

Euro-regional projects conference 11, 12 & 13th June 2003

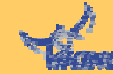
# TRAFFIC MANAGEMENT AND CONTROL

## TEMPORARY HARD SHOULDER LANE USE IN HESSEN

By Dipl.-Ing. Matthias Burger



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Hessen



# TEMPORARY HARD SHOULDER LANE USE IN HESSEN

Presentation  
Stream

**Part 1: History and Pre-Considerations**

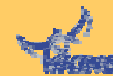
**Part 2: Preliminary Study**

**Part 3: Frame Conditions**

**Part 4: Function**

**Part 5: Experiences**

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# TEMPORARY HARD SHOULDER LANE USE IN HESSEN

## Starting situation:

- Several motorway sections with regular congestions, especially during peak hours
- No possibility to carry out regular solutions (additional lanes) because of financial bottlenecks and difficulties in getting the right to build



History  
and  
precons.

Part 1

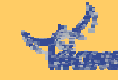
Part 2

Part 3

Part 4

Part 5

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# TEMPORARY HARD SHOULDER LANE USE IN HESSEN

objectives of the study:

- general feasibility?
- identification of the frame conditions concerning traffic flow and control
- estimation of the national economic effects (benefit vs. costs)

prelimin.  
study

Part 1

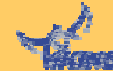
Part 2

Part 3

Part 4

Part 5

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# TEMPORARY HARD SHOULDER LANE USE IN HESSEN

prelimin.  
study

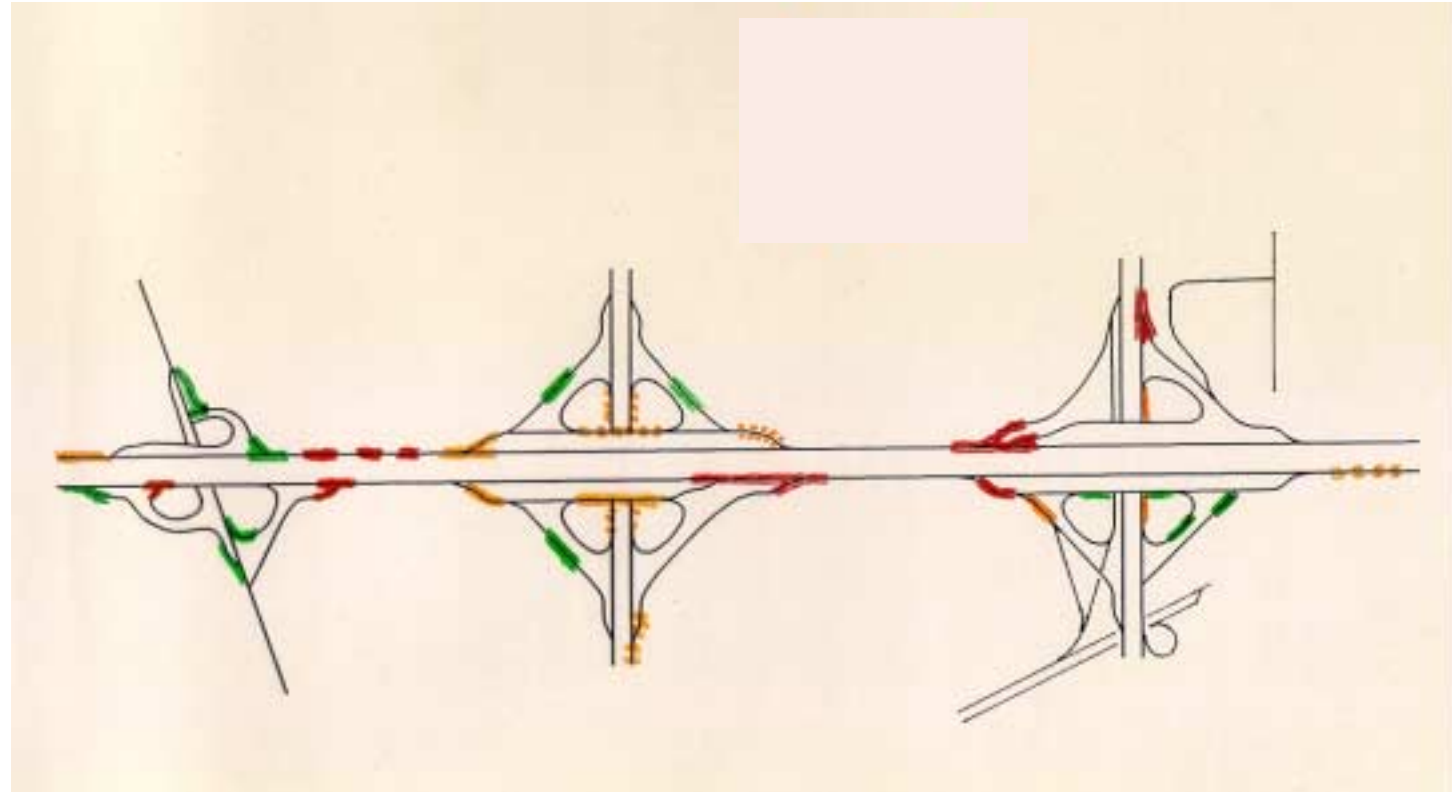
Part 1

Part 2

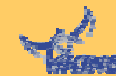
Part 3

Part 4

Part 5



