<b>Category</b>	Transport planning
A 2	<b>Subcategory</b>	Urban mobility - plans & audits
A 3	<b>Transport policy measure (TPM)</b>	Park & Ride systems (urban)
A 4	<b>Description of TPM</b>	Park and ride systems (P&R) are parking facilities at the periphery of cities linked to public transportation. Hence, urban / suburban trips do not have to be entirely performed by car and can partly be conducted by bus or other modes of public transport. Park and ride mostly aims at commuters but is also made for people who make irregular trips to the inner city as well as tourists. The concept targets to improve the accessibility of people which are poorly connected to public transportation and therefore are reliant upon the usage of a car.
A 5	<b>Implementation examples</b>	- EC Smile Project: Park and Ride System in Prague, Czech Republic in 2001 [1] - Park and ride system in Greater Manchester [8]
A 6	<b>Objectives of TPM</b>	- Reduction vehicles in the inner city and thus a reduction of congestion. - Reduce the number of parking facilities in the inner city. - Achieve modal shift to public transport by integrating it with private car use. [4]
A 7	<b>Key changes concerning:</b>	
A 7.1	- Choice of transport mode / Multimodality:	- Increase of multimodality - Choice of transport mode is not definite: Some (exclusive) car users will use the park and ride system and travel part of their journey by public transportation. Concerning people, which used public transportation systems so far, the convenience of the parking spaces close to the station reveals the opportunity to partly use the car for the trip.
A 7.2	- Origin and/or destination of trip:	P&R facilities instead of city center
A 7.3	- Trip frequency:	Slight increase number of leisure trips with city relevance.
A 7.4	- Choice of route:	Dependent on the location of park and ride facilities.
A 7.5	- Timing (day, hour):	No impact
A 7.6	- Occupancy rate / Loading factor:	Increase of public transport occupancy rates
A 7.7	- Energy efficiency / Energy usage:	Depends on the overall vehicle mileage, which is difficult to determine. Likely higher energy efficiency due to increased public transport usage and less energy consumption.
A 8	<b>Main source</b>	[4] [6] [7]

B IMPACTS																					
B 1	<b>OVERVIEW ON IMPACTS</b>	AFFECTED SEGMENTS													Geographical level		Source				
		Passengers					Transport operators							1st level	2nd level	Source of assessment	Spatial level of source				
		Road	Rail	Air	Public transport	Slow modes	Road	Rail	IWW	Air	Maritime	Public transport	Employees in transport	Residents	Economy	Public bodies	Society				
B 1.1	<b>Summary</b>																				
		The measure reduces traffic in the inner city and increases it in the non urban areas. This means positive effects on health, safety, emissions and land use (parking spaces) in the inner city, but has the opposite effect on the surrounding (sub-)urban areas. The effect on absolute vehicle mileage is difficult to determine.																			
B 1.2	<b>Summary: Income groups</b>																				
B 1.3	<b>Summary: Age groups</b>	Due to reduced traffic in the inner city the measure has a positive effect on the safety of children and elderly.																			
B 1.4	<b>Summary: Disabled people</b>																				
B 1.5	<b>Summary: Gender groups</b>																				
B 1.6	<b>Summary: Ethnic groups</b>																				

