



To

From

Telephone

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Enclosure(s)
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Subject

Requirement Specification 'Anders Betalen voor Mobiliteit'
Version: 0.2 (draft)

Introduction

This document is a first draft version of the requirement specification for 'Anders Betalen voor Mobiliteit' (ABvM), the Dutch system for pricing per kilometre [1]. As such, this document will be used for the first round of the market consultation, scheduled in April and May 2006. Hence, the target audience for this requirement specification are those organisations that have registered for this market consultation and fulfil the minimum standards set for registration. The market consultation will result in a 'cost monitor'. This 'cost monitor' details the costs for development, implementation, operation and enforcement of the road pricing system in relation to the required functionality of the system.

Starting point for the requirement specification is an electronic road pricing system with a charge per distance travelled based upon time, location and vehicle characteristics. A road pricing system with these characteristics is described in report 'Nationaal Platform Anders Betalen voor Mobiliteit' [2] as 'variant 5'. The implicit requirements of variant 5 are transformed into more explicit requirements to further analyse the cost driving factors of this policy option and explore alternative solutions to reduce the total costs of the system.

Objective of the requirement specification and relation to the 'kostenmonitor'

A detailed cost calculation of 'variant 5' as described in the report 'Nationaal Platform Anders Betalen voor Mobiliteit' has been conducted [3],[4]. The 'cost monitor' is aimed to verify the previously conducted calculations and update the calculations with respect to the progress of industry. Furthermore, the 'cost monitor' will analyse the cost driving

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factors of the road pricing system and explore possible alternative solutions to reduce the cost of the system.

Feasible alternatives, offering similar functionality at significantly lower cost, may be incorporated in the next versions of the requirement specification. The outcome of the 'cost monitor, is therefore directly related to the development of the detailed requirement specification.

We therefore explicitly invite registered organisations to present their views on the requirements, rationales and questions raised in this document by means of a presentation. Furthermore, we explicitly encourage the registered organisations to present different or alternative points of view on the requirements, rationales and questions. Depending on the background of the registered organisation, one may either choose to discuss all requirements mentioned in this document or make a selection based upon their specific areas of expertise.

By following this process, it is ensured that the knowledge of consulted organisations is adequately incorporated in the development process of the requirement specifications.

Structure of this document

Each requirement is described in general, functional terms. The wordings of the requirements suggest, by using the word 'shall', that a strict interpretation of the requirement is demanded. At this stage however, a less strict interpretation is permitted.

A rationale is given for each requirement. This rationale provides a background for the abovementioned requirement and also gives, where applicable, the interpretation of this requirement in relation to 'variant 5'.

Each requirement includes questions to registered organisations. These questions are divided in two parts. Firstly, the registered organisations are requested to give their view on the requirement and rationale as described (variant 5), in terms of functionality and associated costs (development costs, operational costs and costs for enforcement). Secondly, the registered organisations are encouraged to provide alternative solutions to fulfil the requirements and describe the benefits of the alternatives mentioned, also in terms of functionality, risks and costs.

Terminology in this document

The following terminology is used in the document:

- Road pricing system ('kilometerprijs'): the overall system for direct charging related to the distance travelled with a vehicle, time, location and vehicle characteristics.
- Road user charging: the process of direct charging related to the distance travelled with a vehicle, time, location and vehicle characteristics.
- Charge: price to be paid per distance travelled with a vehicle, time, location and vehicle characteristics.



The terminology mentioned above is commonly used by organisations in the area of road pricing and generally accepted by the industry. Given the objective of this document, i.e. a document for market consultation, this terminology is adopted.

Background information

The following documents ([1] to [4] in Dutch) have been consulted for this requirement specification:

- [1] Nota Mobiliteit, deel 1 t/m 4
- [2] Nationaal Platform Anders Betalen voor Mobiliteit, May 2005
- [3] Het Kan!, 14 June 2005
- [4] Het Kan! (Bijlagenrapport), 14 June 2005
- [5] European directive on the interoperability of electronic road toll systems (2004/52/EC)



