

23rd ATRS WORLD CONFERENCE

VU Amsterdam, July 2 – 5, 2019

Hosted by: VU Amsterdam, School of Business and Economics



MADE POSSIBLE BY:



WELCOME ON BEHALF OF THE LOCAL ORGANIZING COMMITTEE

The Department of Spatial Economics and the School of Business Economics are proud to host the 23rd World Conference of the Air Transport Research Society. Every year ATRS brings together experts from the industry and leading academics to discuss a wide range of topics in aviation. This year, the themes of the plenary session are aviation, economic growth and sustainability. Amsterdam Airport Schiphol, like many other airports, faces capacity limitations, and a decision on future growth has to be taken this year. Should the airport be allowed to grow further? Has the airport reached the limit of what is possible from the perspective of sustainability? Two keynote speakers, from the City of Amsterdam and from Schiphol, will give their view on this matter. Then, an academic keynote and a panel discussion will put the Dutch case in an international perspective.

The conference will not only give you presentations on policy and sustainability. Many other topics are addressed by researchers from all over the world. Airport development, airline competition, safety etc. will all get attention, and we are grateful that so many of you came to Amsterdam to present your papers.

We cannot organize a conference without support. I express my gratitude to the members of the local organizing committee and local staff who made this event possible. And without the support the sponsors listed on the previous page, this event would not be possible: many thanks!

I hope you will enjoy the conference and your stay in Amsterdam.

Eric Pels



https://www.klm.com/corporate/en/images/Smart-and-Sustainable_final_tcm729-1019717.pdf

WELCOME ON BEHALF OF THE AIR TRANSPORT RESEARCH SOCIETY

Welkom! It is with great pleasure that I welcome you to the 23rd ATRS World Conference in the historic city of Amsterdam. This is a return visit for the ATRS. We were last here for our 4th World Conference in 2000. Prof. Jaap de Wit, a member of this year's Organizing Committee, was our host 19 years ago.

The Netherlands has a long history of aviation. In 1909, 110 years ago, ten thousand people gathered to see the country's first flight, which lasted 3.5 minutes. Ten years later, the Dutch carrier, KLM, was founded with its first scheduled flights between London and Amsterdam. Schiphol Airport's history goes back to 1916 when a farmer sold a 12-hectare plot of land to the Dutch Government so that an airfield could be established. Although the Fokker aircraft manufacturing firm started in Germany, it moved to the Netherlands in 1919, so has a 100-year history in this country. More recently, the Netherlands has earned a reputation as a champion of air freedoms; pioneering the signing of liberal and open skies air services agreements.

I would like to thank the conference organizers, especially Chair Eric Pels, for all their hard work putting this conference together. In addition, we are indebted to our sponsors for making this conference possible. As a result of the efforts of the organizers and sponsors, we can offer you a full slate of plenary sessions, panel sessions, and paper presentations on a vast array of aviation topics. Moreover, we hope that you attend the Welcome Reception and Gala Dinner where you can renew old acquaintances and meet new friends.

I wish you a productive and enjoyable conference.

Martin Dresner

President, ATRS

KEYNOTE SPEAKERS

Richard Emmerink **Director of Corporate Development, Royal Schiphol Group**



Analytical, people oriented, and result focussed. This is my approach to improve businesses and organisations as an executive director with more than 15 years of experience and a strong track record. My current position is Director of Corporate Development at Royal Schiphol Group (Amsterdam Airport). Previous positions include:

- CFO/COO at Connexion Public Transport N.V.;
- Director of Transformation at Aegon Netherlands (pensions, insurance, banking);
- CFO at Abellio Group (transportation);
- Consultant at McKinsey & Company.

My expertise lies in the areas of finance, strategy, business development (tendering, M&A, Joint Ventures, Public-Private Partnership), business

transformation (creating synergies among different operating companies, business turnaround and restructuring, post acquisition integration), and LEAN (Operational Excellence). My experience covers a variety of sectors from transportation, logistics, financial institutions (pensions, insurance, and banking) to energy and both public and private contexts.

Udo Kock **Deputy Mayor of Amsterdam**



Udo Kock gained his doctorate at the Vrije Universiteit Amsterdam and the Tinbergen Institute Graduate School of Economics. In 2001 he joined the International Monetary Fund (IMF) in Washington DC. Kock worked there as (senior) economist, including working on economic recovery programmes for Iraq and Pakistan. At the IMF, he also worked on other economic development programmes including Laos, Sri Lanka, Jordan and Uzbekistan. He also analysed financial and economic development in emerging economies. In recent years he has been Permanent Representative of the IMF for Palestinian Territories in East Jerusalem.

Udo Kock has written more than a hundred articles in (scientific) journals and newspapers about diverse subjects, including unemployment, the

employment market, social security, the housing market, higher education, foreign policy and politics.

Anming Zhang **Professor at Sauder School of Business at University of British Columbia**



Anming Zhang is a Full Professor of Operations and Logistics and holds Vancouver International Airport Authority Chair Professor in Air Transportation at Sauder School of Business, University of British Columbia (UBC). He served as the Chair of the Operations and Logistics Division, Sauder School of Business (2003-2005), and as the Director of UBC's Centre for Transport Studies (2003-2004). He was the Vice President (Academic & Program) for the World Air Transport Research Society (2006-2017). He is the recipient of the "WCTR-Society Prize", awarded to the overall best paper of the 8th World Conference on Transportation Research in Antwerp, Belgium, in 1998. In June 2014, he won the "Best Overall Paper Prize" at the annual conference of

International Transport Economics Association, Toulouse School of Economics, France. Professor Zhang has published papers and books in the areas of transportation, logistics, industrial organization, and Chinese economy.

PANELISTS

Anne Graham **Professor Air Transport and Tourism Management, University of Westminster**



Anne Graham is Professor of Air Transport and Tourism Management. She has been involved in the teaching, research and consultancy of air transport for over 30 years and has developed two key research interests. First is in airport management, economics and regulation. Her other research area is the analysis of tourism and aviation demand and the relationship between the tourism and aviation industries. She is a regular speaker at international conferences and has published widely with recent books including Destination London, Air Transport: A Tourism Perspective, Airport Finance and Investment in the Global Economy, Managing Airports, The Routledge Companion to Air Transport Management, Aviation Economics, and

Airport Marketing. She is a previous Editor-in-Chief of the Journal of Air Transport Management.

Tae Oum **President of the WCTR Society and Professor Emeritus, UBC**



Dr. Tae Oum focuses on economics, management strategy and policy analysis in transport/logistics and public utility sectors. He is Editor-in-Chief of Transport Policy since 2016 and serves on Editorial Boards of 13 international journals. He is the founding chair of the ATRS Global Airport Benchmarking Task Force (2002). Since 2016 he is a special invited professor at MIT Global Scale Network China campus hosted at NSCIIC. In May 2019 he assumed the Presidency of the WCTR Society. He (co-)authored 36 books, 130+ refereed journal papers, and numerous reports for international organizations (World Bank, OECD, ITF, APEC, ICAO), and for many government agencies, regulatory commissions and corporations (Canada, United

States, UK, Netherlands, Japan, Korea, Australia, New Zealand, Singapore, Turkey).

Pieter Cornelisse **Vice President Mainport Strategy at Air France – KLM**



Leads a strategic staff department that sets up proposals for the positioning of the KLM network at mainport Schiphol and reports to the Board directly. Department's main focus is to formulate the strategic positioning for accommodating the KLM network at Schiphol Airport, through setting up the demand for capacity and the "translation" into a sustainable development of required infrastructure for the mid- and long-term period. Strategic Schiphol related matters, and their interrelation, are being monitored by his team continuously. The VP participates in the consultation process for the Airport Charges Schiphol. The team safeguards that the company's

requirements are addressed properly in order to obtain the ground infrastructure in time and at a competitive cost level for the operation of the Hub-network. The department is also responsible to maintain and enlarge the social acceptance and public support for KLM's sustainable flight operation at Schiphol.

Jagoda Egeland **Advisor to the Secretary-General, International Transport Forum, OECD**



Jagoda Egeland joined the Organisation for Economic Co-operation and Development (OECD) in 2011. She currently serves as an Advisor to the Secretary-General and leads aviation projects at the International Transport Forum (ITF) at the OECD. Prior to taking up her role at the ITF, she was in charge of managing strategy and relationships with airlines at the UK Airports Commission, a body set up by the Prime Minister to examine the long-term airport capacity needs in the UK. During her time at the Commission, Ms. Egeland led UK Government's work in the fields of aviation connectivity, airline competition, scenario-based forecasting, hub economics, and the future of global route networks. Ms. Egeland also

worked as a consultant on public policy issues in the private sector, the UN International Labour Organization, and at the London School of Economics where she was also a class teacher. Ms Egeland holds an MSc in Public Policy from Maastricht University and a BSc in Mathematics and Economics from the London School of Economics. She is a British and Polish national.

TUESDAY, 2 JULY

9.00-15.00	Meetings (by invitation only)
9:30-17:00	Ph.D. Student and Junior Faculty Workshop (registration required)
15:00-20:30	Conference registration
19:00-20:30	Welcome Reception, offered by Houston Airports

WEDNESDAY, 3 JULY

09:00-09:10	Welcome Address (Room: Auditorium)
09:10-10:10	Keynote Speeches (Room: Auditorium)
10:20-11:00	Coffee Break
11:00-12:00	Panel Discussion (Room: Auditorium)
12:00-13:00	ATRS Global Airport Performance Benchmarking Project, Task Force Report and Excellence Award Presentation (Room: Auditorium)
13:00-14:00	Lunch
14:00-15:30	Airport Policy Session (Room: Auditorium)
14:00-15:30	Airline Session (Room: 2A00)
15:30-16:00	Coffee Break
16.00-17.30	Concurrent Sessions 1
18:30-?	Strategic Management Special Interest Group Social Session (informal)

THURSDAY, 4 JULY

9.00-10.30	Concurrent Sessions 2
10:30-11:00	Coffee Break
11.00-12.30	Concurrent Sessions 3
12:30-14:00	Lunch
14.00-15.30	Concurrent Sessions 4
15:30-16:00	Coffee Break
16.00-17.30	Concurrent Sessions 5
19:00-22:00	Conference Dinner (NH Grand Hotel Krasnapolsky) offered by Royal Schiphol Group

FRIDAY, 5 JULY

9.00-10.30	Concurrent Session 6
10:30-11:00	Coffee Break
11.00-12.00	Concurrent Sessions 7
12:00-13:00	Closing Session (Room: Auditorium)
13:00-18:00	Excursions

TUESDAY, 2 JULY

9.00-15.00 Meetings (by invitation only). Room: 1D-08

9:00-11:00 ATRS Executive Committee Meeting

11:00-12:30 ATRS Networking Committee Meeting

12:30-13:30 Lunch. Location: The Basket, offered by the Department of Spatial Economics

13:30-15:00 Airport Benchmarking Taskforce Meeting

9:30-17:00 Ph.D. Student and Junior Faculty Workshop Room: 2A00
(registration required)

9:30-11:00 Erik Verhoef (VU Amsterdam), "Double Counting Indirect Benefits of Transport Investments: How to Do It, How to Avoid It"

11:00-12:30 Nicole Adler (Hebrew University of Jerusalem),
"Game Theory and Aviation Markets"

12:30-14:00 Lunch, offered by the Department of Spatial Economics

14:00-15:30 Rico Merkert (University of Sydney Business School),
"Benchmarking in Aviation Management"

15:30-17:00 Aisling Reynolds-Feighan (University College Dublin),
"Aviation Data Sources and Data Analysis"

15:00-20:30 Conference Registration

19:00-20:30 Welcome Reception, offered by Houston Airports. Room: Foyer

WEDNESDAY, 3 JULY

09:00-09:10 Welcome Address | Room: Auditorium

Martin Dresner | President of ATRS

Arjen van Witteloostuijn | Dean of School of Business and Economics

09:10-09:30 Keynote Speech I Room: Auditorium

Richard Emmerink | Director of Corporate Development of Royal Schiphol Group)

09:30-09:40 Keynote Speech II Room: Auditorium

Udo Kock | Deputy Mayor of Amsterdam

09:40-10:10 Academic Keynote Speech | Room: Auditorium

Anming Zhang | University of British Columbia

10:20-11:00 Coffee Break

11:00-12:00 Panel Discussion: Environmental and Capacity Restrictions | Room: Auditorium

Moderator: Jaap de Wit

Tae Oum | President of the WCTR Society and Professor Emeritus, University of British Columbia

Anne Graham | University of Westminster

Pieter Cornelisse | KLM

Jagoda Egeland | International Transport Forum at the OECD

12:00-13:00 ATRS Global Airport Performance Benchmarking Project, Task Force Report and Excellence Award Presentation | Room: Auditorium

Chair: Kelly Woodward | Houston Airports

Chunyan Yu | Embry-Riddle Aeronautical University

13:00-14:00 Lunch

14:00-15:30 Challenges and opportunities for the airport industry | Auditorium

Moderator: Jagoda Egeland | International Transport Forum at the OECD

Mitch Kilian | Associate Vice President, Governmental Affairs, Minneapolis–Saint Paul International Airport

Greg Richardson | Deputy General Manager & CFO, Hartsfield-Jackson Atlanta International Airport

CK Ng | Executive Director, Airport Operations, Hong Kong International Airport

Petrouschka Werther | Deputy Director, Aviation Department, Ministry of Infrastructure and Environment

Jae Hee Park | Director of Airport Operation Department, Korea Airports Corporation

Eric Pels | VU Amsterdam

Achim Czerny | Hong Kong Polytechnic University

14:00-15:30 Enhancing Safety and Operational Efficiencies through Industry Collaboration | Room: 2A00

Session Chair: Anastasios Plioutsias | Assistant Professor of Safety & Human Factors, Amsterdam University of Applied Sciences

14:00 - 14:20 **Jesus Rubio** | Director, Data and Digital Content, IATA | Enhancing Safety and Operational Efficiencies through Industry Collaboration

14:20 - 14:40 **Maria Papanikou** | Associate Professor of Safety & Human Factors, Amsterdam University of Applied Sciences | Towards Meaningful and Sustainable Data for Fatigue and Mental Health in Commercial Aviation: Pilot Typologies Considerations

14:40 - 15:00 **Frenchez Pietersz, Bob Verkleij, Inge Kilian** | Amsterdam University of Applied Sciences, Aviation Academy | The Challenges and Opportunities for the Pilots and Cabin Crew Resource Planners

15:00 - 15:30 **Panel discussion** | Is Fatigue a Threat or an Opportunity for an Aviation Company?

