WG 2 Performance goals

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Vice-leader: tbd
Main objective of WG 2 (MoU)

• ... to define a set of goals for the indicators previously identified in WG1.
• These goals will vary according to technical, environmental, economic and social factors.
• Specific recommendations will be given in order to ensure that the definition of such goals should be the most generalized as possible.
Goals should be...
WG 2 Performance goals (PGs)

- **Technical PGs**
  - Reliability and safety related goals

- **Sustainable PGs**
  - Environmental impact related goals

- **Other PGs**
  - Economic and social based goals
How should we define **Performance Goals** for bridges in general?

- Enable safe and reliable traffic
- Require less maintenance
- Have a longer life expectancy
- Meet standards well into the future
- Have least possible impact on the environment
- ...
What is your understanding under the term “PERFORMANCE GOAL”? 

- Thresholds?
- Classification?
- Performance requirements?
- Performance assessment = risk assessment?

- How should the indicators be used to achieve a certain performance goal?
Performance Goals → Risk assessment

• PGs don’t need to be necessarily the same for every owner (e.g. 90% of time available road)
• To each goal are attached certain acceptable risks
• Indicators → Condition Assessment → Risk assessment → Assessment of Performance Goals
1. Background

Relationship between KPIs and Goals?

- **Visual Inspection**
- **NDT Testing**
- **Monitoring System**

**Performance Indicator**

**Performance Goal**

**Quality Control Plan**
KPIs for load-bearing capacity and serviceability of structures
KPIs for system behaviour and inspection
KPIs for Conservation of Structures
Environmental and Other Sustainable KPIs

WG 1

CONDITION ASSESSMENT

PERFORMANCE REQUIREMENTS

RISK / PERFORMANCE ASSESSMENT

Technical Performance Goals
Sustainable Performance Goals
Other Performance Goals (economic and social)
Objectives for WG 2

• How is the condition assessment performed?
  – Usage of KPIs?
  – Element vs. Object level
  – Is this part of WG 1?
• How to translate the condition level to the performance level?
• Technical KPIs vs. Non-technical performance goals?
• Which performance goals are defined on the international level at all?
• ...

### MC 2010

**Table 3.3-5:** Recommended target reliability indices $\beta$ for structures to be designed, related to the specified reference periods

<table>
<thead>
<tr>
<th>Limit states</th>
<th>Target reliability index $\beta$</th>
<th>Reference period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serviceability</td>
<td></td>
<td></td>
</tr>
<tr>
<td>reversible</td>
<td>0.0</td>
<td>Service Life</td>
</tr>
<tr>
<td>irreversible</td>
<td>1.5</td>
<td>50 years</td>
</tr>
<tr>
<td>irreversible</td>
<td>3.0</td>
<td>1 year</td>
</tr>
<tr>
<td>Ultimate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>low consequence of failure</td>
<td>3.1</td>
<td>50 years</td>
</tr>
<tr>
<td></td>
<td>4.1</td>
<td>1 year</td>
</tr>
<tr>
<td>medium consequence of failure</td>
<td>3.8</td>
<td>50 years</td>
</tr>
<tr>
<td></td>
<td>4.7</td>
<td>1 year</td>
</tr>
<tr>
<td>high consequence of failure</td>
<td>4.3</td>
<td>50 years</td>
</tr>
<tr>
<td></td>
<td>5.1</td>
<td>1 year</td>
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Condition assessment

• Deterministic vs. Probabilistic approach

Example

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<th>Condition t1</th>
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<tr>
<td>1</td>
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</tr>
<tr>
<td>2</td>
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<tr>
<td>3</td>
<td>65%</td>
</tr>
<tr>
<td>4</td>
<td>5%</td>
</tr>
<tr>
<td>5</td>
<td></td>
</tr>
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<td>6</td>
<td></td>
</tr>
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</table>

Fig.II.1 Example of condition assessment based on inspection input in probabilistic terms.
Fig. II.5.1 Conceptual scheme of the probabilistic model based on Wenzel et al. (2012)
Proposal of the WG 2 structure

TG 1.2: Technical Performance Goals

TG 1.3: Sustainable Performance Goals

TG 1.3: Other Performance Goals

National expert panels for identification and definition of PGs

International research panels for identification and definition of PGs

Structuring of the PG database
To be discussed next time

• Sustainable performance goals
• Other – economic and social performance goals
Report

• Report – recommendations
  – the meaning of the performance goals
  – how to evaluate it based on the KPIs,
  – how to measure / monitor each performance goal,
  – future steps – how to achieve them...
PLANNING

• 2 physical meetings per year
• Monthly tele-conferences
• The end of year 2 – May 2017 Report
• Workshop