

Career Summary

Richard Anderson is the Managing Director of the Railway and Transport Strategy Centre at Imperial College London, an applied and academic research division within the Department of Civil and Environmental Engineering. He co-directs a growing, multi-disciplinary team, of over 30 researchers, practitioners and consultants, specialising in transport performance and analytics, mass transport in cities, international benchmarking and public transport management.

Richard leads the Centre's initiatives in international benchmarking, currently serving over 100 metros, railways, urban bus, light rail, airports and transport authorities globally, sustaining an annual income of over £3 million. The RTSC's research has been acclaimed by the transport industry and was included by Imperial as an 'Impact Case Study' for the 2014 Research Excellence Framework and rated as achieving "Outstanding impacts in terms of reach and significance." In 2015, the Imperial College London President's Award for Excellence in Innovation and Entrepreneurship was awarded to Richard Anderson, Professor Daniel Graham and the RTSC. Richard has contributed to the Centre's publications in high impact journals, authors many reports to industry, and is responsible for all applied research for industry clients.

Since assuming the role of Managing Director in 2009, Richard has delivered a three-fold expansion of the RTSC's scope and activities to include the growing metros of Asia and to establish new benchmarking consortia for urban bus, suburban rail, light rail and airport operations. Under his direction, the RTSC has secured recognition as the pre-eminent centre for international transport benchmarking and, more generally, eminence in research and strategic advice for urban mass transport.

Richard has a unique, global knowledge of urban public transport operations and is a specialist in international benchmarking and mass transit. He provides advice to the leaders of major urban railways worldwide. He combines an understanding of the commercial imperatives facing transport systems with academically rigorous research and analysis. He is regularly invited to speak at international conferences, including those recently hosted by the OECD International Transport Forum and the Indian Ministry of Urban Development.

Prior to joining the RTSC, Richard was employed by consultants Halcrow Fox until 2000, working on the planning of major rail projects and including a two-year secondment to London Transport Planning. He graduated in 1994 with a First Class Honours degree in Civil Engineering and obtained an MSc in Transport from Imperial College in 1995.

Key Skills and Research Areas

- Transport performance and data analytics
- International benchmarking
- Urban transit management and strategy
- Transport planning, economics and regulation

Education

- 1994-95 MSc in Transport, Imperial College London
- 1990-94 BEng (First Class) Civil Engineering with European Studies, University of Salford

Career and Selected Projects

Position: 2009 - Current: Managing Director, Railway and Transport Strategy Centre

2016 - Current: Airport Benchmarking Group: Directed the development of a new benchmarking group for hub-airport operators, funded by Heathrow Airport, Airports Authority Hong Kong, Los Angeles World Airports, Munich Airport and the Greater Toronto Airports Authority. The research so far has included the development of a Key Performance Indicator system and research into the quality, effectiveness, efficiency and best practices of airports' flight connection processes.

2015 - Current: World Bank / Indian Ministry of Urban Development: 'The Metro Operator's Story' Project Director of an ongoing research programme funded by the World Bank and in collaboration with the Community of Metros and the Indian Ministry of Urban Development. The project aims to identify and disseminate the key factors that make urban metros successful from the experience of metro operators themselves, city stakeholders and Imperial's 20-year research for the metro industry.

2014 - 15: Metro Rio: Review of Contractual and Regulatory Operational Indicators

Directed a study which recommended a new regulatory performance regime for Metro Rio and its Government. The results were presented by Richard to the Government of the State of Rio de Janeiro. The analysis was based on a worldwide review of the metrics and target levels of performance for metros worldwide.

