

9th International Conference on Road and Rail Infrastructure CETRA 2026 Conference Programme

Day 1 - Wednesday - 27th May

17:00 - 20:00 Registration of the participants - Hotel Lobby

20:00 - 21:00 A welcome cocktail for participants and guests - Hotel Terrace

Day 2 - Thursday - 28th May

08:00 - 09:00 Registration of the participants - Hotel Lobby

09:00 - 10:30 Opening Ceremony - Hall A

11:00 - 12:30 Keynote lectures - Hall A

Digitization of condition monitoring for critical parts of the track superstructure

Advanced methodologies and data collection techniques in urban traffic dynamic noise modeling

Toward sustainable and resilient roadway infrastructure

13:30 - 15:00

Hall A

Hall B

Hall C

Session	Strategic and sustainable rail infrastructure: planning, design, (re)construction, and management	Session	Special Session: Sustainable and Resilient Pavements	Session	Urban traffic systems: modelling operational performance
Paper ID	Paper Title	Paper ID	Paper Title	Paper ID	Paper Title
2065	Reconstruction of the Ljubljana Railway Station – Design and Implementation (keynote)	2097	Circular economy conceptual framework for roadway infrastructure: significance of research-to-practice (keynote)	1757	Analysis of traffic patterns and intersection performance at retail facility access points
1822	Complex large-scale infrastructure development in Budapest: new tram line between districts including an intermodal junction at Rákospuszta	1779	Use of recycled wall ceramic waste in bituminous mixtures	1759	Urban roundabouts near signalised intersections: review and preliminary microsimulation findings
1935	Cash flow monitoring during the construction of infrastructure projects	1865	Laboratory and environmental assessment of warm asphalt mixtures modified with plastic waste	1781	Saturation flow rate estimation methods at signalized intersections
1943	Under Sleeper Pads and Under Ballast Mats: Enhancing Railway Superstructure Performance	1968	Evaluation of the methods for determining mixing and compaction temperatures of modified bitumen	2072	GNSS-based tram speed profile modelling: a case study of the Zagreb tram network
1991	Sustainable Development of 1435 mm gauge Railway System using Multicriteria Methods	2039	Contribution to the research on the possible application of heat energy recovery in the aggregate preparation process in the production of asphalt mixtures	1747	Efficient parking – shared use of private parking spaces as a driver for sustainable residential neighbourhoods
1827	A methodology for task identification and selection for the optimization of investments in railway networks	2046	Enhancement and upgrade of polymer modified bitumen for durable asphalt pavement: „Multifunctional additive“ – A new approach	1782	Key elements for the implementation of a mobility concept for inner-city projects
1993	The role of designated bodies in railway infrastructure authorisation	2101	Acoustic performance and durability of low-noise stone matrix asphalt (SMA8 LA) wearing course	1790	Application of microsimulations in assessing the impact of a garage on the functional and safety characteristics of an intersection

