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Construction Site Management System in Hessen – Concept and Experiences

i2TERN– 2nd Conference of Euro-regional Projects

Vienna, Austria 20-22 September 2004

Introduction

- construction sites can badly disrupt traffic flow
 - particularly in the case of short-term work sites
 - about 30% of all traffic disruption on motorways in Hessen is caused by construction sites
 - call for action
 - the State of Hessen recognised this situation early on
 - set up of a construction-site information system in 1997
 - new, revised construction-site management system in 2003
 - precise information about construction work for travellers
- www.verkehr.hessen.de or www.vz.hessen.de



Purpose and Benefit

- **to optimise construction-site planning by evaluating the effect on traffic caused by construction sites**
- **to integrate into the construction-site management system all the planning and authorisation processes**
- **to monitor the handling of all construction sites, taking the current traffic situation into account**

- **benefits are to be found not only in shorter journey times, but in an anticipated increase in traffic safety.**

Application Flow

- entering the construction-site data into the construction-site technical-data profile
- evaluating the construction site, using traffic-based criteria
- agreeing and approving the construction site
- monitoring the construction site, taking the current traffic situation into account

Application Flow – Input (1/3)

- **construction-site technical-data profile consisting of**
 - **type of construction site**
 - **position**
 - **time or**
 - **layout of lanes**

- **menu-driven or via map**

- **definition of certain rules**

- **information on route characteristics (f. e. number of carriageways, their width, traffic demand or capacities)**

Application Flow – Input (2/3)

BMS Hessen

Betrieb Service Kommunikation Ausgabe Hilfe

Baustelle	Baustellenbeginn	Baustellende	Straßen-Nr.	Ort von	Ort nach	Ort zwischen	Ort und	km von	km bis	Länge	Status
40717	06.08.2004 10:00	06.08.2004 19:00	A5	Kassel	Heidelberg	Wetterau	Friedberg	464.000	470.600	6.600	Regeln geprüft
40647	14.09.2004 09:00	18.11.2004 15:00	A67	Mönchhof-Dreie	Mannheim	Groß-Gerau	Büttelbom	14.090	15.567	1.477	Baustelle
40414	04.08.2004 00:00	04.08.2004 23:45	A5	Heidelberg	Kassel	Gräfenhausen	Langen/Mörfelden	511.100	507.000	4.100	Regeln geprüft
40040	23.07.2004 12:15	06.08.2004 13:15	A4	Kirchheim	Erfurt	Bad Hersfeld	Friedewald	351.000	348.000	3.000	-

Übersicht Steckbrief Übersicht Dauerbaustelle

Baustelle: 40414

Art: Tagesbaustelle

Status: Regeln geprüft

Ort: A5 von Heidelberg nach Kassel
zwischen Gräfenhausen und Langen/Mörfelden
Kilometer 511,100 bis 507,000 (Länge 4,100km)

Grund: Baustelleneinrichtung

Verkehrsführung: 6s+0 **Regelplan:** unbekannt

Zeit: 4.08.04 0:00 Uhr-4.08.04 23:45 Uhr

Kommentar: Verkehrstechnische Betrachtung - Testbaustelle

Anhang: AnschreibenStandard
AnschreibenFax

geöffnet: zur Ansicht zum Bearbeiten

SteckbriefEditor SteckbriefHistorie Karte

Erstellung Bewertung Genehmigung Überwachung

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von Heidelberg nach Kassel

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Regelplan/VF unbekannt 6s+0 Grund Baustelleneinrichtung

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VZH Pilz RW

Application Flow – Input (3/3)

