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# SWOV Fact sheet

## Mobility management and road safety

### Summary

Mobility management stands for organizing 'smart travel' and focuses on reducing the amount of car mobility (particularly during peak hours) by stimulating travellers to refrain from travelling (telecommuting), to travel at a different time of day (avoiding peak hours) or to choose a different means of transport. Mobility management should result in, for instance, improved accessibility and less environmental impact; road safety is hardly mentioned as an objective. Mobility management can include many measures, so that it is difficult to arrive at generic statements about its effects. Yet, it has been shown that measures that can be seen as mobility management can reduce congestion during peak hours. Not much research has been carried out into the road safety effects of mobility management measures.

### Background and content

The concept of mobility management was first introduced in the late 1990s (Goudappel Coffeng, 2006); nowadays it is a frequently used term. Mobility management includes measures such as the construction of park-and-ride facilities, the encouragement of telecommuting and the Spitsmijden project. 'Spitsmijden' is the Dutch term for 'avoiding peak traffic'. These measures are often taken in order to improve traffic flow, but they can also have an effect on road safety. Road safety could also be taken into account more pro-actively when mobility management measures are being considered.

This fact sheet will examine the relation between mobility management and road safety, but will first discuss how to define mobility management and its effects.

### What is mobility management?

Various definitions of the term mobility management circulate. Frequent use is made of the definition established by the knowledge centres within the Mobility Management Knowledge Alliance (CROW, KpVV, RWS-AVV, SenterNovem and VM2)<sup>1</sup>. The summary definition is as follows: "Mobility management is the organizing of smart travel." (Goudappel Coffeng, 2006). The extensive definition is as follows:

*"Mobility management stands for organizing smart travel. Since the car cannot solve all problems, the traveller is encouraged to use alternatives such as bicycle, use of P+R, or telecommuting. Requirements and wishes of people travelling take up key position and the focus is on customized solutions. Governments, employers, crowd-pullers and mobility facility providers together organize the prerequisites that travellers can choose from."*

On the website of NL Agency (2011) the following description of mobility management can be found: *"Mobility management is the encouragement of deliberate handling of mobility. Mobility management can help reduce the expected growth in passenger mobility, make better use of the current infrastructure and make it easier to reach locations."*

Mobility management therefore focuses on reducing the amount of car mobility (particularly during peak hours) by stimulating travellers to refrain from travelling (telecommuting), to travel at a different time of day (avoiding peak hours) or to choose a different means of transport. Reduction of the number of car kilometres is no aim in itself, but should result in greater accessibility and less environmental impact, for instance.

<sup>1</sup> CROW: Information and Technology Platform for Infrastructure, Traffic, Transport and Public space.

KpVV: Knowledge Platform for Traffic and Transport.

RWS-AVV: Directorate-General for Public works and Water Management, Transport Research Centre (since 2007 Centre for Transport and Navigation DVS).

SenterNovem (now part of NL Agency).

VM2: Association for Mobility Management.

### Which parties are involved in mobility management?

Various parties are involved in mobility management: governments, employers, and travellers. These parties may pursue different objectives with mobility management. For instance, travellers like to travel to their destinations as quickly, cheaply and comfortably as possible, whereas governments are mainly interested in accessibility and environment. Employers, for example, prefer to limit the expenses, to be esteemed employers or to be socially responsible entrepreneurs.

These last few years, associations (often regional or local) have been established to shape mobility management more fully. A national association in the Netherlands is the Smart Work Smart Travel Platform (Slim Werken Slim Reizen) ([www.slimwerkenslimreizen.nl](http://www.slimwerkenslimreizen.nl)). This initiative follows on the Mobility Management Taskforce established in 2007. The ambition of the platform is that 'smart work, smart travel' will be possible for one million people by the end of 2012. This way they intend to improve accessibility in the Netherlands.

In practice, mobility management in the Netherlands mainly focuses on mobility of employees. The outlook in other countries is wider. There, it also includes the mobility of residents, taking children to and from school, and event-related mobility.

### Which measures are included in mobility management?

A great many measures and instruments can be included in mobility management and be divided into various categories. *Table 1*, for example, provides an overview of categories of measures distinguished by the Knowledge Platform for Traffic and Transport (KpVV) (2007).

Category	Measures
Employers	Stimulating smart work & smart travel by the government, the New World of Work, carpooling and vanpooling, adjusting working hours or visiting hours
Bicycle	Bicycle parking, bicycle route network
Parking and P+R	Parking policy, P+R areas and facilities
Public transport	Price differentiation for bus, tram and metro, financially contributing to transport, free public transport pass during special events
Information and communication	Travel and parking information, education and influencing behaviour, commercial mobility services
Other	Shared car use, social safety

Table 1. *Mobility management measures (KpVV, 2007).*

The Netherlands Institute for Transport Policy Analysis (KiM) (Savelberg & Korteweg, 2011) uses a different distinction with the following types of measures:

- Measures that encourage travelling at another time of day;
- Measures that encourage choosing another mode of transport other than the car;
- Measures that focus on organizing greater cooperation between parties. This may imply customized mobility, area-oriented approach and covenants;
- Measures (such as work and ICT facilities) enabling full productivity without driving a car during peak hours (The New World of Work).

