

# Young Researchers Seminar 2009

Torino, Italy, 3 to 5 June 2009

## Methods to Measure Quality and Reliability of RDS-TMC messages

Jessica Kleine



# Overview

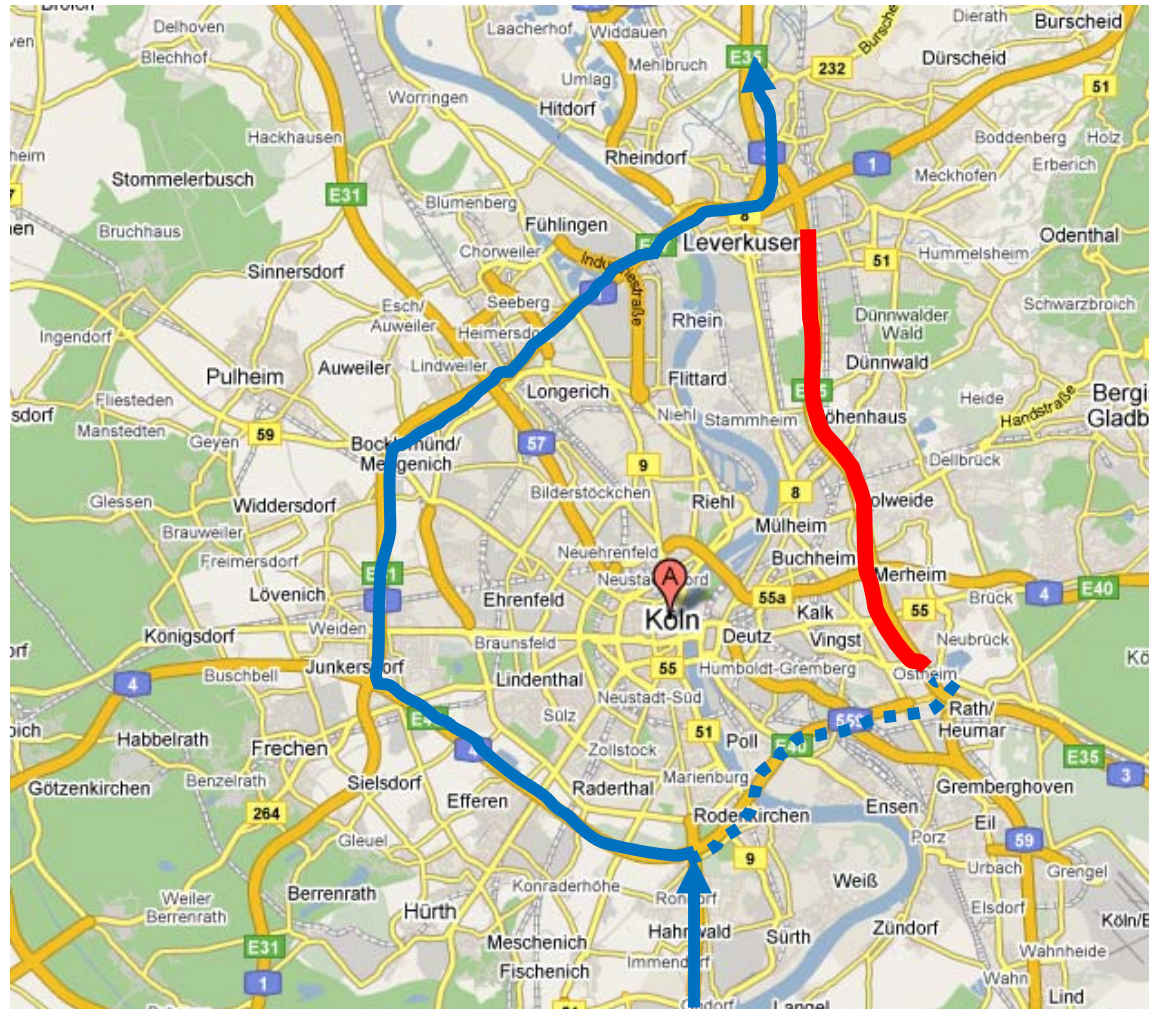
1. Introduction
2. Traffic Information Chain in Germany
3. Traffic Information Quality as Process Analysis
  - Main principle
  - Example: Location Code List
4. Conclusion

# 1. Traffic Message Channel (TMC)

- specific application of the FM Radio Data System (RDS)
- used for broadcasting real-time traffic and weather information
- Coded data messages are received silently in addition to spoken radio program

# 1. Message Text

- Motorway A3, Frankfurt to Dortmund, between motorway intersection Rath and Leverkusen stationary traffic for 10 km

