

Guidelines for the Assessment of Wastewater Networks

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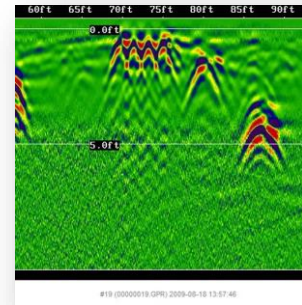
BLUE PLANET Berlin Water Dialogues
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Guidelines for the Assessment of Wastewater Networks

Structure

- Assessment of Wastewater Networks
 - Motivation & Guidelines (*Sewer System Management*)
 - Methodologies
 - Practical Approach (City of Brunswick)
- Discussion



Guidelines for the Assessment of Wastewater Networks

Introduction

- State of the Sewer System in Germany - Results of the DWA survey 2018
 - Average Age of German Sewerage: **45 Years**
 - Total Length of German Sewerage: **600.000 km**
 - **Percentage inspected (at least once):** **86 %**
 - short-to-medium term Need of Rehab. (ZK 0 – 2): **20 %**

*Resilient Statements on Rehabilitation Costs depend on specific
Rehabilitation Strategy according to Guideline DWA-A 143-14.*

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Motivation & Guidelines

- operational and strategic Aspects of Assessment

Operational Purpose:
Planning of Measures
EN 14 654, EN 13 508, ...

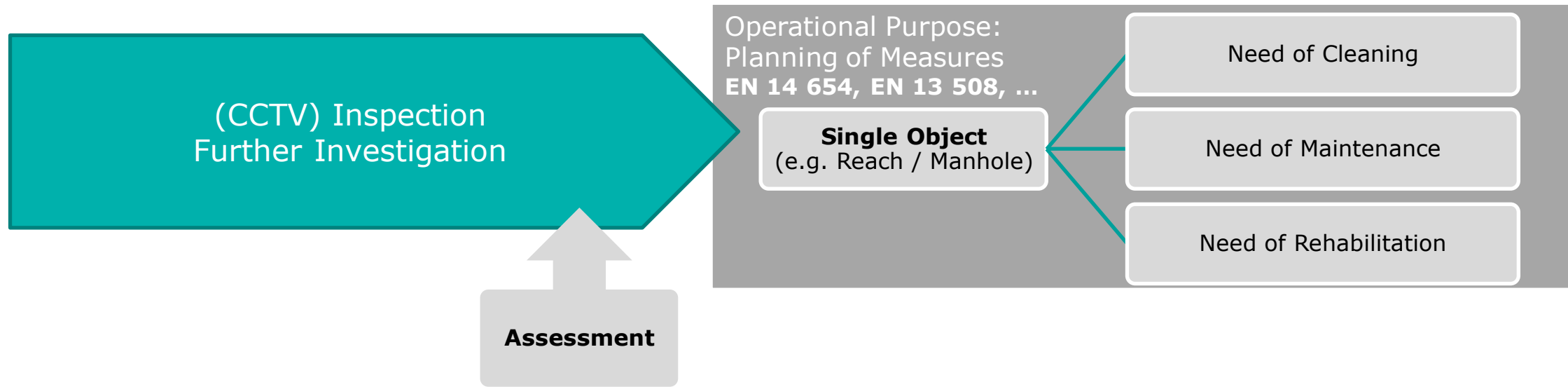
Single Object
(e.g. Reach / Manhole)