### What are the mobility effects of mobility management?

Since mobility management can include many measures, it is difficult to arrive at generic statements about the effects of mobility management. The KpVV SumoBase ([www.kpvv.nl/sumobase](http://www.kpvv.nl/sumobase)) provides an overview of projects with respect to mobility management and of evaluations of these projects. This fact sheet will discuss results of joint inventories and more general evaluations.

KpVV (Martens, Zuiver & Reiding, 2005) drew up an inventory of a number of evaluations with respect to mobility management and, in doing so, focused on an area-oriented (rather than a more generic) approach of mobility management. In the study five areas are mentioned where mobility management may show positive results: 1) accessibility, 2) economy, 3) quality of life, 4) safety, and 5) justice. It shows from this study that mobility management is particularly successful when various parties benefit from it (for instance, governments, employers, 'crowd-pullers' such as hospitals and theme parks); in

other words, when it is a win-win situation. The benefits can differ between parties: governments are often interested in accessibility and environment, whereas employers are interested in cost management for instance.

Twynstra Gudde & MuConsult (Henstra et al., 2005) drew up an overview of the quantitative effects of known measures that can be considered as part of mobility management<sup>2</sup>. They use the degree in which a measure reduces car mobility during peak hours as an indicator for the effectiveness. For instance, shared car use results in a reduction of the number of car kilometres during peak hours of 13 to 33% among participants, telecommuting in 34% fewer car kilometres during peak hours among telecommuters and transport management in 10 to 15% reduction in car usage with organizations involved: for instance, companies that provide alternative means of transport, stimulate carpooling or provide bicycle (parking) facilities. The Twynstra Gudde & MuConsult report also provides insight into the potential of the measures: the effectiveness when the measure is applied and distributed as widely as possible. According to this overview, the most promising measures are: carpooling, encouraging bicycle use, chain mobility and telecommuting (SER, 2006).

In 2010, the Centre for Transport and Navigation (DVS) carried out a policy evaluation of the previously mentioned Mobility Management Taskforce (2007-2010). The mission of this Taskforce was to achieve a more wide-ranging application of mobility management for commuter traffic and commercial transport, by voluntary employer commitment to agreements at the national level and in regions (Korver et al, 2011). One of the objectives of the Taskforce was that the measures agreed upon would reduce the number of peak-hour kilometres of cars by 5%. The DVS policy evaluation shows that the Mobility Management Taskforce was also capable of initiating mobility management in a large number of regions. Moreover, it shows that the Taskforce resulted in a 1.5% reduction of the number of car movements during peak hours; employees of companies involved in the Taskforce reduced car movements by 2%, whereas with other companies this amounted to an average of 0.5% (DVS, 2010). According to DVS (2010), the reduction in the number of car kilometres will be similar.

The Netherlands Institute for Transport Policy Analysis (KiM) provided an overview of effects of measures that belong to 'smart use' (Savelberg & Korteweg, 2011). According to the overview, mobility management results in a maximum of 5% congestion reduction on the main road network (expressed in lost vehicle hours due to congestion during peak hours). Yet, they comment that the measures belonging to mobility management may overlap other types of 'benefit measures', such as tax and price measures. The specified effect of a maximum of 5% is the 'additional' effect of mobility management.

The *Mobility Management Monitors Netherlands 2011* (Metz, 2011) provides an overview of the state of affairs with respect to mobility management in the Netherlands. The effects of a number of concrete projects are dealt with. For instance, the Utrecht Bereikbaar (Utrecht Accessible) project resulted in a reduction of 5,000 cars during peak hours per day, according to Metz. E-bike- and e-scooter campaigns in Rotterdam resulted in 10% of the 950 participants now using an e-bike, so that 133,000 fewer car kilometres per year will be travelled. According to Metz, mobility budgets<sup>3</sup> result in a reduction of car mobility of 3 to 6% per employee.

### **What does mobility management mean for road safety?**

Road safety is hardly mentioned in the publications about mobility management. KpVV (Martens, Quiver & Reiding, 2005) mentioned 'safety' as one of the five areas that could benefit from mobility management. Road safety is mentioned as one of the subdivisions of safety, in addition to external safety and social safety. However, Martens, Zuiver & Reiding (2005) commented that in practice social safety is focused on. For example, when stimulating other transport modes, it is unpleasant to ride a bicycle on an unlit bicycle track in the dark from a social safety point of view. So, in general, road safety is hardly a reason for mobility management, although road safety plays a role in certain projects. For instance, shuttle buses for the transport of shift workers may partly be used because night workers may be tired at the end of their shift, so that it is hazardous to let them drive home on their own.