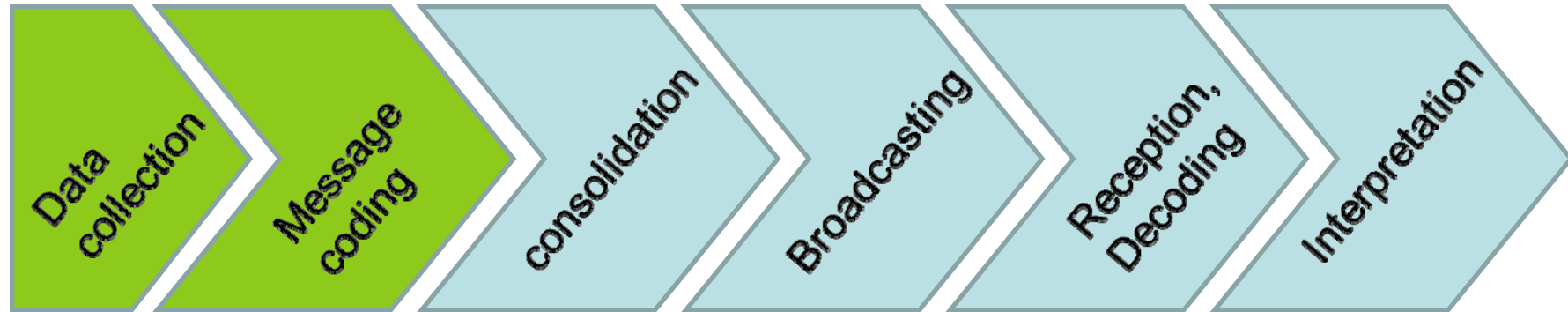


Quality and Reliability of RDS-TMC messages

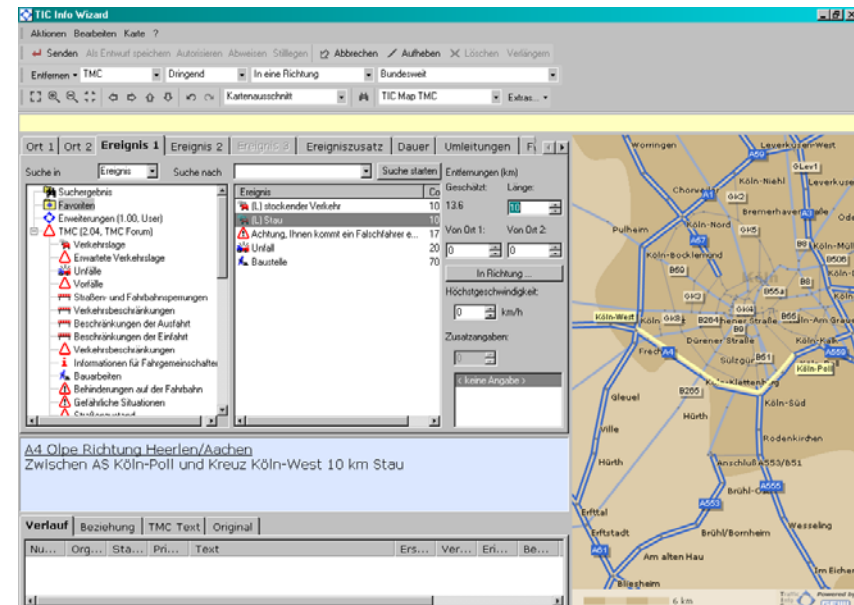
Jessica Kleine



# 2. Message Processing: Information Chain



- Traffic management centre
- Police
- Jam buster

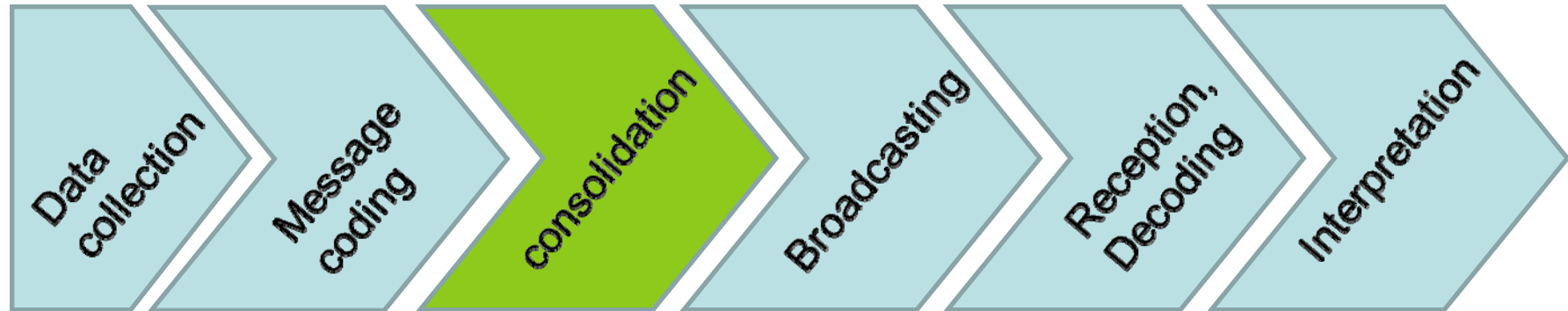


Quality and Reliability of RDS-TMC messages

Jessica Kleine



## 2. Message Processing: Information Chain



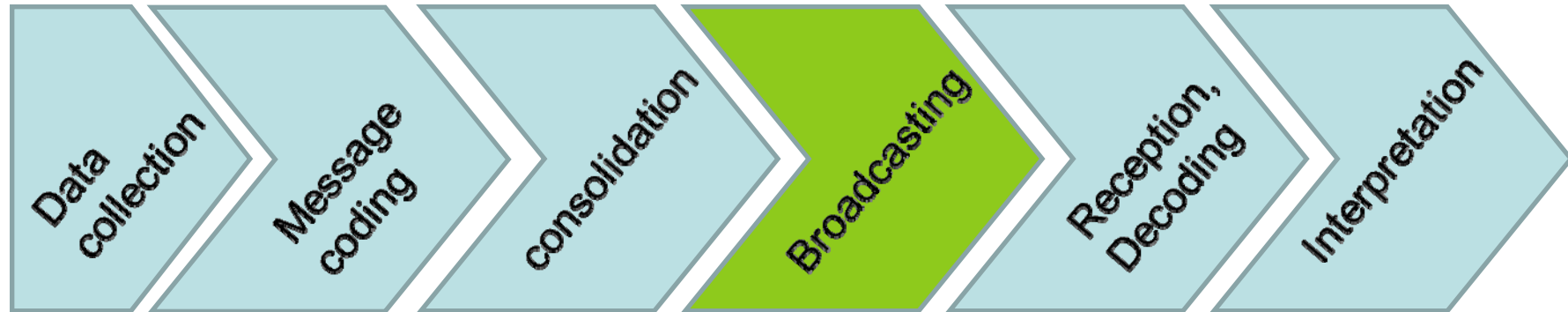
- Regional and national traffic information center (Police)