System functionality	
Requirement [1]	Road user charging shall be based upon the distance travelled with a vehicle in the Netherlands.
Rationale	All distance travelled driven will be charged. This is the basis of the road pricing system.
Question	Organisations are requested to present their views upon the relationship between an accurate measurement of the distance travelled and the associated costs. Organisations are encouraged to present alternative methods for measuring distance travelled, e.g. with different levels of accuracy, and to specify the (financial) benefits of the alternatives.
Requirement [2]	Road user charging shall be differentiated on the basis of time .
Rationale	The charge per distance travelled will vary during the time of day and/or on specific dates.
Question	Organisations are requested to present their views upon the relationship between an accurate measurement of the time in relation to road usage and the associated costs. Organisations are encouraged to present alternative methods for charging based on time differentiation, e.g. with different levels of accuracy or time intervals, and to specify the (financial) benefits of the alternatives.
Requirement [3]	Road user charging shall be differentiated on the basis of the location of the vehicle.
Rationale	The charge per distance travelled will vary based upon the location of the vehicle. This requires an accurate positioning of the vehicle on all different roads in the Netherlands. The combined charge based upon distance travelled, see requirement 1, and location shall have an accuracy of at least 99% .
Question	Organisations are requested to present their views upon the relationship between an accurate measurement of the location of the vehicle and the associated costs. Organisations are encouraged to present alternative methods for charging based on location differentiation, e.g. with different levels of accuracy, and to specify the (financial) benefits of the alternatives.



Requirement [4]	Road user charging shall be differentiated on the basis of vehicle characteristics .
Rationale	The charge per distance travelled will be based upon the environmental vehicle characteristics, e.g. environmentally friendly vehicles will be charged less. New vehicle characteristics may be added in the future for further differentiation in road user charging.
Question	Organisations are requested to present their views upon the relationship between charging based on a classification of environmental vehicle characteristics and the associated costs. Organisations are encouraged to present alternative methods based on a classification of environmental vehicle characteristics and to specify the (financial) benefits of the alternatives.
Requirement [5]	Road user charging shall be introduced on all roads in the Netherlands.
Rationale	The objective of the road pricing system is charging on all roads in the Netherlands, including roads on private territory.
Question	Organisations are requested to present their views upon the relationship between an accurate measurement of the distance travelled in combination with an accurate positioning of the vehicle on all roads in the Netherlands and the associated costs. Organisations are encouraged to present alternative methods for charging distance travelled with the required location accuracy and to specify the (financial) benefits of the alternative. Organisations are encouraged to present alternative implementation scenarios for road user charging on all roads and to specify the (financial) benefits and risks of the alternatives.
Requirement [6]	The road pricing system shall have adequate flexibility in its design to allow changes in the parameters for road user charging as mentioned in requirements [1] to [5].
Rationale	The road pricing system will be durable and will be able to cope with changes in the parameters on which the charge is based. The system to be developed shall be able to react to such changes in a flexible and efficient way.
Question	Organisations are requested to present their views upon the relationship between the required flexibility in design and the associated risks and costs.



Requirement [7]	The road pricing system shall be ' free-flow '.
Rationale	The road pricing system shall not require stopping or slowing down the vehicle for charging.
Question	Organisations are requested to present the characteristics of a free-flow system with the required flexibility in design and the associated risks and costs.
Users	
Requirement [8]	All road users shall be charged for road use.
Rationale	Road users are defined as drivers of motor vehicles with number plates, comprising motorcycles, cars, trucks and buses.
Question	Organisations are requested to present their views upon the relationship between charging of all road users and the associated costs. Organisations are encouraged to present alternative implementation scenarios for road user charging of all road users, e.g. first trucks and buses, followed by cars and motorcycles in a later stage with the possibility to make exceptions for special vehicles, and to specify the (financial) benefits of the alternatives.
Requirement [9]	The road pricing system shall include possibilities/facilities to charge occasional road users .
Rationale	All distance travelled shall be charged, therefore additional facilities are needed for charging of occasional road users, not equipped with a compliant On Board Unit. <ul style="list-style-type: none"> • Vienna convention: Non-equipped users must be admitted to the network. • EU-legislation: equal treatment of all users (equipped and non-equipped) and no trade barriers.
Question	Organisations are requested to present their views upon their solutions for charging occasional users and the associated costs. Organisations are encouraged to present alternative implementation scenarios for charging occasional users to specify the (financial) benefits of the alternative.