Jesus Rubio

Anastasios Plioutsias

Maria Papanikou

Frenchez Pietersz

Bob Verkleij

Inge Kilian

15:30-16:00 Coffee

16.00-17.30 Concurrent Session 1

16:00-17:30 1-A Aviation Policy

Room: Auditorium Chair: **Rogier Lieshout** | SEO Amsterdam Economics

163 Multiple-Airport Systems: The Development of Older Airports in View of Environmental Adverse Impacts (Frederic Dobruszkes, Free University of Brussels; Shinya Hanaoka, Tokyo Institute of Technology; Renato Redondi, University of Bergamo; Jiaoe Wang, Chinese Academy of Sciences; Bonaventure Loko, Free University of Brussels ULB)

20 Expanding Airport Capacity of Cities under Uncertainty: Strategies to Mitigate Congestion (Matteo Balliauw, University of Antwerp; Evy Onghena, University of Antwerp)

136 Options to Mitigate Negative Effects of Airport Capacity Constraints - A Discussion of Potential Mitigation Effects (Dieter Wilken, German Aerospace Center (DLR); Peter Berster, German Aerospace Center (DLR); Marc Gelhausen, German Aerospace Center (DLR))

240 Effects of International Climate Policy on Aviation (Gabrielle Uitbeijerse, PBL Netherlands Environmental Assessment Agency; Hans Hilbers, PBL Netherlands Environmental Assessment Agency; Stefan Grebe, Significance B.V.)

16:00-17:30 1-B Marketing & Consumer Behavior in Air Transport 1

Room: HG-01A33 Chair: **Li Zou** | Embry-Riddle Aeronautical University

2 A Prediction Model of Consumer's Willingness to Fly in Autonomous Air Taxis (Winter Scott, Embry-Riddle Aeronautical University; Stephen Rice, Embry-Riddle Aeronautical University)

49 The Impact of Low-Cost Airlines on Mobility Practices - Brussels South Charleroi Airport Case Study (Amandine Craps, Free University of Brussels (ULB); Catherine Dehon, European Centre for Advances Research in Economics and Statistics (ECARES)/Free University of Brussels (ULB); Frédéric Dobruszkes, Free University of Brussels (ULB))

181 Applying Deep Learning Models on Twitter Data to Detect Airport Service Quality (Luis Martin-Domingo, Ozyegin University; Huda Barakat, Ozyegin University; Reyhan Yeniterzi, Ozyegin University)

284 Spectral and Convolution Analysis between Air Traffic and Tourism Flow (Pong Lung Lau, University of New South Wales; Tay Koo, University of New South Wales)

326 Measuring and Benchmarking Airlines' Quality of Service: A Proposed Methodology (Uzi Freund-Feinstein, Kinneret College; Uri Leibo, Kinneret College)

16:00-17:30	1-C	Airport Strategy & Management 1
Room: HG-02A33	Chair: Tae Oum University of British Columbia	
	44	Towards Airport 4.0: Airport Digital Maturity and Transformation (Nigel Halpern, Kristiania University College; Thomas Budd, Cranfield University; Pere Suau-Sanchez, Cranfield University; Svein Brathen, Molde University College; Deodat Mwesiumo, Molde University College)
	128	Empirical Outcomes of Airport Capacity Expansion (Lynnette Dray, University College London)
	142	Identifying National Macro Environmental Factors Influencing the Performance of International Airports (Mohammed Chaouk, Cranfield University; Romano Pagliari, Cranfield University; Richard Moxon, Cranfield University)
	161	Substitution Effects in Complementary Airport Networks (Hao Lang, Hong Kong Polytechnic University; Achim Czerny, Hong Kong Polytechnic University)
	198	Airport Charges and Non-aeronautical Revenue: Panel Data Evidence from International Airports (Taejin Shin, Incheon International Airport Corporation; Taewoo Roh, Soonchunhyang University)
16:00-17:30	1-D	Aviation & Economic Development 1
Room: HG-02A24	Chair: Wali Mughni Aviation Institute of Management	
	36	Privatization of State-Owned Airlines: An Analysis of Failures and Successes (Wali Mughni, Aviation Institute of Management)
	86	Conceptualising a Jaccard-Like Index for Bias Assessment in Air Transport Networks: The Case of the Bureau of Transport Statistics, Origin-Destination Survey (Filipe Alberto Marques Teixeira, Ghent University; Ben Derudder, Ghent University)
	102	Do Government Subsidies for Air Transport Work? Improve Regional Tourism and Economic Wellbeing (Kan Tsui, Massey University; Ngo Thanh, Massey University; Yi Hsin Lin, National Taichung University of Science and Technology; Hanjun Wu, Massey University)
	259	Spatial Effect of Aviation on Tourism (Flavio Porta, University of Bergamo; Gianmaria Martini, University of Bergamo; Davide Scotti, University of Bergamo; Elena Irina Ungureanu, University of Bergamo)
	69	Economic Impacts of ASEAN Open Sky Agreement to National Economy of the Member Countries (Tomoki Ishikura, Tokyo Metropolitan University; Shinya Hanaoka, Tokyo Institute of Technology; Mikio Takebayashi, Kobe University)
16:00-17:30	1-E	Air Transport Policy & Regulation 1
Room: HG-02A16	Chair: Xingwu Zheng Civil Aviation University of China	

- 56 Market Concentration of Air Service in Europe (Tobias Grosche, Worms University of Applied Sciences; Richard Klophaus, Worms University of Applied Sciences)
- 93 Slot Hoarding: Do Carriers Deliberately Underutilize Scarce Resources at Congested Airports? (Hideki Fukui, Ehime University)
- 154 The Effects of the Open Skies Agreement on the Demand and Fare of Air Transportation: The Case of East Asia (Mina Chae, Inha University; Tae Seung Kim, Inha University)
- ~~193 On the Applicability of Yardstick Competition to Airport Regulation (Mattia Cattaneo, University of Bergamo; Sebastian Birelini, University of Bergamo; Paolo Malighetti, University of Bergamo; Chiara Morlotti, University of Bergamo; Renato Redondi, University of Bergamo)~~
- 17 "Active, Progressive, Orderly": How Does China Relax the Restrictions on Its International Air Transport? (Xingwu Zheng, Civil Aviation University of China; Yi Zhang, Civil Aviation University of China)

16:00-17:30 1-F Airline Network Development 1

- Room: HG-01A32 Chair: **Martin Dresner** | University of Maryland
- 66 Airline Competition and Policy for Socially Optimal Air Network (Yushi Tsunoda, Kobe University; Ryohei Yamamoto, Kobe University/Waterfront Vitalization and Environment Research Foundation)
- 114 The Impact of LCC'S Growth on the Air Networks of European FSCs (Davide Scotti, University of Bergamo; Martin Dresner, University of Maryland; Gianmaria Martini, University of Bergamo)
- 122 Structure Analysis of Aviation Network in Southwestern District of China Based on Hierarchical Quantitative Relationship and Index Matrix (Xiangjun Cheng, Beijing Jiaotong University; Aihui Yu, Civil Aviation Management Institute of China; Xumei Chen, Beijing Jiaotong University)
- 182 Market Structure and Network Optimality (Eric Pels, Vrije Universiteit Amsterdam)
- 216 The Changing Competitive Landscape of Major Airlines in East Asia (Zhenran Zhu, University of British Columbia; Yahua Zhang, University of Southern Queensland; Anming Zhang, University of British Columbia)

16:00-17:30 1-G Sustainability in Air Transport 1

- Room: HG-02A36 Chair: **Tim Ryley** | Griffith University
- 45 Biofuels Versus Synthetic Fuels: Which Is the Best Solution? (Janina Scheelhaase, German Aerospace Center; Sven Maertens, German Aerospace Center)

- 124 The Exploratory Study of Carbon Offset and Carbon Tax Impacts on the Chinese Airline Industry (Bo Lin, ICL Graduate Business School; Benjamin Wu, RMIT University; Kan Wai Hong Tsui, School of Aviation Massey University; Zongling Li, OkAir)
- 279 Towards Zero Emissions Aviation: Clever and Sustainable at the Global Level (Paul Peeters, Breda University of applied sciences)
- 32 Innovative Air-Transport Policy Formulation & Analysis, Including Flight Scheduling, Conducive to Economic Growth and Sustainability: A Focus on Scheduling (Reza Hamzaee, Missouri Western State University)
- 217 Climate Change Adaptation for the Aviation Industry: A Systematic Quantitative Literature Review (Tim Ryley, Griffith University; Liese Coulter, British Columbia Ministry of Agriculture, Innovation and Adaptation Service Branch, Victoria British Columbia)

16:00-17:30 1-H Airport Case Studies

Room: HG-02A37 Chair: **Franziska Kupfer** | University of Antwerp

- 145 Adapting Automated People Mover Capacity on Airports to Real-Time Demand via Model-Based Predictive Control (Mark Van Doorne, AIRBIZ; Gabriel Lodewijks, University of New South Wales; Wouter Beelaerts Van Blokland, Delft University of Technology)
- ~~144 Evaluating the Performance of Pilgrims Arrival Processing at Jeddah and Medina Airport Hajj Terminals: Identifying the Factors that Impede Flow Efficiency from the Perspective of the Airport's Employees (Alhussin K. Abudiyah, Cranfield University; Richard Moxon, Cranfield University; Romano Pagliari, Cranfield University)~~
- 342 US Airline Consolidations and Airport Emissions: Lessons Learned from the Last Six Airline Mergers (Aleksandar Bauranov, Harvard University; Jasenka Rakas, University of California, Berkeley)
- 215 A Study on the Effect of Low-cost Carriers to Major Hub Airport Operations (Suryoun Park, University of Antwerp; Franziska Kupfer, University of Antwerp; Yonghwa Park, Inha University; Evy Onghena, University of Antwerp)

16:00-17:30 1-J Aviation Safety & Security 1

Room: HG-07A37 Chair: **Gabriel Lodewijks** | University of New South Wales

- 57 Using Machine Learning Algorithms to Predict the Risk of Small Unmanned Aircraft System Violations in the National Airspace System (Dothang Truong, Embry-Riddle Aeronautical University; Woojin Choi, Embry-Riddle Aeronautical University)

- 248 Public Risk Perception of Sub 2kg Remotely Piloted Aircraft: An Australian Case (Tay Koo, UNSW Sydney; Brett Molesworth, UNSW Sydney)
- 321 Advanced Persistent Threat (APT) Cyberattack against Smart Airports and Intelligent Aircrafts: Risk Analysis and Mitigation (John Pyrgies, SkyAngels)
- 147 Critical Mass - When Does a UAS (Drone) Become a Risk to Commercial Aviation? (Gabriel Lodewijks, University of New South Wales; Alan Smith, University of New South Wales)