Quality and Reliability of RDS-TMC messages

Jessica Kleine



## 2. Message Processing: Information Chain



- Public and private broadcasters (TMC)
- Audio announcement
- others

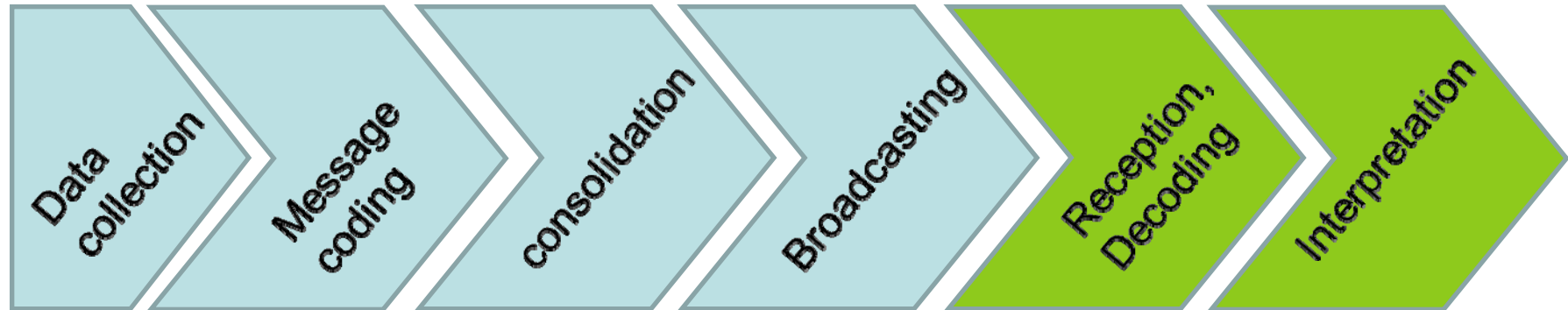


Quality and Reliability of RDS-TMC messages

Jessica Kleine



## 2. Message Processing: Information Chain



- end terminals (radio), navigation systems



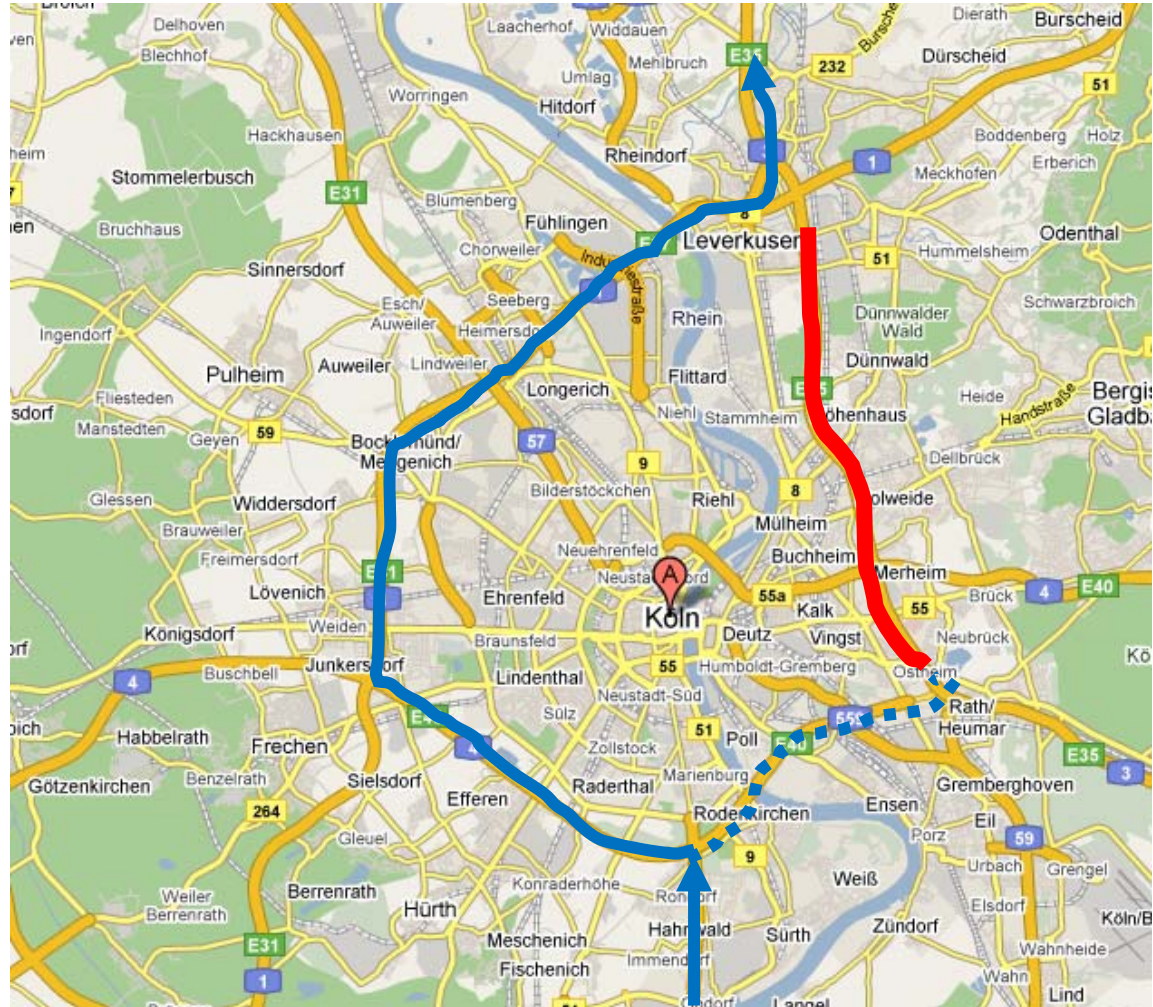
Quality and Reliability of RDS-TMC messages

Jessica Kleine



# 3. Reliability and Quality of Traffic Info

- Trust information and choose detour?
- Don't trust information and choose short distance?



Quality and Reliability of RDS-TMC messages

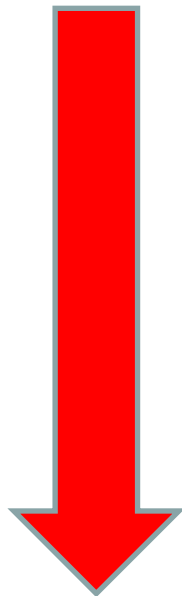
Jessica Kleine



# 3. Existing Quality Approaches

- Comparison between real and reported traffic

situation:



Reference data collection:  
Manually (driving in non-affected direction,...)  
Automatically (inductive loop, FCD, ...)

Calculation model

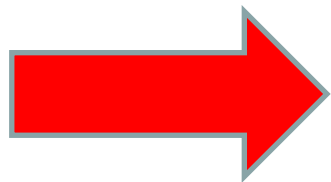
Quality Indicators:  
Error-rate (non-consistant messages),  
Travel time divergency, ...

