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Freight transport planning integrating ITS

SUGAR workshop 04.05.2011

Marcel Huschebeck

Inhalt

- Source Data, traffic information (TI)
- Utilization and usability of traffic information
- Context and test site
- Ideas and implementation
- Application – User Interface
- Results and experiences in practice

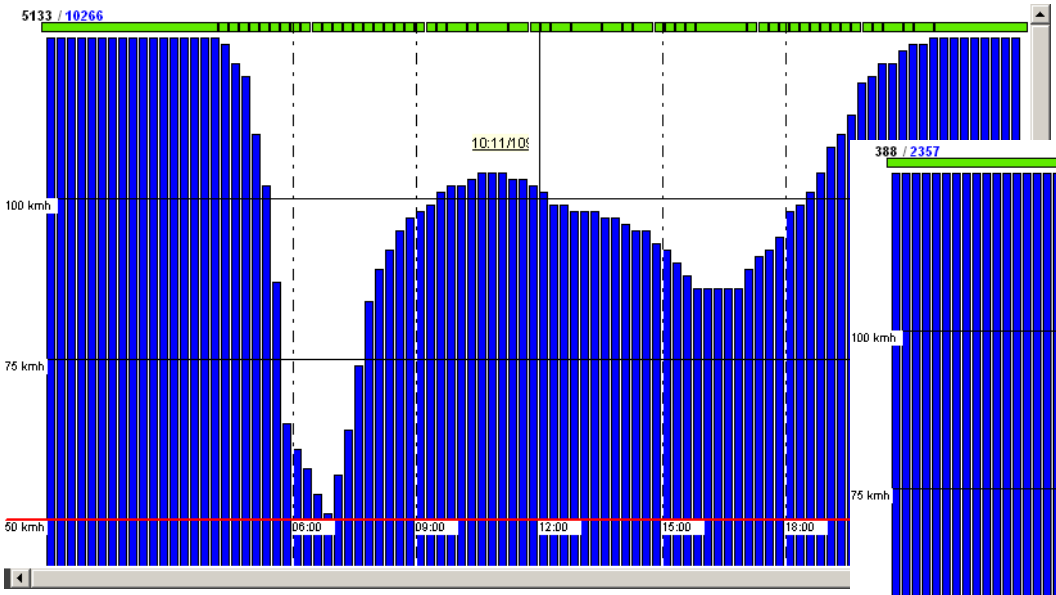
Source data – traffic information

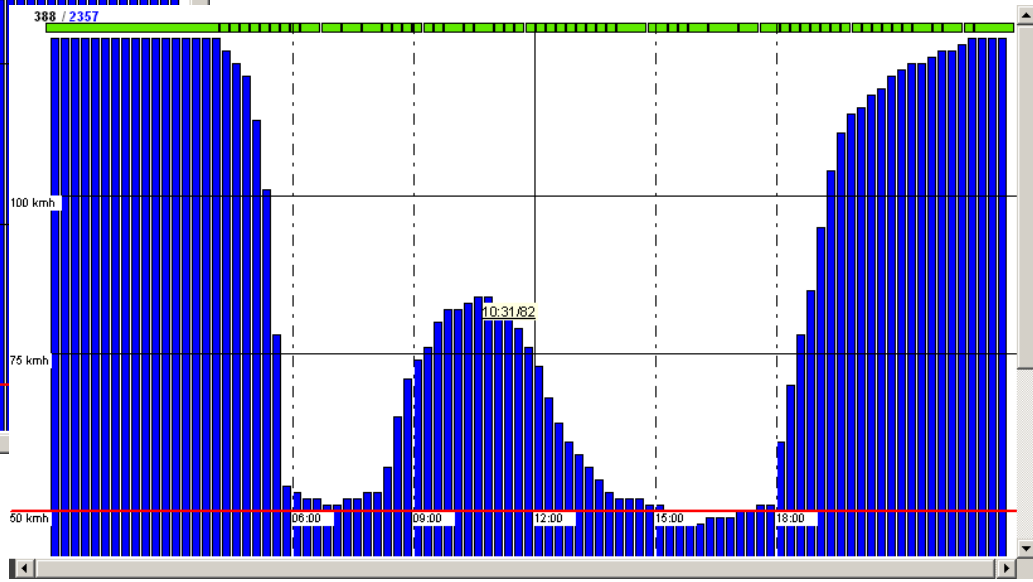
- Traffic information
  - Traffic messages
  - Road construction information
  - Prognoses
  - Level of Service
  - Time variation curves

- Source data
  - Traffic models
  - Traffic Management Centres
  - Traffic counts
  - Sensors
  - Cars
  - ….

