

# Rail<sup>o</sup> Newcastle conference 2015

15-17 July 2015

@ Newcastle University

Conference Programme

organised by:



in collaboration with:



Venue: Research Beehive  
1st floor, Old Library Building  
Newcastle University  
Newcastle upon Tyne, NE1 7RU, UK

# Rail

## Newcastle

### conference

# 2015

## Welcome!

Welcome to RailNewcastle conference 2015!

This rail-focused international conference offers opportunities to students, academics and professionals involved in rail-related research projects and courses to present their scientific work and share their practical experience.

The first two days of the conference are dedicated to scientific sessions and the final day to the Railway Talents networking and collaborative event organised in collaboration with UIC - International Union of Railways.

We hope RailNewcastle conference 2015 will give you some food for (rail and research) thoughts and sparkle new ideas and collaborations in the future.

Enjoy the conference and the city of Newcastle upon Tyne and see you at the sessions!

### The organisers

## Programme at a glance

	 15 <sup>th</sup> July 2015 Wednesday	 16 <sup>th</sup> July 2015 Thursday	 17 <sup>th</sup> July 2015 Friday
			Registration and coffee
9:00	Opening session ROOM 1	Urban rail transit session ROOM 1	Rail freight and logistics session ROOM 2
			Welcome and introduction
			Keynote speakers
10:30	Coffee break		
11:00	Opening session ROOM 1	Urban rail transit session ROOM 1	Rail freight and logistics session ROOM 2
			Speed networking
12:00	Lunch break		
13:00	Rail operations session ROOM 1	Rail engineering session ROOM 2	Leadership and learning session ROOM 1
			Dissemination session ROOM 2
			World cafe workshop
14:40	Coffee break		
15:00	Rail operations session ROOM 1	Rail engineering (poster & video) session ROOM 2	Rail marketing workshop ROOM 1
			Students' session ROOM 1
			World cafe workshop
20:00	Dinner		
			Please check details in the full programme

PROGRAMME AT A GLANCE

- 09:00** Opening  
**Prof Mark Robinson**, Director of NewRail, UK
- 09:15** Welcome message  
**Dr Marin Marinov**, Rail Education Group Manager, NewRail, UK

## Keynote speakers

- 09:30** Development of a European Community Rail Authorisation process  
**Prof John Roberts**, Kasetsart University, Thailand
- 10:00** State-of-the-art of urban rail transit in China (video)  
**Prof Baomig Han**, Beijing Jiaotong University, China

**10:30** **Coffee break**

- 11:00** A great idea - who wants it and how do they know that they want it?  
**David Prescott**, Allan Rail Solutions Ltd, UK
- 11:30** Leadership talent: a study of the potential of people in the Australian rail industry  
**Dr Janene Piip**, JP Research & Consulting, Australia

**12:00** **Lunch break**

A buffet lunch will be served in The Courtyard dining area, ground floor, Old Library Building, Newcastle University

**Session topic: Rail operations, management and economics**  
Moderator: Dr Marin Marinov, NewRail, UK

- 13:00** The economic viability of a parallel Cross Country route for England  
**David Worsley**, Newcastle University, UK
- 13:20** Definition of energy-efficient speed profiles within rail traffic by means of supply design models  
**Valerio De Martinis**, Ulrich A. Weidmann, ETH Zürich, Switzerland
- 13:40** Operation of freight railways in densely used mixed traffic networks – an impact model to quantify changes in freight train characteristics  
**Tobias Fumasoli**, Dirk Bruckmann, Ulrich Weidman, ETH Zürich, Switzerland
- 14:00** Simulation modelling of Vitória-Minas closed-loop rail network  
Reinaldo Pimentel Loyola Meireles, **Marta Monteiro da Costa Cruz**, Carlos Henrique Fernandes de Faria, Federal University of Espirito Santo, Brazil
- 14:20** Plan and schedule an efficient heavy rail track maintenance through a Decision Rules Model  
**Rui Santos**, Paulo Fonseca Teixeira, Antonio Pais Antunes, Instituto Superior Tecnico, Portugal