Quality improvement lies in traffic detection system

## 3. New Approach

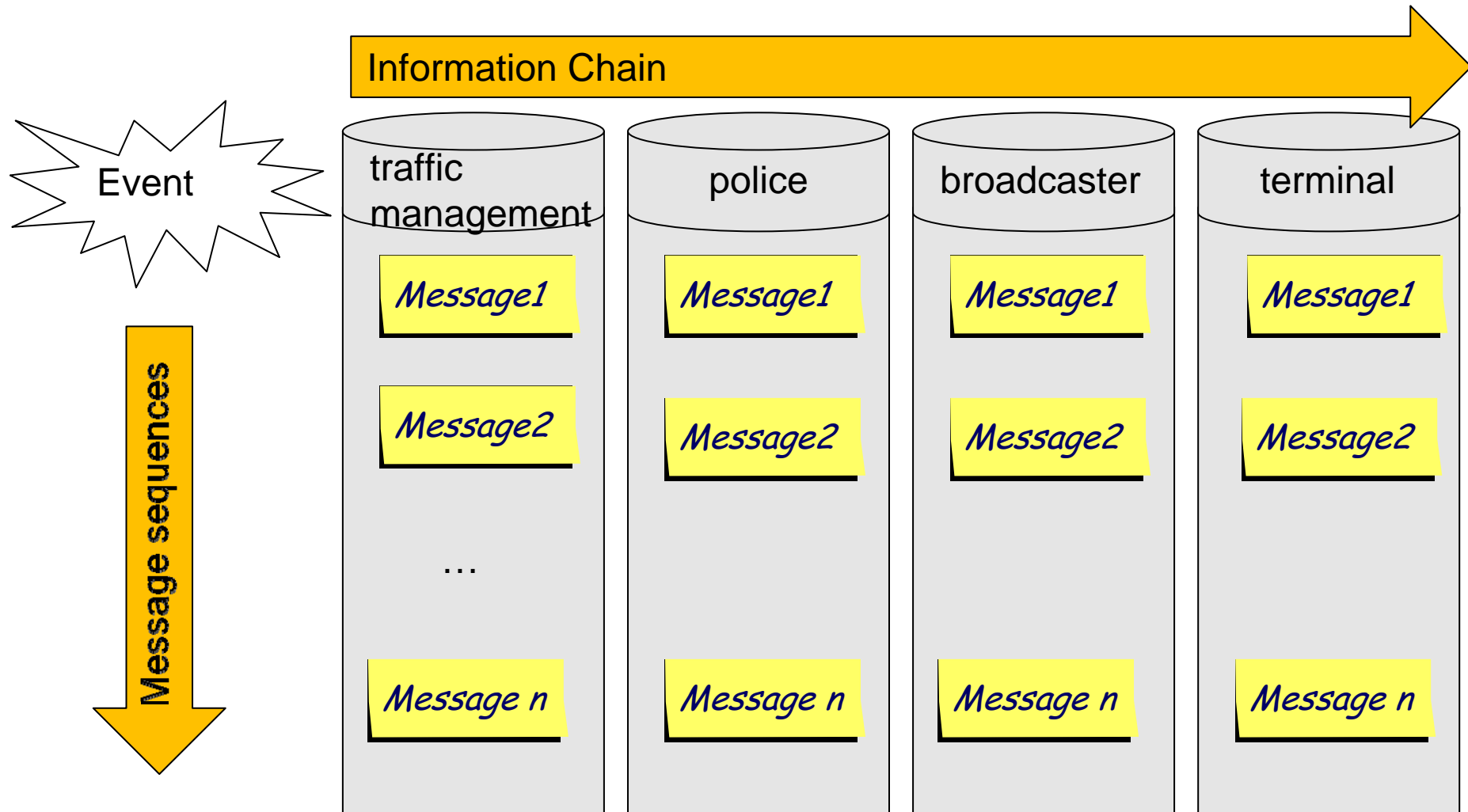
- New Approach to achieve process related quality improvements in information chain:

### Traffic Information Quality as Process Analysis



Development of a two-dimensional analysis model as scientific basis for quality management system for TMC