16:00-17:30 1-K Intermodal Operations & Modal Competition 1

- Room: HG-05A37 Chair: **Michael Williams** | Embry-Riddle Aeronautical University
- 12 Environmental and Social Welfare Impacts of Air-Rail Cooperation (Changmin Jiang, University of Manitoba)
 - 97 High-Speed Rail vs. Air Transportation: An Empirical Study on the Resilience of Multi-Modal Transportation in China (Xiaoqian Sun, Beihang University; Sebastian Wandelt, Beihang University; Chunxiao Zhang, Beihang University; Yifan Xu, Beihang University)
 - 109 Competition between High-speed Rail and Airlines with Heterogeneous Passengers (Yulai Wan, Hong Kong Polytechnic University)
 - 209 Which Is a Stronger Competitor HSR or LCC to FSC? Effects of HSR Network Extension and LCC Entry on FSC's Airfare in Japan (Jun Mizutani, Kobe University; Hiroki Sakai, Kobe University)
 - 29 Can High-Speed Rail be Successfully Integrated as an Intermodal Partner to Air Travel within the U.S. Transportation Network? (Michael Williams, Embry-Riddle Aeronautical University)

18:30-? Special Interest Group "Strategic Aviation Management" Social Session
Informal get-together; details will be forthcoming via email

THURSDAY, 4 JULY

9.00-10.30 Concurrent Session 2

9:00-10:30 2-A Airline Strategy & Management 1

- Room: HG-02A33 Chair: **Frankie O'Connell** | University of Surrey
- ~~22 Decision-making Model for Commercial Aircraft End-Of-Life-Phase Management: A Practical Approach to Support Aircraft-Parking, Market Relocation, Retirement and Decommissioning-Strategic Decisions (Flavio Soares de Oliveira Jr., National Civil Aviation Agency (ANAC); Elton Fernandes, Federal University of Rio de Janeiro; Laura Bahiense, Federal University of Rio de Janeiro; Carlos Moacir Grandi, EMBRAER S.A.)~~

- 38 Competitive Approaches of Scheduled Airlines Operating in Turkey (Huseyin Onder Aldemir; Ferhan Sengur, Eskisehir Technical University; Ibrahim Cemil Ulukan, Anadolu University)
- 58 Use of Financial Derivatives by Airlines (Hari Adhikari, Embry-Riddle Aeronautical University)
- 60 Historical Data Analysis of Global Airline Business Model Evolution (Marcia Urban, Bauhaus Luftfahrt e.V.; Milan Harnischfeger, Deutsche Lufthansa AG; Mirko Hornung, Bauhaus Luftfahrt e.V.)
- 245 Factors Affecting Airlines: Outsourcing Decision in Ground Handling Activities (Umit Dogan, Anadolu University; Umit Dogan, Anadolu University; Nalan Ergun, Eskisehir Technical University)

9:00-10:30 2-B Marketing & Consumer Behavior in Air Transport 2

Room: HG-01A33

- Chair: **Christiaan Behrens** | SEO Amsterdam Economics
- 34 An Empirical Analysis of Airline Loyalty (Steven Leon, Appalachian State University)
 - 48 An Empirical Analysis of Flight Ticket Purchasing Behavior - Determining Generation's Level of Involvement for Different Network Strategies (Emilie Gremion, University of St. Gallen; Erik Linden, University of St. Gallen; Andreas Wittmer, University of St. Gallen)
 - 324 Airline Service Quality and Customer Satisfaction: Does Airline Operational Data Relate in Any Way to Customer Satisfaction Scores (Blaise Waguespack, Embry-Riddle Aeronautical University; Scott Ambrose, Embry Riddle Aeronautical University; Dawna Rhoades, Embry Riddle Aeronautical University)
 - 51 The Consumption Effect of Frequent Flier Programs (Christiaan Behrens, VU Amsterdam/SEO Amsterdam Economics; Jos Ommeren, VU Amsterdam; Gerben De Jong, SEO Amsterdam Economics)

9:00-10:30 2-C Special Interest Group "Strategic Aviation Management" 1

Room: Auditorium

- Chairs: **Ulrike Kluge** | Bauhaus Luftfahrt and **Erik Linden** | University of St. Gallen
- Strategic Partnerships between Airports, Airlines, and Academia (Berend Onnes, Schiphol Airport)
 - Infrastructure Scarcity and the Future of Aviation in 2040 (Rene Puls & Erik Linden, Center for Aviation Competence-University of St. Gallen)
 - Blockchain in the Aviation Industry: What Does It Mean and What Is the Real Impact? (Janik Jugl & Erik Linden, Center for Aviation Competence-University of St. Gallen)

9:00-10:30	2-D	Airline Economics & Performance 1
Room: HG-02A24	Chair: Eddy Van de Voorde University of Antwerp	
	73	Airline Competition in the North-Atlantic Market (Andrea Gualini, University of Bergamo; Michela Valli, University of Bergamo; Gianmaria Martini, University of Bergamo; Martin Dresner, University of Maryland)
	100	Impact of Aircraft Lease Types on Airlines' Financial Performance (Seock J. Hong, University of North Texas; Woongyi Kim, Hanseo University)
	211	Measuring the Competitiveness Level of Major Airlines Focusing on Korean Air (Kyeonghee Sung, Inha University; Tae Seung Kim, Inha University)
	296	The Leasing Puzzle in the Airline Industry (Sylvain Bourjade, Toulouse Business School; Catherine Muller-Vibes, Toulouse Business School)
9:00-10:30	2-E	Air Transport Policy & Regulation 2
Room: HG-02A16	Chair: Rico Merkert University of Sydney	
	16	Economic Gains Obtainable from Opening North Korean Airspace (Kwang Eui Yoo, Korea Aerospace University; Soodong Ha, Korea Aerospace University; Sihyun Yoo, TU Delft)
	88	An Exploration of Alternative Essential Air Service Support Mechanisms for the United Kingdom Following Its Withdrawal from the European Union (Romano Pagliari, Cranfield University)
	158	Research on the Market Structure and Evolution of China's Air Transportation: Based on the Data in 1998-2018 (Yan-Hua Li, Civil Aviation University of China; Yi-Ming Huang, Civil Aviation University of China; Ran Li, Civil Aviation University of China; Zheng Lei, Swinburne University of Technology)
	164	Measuring the Effects of Air Transport Liberalization on China's Bilateral Service Trade (Kun Wang, University of International Business and Economics; Tae Oum, University of British Columbia; Shaoxuan Liu, Ningbo Supply Chain Innovation Institute China; Zhengyang Shi, Shanghai Jiaotong University)
	214	Effective Control of the Drone Revolution: A Systematic Literature Review and Select Cases (Rico Merkert, University of Sydney Business School; James Bushell, University of Sydney)
9:00-10:30	2-F	Air Traffic Control 1
Room: HG-01A32	Chair: Christian Hofer University of Arkansas	
	39	An Analysis and Modeling Resilience of an ATC/ATM System /Airspace/Sector (Zoran Jaksic, Croatia Control Ltd.; Milan Janic, Delft University of Technology, Department of Transport & Planning)
	54	Cascading Failures in Airport Networks (Jose M Sallan, Universitat Politcnica de Catalunya; Joel Cumelles, Universitat

- Politecnica de Catalunya; Oriol Lordan, Universitat Politecnica de Catalunya; Jose M Sallan, Universitat Politecnica de Catalunya)
- 139 Potential Gains from ANSP Mergers in Europe (Sven Buyle, University of Antwerp; Wouter Dewulf, University of Antwerp; Franziska Kupfer, University of Antwerp; Evy Onghena, University of Antwerp; Hilde Meersman, University of Antwerp; Eddy Van de Voorde, University of Antwerp)
- ~~305 Functional Analysis of Occupational Health and Safety in Air Navigation Services (Stylianos Zantanidis, Democritus University of Thrace; Dimitrios Dimitriou, Democritus University of Thrace; Konstandinidis Theodoros, Democritus University of Thrace)~~
- 113 Competition for Air Traffic Management - Lessons Learned from the COMPAIR Project (Eef Delhaye, Transport & Mobility Leuven; Stef Proost, KU Leuven; Nicole Adler, Hebrew University of Jerusalem; Ricardo Herranz, Nommon; Javier Torres, Nommon; Roland Guraly, Slot Consulting)

9:00-10:30 2-G Sustainability in Air Transport 2

Room: HG-02A36

Chair: **Mark Lijesen** | VU Amsterdam

- 103 Corporate Social Responsibility and Performance: The Case of Chinese Airports (Ngo Thanh, Massey University; Qixia Tian, Massey University)
- 123 Flight Behaviour of Long-Haul Commercial Aircraft in Formation Flight (Clemens Zumegen, RWTH Aachen University; Eike Stumpf, Institute of Aerospace Systems (ILR))
- 233 Chemical Composition in Near-Field Aircraft Plumes (Etienne Terrenoire, ONERA; Xavier Vancassel, ONERA; Weeded Ghedhaifi, ONERA; Emmanuel Montreuil, ONERA)
- 253 Fuel (In)Efficiency of Ultra Long-haul Flights (Rogier Lieshout, SEO Amsterdam Economics)
- 344 Airport Operational Energy Analysis and Optimization: Achieving the Zero Net Energy Goal (Jasenka Rakas, University of California, Berkeley; Pietro Antonelli Achatz, University of California, Berkeley; Grace Horvath, University of California, Berkeley; Andy Guan, University of California, Berkeley; Ye Suk Kim, University of California, Berkeley)

9:00-10:30 2-H Air Cargo 1

Room: HG-02A37

Chair: **Evy Onghena** | University of Antwerp

- 43 Assessing Financial Management Factors in the Air Cargo Industry Using an Interpretive Structural Modeling Approach (Robert Walton, Embry-Riddle Aeronautical University; Aman Gupta, Embry-Riddle Aeronautical University)

- 143 Pricing Strategies for Air Cargo Carriers with Fixed Capacity (You Wu, University of Luxembourg; Benny Mantin, University of Luxembourg; Anne Lange, University of Luxembourg)
- 184 Research on Selection of Air Express Hub Based on UMapHMP Model in China (Li Xie, Civil Aviation Management Institute of China; Xujuan Kuang, Civil Aviation Management Institute of China)
- 185 An Optimisation and Forecast Framework for ULD Packing in the Air Cargo Supply Chain (Mike Koch, Delft University of Technology; Alessandro Bombelli, Delft University of Technology; Bruno Santos, Delft University of Technology)
- 188 Competitiveness of Turkish Air Cargo Industry: Effects of Istanbul Airport (IGA) (Gokhan Tanriverdi, Anadolu University; Senay Lezki, Anadolu University)

9:00-10:30 2-J Airport Strategy & Management 2

Room: HG-14A37

- Chair: **Guillaume Burghouwt** | Schiphol Airport
- 67 An Optimization Model for Airport Capacity Planning in the Metropolitan Areas (Woojin Choi, Embry-Riddle Aeronautical University; Dothang Truong, Embry-Riddle Aeronautical University)
 - 307 Strategic Cooperation between German Airports and Their Airlines (Sebastian Weber, Chemnitz University of Technology)
 - 312 Evaluation Framework to Support Decisions for Concession Commercial Activities at Airports (Dimitrios Dimitriou, Democritus University of Thrace; Maria Sartzetaki, Democritus University of Thrace; Simoni Lintzerakou, Democritus University of Thrace)
 - 318 General Aviation Airport Business Models of the Future (Ryan Leick, Utah Valley University; Aaron Organ, Utah Valley University; Jared Esselman, Utah Valley University; Noelle Johnson, West Minster College; Menoda Samuel, Utah Valley University)
 - 1 Estimating Airport Ground Transport Mode Choice Using Market Aggregate Data (Kun Wang, University of International Business and Economics; Wenyi Xia, University of British Columbia; Jong Hae Choi, Incheon International Airport Corporation; Anming Zhang, University of British Columbia)

9:00-10:30 2-K Intermodal Operations & Modal Competition 2

Room: HG-14A36

- Chair: **Kazuyuki Takada** | Tokyo Denki University
- 50 An Overview of Current Research and Developments in Urban Air Mobility - Setting the Scene for UAM Introduction (Anna Straubinger, Bauhaus Luftfahrt e.V.; Raoul Rothfeld, Bauhaus Luftfahrt e.V.; Michael Shamiyeh, Bauhaus Luftfahrt e.V.; Kai-Daniel Buechter, Bauhaus Luftfahrt e.V.; Jochen Kaiser,

- Bauhaus Luftfahrt e.V.; Kay Olaf Ploetner, Bauhaus Luftfahrt e.V.)
- 107 A Bimodal Accessibility Analysis of Australia through Application Programming Interfaces (Sarah Meire, Ghent University; Ben Derudder, Ghent University)
- ~~246 Mode Competition Analysis Framework for Regional Destinations: The Case of Greece (Aristi Karagkouni, Democritus University of Thrace; Dimitriou Dimitrios, Democritus University of Thrace; Sartzetaki Maria, Scientific Associate/ Democritus University of Thrace)~~
- 311 Incumbent Responses to a Low-Cost Entry: Empirical Evidence from the German Airline Industry (Marieke Funck, University Paderborn)
- 168 Impact of Sudden Continual Flight Cancels on Travel Behavior (Kazuyuki Takada, Tokyo Denki University; Kota Miyauchi, Tokyo Denki University)

