

## **Road User Ability and Behaviour – the basis for a road user friendly road design**

Innovation project initiated by The Nordic Road Geometric Group

*The main focus of this project is to collect information on research based knowledge about physical and mental abilities of road users and create a structured overview for practical use in road design and development of Nordic road design standards.*

### **Background**

The present models for estimating capacity and choice of road design and road equipment described in the existing road design standards include parameters of road user behaviour based upon a fictive “standard road user” in the sense of physical and mental ability. The national definition of the “standard road user” is the result of a “political” decision.

From research we already know a lot of differences in physical and mental capacity/ability among different groups of road users. In some cases and in certain traffic environments, it might sometimes be relevant to take these differences into account as an integrated part of the models used for road design. To be able to do so, existing research based knowledge about the ability differences of the different road user groups as elderly and adults, children and disabled road users related to different modes of transport is being collected.

Walking speed is an example of such a parameter included in the model for design of traffic signals at intersections.

### **The aims of the project**

The project includes three main purposes:

- Collection of information on research based knowledge about physical and mental abilities for different groups of road users. The focus should be on elderly people, children and disabled road users. The collection of information must be presented as a structured overview suitable for practical use related to road design.
- Development of a new “explaining model” for road user behaviour
- Discover the lack of knowledge and define the needs for additional research

### **Project Program includes six parts**

#### *Part I: Project Introduction and Preparation*

A workshop with participation of practitioners and researchers – psychologists and engineers - was held in spring 2005 with the purpose to discuss the first project specification, clear up different questions and set up a kind of priority for the work to be done to create a consensus among partners.

#### *Part II: Physical abilities, limits and problems among different groups of road users*

This part of the project includes an international literature study with the purpose of creating an overview of research based knowledge on physical ability factors e.g. reaction time and decision time, essential visual factors, walking speed etc.

*Part III: Mental abilities, limits and problems among different groups of road users*

This part of the project includes an international literature study with the purpose of creating an overview of research based knowledge on the mental/cognitive ability factors e.g. perception of speed, distance and space; information overload and distraction; divided, selective and switching attention etc.

*Part IV: Explaining model for road user behaviour*

Quite a lot of empiric knowledge upon road user behaviour related to different traffic situations and different lay outs of road design is available in international research references. The huge amount of information is handled in the project parts II and III with the purpose of ending with a summary structured overview for practical use.

The substance in these two parts makes up the basis/foundation for development of the “Explaining Model” for road user behaviour. The model should be a frame for understanding.

The model must include a set up for fundamental ways of thinking and must define/formulate some general principles for road user behaviour. Besides, the model must be easy understandable. The intention is to create a tool for understanding and explaining the problems of road users and for specification of good and bad solutions for solving these problems. This frame for understanding should be the foundation for explaining the choice of solutions.

*Part V: Choice and location of road user information in different specific traffic environments*

This part includes cases of selected specified traffic environments. Using the results from part II – IV every case must be described as regards geometric design and traffic information to different groups of road users. Cases include roundabouts, merging lane sections, signalised intersections etc.

*Part VI: The needs of additional research based on discovering knowledge gaps*

An integrated activity of working out the preceding parts of the project will be to identify knowledge gaps and describe the needs for additional research activities.

Part II and Part III are a kind of “bottom up” activities where empirical results are summarised in the form of general conclusions while Part IV is more like a “top down” activity, where some general principles for road user behaviour are defined from general theories of human behaviour. Together those three parts make the foundation for a user friendly road design. The substance of part V is rooted in a “bottom up” as well as a “top down” perspective which means that it is based on empirical results as well as theoretical considerations.

## **Results so far**

- The work is carried out by researchers and engineers from TÖI (N), VTI (S), Trafitec (DK), G. Helmers Consulting (S) and the Nordic Road Directorates in Sweden, Norway, Finland and Denmark. So far nine summary reports are available in Nordic languages which can be found on [www.nmfv.dk/vejgeometrigruppen](http://www.nmfv.dk/vejgeometrigruppen)

In 2009 the work will focus on Part IV and Part V. Summary articles dealing with different topics from the project will be published in Nordic Road & Transport Research during 2009.

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More information: [www.nmfv.dk/vejgeometrigruppen](http://www.nmfv.dk/vejgeometrigruppen)