BMS Hessen

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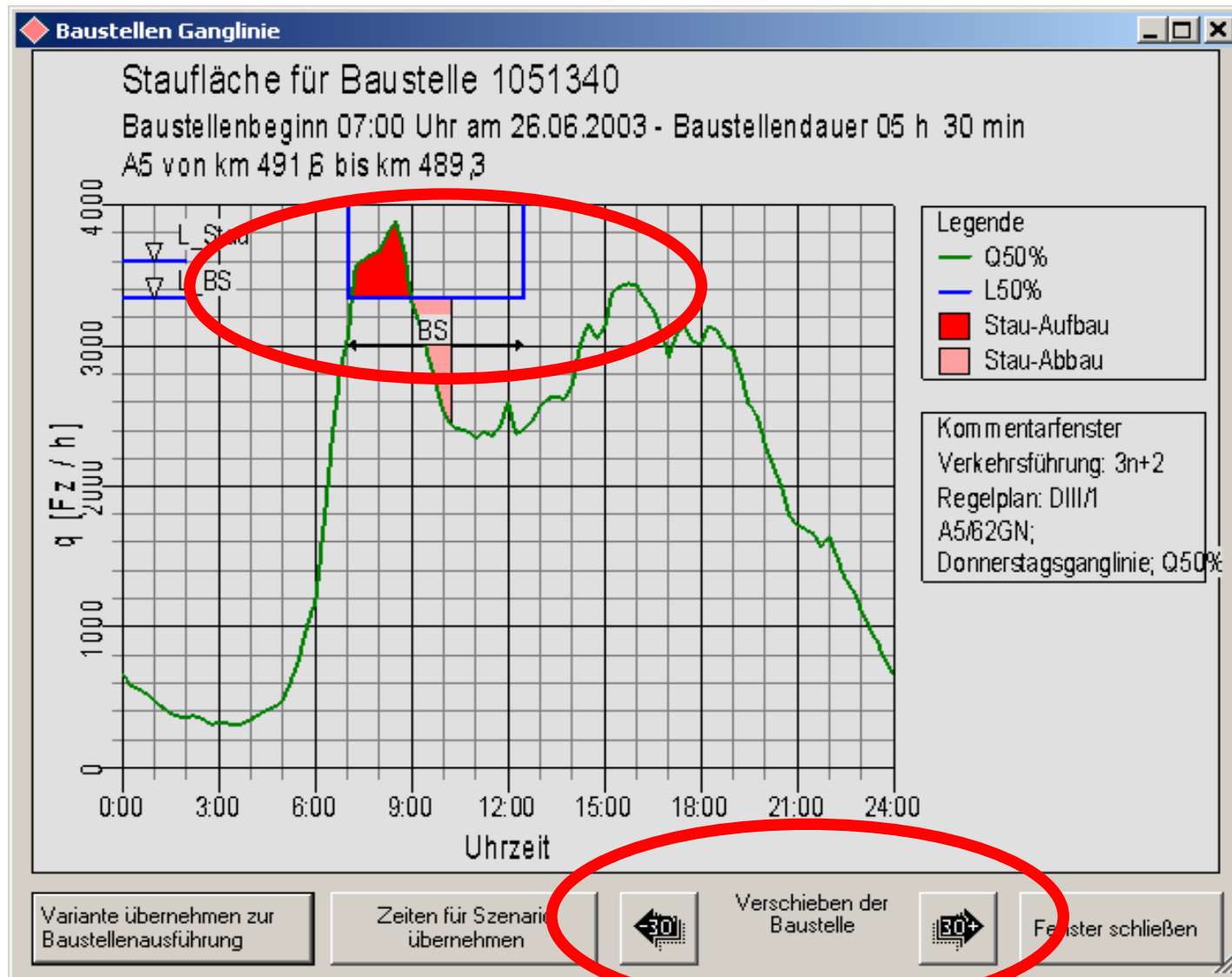
geöffnet: zur Ansicht zum Bearbeiten

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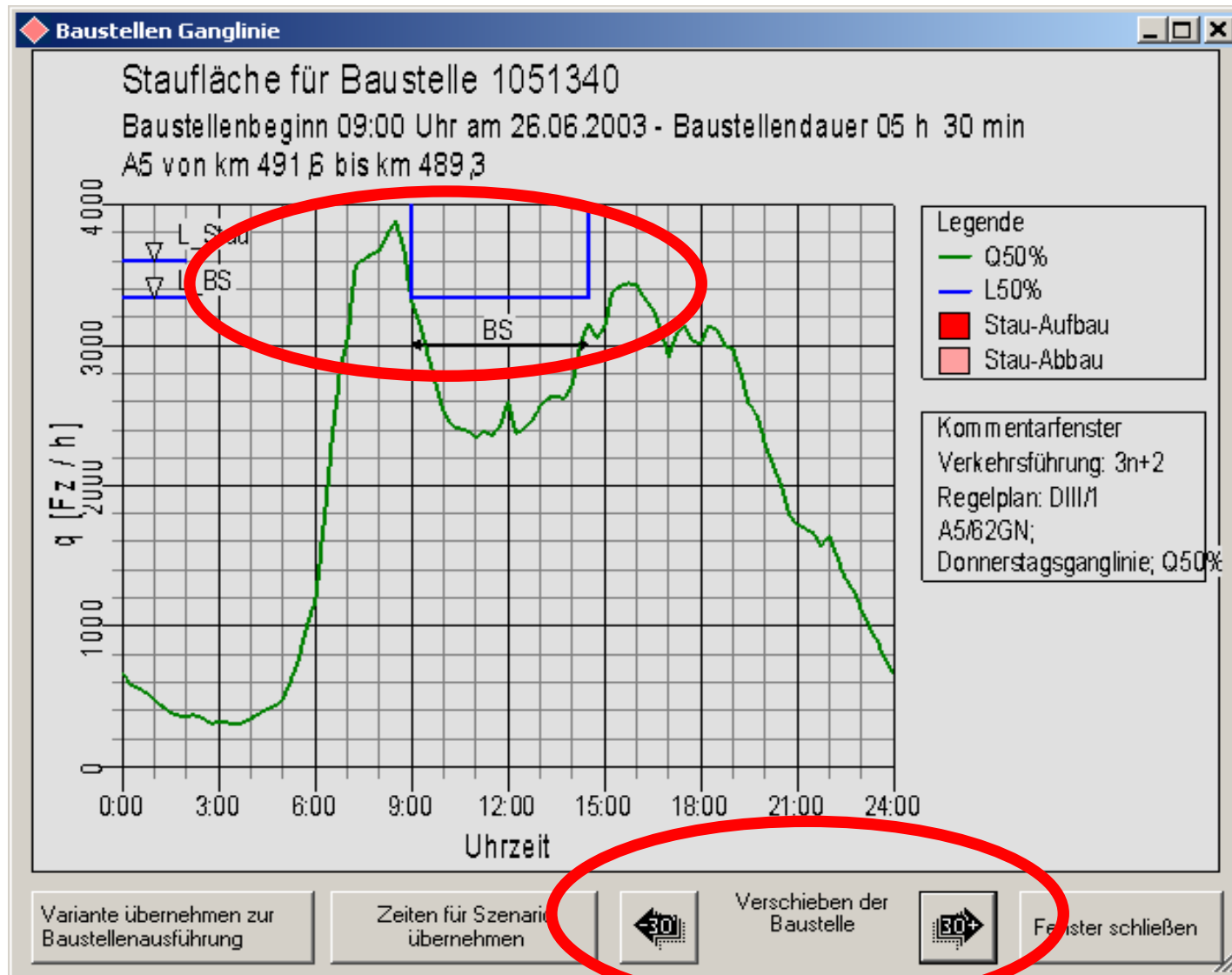
Application Flow – Decision Support (1/3)