10:30-11:00 Coffee break

11.00-12.30 Concurrent Session 3

11:00-12:30 3-A Airline Strategy & Management 2

Room: HG-02A33

Chair: **Hongchang Li** | Beijing Jiaotong University

- 11 The Impact of Football on the Air Transportation Industry: The Case of the UEFA Champions League (Nicole Kalemba, Universitat Oberta de Catalunya; Fernando Campa-Planas, Universitat Rovira i Virgili; Daniel Liviano Solis, Universitat Oberta de Catalunya)
- 63 Airline Revenues 2035: Revenue Generation and Business Models in Commercial Aviation: A Scenario Study (Johannes Michelmann, Technical University of Munich; Annika Paul, Bauhaus Luftfahrt e.V.; Axel Becker, Airbus; Christoph Schneider, Flughafen München GmbH; Gilbert Tay, Technical University of Munich; Mirko Hornung, Technical University of Munich)
- 64 Third Party Ancillary Revenues in the Airline Sector: An Exploratory Study (Mark Shaw, University of Limerick; Siobhan Tiernan, University of Limerick; John Francis O'Connell, University of Surrey; David Warnock-Smith, Buckinghamshire New University; Marina Efthymiou, Dublin City University)
- 230 Modeling Passenger Dynamics and Activities at Airport Terminal Environment Using Real Trajectory Data (Ya-Han Ku, National Chiao Tung University; Yi-Shih Chung, National Chiao Tung University)
- 183 Acceptability of Luggage Charge for Chinese Civil Aviation Passengers: A SP Survey Study (Hongchang Li, Beijing Jiaotong

University; Martin Dresner, University of Maryland; Lingqiu Wang)

11:00-12:30	3-B	Marketing & Consumer Behavior in Air Transport 3
Room: HG-01A33	Chair: Andreas Wittmer University of St. Gallen	
	137	Measuring Airline Passenger Satisfaction and Dissatisfaction through Text Mining (Eren Sezgen, Cranfield University; Keith Mason, Cranfield University; Robert Mayer, Cranfield University)
	149	Cabin Services Innovation, Brand Experience and Customer Loyalty (Fang-Yuan Chen, Feng Chia University)
	303	Relation of Full-Service Airline Customers' Service Quality Sentiments to Value for Money Perception (Emircan Ozdemir, Eskisehir Technical University; Ozlem Atalik, Eskisehir Technical University)
	5	The Potential of Loyalty Programs for Leisure Carriers (Andreas Wittmer, University of St. Gallen; Mara Marchetti, University of Applied Sciences, Chur)
11:00-12:30	3-C	Special Interest Group "Strategic Aviation Management" 2
Room: Auditorium	Chairs: Ulrike Kluge Bauhaus Luftfahrt and Erik Linden University of St. Gallen	
		Understanding the Consumer Experience: Is It a Worthwhile Effort? (Isaac Henderson, Massey University School of Aviation)
		Pro-environmental Behavior in Air Travel: Is There a Market? (Antoine Habersetzer & Ulrike Kluge, Bauhaus Luftfahrt)
		The Nudging Effect of Eco-Labels in Aviation: What Does It Mean for Strategic Aviation Marketing? (Francesco Dorizzi, Swiss Airlines & Andreas Wittmer, Center for Aviation Competence-University of St. Gallen)
11:00-12:30	3-D	Airline Economics & Performance 2
Room: HG-02A24	Chair: Volodymyr Bilotkach Newcastle University	
	110	Empirical Examination of Airline Operating Lease Decisions: Identifying Macroeconomic, Profitability and Business Model Variables (Vitaly Guzhva, Embry-Riddle Aeronautical University; Guangxi Liu, Embry-Riddle Aeronautical University)
	138	Common Operating Factors of Aircraft Maintenance Cost for Commercial Airlines (Yukifumi Ueda, Tokyo Institute of Technology; Kazuyoshi Hidaka, Tokyo Institute of Technology)
	325	Subcontracted Air Transport Services in European and North American Markets (Aisling Reynolds-Feighan, University College Dublin)
	59	Competition on the UK-Australasia Market: Evidence from Skyscanner Data (Volodymyr Bilotkach, Singapore Institute of Technology; James Bedford, Rolls Royce)

11:00-12:30	3-E	Air Transport Policy & Regulation 3
Room: HG-02A16	Chair: Anming Zhang University of British Columbia	
	4	Cost Savings in Federal Employee Air Travel under the City Pair Program: Myth or Reality? (Kathleen Doody, University of Arkansas; Scott Limbocker, United States Military Academy; Andrew Dowdle, University of Arkansas)
	304	Airports and Tourism: New Evidence on the Italian Case (Cecilia Bartaloni, University of Aosta Valley)
	306	Neighbouring Airports and Issues Relating to Permissible State Aid in Aviation in Europe (Basil O'Fee, Northpoint Aviation Services Ltd.; Chris Cain, Northpoint Aviation Services Ltd)
	327	Skyport Planning & Design Standards for Urban Unmanned Aircraft Operations (Ryan Leick, Utah Valley University; Alan Cambell, AECOM; Jared Esselman, Utah Division of Aeronautics; Aaron Organ, Utah Valley University)
	345	Air Transport Subsidies in Europe (Frank Fichert, Worms University of Applied Sciences)
11:00-12:30	3-F	Air Traffic Control 2
Room: HG-01A32	Chair: Stephen Ison De Montfort University	
	89	Identification of Safety Critical Hazards to Support Future Air Traffic Controller Training (Bojana Mirkovic, University of Belgrade; Fedja Netjasov, University of Belgrade; Tatjana Krstic Simic, University of Belgrade; Obrad Babic, University of Belgrade)
	162	Cross Border Free Route Airspace Implementation - Performance Overview Methodology (Tamara Pejovic, EUROCONTROL; Antonio Lazarovski, EUROCONTROL)
	258	Robustness Analysis of the Northeast Asian Air Transport Network as a Complex Network (Seyun Kim, Korea Advanced Institute of Science and Technology (KAIST); Yoonjin Yoon, Korea Advanced Institute of Science and Technology (KAIST))
	266	A Study on Airspace Availability in Urban Areas for Small UAS Operation (Namwoo Kim, Korea Advanced Institute of Science and Technology (KAIST); Yoonjin Yoon, Korea Advanced Institute of Science and Technology (KAIST))
	315	Simulation Analysis of Multiple Runways Operation Considering Departure Delay Prediction and Arrival/Departure Sequencing (Qingqi Wang, Ibaraki University; Terumitsu Hirata, Ibaraki University; Shion Kubo, Ibaraki University)
11:00-12:30	3-G	Sustainability in Air Transport 3
Room: HG-02A36	Chair: Thomas Budd Cranfield University	
	31	The Emission Reduction Potentials of Substituting Air with Non-High-Speed Rail (Stefan Baumeister, University of Jyväskylä)

- 274 Environmental Impact of Airspace Disruptions (Gerben de Jong, SEO Amsterdam Economics; Rogier Lieshout, SEO Amsterdam Economics)
- 277 Analysis of the Results of Noise Mitigation Measures: A Comparison of the Tools of Reaction Chains and System Dynamics (Hansjochen Ehmer, DLR/IUBH)
- 295 The Evolution of Airport Noise Management Strategies in the UK and ROI (Andrew Timmis, Loughborough University; Thomas Budd, Cranfield University)

11:00-12:30 3-H Air Cargo 2

- Room: HG-02A37 Chair: **Mikio Takebayashi** | Kobe University
- 156 SkyBridge Arizona: International Air Cargo Model for the Future? (Thomas Drape, Embry-Riddle Aeronautical University)
 - 290 Network Analysis of Global Air Passenger and Cargo Co-Development (Tommy King-Yin Cheung, Swinburne University of Technology; Collin WH Wong, Hang Seng Management College)
 - 298 Single-Type Fleet Versus Multiple-Type Fleet: Effects of Fleet Structure on Air Cargo Spill Costs (Mohamed Badr, Embry-Riddle Aeronautical University)
 - 337 Regional Air Cargo Operations in the UK: Hub Feed or Essential Infrastructure for Globally Connected Regional Cities? (Christopher Cain, Northpoint Aviation)
 - 108 Inviting Cargo Hub and Airport Consortium (Mikio Takebayashi, Kobe University)

11:00-12:30 3-J Airport Strategy & Management 3

- Room: HG-14A37 Chair: **Ian Douglas** | UNSW Sydney
- 14 Abiotic Determinants of Airport Performance: Insights from a Global Survey (Elen-Paraskevi Paraschi, University of Patras/Hellenic Civil Aviation Authority; Antonios Georgopoulos, University of Patras; Andreas Papatheodorou, University of the Aegean)
 - 127 Measuring Attractiveness of Air Transport Networks in Self-Connecting Era (Slavica Dozic, University of Belgrade; Danica Babic, University of Belgrade)
 - 200 Analysis of Economic Effects of Arrival Duty-free Shops at Incheon International Airport (Yu-Jin Choi, Incheon International Airport Corporation; Seok Kim, Incheon International Airport Corporation)
 - 210 Research on the Prediction Model of Exit from Route Market by Applying Machine Learning (Kota Miyauchi, Tokyo Denki University; Kazuyuki Takada, Tokyo Denki University)

359 Strategic Inflections: The Changing Fortunes of Hub Airports
(Ian Douglas, UNSW)

11:00-12:30 3-K Aviation & Economic Development 2

Room: HG-14A36

Chair: **Eric Pels** | VU Amsterdam

- 25 European Air Traffic Management Fragmentation: A Cost-Effectiveness Based Airspace Assessment (Zvonimir Rezo, Croatian Academy of Sciences and Arts; Sanja Steiner, Croatian Academy of Sciences and Arts, Traffic Institute; Ružica Škurla Babić, University of Zagreb; Cristiana Piccioni, Sapienza University of Rome)
- 238 The Impact of Blockchain on the Aviation System (Janik Jugl, University of St.Gallen; Andreas Wittmer, University of St. Gallen; Erik Linden, University of St. Gallen)
- 297 Relationship among Product Volume, Variety and Value Addition Achieved by Integrating Mass Customisation and Lean Methods in Aviation (Govardhana Rao Banna , Singapore University of Social Sciences; Teik-Cheng Lim, Singapore University of Social Sciences; Kotireddy Rama Bhupal Reddy, Republic Polytechnic)
- 331 Enhancing the Performance of Urban Logistics with New Air Transport Systems (Rosario Macario, CERIS, IST, Universidade de Lisboa and TPR/University of Antwerp; Jorge Miguel Reis Silva, Universidade de Lisboa/Universidade da Beira Interior; Vasco Reis, Universidade de Lisboa; Maria Emilia Baltazar, Universidade de Lisboa/Universidade da Beira Interior)
- 197 Recovery Policies to Mitigate Airline Disruptions: Case Study of a European Airline (Lucas Montenegro; Vasco Reis; Rosário Macário, Universidade de Lisboa)

12:30-14:00 Lunch

14.00-15.30 Concurrent Session 4

14:00-15:30 4-A Airline Strategy & Management 3

Room: Auditorium

Chair: **Koki Nagata** | University of Maryland

- 133 The Emergence of Low-cost Carrier in Long-Haul Markets and Its Impact on Incumbent Carriers: Implications to Competition on Transatlantic Routes (Jovana Kuljanin, University of Belgrade-FTTE; Milica Kalic, University of Belgrade-FTTE; Nemanja Mijovic, University of Belgrade-FTTE; Manuel Renold, Zurich University of Applied Sciences)
- 150 The Impact of Formal and Informal Institutions on Airline Hedging Strategies: Uncertainty Avoidance vs Risk Management (Hassan Swidan, University of Sydney Business School; Rico Merkert, University of Sydney)

- 225 Board Internationality and Corporate Performance: Theory and Evidence from the International Passenger Airline Sector (Erik Linden, University of St. Gallen; Maximilian Kinzel, University of St. Gallen; Andreas Wittmer, University of St. Gallen)
- 231 Digital Dynamic Capabilities in the Airline Industry (Michael Weibel, Credit Suisse; Erik Linden, University of St. Gallen; Andreas Wittmer, University of St. Gallen)
- 98 The New Basic Economy Fare in the Long-Haul, North-Atlantic Routes and Its Impact on Price Elasticity (Jesus Rubio, Cranfield University; Chikage Miyoshi, Ningbo Supply Chain Innovation Institute/MIT Network Scale; Keith Mason, Cranfield University; Robert Mayer, Cranfield University)