Need of Cleaning

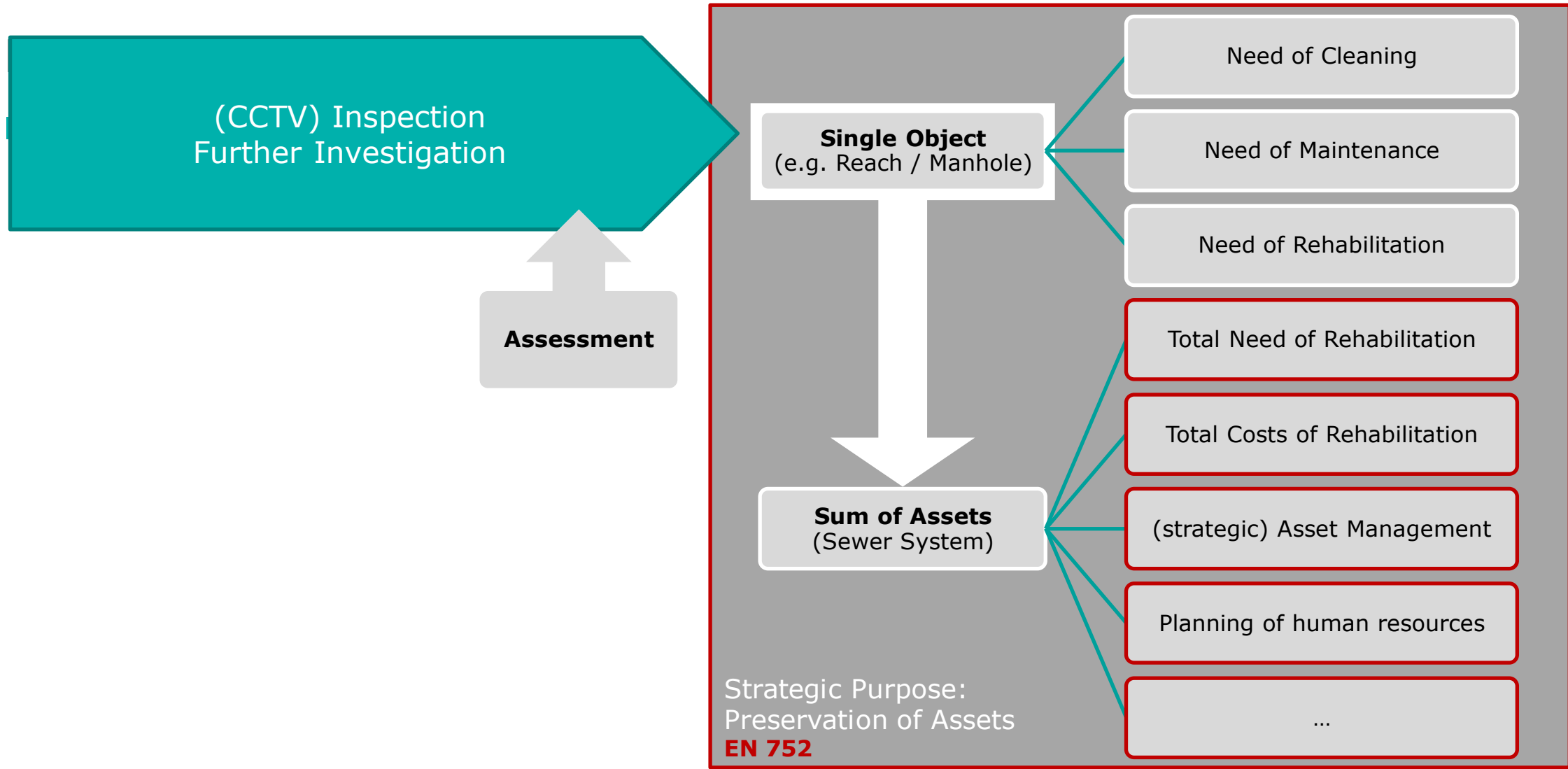
Need of Maintenance

Need of Rehabilitation

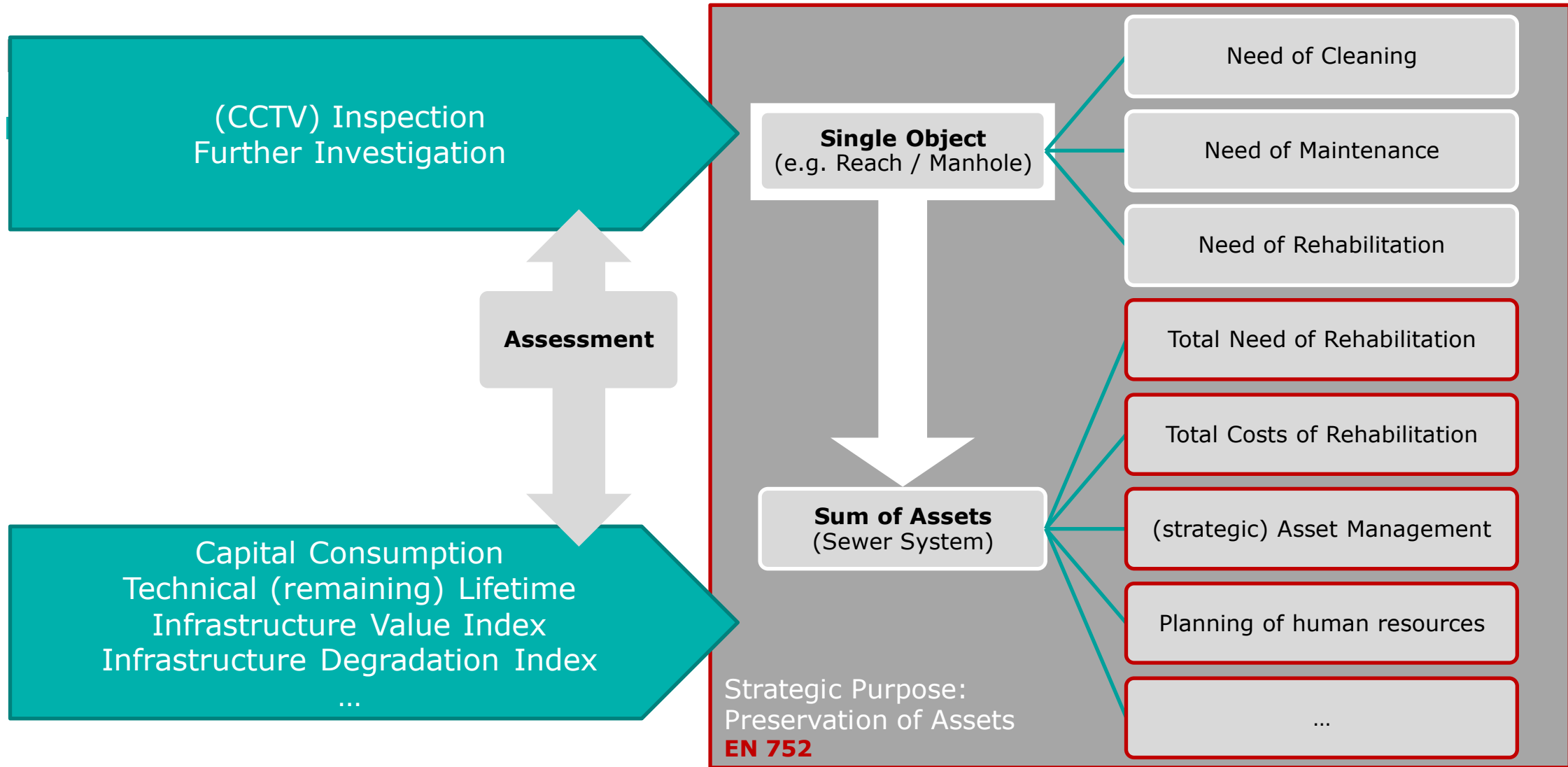