Identified bottlenecks and potential problem areas on the A 5 near Frankfurt



# TEMPORARY HARD SHOULDER LANE USE IN HESSEN

## Results of the study:

- Feasability is generally given, BUT
- the stretches carrying the outflowing traffic have to have a sufficient capacity (in the examined case, some had to be widened or improved in another way)
- The project is very economic: benefit-cost ratio approx. 50!

prelimin.  
study

Part 1

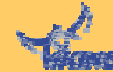
Part 2

Part 3

Part 4

Part 5

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# TEMPORARY HARD SHOULDER LANE USE IN HESSEN

- Legal: In 2001 the German Road Traffic Act has been changed to make it possible – under strict pre-conditions (planning status, speed limit)
- Concerning traffic: sufficient capacities in the outflows!
- Structural: - lane width (min 3,5 m without, 3,25 m within durable speed limit)  
- homogenous structure of carriageway and hard shoulder lane  
- maximum load of bridges

frame  
conditions

Part 1

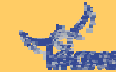
Part 2

Part 3

Part 4

Part 5

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# TEMPORARY HARD SHOULDER LANE USE IN HESSEN

frame  
conditions

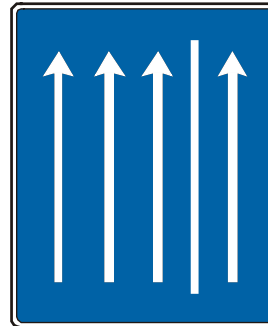
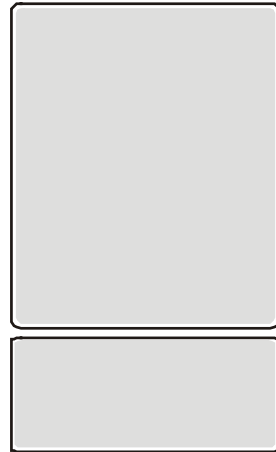
Part 1

Part 2

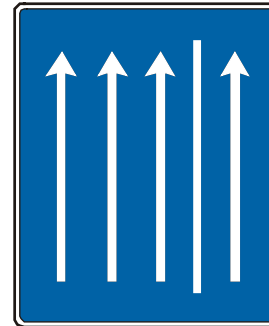
Part 3

Part 4

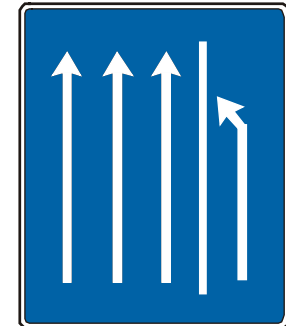
Part 5



Seitenstreifen  
befahren



Ende in ...m



Seitenstreifen  
räumen

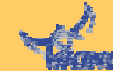
Regular state:  
hard shoulder  
lane closed –  
no indication

Indication „Use  
hard shoulder  
lane“ obliges  
drivers to use  
it as a right  
hand lane