# 3. Quality Measurement as Process Analysis

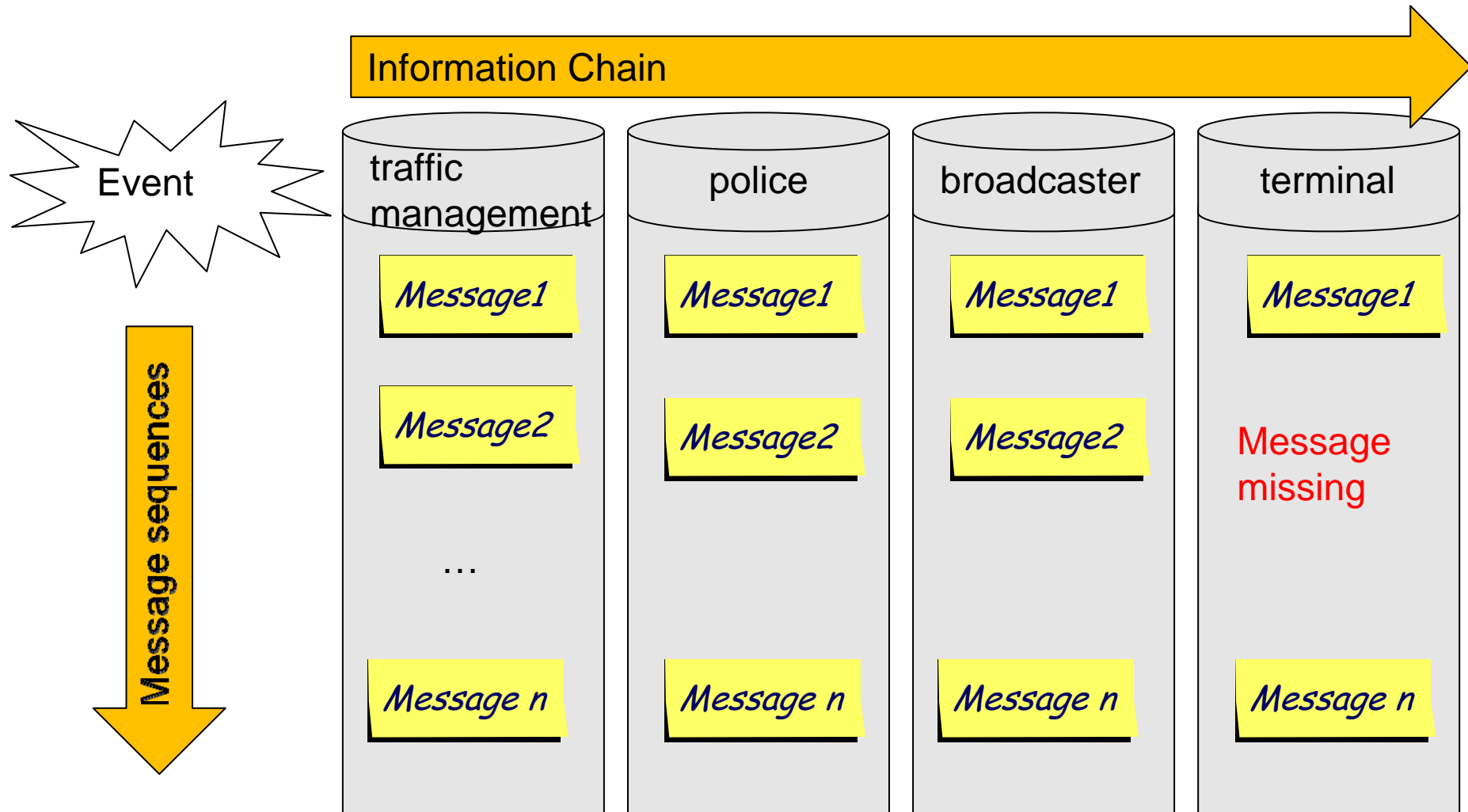


Quality and Reliability of RDS-TMC messages

Jessica Kleine



# 3. Quality Measurement as Process Analysis

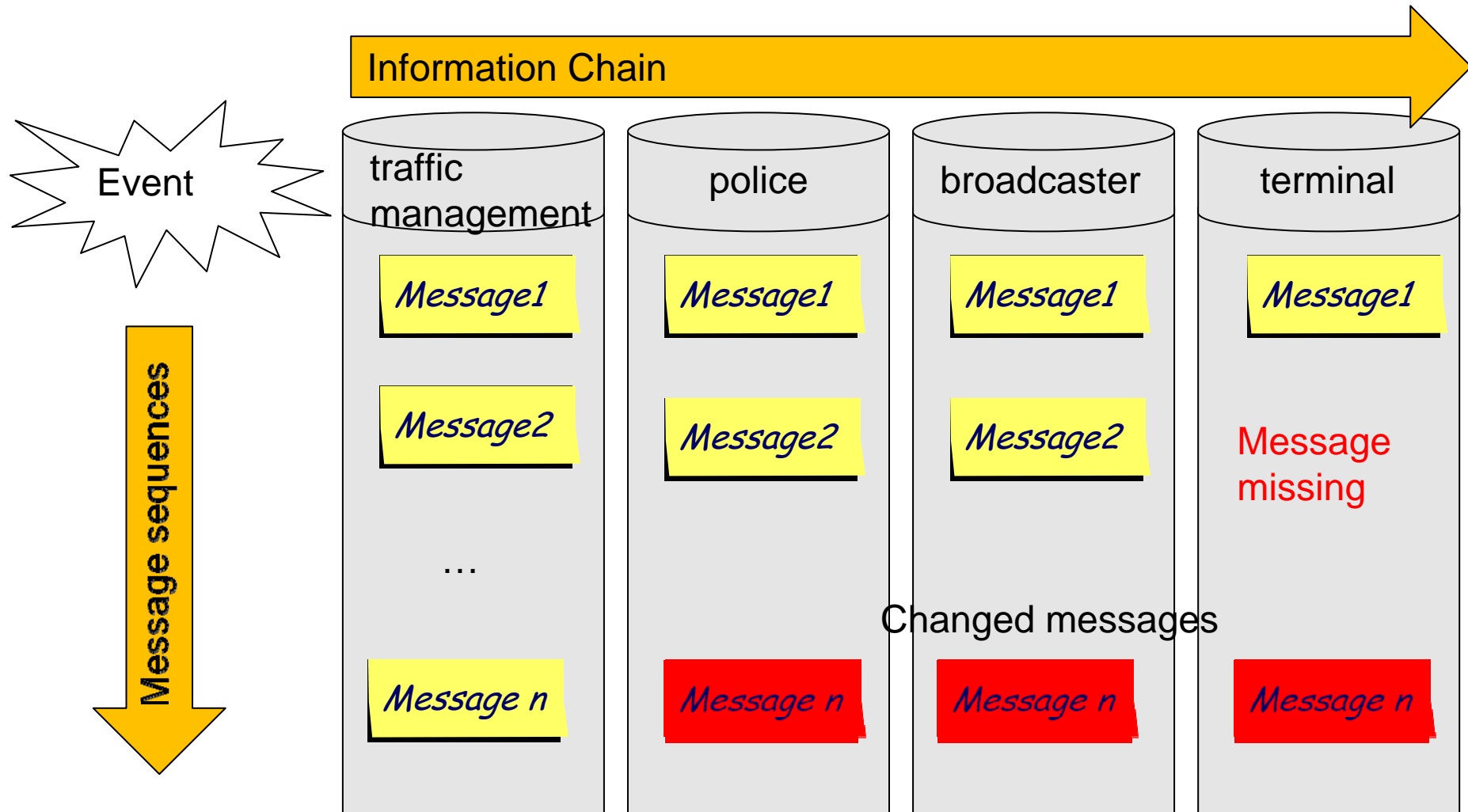


Quality and Reliability of RDS-TMC messages

Jessica Kleine



# 3. Quality Measurement as Process Analysis



Quality and Reliability of RDS-TMC messages

Jessica Kleine



# 3. Quality Measurement as Process Analysis

## Quality indicators:

update  
intervall?

Number of  
sources?

Level of  
detail?

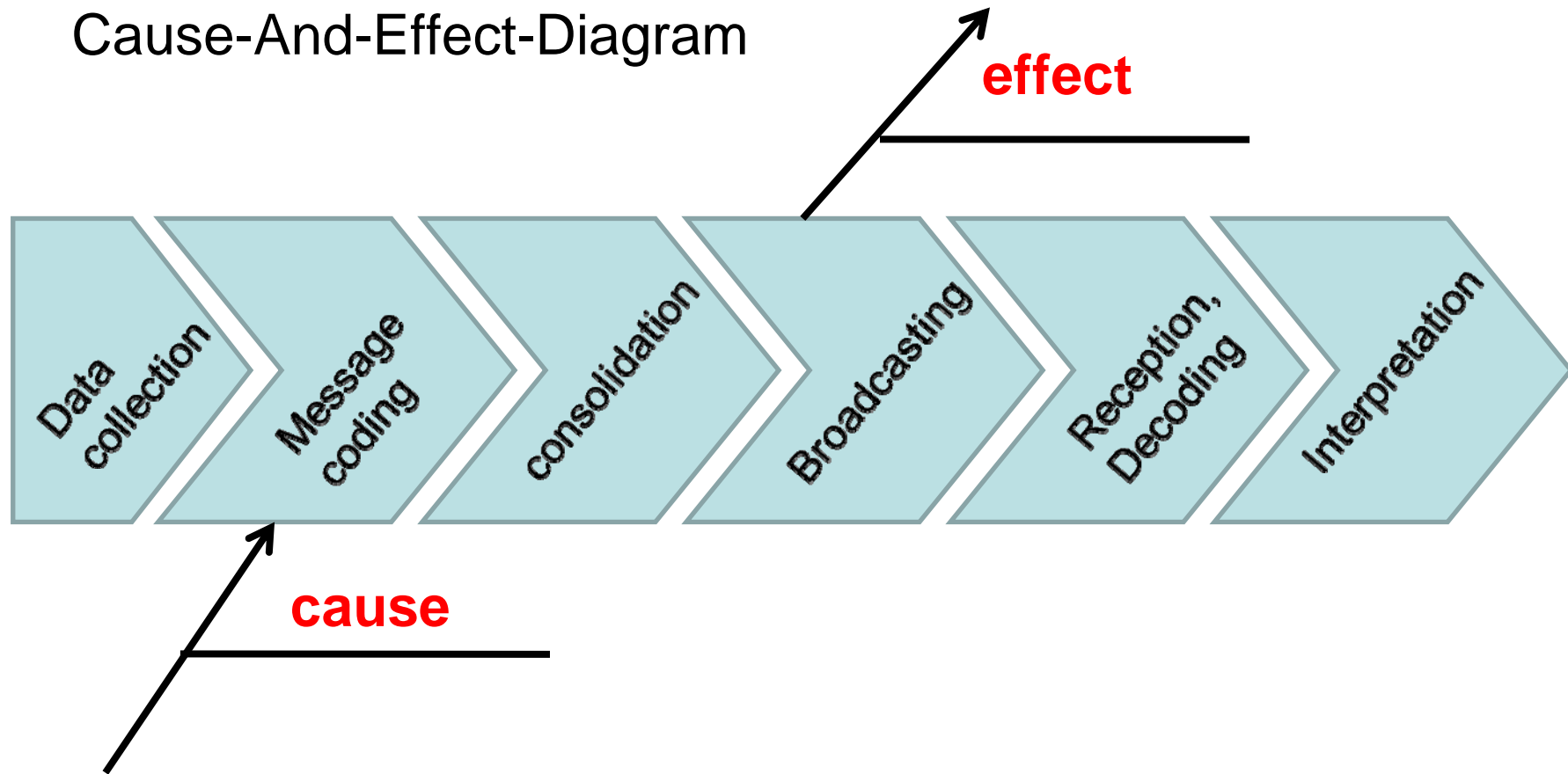
Freetext?