15:30 - 17:00

Hall A		Hall B		Hall C	
Session	Railway transport: capacity, operations, and performance management	Session	Pavement management: monitoring, condition evaluation, and rehabilitation	Session	Traffic noise and vibroacoustics: measurement, modelling, and mitigation
Paper ID	Paper Title	Paper ID	Paper Title	Paper ID	Paper Title
1812	Cancel-run frontiers for delayed trains under railway performance regimes	2107	Understanding the resilience of asphalt through its internal structure (keynote)	1909	Advancing in-situ noise barrier testing: insights from international inter-laboratory studies
1833	Capacity analysis of Bologna Centrale railway node based on public infrastructural and operational data	1766	Geodetic surveying of motorways using mobile LiDAR systems for pavement rehabilitation and road database updating	1987	Micro roundabouts as a road traffic noise mitigation measure
1754	Delay trends in rail freight transport due to temporary unavailability of infrastructure	1775	Validation of pavement condition evaluation by using mobile mapping system	2013	An ITS System for mitigating noise induced by port-related road traffic
1852	Development and practical application of the highest train traffic diagram level in railway passenger transport	1786	Evaluation of pavement structural condition using FWD and TSD measurements	2102	Vehicle/road noise as one of the factors determining the level of traffic noise in the vicinity of roads
1805	Relevant services for strengthening intermodal travel chains rail-air travel	1789	Applications of unmanned aerial vehicles in pavement engineering: recent advances and challenges	1803	Vibroacoustic characterisation of ballastless tram tracks: Comparing various on-site measurement approaches
1808	Information systems for passengers in railway passenger transport in the Slovak Republic	1804	New condition indicator for sidewalk maintenance management	1912	Regression analysis of train operating parameters influencing railway noise emission based on field measurements
1917	Mitigating tram bunching and enhancing headway uniformity using an innovative service: a simulation-based case study in Zagreb	2062	Non-intrusive road condition data collection for powered two-wheelers: a Croatian case study	2103	Influence of rail corrugation and rail grinding on noise levels from tramway traffic
2028	Scenario modelling to optimize railway capacity of a Northern Italian regional logistics system: challenges and solutions				

Day 3 - Friday - 29th May

09:00 - 10:30

Hall A		Hall B		Hall C	
Session	Resilient transport infrastructure: road and rail systems	Session	Special Session: Advanced Assessment and Monitoring of Bridges	Session	Rail superstructure: monitoring, condition assessment, and predictive maintenance
Paper ID	Paper Title	Paper ID	Paper Title	Paper ID	Paper Title
1749	Vulnerability assessment framework for climate resilient roads network in ethekwini municipality, kwazulu-natal	2053	Data-driven bridge analysis using traffic load measurements (keynote)	1846	AI-Driven predictive optimization framework for railway infrastructure maintenance
1925	Protecting infrastructure lines from increasing geotechnical risks due to climate change in Hungary	1765	The next generation of bridge girders and bridge elements	1854	Artificial intelligence techniques for forecasting railway track profile: Leixões line case study
1930	The influence of temperature on steel performance in risk mitigation systems	1770	Experimental and operational modal analysis estimation of damping ratios for stays of a bridge under construction	1871	AI-enhanced condition-based maintenance framework for NRPCES - new replacement policy considering environmental sustainability project
1931	Sustainable electrification of road transport in rural areas: challenges, opportunities, and climate change impact	1828	Comparative analysis of design parameters for equestrian bridges	1755	From track geometry to subsoil: a signal processing approach to substructure condition assessment
1988	Enhancing operational efficiency of China-Europe freight train service: a case study of Xi'an terminal	1896	Robust AI-based drive-by damage detection for railway bridges under operational and environmental variations	1758	Demonstration of a novel non destructive testing method for Mn-13 turnout frogs in track
2003	Impact of road network changes on transportation accessibility before and after the 2024 Noto peninsula earthquake	1911	Seismic retrofitting of the Gromovi bridge in Sisak	1955	Quantification and assessment of short-wave rail corrugation
1815	AI-driven UAV support system for first responders: integrating medical and infrastructure data in emergency scenarios	1964	Impact of flooding on bridge condition: insights from two case studies	1874	Comparative analysis of standardized and country-specific methods for calculating the track quality index (TQI)
1806	Impact of environmental conditions on stray current in urban track systems	1762	A comparative study of a 48.5 m railway bridge with continuous welded rail: open web girder and prestressed box girder superstructures	1886	A dual-level data processing framework for condition-based railway maintenance: integrating autonomous fleet inspection and advanced prognostics
1826	Decarbonization possibilities for technically demanding non-electrified railway lines: a case study of the Slovak Republic	1834	Hybrid precast-cast-in-place methodology for accelerated pier table construction in extradosed bridges	2004	Extension of rail replacement cycle using rail health index reflected onboard train data