14:00-15:30 4-B Marketing & Consumer Behavior in Air Transport 4

Room: HG-01A33

Chair: **Daive Scotti** | University of Bergamo

- 62 Analysis of Online Booking Air Passengers' Behavior Characteristics based on Different Scenarios in China (Guihong Zhao, Civil Aviation University of China; Run-Qing Wang, Civil Aviation University of China)
- 87 A Border Effect in Airport Choice: Evidence from North-West Europe (Toon Zijlstra, Netherlands Institute for Transport Policy Analysis; George Gelauff, Netherlands Institute for Transport Policy Analysis)
- 173 The Satisfaction Experienced by Airport Passengers in Food-and-Beverage Retailers: A Segmentation Analysis based on Nationality, Gender and Place of Residence (Juan Carlos Martin, University of Las Palmas GC; Giacomo Del Chiappa, University of Sassari; Concepción Román, University of Las Palmas)
- ~~187 World Heritage Sites and Airports (Jocelyne Napoli, University of Toulouse; Ben Trapman, University of Toulouse)~~
- 276 Airport Positioning and Travellers' Shopping Experience (Yi Hsin Lin, National Taichung University of Science and Technology; Chrystal Zhang, Swinburne University of Technology)

14:00-15:30 4-C Airline Operations 1

Room: HG-02A33

Chair: **Achim Czerny** | Hong Kong Polytechnic University

- 75 A Maintenance Task Packaging and Scheduling Model Applicable to Aircraft Maintenance (Max Witteman, Delft University of Technology; Qichen Deng, Delft University of Technology; Bruno Santos, Delft University of Technology)
- 178 Airport and Airline Seasonality: An Exploratory Analysis of Large US and European Airlines (Li Zou, Embry-Riddle Aeronautical University; Chunyan Yu, Embry-Riddle Aeronautical University; Aisling Reynolds-Feighan, University College Dublin)

- 206 Bootstrapping QAR Fuel Flow and Quantifying Aircraft Fuel Consumption Uncertainty: Towards a Dynamic Risk-informed Fuel Uplift Approach (Nga Yung Agnes Tang, UNSW, Sydney; Cheng-Lung Wu, UNSW, Sydney; David Tan, UNSW, Sydney)
- 270 Optimizing the Tactical Plan of Airframe Maintenance in an Airline Network (Collin WH Wong, Hang Seng University of Hong Kong; Gang Chen, Sun Yat-sen University; Hoi Lam Ma, Hang Seng University of Hong Kong)
- 269 Block-Time and Ground-Time Buffers in Airline Schedules (Achim I. Czerny, Hong Kong Polytechnic University; Jan K. Brueckner, University of California, Irvine; Alberto A. Gaggero, UNIPV)

14:00-15:30 4-D Airline Economics & Performance 3

- Room: HG-02A24 Chair: **Xiaowen Fu** | Hong Kong Polytechnic University
- 7 Price and Marginal Cost Effects of On-time Performance: Evidence from the US Airline Industry (Javad Gorjidoz, Embry-Riddle Aeronautical University; Jules Yimga, Embry-Riddle Aeronautical University)
 - 55 A Tale of Airline Competition: When FSCs Undercut LCCs Fares (Andrea G. Salanti, University of Bergamo; Paolo Malighetti, University of Bergamo; Stefano Paleari, University of Bergamo; Renato Redondi, University of Bergamo)
 - 119 In Search of the "Right Price" for Air Travel: Estimating Price-Demand Elasticity at the Flight-Date Level (David Tan, University of New South Wales; Suranga Perera, Qantas Airways)
 - 165 Low-cost Carrier Development and Competition Effect in the Chinese Market (Xiaowen Fu, Hong Kong Polytechnic University; Huaxin Zhang, Shanghai Maritime University; Chuanzhong Yin, Shanghai Maritime University; Kun Wang, University of International Business and Economics)
 - 222 Southwest Airlines' Post-Merger Performance: An Econometric Analysis (Tamilla Curtis, Embry-Riddle Aeronautical University; Wilfred S. Manuela Jr., Asian Institute of Management)

14:00-15:30 4-E Air Transport Policy & Regulation 4

- Room: HG-02A16 Chair: **Peter Morrell** | Cranfield University
- ~~33 Use of Indicators System for Expanding an Airport Network – Brazilian National Air Transport Plan Case Study (Leandro Rodrigues Silva, Ministry of Transport, Ports and Civil Aviation; Rubem Oliveira De Paula, Rubem Oliveira; Marcelo Leme Vilela; Fabiana Todesco)~~
 - 132 Policy for Multiple-Airports Complementation in Hub-City (Ryohei Yamamoto, Kobe University/Waterfront Vitalization and Environment Research Foundation; Yushi Tsunoda, Kobe University)

- 189 Air Transport as an Essential Service in a Deregulated Environment: The Case of Colombia (Luz Angela Giron, Universidad Nacional de Colombia; Mario Avellaneda Gonzalez, Universidad Nacional de Colombia; Edgar Jimenez Perez, Cranfield University)
- ~~272 US Passenger Rights – Lessons Learnt from EU (Claudia Hipp, German University of Administrative Sciences Speyer)~~
- 336 Empirical Evidence on Airline Internationalization Process: Focus on Host Countries' Institutions and Airlines' Property Rights Allocation (Eric F. Schneider de Almeida, University of São Paulo (USP); Humberto F. A. J. Bettini, University of Sao Paulo)

14:00-15:30 4-F Airport Operations 1

- Room: HG-01A32 Chair: **Lucy Budd** | De Montfort University
- 151 An Analysis of the Impact of Technology at the Airports from the Passenger's Perspective using Delft System Approach (Sarika Tyagi, University of New South Wales (UNSW); Gabriel Lodewijks, University of New South Wales (UNSW))
- 175 Investigation of Airport Terminal Resilience by Simulation Modelling (Nora Metzner, RWTH Aachen)
- 280 The Capacity Impact of the Physical Separation of Domestic and International Passengers at Airport Terminals Applied to the European Example (Max Georg Schulze Schwienhorst, RWTH Aachen University)
- 339 Development of Simulation Model for Ground Handling Service Equipment (Eun-ji Kim, Korea Aerospace University; Seok-jae Yun, Korea Aerospace University; Dong-yub Choi, Incheon International Airport Corporation; Joong-ha Shin, Incheon International Airport Corporation; Ho-jong Baik, Korea Aerospace University)
- 190 Supporting the Diverse Needs of Special Assistance (or PRM) Passengers: A Survey of Current Practice at UK Airports (Lucy Budd, De Montfort University; Stephen Ison, De Montfort University; Andrew Timmis, Loughborough University)

14:00-15:30 4-G Sustainability in Air Transport 4

- Room: HG-02A36 Chair: **Milan Janic** | Delft University of Technology
- 42 Analysis and Modelling Performance of an Air Transport Network Served by the Subsonic and Supersonic Commercial Aircraft (Milan Janic, Delft University of Technology)
- 72 A Study on Airline Pilots' Behavior on Decision during Aircraft Maneuvers in Flight Operation, Reflecting Pilots' Awareness of Climate Change (Sihyun Yoo, Delft University of Technology; Kwang Eui Yoo, Korea Aerospace University; Seung Joon Jeon, Catholic Kwandong University; Se-Yeon Jung, Korea Transport Institute)

- 235 The Nudging Effect of Eco-Labels in Aviation: A Discrete-Choice-Model Experiment (Francesco Dorizzi, University of St. Gallen; Erik Linden, University of St. Gallen; Andreas Wittmer, University of St. Gallen)
- 263 The Effect of Providing Carbon Footprint Information on the Airline Ticket Purchase Decision: A Case Study in Japan Using the Doubly Randomized Preference Trial on the Randomized Conjoint Experiment (Yunichiro Yoshida, Hiroshima University; Volodymyr Bilotkach, Newcastle University; Miyu Sakamoto, Hiroshima University; Keisuke Kawata, University of Tokyo; Mirlan Atabekov, Hiroshima University)

14:00-15:30 4-H Air Cargo 3

- Room: HG-02A37 Chair: **Wouter Dewulf** | University of Antwerp
- 3 Size Versus Efficiency: A Case Study of Flag Carrier Air Cargo Operations in Continental Europe (Bora Suavi Unsal, Embry-Riddle Aeronautical University)
- 84 International Routes of Air Cargo and Exports: A Case Study of High Technology Product Exports in China (Kong Wing Clement Chow, Lingnan University; Ka Yiu Michael Fung, Chinese University of Hong Kong; Chi Lok Andrew Yuen, Chinese University of Hong Kong)
- 131 The Significance of Air Cargo Revenues at the Selection Process of New Destinations for Passenger Transport - Nice-to-Have or Crucial Contribution? (Wouter Dewulf, University of Antwerp; Eddy Van de Voorde, University of Antwerp; Hilde Meersman, University of Antwerp)
- 212 UPS and FedEx: Comparative Integrated Cargo Carrier Network Strategies in Japan and China (Mark Aroney, Embry-Riddle Aeronautical University)
- 180 The Cargo Strategies of Airports in Europe: A Typology from Cargo Stars to Cargo Deserts (Thomas Van Asch, University of Antwerp; Wouter Dewulf, University of Antwerp; Franziska Kupfer, University of Antwerp; Hilde Meersman, University of Antwerp; Eddy Van de Voorde, University of Antwerp)

15:30-16:00 Coffee Break

16.00-17.30 Concurrent Session 5

16:00-17:30 5-A Airline Strategy & Management 4

- Room: Auditorium Chair: **Aisling Reynolds-Feighan** | University College Dublin
- 167 The Role of Service Attributes for Airline Low-Cost Long-Haul Travellers (Wafi Al-Karaghoul, Brunel University London; Sarmad Alshawi, Brunel University London; Usman Hussain, Brunel University London)

- 224 The Features and Impacts of Alliance Agreements by Low-Cost Airlines (Yuh-Horng Wen, Tamkang University)
- 286 Is the A.I. Based Dynamic Pricing Still Profitable for the Airline Industry? (Kiyotaka Yuguchi, Sagami Women's University)
- 291 Airlines and Almost-Mixed Bundling Pricing Strategy (Marco Alderighi, University of Aosta Valley; Christophe Feder, University of Aosta Valley; Elena Irina Ungureanu, University of Bergamo and Pavia)

16:00-17:30 5-B Marketing & Consumer Behavior in Air Transport 5

- Room: HG-01A33 Chair: **Seock-Jin Hong** | University of North Texas
- 141 Characteristics of Potential User Groups of New Forms of Mobility Using the Example of Urban Air Mobility (Ulrike Kluge, Bauhaus Luftfahrt e. V.; Annika Paul, Bauhaus Luftfahrt e. V.; Kay O. Ploetner, Bauhaus Luftfahrt e. V.)
 - 239 Effect of Risk and Ambiguity Attitudes toward Road Travel Time on Airport Arrival Behaviors (Szu-Yu Tu, National Chiao Tung University; Yi-Shih Chung, National Chiao Tung University)
 - 316 The Impact of Passenger's Characteristics on Airport Non-Aeronautical Activities: An Empirical Study in the UK (Muneki Yokomi, Kindai University; Phill Wheat, University of Leeds)
 - 354 Factors Affecting Postponement, Rejection, and Opposition to Biometric Boarding Process (Cheong Kim, Sungkyunkwan University; Sungmi Lee, Korea Airports Corporation)

16:00-17:30 5-C Airline Operations 2

- Room: HG-02A33 Chair: **Hansjochen Ehmer** | German Aerospace Center (DLR)
- 10 Dynamic Optimization for Airline Maintenance Operations (Felipe Delgado, Pontificia Universidad Catolica de Chile; Carlos Lagos, Pontificia Universidad Catolica de Chile; Mathias Klapp, Pontificia Universidad Catolica de Chile)
 - 172 Dynamic Design of Reserve Crew Pairings for Long-Haul Airline Crew (Lennart Scherp, Delft University of Technology; Richard Janssen; Bruno F. Santos, Delft University of Technology)
 - 192 What Drives Aircraft Ground Times? (Anne Lange, University of Luxembourg; Garoe Gonzalez Parra, Jeppesen GmbH, Boeing Global Services - Digital Aviation & Analytics Lab Frankfurt; Julian Sieling, Jeppesen GmbH, Boeing Global Services - Digital Aviation & Analytics Lab Frankfurt)
 - 221 A Study on the Vertical Alliance Effects (Yonghwa Park, Inha University; Wooyoung Hur, Inha University)
 - 236 Dynamic Evaluation of Flight Requests in Airline Crew Rostering (Maud Beulen, Delft University of Technology; Lennart Scherp, Delft University of Technology; Bruno F. Santos, Delft University of Technology)