**14:40** **Coffee break**

- 15:00** Benchmarking suburban, regional and freight train driving styles in a mixed-traffic railway  
**Jonathan P. Powell**, Roberto Palacin, Newcastle University, UK
- 15:20** Modelling and optimising periodic timetables on single track lines: improving the service quality through infrastructural adjustments and advanced control systems  
**Nicola Coviello**, Politecnico di Torino, Italy
- 15:40** Railways regulation-critical factors for a successful management: The Spanish HSR experience  
**Aurora Ruiz-Rua**, Pompeu Fabra University, Spain
- 16:00** Shunting yard simulation with synchronous decision integration  
**Benno Hüttler**, Nikola Ilo, Manfred Gronalt, University of Natural Resources and Life Sciences, Austria
- 16:20** Modelling the influence of wagon technical parameters on variable costs in rail freight transport  
**Anna Dolinayová**, Martin Loch, Juraj Kanis, University of Žilina, Slovakia
- 16:40** Wrap up session
- 17:00** Closure

# Wednesday 15 July 2015

AFTERNOON ROOM  
SESSION 2

**Session topic: Rail engineering**

Moderator: **Prof Stefano Ricci**, La Sapienza, Italy

- 13:00** Crash safety of a typical bay table in a railway vehicle  
**Emmanuel Matsika**, Qian Peng, Newcastle University, UK
- 13:20** The methodology of rating quality standards in the regional passenger transport  
**Vladislav Zitrický**, Jozef Gašparík, Lumír Pečený, University of Zilina, Slovakia
- 13:40** Personal Smart Travel Agent for empowering Persons with Disabilities using public transport  
**Jörn Schlingensiepen**, Gudrun Stockmannsb, Edwin Naroskab, Oliver Christenb, Tobias Boltenb, TH Ingolstadt, Germany
- 14:00** Assessing steam locomotive dynamics and running safety by computer simulation  
**Dāvis Bušs**, Riga Technical University, Latvia
- 14:20** Rare earth elements in railway infrastructure – potentials for an information system as a tool for operators and other stakeholder  
**Frank Michelberger**, Hirut Grossberger, Peter Judmaier, University of Applied Sciences St. Pölten, Austria

14:40

## Coffee break

- 15:00** Development of a simulation tool for the dynamic analysis of railway vehicle- track interaction (video)  
**Ramy E. Shaltout**, Luis Baeza, Cristian Ulianov, Newcastle University, UK
- 15:20** A framework for categorizing risks in High Speed Train (HST) Projects: the example of the first HST in Brazil (video)  
Viviane V. F. Grubisic, Elisete S. S. Zagheni, **Yesid Asaff**, Acires Dias, Federal University of Santa Catarina, Brazil
- 15:40** 3D Laser scanning technique for the inspection and monitoring of railway tunnels (video)  
**Han-Mei Chen**, Cristian Ulianov, Ramy Shaltout, Newcastle University, UK
- 16:00** Development of Origin-Destination Matrix (OD Matrix) of the Public Passenger Transport and the use of the railway line that crosses the urban area of Santos Dumont city - Minas Gerais - Brazil - extreme of the extreme to transport loads (video)  
**Lisleandra Machado**, Neuzete Pires Ferreira, Patrick Bastos Novaes, Iago Pereira Passos, Yohana Helena Silva da Silveira, Bárbara Ferreira da Rocha Lemos, Júlia Machado de Souza Freitas, F SUDESTE MG - Instituto Federal de Educação, Brazil

# Wednesday 15 July 2015

AFTERNOON ROOM  
SESSION 2

- 16:20** Railway industry roadmap in the state of Santa Catarina, Brazil (video)  
**Acires Dias**, Alvaro G. R. Lezana, Jonny C. da Silva, Dante Juliatto, Heitor H. Kagueiama, Carolina Resende Haddad, Maurício Uriona Maldonado, Federal University of Santa Catarina, Brazil
- 16:40** Proposal and application of methodology of revitalisation regional railway track in Slovakia and Serbia (poster)  
Jaroslav Masek, Sanjin Milinkovic, Martin Kendra, Slavko Veskovic, **Dalibor Barta**, University of Zilina, Slovakia
- 17:00** Closure

## Free evening

Newcastle upon Tyne sightseeing recommended.