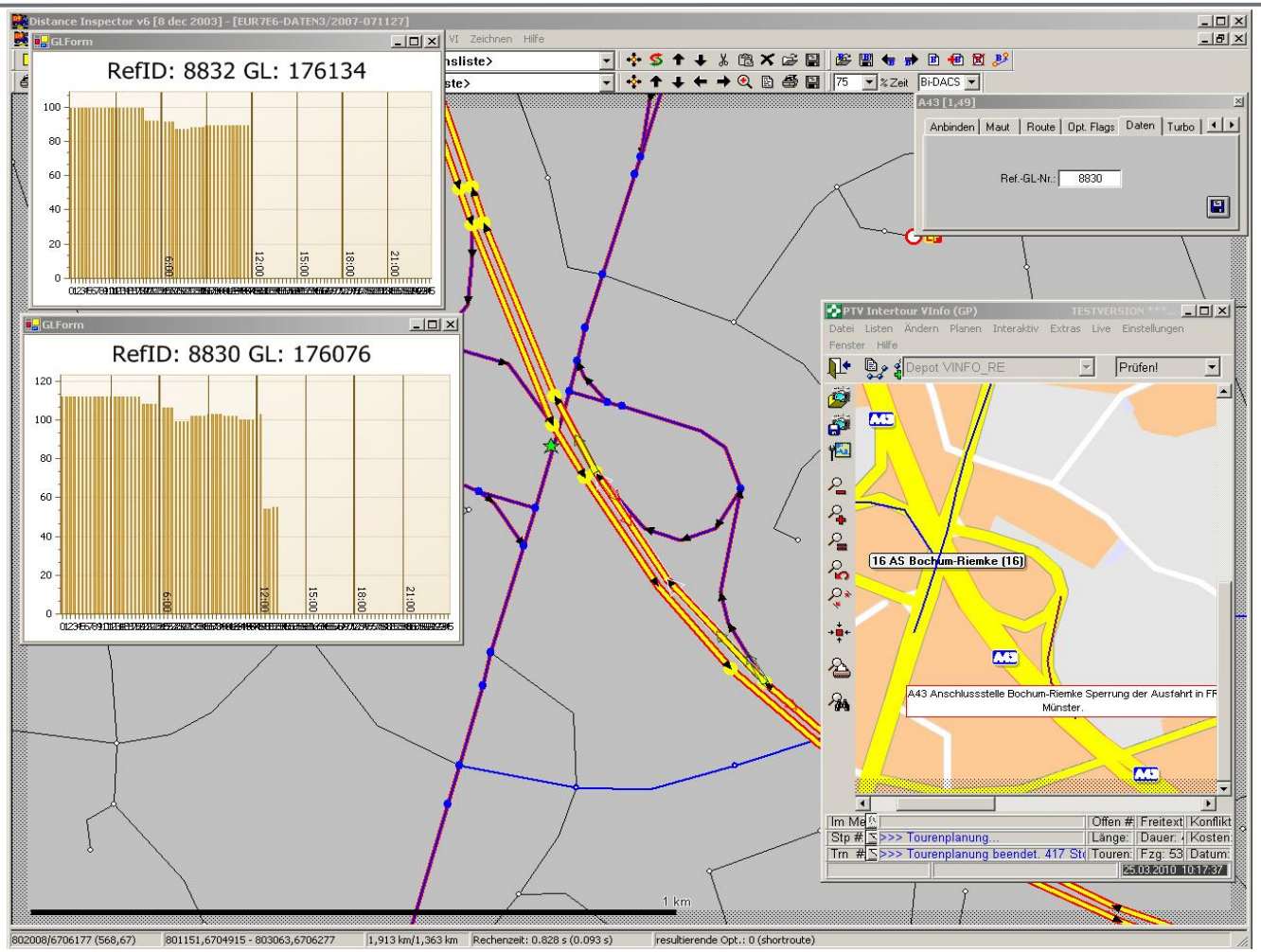
Basics: traffic data

- Basics for the use of traffic information in planning and routing
  - Speed/ daytime per segment with 15 min. timeslots
  - Longterm-prognosis: RushHour-Model