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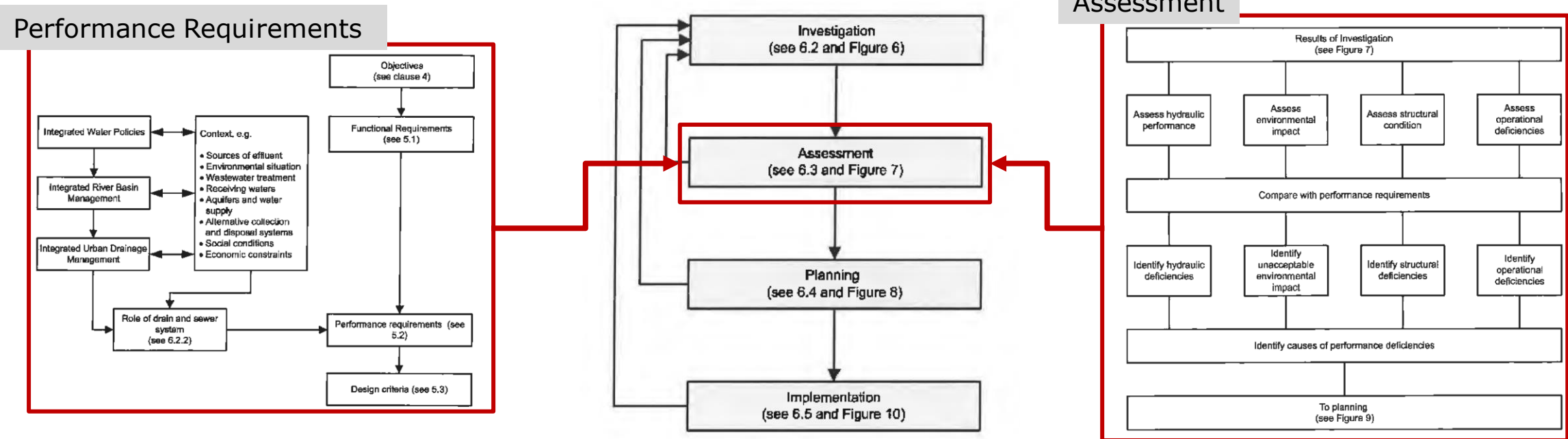
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Motivation & Guidelines