Kind of  
cancellation?

...

# 3. Quality Measurement as Process Analysis

Cause-And-Effect-Diagram

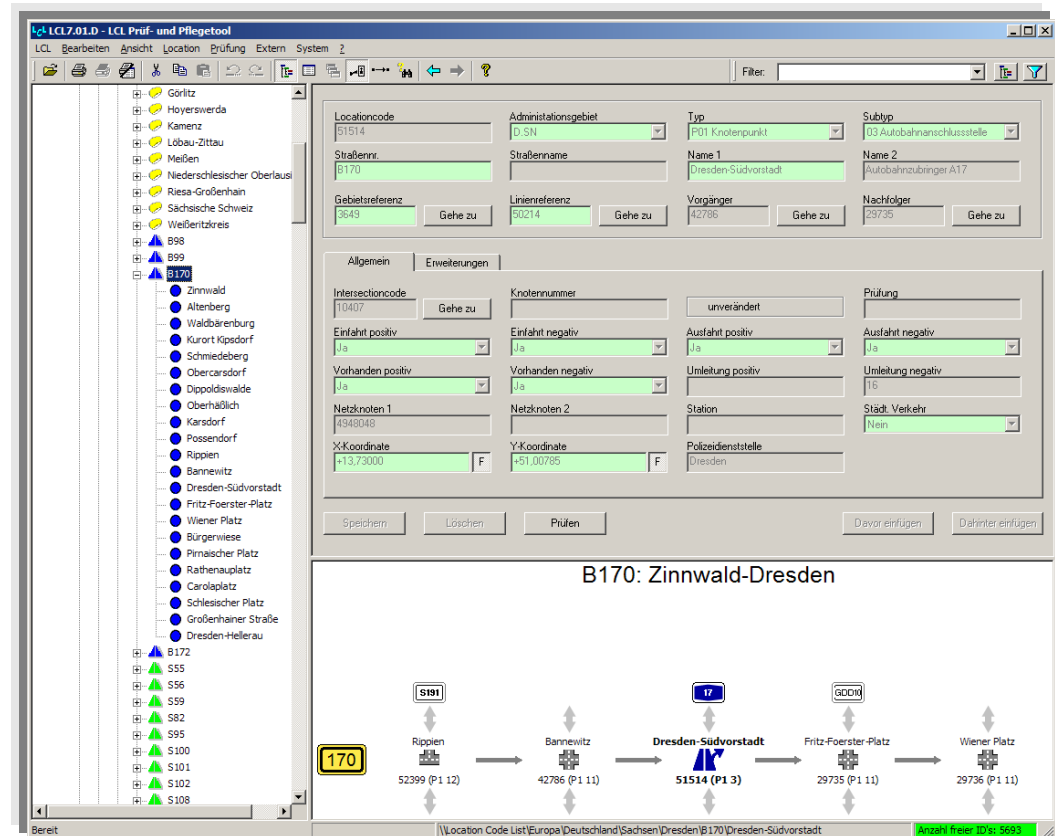


# 3. Example: Location Code List

## Location Code List (LCL)

[EN ISO 14819-3]

- Location-ID
- Type
- Subtype
- Road number
- Road name
- Offsets
- x-/y-Coordinate
- ...



The screenshot shows the 'LCL7.01.D - LCL Prüf- und Pflege' tool. The left pane displays a tree view of location codes, with 'B170' selected. The main pane displays the configuration for location code 'B170: Zinnwald-Dresden'. The configuration includes fields for Locationcode (51514), Administrationsgebiet (D-SN), Typ (P01 Knotenpunkt), and Subtyp (03 Autobahnanschlussstelle). It also shows fields for Straßennr., Straßennamen, and various references. Below the configuration is a diagram titled 'B170: Zinnwald-Dresden' showing a network of roads and nodes. The diagram includes nodes for Rippen (S191), Bannwitz (42786 P1 11), Dresden-Südvorstadt (51514 P1 3), Fritz-Foerster-Platz (29735 P1 11), and Wiener Platz (29736 P1 11). A yellow box highlights the '170' node. The status bar at the bottom indicates the current location code list and the number of free IDs (3693).