The ending is  
also announ-  
ced so that  
traffic can  
sort

When the tem-  
porary use is  
finished, the  
clearing of the  
hard shoulder  
lane is indica-  
ted as above

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# TEMPORARY HARD SHOULDER LANE USE IN HESSEN

Function

Part 1

Part 2

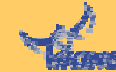
Part 3

Part 4

Part 5

- In Hessen always integrated into a stretch control (variable speeds etc. by VMSs) AND video monitoring (one camera for each direction every 500 m)
- Reasons: Safety / dealing with broken down vehicles / quick and clear clearing of hard shoulder / use of h. s. only if necessary → semi-automatic (open loop) activation depending on the actual traffic amount

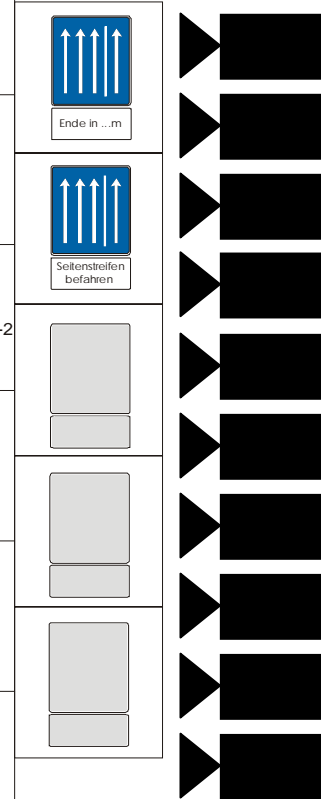
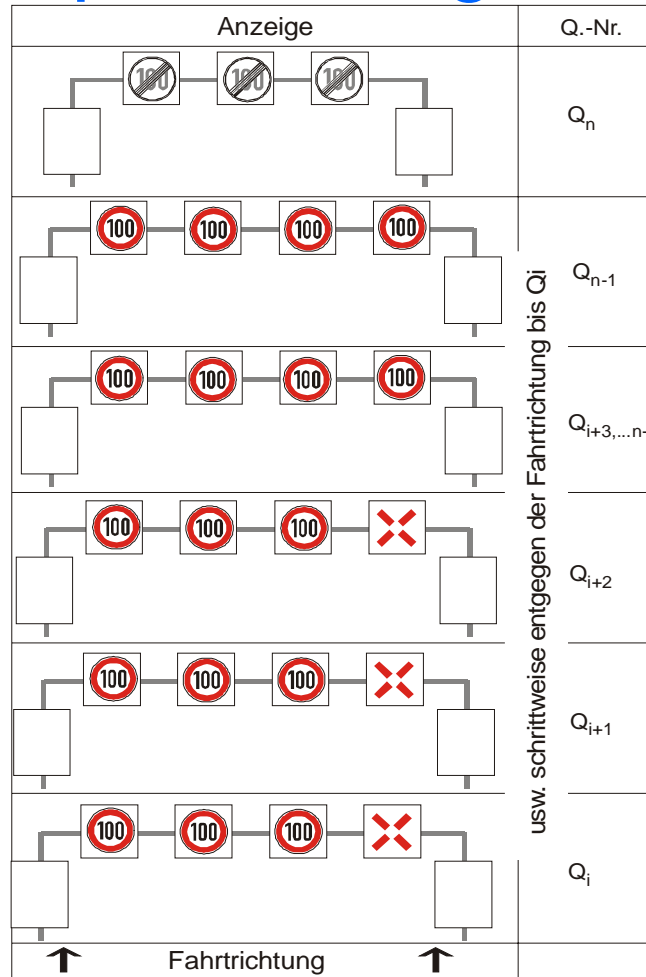
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# TEMPORARY HARD SHOULDER LANE USE IN HESSEN

Activation proceeding:

Gradual upstream activation



Cameras automatically panning over the stretch

Function

Part 1

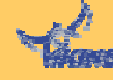
Part 2

Part 3

Part 4

Part 5

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# TEMPORARY HARD SHOULDER LANE USE IN HESSEN

## Deactivation proceeding - regular

Function

Part 1

Part 2

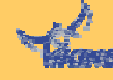
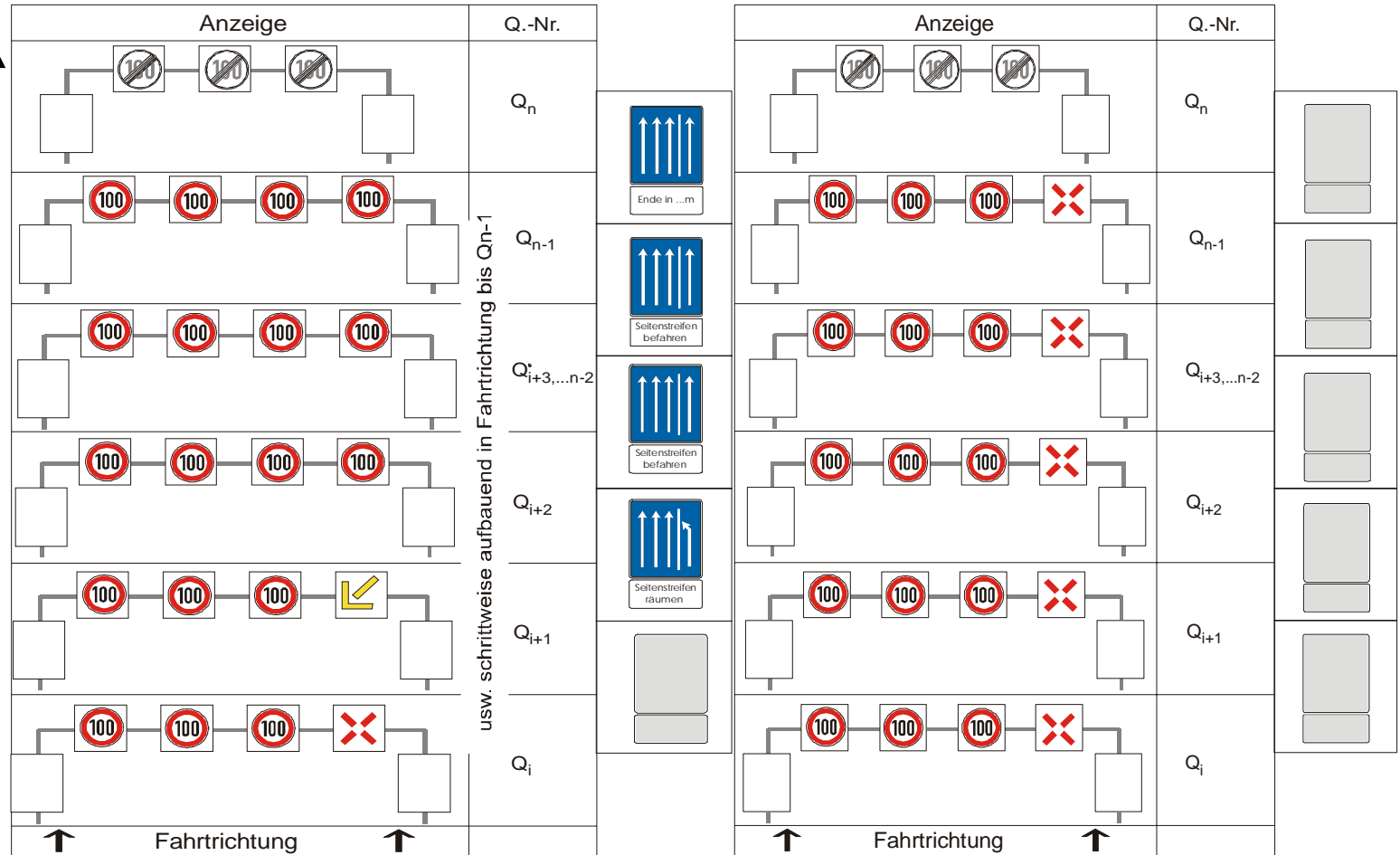
Part 3

