

EU funded Capacity4Rail Project Workshop & Training  
Innovations for Increasing Track Performance & Capacity

15th March, 2017

FNTP/EFRTC Meeting Facilities,

3 rue de Berri, Paris, France

# Detailed Programme & Practical Information

*An event co-organised by:*



## Programme

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### Morning session

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**10.00 – 10.30**    **Welcome Coffee & Registration**

**10.30 – 11.00**    **Welcome by Host**

Imrich Korpanec, EFRTC Secretary General

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**Outline of the Workshop by Project Coordinator:**

Álvaro Andrés, UIC

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**11.00 – 11.30**    *New track concept generation, selection & design - Slab track concept*

Amador Quintana, INECO

- Overview of existing slab track systems. Analysis of performance and maintenance issues
- New design requirements and methodology
- Track concepts: selection and design
- Optimisation of designs. Future applications

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**11.30 – 12.00**    *Effect of very high speed on track and bridges*

Erica Calatizzo, SYSTRA

- Dynamic behaviour of short span bridge for very high speed line
- Comfort analysis on short span bridge for very high speed line
- Particular effects of track irregularities

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**12.00 – 12.30**    *New approach to maintenance based on advanced sensors and monitoring technologies in S&C*

Edd Stewart, University of Birmingham

- Technology evaluation frameworks used within SP4
- Technologies being taken forward for evaluation by field testing
- Field test / demonstration activities

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**12.30 – 13.00**    *Understanding root causes of S&C defects and assessing effective remedies*

Yann Bezin, University of Huddersfield

- Review key damages from the C4R S&C failure catalogue in relation to system interface
- Understanding the interaction between wheel and rail on several crossing geometries
- Predicting the damage mechanism in the rails and support and identifying the key drivers
- Assessing the benefit of crossing geometry change on the system performance

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**13.00 – 14.00**    **Networking Lunch**

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### Afternoon session

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**14.00 – 15.00**    **Advanced Monitoring and diagnostics of track infrastructure for predictive track maintenance**

*Monitoring technologies, strategies and sensors*

Gunnar Baumann, Deutsche Bahn

- Objectives
  - Monitoring Technologies & Sensor
  - Implementation in new structures
  - Achievements
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*Sustainable strategies for monitoring in slab track*

Noemi Jimenez-Redondo, CEMOSA

- Critical parameters in the slab track systems
  - Current technologies in the market.
  - Benefits and drawbacks.
  - Radio frequency identification tags - RFID
- 

**15.00 – 15.30**    **Migration strategies for innovative track solutions 2030/2050**

Burchard Ripke, Deutsche Bahn

- Requirements of the future railway
  - Multi Criteria Assessment and Cost Benefit Analysis to identify suitable innovations
  - Scenarios and migration from now to 2030
  - Further work
- 

**15.30 – 16.15**    **Round Table**

*With representatives from*

Infrastructure Managers:

Paul Godart, INFRABEL

Academia:

Björn Paulsson, CHALMERS

Private contractor - Railway construction industry:

Valentí Fontserè, COMSA

*Moderator:*

Pierre-Etienne Gautier, SYSTRA

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**16.15 – 16.30**    **Conclusions, Wrap up, Close**

Álvaro Andrés, UIC

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## Hosts

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### **Imrich Korpanec, EFRTC**

Imrich Korpanec holds a PhD degree in Civil Engineering, specialised in railway infrastructure. He was Senior Lecturer at Prague Technical University and did lectures at the University of Delft. He worked as Technical Adviser for ORE – Office for Research and Experiments of UIC, was the Managing Director of ERRI – European Railway Research Institute in Utrecht. Imrich was also UIC's Deputy Director in charge of railway research managing the participation of UIC members in EC projects. He represented UIC in ERRAC, WCCR (world research), Member of EC Advisory Group; he participated in CEN and ERA working bodies;

Imrich is EFRTC's Secretary General since 2008.

He published numerous publications, research reports and presentations at Conferences in Europe in English, French, German, Czech and Russian and worldwide in USA, Australia, Japan and China.

In Capacity4Rail, EFRTC is responsible for the dissemination on behalf of the private construction industry.

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### **Álvaro Andrés, UIC**

Álvaro Andrés Alguacil has joined UIC in 2016, seconded from Adif (Spain). He is currently Infrastructure Senior Advisor, in charge of the coordination of research work in the Track and Structure and Train-Track Interaction sectors. Civil Engineer from the Polytechnic University of Madrid and from the École Nationale des Ponts et Chaussées of Paris.

