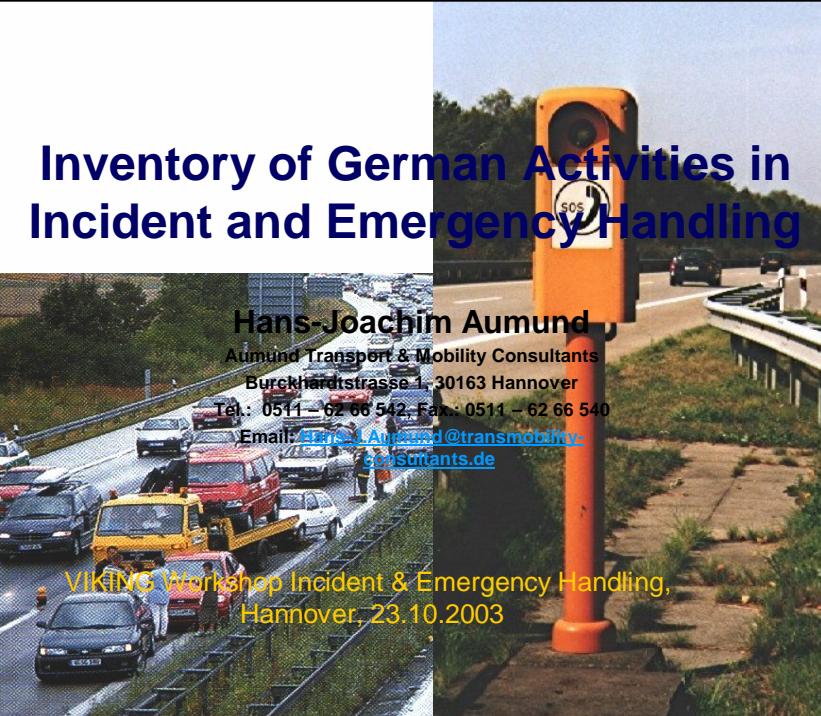



## Inventory of German Activities in Incident and Emergency Handling

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## Fields of German R+D Activities and practical Applications

1. Incident Detection / Incident Warning Tools
2. Automatic Detection Systems and Image Processing
3. Incident Communication and collective warning Instruments
4. Instruments and Measures of Traffic Management and Traffic Warning
5. Breakdown and Accident Services for Motorists
6. Emergency Calls / Danger Warnings for Motorists
7. Incident Management in Tunnels
8. Incidents and Dangerous Goods Transport


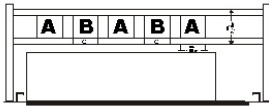



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## Incident Detection / Incident Warning Tools

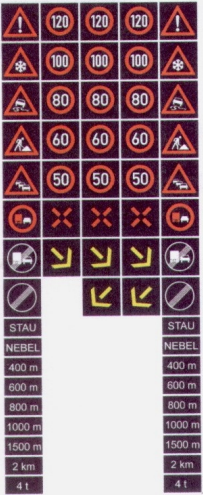
# Line Control Systems


  
Regulation Signs

  
Warning Signs

  
Additional Information




- ✦ about 850 km of Line Control Systems (LCS) are in operation in Germany now
- ✦ LCS are used on sections with high traffic density ; their tasks are:
  - ◆ Harmonisation of traffic flow and hazard warning in case of disturbances;
  - ◆ Disposition of Speed restrictions, line closures and other regulation measures such as heavy vehicle overtaking ban;
  - ◆ Traffic warnings like congestion warning, slippery road or road construction ahead are disposed
- ✦ Measurement of traffic Parameters: spot speed, traffic volume, vehicle class and occupancy per lane;




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## Incident Detection / Incident Warning Tools

# Line Control Systems



**Problem:**


- Local detected parameters are transferred to complete section;
- Undetected incidents, late detection; False alarms;
- Operated strategies not adapted to the traffic situation
- local parameters are compared with empiric threshold values; Lots of parameters → no optimisation means;
- For incident and congestion warnings criteria are insufficient.

**Approach:**

- Newer attempts are more section-oriented, including data from two cross sections.
- Kalman-Filter-Procedure and Fuzzy-Logic-Model are used for the improvement of incident detection;
- detection quality in terms of time and location is still relatively bad ;

**Newer Activities:**


- Running Project in CORVETTE
- Improvement of the algorithm combination logic
  - solution for the parameter optimisation
  - Improvement of the decision logic for the incident control
- Reports on the TEMPO Düsseldorf Conference and on the Stockholm Monitoring Workshop in November




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**VIKING** Automatic Detection Systems  
**Digital Video Detection**




- Videosignal is analysed digitally;
- Traffic volume, Traffic density, speed, broken down cars, fire and smoke, use of hard shoulders, persons and lost loadings and motorist driving against traffic are detected automatically.
- Advantage: Incidents and their causes are detected exactly; Data can be stored .
- Different procedures for digital analysing are in use:
  - Tripwire Systems
  - Tracking Systems
  - Space Analysis Systems (IMPACT)
- Digital Video analysis is an important contribution to safety in tunnel surveillance and on roads



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**VIKING** Incident Communication and collective Warning Instruments  
**Emergency Column**



- 14.000 Emergency Telephones along the Autobahn network
- since 1999 operated by the German insurance association (GDV) with a call centre in Hamburg
- bought from the road administration to reduce accident costs (24 mio EURO per year)
- 1.5 million emergency calls per year (1999) with 10% emergency calls and 80% breakdown call.
- The importance of these telephones decreases with growing importance of mobile phones


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## Incident Communication and collective Warning Instruments

# Companion System




Source: BMW Group, 2001

- COMPANION aims to provide road users with a warning of the exact location of danger and critical situations which cannot be recognized at that moment in time.
- The system is based on electronic beacons at the side of the road equipped with lighting units.
- These beacons are connected with a data network, incident detection systems and a control system that activates them.
- Beacons are similar to the conventional reflector posts but some 30 percent larger.