2004 - 15: Community of Metros Benchmarking Group

Project Director for a highly successful, industry funded, collaborative research programme serving 35 of the world's metros including London Underground, Hong Kong MTR, Paris RATP and New York City Transit. The programmes assist metros in identifying and implementing best practice through the application of benchmarking and evaluations of management processes. Responsible for delivery and management of all research input from Imperial College London and full responsibility for client liaison and project administration. The RTSC is the sole academic partner and has been supported by £5m of industry funded research over the last 5 years. Studies have recently been accomplished in a breadth of topics including Fares Regulation and Funding, Train Service Reliability, Metro Energy Strategies and Rolling Stock Replacement.

Since 2004, the funders of the RTSC's benchmarking research have directly evidenced hundreds of millions of dollars of financial savings in public funds. Imperial included this work as an *Impact Case Study* for the UK Universities 2014 Research Excellence Framework and was graded as having achieved '*Outstanding impacts in terms of their reach and significance.*'

2012 – 14: London Underground: Understanding Cost Efficiency Using Econometric Benchmarking

Principal investigator of a research project to identify the key causal factors of metro operating costs. The findings will be used by Transport for London to inform their future efficiency strategies.

2013: Hong Kong Mass Transit Railway: Metro Fare and Performance Regulation

Led a worldwide state-of-the-art review of performance and price regulation in the public transport and utilities sectors. The work informed the MTR's strategy leading to its renegotiation of its regulatory contract with the Hong Kong Government.

2014: Organisation for Economic Cooperation and Development (OECD): Measuring and Valuing Convenience and Service Quality

Lead author of an invited research paper, presenting a global review of the practices and policies governing the measurement and management of convenience and service quality for metros and railways.

2013: London Underground: Dwell Time Recalibration

Project Director of a research project that determined a model to predict boarding and alighting rates through metro train doors. London Underground will use the results in their train service modelling and may inform future rolling stock design.

2011-12: Office of the Rail Regulator: Network Rail Bottom-Up Benchmarking Programme Audit (in collaboration with consultants Arup)

Reporting and advising on the direction of Network Rail's international benchmarking programme.

2010 - 15 (on-going): International Suburban Rail Benchmarking Group

Led the original RTSC team (now led by colleagues in the RTSC) that established an international benchmarking consortium of suburban railway operators, including JR East, New York MTA, Norwegian Railways, TfL London Rail, S-Bahn Munich and MetroTrains Melbourne. The group replicates and expands on the success of the global metro and bus benchmarking initiatives to cover suburban and commuter rail modes.

2009: London Underground Limited: Escalator Asset Management

Directed a consultancy project which London Underground estimate will lead to over £500 million in cost savings in escalator procurement and maintenance expenditure over a 20 year period.

Position: 2004 - 2008: Managing Associate, RTSC

2003 – 2007: International Bus Benchmarking Group

Established and directed the International Bus Benchmarking Group which has now provided continuous research funding to the RTSC for eleven years. The group was formed in 2004 applying the same model as the CoMET and Nova metro benchmarking groups and continues to grow. The group includes the participation of urban bus operators and authorities in 14 cities including Barcelona TMB, Brussels STIB, London Buses and Singapore SMRT. Seven years ago, the RTSC also established the 'American Bus Benchmarking Group' at the request of a group of US bus operators.

Position, 2000 - 2004: Senior Research Associate, RTSC

2004: MTRC Ltd. (Hong Kong): advisor on metro fare regulation

Responsible for advising the Mass Transit Railway Corporation Ltd. on the implications of revisions to the regulation of public transport fares in Hong Kong. The work was influential in determining the 'Fare Adjustment Mechanism' agreed with the Hong Kong Government.

2003: Strategic Rail Authority: Benchmarking the Passenger Railway – a pilot study for the UK Strategic Rail Authority (in collaboration with Jacobs Consultancy)

Led the RTSC's contribution to a benchmarking study of Train Operating Company performance and practices. A comprehensive picture of TOC performance was developed with the development of Key Performance Indicators, covering costs, revenues, internal processes and service quality.

2003: European Commission, DG TREN - IMPROVERAIL Project (5th Framework)

Project Manager of a work package concerned with the development of benchmarking tools for railway infrastructure managers.

