

## TUNNEL RENOVATION PROGRAM AUSTRIA

### NEXT LEVEL

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#### ABSTRACT

Within the framework of the ASFINAG tunnel renovation and extension program based on the EU directive on road tunnel safety, around 50 individual projects were completed in the TERN network with a total volume of around EUR 1.7 billion. As of April 2019, all relevant projects have been successfully completed on schedule, thus significantly increasing tunnel safety in Austria.

ASFINAG is now facing the next major challenges. These are due to the ageing of facilities, IT security requirements, electricity saving requirements, short life cycles of safety equipment and finally also due to the necessary compliance with the EU directive on road tunnel safety 2029 in Austria's Non-TERN network.

The investment volume required for this is more than EUR 4 billion until 2035 and the actual measures required are still being evaluated on an ongoing basis. This enormous project and investment volume presents ASFINAG with almost insurmountable tasks. These begin with maintaining tunnel availability for users and end with the actual feasibility in cooperation with stakeholders, planning companies, construction companies, authorities, equipment suppliers. It is also questionable whether sufficient capacity is available at suppliers and in the personnel sector.

*Keywords: Tunnelsafety, Live cycle, Renovation, Sustainability, Availability*

#### 1. INTRODUCTION

Project development at ASFINAG is ensured by the Asset Management activities. Regular reviews and forecasts are carried out to identify refurbishment requirements and necessary improvements to the system. The latest result was published in the Network Status Report 2022. It describes the strategic objectives for the maintenance, the development the condition of the structural, electrotechnical and mechanical installations and provides a long-term outlook about the development of the condition and the resulting financial requirements. [2]

The current plans for the construction projects in the tunnel area include many individual projects and a very high investment requirement. It has been shown that, in combination with the adjustments still required to the „EU Directive 2004/54 – Minimum safety requirements for tunnels in the trans-European road network“[1] am Non-trans-European road network, which are to be implemented by 2029, a new, very comprehensive tunnel safety program is being created.

ASFINAG therefore decided to set up a strategic "Tunnel Task Force" to deal specifically with the feasibility of such a program. A select group of experts and senior project managers from the various specialist areas, such as asset management, operations, infrastructure construction and electromechanical, were nominated for this purpose. A consulting company

specializing in construction processes and construction management provided the content-related support for the task force.

## 2. TUNNEL TASK FORCE

### 2.1 Task and Target Definition

The most important task was to analyse the upcoming construction projects regarding the specific number, scope, framework conditions, challenges, and content-related issues. Based on these results, the focus was on the development of strategies and measures to ensure the manageability of this new tunnel program from 2025. The main thrusts were defined as optimizing demand, strengthening expertise, processing efficiency, and making construction projects more attractive for bidders in the construction and service environment.

### 2.2 Construction volume

The data and cost analysis carried out in the first step showed that around 120 individual construction projects involve investments in tunnel systems. The total investment sum was put at more than EUR 4 billion.

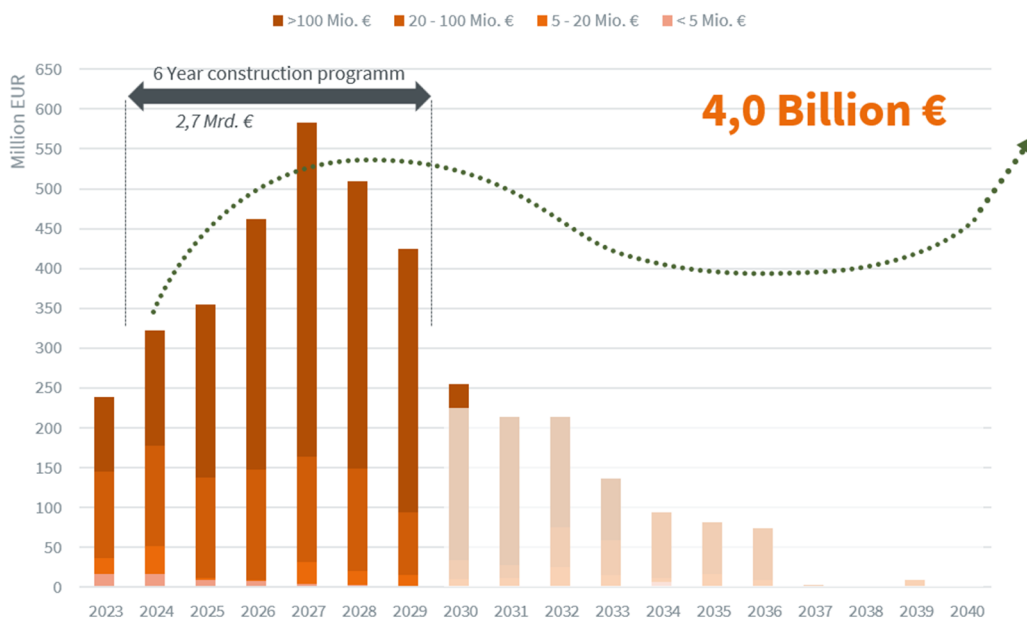


Figure 1: 6 year investment program Tunnels

A further result of the analysis was that, due to the ageing of the system, regular long-term continuous refurbishment and maintenance will be necessary.