16:00-17:30 5-D Airport Economics & Performance 1

Room: HG-02A24

- Chair: **Sam Choo** | British Columbia Institute of Technology
- 121 The Spatial Dimension of Competition among Airports at Worldwide Level: A Spatial Stochastic Frontier Analysis (Mario Intini, University of Bari; Angela Stefania Bergantino, University of Bari; Nicola Volta, Cranfield University)
- 159 The Effects of Dominant Carriers' Efficiency on the Efficiency of the Hub Airports (Jongchul Kim, Inha University; Kichan Park, Inha University)
- 177 Risk Assessment Impact in Project Financing for New Infrastructure Projects at Airports (Iliana Kalenderidou, Democritus University of Thrace; Dimitriou Dimitrios, Democritus University of Thrace; Sartzetaki Maria, Democritus University of Thrace)
- 282 Airport Assets Valuation towards Business Performance Volatility (Maria Sartzetaki, Democritus University of Thrace; Dimitrios Dimitriou, Democritus University of Thrace)
- 294 Evaluation of the Brazilian Airport Management: Challenges and Its Impact on Quality of Services (Rafael Cardoso Cunha, Federal University of Santa Catarina (UFSC); Paola Cemin da Silva, Federal University of Santa Catarina (LabTrans/UFSC); Amir Mattar Valente, Federal University of Santa Catarina (LabTrans/UFSC); John Weber Rocha, Civil Aviation Secretary of the Ministry of Infrastructure (SAC/MI); Fabiano Gonçalves de Carvalho, Civil Aviation Secretary of the Ministry of Infrastructure (SAC/MI))

16:00-17:30

5-E Air Transport Demand 1

Room: HG-02A16

- Chair: **Katsuhiko Yamaguchi** | University of Tokyo
- 196 A Nested Logit Model for the Overall Air Passenger Trip (Sebastian Birolini, University of Bergamo; Cattaneo Mattia, University of Bergamo; Chiara Morlotti, University of Bergamo; Stefano Paleari, University of Bergamo)
- ~~199 The Development of Air Transportation Network Models on Pioneer Routes in Papua, Indonesia (Sakti Adji Adisasmita, Hasanuddin University; Yoniman Ronting, Hasanuddin University; Resti Octavia Palayukan, Hasanuddin University)~~
- 213 ~~The Effects of Code Sharing on Demand`1 Changes in Air Transport: The Case of Turkish Airlines (Jaehong Park, Inha University; Tae Seung Kim, Inha University)~~
- 285 Second Best Congestion Pricing for Air Navigation Service Providers to Minimize En-Route Congestion in Europe (Thi Thuy An Vo, Vrije Universiteit Amsterdam; Christiaan Behrens, Vrije Universiteit Amsterdam; Eric Pels, Vrije Universiteit Amsterdam; Frank Fichert, Worms University of Applied Sciences; Erik Verhoef, Vrije Universiteit Amsterdam)
- 218 Strategic Route Development in a Multi-airport Metropolis of Kansai (Katsuhiko Yamaguchi, University of Tokyo; Kiyoshi

Yamasaki, Value Management Institute; Kazuki Iwakami, Value Management Institute; Atsushi Koike, Kobe University; Takashi Sekiyama, Toyo University)

16:00-17:30	5-F	Airport Operations 2
Room: HG-01A32	Chair: Anne Graham University of Westminster	
	160	The Flight Operations and Development Strategy of Guangzhou Baiyun International Airport in China (Di Qiu, Embry-Riddle Aeronautical University)
	153	Factors Affecting Car Parking Revenues: An Econometric Analysis of Large European Airports (Mark Friesen, QUINTA Consulting; Wilfred S. Manuela Jr., Asian Institute of Management)
	232	Development of a Simulation Model for Airport Stand Allocation (Seok Jin Cho, Korea Aerospace University)
	313	Influence of Airfield Operations Management on Flights Time and Cost Efficiency (Tatjana Krstic Simic, University of Belgrade; Obrad Babic, University of Belgrade)
	70	An Analysis of Service Quality at UK Airports (Anne Graham, University of Westminster; Nigel Dennis, University of Westminster)

16:00-17:30	5-G	Airline Network Development 2
Room: HG-02A36	Chair: Nigel Halpern Kristiania University College	
	126	When the Engines Are Switched Off: The Impact of European Airline Bankruptcies on Market Concentration (Robert Mayer, Cranfield University; Pere Suau-Sanchez, Cranfield University)
	174	The Utility of Excessive Flight Frequencies from European Airline Hubs Considering their Impact on Departure and Schedule Delay (Felix Presto, Hamburg University of Technology; Volker Gollnick, Hamburg University of Technology; Klaus Luetjens, German Aerospace Center)
	264	Airport market-share determinants in Brazilian international flights (Fernando Seabra, Federal University of Santa Catarina (UFSC); Carla Acordi, UFSC/Labtrans; Rafaella Assis, UFSC/Labtrans; Leandro R. Silva, Ministry of Infrastructure, Brazilian Government; Amir M. Valente, UFSC)
	267	Market Share Evolution of Full-Service Network Carriers and Low-Cost Carriers: The Case of US Domestic Markets (Yi-Ching Lee, National Chiao Tung University; Yi-Shih Chung, National Chiao Tung University)

16:00-17:30	5-H	Aviation Safety & Security 2
Room: HG-02A37	Chair: Renato Redondi University of Bergamo	
	112	Pilot's Air Traffic Controller Communication Errors and Aviation Occurrences (Hui-Hua Yang, Chang Jung Christian University;

- Yu-Hern Chang, National Cheng Kung University; Yi-Hui Chou, National Cheng Kung University)
- 314 Legitimacy Concerns of Air Taxi Operators: A Voluntary Reporting System Case (Ilker Under, Anadolu University)
- 346 Exploration of Rationale behind Airline Passengers' Decision to Retain Possession of Personal Items during Aircraft Evacuation (Steven Leib, University of South Australia)
- 352 Improving Aviation Safety through Mitigation of Human Error (Bijan Vasigh, Embry-Riddle Aeronautical University; Z. Ziarati, Azad University)

19:00-22:00 Conference Dinner, offered by Royal Schiphol Group
NH Grand Hotel Krasnapolsky

FRIDAY, 5 JULY

9.00-10.30 Concurrent Session 6

9:00-10:30 6-A Airport Strategy & Management 4

Room: HG-01A33 Chair: **Ian Douglas** | UNSW Sydney

140 Airport's Catchment Area Size Definition: A Portuguese Case Study (Maria Baltazar, Universidade da Beira Interior; Jorge Silva, Universidade da Beira Interior)

~~265 Analysis of Multi-Airport System Development in East Indonesia Region (Resti Octavia Palayukan, Hasanuddin University; Sakti Adji Adiasmata, Hasanuddin University; Muralia Hustim, Hasanuddin University)~~

289 Modelling Ground Access Mode Choice Behavior for Adelaide Airport (Kai Xuan Lee, University of South Australia; Wen-Chun Tseng, University of South Australia)

333 Sao Tome Aircraft Parking Area Redesigning: An International Infrastructure Regulation Study Case (Thyago Hermeto, Petróleo Brasileiro S.A.; Nathalia Hermeto, Petróleo Brasileiro S.A.; Pablo Hawson, Agave Arquitetura e Engenharia Ltda)

9:00-10:30 6-B Airline Economics & Performance 4

Room: HG-02A33 Chair: **Christian Bontemps** | ENAC/Toulouse School of Economics

65 Air Connectivity Models and Passengers' Behavior (Renato Redondi, University of Bergamo; Sebastian Birolini, University of Bergamo; Chiara Morlotti, University of Bergamo; Stefano Paleari, University of Bergamo)

155 The Role of Customer Service Employees' Emotions in Airline (Noriko Okabe, Yokohama National University)

- 255 Towards a Measure of Airline Connectivity (Keith Mason, Cranfield University; William Morrison, Wilfrid Laurier University; Aina Sagraera Guibernau, Cranfield University)
- 220 An Entry Game for Estimating the Market Structure of the Airline Industry (Christian Bontemps, ENAC/Toulouse School of Economics)

9:00-10:30 6-C Airport Economics & Performance 2

Room: HG-02A24 Chair: **Peter Forsyth** | Monash University

- 95 Impact of Airports' Environment in Productive Efficiency (Ane Elixabete Ripoll-Zarraga, Centre for Innovation in Transport (CENIT); Sonia Huderek-Glapska, Poznan University of Economics and Business (PUEB))
- 101 The Impact of Low-cost and Charter Airlines on Airport Efficiency: Empirical Evidence from Greece (Annitsa Koumoutsidi, National Technical University of Athens; Ioanna Pagoni, National Technical University of Athens; Paraskevi Psaraki-Kalouptsidi, National Technical University of Athens)
- 106 Hub Status of European Major Cities in International Aviation (Hidenobu Matsumoto, Kobe University; Koji Domae, Kansai Gaidai University)
- 152 Is Total Factor Productivity at Major Airports Falling? (Peter John Forsyth, Monash University)

9:00-10:30 6-D Air Transport Demand 2

Room: HG-02A16 Chair: **Sarah Wan** | Hong Kong Polytechnic University

- 40 Are We Ready for the Future Airport? (Joao Rosao, Universidade Lusófona; Lucia de Fatima Piedade, Lusofona University)
- 79 The Sensitivity Analysis of Endogenous Variables in Airport Connectivity Index (Min Feng, Civil Aviation University of China)
- 288 Analysis of the Impacts of Airline Consolidations on Passengers' Welfare (Chieh-Yu Hsiao, National Chiao Tung University; Hui-Yu Chen, National Chiao Tung University)
- 125 Network Development and Delays (Miguel Urdanoz, Toulouse Business School; Chantal Roucolle, ENAC, University of Toulouse; Tatiana Seregina, ENAC, University of Toulouse)

9:00-10:30 6-E Airport Operations 3

Room: HG-01A32 Chair: **Peter Meincke** | German Aerospace Center (DLR)

- 9 The Key Drivers for Klia2 Terminal Passengers' Overall Satisfaction (Nor Azlina Mohd Isa, Universiti Teknologi MARA; Hazelin Ghaus, Malaysia Airports; Norlida Abdul Hamid, Arshad Ayub Graduate Business School; Peck Leong Tan, Arshad Ayub Graduate Business School)
- 329 Flight Delay Error Analysis for Amsterdam Schiphol Airport Using a Deep Neural Network (DNN) (Christopher Overtveld,

- Delft University of Technology; Viranca Balsingh, Delft University of Technology; Robbie Lunenburg, Delft University of Technology)
- 223 The Evaluation of Southeast Asia International Airports Competitiveness by a Two-Stage Approach (Minh Triet Huynh, Inha University; Hun-Koo Ha, Inha University)
- 148 Identification of Threats of Power Outages for Airports and the Likelihood of Their Impact (Peter A. Meincke, German Aerospace Center (DLR); Andrei Popa, German Aerospace Center (DLR))
- 363 Online scheduling of flights arrival and departure (Amir Salehipour, University of Technology Sydney)

9:00-10:30 6-F Airline Network Development 3

- Room: HG-02A36 Chair: **Nigel Dennis** | University of Westminster
- 195 Connecting Flights in LLCs' Business Model (Chiara Morlotti, University of Bergamo; Sebastian Birolini, University of Bergamo; Mattia Cattaneo, University of Bergamo; Renato Redondi, University of Bergamo)
- 226 The Impact of Product Differentiation and Competition on Carriers: Entry in a Liberalizing Transatlantic Air Transport Market (Shengrun Zhang, Nanjing University of Aeronautics and Astronautics; Mark Hansen, University of California, Berkeley; Frank Witlox, Department of Geography, Ghent University)
- 252 Competitive, Operational and Spatial Characteristics of Evolving LHLC Networks in the Transatlantic Market (Joost Zuidberg, SEO Amsterdam Economics; Jaap de Wit, Pintail Aviation Economics; Guillaume Burghouwt, Schiphol Group)
- 134 Crossing the Pond: Developments in North Atlantic Airline Operations (Nigel Dennis, University of Westminster; David Pitfield, University of Westminster)

9:00-10:30 6-G Airline Strategy & Management 5

- Room: HG-02A37 Chair: **Chunyan Yu** | Embry-Riddle Aeronautical University
- 15 Mesh Network as a Competitive Advantage for European Low-Cost Carriers: An Alternative Topology to Hub-and-Spoke for Selling Online Connections (Richard Klophaus, Worms University of Applied Sciences; Rico Merkert, Institute of Transport & Logistics Studies; Oriol Lordan, Universitat Politècnica de Catalunya, Barcelona Tech)
- 120 Hub Selection under Competition Using Graph Model for Conflict Resolution (Shawei He, Nanjing University of Aeronautics and Astronautics)
- 179 Hub, Dominance or Double Margins? - Disentangling the Sources of Regional Airlines Pricing Power (Adams Steven,

University of Maryland; Farbod Farhadi, Roger Williams University)