Please visit NewcastleGateshead website for details of tourist attractions and local events:

[www.newcastlegateshead.com](http://www.newcastlegateshead.com)



**Session topic: Urban rail transit and light rail**

Moderator: **Dr Florin Nemtanu**, Politehnica University of Bucharest, Romania

- 09:20** Testing the efficacy of platform and train passenger boarding, alighting and dispersal through innovative 3D agent based modelling techniques  
**Selby Coxon**, Tom Chandler, Elliott Wilson, Monash University, Australia
- 09:40** The circumvention of barriers to urban rail energy efficiency  
Paul Batty, **Roberto Palacin**, Newcastle University, UK
- 10:00** Comparative assessemnt of virtual track circuit based on image processing  
**Florin Codruț Nemtanu**, Dorin Laurențiu Buretea, Luigi Gabriel Obreja Politehnica University of Bucharest, Romania
- 10:20** Public perception of driverless trains  
**Anna Fraszczyk**, Philip Brown, Suyi Duan, Newcastle University, UK

10:40

## Coffee break

- 11:00** Passenger stability within moving railway vehicles: limits on maximum longitudinal acceleration  
**Jonathan P. Powell**, Roberto Palacin, Newcastle University, UK
- 11:20** Direct observations of pedestrian unsafe crossing at urban Australian level crossings  
**Teodora Stefanova**, Jean-Marie Burkhardt, Christian Wullems, Andry Rakotonirainy, Patricia Delhomme, Queensland University of Technology, Australia
- 11:40** Attitudes of metro drivers towards design of immediate physical environment and system layout  
**Aleksandrs Rjabovs**, Roberto Palacin, Newcastle University, UK

12:00

## Lunch break

A buffet lunch will be served in The Courtyard dining area, ground floor, Old Library Building, Newcastle University

**Session topic: Rail freight and logistics**

Moderator: **Dr Dewan Islam**, NewRail, UK

- 09:20** Futuristic multimodal business model for European freight railways: a survival and revival strategy  
**Anuradha Jain**, Consulting Partners St. Gallen, Switzerland
- 09:40** Organization of railway freight transport between Slovakia and Ukraine  
**Borna Abramovic**, Vladislav Zitricky, Vedran Biškup, University of Zagreb, Croatia
- 10:00** How to make modal shift from road to rail possible in the European transport market?  
**Dewan Islam**, Stefano Ricci, Bo-Lennart Nelldal, Newcastle University, UK
- 10:20** Swiss Split – a holistic approach for distributing containers to private sidings  
**Dirk Bruckmann**, Patrik Dober, Albert Mancera, Irmhild Saabel, Ulrich Weidmann, Rhine-Waal University of Applied Sciences in Kamp-Lintfort, Germany

10:40

## Coffee break

- 11:00** Increasing security of transportation of dangerous goods in related European research projects  
Alena Loudová, **Petr Kroča**, OLTIS Group, Czech Republic
- 11:20** Adapted Cost-Benefit Analysis methodology for innovative railway services  
**Giuseppe Siciliano**, Francesco Barontini, Carlo Vaghi, **Dewan Islam**, Ross Jackson, **Thomas H Zunder**, Stefan Mahler, Ilaria Grossoni, Aniruddha Kaushal, Simon Iwnicki, Ming Chen, Igor Davydenko
- 11:40** Rail freight in Brazil  
**Andre Luis Oliveira de Melo**, Agência Nacional de Transportes Terrestres, Brazil, **Raphael Kling-David**, Newcastle University, UK

12:00

## Lunch break

A buffet lunch will be served in The Courtyard dining area, ground floor, Old Library Building, Newcastle University

# Thursday 16 July 2015

AFTERNOON ROOM  
SESSION 1

**Session topic: Leadership and learning in the railway industry**  
Moderator: **Dr Janene Piip**, JP Research & Consulting, Australia

- 13:00** Analysis of benefits to young rail enthusiasts of participating in extracurricular academic activities  
**Anna Fraszczyk**, Joseph Dungworth, Marin Marinov, Newcastle University, UK
- 13:20** Training of PTE teachers: building the teaching knowledge in the daily school routine (video)  
**Neuzete Ferreira**, Lisleandra Machado, F SUDESTE MG - Instituto Federal de Educação, Brazil
- 13:40** A successful cooperation between academia and industry in higher rail education: the postgraduate course in "Railway Infrastructure and Systems Engineering" at Sapienza  
Luca Rizzetto, Gabriele Malavasi, **Stefano Ricci**, Noemi Montaruli, Nicoletta Abbascià, Riccardo Risica, Giovanni Bocchetti, Federico Gherardi, Alessandra Raffone, Sapienza Università di Roma, Italy
- 14:00** The resurgence of education in railway and metro engineering in Brazil (video)  
**Yesid Asaff**, Viviane V. F. Grubisic, Regis Kovacs Scalice, Acires Dias, Federal University of Santa Catarina, Brazil
- 14:20** A profile from Spain  
**Alicia Garcia Hernandez**, Carlos III University of Madrid, Spain

