SAFETY

SPECIAL ISSUE

VISION JOURNAL

Operators' strategies to protect roads and railways

ASFINAG
Science, technique and communication

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Safe mobility target for national roads

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All the arrows of safety

TELT
Tunnel safety all-out

ASECAP
United motorways of Europe

ASPHALTICA
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SPECIAL ISSUE

VISION JOURNAL

Science, technique and communication

FOCUS ON THE APPROACH OF ASFINAG, THE OPERATOR OF AUSTRIAN MOTORWAYS, TO ROAD SAFETY, A TOPIC INCLUDED IN THE COMPANY'S PRIORITY STRATEGIES AND A 2030 PROGRAMME FOCUSING ON MEASURABILITY, INNOVATION AND DIALOGUE WITH STAKEHOLDERS.

Motorway of Asfinag network (2.249 km)

Fabrizio Apostolo

From Bruxelles to Salzuburg. From the Asecap Days to the Asecap Road Safety Conference (21st-22nd March). Looking at the people, a common thread between the events is represented by the appointment of Josef Fiala, member of the board of directors of Asfinag, as president of the association of European toll concessionaires. *"Through my presidency* - the new Asecap president said - *I will be honored to help meet the great challenges of our time. Recovery after the pandemic, economic efforts brought about by the energy crisis, the Russian-Ukrainian conflict and climate change are priorities. The infrastructure sector, for its part, has always played a crucial role for the economy and society: today more than ever it can be a lever to achieve epochal goals such as the neutrality of CO_2 emissions or the sustainable use of energy".*

Turning to the merits of Asecap topics, the best "bridge" between the two events is represented by road safety, a topic that *VISIONJ* wanted to address by telling the Asfinag approach. Our guide: Bernhard Lautner, Road Safety expert at Asfinag. To him (and to Alexander Holzedl of Asfinag and Emanuela Stocchi of Aiscat) goes our thanks for the precious collaboration.

"CORE" STRATEGIES

A few numbers, to start with. Asfinag manages a total of 2,249 km of highways and long-distance roads counting on a "staff" of about 3,000 people. A total of 9 traffic control centres and 42 maintenance equipment depots. Asfinag wants first of all to be - says its Vision 2030 - *"a reliable, innovative and sustainable mobility partner, connecting regions and people in the heart of Europe".*

The 9 Asfinag Core Strategies

The reference to the "Vision" already tells us a lot about one of the "specialties of the house", the strategic planning according to which the objectives are reached also and above all through considered and calibrated strategies. The road operator has identified 9 of them, considered priority ("core"):

- Road safety
- Service and control
- Availability ("no traffic jams")
- Eco-sustainability and climate
- Multimodality, parking, rest areas
- ITS
- International affairs and cooperation
- Innovation
- Construction and maintenance.

Traffic manager crew

High-tech network monitoring

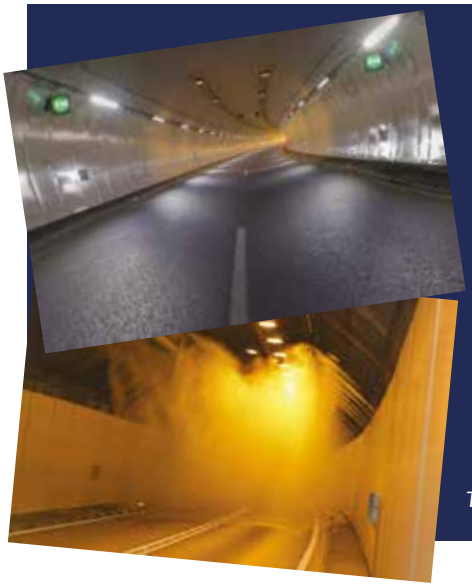
Bernhard Lautner, Asfinag Road Safety expert

INDICATORS AND MEASURES

The map of the Road Safety priority strategy is a document entitled *"Asfinag Road Safety Programme 2030"* which outlines the objectives (and tools to achieve them) for the current decade, the second consecutive permeated by this strategic approach that also uses and above all of what elaborated in terms of "Safe System Approach".