- 340 Market Entry and Exit Behaviour of the Three Ultra-Low-Cost Airlines in the US (Chunyan Yu, Embry-Riddle Aeronautical University; Li Zou, Embry-Riddle Aeronautical University; Blaise P. Waguespack, Embry-Riddle Aeronautical University)

10:30-11:00 Coffee Break

11:00-12:00 Concurrent Session 7

11:00-12:00 7-A Airline Economics & Performance 5

Room: HG-02A33 Chair: **Hangjun Yang** | University of International Business and Economics

- 76 Does One Model Fit Them All? Or How Airlines Tune Their Businesses Up in Face of Competition (Renan Oliveira, Aeronautics Institute of Technology; Alessandro V. M. Oliveira, Aeronautics Institute of Technology)
- 332 Longitudinal Analysis of Perceived and Objective Airline Performance Quality (Brent Bowen, Embry-Riddle Aeronautical University Prescott; Erin Bowen, Embry-Riddle Aeronautical University Prescott; Javad Gorjidoz, Embry-Riddle Aeronautical University Prescott; Kaetlyn Blocker, Embry-Riddle Aeronautical University Prescott; Timothy Holt, Embry-Riddle Aeronautical University, Prescott)
- 83 The Impact of High-Speed Rail Competition on Airlines' On-Time Performance (Hangjun Yang, University of International Business and Economics; Changmin Jiang, University of Manitoba; Kun Wang, University of International Business and Economics; Qiang Wang, University of International Business and Economics)

11:00-12:00 7-B Airport Economics & Performance 3

Room: HG-02A24 Chair: **Joel Shon** | Tainan University of Technology

- 292 Evolutionary Algorithm Based Capacity Optimization of a Baggage Sorting System Using a Modular Cellular Automaton (Manuel Renold, Zurich University; Simon Wacker, Zurich University; Claudio Gomez, Zurich University)
- 309 Financial Metrics for Benchmarking U.S. Airports (Sunder Raghavan, Embry-Riddle Aeronautical University; Chunyan Yu, Embry-Riddle Aeronautical University)
- 85 Catalytic Effects of Regional Airports: Impact Study of Lugano Airport (Rene Puls, University of St. Gallen; Andreas Wittmer, University of St. Gallen)

11:00-12:00 7-C Air Transport Demand 3

Room: HG-02A16 Chair: **Hanaoka Shinya** | Tokyo Institute of Technology

77 Demand Leakage from a Local Small Airport to a Regional Main Airport (Yu Morimoto, Konan University)

208 The Effect of Increasing Connectivity over European Tourism to Peru (Gutierrez Jesus, Universidad del Pacifico; Enzo Defilippi, Universidad del Pacifico)

219 The Impact of LCC on Total Travel Volume: Observation in Japanese Domestic Market (Yuki Takamoto, Kanazawa University; Hiromichi Yamaguchi, Kanazawa University; Shoichiro Nakayama, Kanazawa University)

11:00-12:00 7-D Airport Operations 4

Room: HG-01A32 Chair: **Alexandre de Barros** | University of Calgary

8 Simulation-based Analysis of Capacity of a Multi-Airport System: Mexico City Case Study (Miguel Mujica Mota, Amsterdam University of Applied Sciences; Alejandro Di Bernardi, Universidad Nacional de la Plata; Paolo Scala, Amsterdam University of Applied Sciences)

257 Research on Design of Aircraft Push-back Combination Operation Mode and Performance Evaluation under Finger Pier Apron Configuration (Xiaowei Tang, Nanjing University of Aeronautics and Astronautics; Yeqing Liu, Nanjing University of Aeronautics and Astronautics; Sisi Ma, Nanjing University of Aeronautics and Astronautics)

146 An Analytical Model for Open V-Shaped Runway System with Steeper and Staggered Approach Procedures (Marcela Coelho Lopes, University of Calgary; Carlos Muller, Aeronautics Institute of Technology; Alexandre de Barros, University of Calgary)

11:00-12:00 7-E Airline Network Development 4

Room: HG-02A36 Chair: **Gianmaria Martini** | University of Bergamo

256 Airports on the North Atlantic: The Impact of Alliances and Joint-Ventures (Frances Kremarik, University of Westminster; Nigel Dennis, University of Westminster; Anne Graham, University of Westminster)

271 European Passenger Reliance on Indirect Travel (Valentijn van Spijker, SEO Amsterdam Economics; Christiaan Behrens, SEO Amsterdam Economics; Joost Zuidberg, SEO Amsterdam Economics)

353 Characteristics and Impact Factors of Flight Bank of Network Airlines at Hub Airports (Yonglei Jiang, Dalian Maritime University; Zhongzhen Yang, Ningbo University)

11:00-12:00 7-F Sustainability in Air Transport 5

Room: HG-02A37 Chair: **Keith Mason** | Cranfield University

- 46 Environmental Benefits and Efficient Monitoring, Reporting and Verification (MRV) Options of Continuing with the EU-ETS for Aviation in a CORSIA-World (Sven Maertens, German Aerospace Center; Janina Scheelhaase, German Aerospace Center)
- 171 How to Decarbonize Aviation in Europe? The Difficult Route of Sustainable Aviation Fuels (Inge Mayeres, Transport & Mobility Leuven; Stef Proost, KU Leuven; Eef Delhaye, Transport & Mobility Leuven)
- 361 Roadmap to Decarbonising European Aviation (Carlos Calvo-Amber, T&E; Laura Buffet, T&E; Thomas Earl, T&E; Lucy Gilliam, T&E; Bill Hemmings, T&E; Andrew Murphy, T&E; Jori Sihvonen, T&E)

12:00-13:00 Closing session

Room: Auditorium

13:00-18:00 Excursions

13.00-18.00 Zaanse Schans

Meeting Place: Registration Desk

13.00-18.00 Canal Cruise

Meeting Place: In front of Main Building VU

RECEPTION AND DINNER

RECEPTION

Date: Tuesday, 2 July
 Time: 19:00 - 20:30
 Venue: Foyer, VU Amsterdam, De Boelelaan 1105
 Offered by: Houston Airports



DINNER

Date: Thursday, 4 July
 Time: 20:00 – 23:00
 Venue: Winter Garden, Hotel Krasnapolsky, Dam 9
 Offered by: Royal Schiphol Group



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HOST AND PARTNERS



The Department of Spatial Economics

The Department of Spatial Economics, at the School of Business and Economics of VU Amsterdam, is engaged in economic problems in which space plays a prominent role. The Department of Spatial Economics offers insights and applications in urban, regional, transport and environmental challenges from a primarily economic perspective, often enriched through multi-disciplinary collaborations.

The 60 staff members are involved in both fundamental research as well as in national and international commissioned research. With this research, the department has gained national and international recognition, as shown by the large number of international publications and citations; the appearance of different staff members in editorial boards and as experts in the media and advisory boards; and the presence of various section members on the typically Dutch phenomenon of 'Economists Parade'.

According to RePEc (accessed in April 2018), the School ranks in the top 5% of institutions worldwide in the fields of [Transport Economics](#), [Urban and Real Estate Economics](#), [Economic Geography](#), [Environmental Economics](#) and [Energy Economics](#). Moreover, various current staff members make it to the top 5% in RePEc's [general ranking](#) of economists, or in the economists' rankings in the fields just mentioned: Erik Verhoef, Jos van Ommeren, Henri de Groot, Jan Rouwendal, Carolyn Fischer, Cees Withagen, Rik van der Ploeg and Richard Tol. The research programme addresses four interrelated themes: urban and regional dynamics, land use, transport and environmental and resource economics. Some keywords to sketch the topics within these themes are:

- *Urban and regional dynamics*: agglomeration economies, housing markets, regional labour markets, migration
- *Land use*: land rents, spatial externalities, flood risk, spatial planning
- *Transport*: congestion, network reliability, accident risks, sustainable transport, transport policy
- *Environmental and resource economics*: biodiversity, agri-environmental schemes, renewable resources, green paradox, climate change adaptation

VISIT OUR BLOG AT [SPATIALECONOMICS.NL](https://spatialeconomics.nl)

The School of Business and Economics

The School of Business and Economics seeks to combine quality education with excellent research. The School is the largest faculty of Vrije Universiteit Amsterdam. SBE accommodates approximately 5000 students, 1700 postgraduate students and 500 employees. The scientific staff consists of professors, lecturers, researchers and PhD's, and is connected to the various departments.

The accessibility of VU Amsterdam is excellent. The Amsterdam-Zuid train station is only a seven-minute walk from VU Amsterdam. The VU can also be easily reached by car, since the campus is near the A-10 motorway. The centre of Amsterdam can be reached in 20 minutes by tram so people can easily benefit from the advantages of a large and beautiful city.

Education

SBE is ambitious and aims at challenging education. The School offers a wide range of Bachelor's programmes, English taught minors, (Research) Master's programmes and Postgraduate programmes.

Research

Our mission is to do Science with Purpose. We enable our staff to push forward the boundaries of scientific knowledge and to aim for the highest quality theoretical and empirical research contributions, leading to publications in top international journals. Our research is closely aligned to all degree programmes offered by SBE in the fields of Economics and Business Administration, substantiating our claim to provide our students with the best research-led teaching and education. High-quality research is also key to our ambition to provide impact on policies and practices at firms, government and society in general.

In line with this overall mission statement, research at SBE is organised in two research institutes, the Tinbergen Institute (TI) and the Amsterdam Business Research Institute (ABRI). These institutes create research capacity through PhD training in Economics and Business Administration and provide an environment conducive to high-quality research. In the ABRI, SBE collaborates with the University of Amsterdam, and in the TI with both the University of Amsterdam and Erasmus University Rotterdam.

PLATINUM SPONSOR

Amsterdam Airport Schiphol – Gateway to the Netherlands

Who we are

Amsterdam Airport Schiphol (hereafter ‘Schiphol’) is the largest international airport in the Netherlands, as well as an important commercial, traveller and cargo gateway to and from Europe. Royal Schiphol Group is the owner/operator of several Dutch airports, including Schiphol, Rotterdam The Hague and Lelystad Airports, and majority shareholders in Eindhoven Airport.

Over the years, Schiphol has gone on to become one of Europe’s best-connected airport hubs. 71.1 million travellers were welcomed in 2018, a year-on-year growth of 3.7%. Those travellers were connected to upwards of 327 destinations, ranking us second worldwide for hub connectivity. Schiphol and the greater area also serve as an important marketplace – the airport accommodates 500+ companies that employ upwards of 67,000 people. In addition, we facilitated cargo volumes of 1.72 million tonnes in 2018.

We connect our country

Royal Schiphol Group carries an important socio-economic function – to create value for society and for the Dutch economy. Our mission is 'Connecting the Netherlands'. We contribute to prosperity and well-being in the Netherlands and abroad by facilitating optimal links as effectively as possible. In addition, it is Royal Schiphol Group’s ambition to develop Schiphol into Europe’s Preferred Airport: the airport of choice for travellers, airlines and logistics service providers alike.



We connect airlines, people and commerce

As an airport, we believe that the air connects us all. Planes form invisible bridges between

cities, countries and continents. Along with that, air travel brings together business, people and opportunities. It helps loved ones, separated by distance, to be together again, and brings travellers the adventure they seek. These connections begin on the ground – from our partners, to airlines, to travellers.

We focus on safety, sustainability and quality

Royal Schiphol Group aims to lead by example within the aviation sector when it comes to sustainability. Our ambition is to become the most sustainable airport operator in the world, while paying particular attention to four key topics: (1) sustainable aviation, (2) zero-emissions, (3) zero-waste, and (4) wellbeing. Two important long-term goals for the group are to ensure that our airports have zero-waste and zero-emissions by 2030.

In addition, safety is also fundamental principle that governs the actions and activities of all aviation and non-aviation activities across our Group. Schiphol has a responsibility to uphold these principles, which is an integral consideration in the many decisions we make as an organisation. In this sense, a sustainable and safe performance directly underpins our new vision and strategy for the future.

From now and into the future

With renewed strategic objectives, a commitment to safe, reliable and sustainable operations and a focus on building the airport of the future, Amsterdam Airport Schiphol is well on its way to becoming Europe’s Preferred Airport – for today, as well as tomorrow.



GOLD SPONSORS

KLM



KLM was established on 7 October 1919 and is the world's oldest airline still operating under its original name. KLM will celebrate its centenary this year. Operating out of its home base in Amsterdam, the KLM Group served its global network with a fleet of 209 aircraft in 2018. KLM employs 33,000 people. In 2017, the KLM Group generated EUR 10 billion in revenue.



Based on the principle that our people are the key to our brand, we are convinced that we can make the difference by consistently offering our customers a memorable experience. This ambition is in our DNA. Thanks to the sincere attention we give our passengers, they feel acknowledged, contented and at ease.