Part 4

Part 5

Gradual downstream deactivation

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# TEMPORARY HARD SHOULDER LANE USE IN HESSEN

## Deactivation proceeding - emergency

Function

Part 1

Part 2

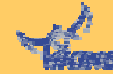
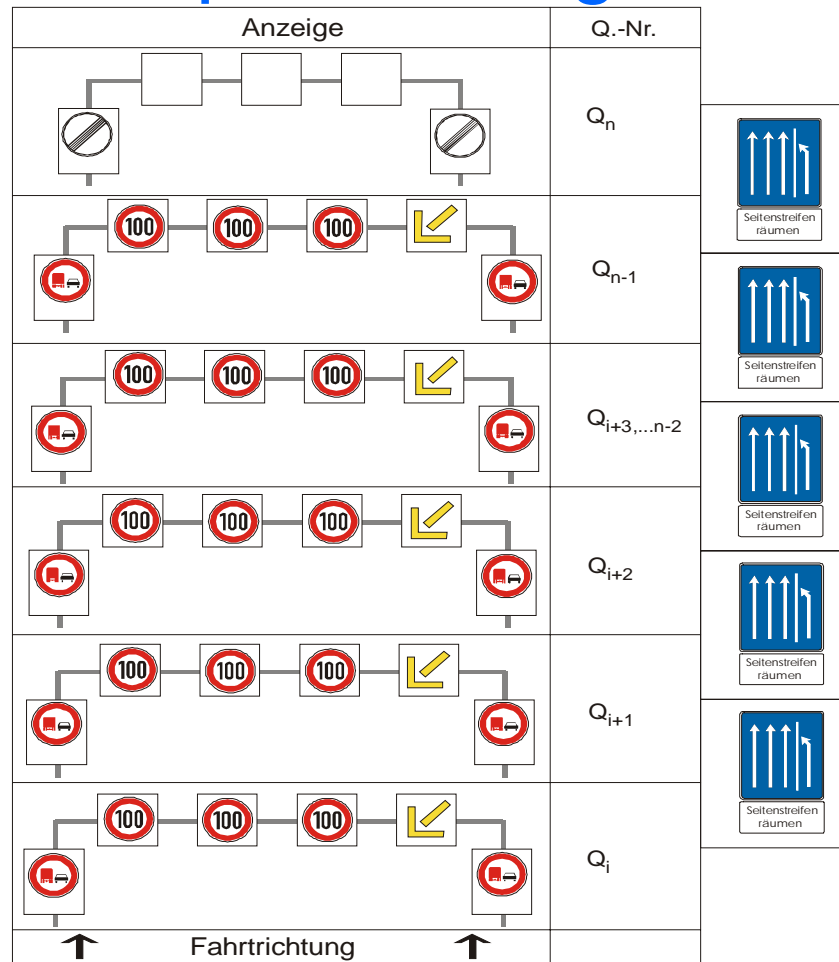
Part 3

Part 4

Part 5

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„all at once“ deactivation



# TEMPORARY HARD SHOULDER LANE USE IN HESSEN

## Roadside situation

Function

Part 1

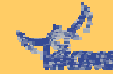
Part 2

Part 3

Part 4

Part 5

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# TEMPORARY HARD SHOULDER LANE USE IN HESSEN

## Control room in the traffic centre

Function

Part 1

Part 2

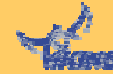
Part 3

Part 4

Part 5



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# TEMPORARY HARD SHOULDER LANE USE IN HESSEN

## Roadside situation at emergency deactivation

Function

Part 1

Part 2

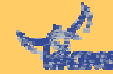
Part 3

Part 4

Part 5



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# TEMPORARY HARD SHOULDER LANE USE IN HESSEN

## Situation at the end of the stretch

Function

Part 1

Part 2

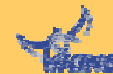
Part 3

Part 4

Part 5



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# TEMPORARY HARD SHOULDER LANE USE IN HESSEN

- Congestion has strongly decreased!
- Sometimes still congestion because of overloaded outflow(s)
- In average, the hard shoulder can only be opened with delay or must be closed too early because of broken down vehicles every second day → congestion!
- No measurable increases in accidents up to now, but...

Experiences

Part 1

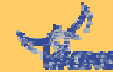
Part 2

Part 3

Part 4

Part 5

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# TEMPORARY HARD SHOULDER LANE USE IN HESSEN

... for some it still seems to be hard to understand...



Thank you for your attention!

Experiences

Part 1

Part 2

Part 3

Part 4

Part 5

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