- EN 752 *Sewer System Management*
- Integrated sewer system management process



Methodologies

■ Condition and Wear Reserve

DWA-M 149-3

Condition (Priority)

Criterion for the present function fulfillment

⇒ Rehabilitation priority

Consideration of the most severe single defect



DWA-M 149-10 (in Progress)

Wear (Wear reserve)

Criterion for the remaining function fulfillment

⇒ Wear reserve + rehabilitation type

Consideration of distribution, extent and degree of the defects

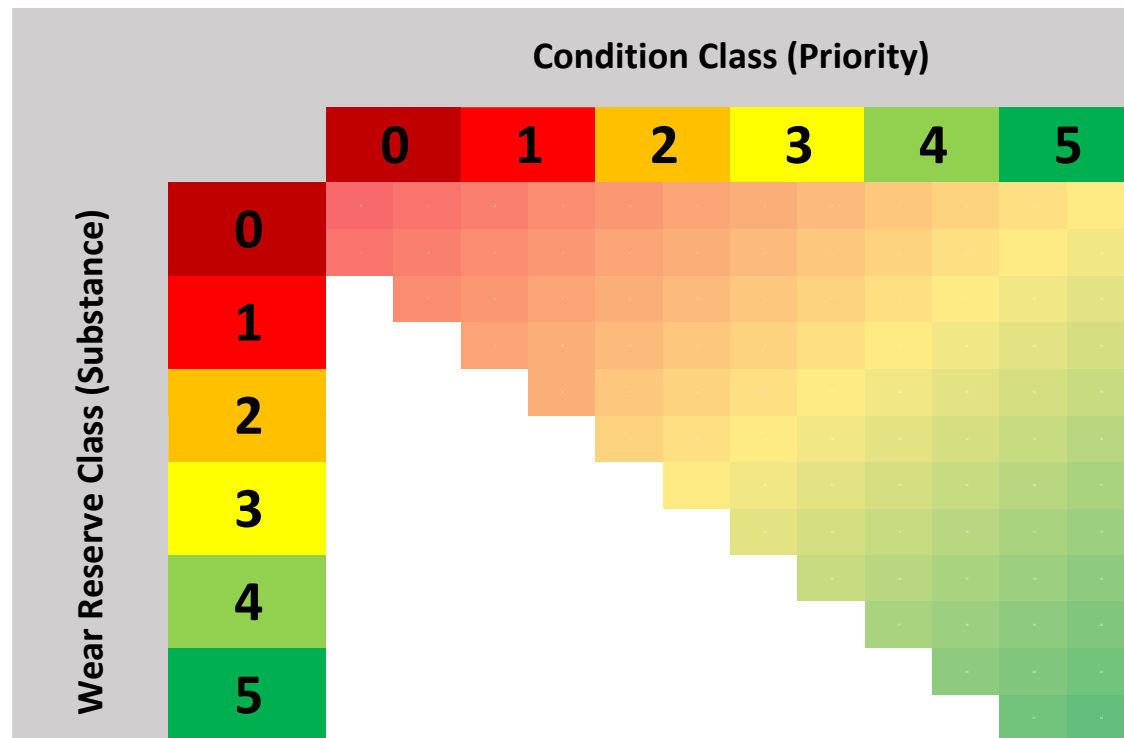


Source: www.unitracc.de

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Methodologies

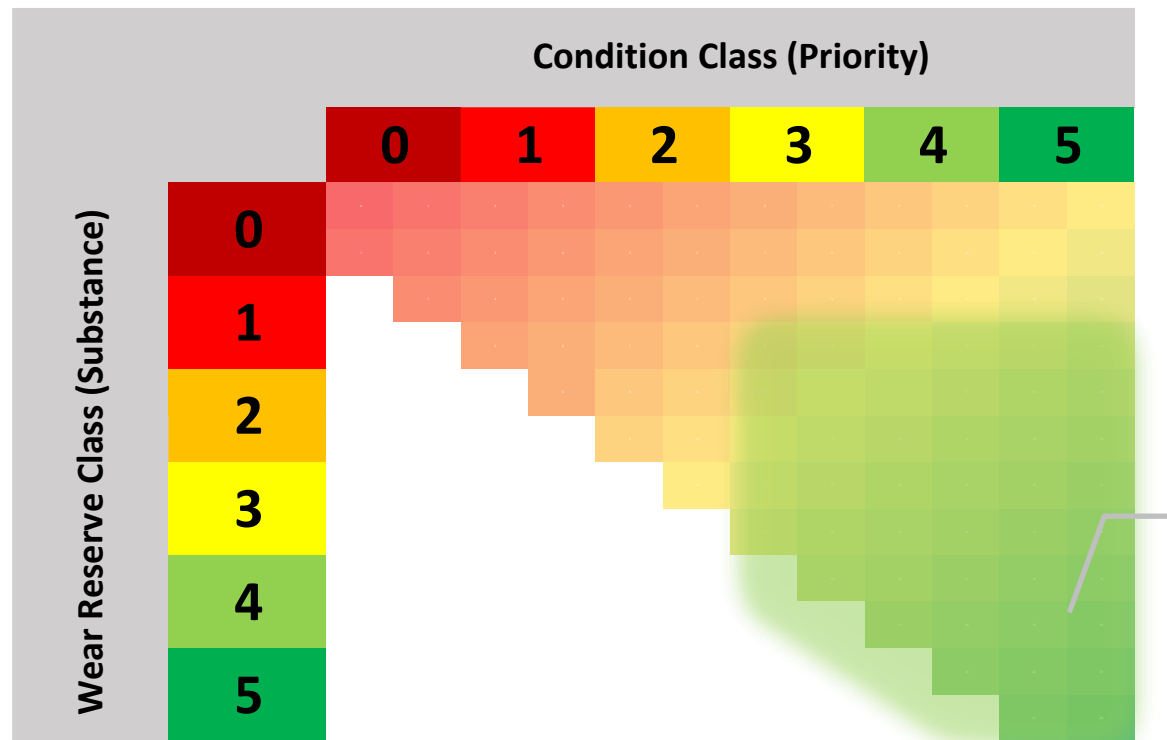
- Condition, Wear Reserve Rehabilitation