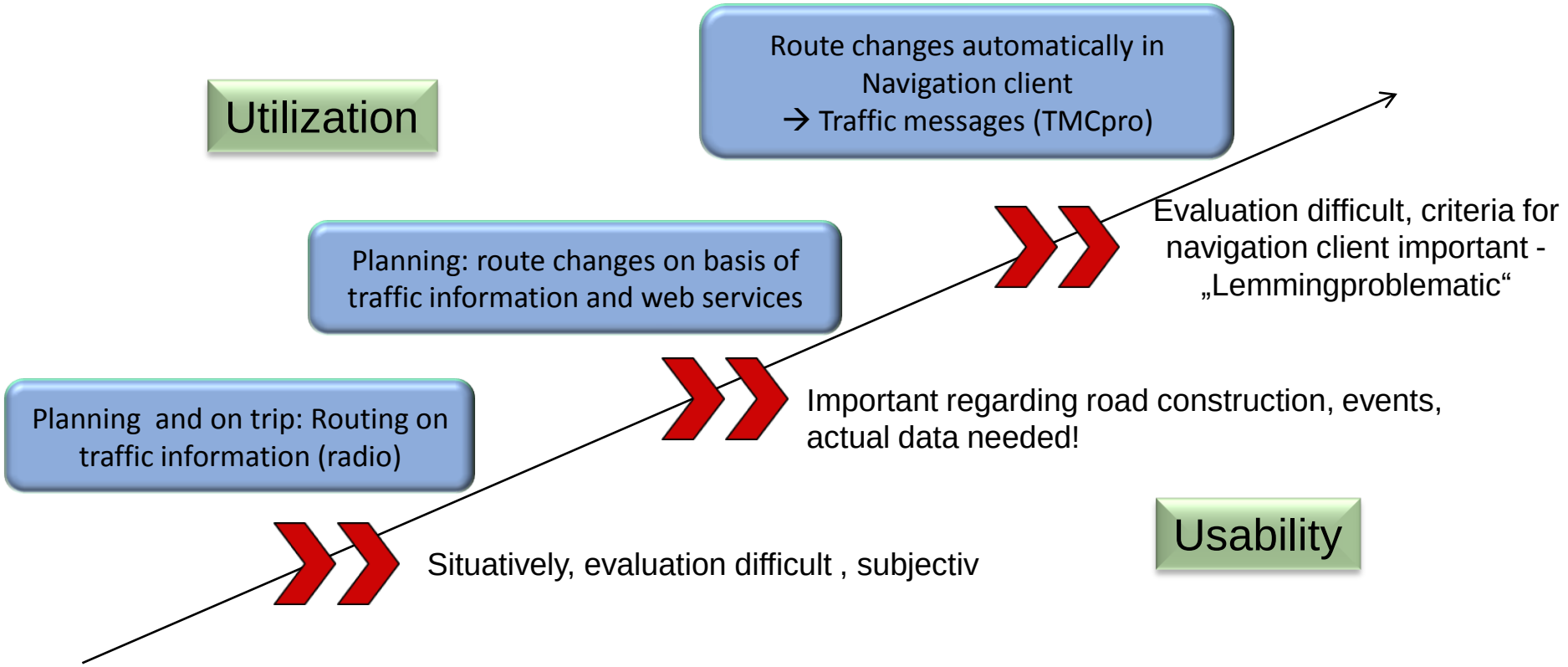




Example: blocked exit

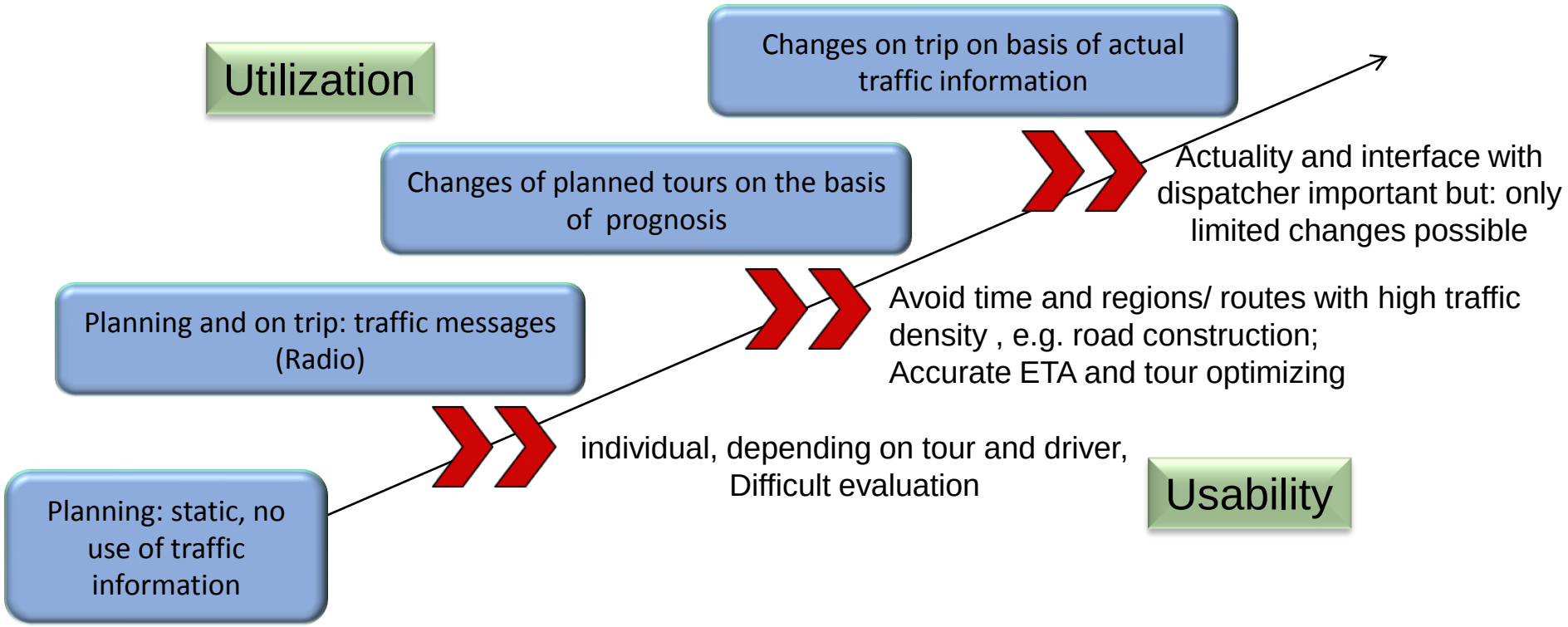


Utilization and usability in individual traffic



Source: PTV Research

Utilization and usability in logistics



Source: PTV Research

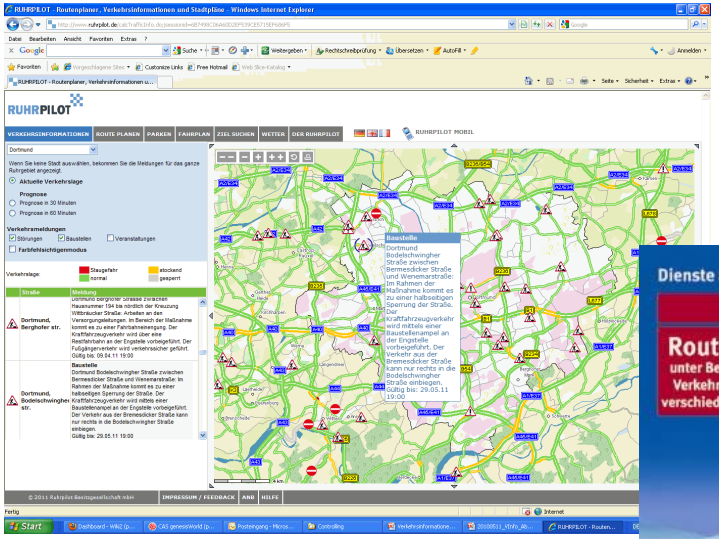