SOCIAL SCIENCES

# Thursday 16 July 2015

AFTERNOON ROOM  
SESSION 2

**DISSEMINATION ROUTE**

Moderator: **Prof John Roberts**, Kasetsart University, Thailand

- 13:00** Regional trams and light rail systems: barriers, opportunities and critical success factors to innovative core-periphery connections  
**Iqbal Hamiduddin**, Charles King, Colin Osborne, University College London, UK
- 13:20** Innovation vs Standardization - The example of wheelsets  
**Michel Pineau**, SNCF, France
- 13:40** What future for rail freight in Europe?  
**Philip Mortimer**, Newcastle University, UK
- 14:00** Suitability of tilting technology to the Tyne and Wear metro system  
**Ovuezirie Darlton Agajere**, Marin Marinov, Newcastle University, UK
- 14:20** Development of rail crashworthiness in Europe  
**John Roberts**, Mark Robinson, George Kotsikos, Kasetsart University, Thailand

DISSEMINATION ROUTE

## 14:40 Coffee break

TALK

**15:00** Evaluating Rail – The development and piloting of guidance to evaluate new rail infrastructure projects in Scotland by **John Galilee**, Transport Scotland

WORKSHOP

**15:20** Rail marketing and public engagement workshop by **Trevor Garrod**, European Passenger Federation, UK

Moderator: **Dr Marin Marinov**, NewRail, UK

STUDENTS' SESSION

**16:00** Rail liberalisation in the EU: the application to Thailand's context by **Thanaphon Charanwanitwong**, Newcastle University, UK

**16:20** Modal choice problem for services between Newcastle and London by **Yisong Ji**, Newcastle University, UK

**16:40** New designs for interchanges by **Raphael Kling-David**, Newcastle University, UK

## 20:00 Conference & Railway Talents Dinner

Venue: Northern Stage  
Barras Bridge,  
Newcastle upon Tyne  
NE1 7RH, UK



In collaboration with:



# Collaborative and networking event

Friday 17 July 2015 @ Great North Museum

Newcastle Upon Tyne, UK

Organised by:



INTERNATIONAL UNION OF RAILWAYS

- 08:30** Registration and coffee
- 09:00** Video welcome address by Jean-Pierre Loubinoux, Director General, UIC
- 09:05** Welcome and introduction to the Railway Talents project and online platform by Nathalie Amirault, Head of Unit Expertise Development, UIC
- 09:30** Keynote speaker:  
Janene Piip, JP Research & Consulting, Australia  
**What is Talent management and why is it so critical for companies competitiveness and sustainability? Talent management policies and practices across the world and sectors.**
- 10:00** Keynote speaker:  
Roy Rowlands, Rail Technology Magazine, UK  
**What have we done as a business to engage with young people to promote careers in the rail industry?**
- 10:30** Speed networking session  
(Please bring your business cards with you)
- 11:30** Networking in the museum (and exhibitions sightseeing)

## 12:00 Lunch break

- 13:00** World cafe workshops' introduction by Nathalie Amirault, UIC
- 13:15** Workshop 1: **How to attract and engage Talents?**
- 14:05** Workshop 2: **How to develop and grow Talents?**

## 14:55 Coffee break

- 15:10** Workshop 3: **How to retain and commit Talents?**
- 16:00** Workshops' summary
- 17:00** Closure

## 'The World Café' workshops

The World Café conversation is a creative process for leading collaborative dialogue, sharing knowledge and creating possibilities for action. Participants are split into small groups where they discuss a topic given while sitting at a café-style table. Please take notes as a group and feed back your thoughts to the delegates at the end of the session.