"Asfinag approach - explains Lautner to *VISIONJ - starts from strategies and comes to outline a program of actions. The starting point is a systemic approach, taking into account a precise set of factors and their interrelations. In particular: the search for the best possible solutions at national level, local and global responsibility (collaboration with stakeholders), joint work at all levels, error tolerance and minimization of the effects of accidents (claims occur, but we can aim to minimize their number and severity). In this context, the ability to always adapt all areas of intervention to the changes taking place is very important. If, for example, the user's behaviors change, then the maintenance or standards must also be sensitized and calibrated".*

To achieve results in the field of road safety is crucial, recalls Lautner, to take a picture of the objectives already achieved and here comes to help the PIARC Road Safety Manual that identifies four areas of evolution: Safe System Transformation, Safe Corridors, Safe Management and Safe Maintenance. Recent history places Asfinag in the latter category: *"Today we work on a sy-*



TUNNEL SAFETY

Tunnel safety by Asfinag

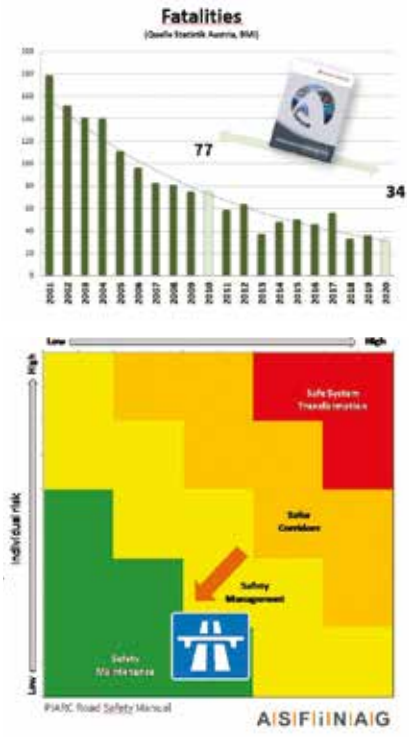
Among the many safety aspects that Asfinag takes care of, the tunnel safety plays a leading role. The Austrian motorway tunnels managed by Asfinag (165 tunnels) are in fact real innovation laboratories at the service of safety. Among the safety equipment we can remember the niches (every 1,000 m), the acoustic monitoring system in the tunnels called AKUT (microphones every 125 m next to the cameras that detect abnormal noise), fire prevention stations every 125-150 m, thermo-scanner, video analysis software, high pressure misting systems.

Tunnel innovations: lighting and spray mist system

stem that presents comforting data, about incidentality, so we can focus on timely actions that make our improvement constant. But we must never lower our guard: success is essential because we all take the utmost care of every aspect of the system, at all times".

In Asfinag the way forward is, at this point, that of the Safety Performance KPI, the safety performance indicators. In other words: a road safety that is measurable. Therefore - and here we are already entering into the field of the measures to be taken - here are identified 8 current topics, or priorities of attention and, therefore, of investment.

These are: driving ability; driving behaviour and education; bans, rules and restrictions; roads and road design; enforcement; road works; incident management, vehicle equipment and insurance. Thinking about these areas finally leads the operator to outline 13 fields of action, infrastructure or connected to public safety or users.



AREAS OF ACTION

"As far as infrastructure is concerned, areas of action include aspects such as safety standards on the existing network (guard-rail, signage, green maintenance and so on), but also upgrading of motorways. So here is innovation, with new technologies for safety in the lead, or traffic management and digitization (Asfinag is among the European leaders in the field of C-ITS), safety in tunnels and in construction sites. Other fields of action are still the safety of motorcyclists and truck drivers. Therefore, there are other aspects related to the behavioral sphere, such as communication and user awareness, as well as safety for our employees, inspections, drivers on the wrong side and accidents caused by fog".

The actions mentioned are never seen as separated activities but live on interdependence and continuous exchanges, just think of the innovation that Asfinag generates by developing enforcement devices that will then be used by the public safety forces or the large project to equip with C-ITS equipment the vehicles of the company fleet. Among the topics, another mention goes, in conclusion, to that of communication to users, at the heart of the days of Salzburg. ■

SPECIAL ISSUE

VISION JOURNAL

Safe mobility target for national roads

New asphalt pavements on SS 16 Adriatica

© *Anas SpA*

VISIONJ Report

ANAS (FS ITALIANE GROUP) INITIATIVES AIM TO SIGNIFICANTLY RAISE ROAD SAFETY STANDARDS: FROM MAINTENANCE TO PROTECTIVE DEVICES, FROM RESEARCH TO AWARENESS-RAISING. THE BEST PRACTICE OF THE NATIONAL ROAD NETWORK.

