

Centrico AWARD

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BEST TRAFFIC MANAGEMENT PROJECT

AWARD WINNER

Temporary hard shoulder use Hessen

Hessen is focusing on a consistent use of Intelligent Transport Systems in order to optimise traffic flow and increase road safety on the TERN. The temporary hard shoulder use is one of the key elements to reach this goal. The additional lane increases the capacity during peak hours significantly on the TERN around Frankfurt with traffic loads of up to 150,000 vehicles per day on particular road stretches. Evaluation shows that traffic congestion can be reduced and the risk of accidents can be lowered.

BACKGROUND

The Traffic Centre Hessen is successfully running a large number of traffic control systems. Temporary hard shoulder use is one of the relevant applications. Hessen contributed significantly to research and studies carried out prior to the implementations especially with regard to the aspect of the effectiveness of such measures. Further results of the studies were, that temporary hard shoulder usage may only be set up under special circumstances – e.g. only on motorway sections where congestion or serious accidents frequently occur and for which a proper expansion has already been planned.

One of the reasons that temporary hard shoulder usage is so interesting is that laborious planning approval procedures are not usually required. Unlike a proper expansion, additional capacity can be created relatively quickly. Another factor supporting temporary hard shoulder usage is that it can often be realised for relatively low structural effort. If the hard shoulder is adequately constructed, only the markings have to be adapted.

HOW IT WORKS IN HESSEN

The temporary use of hard shoulders is controlled by the Traffic Centre Hessen. As soon as a certain traffic volume is exceeded, the traffic counter of the line control system suggests that the hard shoulder is released. Video cameras installed along the entire section are then used to check whether the hard shoulder is free of broken-down vehicles, objects or other obstacles.



A total of approx. 80 video cameras are provided for this purpose. To help the operator, fixed movement sequences are programmed into the pivoting cameras. During the scanning operation, the cameras are controlled so that even small objects can be detected. During the release process too, the Traffic Centre Hessen regular carries out video monitoring of the



User interface

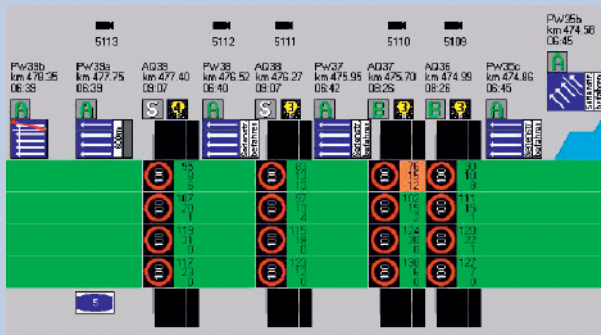


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hard shoulders. Unlike with the scanning operation, the cameras use the “waggle programme” to show large sections of the released hard shoulder for a few seconds. If the operator detects a broken down vehicle during the release process, the release is cancelled for the period of time concerned.

Outside peak times, the hard shoulders remain closed to flowing traffic. As per its real function, it then offers additional space for accidents, breakdowns and maintenance work. This guarantees safe motorway usage.

RESULTS AND LESSONS LEARNT

Evaluation conducted by the Traffic Centre Hessen shows that temporary hard shoulder usage on Hessian motorway sections has proved to be successful. Traffic flow has been notably improved; accidents and congestion have been significantly reduced. Releasing the hard shoulder increases the capacity of the standard three-lane motorway sections by 20%. This permits traffic volumes of over 7,000 vehicles per hour without traffic breakdown.



Evaluations for the section of the A5 between the Frankfurt NW intersection and the Friedberg junction revealed that temporary hard shoulder usage saves congestion-related losses amounting to approx. 3,200 vehicles per hour. Converted using the corresponding time cost rates; this means economic benefits from avoided time losses amounting to 50,000 euro per day and/or over 10 million euro per year. Not included in this consideration are the additional benefits created by minimising environmental damage from exhaust and noise emissions due to the more steady traffic flow.

The extent of the positive effect of temporary hard shoulder release on traffic flow is demonstrated when occasional vehicle breakdowns or accidents interrupt or prevent the release of the hard shoulder; in these cases kilometres of congestion often occurs.



The fact that the extremely positive effect on traffic flow is also shared by road users is demonstrated by the host of phone calls and emails from car drivers who comment hard shoulder usage very positive.

As far as road safety is concerned, no negative changes were found. Evaluation shows that in this area, neither the number of accidents nor the number of accidents involving serious injury have increased. A positive effect on safety will certainly be that reduced congestion will also reduce congestion-related accidents.



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CONCLUSIONS AND OUTLOOK

Overall, temporary hard shoulder usage has shown to be swift to implement, relatively cost efficient and most important a highly effective measuring for improving mobility. The procedure is especially suitable for motorways that show pronounced traffic peaks due to high volumes of commuter traffic.

Temporary hard shoulder release can achieve a highly cost-efficient relieving of the existing infrastructures and is therefore a good example of how the existing infrastructure can be used intelligently using traffic telematics. For this reason, the intention is to use the hard shoulders on other highly impacted motorway sections in Hessen on a temporary basis to help guarantee smooth traffic flow.



Gerd Riegelhuth, Head of the VZ Hessen

Gerd Riegelhuth, head of the Traffic Centre Hessen, is pleased with the CENTRICO Award for the best traffic management project. "First, the Award is an acknowledgment of the work done by all participating employees in the past. At the same time it of course serves as an incentive to continue along the adopted path without losing sight of the traffic target value.