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<sup>2</sup> They define mobility management as a collection of measures to improve location accessibility.

<sup>3</sup> With the mobility budget, employees are free to choose the means of transport with which they prefer to travel for their company. The money saved by employees by not always travelling by (lease) car can be exchanged for extra days off, a tax-free bicycle or other facilities.

Not much is known about the effects of mobility management on road safety either; as far as known, this has not been studied in the Netherlands. Savelberg & Korteweg (2011) pay attention to road safety effects in their inventory of 'utilization measures'. The 'mobility management' measure scores 0 on safety, implying that the measure has no or only limited effect on road safety. Moreover, they comment that in general an increase in vehicle kilometres results in an increase in casualties, that travelling with public transport is safer than with other modes of transport and that a transition from the modal split to more vulnerable transport modes may result in more road casualties.

On the other hand, road safety effects of mobility management have been studied in Canada (Littman & Fitzroy, 2012). This study concludes that mobility management can have a positive effect on road safety. However, they comment that the research was rather limited and that the findings have no more than a provisional and general character. According to Littman & Fitzroy, measures for the purpose of reducing the number of car kilometres or encouraging people to use other modes of transport consequently result in a lower crash rate. According to them, a shift from car kilometres during peak hours to periods outside peak hours results in a decrease in the number of crashes, but possibly to an increase in the severity of the crashes as a result of higher speeds.

In the past, SWOV took a number of initiatives to focus attention on road safety during the development of mobility policy. These initiatives are discussed in the report *Integral road safety policy: what, in fact, is it?* (Doumen et al., 2010). The report discusses various measures that qualify as mobility management. For instance, SWOV advised the Ministry of Transport and Public Works (currently Infrastructure and Environment) to carry out an assessment of the road safety effect of *Different Payment for Mobility*. This advice resulted in a study (Schemers & Reurings, 2009) that concluded that the number of fatalities and casualties would decrease by 3.7 to 6.9% as a result of *Different Payment for Mobility*. Another measure mentioned by Doumen et al. (2010) concerns encouraging bicycle use. Increased bicycle use, at the expense of car transport, is not automatically favourable for road safety. A study into the substitution of short car rides for bicycle rides (Stipdonk & Reurings, 2010) shows a negative effect on road safety. According to Doumen et al. (2010), a safe infrastructure for cyclists is necessary to avoid negative consequences for road safety. Yet, substituting car rides for use of public transport is by definition favourable for road safety, according to Doumen et al. (2010). However, attention should be paid to proper construction of the infrastructure around stations and boarding areas to enable safe arrival and follow-up transport.

Attention is also paid to the link between road safety and mobility management in the report *Sustainable Mobility: also point out the road safety effects* (Schoon, 2011). According to this report, mobility management is one of the areas for interventions in the context of Sustainable Mobility. According to Schoon (2011), road safety is mainly implicitly involved in mobility management, because the measures often have such an effect on mobility that this is favourable for road safety. For instance, the risk of a crash diminishes with a decrease in mobility (due to, for instance, telecommuting, peak-hour avoidance or carpooling). As Doumen et al. (2010) had already commented, road safety also benefits from a shift in road kilometres towards public transport kilometres. According to Schoon (2011), road safety can further benefit when Sustainable Mobility explicitly pays attention to road safety. By taking additional measures, further casualties can be prevented, without this being at the expense of the traffic flow or the environment. Schoon (2011) argues in favour of road safety becoming a standard aspect in the decision-taking procedure about Sustainable Mobility in future. Furthermore, it is advisable to express the road safety effect of (extra) mobility management measures in the decreased number of casualties, according to Schoon (2011).

The publications mentioned above mainly discuss the role of the government. In addition, companies should also include road safety in their choices with respect to mobility management. Companies are also financially affected when an employee is killed or becomes disabled as a result of a crash during working hours. According to Venema & Bakhuys-Roozeboom (2011), employers often lack the insight into the expenses that are the result of work-related road crashes. In addition to costs of absence, there are also expenses due to damages, fines and image damage. When making decisions with respect to mobility management, companies could take these expenses into account.

A concrete example of road safety and mobility management potentially going hand in hand is taking children to and from elementary schools. Many parents take their children to school by car, so that a great deal of traffic converges around the school in a short time, whereas the capacity of the roads is insufficient for this purpose and not enough parking facilities are available. Mobility management could

increase road safety. However, so far, mobility management in the Netherlands has focused on the mobility of employees.

## Conclusions

Mobility management stands for organizing 'smart travel' and can include many measures; it is therefore difficult to arrive at generic statements about its effects. However, a number of inventories have shown that measures that can be qualified as mobility management, can reduce the number of peak-hour kilometres. Road safety is hardly mentioned in publications about mobility management. Moreover, hardly any research is carried out into the road safety effects of mobility management measures. Various studies focus on the option for government and companies alike to take road safety into account as a rule when taking decisions with respect to mobility management.

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