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Measure Evaluation Results

UTR 8.1 Traffic control center and traffic management

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Executive Summary

The measure “traffic control centre and traffic management” aims at elaborating an efficient strategy for traffic system management at regional level, and at implementing this strategy to improve the current situation by combining local and regional competences. This requires the realization of a joint regional traffic management centre. All stakeholders involved in traffic management agreed about the urgent need to establish a centralised centre. The CIVITAS MIMOSA measure aimed at meeting this need. The measure was implemented in two phases:

Stage 1: Implementation of the temporary traffic control centre (*October 2008 - February 2009*) As first stage the aim of all regional partners was to have a temporary traffic control centre in operation by early 2009. The objective was to establish multi-level traffic management cooperation by developing common data collection methods and scenario planning in the context of the road work situation in the west part of Utrecht. The large number of road works taking place in this area was expected to cause serious disruption for the road users and therefore imposed a more integrated traffic management on this part of the road network. The national, regional and local authorities closely cooperated to come to appropriate scenarios to prevent congestion and keep the air quality at an acceptable level, making full use of the possibilities of the Regional Traffic Control Centre (RTCC). This was done in a bottom-up approach driven by practitioners.

Stage 2: Working towards the establishment of the permanent traffic centre (*February 2009 – End of 2012*) After the successful implementation in stage 1, the aim of the stage 2 was to enlarge step-by-step the multi-level cooperation to the entire region. Several organisational changes and agreements on regional level were undertaken to achieve the establishment of an efficient regional traffic control centre. Establishing a permanent regional traffic management implied a standardised package of measures and procedures in the field of data collection, monitoring of traffic streams, traffic management strategies, incident management and a common organisation of traffic monitoring and control in favour of all road users.

Since February 2012, the permanent regional traffic control centre is fully operational. A political agreement was signed early autumn 2012 which assured the correct functioning in terms of maintenance and resourcing of the centre up to 2020.

The evaluation of the measure concerned the process of implementation. Based on the compiled standardized forms, the process evaluation of the measure showed that drivers by far outweigh the barriers.

The involvement of several stakeholders from diverse fields of expertise and different levels (local, regional, provincial, national) raise the complexity of the coordination process and was identified as a **barrier** during the implementation process.

The integration in a wider covenant (VERDER/ Further) on spatial planning, transport mobility, traffic and infrastructure was a critical **driver** to embed the traffic management centre and its developments efficiently in a wider policy framework and therefore guarantee the future development of the measure.

Since multi-stakeholders are involved in the process, **it is recommended** to establish a communication platform, from the earliest stages of the process, to ensure a common understanding of the objectives, a productive cooperation and a fair sharing of responsibilities.

The measure implemented in the frame of the CIVITAS MIMOSA project **enabled the establishment of an efficient centralised traffic management** in the region of Utrecht. This

measure overcame the deficit of an efficient traffic management which had been identified prior to this measure.

The project took some more months before it was fully officially functioning. The establishment of the permanent traffic control centre was foreseen from February 2012 on, whereas it will be fully operational early 2013.

A Introduction

A1 Objectives

After an initial implementation phase, the CIVITAS measure focusses on the organizational processes, development of procedures and strategies necessary in line with the establishment of a regional traffic monitoring and management centre joining the competences of local, regional, provincial and national road authorities. The following objectives were defined for the measures within the CIVITAS frame, in particular for the city of Utrecht:

High level objectives:

- Improvement of air quality in, and around the city of Utrecht;

Strategic level objectives:

- To achieve a better and more efficient use of the regional network and to improve reliability of travel times;

Measure level specific objectives:

- To improve and integrate traffic management and information of the different responsible authorities in accordance with the application of new systems and linking of (existing) systems.

A2 Description

Within the region of Utrecht the road networks of the different road authorities have a direct mutual interaction. Yet traffic management and traffic information provision in Utrecht and its surroundings were divided, and managed along modal and organizational boundaries. This significantly reduced the possibilities of managing traffic flows in an integrated way. At the start of the project, the existing traffic control centre used by the national road authorities (Rijkswaterstaat) mainly focused on the management of the traffic on the highways.