B 2 TRAFFIC IMPACTS																					
		AFFECTED SEGMENTS													Geographical level		Source				
		Passengers					Transport operators							1st level	2nd level	Source of assessment	Spatial level of source				
		Road	Rail	Air	Public transport	Slow modes	Road	Rail	IWW	Air	Maritime	Public transport	Employees in transport	Residents	Economy	Public bodies	Society				
B 2.1	Travel or transport time																	R	L	E	
B 2.2	Risk of congestion																	R	L	E	N
B 2.3	Vehicle mileage																	R	L	E	N
B 2.4	Service and comfort																	L	L	E	
B 2.I	<b>Overall impacts on social groups</b>																				
B 2.II	<b>Implementation phase</b>																				
B 2.III	<b>Operation phase</b>																				
B 2.IV	<b>Summary / comments concerning the main impacts</b>	- The effect on vehicle mileage is ambiguous, there are several effects that increase or reduce the vehicle mileage, depending on the specific area: Inner city: The TPM is expected to reduce traffic in the inner city and reduced congestion. Whether congestion is really reduced depends on how much induced traffic occurs due to the freed road capacity. [3] [4] Whether a reduction of traffic occurs also depends on the available parking space in the inner city. [4] Park and ride might, due to the increased convenience (concerning parking possibilities and avoidance of congestion) induce (leisure) traffic to the inner city. [4] [6] - An increase in traffic occurs in the suburban areas, especially around the park and ride facilities. This is enhanced by public-transport and slow mode users switching to park and ride and thus using a car. [3] But the negative impact on congestion is smaller than the positive impact in the inner city. [3] [4] The new trips to the park and ride facilities might be longer than trips to the city centre, but empirical evidence indicates that even with some longer trips, the overall vehicle mileage of the P&R trips decrease in comparison to the trips made before. [6] Considering urban and non-urban areas, the reduction of vehicle mileage of cars is expected to be larger than the additional mileage of the P&R-buses [3], but they are high frequent and thus have often a low load factor. [6] This indicates, that then effect on vehicle mileage for all modes can not be determined. - The travel and transport time of road users is expected to increase, because of an additional mode shift. The very transport time on road infrastructure is not affected.																			
B 2.V	<b>Quantification of impacts</b>	- Case study of seven UK cities of traffic implications of the installment of short-range bus-based park and ride opportunities: The traffic avoided in case studies, where reduction occurred, ranged between 1.1 car-km per intercepted car (Brighton) to 6 car-km (Shrewsbury). [3] - Case study of seven UK cities: removed/redistributed traffic outside urban area: The range of traffic redistribution per intercepted car is between 1.5 car-km (Reading) to 6 car-km (Cambridge). [3]																			

B 3 ECONOMIC IMPACTS																					
		AFFECTED SEGMENTS													Geographical level		Source				
		Passengers					Transport operators							1st level	2nd level	Source of assessment	Spatial level of source				
		Road	Rail	Air	Public transport	Slow modes	Road	Rail	IWW	Air	Maritime	Public transport	Employees in transport	Residents	Economy	Public bodies	Society				
B 3.1	Transport costs																	L	R	E	
B 3.2	Private income / commercial turn over																	L	R	E	
B 3.3	Revenues in the transport sector																	L	R	E	
B 3.4	Sectoral competitiveness																	L	R	E	
B 3.5	Spatial competitiveness																	R	L	S	N
B 3.6	Housing expenditures																	R	L	S	N
B 3.7	Insurance costs																	R	L	S	N
B 3.8	Health service costs																	R	L	S	N
B 3.9	Public authorities & adm. burdens on businesses																	R	L	S	N
B 3.10	Public income (e.g.: taxes, charges)																	L	R	E	
B 3.11	Third countries and international relations																	L	R	E	
B 3.I	<b>Overall impacts on social groups</b>																				
B 3.II	<b>Implementation phase</b>																				
B 3.III	<b>Operation phase</b>																				
B 3.IV	<b>Summary / comments concerning the main impacts</b>	- Increase of spatial competitiveness concerning local businesses and shops compared to those of a town nearby, but without park and ride facilities. [4] - The public bodies have to subsidise the parking spaces (in good location), as these are expensive and not be accepted otherwise, thus in fact subsidises car owners. [4] Some P&R spaces can even be used for free. At the same time, this reduces the need for urban road maintenance and construction, which reduces costs. [4] - The impact on transport costs depends on the implemented scheme. - Effects on public income: Less charges due to reduction of parking fees, higher revenues for public transport services.																			
B 3.V	<b>Quantification of impacts</b>																				

B 4	SOCIAL IMPACTS	AFFECTED SEGMENTS													Geographical level		Source							
		Passengers					Transport operators								Employees in transport	Residents	Economy	Public bodies	Society	1st level	2nd level	Source of assessment	Spatial level of source	
		Road	Rail	Air	Public transport	Slow modes	Road	Rail	IWW	Air	Maritime	Public transport												
B 4.1	Health (incl. well-being)																				L	R	S	N
B 4.2	Safety	↘				↗															L	R	S	N
B 4.3	Crime, terrorism and security	↘																						
B 4.4	Accessibility of transport systems	↘																						
B 4.5	Social inclusion, equality & opportunities																							
B 4.6	Standards and rights (related to job quality)																							
B 4.7	Employment and labour markets																				L	R	E	
B 4.8	Cultural heritage / culture																							
B 4.I	<b>Overall impacts on social groups</b>	Especially children and elderly profit from increased safety due to less traffic in inner cities.																						
B 4.II	<b>Implementation phase</b>																							
B 4.III	<b>Operation phase</b>																							
B 4.IV	<b>Summary / comments concerning the main impacts</b>	<p>- The reduced traffic in the inner city has positive effects on the safety, especially on the (more vulnerable) slow mode users as there are more pedestrians and cyclists in the inner city.</p> <p>- Growing traffic in non urban areas increases accidents, especially the average traffic speed in non urban areas is higher than in urban areas. [7]</p> <p>- The reduced traffic in inner cities has a positive effect on health for urban residents, the increased traffic in the non urban areas an negative effect for the residents in those areas. [7]</p> <p>- 3rd level impact: Park and ride systems can decrease vehicle mileage of passenger cars, which reduce the need for maintenance for cars. This means that passenger cars will require less maintenance which will negatively affect car repair shops.</p>																						
B 4.V	<b>Quantification of impacts</b>																							