Quality and Reliability of RDS-TMC messages

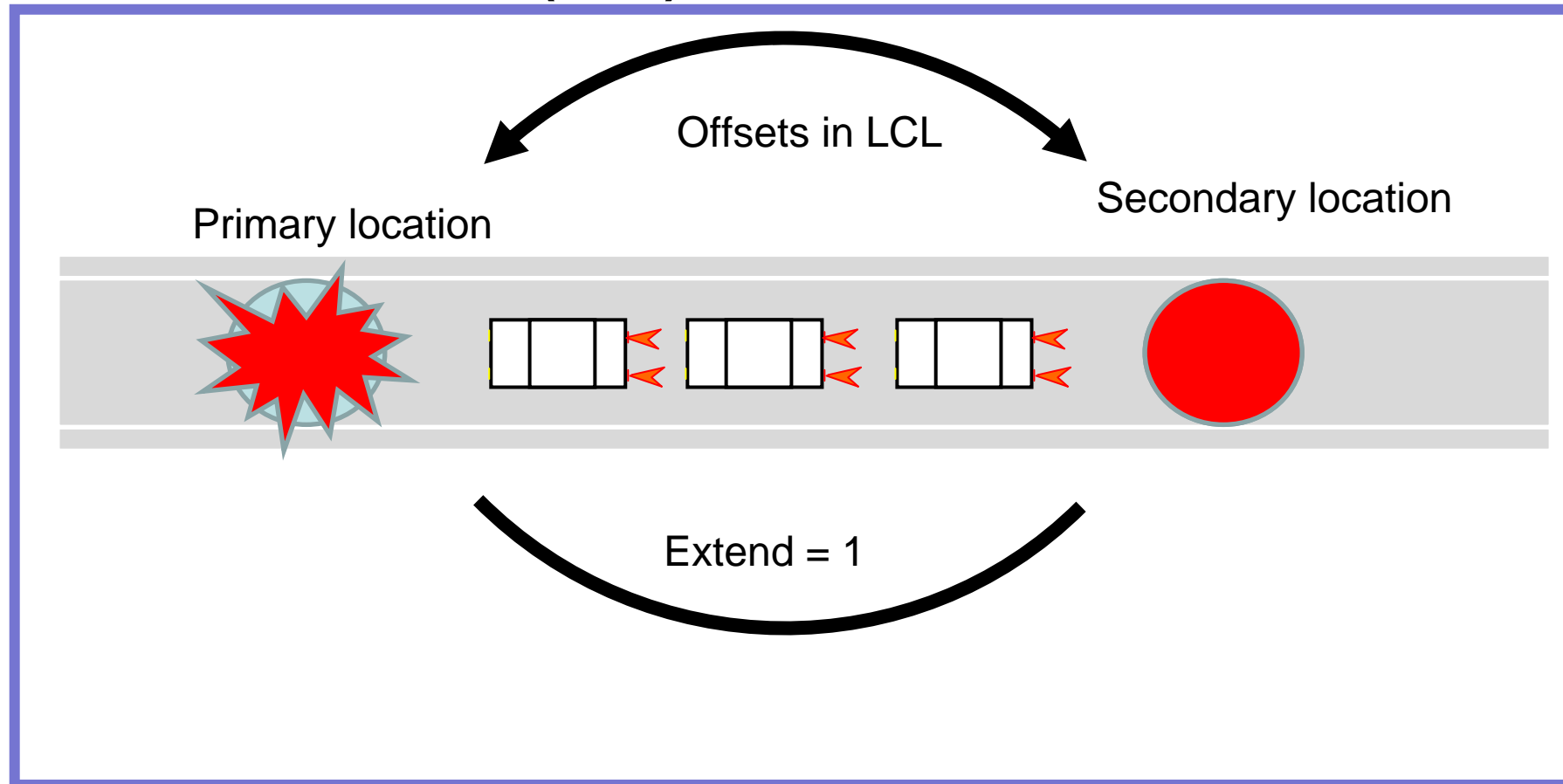
Jessica Kleine



# 3. Example: Location Code List

## Location Code List (LCL)

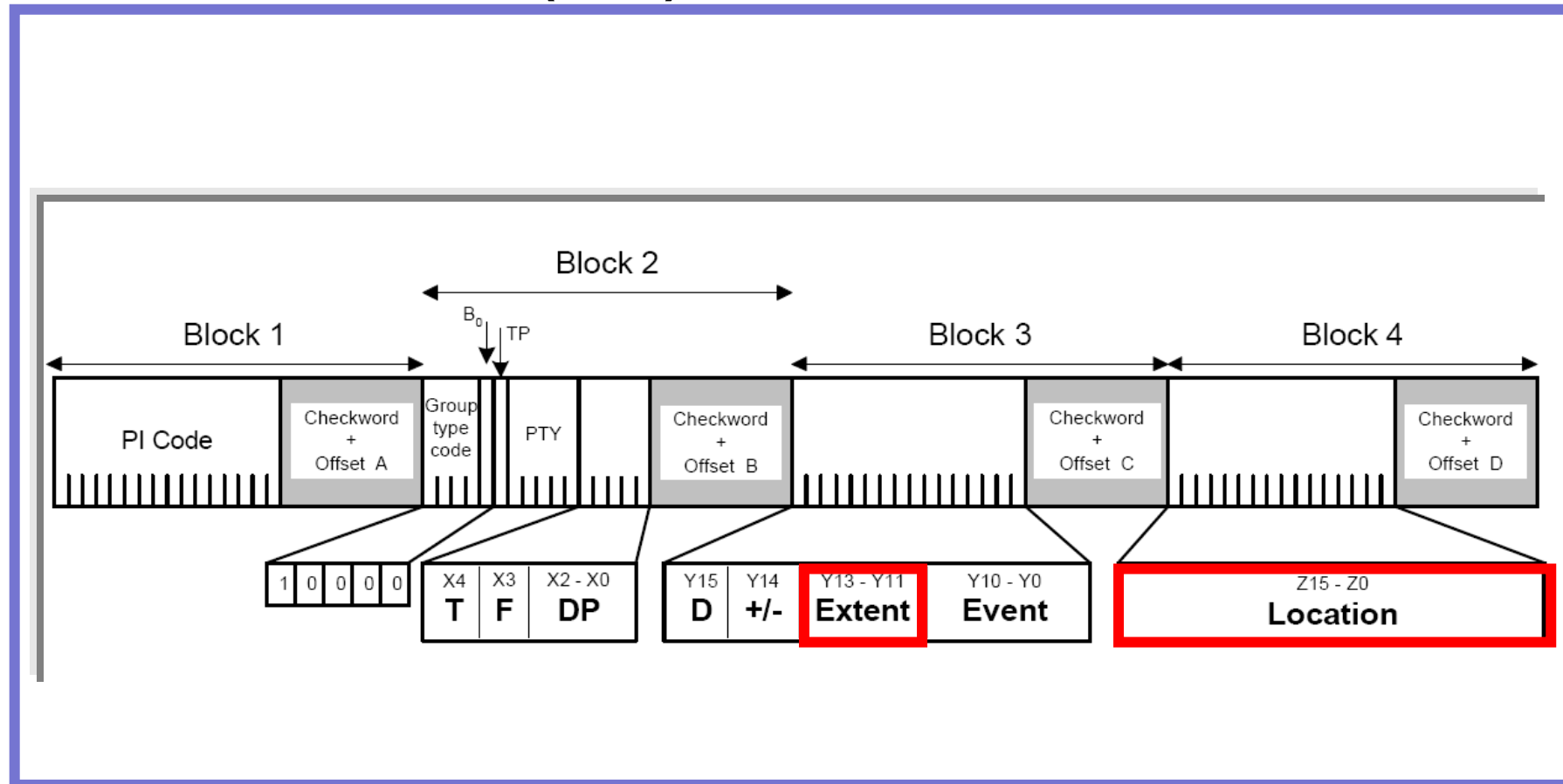
[EN ISO 14819-3]