Distribution in urban areas

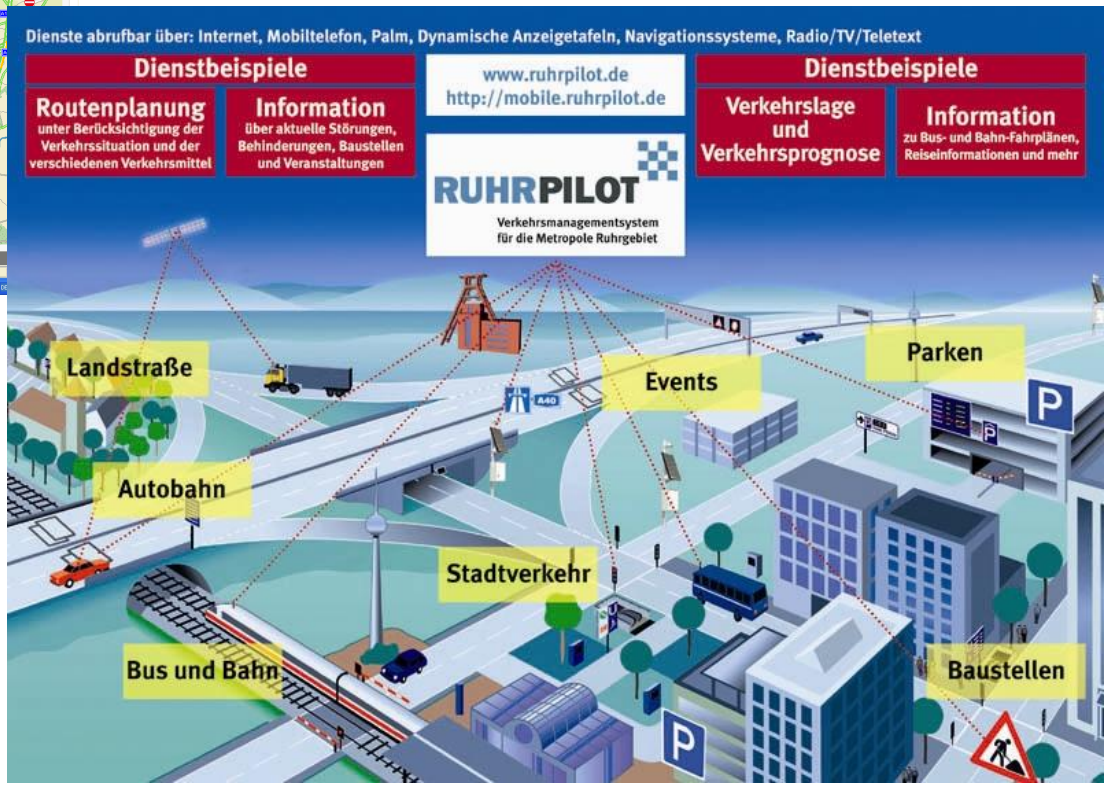
- Delivery times inaccurate
- Buffer times necessary
- congestion
- Limited access to inner city

- Dynamic, time sensitive
- Different vehicle types
- heterogenous customer structure