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Methodologies

- Condition, Wear Reserve Rehabilitation

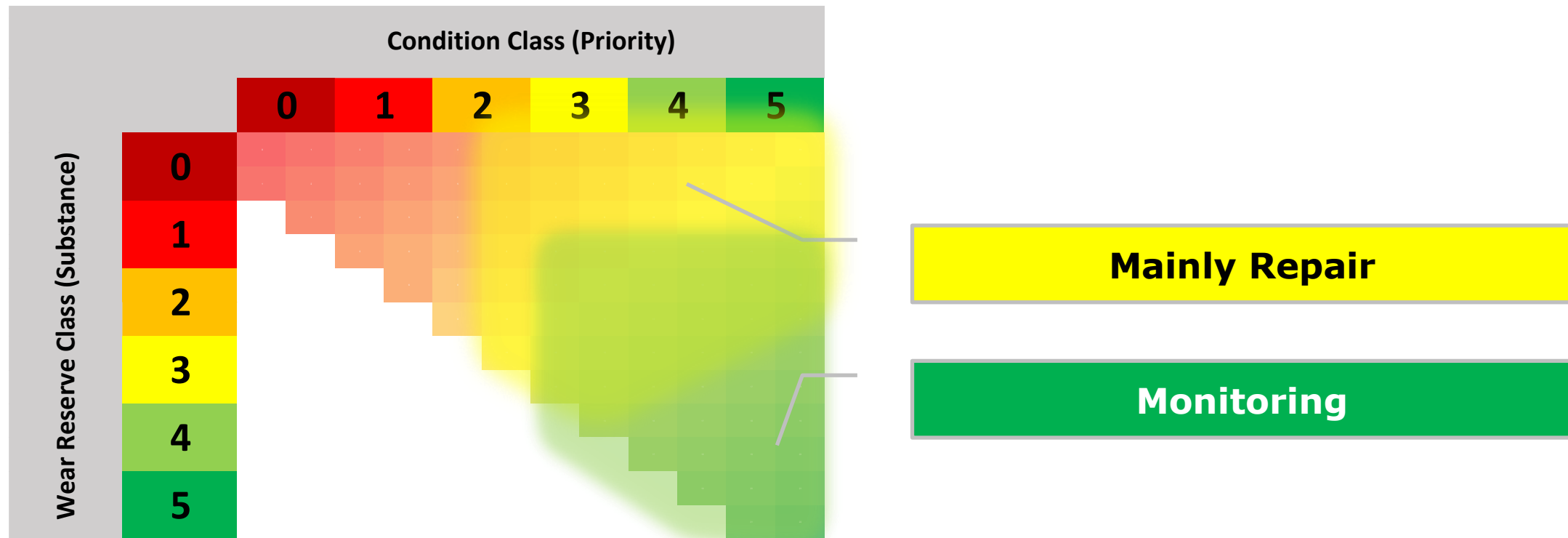


Monitoring

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Methodologies

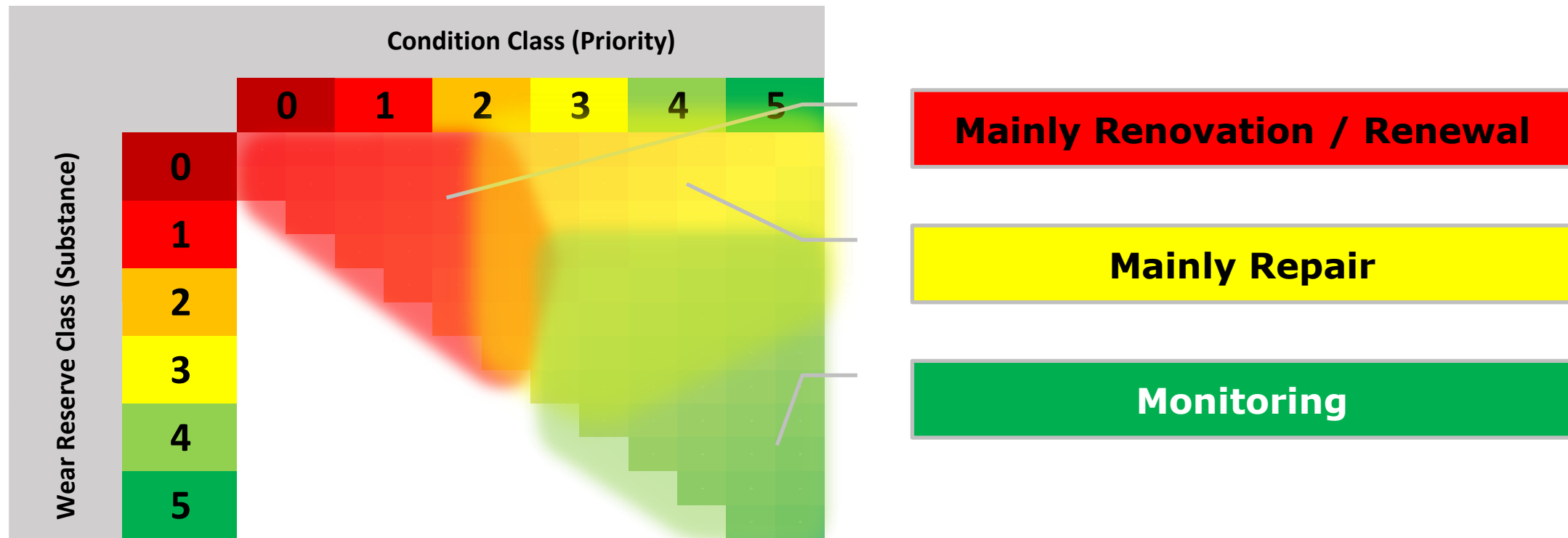
- Condition, Wear Reserve Rehabilitation



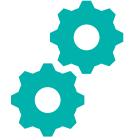
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Methodologies

- Condition, Wear Reserve Rehabilitation



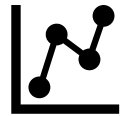
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Goal: Ensure Function and Value

■ Strategic Steps

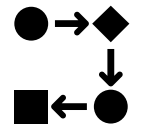
1. Capture all available Data of Condition
2. Identify the relative Value (remaining useful life)
3. Compare this value (IVI) with the relative financial Asset Value,
4. Give envelopes of specific Values (min., max.),
5. Determine hydraulic and environmental Needs (DIN EN 752),
6. Calculate necessary Budgets,
7. Rank Rehabilitation-Projects,
8. Start of Construction-Works, same procedure as every year.