Discover the "Guida e Basta" campaign

Anas, company of the Italian FS Group with a road and motorway heritage of over 32,000 km of network, in addition to 18,600 bridges and viaducts and 2,000 tunnels, is the largest public contracting authority in the country together with RFI. Regarding road safety, Anas is very ambitious. The goal, in fact, is the challenge of reducing by 50% within 2030 the victims of road accidents to align Italy with the performance of the most advanced European countries. Another target on the horizon: the Vision Zero by 2050.

To achieve these results, Anas has prepared a strategic plan of initiatives on several fronts: maintenance and surveillance of the network; research and development of new technologies (road safety barriers, high-performance asphalts); spreading the culture of road safety.

MAINTENANCE AND SURVEILLANCE

In this context it should be stressed that the overall "production" of maintenance has increased significantly: from € 570 million invested in 2018 to € 1,149 million in 2021. The logic of episodic or emergency intervention has thus been overcome thanks to a comprehensive reading of the infrastructure and the events that occur on this or its surroundings, to intervene by preventing critical safety, functionality or comfort. In order to work effectively on maintenance, careful monitoring of the infrastructure is necessary, which is why their oversight plays a key role.

Through more and more accurate inspections and controls for the verification of the state of the works of art, of the pavements, of the quality of the signage and the lighting in tunnels, Anas is in a position to better plan the maintenance interventions. This operation is also the result of a radical change in the investment strategy, which focuses on the maintenance and expansion of the network.

NDBA concrete barrier © *Anas SpA*

In addition, through the use of IT tools that support technicians during visits, the inspection process on works of art has been made more efficient: this computerization allows to organize, manage and optimize a huge amount of data concerning the 18,602 bridges and viaducts. The entry into operation of the new information systems allows, every year, a greater efficiency and precision in the performance of the recurrent inspections. In this path Anas is also testing the most advanced technologies available with the aim of identifying the best.

An electronic monitoring plan of the works of art has been developed, articulated in more levels of control, to be applied on bridges, viaducts and overpasses. Thanks to this process, 67,979 recurring inspections and 8,621 major inspections were carried out in 2020 on 17,738 bridges, viaducts and overpasses, and in 2021 on 18,625 bridges, viaducts and overpasses 70,064 recurring inspections and 15,703 major inspections.

RESEARCH AND DEVELOPMENT

Anas is also accelerating in the field of R&D. This includes a highly innovative project such as the new National Dynamic Barrier Anas (NDBA) concrete median barriers, a fundamental element of the process of improving infrastructure safety. The complete range of road safety barriers has been designed and developed to protect all users with in addition functional innovations to solve particular problems, including installation in the presence of critical conditions, as well as the development of singular point protection systems.

But Anas research is increasing safety standards also on the pavement front thanks to the adoption of new sound-absorbing and eco-sustainable draining asphalt. Made with recycled rubber added to bitumen, these materials guarantee high performance, increasing comfort and *safety* thanks to optimal grip and reducing noise due to strong drainage.

New pavement on E45 itinerary (Umbria, Italy)

Anas takes care of the infrastructure safety along over 32,000 km of roads

ROAD SAFETY CULTURE

In conclusion, cultural and social awareness of road safety must not be underestimated. Education to road safety, especially towards young people, is of primary importance for Anas.

For this reason, in recent years the company has promoted, with MIT and State Police, information campaigns such as *"Guida e basta"* (*"Just drive"*) that highlight the need for greater attention to driving and compliance with the National Code for Roads.