2002: Institute for Public Policy Research: Child Pedestrian Accident Study

Research project in collaboration with the Institute for Public Policy Research, examining the relationship between pedestrian accidents and socio-economic conditions. Presented results to the UK Prime Minister's Policy Unit at No. 10 Downing Street.

2000: Corporation of London: Economic Evaluation of Crossrail

Responsible for developing an economic appraisal of this proposed East-West cross-London railway. The project centred specifically on the impacts of changes in the London economy and travel demand patterns over the 1990's.

Halcrow Fox, 1995 - 2000

2000: European Commission DG- Information Society (EU / China Co-operation)

A secondment to ERTICO (Europe's forum for ITS – Intelligent Transport Systems) in Brussels for the co-ordination of two EU-China co-operation projects for the European Commission relating to the implementation of ITS technologies in China.

1997-9 Bangkok Metro Company Ltd: Bangkok Blue Line Concession Bid

Transport Planning Manager during an eight-month placement in the Client's office in Bangkok. Responsible for the development of demand forecasts, risk assessment, operational strategy and production of relevant tender documents.

1995-9 London Transport Planning: Secondments

Secondments to London Transport Planning (now Transport for London) over a four year period. Various transport planning studies of large-scale railway infrastructure projects were undertaken, including the Crossrail and Chelsea-Hackney lines, involving both transport modelling and economic appraisals.

External Positions

Member, Committee on Transit Management and Performance, Transportation Research Board (US), 2017 – 2021.

Publications

Horcher D, Graham DJ, Anderson RJ (2017). **The economics of seat provision in public transport.** TRANSPORTATION RESEARCH PART E: LOGISTICS AND TRANSPORTATION REVIEW. ISSN: 1366-5545

Trompet M, Anderson RJ, Graham DJ (2017). **Improved understanding of the relative quality of bus public transit using a balanced approach to performance data normalisation.** TRANSPORTATION RESEARCH PART A-POLICY AND PRACTICE, (In Press) Vol: 95, Pages: 105-125, ISSN: 0191-2615

Horcher D, Graham DJ, Anderson RJ (2017) **The economic inefficiency of travel passes under crowding externalities and endogenous capacity.** JOURNAL OF TRANSPORT ECONOMICS AND POLICY, ISSN: 0022-5258

Horcher D, Graham DJ, Anderson RJ (2017). **Crowding cost estimation with large scale smart card and vehicle location data,** TRANSPORTATION RESEARCH PART B-METHODOLOGICAL, Vol: 95, Pages: 105-125, ISSN: 0191-2615

Brage-Ardao R, Graham DJ, Anderson RJ (2016). **Determinants of rolling stock maintenance cost in metros,** PROCEEDINGS OF THE INSTITUTION OF MECHANICAL ENGINEERS PART F-JOURNAL OF RAIL AND RAPID TRANSIT, Vol: 230, Pages: 1487-1495, ISSN: 0954-4097

Brage-Ardao R, Graham DJ, Anderson, RJ (2015). **Determinants of Train Service Costs in Metro Operations.** TRANSPORTATION RESEARCH RECORD: Pages: 31-37, ISSN: 0361-1981

Canavan S, Graham DJ, Melo PC, Anderson, RJ, and Cohen JM (2015). **Impacts of Moving Block Signaling on Technical Efficiency: Application of Propensity Score Matching on Urban Metro Rail Systems.** TRANSPORTATION RESEARCH RECORD. Pages: 68-74, ISSN: 0361-1981

Cohen, JM, Barron, AS, Anderson, RJ and Graham DJ (2015). **Impacts of Unattended Train Operations (UTO) on Productivity and Efficiency in Metropolitan Railways.** TRANSPORTATION RESEARCH RECORD: JOURNAL OF THE TRANSPORTATION RESEARCH BOARD. Pages: 75-83, ISSN: 0361-1981.