Since 2004, Álvaro has been working in projects dealing with transports and infrastructure maintenance. In Adif he joined the Technological Innovation Direction collaborating and managing the research projects related with track support and track maintenance (National projects and EU funded projects).

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## Speakers

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**Amador Quintana, INECO**

Amador is a track materials engineer interested in Assessment in track superstructure technology –components, materials and maintenance. He is an expert in track materials and their behaviour and has large experience in track measurements, testing and validation of new developments and its geometrical and functional design. Amador has collaborated in several studies about infrastructure and track systems and has participated in international working groups (interoperability, R&D, etc.)

**Qualifications:**

2008 – M. Sc. Chemical Engineering (University of Valladolid, Spain)

2015 – Master in durability and integrity of materials and components in service

**Key skills**

- Track materials (validation, approval processes, R&D projects)
  - Assistance to design, manufacture and maintenance of track systems
  - General works related with track technology – track inspections
  - Interoperability.
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**Erica Calatozzo, SYSTRA**

Since 2007, Erica CALATOZZO has been a structural engineer specialized in structures and bridges and works in the major international infrastructures projects.

Her knowledge and expertise in the field of calculations to the finite elements, linear, nonlinear, dynamic and seismic, allow her to take part in the execution and, optimization of design of reinforced concrete, prestressed and cable structures (projects of Al Mashaer Al Mugaddassah, Panama, PADMA, Subiyah, Artscape, Chambal Bridge etc.).

Within this framework, she took part in the studies of execution/optimization of complex structures with cables (Artscape, Chambal Bridge), prestressed decks (Viaduct of Subiyah) and the substructures in strongly seismic contexts (Bridge of Padma, Bangladesh and Panama).

For SYSTRA Erica has been in charge of developing the methods of reference of the dynamic calculation of the railway bridges, rolling stock analysis and passengers comfort. These methods are applied to the software SOFISTIK to the project of the Russian HSL and to international research projects such as C4R (comfort of the passengers with modelling the track irregularities).

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**Edward Stewart, The University of Birmingham**

Edd Stewart is a lecturer in digital electronics and microprocessor systems at the University of Birmingham. He is currently leading research projects focused largely on the instrumentation and condition monitoring of both railway vehicles and fixed assets in his role within the Birmingham Centre for Railway Research and Education.

Over the past few years Edd has developed instrumentation systems and supporting algorithms to monitor a wide variety of railway assets, either as short term investigations or longer term in-service installations. His current research portfolio includes projects to integrate acoustic and visual condition monitoring systems, third rail and running rail alignment monitoring from in-service vehicles, energy harvesting wireless sensor networks, depot based maintenance test and monitoring systems, and novel computational platforms and their use within distributed monitoring architectures.

Edward is involved in C4R through SP4, he is leader of SP4.2 and participant in SP4.3.



**Yann Bezin, University of Huddersfield**

Dr Yann Bezin is Head of Research of the Institute of Railway Research at the University of Huddersfield, UK. He has over 17 years of experience leading and carrying out research based on the scientific understanding railway vehicle-track system's interaction to solve engineering issues and help innovative design. His PhD work led to the development of a steel track demonstrator in the EU project INNOTRACK. Dr Bezin current leads the Institute's research work in the areas of Switches and Crossing and track enhancement design, in a number of recent European projects such as Dynotrain, SustRail, Spectrum, Capacity4Rail, In2Rail, WRIST and S2R. Dr Bezin is also a co-investigator on a £8.5m UK research grant, leading the work stream on crossings and transitions.



**Gunnar Baumann, Deutsche Bahn**

Gunnar Baumann earned his PhD in materials science from Technical University Berlin and has been working for Deutsche Bahn AG since 1999. His major fields of work are service and R&D in track technology and track/vehicle interaction with main experience in national and international project management (e.g. WP-leader "high speed inspection" in AUTOMAIN). Since 2015 Gunnar has been head of the Track Measurement Department of DB Netz. Within Capacity4Rail, Gunnar is the leader of the SP4 "Advanced Monitoring".

