



## Questions for ASFiNAG in preparation of the 2-day workshop at the COB, Netherlands

### Theme 1 Preparation and technical realization

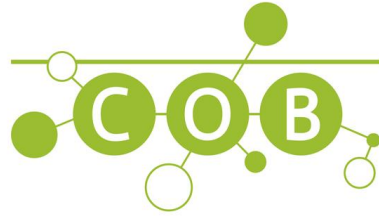
- Which renovation strategies do you apply to keep the tunnel available for traffic as much as possible?
- Which parts of the renovation are considered generic and which tunnel-specific?
- How much has been done in the field of virtual testing and/or training? Which techniques and tools have been used?
- Has the renovation been carried out at tunnel level or did you also look at a system level at traffic flow when the tunnels were closed?
- Has the renovation been tackled as a project or has it been renovated per system?
- To what extent have innovations / replacements / design changes been implemented in the context of future-proofness?
- Which temporary facilities have been included in the design?
- Are specific tools or techniques applied (such as special vehicles, equipment, but also specific digital tools, design tools, etc.)

#### ASFiNAG Question:

- Legal situation regarding the approval of tunnel renovation in the Netherlands
- How you have implemented “Tunnel system test procedures” and “time benchmark’s before Go-Live and Start-of-Operation?”

### Theme 2 Safety during renovation

- Which method is used to make the tunnel fully available for traffic during the renovation period and to be demonstrably safe at all times according to tunnel law(s)?
- What measures have been used to achieve this?
- How do you balance the temporary non-compliance with the requirements regarding tunnel safety? Which framework is used in this? The QRA we use is not always the right instrument....
- What is / is not acceptable during a certain period? Especially the question: which safety levels are considered sufficient during the various renovation steps. This does not necessarily have to be equal to the regular safety level (may it temporarily be at a lower level?) How is this determined (substantively) and coordinated with stakeholders and decision-makers (support)?
- How do you demonstrate the effectiveness of temporary compensatory measures (phasing, systems, emergency services, temporary operation controls)?
- How is the cost - benefit analysis made for temporary measures.
- How is the coordination with the competent authority effectuated and what happens if there is a deviation from the agreements? Does the tunnel have to be closed?
- How is the safety of the personnel working on the tunnel during use of the tunnel guaranteed?
- Apart from tunnel safety: have there been any other safety issues / challenges (e.g. working conditions, living environment, etc.) during the renovation?
- Which safety issues have occurred during the renovation and how has this been handled substantively, legally and with regard to communication and environment?
- Which QRA calculation and failure definitions (when must the tunnel be closed) have been used?



### **Theme 3 Management and maintenance**

- Is the next renovation already taken into account during the renovation? Or: during the renovation, how was the subsequent operation and maintenance phase taken into account, including future renovations?
- How was maintenance organized during the renovation? Which parties are involved?
- Has a maintenance period been included in the renovation contract? How long?
- How is the tunnel operator involved into the renovation project
- Which information / information systems (BIM, ..) are taken over from the renovation project by the tunnel operator or, more generically: how did the entire information provision go from tunnel operator and maintenance to renovation project and back to the tunnel operator?
- How has the aspect of operation (training), traffic management and incident management been dealt with during the complex construction phasing? How has it been ensured that during this changing situation all involved at every moment / phase in the project were faced with their task?

### **Theme 4 Governance and contracting**

- Which type of contract do you use? Based on which contract strategy? And which performance indicators have been named towards the contractor?
- Which cut is chosen in the scope of the various contracts?
- What does the division of responsibilities between the client and the contractor look like?
- Is the renovation contract also combined with a multi-year maintenance contract?
- Does the contract include a bonus-males scheme, e.g. regarding time, availability, security, ...
- What are the most important stakeholders and how do they affect the renovation project?
- Is there a licensing authority? How is it involved in the project?
- How is verification and validation demonstrability guaranteed and recorded at every stage? Has new tooling been used for this?

#### **ASFiNAG Questions:**

- How is a standardization of systems and equipment for tendering purposes (functional or specific) implemented?
- Implementation of the "DIRECTIVE (EU) 2016/1148 concerning measures for a high common level of security of network and information systems across the Union's in the Netherlands tunnel environment.

#### **Some general questions:**

- What do you consider to be the biggest success factors and what would you decide not to do next time or do differently?
- What were the most important unforeseen events / findings and how were they dealt with (substantively, legally, decision making, communication strategy and environment)