A look at the individual projects also shows that very large, extensive projects with long construction periods are due for implementation. These also have high demands on the availability of traffic corridors and the associated impact on traffic flow. The following chart provides an overview of projects with an investment volume of more than 100 million euro for the coming years:

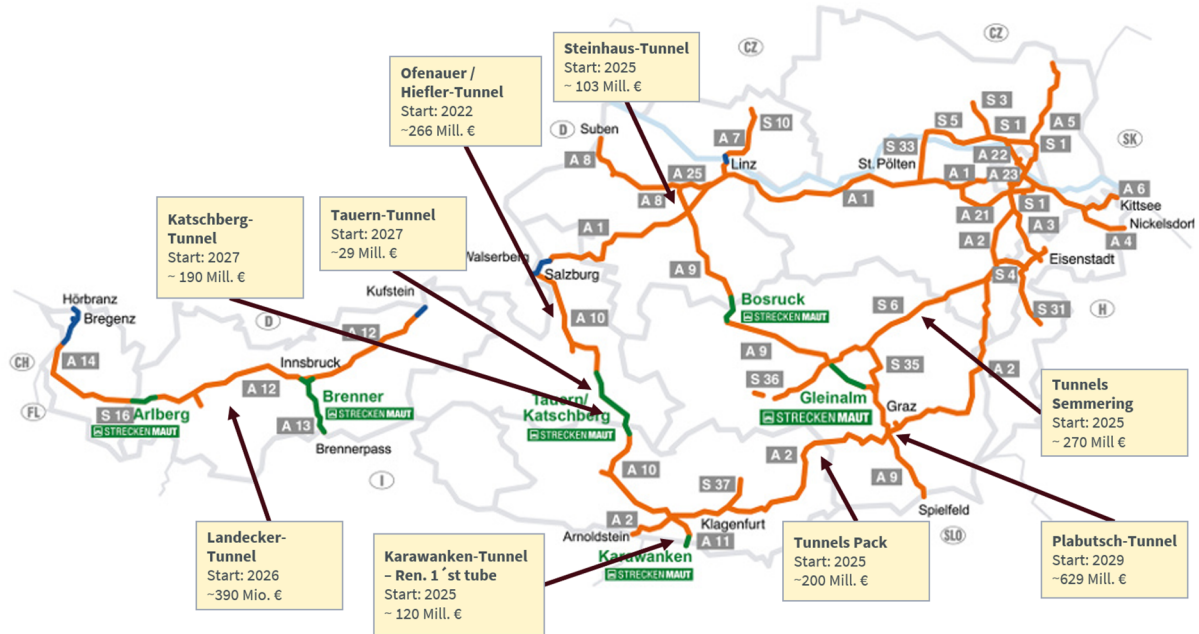


Figure 2: Projects with >100 Mill. € investment volume next years

### 2.3 Key Challenges and starting Points

The cost forecasts are also problematic in this context due to general conditions such as supply bottlenecks, rising construction costs, rising energy costs and staff shortages. The analysis concludes that the following are the most significant challenges for the coming years and require a very high level of management attention:

- Stability of project content
- Predictability of costs
- Securing the execution of construction projects
- Shortage of personnel and loss of know-how
- Increased attractiveness for the Construction company market

The following possibilities and options were defined as starting points for compensation measures and will be dealt with in greater depth in the coming years:

- Changes to the framework conditions (e.g. legal aspects)
- Extending the service life of systems and equipment
- Optimization or reduction of the scope of construction and renovation work
- Control of the market for construction and consulting
- Adaptation of contract models for construction management
- Optimization of processes and process requirements
- Targeted focusing of existing personnel resources
- Transfer of experience in the field of tunnel renovation

## 3. SUMMARY AND CONCLUSION

Tunnels are complex structures with high safety requirements and high level of safety equipment. This also results in disproportionately high refurbishment and operating costs, which increase with the age of the facilities. At the same time, the complexity and demands

on construction project management increase for all project partners involved. This means that not only road operators are required to react to these circumstances, but also planning offices and construction companies.

To ensure the feasibility of this Next Level Program, strategic and operational concepts with effective measures are urgently needed. Without these, a sufficient level of safety in Austrian motorway tunnels will not be sustainable in the long term.

#### **4. REFERENCES**

- [1] Directive 2004/54/EC of the European Parliament and of the Council of 29 April 2004 on minimum safety requirements for tunnels in the Trans-European Road Network  
<https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32004L0054>
  
- [2] ASFINAG Netzzustandsbericht 2022  
<https://www.asfinag.at/media/p5tpase5/netzzustandsbericht-2022.pdf>