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**Noemi Jimenez-Redondo, CEMOSA.**



Noemi Jiménez-Redondo holds a M.Sc. in Industrial Engineering (1991) and PhD in Industrial Engineering (1999). She worked as a researcher for Instituto de Investigación Tecnológica (Universidad Pontificia Comillas, Madrid, Spain) from 1991-1993. Then, she joined Universidad de Malaga (Málaga, Spain) as a researcher and lecturer. Since 2001, she is an Associate Professor at Universidad de Málaga, since 2010 in an unpaid leave. She joined CEMSOA in 2007 where she is the head of the Research & Innovation department. She has been leading or collaborating in more than two tenth of research projects funded by the European Union, the Spanish Government, the Andalusia Regional Government or private companies. Her current areas of interest cover transport infrastructures, energy efficient buildings and smart cities. Within the Capacity4Rail project, she participates in the design of modular new concepts for slab track within SP1 on Infrastructure, in SP4 on Monitoring where she leads the development of a monitoring system for the new slab track concepts produced in SP1 and in the validation of the slab concepts together with the monitoring system, in SP5.

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**Dr. Burchard Ripke, DB Netz AG**



Dr. Burchard Ripke received his PhD in vehicle-track dynamics from Technical University Berlin and joined DB in 1997. He is an expert in technical and economical assessment and optimisation of track constructions, vehicle-track interactions and operational conditions using RAMS technology and LCC analysis. Having been involved in several national and international projects like INNOTRACK and AUTOMAIN he has a wide experience in project management. In INNOTRACK he was responsible for the LCC and RAMS analysis, in AUTOMAIN he lead the WP "Demonstrators". In Capacity4Rail, Dr Burchard Ripke leads SP5 "System assessment and migration to 2030/2050".

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## Round table

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### Moderator



**Pierre-Etienne Gautier, SYSTRA**

Pierre-Etienne Gautier has been Director of Innovation for SYSTRA since July 2012, prior to this, he was Scientific Director for Inexia, from March 2011.

From October 2007 through February 2011, he was Scientific Director at the Directorate of Research Innovation at SNCF, for which he developed research activities on mechanics of infrastructures and railway transport system (acoustics, aerodynamics, in particular crosswind, train-track interaction and railway behaviour, pantograph-catenary behaviour).

He has edited and supervised numerous collaborative projects in the fields of STAIRRS (acoustics) INNTRACK, TRIOTRAIN (virtual certification in aerodynamics, railway dynamics, pantograph-catenary), DEUFRAKO crosswind and more recently CAPACITY4rail.

He is Chairman of the train-track interaction sector of UIC. He is a Professor at the Ecole Centrale Paris and member of Scientific Council of IFSTTAR, policy committee for civil and urban engineering network of IREX. He was Vice-Chairman of the Energy-Environment Group PREDIT. He currently organises, manages and undertakes large innovation projects to support tangible achievements for the company.

- Lobbying in international networks
- Creative partnerships and coordinator stakeholders
- Collaboration with Hyperloop One

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### Panelists



**Paul Godart, INFRABEL**

Paul Godart received a master's in Civil Engineering from the University of Louvain in 1977. In 1978 he joined SNCB (now Infrabel, Infrastructure Manager for the Belgian railways) and after 8 years of Construction Contract Manager, he joined the Track Study Department where he developed the technical specifications for the high speed lines in Belgium. In 1995 he became Head of the Track Study Department and in 2003 was nominated as Chief Civil Engineer at Infrabel. He is now Deputy director in charge of the Linear Assets: tracks, civil engineering, overhead contact lines and cabling.

Since 1988, Paul has also been participating in several UIC and CEN working groups. He is now Chairman of the UIC Track Expert Group and representative of CEN TC 256 SC 1

Railway applications – Infrastructure for Belgium.

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**Björn Paulsson, CHALMERS**

Björn Paulsson is a senior researcher managing projects at Chalmers University of Technology supporting the implementation of results from research and development projects.

He holds an MSc from Lund University, degree in Economics & IT from Stockholm University and obtained a PhD from Luleå University.

Björn joined Skanska in 1974 where he spent 17 years from his role as a new employee to take responsibility for an advanced design unit. He was the Head of the Track and Structure Department at Banverket (the Swedish Rail Infrastructure Manager) for 16 years. During this time he was actively involved promoting railway and structure research at several universities. One example is as Chairman of CHARMEC Chalmers in Sweden. Most of these initiatives were conducted in cooperation between the industry and Banverket.

As an active participant in railway technical research, Björn has been serving on numerous committees and conferences and is also a member of the European Road and Railway Construction Technology Platform (ERRTC). He led Banverket's participation in other European Commission funded research projects, such as Sustainable Bridges and INNOTRACK.

In 2006, he joined UIC where he spent five years leading EU-projects such as INNOTRACK and was responsible for Track & Structures and Train Track Interaction groups. From 2012 to 2016 he was a senior advisor at Trafikverket leading EU-projects including MAINLINE & D-RAIL, working with EU-projects like Capacity4Rail, preparing Shift2Rail & In2Rail and implementing result from research and development projects.