„Ruhrgebiet“ and „Ruhrpilot“

Technical data:
600 Ruhrpilot Detectors
660 BAB Detectors
70 Server, 8TB Harddrive
11 Traffic server
7 Parking management systems





Ruhrgebiet:
5.3 Mio Inhabitants
1.1 Mio commuter/day
513 Pkw /1000 Inh.
20% increase in passenger traffic
60% increase in freight transport
→ in 10 Years

Source: www.ruhrpilot.de

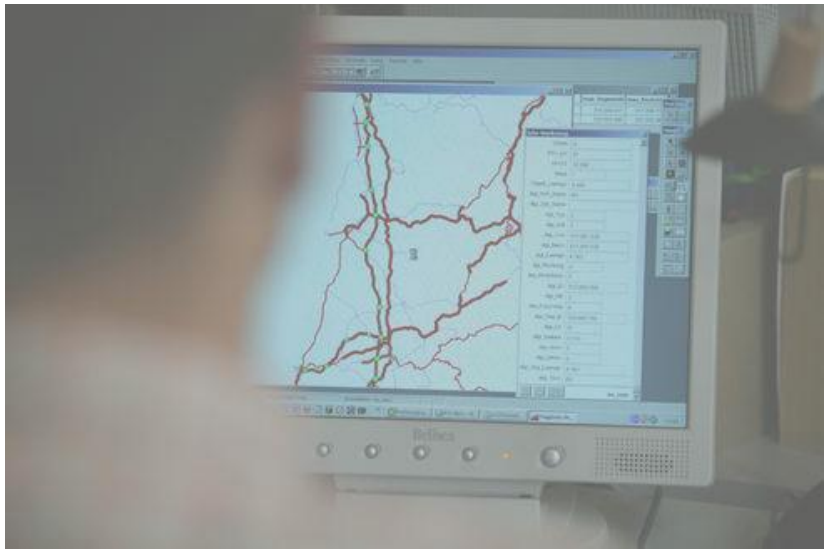
Ideas and implementation

- National funded research project Logistik-V'Info

- Partner:

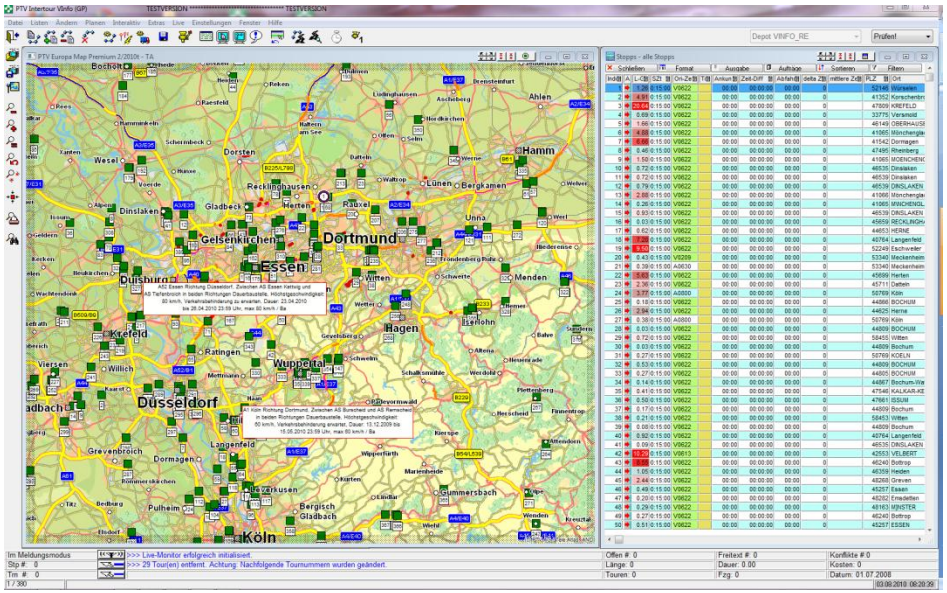
Ideas and concepts: Integration

- Enhanced INTERTOUR with functionality for planning with dynamic TI
- Analyses of effects with static and dynamic routines
- Evaluation and comparison
- 10min update of Traffic messages
  → Map-vizualisation
- Visualisation of dynamic routes