B 5	ENVIRONMENTAL IMPACTS	AFFECTED SEGMENTS													Geographical level		Source							
		Passengers					Transport operators								Employees in transport	Residents	Economy	Public bodies	Society	1st level	2nd level	Source of assessment	Spatial level of source	
		Road	Rail	Air	Public transport	Slow modes	Road	Rail	IWW	Air	Maritime	Public transport												
B 5.1	Air pollutants																				R	L	S	
B 5.2	Noise emissions																				R	L	S	
B 5.3	Visual quality of the landscape																				L	R	S	N
B 5.4	Land use																				L	R	S	N
B 5.5	Climate																				I		E	
B 5.6	Renewable or non-renewable resources																							
B 5.I	<b>Overall impacts on social groups</b>																							
B 5.II	<b>Implementation phase</b>																							
B 5.III	<b>Operation phase</b>																							
B 5.IV	<b>Summary / comments concerning the main impacts</b>	<p>- The reduced traffic in inner cities reduces air pollutant and noise, while the traffic in the non urban areas increases air pollutants and noise. [7]</p> <p>- As it is difficult to determine the overall effect on the vehicle mileage, the effect on CO2 emissions and thus the effect on the climate is not definite.</p> <p>- Negative impact on the visual quality of the landscape as well as land use for the peripheral areas. [4] The latter includes the direct negative impact on land use due to large parking spaces near the stations, which are costly and could be used otherwise and furthermore fostering the urban sprawl. [3] [5]</p> <p>- Positive impact on land use for the urban area as it opens former parking space for other uses. [4]</p>																						
B 5.V	<b>Quantification of impacts</b>																							

**C REFERENCES**

C 1	Other TPMs of this subcategory	
C 2	References	<p><b>International</b></p> <p>[1] European Commission Energy: <a href="http://www.managenergy.net/resources/771">http://www.managenergy.net/resources/771</a> (accessed on 16.01.2012)</p> <p>[5] Oxford et al. (2010). OPTIC Deliverable 1: Inventory of measures, typology of non-intentional effects and a framework for policy packaging</p> <p><b>National</b></p> <p>[2] Whitfield, Cooper (1998): The travel effects of park and ride, in Public Transport Planning and Operations. Proceedings of Seminar F held at the European Transport Conference, Loughborough University, England, 14-18 September 1998. Volume P425</p> <p>[3] Parkhurst (2000): Influence of bus-based park and ride facilities on users' car traffic, in: Transport Policy 7, p. 159-172</p> <p>[4] Department for Regional Development, Transport Policy Division (2011): Strategic review of park and ride: Report of the park and ride project group, UK</p> <p>[6] Meek, Ison and Enoch (2007): Park and ride: Lessons for the UK experience, Proceedings of 87th Annual Meeting of the Transportation Research Board. Paper 08-0730. Washington DC, January 2008</p> <p>[7] KonSULT: Policy Instruments: A Policy Guidebook, Park and ride: Evidence on Performance, <a href="http://www.konsult.leeds.ac.uk/private/level2/instruments/instrument035/12_035c.htm">http://www.konsult.leeds.ac.uk/private/level2/instruments/instrument035/12_035c.htm</a> (accessed 16.02.2012)</p> <p><b>Regional / Local</b></p> <p>[8] Transport for Greater Manchester: Greater Manchester's third Local Transport Plan 2011/12 – 2015/16, <a href="http://www.tfgm.com/ftp3/documents/Greater_Manchester_Local_Transport_Plan_Core_Strategy.pdf">http://www.tfgm.com/ftp3/documents/Greater_Manchester_Local_Transport_Plan_Core_Strategy.pdf</a> (accessed 16.02.2012)</p>