The Hessian government has created the future initiative **Staufreies Hessen 2015** (Congestion Free Hessen 2015). The goal thus defined is admittedly ambitious. But it also offers the opportunity to establish traffic management measures as substantial components in a comprehensive scheme towards ensuring mobility for the long-term future".



Hessen will implement in the next five years additional temporary hard shoulder use projects on selected motorway sections round the conurbation regions of Frankfurt and Darmstadt.

Through this, Hessen is making a significant contribution to increase road safety and efficiency on the TERN.

For more information on this topic, please contact:

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For further information on other CENTRICO activities visit:

www.centrico.org



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BEST TRAFFIC MANAGEMENT PROJECT

AWARD NOMINEE

Road Works Management System Hessen

30% of the traffic problems in Hessen are caused by road works. The System helps to avoid or to reduce this negative impact on traffic flow considering short term road works (one day) as well as long term road works on the federal motorways in Hessen.

The innovation is the decision support tool that allows the assessment of the impact of road works on traffic flow to find the optimum time frame for shifting the road work to a non-critical point of time.

INTRODUCTION

The construction-site information system operated by the Hessen Road and Traffic Authority since 1997 has been considerably expanded and turned into a "management system." All daytime construction sites scheduled on motorways are now given a traffic assessment. The indicators involved cover maximum traffic-queue length, maximum time loss and the number of all vehicle hours in the queue as a measured value for the economic costs of a construction site. On this basis it is possible to carry out optimised construction-site planning and to minimise the risk of traffic disruption caused by construction sites.

Furthermore the system and its information are used for e. g. coordination and approval of administrative aspects and for the website.

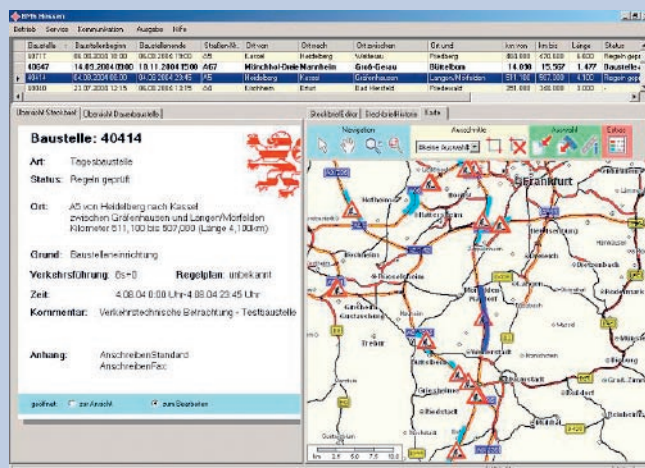
RESULTS AND LESSONS LEARNED

The system supports the planning of a road works to find the optimum time frame for shifting the road work to a non-critical point of time. This helps to avoid or reduce traffic congestion. Beyond that, especially with regard to long term road works, the measures can be coordinated considering aspects such as financial resources, road surface condition or traffic demand. Evaluation has shown that the system is working very well and helps to reduce the negative impact on traffic flow caused by road works on the TERN.

OUTLOOK

Plans are already underway for traffic evaluation of long-term construction sites, and this will be implemented in the second development stage. The principle aim of this stage will be to analyse and optimise all scheduled longer-term construction work to gauge its effect on traffic and the economic costs associated with this.

The third development stage will mark a spatial extension beyond the motorways: this will allow to cover allocated diversion routes on national trunk roads and minor roads relevant to traffic management.



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BEST TRAFFIC MANAGEMENT PROJECT

AWARD NOMINEE

Peak Hour Lanes

Thanks to a new Dutch law procedures for the implementation of peak hour lanes could be sped up. These quick measures will later on be followed by long term measures like adding lanes at certain links in the network. But for now more than 30 peak hour lanes are or will be implemented.

INTRODUCTION

The Netherlands has one of the most dense networks in Europe and due to European environmental legislation it is not allowed to expand her road network. In the rest of Europe similar situations exist in Urban areas. The experiences of the Dutch projects can be used to implement hard shoulder use projects in other countries.

PROGRAMME

For the Rijkswaterstaat programme ZSM (Dutch abbreviation for Visible, Smart and Measurable) a law was passed 'Spoedwet wegverbreding'. This law enables Rijkswaterstaat to take some quick measures to reduce congestion on several locations on the Dutch road network (Top 50 traffic jams). It is used to speed up procedures for implementation of peak hour lanes. These quick measures will later on be followed by long term measures like adding lanes at certain links in the network.

PILOT

In 2003 a pilot was carried out to test the use of hard shoulders: continuous use of the hard shoulder was prepared as well as the peak hour use of an extra left lane. The peak hour lane improved traffic flow. In spite of an increase in traffic by 30%, congestion was reduced with nearly 70%. Travel times were reduced with 5 to 20%.

ROLL-OUT

Currently 23 peak hour lanes are operational and 8 more are expected.

At some locations the implementation was delayed due to legislation problems. Questions were raised whether or not peak hour lanes would enhance emission rates as much as a new lane would. Independent parties measured the emission rates and it was found peak hour lanes do not cause higher emission rates at all.

WORKSHOP

The CENTRICO Award encouraged the Dutch project managers to organise an international workshop on the ITS aspects of hard shoulder use. The goal of the workshop is to learn from foreign experiences. It will be held at 24 and 25 May in Rotterdam. Please contact Henk Jan de Haan if you are interested in participation or in the results of the workshop.

More information: Henk Jan de Haan, henkjan.de.haan@rws.nl



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