### Topic of the workshop:

# How can we collectively make the railway sector irresistible for the best talents in the job market?

In collaboration with:



Venue: Double Clore Suite,  
Great North Museum: Hancock  
Barras Bridge  
Newcastle upon Tyne  
NE2 4PT, UK

SPEED NETWORKING SESSION

WORKSHOPS

WORLD CAFE WORKSHOPS

The event aims to officially launch the **UIC Global Network of Railway Talents**, the main theme of the event is proposed to be in line with the overall purpose of the UIC Global Network of Talents project:

**“Create a better future for railways – Attracting the best talents in the job market and make the railway sector a career opportunity of choice”**

During the workshops, it is expected to address the core theme:

**“How can we collectively make the railway sector irresistible for the best talents in the job market?”**

It is proposed to look at the question through two angles:

— **At a national level** (set of recommendations for companies)

The task of making railway sector a career opportunity of choice aligns with achieving excellence of services of railways and the customer focus is a global challenge of the sector. The rail talents of today should also answer the question “What do the companies have to do to deliver the best service?”, in order to contribute to the efficient growth of their respective companies, as well as to attract the next generation of talents in the sector.

— **At the international level** (set of actions and next steps for the Global Network of Railway Talents)

What are my expectations from the Network and what could be my contribution?

What are the risks and opportunities? How can I impact on them?

A set of sub-questions that can facilitate the discussions during the workshops is presented in workshops’ descriptions.

## Workshop 1

### How to attract and engage talents?

What are the employer **branding strategies** and programs across companies and geographies? What countries do invest strategically in employer branding initiatives? How can we learn from them? How can UIC help to build members **corporate image and reputation** regarding young talents?

How many railway companies participate in “**best companies** to work for national and international programs”? What are the results? How do they classify against the market? What are the best and worst results compared with “better companies to work for”?

Despite the national and specific market conditions (surplus or shortage) what are the critical success factors for **attracting talents** from the market to our companies? Is there any particular skill shortage in special countries and geography? What are they? Is there any hot skill (shortage and higher wages) in special countries and geography?

Do we (the railway sector) still have **a career to offer** to external targets/applicants? Do we want to offer a career? Is a career an attracting differentiator for railway companies? Who should be responsible for planning and career decision making, the employee or the company?

What are the pros and cons of developing **a recruitment data base** managed by UIC (to post jobs, share a job, connect, apply to jobs, access resumes database)? Do we need it? Can we use other online database infrastructure (Railway Talents, LinkedIn, etc.)?

What are the **other functionalities** that should be incorporated in UIC GT Platform?

## Workshop 2

### How to develop and grow talents?

How's the specific **railway offer** (railway training centers, railway universities, UIC courses) compared with market general offer in terms of technical training, strategic planning, general management, higher education, soft skills, and so on? Do we feel that UIC may enlarge it's offer to it's members (is there a need which could be addressed)? What else may be promoted?

The technical **railway knowledge learning** is being managed correctly by the different companies? Are there any distance learning training courses that can be shared across different countries? Does it make sense that UIC may promote those courses?

How do we overcome the **language limitations** in international training?

How can UIC organize **Summertime Internships** between countries or other Internships (short - up to 1 month - and midterm - from 1 month up to 1 year)? Is this consider valuable from the employee and employer point of view?

Do we consider critical to obtain **international experience** to a young manager? Does a a recruitment data base managed by UIC may help to promote international mobility? Do we really need it?

How can we **exchange trainers and teachers** across geographies? Is it important to have an international training and certification program for trainers?

What **other initiatives** shall we propose to promote development on the current job? And planned jobs? What new functionalities should we add to UIC GT Platform? How can we use the platform to support succession planning, coaching and mentoring programs?

## Workshop 3

### How to retain and commit talents?

Does the railway have a **turnover problem**? What it is the gap between the expected and actual turnover? What are the companies doing about it? What are the main conclusions from exit interviews that may be generalized? What are the main issues?

How many railway companies participate in "**salary surveys**"? What's the position railway companies have regarding market average? What other fringe benefits may increment job attraction and retention?

What **high performance management practices** may be shared between UIC members?

For inspiration please check:

**[www.railtalent.org](http://www.railtalent.org)**



# Organisers



organised by



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Dr Marin Marinov, Rail Education Group Manager, NewRail  
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[www.newrail.org](http://www.newrail.org) | <http://conferences.ncl.ac.uk/railnewcastleconference/>



organised by



INTERNATIONAL UNION  
OF RAILWAYS

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Nathalie Amirault

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[www.uic.org](http://www.uic.org)

[www.railtalent.org](http://www.railtalent.org)

# Directions

15<sup>th</sup> and 16<sup>th</sup> July 2015  
9:00 - 17:00

**RailNewcastle conference 2015** venue:

Research Beehive, 1st floor, Old Library Building  
Newcastle University, Newcastle upon Tyne, NE1 7RU, UK