Anderson RJ, Condry BJ, Findlay N, Brage-Ardao R, Li H (2013). **Measuring and Valuing Convenience and Service Quality: A review of global practices and challenges from mass transit operators and railway industries,** OECD round table, 12-13 September 2013 Paris, Valuing Convenience in Public Transport, OECD, Paris

Mohammad, SI, Graham DJ, Melo PC, Anderson RJ (2013). **A Meta-Analysis of the Impact of Rail Projects on Land and Property Values,** TRANSPORTATION RESEARCH PART A: POLICY AND PRACTICE, Vol.50, Pages 158-170.

Barron A, Melo PC, Cohen JM, and Anderson, RJ (2013). **A Passenger-Focused Management Approach to the Measurement of Train Delay Impacts,** TRANSPORTATION RESEARCH RECORD: JOURNAL OF THE TRANSPORTATION RESEARCH BOARD. Pages: 46-53, ISSN: 0361-1981.

Trompet M, Parasram R, Anderson, RJ (2013). **Benchmarking Disaggregate Customer Satisfaction Scores Between Bus Operators In Different Cities and Countries,** TRANSPORTATION RESEARCH RECORD: JOURNAL OF THE TRANSPORTATION RESEARCH BOARD. Pages: 14-22, ISSN: 0361-1981.

Melo PC, Harris NG, Graham DJ, Anderson RJ, Barron, A (2011). **Determinants of Delay Incident Performance of Urban Metros,** TRANSPORTATION RESEARCH RECORD: JOURNAL OF THE TRANSPORTATION RESEARCH BOARD, Vol 2216, Pages 10-18.

Allport RJ, Anderson RJ (2011). **Managing strategic risk – the worldwide experience of metros**, PROCEEDINGS OF THE ICE - MANAGEMENT, PROCUREMENT AND LAW, Volume 164, Issue 4, Pages 173 –180.

Graham DJ, Crotte A, Anderson RJ (2009). **A Dynamic Panel Analysis of Urban Metro Demand** TRANSPORTATION RESEARCH PART E: LOGISTICS AND TRANSPORTATION REVIEW, Volume 45, Pages 787-794.

Trompet M, Anderson RJ, Graham DJ (2009). **Variability in Comparable Performance of Urban Bus Operators**, TRANSPORTATION RESEARCH RECORD. Vol 2111, Pages 177-184, ISSN: 0361-1981.

Harris NG, Anderson RJ (2007). **An international comparison of urban rail boarding and alighting rates**, PROCEEDINGS OF THE INSTITUTION OF MECHANICAL ENGINEERS, PART F: JOURNAL OF RAIL AND RAPID TRANSIT, Vol. 221, No. 4, Pages 521-526, ISSN: 0954-4097.

Graham D, Glaister S, Anderson RJ (2005). **The effects of area deprivation on the incidence of child and adult pedestrian casualties in England**, ACCIDENT ANALYSIS AND PREVENTION, Vol:37, Pages:125-135.

Conferences

Note: in addition to the public conference addresses listed below, Richard Anderson also gives key presentations to the many closed conferences hosted by the global public transport consortia which he directs.

Brage-Ardao R, Graham DJ and Anderson RJ (2015). **Determinants of Rolling Stock Maintenance Cost in Metros**. Proceedings of the the 94th Transportation Research Board Annual Meeting, Washington DC, USA.

Anderson RJ, Harris NG, Graham DJ and Haojie L (2014). **The Impact of Urban Rail Boarding and Alighting Factors**. Presentation and proceedings of the 93rd Transportation Research Board Annual Meeting, Washington DC, USA.

Anderson RJ (2013). **Utilising Benchmarking to Improve Metro Operations**. Invited keynote address, ASIA PACIFIC RAIL 2013, Hong Kong.

Anderson RJ, Condry BJ (2013). **International Public Transport Benchmarking: Can It Be Useful?** Invited address, TRANSPORT ECONOMISTS' GROUP, London.