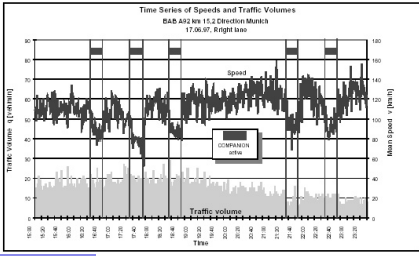
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## Incident Communication and collective Warning Instruments

# Companion System



Source: BMW Group, 2001

- Field Test of the system on A92 north of Munich (since 1996), on A4 near Verona (Italy) and near Edinburgh in Scotland (since 1998)
- The trials brought a significant reduction in speed and contributed to a safer and more homogenous flow of traffic. Extreme top speeds completely disappeared.
- The weak point for an effective operation of this system is the imprecise conventional recognition of traffic disturbances.
- Newer efforts now integrate mobile traffic data detection into this incident management system to improve the effectiveness basically



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**Breakdown and Accident Services for Motorists**  
**ADAC Telematic Kit / GPServicePilot**



**In Car System Devices:**

- Hands-free speaking system
- GPS/GSM Technology
- Mobile Phone and Service pad

**System Functionalities:**

- SOS Service call in case of an incident
- Break Down Assistance
- GPS Positioning via SMS message
- Info Service on Traffic Information

**ADAC Service Center:**

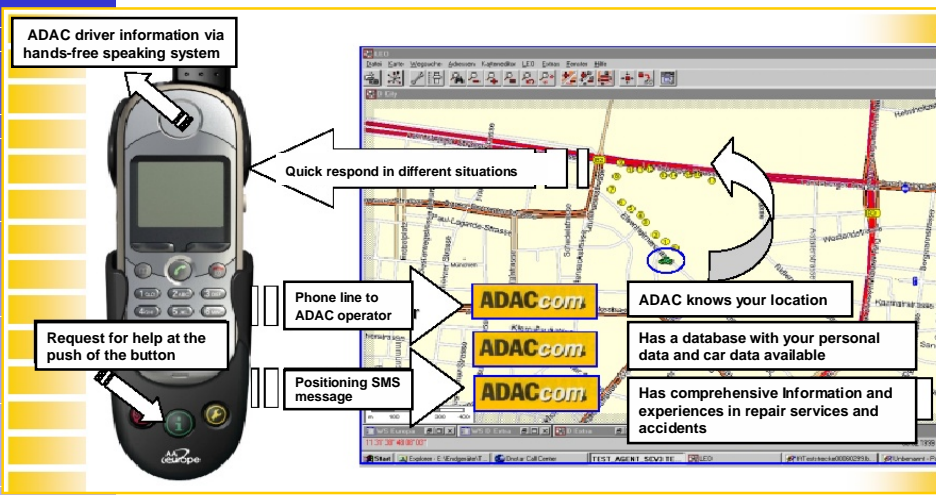
- Automatic mobile phone connection installed
- Digital road map with current location
- Direct connection to 112 Emergency Centre
- ADAC Database with car / driver relevant data
- Individual Traffic Information available

Source: ADAC 1999

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**Breakdown and Accident Services for Motorists**  
**ADAC GPServicePilot**



**ADAC driver information via hands-free speaking system**

**Quick respond in different situations**

**Request for help at the push of the button**

**Phone line to ADAC operator**

**Positioning SMS message**

**ADAC.com**

**ADAC.com**

**ADAC.com**

**ADAC knows your location**


**Has a database with your personal data and car data available**

**Has comprehensive information and experiences in repair services and accidents**

Source: ADAC 2002

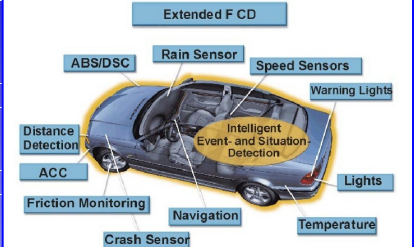
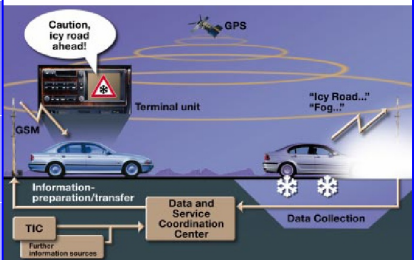
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## Individual Emergency / Danger Warnings for Motorists

# Local Danger Warning with XFC D

- Part of the MoTiV Project (1996 –2000) supported by German Research Ministry;
- XFC D stands for extended floating car data. Transmission of additional data from car sensors like:
  - Rain and temperature
  - brake and fog lights
  - hazard warning flashers
  - driver assistance systems
- Internal transmission of data to event, traffic and road condition messages, e.g.
  - poor visibility and fog
  - heavy rain, aquaplaning, icy road
  - approaching to congested area
  - traffic flow
- Messages from cars are processed in a data centre and transmitted to the road user as traffic information or warning message



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## Emergency / Danger Warnings for Motorists


# BMW: LoCoMoTiV Field Trial



The field test was hold in three phases:

- FCD generation and transmission to the LIC centre, being merged with conventional road data from the TIC
- Configuration of cars for XFC D detection; implementation and test of recognition models; transmission of hazard, traffic and road condition information to LIC centre.
- Closing of information chain; vehicle devices receive local hazard warnings and supply them to the driver.

These and similar research results which are strongly supported by the automobile manufactures are important contributions for the development of driver assistant and information services. They are now in the phase to be launched.



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**Thank you for your attention !**

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