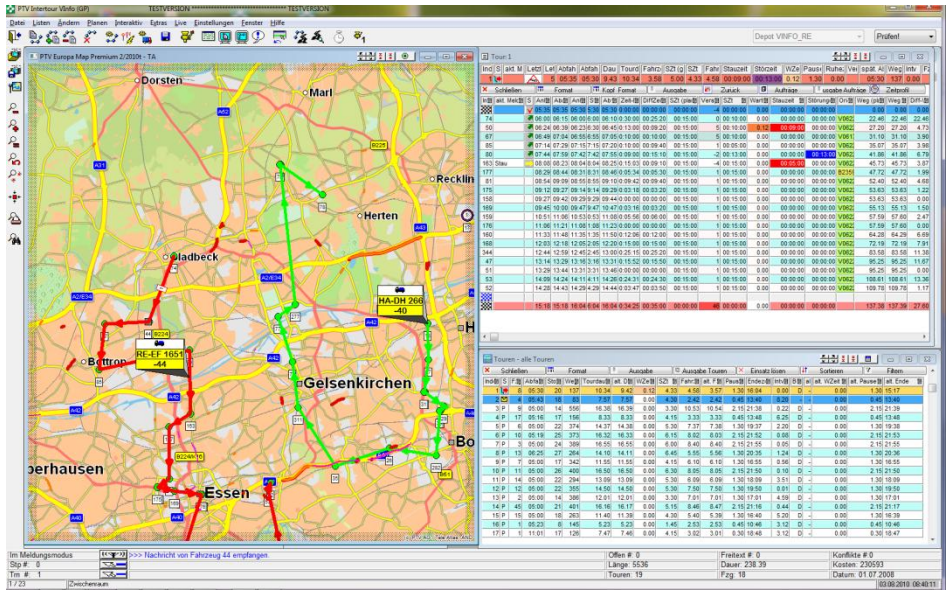
Two practical use cases

Tour planning



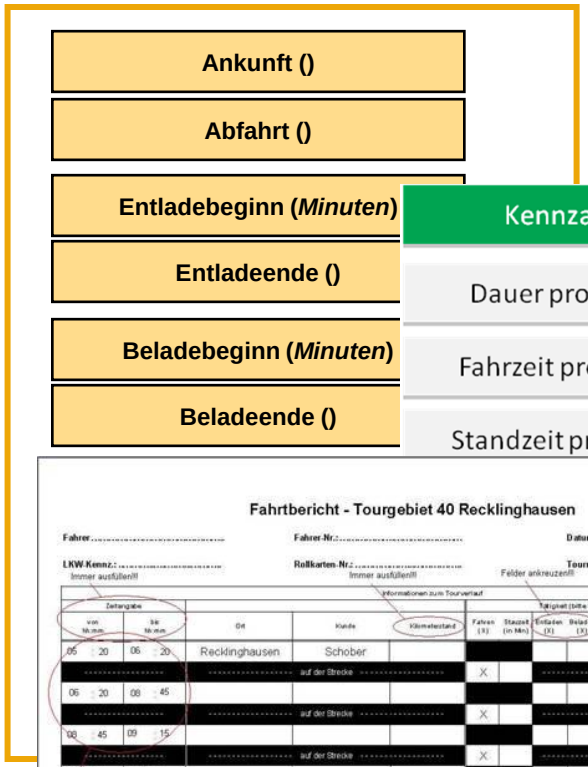
- Integration of prognoses
- mid-/ longterm prognoses
- Basis: Validate RushHour

Tour monitoring

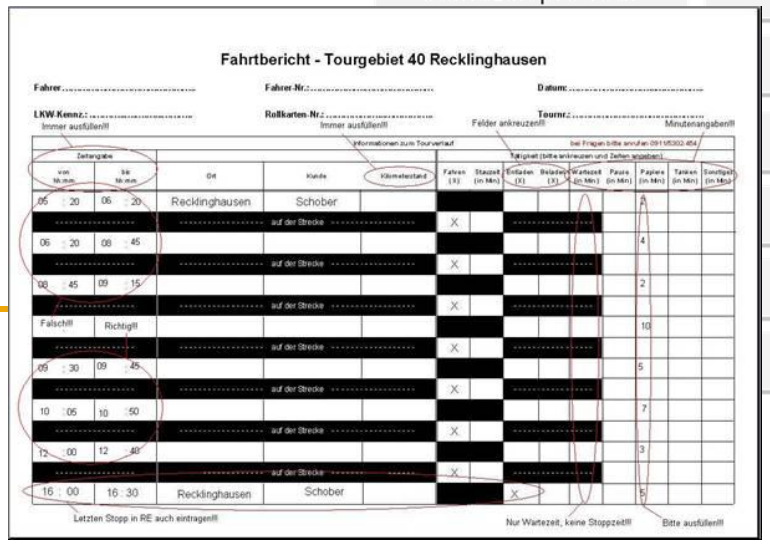


- Considering actual traffic situation
- Short-term prognosis, traffic messages
- Monitoring and re-calculation

Implementation



Kennzahl	Messung 2a
Dauer pro Tour	11:43
Fahrzeit pro Tour	05:16
Standzeit pro Tour	06:27
	51
	271
	7
	16,1
	7


Fahrtbericht - Tourgebiet 40 Recklinghausen

Fahrer..... Fahrer-Nr.:..... Datum:.....

LKW-Kennz.:..... Rollkarten-Nr.:..... Tournr.:.....

Immer ausfüllen!!! Immer ausfüllen!!! Felder ankreuzen!!! Minutenangaben!!!