- new interactive component to aid decision making
- calculate major traffic statistics, such as maximum queue length, maximum loss of time and number of total vehicle hours in queue
- it is possible to minimise the risk of traffic disruption by optimising construction-site planning (e.g. shifting the time slot to non-critical periods),
- time-variation curves (traffic demand) are stored here for all route sections, and these are then compared with the available capacity

Application Flow – Decision Support (2/3)



Application Flow – Decision Support (3/3)



Application Flow – Coordination and Approval (1/2)

- **display of complete agreement and authorisation process**
- **all departments involved in this process can call up the data-profile statistics of each construction site**
- **a matrix has been developed for communication between the individual departments**
- **status management, i.e. each processing status (e.g. entered, scheduled, active or concluded)**

Application Flow – Coordination and Approval (2/2)

SteckbriefEditor | SteckbriefHistorie | Karte

Erstellung | Bewertung | Genehmigung | Überwachung

Steckbrief versenden

Dienststelle	Verteiler	Verk.Prüfung	Prüfung VZP	Zustimmung	Hoheit
HLSV - Abt. Bau	<input type="checkbox"/>				
Verkehrsbehörde	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	
VZH	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
ASV Darmstadt PM I	<input type="checkbox"/>				
ASV Darmstadt PM II	<input type="checkbox"/>				
ASV Darmstadt NM	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>	👑
ASV Frankfurt PM I	<input type="checkbox"/>				
ASV Frankfurt PM II	<input type="checkbox"/>				
ASV Frankfurt NM	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	
ASV Kassel PM I	<input type="checkbox"/>				
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ASV Kassel NM	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	
AM Alsfeld	<input type="checkbox"/>				
AM Baunatal	<input type="checkbox"/>				
SAM Darmstadt	<input type="checkbox"/>				
AM Diedenbergen	<input type="checkbox"/>				
AM Ehringshausen	<input type="checkbox"/>				
SAM Frankfurt/Main	<input type="checkbox"/>				