Instead of considering the different modes and parts of the network separately, it was understood quite early in the process (starting in 2003) that it was better to consider them as one whole road network, and to manage these roads jointly. The planned large road works on the western part of the ring road of Utrecht made it clear that without cooperation severe traffic problems could be expected.

Joint traffic management in an efficient way required the realization of a joint regional traffic management centre. Not less important this implied coming to an agreement on issues like the functionality of the various roads, joint data collection, and agreement when to use which traffic management scenarios. These ambitions were shared, but before CIVITAS not realized. A traditional reasoning (i.e. not beyond the organisational boundaries of its own organisation) at each level of authority (local, regional, national), prevented strong cooperation. Moreover until then each of the regional authorities used its own systems.

The investment in the traffic control centre itself is not regarded as the CIVITAS measure. In 2008 a start was made with the common temporary traffic centre. To achieve a regional traffic control centre, a lot of adjustments are needed in the organisation, procedures, and strategies. These are changes that needed to be discussed between the city and its regional partners such as the RWS (Rijkswaterstaat/ highway managers), Provincial Authority of Utrecht the Region (BRU), and surrounding smaller cities.

The CIVITAS measure itself consists of a realisation of a reinforced cooperation between the different actors involved, and their management tools. All the efforts planned and implemented in this measure aim to develop the organisational part of the regional traffic control centre. Here is all traffic information about all regional roads (highways, regional roads and major local roads) collected, analysed and used to manage the traffic flows in the whole region of Utrecht.

To achieve this the city of Utrecht worked together with the other authorities on a plan with the objective to realise one traffic control centre for traffic management for the motorways surrounding Utrecht and the main (distributor) roads within the city. For the benefit of the traffic flow, a traffic management system was intended to be implemented that controls traffic 24 hours a day.

First priority was given to the development of an increased cooperation for the Utrecht West area through the development of a temporary traffic control centre covering this area. The large number of road works taking place in this area was expected to cause serious hinder for the road users and therefore imposed a more integrated traffic management on this part of the road network.

Making also a permanent regional traffic management a success meant in practice that it was necessary to realise a standardised package of measures and procedures in the field of data collection, monitoring of traffic streams, traffic management strategies, incident management and a common organisation of traffic monitoring and control in favour of all road users, while facing the fact that there are different road authorities in the region.

The CIVITAS activities involved there joint implementation and operation. Concretely the measure looks at the process around the development of common:

- traffic data collection;
- traffic management strategies;
- traffic control scenarios, including scenarios for incident management; and
- the realisation of a joined regional traffic control centre (RTCC);
- sharing mandates between road authorities.



The partnership realised a joint organisation with contracts that enable the creation of a real joint monitoring in practice on all roads (highways, regional roads, and main city roads), 24 hours a day. Moreover part of the plan was to build this traffic control organisation hand in hand with the organisation that is needed for a wider mobility management beyond the interest of only the car. Since February 2012, the regional traffic control centre is fully operational. An agreement will be signed early autumn 2012 in relation to the operation; maintenance and resourcing of the centre which assures the correct functioning for the future up to 2020.

B Measure Implementation

B1 Innovative aspects

The innovative aspects of the measure are the testing of **new organizational arrangements** that are made possible by the use of new technologies. These arrangements take place around the development of a traffic control centre at regional level with application of new systems and coupling of (existing) systems. Although under development in other European cities, involving different organisational schemes and stakeholders, the approach is rather unique for the Netherlands, and Utrecht can be considered as a showcase.

B2 Research and Technology Development

In the scheme presented on the next page the different steps are visualized that should be taken during the preparation, development, implementation and management of the traffic management scenarios prepared for the traffic management centre¹. This process scheme and description was developed nationally for the traffic management centres. The city of Utrecht and other stakeholders participated to these works (See also B4). The objectives of this common format are:

1. To put down the different elements, imperatives and recommended parts of traffic management scenarios;
2. To describe the process of development of a traffic management scenario.

This format has to be used for the development of traffic management scenario's related to executed infrastructure projects, events, regular peak hour congestion, and calamities that are managed from the traffic management centre. The need for a traffic management scenario and timing of the different process is based on a categorization of the expected hinder.