Requirement [10]	The road pricing system shall include possibilities/facilities to charge road users with foreign number plates .
Rationale	Road users with foreign number plates include occasional road users (e.g. holidaymakers) and frequent foreign road users (e.g. business travellers). Road user charging in relation to the Eurovignet regulations for trucks will be taken into account.
Question	Organisations are requested to present their views upon their solutions for charging road users with foreign number plates and the associated costs. Organisations are encouraged to present alternative implementation scenarios for charging road users with foreign number plates and to specify the (financial) benefits of the alternatives.
Technological requirements	
Requirement [11]	The road pricing system shall comply with the European directive on the interoperability of electronic road toll systems (EU-directive 2004/52/EC)
Rationale	The European directive stipulates, amongst others, the technological solutions for carrying out electronic toll collections. One or more of the following technologies shall be used: <ul style="list-style-type: none"> • satellite positioning • mobile communications using the GSM/GPRS standard (GSM TS 03.60/23.060) • 5,8 GHz microwave technology
Question	Organisations are requested to demonstrate that their proposed solution(s) comply with the European directive and to indicate the associated costs. Organisations are encouraged to present their views upon the requirements as stipulated in the abovementioned European Directive.



Requirement [12]	The road pricing system shall be sufficiently reliable to ensure correct and adequate road user charging.
Rationale	<p>Correct and adequate functioning of the system increases user-friendliness of the system and improves user-acceptance. The reliability requirements are as follows:</p> <ul style="list-style-type: none"> • correct charging (within 1% accurate): >99% of all invoices • over charging: < 0.1% of all invoices • Mean Time Between Failure of the On Board Unit: 25 years
Question	<p>Organisations are requested to present their views upon the reliability of their solutions and the associated costs.</p> <p>Organisations are encouraged to present alternative reliability scenarios for their solutions and to specify the (financial) benefits of the alternatives.</p>
Requirement [13]	<p>The road pricing system shall be sufficiently reliable to ensure correct and adequate road user charging.</p> <p>In particular:</p> <ul style="list-style-type: none"> • the road pricing service organisation shall be adequately protected against loss of income due to system failure
Rationale	<p>Correct and adequate functioning of the system ensures that revenues are secured. The reliability requirements are therefore high:</p> <ul style="list-style-type: none"> • System availability: >99% • Service window: 7x24h <p>These reliability requirements shall result in securing at least 99% of all possible revenues.</p>
Question	<p>Organisations are requested to present their views upon the reliability of their solutions and the associated costs.</p> <p>Organisations are encouraged to present alternative reliability scenarios, e.g. with different service windows, for their solutions and to specify the (financial) benefits of the alternatives.</p>



Requirement [14]	The road pricing system shall adequately protect its users against discomfort .
Rationale	A reliable system will enhance user-acceptance of the system and reduce operational costs. The reliability requirement in relationship to the discomfort of users is defined as follows: <ul style="list-style-type: none"> • A justified claim by a single user, with respect to experienced discomfort, such as a required visit to a workshop or service call due to mal-functioning, shall (on average) occur no more than once every 10 years.
Question	Organisations are requested to present their views upon the reliability of their solutions and the associated costs. Organisations are encouraged to present alternative reliability scenarios for their solutions and to specify the (financial) benefits of the alternatives.
Requirement [15]	The actual costs for driving (road charge) shall be visible in the vehicle .
Rationale	A visible feedback of the actual charging tariff to the user will enhance awareness and user-acceptance of the system.
Question	Organisations are requested to present their views upon solutions for displaying the actual costs for driving in the vehicle and the associated costs. Organisations are encouraged to present alternative solutions for offering charging information to road users and to specify the (financial) benefits of the alternatives.
Requirement [16]	The road pricing system shall be sufficiently safe and easy to use (human machine interaction) to avoid dangerous behaviour and social exclusion.
Rationale	The road pricing system should, amongst others, not decrease road safety. Therefore, the use of the system should not require or lead to dangerous behaviour of users. Social exclusion is, in this context, defined as a process that causes individuals or groups, e.g. elderly drivers or disabled drivers, not being able to participate in the road pricing system.
Question	Organisations are requested to present their views upon the safety and ease of use of their solutions and the associated costs. Organisations are encouraged to present alternative scenarios with respect to safety and ease of use of for their solutions and to specify the risks and (financial) benefits of the alternatives.