Findlay N, Anderson RJ (2013). **Fares and Funding Policies to Support Sustainable Metros**, UITP FARE MANGEMENT CONFERENCE, Izmir, Turkey. Invited speaker; address given by Findlay N.

Trompet M, Parasram R, Anderson RJ (2013). **Benchmarking Disaggregate Customer Satisfaction Scores Between Bus Operators In Different Cities and Countries**. Paper for the 92ST TRANSPORTATION RESEARCH BOARD ANNUAL MEETING, Washington DC, USA.

Cohen JM, Anderson RJ, Melo PC, Graham DJ and Hirsch R (2013). **Air Quality Regulation in Metropolitan Railways: A Benchmarking Approach**. Paper for the 92ST TRANSPORTATION RESEARCH BOARD ANNUAL MEETING, Washington DC, USA.

Parasram R, Steel R, Maxwell RJ, Anderson RJ, Hirsch R, Melo PC (2013). **A Practical Framework For Metro Maintenance Management.** Paper for the 92ST TRANSPORTATION RESEARCH BOARD ANNUAL MEETING, Washington DC, USA.

Anderson RJ, Allport RJ, Findlay N (2012). **Metro Financial Sustainability: Benchmark Management for Urban Rail.** Invited address, WORLD BANK CHINA RAIL WORKSHOP, Beijing, China. Also presented by invitation to the Ministry of Transport (MOT) of the Government of the People's Republic of China, Beijing.

Anderson RJ, Karathodorou N (2012). **Maximizing the potential for metros to reduce energy consumption and deliver low-carbon transportation in cities.** Invited address, RAIL POWER EUROPE CONFERENCE, Berlin, Germany.

Anderson RJ, Barron A, Findlay N, Allport RJ (2012). **Global metro challenges and the strategies to tackle them.** Invited address, METRORAIL CONFERENCE, London.

Anderson RJ, Findlay N, Graham DJ (2012). **Improving Fares and Funding Policies to Support Sustainable Metros.** Paper presented at the 91ST TRANSPORTATION RESEARCH BOARD ANNUAL MEETING, Washington DC, USA.

Anderson RJ (2012). **Funding Sustainable Mass Transit.** Invited address, ASSOCIAÇÃO PORTUGUESA PARA O DESENVOLVIMENTO DOS SISTEMAS INTEGRADOS DE TRANSPORTES, FEBRUARY 2012 SESSION, Lisbon, Portugal.

Anderson RJ, Graham DJ (2010). **The Economics of Fare Regulation for Metros.** Invited address, 3RD UITP INTERNATIONAL CONFERENCE ON PUBLIC TRANSPORT FINANCING, Hong Kong.

Anderson RJ, Allport RJ (2010). **The Strategic Importance of Urban Railway Benchmarking.** Invited address, 17TH ANNUAL ASIA RAIL CONGRESS, Singapore.

Anderson RJ, Findlay N, Trompet M (2010). **Funding Metros: Lessons learned from the CoMET and Nova Benchmarking Groups.** Invited address and paper, METRORAIL CONFERENCE, London.

Anderson RJ, Maxwell RJ, Harris NG (2009). **Maximizing the potential for metros to reduce energy consumption and deliver low-carbon transportation in cities.** Invited address and paper, METRORAIL ASIA CONFERENCE, Delhi.

Anderson RJ (2008). **Lessons Learned from International Benchmarking.** Invited address, ATOC NATIONAL TASK FORCE GOOD PRACTICE FAIR, London.

Anderson RJ, Graham DJ (2006). **Nova and CoMET: Improving the management and delivery of mass public transportation in cities.** Keynote address, NOVA SYMPOSIUM, public conference, Buenos Aires, Argentina.

Anderson RJ (2006). **CoMET and Nova Update.** Invited address, 81ST UITP METRO ASSEMBLY, St. Petersburg, Russia.