Table B2.1 Hinder categorization

Hinder categorisation	Delay	Persons hindered					
			<1000	<10,000	<100,000	<1 million	>1 million
0							
1	A few minutes		E	E	D	C	B/C
2	< 10 minutes		D	D	C	C	B
3	10 - 30 minutes		C	C	B	A	A
4	> 30 minutes		B/C	B	B	A	A

¹ Source: "Landelijk format opgesteld in het kader van de uniformiteit van het product en proces regelscenario's/ Format uniform traffic management scenarios, National format set up in the frame of the product and process management scenarios", Rijkswaterstaat (National road authorities), 22nd of november 2011

The categorization relates in general to the following types of works:

Category A: Major works, all traffic management tools will be used, incl. mobility management

Category B: Large works, no national impacts

Category C: Middle-sized works with a regional impact

Category D: Small works and road closures, press release is send out

Category E: Small road closures, on site information provision

For the categories A, B and C a traffic management scenario has to be developed, for the categories D and E it is not necessary. Equally this categorization exists for events, calamities, and regular peak hour congestion. In relation to the time required for the development steps of a traffic scenario a difference is made on the basis time of usage, i.e. short term traffic distortions (less than 3 days) for example in the case of events, and long term traffic distortions.

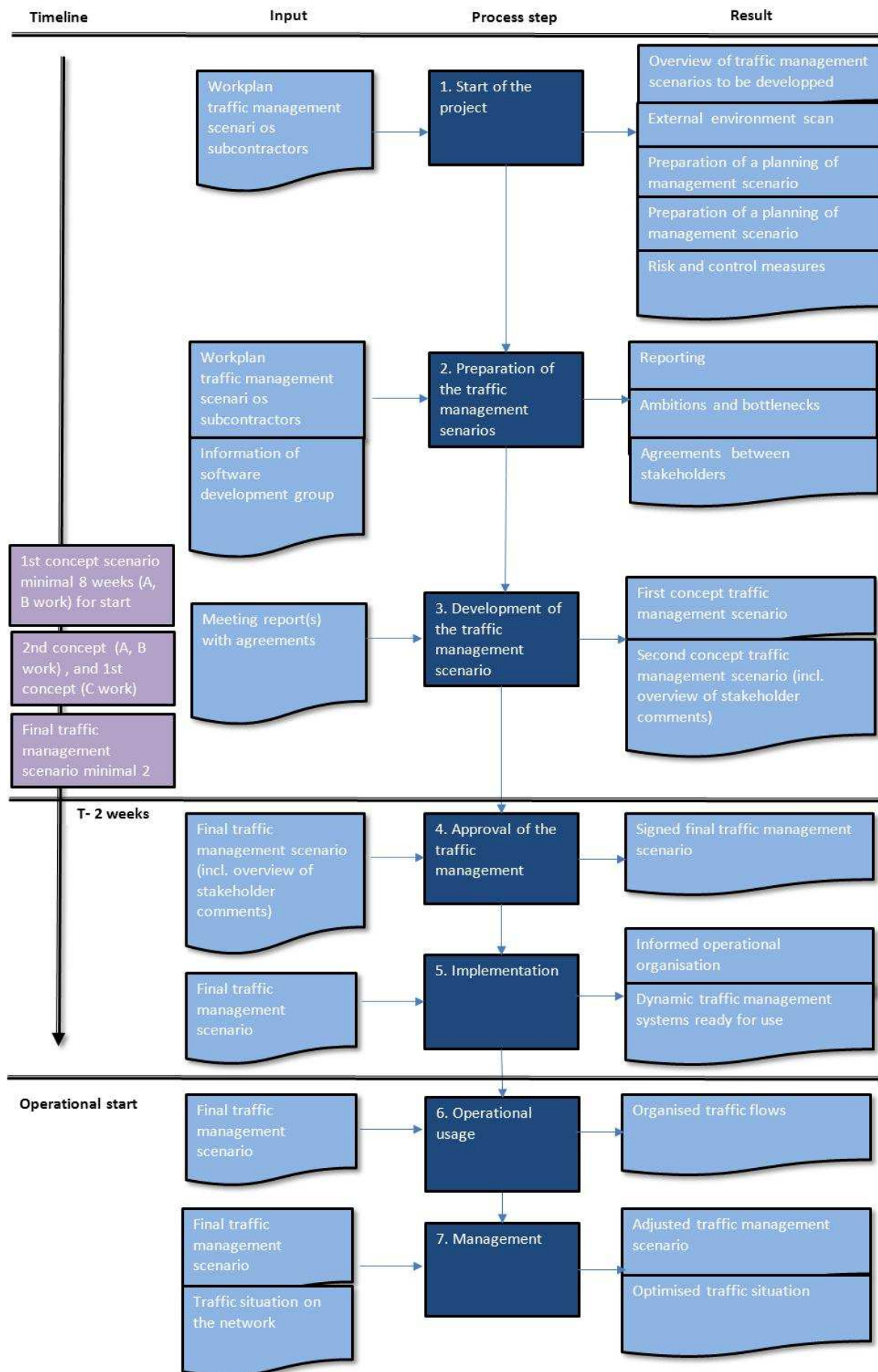


Figure B2.1 Format of a traffic management scenario development

B3 Situation before CIVITAS

Before this measure started, there was no traffic management and traffic information integration between modes and responsible regional road authorities. This reduced the possibilities of managing traffic flows in an integrated way, thereby balancing modal priorities better (see also description in section A2).

B4 Actual implementation of the measure

The development of a regional traffic centre (both temporary and permanent) is part of a wider regional cooperation on transport and mobility called VERDER (FURTHER). This cooperation is based on an agreement signed by the National government and the regional authorities of Utrecht in 2006.

The operational phase in this measure can be described as the period from the taking in operation of the temporary traffic central, yet as all the measure is about the process coming to the realization of the temporary (2009) and permanent (2013). All the activities of this measure can be considered to have taken place in the implementation phase.

In accordance the following stages can be defined:

Stage 1: Implementation of the temporary traffic control centre (*Start of project – February 2009*) At a first stage the aim of all regional partners was to have a temporary traffic control centre in operation by early 2009. The temporary centre had to focus on the areas Utrecht-West. During this stage the development of collection strategies, scenarios and procedures mainly focused on the expected traffic situations related and around the areas of the large road constructions. Developments of scenarios in relation to temporary road works also took place beyond this date, e.g. in September 2011 at the 24 October Square: a large roundabout (close to the high way) where several major road (re)constructions are taking place (and will for years to come). The national, regional and local authorities closely cooperate to come to appropriate scenarios to prevent congestion and keep the air quality on an acceptable level, making full use of the possibilities of the Regional Traffic Control Centre (RTCC).

Stage 2: Working toward the establishment of the permanent traffic centre (*February 2009 – end of the project*) After the installation of the temporary centre, in a second stage a step by step up scaling to the regional level was planned. Specific activities that were undertaken in the process to come to a fully regional traffic control centre were amongst others:

- To reach agreement on the regional level about the traffic coordination strategies and procedures and to fine-tune the strategies for specific routes;
- To make an inventory of black-spots and alternative routes in case of road accidents;
- To organise a coordinated traffic information monitoring and management
- To participate in regional project steering groups and policy groups.

To reach agreement on the regional level about the traffic coordination strategies and procedures and to fine-tune the strategies for specific routes

Every partner in this Regional Traffic Management Group has one or more Traffic Control Centres to manage its own roads. To get to a structure for a common, regional Traffic Control Centre, a lot of “process” (coordination, fine-tuning) of all procedures took place.

Much discussion went on regarding which partner needs to have which mandates for certain decisions. Indeed, a decision from one partner to re-route traffic due to e.g. an accident can

heavily influence traffic in neighbouring cities. This fine-tuning of responsibilities involved politicians as well, not in the least.

The Project Management Group tried to synchronize as much as possible their work with existing national policies and give input to the development of a national vision on regional cooperation in relation to traffic management.

Beyond the development of procedure and strategies, an external independent consultant was taken on board to organize the discussion on the needed agreement until 2020 on the management, maintenance and resourcing of the traffic centre.