An awareness that is based on scientific and psychological findings: in fact, to make the message even more effective, Anas commissioned a research in order to investigate incorrect driving behavior. ■

All the arrows of safety

© FS Italiane

Ciro Ianniello

Head of Infrastructure Safety
Direzione Operativa Infrastrutture
RFI Rete Ferroviaria Italiana

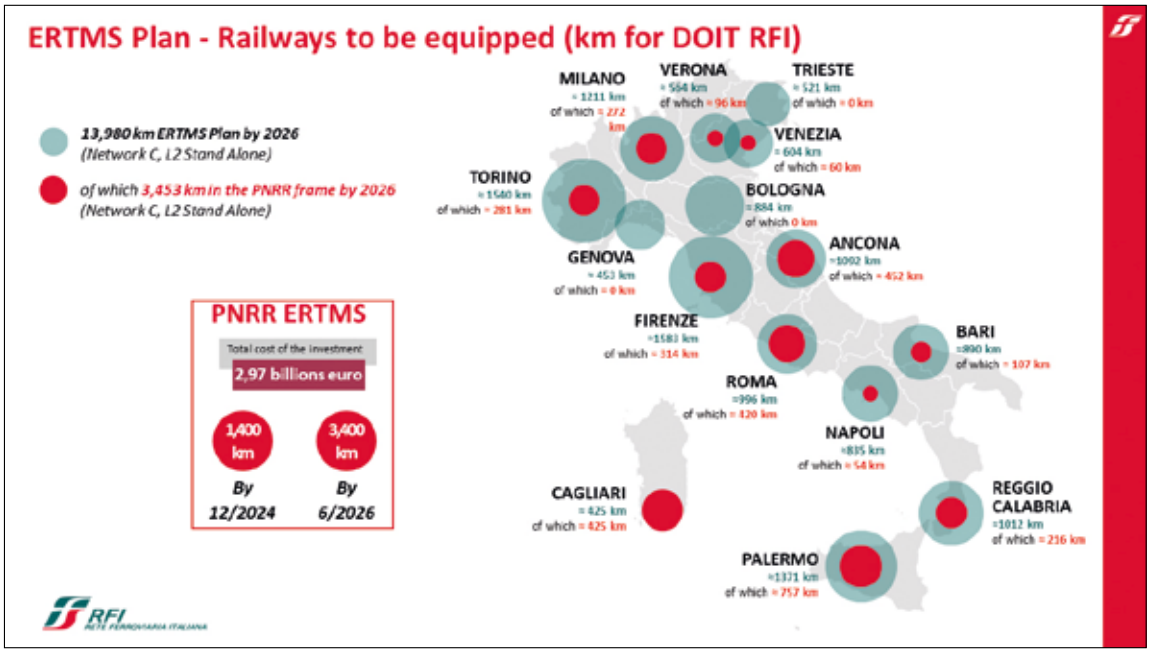
PREDICTIVE MAINTENANCE, TECHNOLOGICAL INNOVATION, CONTINUOUS LEARNING: THE ITALIAN RAILWAY NETWORK APPROACH TO THE SAFETY OF INFRASTRUCTURE, TRAFFIC AND CONSTRUCTION SITES.

The approach of Rete Ferroviaria Italiana (leading company of the Polo Infrastrutture of the FS Group) to the issue of railway safety can be briefly illustrated by first establishing a series of key factors - the safety of infrastructures, traffic safety, safety on construction sites and the human factor (skills and training) - which we have also put at the centre of a report presented during Visione Sicurezza Monza 2022.

The framework in which we move is that of a railway network consisting of 17,000 km of lines (which become 24,000 counting the double track), as well as 1,500 high-speed tracks, all taken care of by about 26,000 employees, of which 65% dedicated to maintenance.

INFRASTRUCTURE SAFETY

We begin right from here, from the maintenance, beyond that of the lines, of the 26,000 bridges and the 2,100 tunnels of the RFI net, to which 15 DOIT (*"Direzioni Operative Infrastrutture Territoriali"*) articulated in 37 Territorial Units provide, 245 Maintenance Units and 739 Maintenance Units. RFI maintenance is divided into *extraordinary* and *ordinary*.