# Example: Location Code List

## Location Code List (LCL)

[EN ISO 14819-3]



Quality and Reliability of RDS-TMC messages

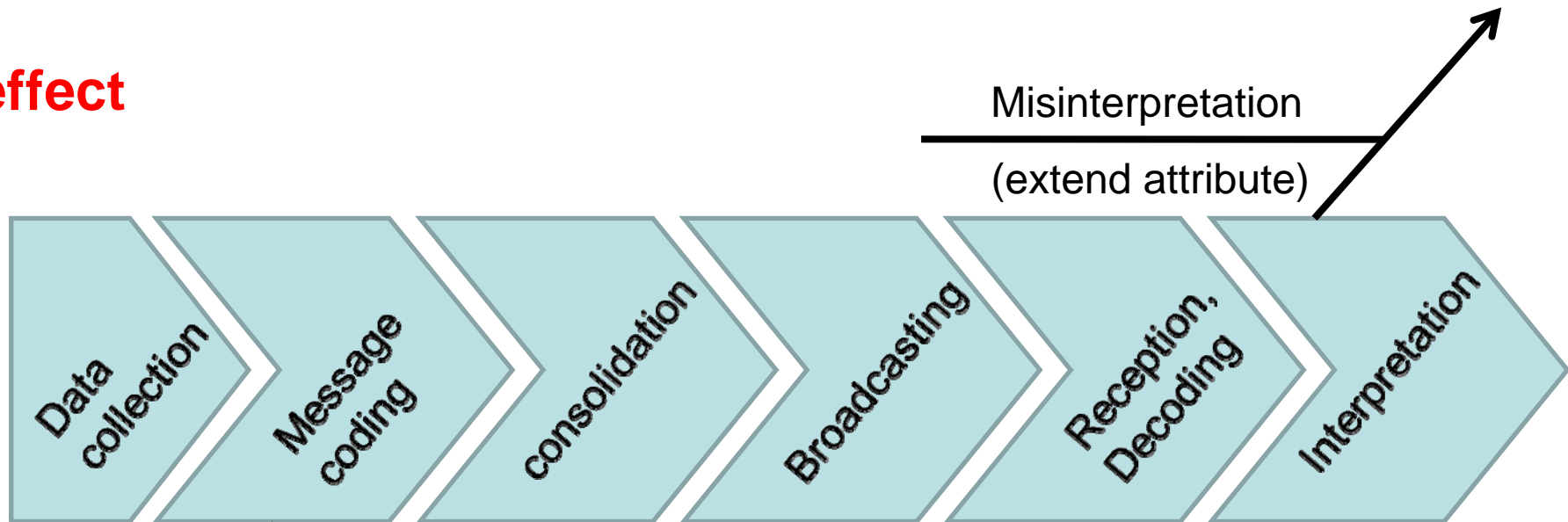
Jessica Kleine



# Traffic Information Quality as Process Analysis

## Cause-Effect-Diagramm for Mistakes in LCL content

**effect**



**cause**

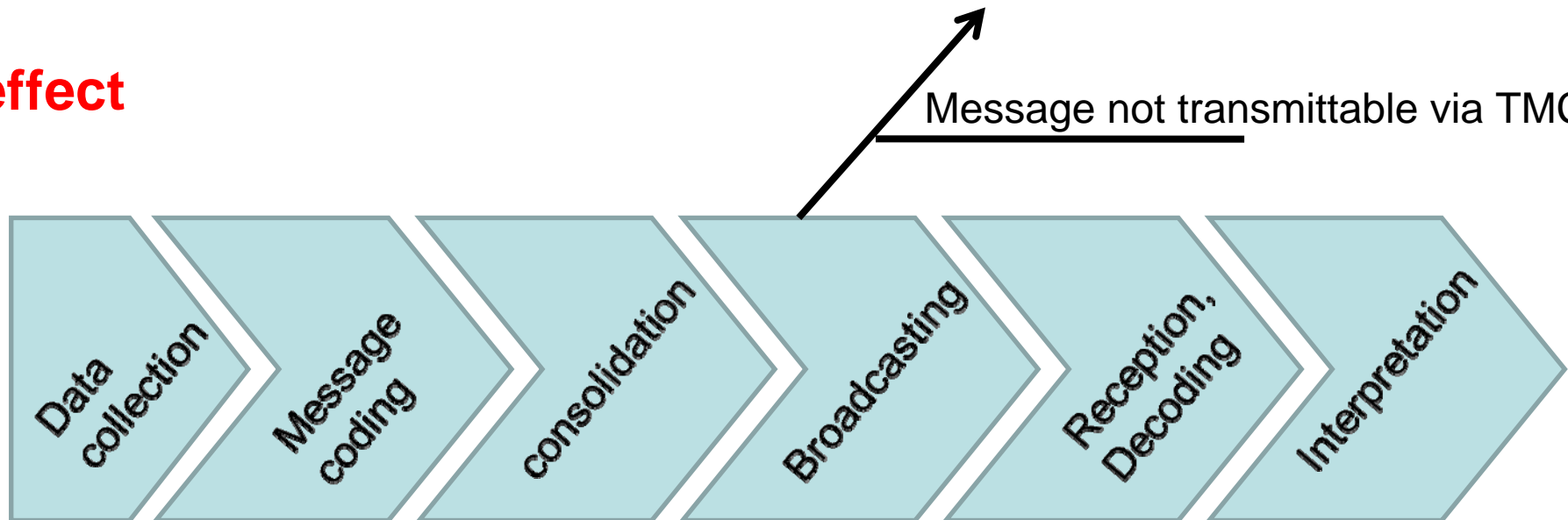
Object logically wrong in LCL

# Traffic Information Quality as Process Analysis

Cause-Effect-Diagramm for Mistakes in LCL content

**effect**

Message not transmittable via TMC



**cause**

Object not in LCL

Quality and Reliability of RDS-TMC messages

Jessica Kleine



# Conclusion

- New approach: Whole information chain systematically analysed – improvements possible in all iterations
- Empirical analysis currently in preparation
- Results will establish basis for quality management covering all partners

Jessica Kleine  
Bundesanstalt für Straßenwesen  
Bergisch Gladbach, Germany  
kleine@bast.de

04.06.2009

---

Quality and Reliability of RDS-TMC messages

Jessica Kleine