Following the merger with Air France in 2004, KLM has pursued the concept of one Air France-KLM Group, two airlines and three core activities (passengers, cargo and engineering & maintenance). Together with Air France, KLM plays a pioneering role in the European air transport industry. KLM pursues profitable growth in order to achieve its own commercial objectives as well as more general economic and social objectives. KLM is actively driving sustainable growth at Amsterdam Airport Schiphol and seeks to gain access to any market that will improve the quality of its network.

For the Dutch speaking: here is the link to our MainportVision:



GOLD SPONSORS

Houston Airports

The Houston Airport System is comprised of three different airport facilities: George Bush Intercontinental Airport (IAH), William P. Hobby Airport (HOU) and Ellington Airport (EFD).



George Bush Intercontinental (IAH), the city's largest airport and global gateway.
William P. Hobby (HOU), a medium-sized, low-cost regional international airport.
Ellington Airport (EFD), a commerce and aviation center and a licensed commercial spaceport, accommodating general aviation and U.S.



Houston Airports served more than 58 million passengers in 2019. Approximately 200 destinations are available from Houston via a nonstop flight. In addition, Houston remains the only city in the Western Hemisphere with two 4-star rated airports. And the airports contribute more than \$27 billion to the local economy.

Connect with the airports at www.fly2houston.com.



BRONZE SPONSORS

× City of × Amsterdam

From its humble beginnings as a 13th-century fishing village on a riverbed to its current role as a major hub for business, tourism and culture, Amsterdam has had a strong tradition as a centre of culture and commerce.



NBTC
Holland Marketing

NBTC is responsible for branding and marketing the Netherlands nationally and internationally. Using the 'Holland' brand, NBTC puts the country on the map as an attractive destination for holidays, business meetings and conventions.

To market 'Holland' NBTC uses a cooperation model that unites public and private partners. NBTC receives government funding from the Ministry of Economic Affairs & Climate and cooperates intensively with relevant parties within and outside the hospitality sector.



**Amsterdam University
of Applied Sciences**

Amsterdam University of Applied Sciences, Aviation Academy

The Aviation Academy is our vision for the future. The Aviation Academy is the aggregate of our education, applied research and continuous cooperation with industry partners. Our focus is to enable the professional on the work floor to excel in their jobs and tasks.

Focus on operational processes.

The operational process is key, whether you work for an airline, handler, airport, ATC or government organisation. Our education and research covers the operational readiness of the aircraft (the aircraft as a technical entity) as well as how the aircraft is used to transport people and goods from A to B including the infrastructure needs. Each student understands the interrelationship between engineering, operations, business model and regulations.

International growth

The Aviation Academy is developing fast from an education in the Netherlands towards an international actor. The industry is an integral partner in our activities, both in developing our curriculum, providing lectures and internships as well in our applied research. We are expanding our network and partnerships and are constantly looking forward to expand the network and to link our areas of expertise to those of our partners.

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Acknowledgement

We are grateful to Christiaan Behrens, Christian Bontemps, Achim Czerny, Nigel Dennis, Xiaowen Fu, Anne Graham, Shinya Hanaoka, Christian Hofer, Seock-Jin Hong, Gianmaria Martini, Koki Nagata, Evy Onghena, Eric Pels, Mikio Takebayashi, Andreas Wittmer, Katsuhiko Yamaguchi, Chunyan Yu, Anming Zhang, Xingwu Zheng, Li Zou, and Martin Dresner for taking their time to evaluate a large volume of abstract submissions.

We also would like to give special thanks to Christian Bontemps, who organized the PhD Students and Junior Researchers Workshop.

We extend our sincere thanks to all Sessions Chairs, our conference hosts and every participant for your kind support!

We look forward to seeing you all next year in Sydney!

ATRS

LOCAL ORGANIZING COMMITTEE



Jaap de Wit
(Professor Emeritus of Transport Economics, University of Amsterdam)



Eric Pels
(Associate Professor, Department of Spatial Economics, School of Business and Economics, VU Amsterdam), conference chair



Mark Lijesen
(Assistant Professor, Department of Spatial Economics, School of Business and Economics, VU Amsterdam)



Elisa Binnerts
(Secretary, Department of Spatial Economics, School of Business and Economics, VU Amsterdam)

CONFERENCE EXCURSIONS

On the last day of the conference, 5th of July, there will be two conference excursions. You can choose between the Zaanse Schans or a canal cruise.

ZAANSE SCHANS

Date: Friday, 5 July

Time: 2:00 p.m. – 6:00 p.m.

Meeting place: Registration desk

Registration: Mail to Elisa Binnerts (e.binnerts@vu.nl).

After July 2: registration desk.



The first excursion is to the Zaanse Schans. After the closing session, a bus departs from VU Amsterdam at 2 pm. It is a 30 minute drive to the Zaanse Schans. You'll have about 3 hours to walk around and discover what the Zaanse Schans has to offer. The bus will leave at 5:30 pm from Zaanse Schans and bring you back to VU Amsterdam.

The Zaanse Schans is a residential area in which the 18th and 19th centuries are brought to life. You can stroll past the bakery museum and enjoy the smell of fresh cookies, or take a look at the warehouse where clogs are made. You should be sure not to miss the cheese factory, pewter foundry and the various windmills. The Zaanse Schans is a unique part of the Netherlands, full of wooden houses, mills, barns and workshops. You can download the Zaanse Schans app for walking routes to make sure you don't miss anything.

CANAL CRUISE

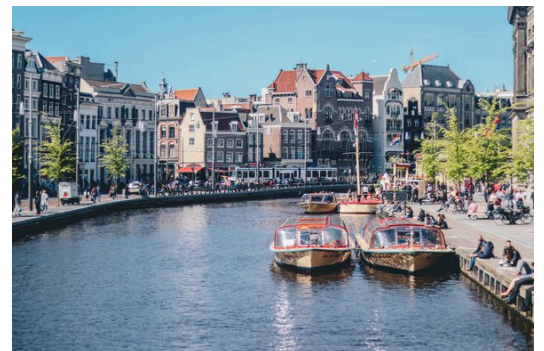
Date: Friday, 5 July

Time: 2:00 p.m. – 6:30 p.m.

Meeting place: In front main building

Registration: Mail to Elisa Binnerts (e.binnerts@vu.nl).





After July 2: registration desk.

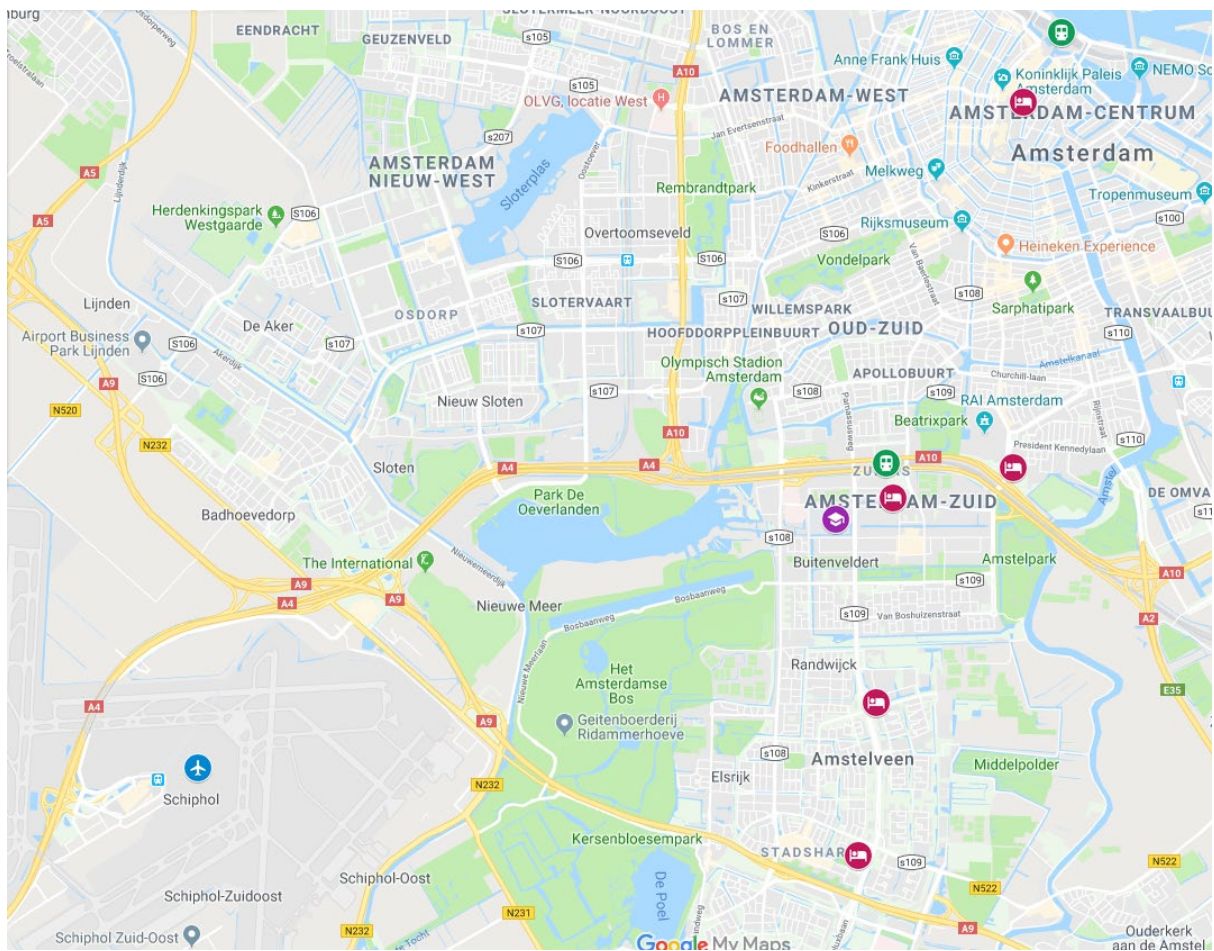


The second excursion is canal cruise through the canals of Amsterdam, a must see for anyone visiting Amsterdam. Amsterdam has 100km of waterways, so an Amsterdam canal cruise is the best way to view what the city has to offer: grand merchant houses, churches, medieval buildings, etc.

We will walk from VU Amsterdam to Zuider Amstelkanaal/Parnassusweg, this is a 20 minute walk. The tour starts there and will also end there, and then we will walk back to VU Amsterdam. You can buy beverages on board and there will be a tour guide.

ATRS 2019 LOCATION MAP

-  VU Amsterdam
-  Hotels
-  Amsterdam Airport Schiphol
-  Train stations



GETTING TO VU AMSTERDAM

BY PUBLIC TRANSPORT

From Central Station

Option 1: Take tram 24 towards VU Medisch Centrum to the final stop (De Boelelaan/VU), trip duration: 35 minutes.

Option 2: Take metro 52 towards Zuid to the final stop (Station Zuid), duration 11 minutes. From Station Zuid it is possible to walk (around 10 minutes) or change to bus or tram (see “Public Transport: From Station Amsterdam Zuid”).

Option 3: Take metro 51 towards Isolatorweg to Station Zuid, duration 14 minutes. From Station Zuid it is possible to walk (around 10 minutes) or change to bus or tram (see “Public Transport: From Station Amsterdam Zuid”).

From Amsterdam Airport Schiphol

Take the train to Station Amsterdam Zuid, duration 5 minutes. From Station Zuid it is possible to walk (around 10 minutes) or change to bus or tram (see “Public Transport: From Station Amsterdam Zuid”).

From Station Amsterdam Zuid

Option 1: Take tram 5 towards Amstelveen Stadshart to De Boelelaan/VU (second stop), duration 2 minutes.

Option 2: Take bus 55 towards Amstelveen to De Boelelaan/VU (first stop), duration 4 minutes.

Option 3: Take bus 62 towards Station Lelylaan to De Boelelaan/VU (first stop), duration 3 minutes.

Option 4: It is a 10-minute walk to the VU Amsterdam from Station Amsterdam Zuid.

BY CAR

The A-10 Amsterdam ring road can be reached from all directions. Follow the A-10 to Zuid/Amstelveen, exit S 108. Turn left at the end of the slip road onto Amstelveenseweg: after about three hundred yards (at the VU hospital building) turn left again onto De Boelelaan. VU Amsterdam can be reached via city routes S 108 and S 109.

Parking

There is a limited amount of parking space around the Vrije Universiteit Amsterdam itself in De Boelelaan, which has parking bays, and also in Gustav Mahlerlaan. There is paid parking on VU Amsterdam parking lot to the right of the Hospital Outpatient Clinic. There is even more parking space on the east side of Buitenveldertselaan at the junction with Willem van Weldammelaan, within 5 minutes walking distance of VU Amsterdam. A number of parking places for the handicapped are reserved in front of the Vrije Universiteit Amsterdam Main Building.