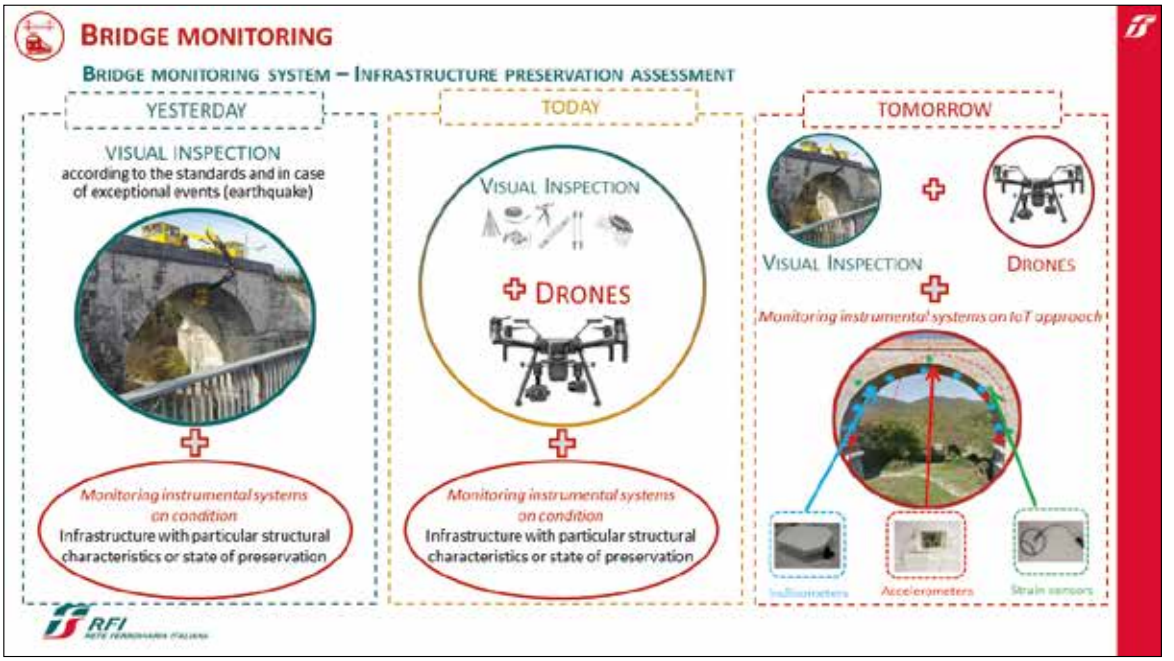


The latter can be *corrective* (following failure detection) or *preventive*, in turn distinguishable in *cyclic* and *on condition*. The second includes activities such as monitoring, inspections and testing, thus bringing us to the threshold of what is the declared RFI objective: to make *predictive* maintenance, that is, carried out following a prediction resulting from repeated analysis or known characteristics, and the assessment of significant parameters relating to the degradation of infrastructure.

Diagnostic, fixed and mobile tools, for example diagnostic trains, help us to achieve this goal. An example of fixed diagnostics, however, is the use of sensors applied to the most critical works of art that together with the use of drones to support visual inspections, allow to know in depth the state of the structure. The challenge that awaits us is to extend the use of sensor systems to all railway works of art on IoT logics that can transpose and process the huge amount of data from the applied instrumentation and provide continuous diagnostic data on the state of works health.

SAFE CIRCULATION

In this context, we are moving from the SCMT system, the train running protection system that provides a discontinuous information mode, to the fully computerized ERTMS level 2 system, which makes a continuous control through the connection with the GSM-R network. The RFI plan, in this regard, is very ambitious, planning to extend the system, by 2036, to a network of about 14,000 km. There will already be about 3,400 by 2026, the goal of the PNRR.



WORKSITES AND SKILLS

Further key factors to increase safety standards, on construction sites and beyond, therefore are technology and skills. In the first case, circumscribing the speech to the worksites, three years ago RFI has launched a series of specific projects now being implemented: SIPAC (Worksite Automatic Protection Integrated System), Dynamic Interruption, Geolocation Means of Work, 3 kV dc voltage detectors.

The second aspect, based on the key concept that the first measure of risk mitigation is ourselves, finds its roots in the experience of the Technical Academy and a perspective of great value, especially regarding infrastructure, in the construction project of three Centres of Excellence (Bologna San Donato, Napoli Afragola and Milano Greco) and 12 DOIT satellite centres, which at full capacity will provide about 120 courses per day. ■

Tunnel safety all-out

VISIONJ Report

IN THE YEAR OF SIFER LILLE AND WTC ATHENS WE TURN THE SPOTLIGHT ON TELT (TURIN-LYON) 'S APPROACH TO TUNNEL SAFETY: FROM DESIGN TO SHARED CULTURE WITH THE MISSION-S PROGRAMME, TO INNOVATION, WITH THE AXEL CASE: THE FIRST "OPEN TRACK" ROBOT.