16<sup>th</sup> July 2015  
20:00

**Conference and Railway Talents dinner** venue:

Northern Stage, Barras Bridge,  
Newcastle upon Tyne, NE1 7RH, UK

17<sup>th</sup> July 2015  
8:30 - 17:00

Please note that side entrance to the  
museum will be open from 8:30am

**Railway Talents networking event** venue:

Double Clore Suite, Great North Museum: Hancock  
Barras Bridge, Newcastle upon Tyne, NE2 4PT, UK



## Alphabetical Key of Buildings and Services

Accommodation Service	1	Courtyard Restaurant	25	Jesmond Road	36	Politics Building	37
Admissions Office	1	Culture Lab	7	Joseph Cowen Halls	14, 15	Richardson Road	73
Agriculture Building	16	Curtis Auditorium	17	Kensington Terrace	46	Ridley Building 1	51
Albion House	98	David Shaw Lecture Theatre	62	King Edward VII Building	29, 30	Ridley Building 2	52
Architecture Building	27	Daysh Building	31	King George VI Building	19	Robert Boyle Lecture Theatre	22
Armstrong Building	22	Dental Hospital	64	King's Gate	1	Robinson Library	35
Baddiley-Clark Building	69	Dental Sciences, School of	63	King's Hall	22	Royal Victoria Infirmary (RVI)	53 - 55
Barbara Strang Teaching Centre (Formerly Bedson Teaching Centre)	21	Development and Alumni Relations Office	1	King's Road Centre	4	Security Control Centre	22
Barras/Claremont/Eldon Buildings	2	Devonshire Building	48	Language Resource Centre	26	Side Cluster	21
Bedson Building	20, 21	Drummond Building	47	Law School	38	Sir James Spence Institute	74
Bernicia Halls	11, 12	Estate Support Service	16	Leazes Parade	76	Sports Centre	70
Beehive, Research	25	Executive Office	1	Leazes Terrace	79	Squash Courts	72
Bistro	4	Finance Office	1	Library, Robinson	35	Staff Development Unit	19
Building Science	28	Framlington Place (16-17)	65	Line Building (East)	10	Stephenson Building	50
Campus Coffee	8	Grand Hotel	9	Marris House	71	Student Services	1
Careers Service	1	Great North Museum: Hancock	34	Medical School	60	Student Wellbeing	1
Carlton Lodge Accommodation	96	Hatton Gallery:	1	Merz Court	24	Students' Union	5
Cassie Building	49	Great North Museum	29	Music Studios, The	6	The Core, Science Central	100
Castle Leazes including Castle Court	75	Henry Wellcome Building	61	Newcastle Law School	38	The View - Downing Plaza	99
Catherine Cookson Building	59	Herschel Annex	18	Newcastle University Centre for Professional and Executive Development	100	Turner Court	101
Chaplaincy	39	Herschel Building	17	Northern Stage	3	University Security	22
Claremont Bridge	33	Howden Room	19	Old Library Building	25, 26	Walton Library	60
Claremont Terrace (1-4)	67	Human Resources	1	Park Terrace	45	William Leach Building	58
Claremont Tower	32	International Office	1	Paul O'Gorman Building	68	Windsor Place Accommodation	97
		INTO Building, The	13	Percy Building	23	Windsor Terrace	38 - 41
		IT Service Desk	32			Wolfson Building	57

# University Campus Map

**Rail Newcastle conference 2015**

**RAILWAY TALENTS**

**RailNewcastle conference 2015 venue:**

Research Beehive, 1st floor, Old Library Building  
Newcastle University, Newcastle upon Tyne, NE1 7RU, UK

**Railway Talents networking event venue:**

Double Clore Suite, Great North Museum: Hancock  
Barras Bridge, Newcastle upon Tyne, NE2 4PT, UK

**Conference and Railway Talents dinner venue:**

Northern Stage, Barras Bridge,  
Newcastle upon Tyne, NE1 7RH, UK



One square represents approximately 2 minutes' walk		University Information		Student Accommodation
		Travel Shop		Campus Restaurant/Café
		Hospital		Building Entrance (steps)
		Public Toilets		Under Construction
		Public Accessible Toilets		Public Toilets
		Accessible Parking		Accessible Entrance
		Accessible Lift		
		Public Parking		
		NCP Parking		