Informationen zum Tourverlauf bei Fragen bitte anrufen 0911/9302-454

Zeitangabe von Uhrzeit	Zeitangabe bis Uhrzeit	Ort	Kunde	Kilometerstand	Tätigkeit (bitte ankreuzen und Zeiten angeben): Fahren (X)	Stauzeit (in Min)	Entladen (X)	Beladen (X)	Wartezeit (in Min)	Pause (in Min)	Papiere (in Min)	Tanken (in Min)	Sonstiges (in Min)
05 : 20	06 : 20	Recklinghausen	Schober										
		auf der Strecke			X								
06 : 20	08 : 45												
		auf der Strecke			X								
08 : 45	09 : 15												
		auf der Strecke			X								
Falsch!!!	Richtig!!!												
		auf der Strecke			X								
09 : 30	09 : 45												
		auf der Strecke			X								
10 : 05	10 : 50												
		auf der Strecke			X								
12 : 00	12 : 40												
		auf der Strecke			X								
16 : 00	16 : 30	Recklinghausen	Schober		X								

Letzten Stopp in RE auch eintragen!!! Nur Wartezeit, keine Stoppzeit!!! Bitte ausfüllen!!!

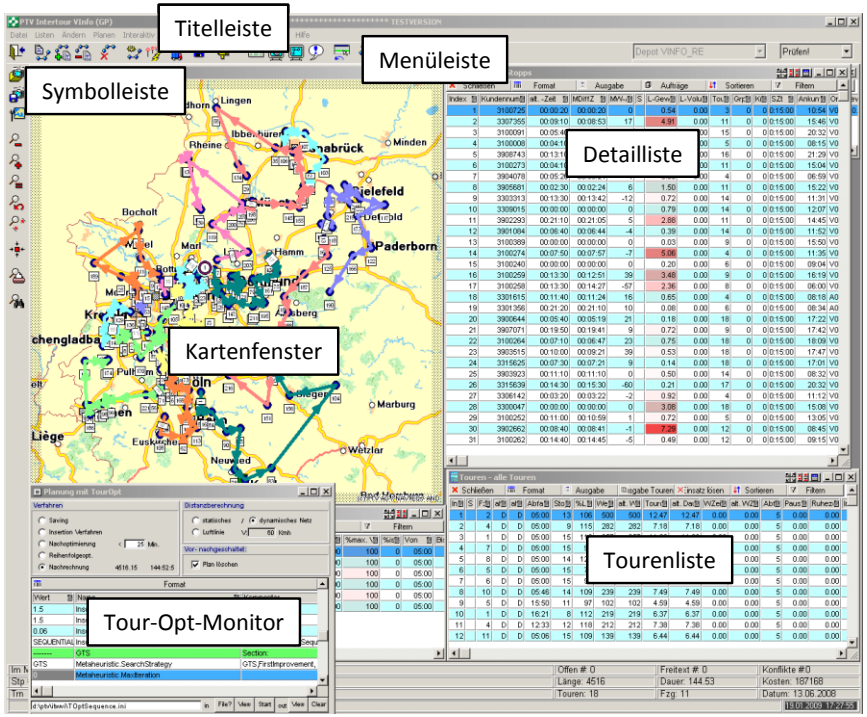
Developments

- Consideration of day-time specific traffic cycles
- Interfaces Logistics planning and traffic management
- Dynamic Routing
- User Applikation

Fieldtests and evaluation

- Dynamic planning in real business practice
- Evaluation and analyses of tourplans and processed tours
- Performance indicators for different test phases and parameters

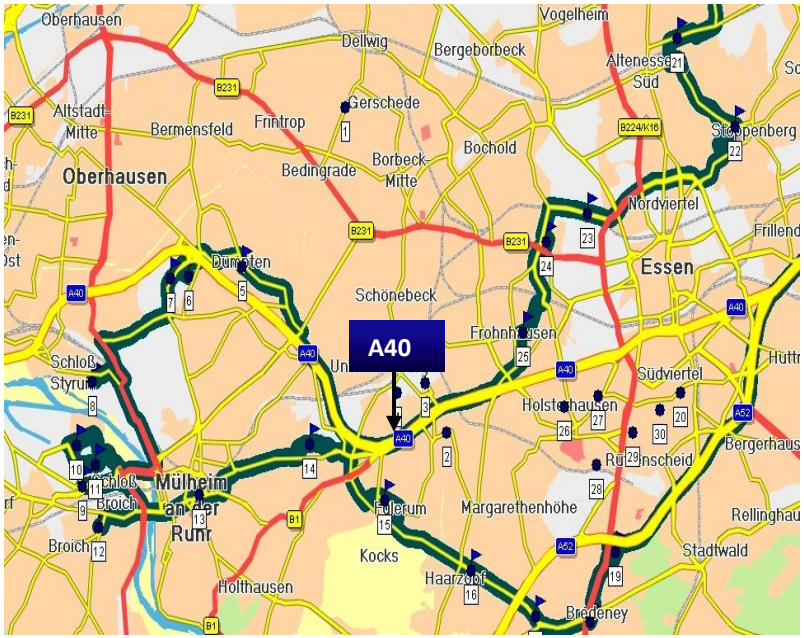
V‘Info testsystem based on PTV Intertour