Mission-S
SHARING SAFETY

Road, underground and rail-way tunnels. Under the spotlight of two major events for specialists in a sector that, with that of bridges, has always been a laboratory of technical excellence. In the 2023 agenda, in fact, there are the SIFER in Lille (France), the exhibition dedicated to railway technologies now in its 13th edition (28th-30th March), then the WTC World Tunnel Congress that this year will be held in Athens, Greece, from 12th to 18th May. There are and will be many ideas to collect in these two events. If, however, we want to find a technical history that unites, as of now, factors such as safety, the main subject of this *Dossier*, innovation, the railway tunnels, as well as the international dimension, the thought can only go to what TELT is doing.

TELT is the Italian-French company established in 2015 and in charge of the construction and management of the cross-border section of the freight and passenger railway line Turin-Lyon, that is the historical line with the tunnel of the Fréjus and the new line with the tunnel of base of the Moncenisio to two parallel reeds of length pairs to 57,5 km (on the 65 km of the cross-border section between Saint Jeanne de Maurienne and Susa).

The numbers of the working sites tell us also that in the past January there were dug 31 km of galleries with 1.400 employees at work. Another significant number is that of the by-passes, 204 in all, one every 333 m. Without almost realizing it, we have already mentioned the first two safety factors of the work, resulting from its "conception and design": the fact that it consists of two parallel tunnels and studded by by-passes. In fact, in case of need, the escape route will always be guaranteed. Other factors, we come to the aid of the same TELT, are the underground safety sites that allow the stop of convoys in difficulty connected with the surface in La Praz, Modane and Chiomonte, as well as a capillary and state-of-the-art system of safety rail systems and equipment: smoke extraction systems, fire pipes, water collection tanks, video surveillance 24/7.

Turin-Lyon Base Tunnel: a worksite in France

Chiomonte worksite in Susa Valley (Italy)

The rover Axel remote controlled

SHARED CULTURE

From the project to the construction sites, places where safety has become widespread strategy or, even better, mission. Indeed: Mission-S, named after a program that TELT dedicates to this key factor. The objective: zero mortality at work and minimized accidents. The means to achieve it: strict control measures, collaboration with companies investing in training and new technologies, links between safety and productivity, sharing responsibilities, experience returns: *"Mission-S (Safety) is a constant invitation to attention towards oneself and others, so that safety is increasingly a shared culture"*. The key words of Mission-S are: unity (operational and regulatory), rigor, training, involvement, care (environment and health), will and innovation. Pioneering and exemplifying, in this regard, the *"Pact for safety at work"* signed in April 2022 in a large French construction site between TELT and companies and declined into 5 commitments: training and information; safety and comfort at work; shared evaluation of performance; control on construction sites; implementation of technologies.

INNOVATION

Speaking of technology, moving from France to Italy, a fitting example of the Mission-S approach was the "Axel case" a new entry of 2022 in the construction site that will lead to the construction of 22 niches for the interchange of work equipment within the La Maddalena gallery in Chiomonte. It is an intelligent rover commissioned by TELT to Webuild (which has availed itself of the collaboration of the center of excellence CIM 4.0, as well as of the company of the group Csc Costruzioni) with the aim of investigating the environmental conditions in tunnels in advance, thus ensuring the safety of workers.

First of its kind in the world, the remote-guided robot can travel 4,000 m deep collecting and analyzing environmental data (from temperature to gases) thanks to a system of cameras, sensors and antennas. The results of the investigations allow to better prepare - and in total safety - restoration interventions such as washing, air exchange, consolidation of the walls, installation of the systems. Axel (Autonomous Exploration Electrified Vehicle) guarantees very high levels of reliability, resists critical environmental conditions and being electric - also to prevent pollution by exhaust gases from data collection - is zero emissions. ■

Axel's journey

United motorways of Europe

FROM BRUSSELS 2022 TO ISTANBUL 2023 THROUGH SALZBURG AND VIENNA 2023, NEXT LOCATIONS FOR KEY MEETINGS ON SAFETY AND SUSTAINABILITY. THIS IS HOW ASECAP RELAUNCHES ITS HISTORIC VISION, BASED ON THE PILLARS OF EU DIGITAL-GREEN POLICIES.