11:00 - 12:30

Hall A

Hall B

Hall C

Session	Transport infrastructure: policy, planning, and digital transformation	Session	Special Session: Advanced Assessment and Monitoring of Bridges	Session	Dynamics and digitalization of railway tracks: from numerical models to digital twins
Paper ID	Paper Title	Paper ID	Paper Title	Paper ID	Paper Title
2105	New General Technical Conditions for Road Works (OTU 2024) in Croatia (keynote)	1969	Efficiency of the composite bridge sections with open and box-shaped thin-walled steel girders	1772	Parametric and generative BIM modelling framework for railway track maintenance using track geometry inspection data
1946	Sustainable planning of state road network development in Croatia	1980	Assessment of permissible speeds (EN 15528) for rail vehicles on the European railway network regarding dynamic vehicle-bridge compatibility	1773	DEM analysis of the Influence of ballast properties on sleeper longitudinal resistance in railway tracks
2106	Comparative Evaluation of IRI Derived from Connected Vehicle Data and Laser Profiler Measurements	1994	Railway bridge serviceability limit states and rail stresses for track-bridge interaction – overview and case study	1778	Determination of torsional resistance of rail fastenings and their effect on stability of the railway tracks
1904	From “optimistic” projects to a surge of variations: ethical explanations of technical and cost deviations in road construction	2019	Pedestrian bridges – a holistic approach in rating their efficient use and sustainable design	1811	Automated BIM models generation in railway infrastructure
1932	The challenges Croatian experts have faced when using various road traffic noise calculation methods before and after joining the EU	2026	Strengthening of existing railway bridges using corrugated steel plate shells	1825	GIS-enabled digital integration for railway maintenance
1999	Digital twin of Zagreb airport infrastructure using unmanned aerial systems	2078	Temperature-induced variability in bridge dynamic response: a prerequisite for reliable damage detection	1938	Simulating effect of high-speed rail on underground tunnel through soil structure interaction analysis and numerical modelling using PLAXIS 3D
		2080	Influence of mode coupling on perceived health of scoured bridges using vibration-based monitoring	1951	Digital twinning for rail track components – from monitoring to reporting
		1845	A hybrid precast-in-situ approach for Piercap construction in challenging Inter-tidal zones	2030	Machine learning and hyperspectral imaging of degraded railroad ballast for determination of fouling and water contents
		1840	Bridging the gap: sustainable emergency rescue area (ERA) design through deck integration	1756	Detection of maintenance actions based on rail wear analysis

13:30 - 15:00

Hall A

Hall B

Hall C

Session	Road infrastructure: design, rehabilitation, and engineering solutions	Session	Transport systems: safety and risk management	Session	Special session: Advances in noise and vibration-based approaches for rail infrastructure condition monitoring (Project URITMIS Workshop)
Paper ID	Paper Title	Paper ID	Paper Title	Paper ID	Paper Title
0000	PREZENTACIJA SPONZORA	1771	A methodological framework for railway trespass risk assessment and prioritization	2098	Onboard monitoring for intelligent assessment of railway tracks (keynote)
2076	Application of geosynthetics in the remediation of urban roads	1788	The functional safety of road infrastructure in the context of augmented CCAM physical, digital and communication (PDI) infrastructure solutions	1829	Machine learning methodology to predict three-dimensional wheel-rail contact forces in hybrid vehicle-structure interaction algorithm
1948	Effect of laboratory tests with water on samples of compacted lateritic soil	1800	Wayside train monitoring systems for the second track Divača Koper	1859	Utilization of an FEM turnout model for smart diagnostics
1959	Deep soil stabilization in transportation infrastructure using industrial by-products: the CIRCUIT project framework	1947	Road traffic crashes and their socioeconomic impacts in Sabon Gari local government area, Nigeria	1885	Smartphone sensor data for monitoring tram infrastructure - a case study of Cluj-Napoca, Romania
1856	Multi-criteria analysis of design alternatives for an urban signalized intersection: a case study from Split (Croatia)	1953	Material influence on the performance appearances of passively safe poles	1956	Sustainable ballasted track design for noise and vibration mitigation
1982	Exit ramp design at dual-carriageway interchanges: potential implications for operating speeds	1960	Designing a QGIS-based multimodal database for level crossing mapping: a Croatian case study	1970	Assessment of dynamic impact forces generated by wheel flats: A comparison of estimates by BEZGIN-KOLUKIRIK Equations and measurements by RUTE
1942	Challenges in reconstructing state road DC101 in Croatia	1985	Analysis of Vehicle Behavior at Unsignalized Crosswalks Using a Near-Infrared Laser Ranging Sensor	2056	Experimental setup and instrumentation of a full-scale ballasted railway track test
		2040	Methodology for measuring water film depth on the road sections prone to aquaplaning under the traffic		
		2049	Cut slope stability in heterogeneous earth mass and risk of slides in road construction projects		