Anderson RJ (2006). **International benchmarking: The experience in metro railways.** Invited speaker, OFFICE OF THE RAIL REGULATOR RAIL BENCHMARKING WORKSHOP, London.

Anderson RJ (2005). **Transport Performance and the Data Clubs Approach.** Invited address, ESRC INTERNATIONAL PUBLIC SERVICE RANKINGS CONFERENCE, London.

Anderson RJ, Hirsch R, Trompet M, et al (2003). **Developing Benchmarking methodologies for Rail Infrastructure Maintenance Management Companies**. Presentation to the EUROPEAN TRANSPORT CONFERENCE, Strasbourg, France.

Anderson R, Adeney W (2001). **Lessons from an International Railway Benchmarking Study: Process and Benefits**. Presentation to the APTA RAIL TRANSIT CONFERENCE, Boston, USA.

Selected Reports

Recent reports from the last year (2012 – 13) authored, co-authored and arising from the collective research by the RTSC and submitted to clients only after Richard Anderson's approval:

RTSC, The Railway Consultancy Ltd. (2013). **Dwell Time Recalibration**. Report prepared for London Underground Ltd.

RTSC (2013). **Metro Fare and Performance Regulation– 2012 Update**. Report prepared for the Hong Kong Mass Transit Railway Ltd.

RTSC (2013). **Accessibility and Safety for Elderly, Disabled, and Mobility-Restricted People**, Case Study Report, CoMET 2012. Report prepared for the Community of Metros (CoMET).

RTSC (2013). **Energy Saving Strategies**, Case Study Report, CoMET 2012. Report prepared for the Community of Metros (CoMET).

RTSC (2013) **Improving Incident Response and Recovery: Phase 2**, Case Study Report, CoMET 2012. Report prepared for the Community of Metros (CoMET).

RTSC (2012). **Key Performance Indicators**, Report prepared for the Community of Metros (CoMET).

RTSC (2012). **Key Performance Indicators**, Report prepared for the Nova Group of Metros.

RTSC (2012). **Causal Factors of Cost**, Case Study Report, Nova Phase 14. Report prepared for the Nova Group of Metros.

RTSC (2012). **Driver Productivity**, Case Study Report, Nova Phase 14. Report prepared for the Nova Group of Metros.

RTSC (2012). **Rolling Stock Replacement vs. Refurbishment**, Case Study Report, Nova Phase 14. Report prepared for the Nova Group of Metros.

Other notable reports authored or co-authored:

Arup, RTSC (2013). **Network Rail bottom-up benchmarking review -2012 update**. Report prepared for the UK Office of the Rail Regulator and Network Rail.

Arup, RTSC (2012). **Network Rail Bottom-Up Benchmarking Programme Audit**. Report prepared for the UK Office of the Rail Regulator and Network Rail.

RTSC (2009). **Escalator Asset Management Drill-Down Study, CoMET 2009 Report**. Anonymised report prepared for London Underground Ltd. (industrial research report, reviewed by peer metros).

CURRICULUM VITAE

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RTSC (2003). **Improved Tools for Railway Capacity and Access Management, IMPROVERAIL Deliverable 3: Benchmarking Exercise in Railway Infrastructure Management.** Report prepared for the European Commission.

Graham DJ, Glaister S, Anderson, RJ (2002). **Child pedestrian casualties in England: the effect of area deprivation.** Report published by the Institute of Public Policy Research.

Graham DJ, Anderson RJ, Glaister S, Travers T (2001). **A reassessment of the economic case for CrossRail.** Report published by the Corporation of the City of London.

Awards

President's Award for Excellence in Innovation and Entrepreneurship, Imperial College London, 2015

Rees Jeffreys Road Fund Bursary, Rees Jeffreys Road, 1994

University of Salford Award for Civil Engineering and European Studies, University of Salford, 1994