VISIONJ Report

Decarbonising road infrastructure: challenges, prospects and actions in a difficult economic environment. Under this title, were held on last 23rd, 24th and 25th November, the Study and Information Days (edition 49) of Asecap, the association of European toll concessionaires led by the General Secretary Malika Seddi. The headquarters, Brussels, "home" of the association that historically makes the toll a lever of economic, technological and environmental development, for industry and community.

The issue is not new, but its topicality remains and intensifies, just think of climate change, topic known in Asecap also because of the close relationships with realities such as IBTTA, the International Bridge Tunnel and Turnpike Association USA (guided by the CEO Pat Jones, present in Brussels), whose members are rather "trained" to make their infrastructure increasingly resilient (just think of the phenomenon of hurricanes).

The management of the extraordinary climatic conditions in function of the protection of the environment and territory is today an absolute priority for the Asecap world, of which to take care with the maximum engagement jointly to the historical mission of the association, i. e. the road safety. These are not

Gran Place, Bruxelles, the city that hosts Asecap headquarters

Main topics: innovation, safety and sustainability

parallel universes, but extremely integrated, as the UN reminds us. Just to give one example among many: working for safety, all-out, means cultivating the strength, resilience and durability of the same, with consequent environmental benefits in terms of "no" traffic interruptions and reduced maintenance. Environment and safety, then.

Two factors not disconnected, in turn, from a fundamental third, that of technological innovation that brings with it the issue of the digitalization of road infrastructure. We are, not only physically, in the center of the EU, gravitating to Green Deal and Digital Europe, with all the consequent issues, from data quality to cybersecurity. The toll, Asecap reminds us, can really be the right tool to make sustainable and feasible a large plan that improves safety and environmental standards and at the same time consolidates that great laboratory of road innovation that can allow the sector, in unison, to make a real leap in quality.

THEMES AND PRESENTATIONS

Having defined the framework, we review the themes presented in Brussels by 250 specialists from all over the Old Continent (22 Countries), but also from the USA and States such as Morocco or Turkey, which will host the 2023 edition of the Asecap Days in Istanbul, recalling that the presentations are available on the **asecapdays.com:** infrastructure financing (acceleration in the implementation of carbon-free mobility projects and responding to the challenges of global climate change); low-carbon motorways in line with Green Deal and FIT for 55 package; Vision Zero with short and long-term road safety targets; Cooperative, connected and automated mobility (CCAM); Resilience and asset management; Innovations in toll collection; R&D and improvement of European research cooperation; IT security.

The Italian Bologna Bypass Project (TECNE/ASPI) has been one of the best practices presented at the conference

MADE IN ITALY

From the world to Italy, pillar of Asecap with Aiscat (in Brussels there were present both the president Diego Cattoni, and the general manager Massimo Schintu). Our highway companies have made an important contribution to the success of this first post-Covid edition of the Days, in which *VISIONJ* participated as the only present Italian media, following the sessions and distributing the first paper issue of its history.

Among the Italian motorway companies present A4 Holding (Abertis), then A35 Brebemi (Aleatica) with its president, as well as vice president of the Aiscat, Francesco Bettoni and again Milano Serravalle-Milano Tangenziali, the company with the recent opening to traffic of Rho-Monza, the

North completion of the ring of the Milan ring roads, which saw among the speakers its president Beniamino Lo Presti.

The speaker team of the Autostrade per l'Italia Group (ASPI) was very strong. We mention them: Livia Pardi (ASPI) on the European project FORSEE; Massimiliano Masi (ASPI) on cybersecurity; Agostino Viglione (ASPI) on CO_2 neutralisation; Fabrizio Paoletti (ASPI) on ITS and C-ITS standards; Anna Brambilla (Tecne) on sustainable engineering; Sabino Titomanlio (Movyon) on C-ITS systems; Paolo Guarnieri (also Movyon) on video-tolling innovation. Finally, Pietro Torchi Lucifora, general manager of Ecogest, and Antonio Stornello, co-founder of Kassandra, on the theme of the Integrated Decision Support System in infrastructures.