To make an inventory of black-spots and alternative routes in case of road accidents;

Black spots were identified and scenarios were developed. Incident management was closely monitored and adaptations have been made in process and technique. It turned out that not all notifications from the Region Police were reported to the regional traffic management centre. It was agreed that all incidents are now reported and the management centre itself determines which incidents are relevant for them. It has also been arranged between partners that the regional traffic management centre receives notifications of all Traffic lights that are out of order during the night or in weekends. As an example, in line the City of Utrecht delivered various Incident Management Reports to the RTCC.

To organise a coordinated traffic information collection and monitoring

After much discussion, regional cameras have been connected to the infrastructure of Rijkswaterstaat (in charge of national and partly regional road management, part of Min. Transport) by the end of 2010. Not only cameras were linked to the centre but also DRIPs (Dynamic Roadside Information panels), license plate reading cameras and traffic light installations. Information from all these systems will serve as input to the Regional Traffic Control Centre (RTCC). An extra software "layer" of electronics has been developed to collect the traffic information from all individual Control Centres into one database, was made for this purpose.

To participate in regional project steering groups and policy groups

The City of Utrecht is part of the management group (MOVV Management overleg verkeer en vervoer/ Management group transport and traffic) for the development of the regional traffic management. This core team consists of members of various governmental layers. The Province of Utrecht plays also an important role in this Group. Other involved parties are the regional office of the Ministry of Transport, Public Works, and Water Management (RWS), the Region of Utrecht (BRU), the Region of Amersfoort and other cities like Amersfoort and neighbouring cities of Utrecht. The Management Group meets up regularly. In addition to the management group there is a decision making platform on a political level.

B5 Inter-relationships with other measures

The development of the regional traffic centre is not directly linked to the other CIVITAS measures even though in its functioning it has clear interlinkages with the wider mobility management strategies of the city of Utrecht of WP4 yet also for example the promotion of park and ride facilities (M2.1), or the clean route planning for freight vehicles (M8.2). The measure is part of the VERDER Programme (FURTHER) 2010-2020 which includes wide scale integrated measures on topics like spatial development, pricing, public transport, cycling, mobility management, traffic network management, infrastructure and monitoring.

C Impact Evaluation Findings

The impact evaluation is not applicable. This measure aims at improving and integrating traffic management and information and at applying new systems and linking of (existing) systems. To evaluate if these goals will be reached, the processes of interaction and communication of the different actors was of interest.

D Process Evaluation Findings

D.1 Deviations from the original plan

Small deviation has been taken place from the original plan, in terms of timing. In terms of finances it proved much cheaper. The project took some more months to be fully officially functioning. The establishment of the permanent traffic control centre was as foreseen functioning from February 2012 on, whereas it will be fully operational early 2013.

D.2 Barriers and drivers

D.2.1 Barriers

During the process of establishment of scenarios, procedures, and agreements related with the regional traffic control centre (both temporary and permanent) the discussions were long, yet considered normal. Little real barriers have occurred.

Implementation phase

- **Complex coordination and integration of bottom-up organizational initiatives in an official traffic centre organizational structure** - An organizational barrier identified related to the establishments of a group of operational traffic experts from various governmental layers (a.o. City of Utrecht) that designed software for various Traffic Management Scenario's to be used during Road Works. The group was set up bottom-up, yet when the organization set up for the regional traffic centre was developed (top-down) by the management group, it was not easy to get the role of this Group fully clear in the new organizational structure, and intensive coordination was needed between the partners to overcome this situation.

Operation phase

- **Complex procedural steps not fitted to the already evolved readiness to integration of the project partners** - Due to expected conflicts of interest between partners, an external independent organization was taken on board to organize the discussion on the needed agreement until 2020 on the management, maintenance and resourcing of the traffic centre. This slowed down the process, as several procedural steps were taken. It proved later that most likely it would not have been fully needed. Once the different authorities sat together the agreements were reached rather fast.