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**Valentí Fontserè, COMSA**

Valentí Fontserè joined COMSA in 2002 where he currently occupies the position of Technical and R&D Director.

Valentí Fontserè is Member of the EFRTC (European Federation of European Trackworks Contractors), of the CEN Working Group developing the EN14.969 standard – Qualification of Trackworks Contractors. He has been invited as a speaker for various Construction and Railways Masters. He has been involved in the FP7 UE funded R&D railways projects INNOTRACK and URBANTRACK, ECO-Innovation project ECOTRACK and LIFE+ GAIN as well as in other UE funded railways projects (FP 7: MAINLINE, MAXBE and CAPACITY4Rail; H2020: IN2Rail, S-CODE; Fast Track to Innovation: NEOBALLAST).

Valentí has contributed to the book "Slab track versus Ballasted Track. Technical & Economical criteria" AULA CARLOS ROA, Madrid (2007).

He has also been invited to speak at several railway congresses: Rail Forum-Spain (2004-2007-2008), Union Internationale des Chemins de Fer (UIC) Formation Grande Vitesse-Paris, 2005 & 2013; UIC-Eurailspeed-Milano, 2005; Frankfurt Track Maintenance, 2006; Latin Rieles-Buenos Aires, 2006; Tecnología Ferroviaria-Gijón, 2010; UE Counsellors Meeting-Warsaw, 2010; Instituto Superior Técnico- Lisboa, 2010; AVIA-Madrid, 2010; UIC HS World Congress-Philadelphia'2012; UIC Ballast: Issues & Challenges-Paris, 2013; Rail Technology Conferences-Dusseldorf, 2014; UIC-HS World Congress-Tokyo 2015.

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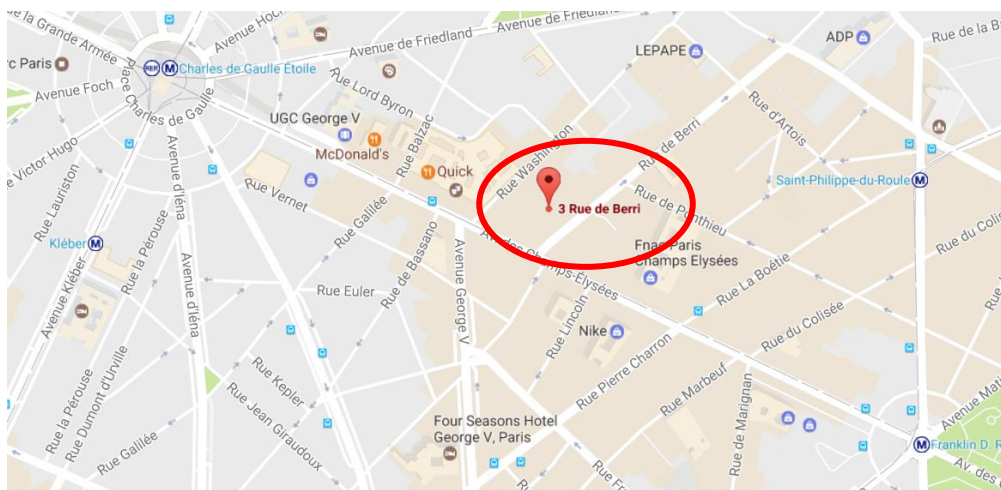
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## Practical information

### Venue

**Auditorium André Borie**  
Floor -2  
FNTP/EFRTC  
3 rue de Berri  
F-75008 Paris (France)

### Access



### Metro

Line 1, station “Georges V” or “Franklin D. Roosevelt”.

### Information and contact:

To know more about Capacity4rail, visit: <http://www.capacity4rail.eu/>

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This event is co-organised by:



## The Consortium



*Co-funded under the 7<sup>th</sup> Seventh Framework Programme for research, technological development and demonstration of the European Commission, Capacity4Rail is bringing together a range of 46 stakeholders from 13 nations in an ambitious partnership: infrastructure managers, railway undertakings, logistics developers, research institutes and universities, industrial equipment providers, engineering companies, end-users...*

### Facts and figures:

Total budget: € 15 million  
(€9.9 M€ funded)

Duration: 48 months

Project start date: 01/10/2013

Project end date: 30/09/2017

Partners: 46

Grant agreement: n° 605650

### Project coordination:

**International Union of Railways**

16, rue Jean Rey, 75015 Paris, France

**Coordinator: Álvaro ANDRÉS ALGUACIL**

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