Anything else to add? For example, the preview of the Asecap 2023 route, a year that will be marked by the Austrian Presidency: in Brussels, in fact, the handover took place between the outgoing president, the Portuguese Antonio Nunes de Sousa, and the incoming one, namely Josef Fiala, CFO of Asfinag.

In Austria there will be two key meetings of the imminent future: in Salzburg from 21st to 22nd March 2023 there will be the Asecap Road Safety Conference, while in Vienna on 29th June 2023 there will be the II Asecap Sustainability Forum, as part of another first level event, the Innovation Advances Toward The Future of Managing Traffic, in partnership with TRB, AASHTO, ERTICO and Asecap (20th-26th June). *VISIONJ* magazine will be there. ■


Olivier Quoy (Atlandes)


Carole Défosse (Asecap)
Bill Halkias (Attika Tollway)


Pat Jones (IBTTA)


Josef Fiala (Asfinag)

Francesco Bettoni (A35 Brebemi)

Malika Seddi, Asecap General Secretary, with Fabrizio Apostolo, VISIONJ director

The right Italian road

TOWARDS ASPHALTICA 2023, FROM 3RD TO 7TH MAY AT VERONAFIERE, ORGANIZER SITEB. THE MAIN TOPICS, SHARED WITH VISIONJ, ARE GREEN TECHNOLOGY AND ROAD SAFETY.

Redazione VISIONJ

On the way to sustainable roads. From 3rd to 7th May Asphaltica returns with Samoter to VeronaFiere, the historic and always innovative SITEB event which will have its main goal - as the title recalls - focusing on highly environmental solutions for road paving and infrastructure. Environmental sustainability through innovation, therefore, which is always strictly connected to safety. In the spotlight of Asphaltica 2023 there will thus be exactly the three major topics that *VISIONJ* declines every day by reporting news from the road and railway sectors and for which we are honored to be media partner of the Verona event.

Asphaltica 2023 will highlight knowledge (with the usual networking opportunities), design and construction solutions. In all these areas, the protagonists will be the specialists of the sector, who develop and bring good technology on the right track.

An ingredient to do it best is teamwork, both within the supply chain (regulatory bodies, contracting authorities, designers, companies, R&D, manufacturing, control) and the different technical components of the construction process (materials, technologies, machinery and equipment).

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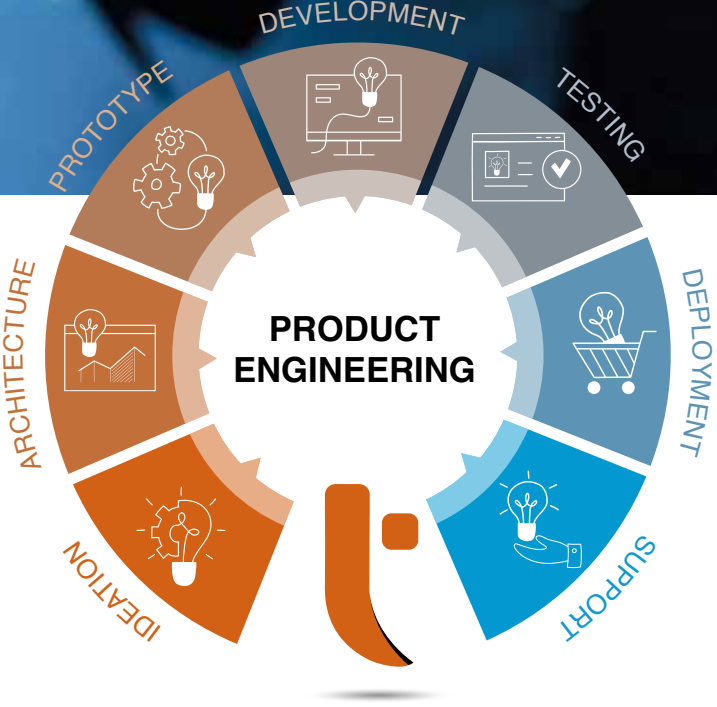

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VISION
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THE JOURNEY OF TECHNICAL COMMUNICATION FROM ITALY TO THE WORLD

Safety, *Sustainability* and *Smart Infrastructure* are the main topics of *VISION JOURNAL*, a new high quality dissemination project of Road and Railway best practices based on digital and paper communication tools.

SAFETY

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