D.2.2 Drivers

Implementation phase

- **Large road infrastructure works planned** - Clear drivers for initiation of the development of the regional traffic centre are the large road infrastructure works planned in the Utrecht region. It became clear that if the different road authorities would not cooperate this would lead to high levels of traffic congestion.
- **Local air quality problems and related authority counter initiatives** - Also the local air quality problems and following developed Air Quality plan of the city of Utrecht can be seen as a driver for the initiation of the increased cooperation between authorities.
- **Upfront agreement reached by the partners on the form of cooperation** - So it was quite clear from the beginning that cooperation was needed. A second stage driver was the following agreement reached by the partners on the form of cooperation which facilitates the coordination strategies on a regional level traffic.
- **Integration a wider covenant on spatial planning, transport, mobility, traffic and infrastructure (VERDER)** -The agreement was embedded in the wider VERDER (further) cooperation. This covenant between the local authorities and the national government framed the plans and works related with traffic control for the region, among other including the development of the Regional Traffic Control Centre.
- **Integration of regional visions and solution in national policies** - In addition the Project Management Group participated to a national workgroup which they tried to synchronize the Utrecht approach with existing and developing national policies, strategies and procedures. Partly this helped to promote the vision of the region of Utrecht, and its integration with the development of a national vision on regional cooperation in relation to traffic management.

D.2.3 Activities

Implementation phase

- **Organizing of regular stakeholder meetings** - The main activities that were undertaken to keep the processes running and helped solving natural conflict where the organization of regular meetings (every three weeks) of the management group and close involvement of the different stakeholders. This helped to establish the agreements and assured the cooperation in the implementation of the traffic centre.
- **Detailed discussion on traffic management responsibilities and decision making** - Additional discussions were organized to agree on which partner needs to have which mandates for specific transport management-related decisions. Indeed, a decision from one partner to re-route traffic due to e.g. an accident can heavily influence traffic in neighbouring cities. This fine-tuning of responsibilities involves politicians as well

D.3 Participation

D.3.1. Measure Partners

The following partners were involved in the process of the development of the procedures and joined managing of the regional traffic control Centre:

- **City of Utrecht** – Partner in the CIVITAS Mimosa project, responsible for transport and traffic issues within the city boundaries, except for the provincial and national road;

Even though only the City of Utrecht was a CIVITAS consortium member, all other authorities below identified as stakeholders were directly involved in the measure.

D.3.2 Stakeholders

- **Utrecht region (BRU)** – BRU a regional authority joining all local authorities in the metropolitan area of the city of Utrecht;
- **Province of Utrecht** – Responsible for the provincial road network;
- **RWS (National highway authority)**- Responsible authority for the national road network;
- **Surrounding cities** (occasional partners) like the city of Utrecht responsible for the local road network and traffic.

D.4 Recommendations

D.4.1 Recommendations: measure replication

The measure is considered to be replicable in all other metropolitan areas where several transport authorities exist with their own traffic control systems. Due to the focus of the measure on the processes, further recommendations are provided in D4.2.

D.4.2 Recommendations: process (related to barrier-, driver- and action fields)

- **Focus in the general approach on what is binding, not what is separating** – In the case of the regional traffic control centre in an around the city of Utrecht all partners understood that they had to cooperate to face the expected traffic problems caused by the large road works, yet also to avoid traffic congestion in general, and related air quality issues. This allowed during the different long discussions on organization, procedures and scenarios to come each time to a balanced outcome, and as a final result the establishment of a joint regional traffic centre.
- **Clarification of the role of all partners (and groups)** – The developments around a software development subtask group showed that new cooperation can lead to good bottom-up initiatives, yet that at a certain point it should be made clear what exact role of partners and workgroups are in the official organization of the Regional Traffic Control Centre.
- **From a temporary central to permanent central** – The Utrecht case asked for a fast solution to face the expected traffic congestion around the large road infrastructure works. A

temporary central responded to this timing issue. It proved that once the temporary central established an external organization engaged to come to an agreement between partners proved to be only partly necessary. A common understanding was already created and agreements on the details of maintenance, procedures and resources were relatively easy reached between partners.

E References

<http://www.ikgaverder.nl/> -the website of VERDER (Further) program.

“Verslaggevingsrapport RVMC-U 2010” - Process reporting of the regional traffic management centre of Utrecht project.

Landelijk format opgesteld in het kader van de uniformiteit van het product en proces regelscenario's/ Format uniform traffic management scenarios, National format set up in the frame of the product and process management scenarios”, Rijkswaterstaat (National road authorities), 22nd of November 2011.