Selection of Current Issues

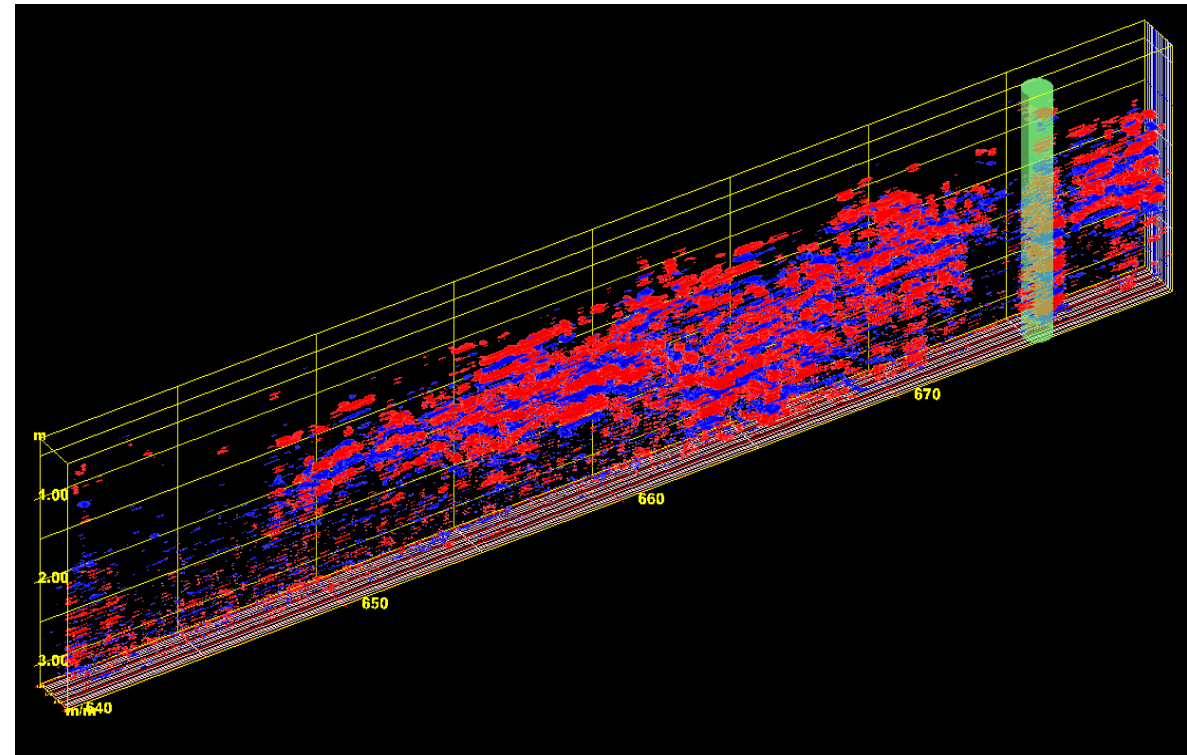
- Guidelines, based on CCTV-Inspections, could be evaluated by Artificial Intelligence (AI).
- Guidelines are to extend to all Devices (not only Main-Sewers).
- Priorities according to Guidelines must be transferred into the Line of Construction and Maintenance Works.
- The condition of „Road-Soil-Sewer-System“ could be investigated by geophysical Methods. But no Standard is available.



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Road-Soil-Sewer-System

- Load-carrying Action of the hole Construction is affected by dynamic Pressures of **Traffic**, **Groundwater**, **Damages** of Sewers and other Conditions.
- Geophysical Methods to detect **Bulking Zones** or Excavations are written in DWA M-149-4.
- Up to now no Standard is available. **Emergencies** are possible.



Radar-Screen of bulking Zones
(favourable Ground Conditions)

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Road-Soil-Sewer-System



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Asset management is a long-term challenge



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Discussion



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Polls

- Where are You from?
 - Germany / Europe / other
- What is Your Role?
 - Operator / consulting Engineer/ other
- Are you familiar with Assessment of Wastewater Networks?
 - CCTV-Inspection, Ground penetrating Radar, other
- Are you familiar with strategic Benchmarks?
 - Condition Class, Wear Reserve Class, Technical (remaining) Lifetime, Infrastructure Value Index, Infrastructure Degradation Index
- Are you familiar with strategic Asset Management?
 - Yes/no
- Open Questions