Costs	
Requirement [17]	The costs for development and initial implementation of the road pricing system shall not exceed € 2,200 million
Rationale	The cost for development and initial implementation of 'variant 5' are estimated between € 2,200 million and € 4,100 million (estimate in 2005). The 'Nota Mobiliteit' states that these development costs should be significantly reduced.
Question	Organisations are requested to present their view upon the development costs of the total system. Organisations are encouraged to present alternative solutions to reduce the development costs and to specify the alternatives both technically and financially.
Requirement [18]	The annual costs for operation and enforcement of the road pricing system shall not exceed 5% of the system revenue
Rationale	The Dutch Parliament has required an efficient system with low operational costs. The target is that the costs for operation and enforcement shall not exceed 5% of the total revenue. The total revenue of the system is limited to the total sum of fixed taxes for vehicles. These taxes include 'Belasting van personenauto's en motorrijwielen' (BPM) and 'Motorrijtuigenbelasting' (MRB). This total revenue will range from 3,000ME to 7,000ME per year, depending on the amount of reduction of fixed taxes.
Question	Organisations are requested to present an overview of the annual costs of the system, as defined in the requirement specification. Organisations are encouraged to present alternative cost scenarios for their solutions and to specify the alternatives both technically and financially.
Implementation	
Requirement [19]	System developments for acceleration scenarios shall be able to migrate into the general road pricing system.
Rationale	The 'Nota Mobiliteit' describes implementations of local road pricing systems ('local toll') to finance improvements in the road infrastructure. These implementations, acceleration scenarios, will migrate into the national road pricing system.
Question	Organisations are requested to present their solutions for acceleration scenarios, the migration strategy for acceleration scenarios and the associated costs. Organisations are encouraged to present alternative implementation scenarios, including acceleration scenarios, for their solutions and to specify the alternatives both technically and financially.



Requirement [20]	The road pricing system shall be designed, developed and built in such way that different implementation scenarios can be supported.
Rationale	Due to foreseen developments, it is essential that the road pricing system can be implemented taking into account the different competences and responsibilities of the administration in the Netherlands. Furthermore, different implementation scenarios may be used to enhance user acceptance of the system.
Question	Organisations are encouraged to present their views on implementation strategies (e.g. phases for implementation: certain users, certain regions, certain roads) and the related risks and costs.
Requirement [21]	The road pricing system shall be designed, developed and built in such way that future developments can be incorporated.
Rationale	Due to foreseen developments, it is essential that the road pricing system is sufficiently 'future-proof'.
Question	Organisations are encouraged to present their views on possible future developments and how the design of their (parts of) the systems is/will be prepared for such developments.
Requirement [22]	The road pricing system shall have adequate capacity to charge the road use of 8,159,000 vehicles
Rationale	The number of 8,159,000 million vehicles is stated in the document 'Nationaal Platform Anders Betalen voor Mobiliteit', and used for the initial cost calculations of variant 5.
Question	Organisations are requested to present their solutions based upon the number of 8,159,000 vehicles. Organisations are encouraged to present their solutions based upon 10, 15 and 20 million users and to specify the costs in relation to these numbers.



Security and privacy	
Requirement [23]	<p>The road pricing system shall have adequate security measures to:</p> <ul style="list-style-type: none"> • Prevent fraudulent use of the system • Detect fraudulent use of the system • Recover from fraudulent use of the system
Rationale	<p>A high level of security of the system is required to ensure the correct functionality of the system. Protection against evasion of payment is foreseen as an important security measure.</p> <p>It shall not be possible to avoid payment in at least 99% of all transactions.</p>
Question	<p>Organisations are requested to present their views upon the security aspects of the system and the associated costs.</p> <p>Organisations are requested to present their views upon the implementation of security measures to avoid evasion of payment and the associated costs.</p> <p>Organisations are encouraged to present alternative security scenarios and to specify the alternatives both technically and financially, also taking into account the support for the system by the citizens</p>
Requirement [24]	<p>The road pricing system shall comply with national and international privacy regulations (Wet Bescherming Persoonsgegevens (WBP) and EU-directive 95/46/EC)</p>
Rationale	<p>The privacy of the road users must be adequately protected by the system. All (parts of) the system shall comply with privacy regulations.</p> <p>Starting point for the cost calculation of variant 5 is the requirement that data describing road use and behaviour of individuals should be communicated as little as possible. Therefore, variant 5 is based upon an OBU with adequate on-board data processing and security capabilities.</p>
Question	<p>Organisations are requested to demonstrate that their proposed solution(s) comply with national and international privacy regulations and the associated costs for this compliance.</p> <p>Organisations are encouraged to present alternative solutions to meet the abovementioned requirement and to specify the alternatives both technically and financially.</p>