15:30 - 17:00

Hall A

Hall B

Hall C

Session	Road systems: network performance and infrastructure assessment	Session	Road traffic: engineering, flow theory, and network operations	Session	Special session: Advances in noise and vibration-based approaches for rail infrastructure condition monitoring (Project URITMIS Workshop)
Paper ID	Paper Title	Paper ID	Paper Title	Paper ID	Paper Title
2074	Application of temporary roundabouts in enhancing of road basic capacity	1768	Optimization of roundabout geometry based on measured and simulated operating speeds		Vibration-Based Predictive Maintenance of Urban Railway Infrastructure: From Monitoring to Decision Support (URITMIS PROJECT Overview)
1894	Equilibrium concepts and driver behavior in transport network optimization: A systematic literature review	1887	Understanding congestion-prone road links through tipping point detection and classification	1803	Vibroacoustic characterisation of ballastless tram tracks: Comparing various on-site measurement approaches
1983	Directional distribution on two-lane rural highways - some analysis and recommendations	1760	Development and strategic framework of the main cycling routes network in the Republic of Croatia	2095	Track instrumentation for digital twin development in urban slab track structures
1986	Assessment of traffic efficiency indicators for two-way, two-lane rural highways through different HCM methodologies	1752	A data-driven approach to improve signalised junction safety using SCATS variations	2104	Machine learning techniques for long-term condition monitoring of tramway tracks
1863	Accessibility of pedestrian crossings – case study Dubrovnik	1853	GIS application in military vehicles' route planning	2079	Monitoring scour and soil–structure interaction in pile-supported rail infrastructure using vibration-based digital twins
1957	A multi-day thermal signature and machine learning framework for predicting defect detectability in passive infrared thermography of reinforced concrete slabs	2001	Impact of military mobility on the use of European transport infrastructure	2094	Federated digital twin for rail defect management
2042	Analysis of the impact of reducing evaluation items on urgency classification in sewer pipe inspection	2058	Buckling, quants and continuity: new paradigms in traffic flow		
		1973	Evaluating variations of advanced multimodal signal control strategies for urban corridors		