Email

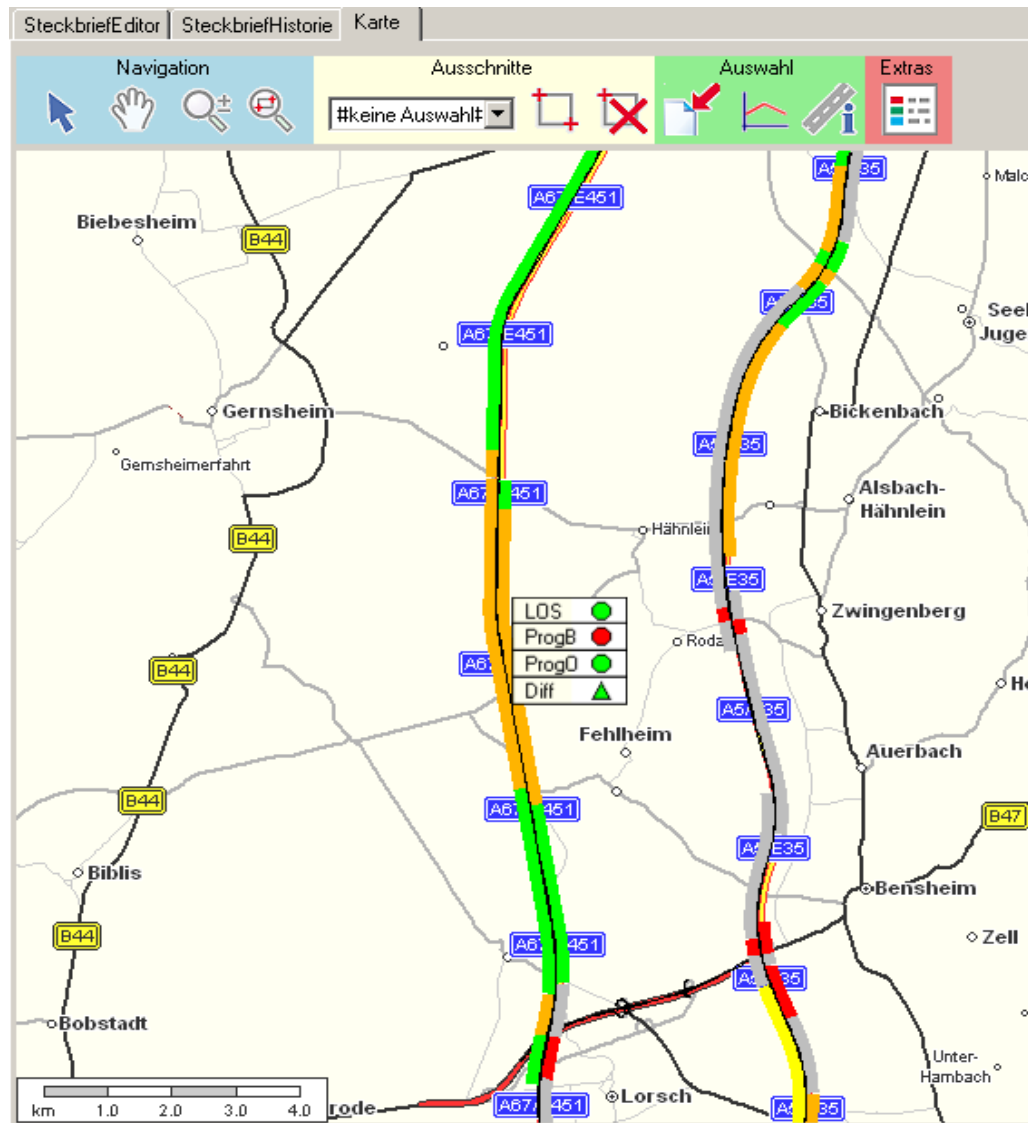
Fax

eMail hinzufügen | eMail Protokoll | Fax hinzufügen | Fax Protokoll | VZP anordnen

Application Flow – Monitoring (1/2)

- **the effects on traffic calculated during the planning stage are compared with the actual traffic situation**
- **the Traffic Centre Hessen supplies up-to-date traffic information for this purpose**
- **interruption of an ongoing construction site may even be considered in serious cases, providing the type of work underway allows of this**

Application Flow – Monitoring (2/2)



Operation Experiences

- **experience gained from the Hessen construction-site management system has been very positive overall**
- **the system is stable in its running, even though**
 - **more than 30 departments connected**
 - **a number of interfaces with other software programs**
 - **a complex digital-map basis**
- **the system can also be used for other problems, f.e. simply looking up a specific information on a route section (f. e. traffic demand)**

Operation Experiences – User Acceptance

- user acceptance has attracted a particular focus
- during the whole development period, a team of potential users was available to evaluate the feasibility of the software in everyday practice
- comprehensive training courses were held
- handbook containing detailed notes on operating the software
- high percentage of construction sites entered in the system as an indicator for user acceptance

Operation Experiences – Support

- key element for successful operation of the system
- a member of staff has been appointed at the Hessen Traffic Centre as a so-called “construction-site manager”
 - contact officer
 - he consults the system regularly, e.g. to identify any input errors
 - he has the necessary technical expertise in questions on traffic management
- special training courses for the IT department of the Hessen Traffic Centre, so that a proper reaction can be made immediately in the face of technical problems

Outlook

- traffic evaluation has so far only covered short-term construction sites
- plans are underway for traffic evaluation of long-term construction sites, and this will be implemented in the second development stage
- third development stage will mark a spatial extension beyond the motorways
- along with these functional extensions, work will also be done to further improve the existing system
- incorporation of external partners
- approach / components can also be used in other regions / by other road-construction authorities