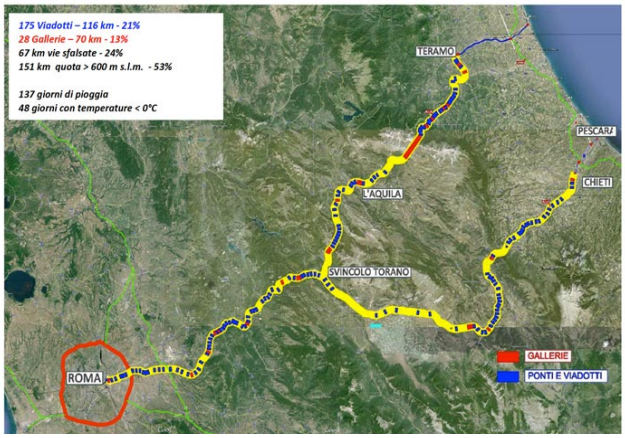
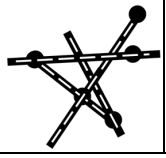
A24 Highway (Torano-Carsoli) Strada dei Parchi



Context

Climate Region: Mediterranean / Mountain	**Location:** Italy	**Key Actors:** Infrastructure Owners, Consultants, Contractors
Processes Covered: Risk assessment, Risk Evaluation, Resilience Assessment, Resilience Evaluation, Adaptation Solutions	**Scale:** Network 	**Infrastructure Type:** Road 

Outline

The highway A24 or “Strada dei Parchi”, is a highway connecting Rome to the Adriatic Sea. First planned in 1973 to connect Tyrrhenian to Adriatic highways, the route currently ends on Teramo and continue by dual-carriageway up to A14 "Teramo-Giulianova" toll road, ending near the Adriatic Sea. The considered section of the A24 highway connects Carsoli and Torano and it is located near the small city of Pietrasecca, in the region of Abruzzo (Italy).

The A24, especially its Apennine section in winter, is particularly prone to bad weather with sudden storms, strong winds, fog and ice. Snow chains on board or snow tyres from 15 November to 15 April are mandatory.

The EU funded Horizon 2020 FORESEE Project (funded under grant agreement No 769373) is a collaborative research project which developed a toolkit to improve road and rail asset managment schecmes for authorities and infrastructure operators. The toolkit provides short and long term resilience schemes for rail and road corridors that are able to reduce the magnitude and/or duration of disruptive events produced by humans or the nature.

The idea was to understand to what extent the H2020 FORESEE solutions were capable to raise the level of resilience on a section of the A24, by helping the infrastructure manager in achieving the target identified according to the guidelines developed in FORESEE. The case study focusses on heavy snow and earthquake hazard scenarios on a section of the A24 Highway (from km 52 to km 73) to evaluate, through the FORESEE Tools, taking into account the data coming from past events (e.g. L’Aquila Earthquake of 2009) and trying to use the solutions to make a comparison with the previous events.

Analysis of climate hazards

In this H2020 FORESEE Case Study, the impacts of heavy snow events were analysed against existing KPIs. The likelihood and intensity of the climate hazards was not addressed. FORESEE developed the Command and control tool for Case Study 4, which offered a Big-Data-based automated and early hazard detection and prevention service.

Climate Hazards Considered:
Temperature Snow
Earthquakes

Resilience assessment

NRAs Process
- Operations
- Maintenance

FORESEE Guidelines to measure and set targets of Level of Service and Resilience in infrastructures that were later upgraded to CWA 17819:2021 'Guidelines for the assessment of resilience of transport infrastructure to potentially disruptive events'. Key Resilience Indicator (KRI) and Key Resilience Targets (KRT) measured in € were defined in the first step and later used for the selection of the FORESEE solutions linked to improve those indicators' performance at asset and network scale. https://foreseeproject.eu/publications/

How is increased resilience achieved?
- Prevent
- Prepare
- Respond
- Recover

How are adaptation solutions considered?

Risk mapping tool for the update and control of hazards that potentially could affect the network and for the update of operational and maintenance plans. Traffic module and hybrid data fusion for traffic monitoring and prediction to activate redirection plans in case of a scenario. Resilience increase thanks to the use of these solutions was estimated and monetized following the guidelines and compared to the current situation to prioritize which combination of solutions was the optimal (even the do-nothing scenario).

Appraisal Methods:
- Multi-criteria-analysis
- Cost-benefit-analysis

Solution types considered:
- Soft measures

How is the adaptation strategy implemented in practice?

The resilience and service KPIs were analysed and validated with hybrid data (synthetic and real) data. This CS was the first approach to resilience assessment and they are figuring out how to implement it. All the process can be consulted on D 6.2 Case Study #1_A24 Highway_Italia on https://foreseeproject.eu/publications/.

Lessons learned?

The use of the H2020 FORESEE Guidelines has enabled to the NRA the integration of resilience concepts in their strategies at management and operational level in easier terms (€, KPIs) that are understandable by all the stakeholders.