20:30 - 24:00 Gala Dinner

Day 4 - Saturday - 30th May

09:00 - 10:30

Hall A		Hall B		Hall C	
Session	Vehicle systems engineering: design, safety, and management	Session	Pavement engineering: innovation and green technologies	Session	Rethinking urban mobility: intermodality, safety, and human behavior
Paper ID	Paper Title	Paper ID	Paper Title	Paper ID	Paper Title
1839	Leveraging data-driven safety assurance and digital-twin validation for safe and reliable autonomous public transport systems	1824	Development of sustainable concrete using waste ashes as recycled aggregates: solution for green urban infrastructure	1916	Management of port-city osmosis: urban transport intermodality led by autonomous vehicles
1847	Study of the strength of an open wagon structure for long cargo transportation	1876	Mechanical characterization of moderately warm asphalt binder course mixes using rubber-modified and conventional bitumens	1921	Exemplary calculations for necessary traffic changes through behavioral changes in order to achieve emission limits using the example of Potsdam
1851	Innovative single-axle bogie design for a regional rail vehicle	1892	Construction and field performance monitoring of experimental permeable asphalt pavement with warm mix asphalt in a parking area	1810	Assessment of the impact of traffic signalization on the behavior of vulnerable road users
1906	Design of a new type of self-locking axle differential intended for installation in light road vehicles, designed to increase the reliability of function	1897	Effect of reclaimed asphalt pavement on LCC-based roller-compacted concrete pavements	1838	Mechanical-clinical mapping of injury patterns in bicycle and motorcycle crashes
1908	Development of methodology for calibration of an inertial brake test stand	1902	Evolution of rubber-modified concrete – A review	1849	Machine learning-based pedestrian intention prediction models for collision warning at unsignalized crosswalks
1783	Cargo securing aspects depending on mileage	1974	Synergistic assessment of carbon black and crumb rubber on the performance of asphalt binder: physicochemical characterization and dosage optimization	1857	Assessing risk factors for E-scooter safety: a weighted risk model based on existing literature
1792	Evaluation of the impact of the discretization order of the passenger wagon body model on ride comfort	2091	Performance, Sustainability, and Field Implementation of Reclaimed Asphalt Pavement–Based Geopolymer Concrete for Rigid Pavement Applications	1860	Gaze patterns of E-scooter riders at urban intersections: a real-world eye-tracking study
		2092	From storage to service: ageing-induced polymer network degradation in SBS-modified asphalt binders	1914	Comparative analysis of pedestrian crossing behaviour before and after the construction of a pedestrian overpass
		1796	Pavements as active thermo hydraulic systems for safety and sustainability in hospital engineering		

11:00 - 12:30

Hall A		Hall B		Hall C	
Session	Vehicle technologies: new approaches for a low-carbon and safe future	Session	Pavement design and analysis: from materials to performance	Session	Smart and multimodal urban transport: data-driven planning
Paper ID	Paper Title	Paper ID	Paper Title	Paper ID	Paper Title
1821	Optimization of a hydrogen-enabled microgrid for seasonal energy storage in sustainable railway infrastructure	1939	Comparative design and performance evaluation of pavement design methods for low volume roads using empirical mechanistic and FEM approaches	1798	Exploring the first and last mile connections for railway passenger travel: evidence from Zagreb
1895	Leveraging the triple - layer business model canvas for the transport-related biomethane industry	1961	Geotechnical characteristics of cement kiln bypass dust and its suitability for application in soil stabilization and pavement engineering	1848	User profile-based comparison of improvement expectations in shared e-scooter systems
1830	A life-cycle approach to safety in Maglev derived railway technologies	1975	A unified framework for mechanistic correlation between laboratory and field rutting response in asphalt pavement	1995	Cargo bikes in urban logistics: an infrastructure readiness assessment for the city of Zagreb
1802	Dropper-length-aware preprocessing for anomaly detection of overhead contact line fittings	1998	Machine-learning-based prediction of skid resistance from 3D pavement surface texture: identifying an effective texture depth	1996	Real-time AI monitoring: advancing sustainable and safe road networks
2093	Fatigue Crack Growth in Railway Axles: The Role of Testing Environment and Variable Loads	2002	Chemo-rheological evaluation of rejuvenated blends of RAP–virgin binder	2000	Enhancing strategic transport modelling through multi-source data integration: a case study of the Žilina SUMP
2025	The potential for ecodriving savings in regional and suburban rail traffic based on studies conducted in 2024–2025 using journeys operated in central Poland	2016	Understanding in-situ pavement responses: a comparative study of static and dynamic analysis for an instrumented pavement section	2009	A methodological framework for extracting pedestrian movements from wi-fi sensing data in a congested central urban area
2068	Geometric optimization of magnetic field energy harvesters under practical weight constraints for railway catenary systems	2020	Performance-based laboratory study on asphalt mixtures under temperature and traffic loading	2036	Methodology for multimodal service level assessment in Romanian traffic conditions
		2034	Durability assessment of reclaimed asphalt pavement (RAP) concrete with explainable ML	1913	Modeling the factors influencing metro & bike-sharing integration: a case study from İzmir