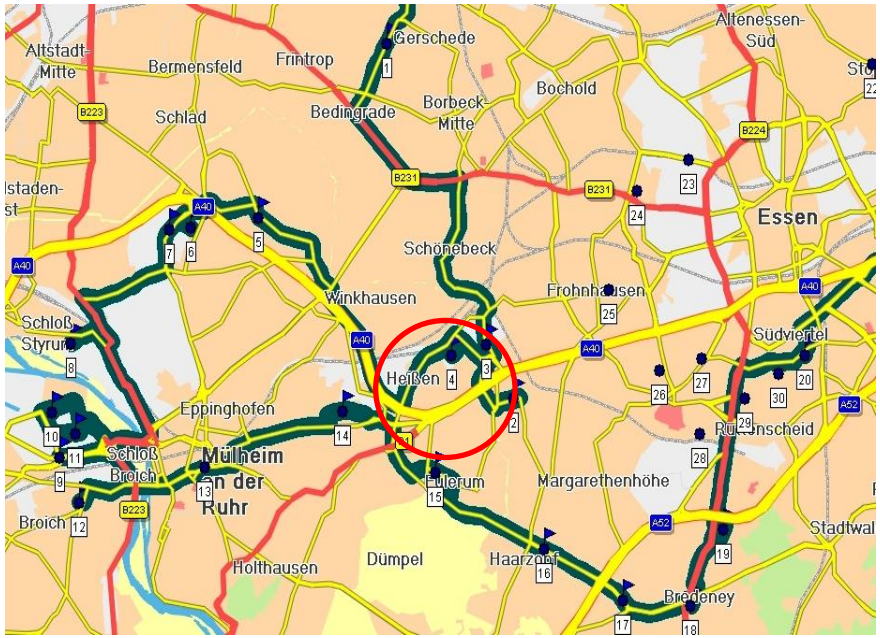
- Planning system for cost effective and efficient order management
- Wide range of parameters
- Customized for different requirements in practice
- Different interfaces to ERP-Systems
- Additional functionalities in V‘Info-testversion

Results - Comparisons

Static



Dynamic

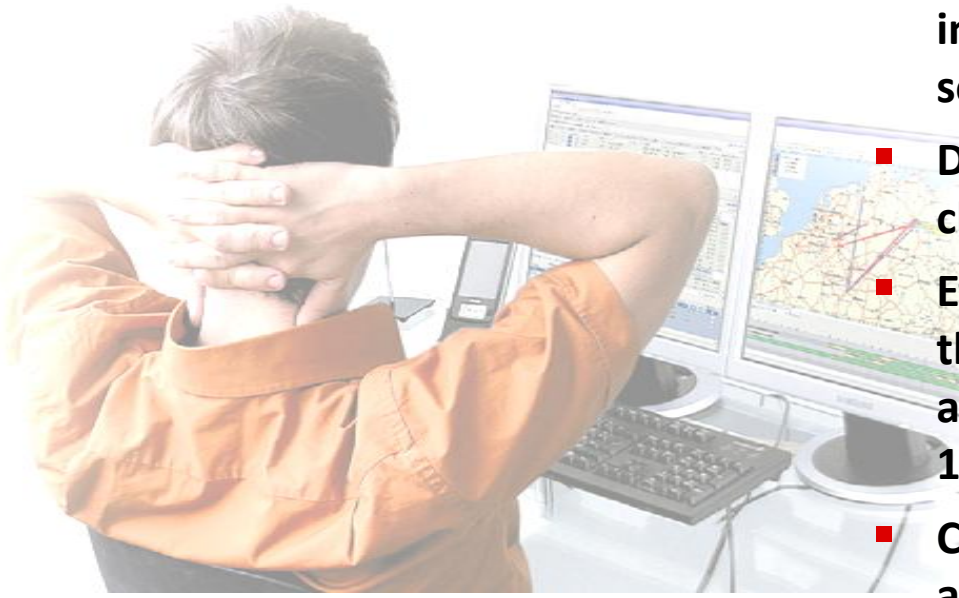


- example of two tour alternatives static – dynamic
- spatial shift of routes – avoidance of congestion routes

System developoments – review of results

- Dynamic travel times are being considered in planning
- Spatial and time related shift of routes and tours (congestion areas)
- Alternative Tour-processing with less tours, distances and costs
- Time profile optimization of tours successful
- TI have effects on tour structure and plans
- Better and more reliable tour planning and ETA - results

Experiences from field-tests



- **Systems reliable in practice, system architecture can be complex, to be individually defined for use case (support, service level, interfaces)**
- **Data availability important (orders, changes etc.)**
- **Effects of TI in planning more significant than on trip (process changes on trip can affect planning results), savings between 15-20%**
- **Changes (Route/ Time) depending on tour and parameter**

traffic mobility logistics.

www.ptv.de

PTV. Powering Transportation Visions.

Thanks for your attention