

# PROF. AVISHAI (Avi) CEDER

## Abbreviated Curriculum Vitae



**Personal:** Birthplace: Haifa, Israel;  
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### Education:

**B.Sc.** (1971) at the Technion, Faculty of Industrial and Management Engineering. **M.Sc.** (1972) and **Ph.D.** (1975) on the subject of Transportation with emphasis on Operations Research and Human Factors, at the University of California at Berkeley, USA.

### Academic Appointments:

**Technion** - Israel Institute of Technology

1975-1979 - Lecture; 1979-80 - Senior Research Fellow; 1980-89 - Senior Lecturer

1990-2001 - Associate Professor; 2001- 2008 – Full Professor and Senate Member

2008-present – Emeritus Professor

**M.I.T.** - Massachusetts Institute of Technology

1981-1982 and 1985-1987 - Visiting Professor

**University of Tokyo**

1999 - Visiting Professor

**Hong Kong (University of Science and Technology- HKUST, PolyTechnic University)**

1999-2000 - Visiting Professor

**University of California at Berkeley (UCB)**

2001 - Visiting Professor

**University of Auckland (UoA), New Zealand**, Faculty of Eng, Dept of Civil and Envir. Eng,

2007 – Oct-2016 – Professor, Chair in Transportation

2016-2020 – Honorary Professor

**Hiroshima University, Japan**, the International Development and Cooperation (IDEC)

2017 - Visiting Professor

**Beijing Jiaotong University (BJTU), China**

2017-2021: Zhi-xing professor

### Research Experience

Principal Investigator (PI) at the **Technion** (1975-present); PI at CTS (Center of Transport Studies), **M.I.T.** (1981-82, 85-87); PI in ITS (Inst. of Transport Studies), **Sydney University** (1994, 2000); PI in ISST (Inst. for Sustainable Systems and Techno.), **Univ of South Australia** (2000); PI in the Hong Kong **University of Science and Technology (HKUST)** (2000-2001); PI in the PATH of ITS (Inst. of Transport Studies) at **UCB in Berkeley** (2001); PI at the TRC (Transportation Research Centre), **University of Auckland** (2008-2016); Consultant to **TUM-CREATE** in Singapore (2017-2019); Investigator at the IPTOP project at **DTU - the Technical University of Denmark** (2017-2020); Lecturing and implemented research at the **Beijing Public Transport Corporation (BPTC)**, the largest bus company in the world (2020-present).

**Areas of Research:** Public Transport, Operations Research, Human Factors and Behavior, Intelligent Transportation Systems, Road Safety, Traffic Control, Logistics.

### Appointments:

2007-2014 Director of Transportation Research Centre (TRC), University of Auckland

2006-2007 Head, Transportation Eng and Geo-Information Department, Technion

1994-1997 **Chief Scientist**, Ministry of Transport, Israel

1996-1999 Israel delegate at the Transport Program of the European Community

1993-present Member of the Organizing Committee of International Symposium on Transportation and Traffic Theory (ISTTT)

1990-present Member of the Organizing Committee of International Conference on Advanced Systems for Public Transport (CASPT)

1987-1989 President of the IATR (Israel Association of Transportation Research)

### Publications:

Author or co-author of **over 200 articles** in refereed journals, book chapters and proceedings. Author of **four** books: "Network Theory and Selected Topics in Dynamic Programming"(1978), "Systems Analysis"(1988), "Systems Analysis Using Operations Research"(1999), "Public Transit Planning and Operation: Theory, Modeling and Practice"(2007, translated to Chinese in 2010), "Public Transit Planning and Operation: Modeling, Practice and Behavior" (*Second Edition*, 2016, translated to Chinese in 2017 and to Korean in 2018), and Editor of the Proceedings "Transportation and Traffic Theory"(1999). The publications include modeling and analysis in the areas of Public Transport, Road Safety, Traffic Flow and Control, Human Factors and Behavior and Operations Research in Transportation, Intelligent Transportation Systems, Logistics, and Intermodalities of Passengers and Freight. See, in the last page, a list of selected last 10-year publications.

### Academic and Professional Background

**B.Sc.** (1971) at the Technion, Faculty of Industrial and Management Engineering. **M.Sc.** (1972) and **Ph.D.** (1975) on the subject of Transportation with emphasis on Operations Research and Human Factors, at the University of California at Berkeley, USA. Was the **Chief Scientist** at the Israel Ministry of Transport and Israel delegate to the Transport Program of the European Community from 1994 to 1997. In 2006-2007 was the **Head of the Department** of Transportation Engineering and Geo-Information at the Technion, and between 2008-2014 **Founder**, and the **Director** of, the Transportation Research Centre (TRC) at the University of Auckland (the first such research centre in New Zealand).

### Scientific Impacts

His most significant contributions are: (1) as the sole author of the books *Public Transit Planning and Operation: Theory, Modeling and Practice*, Elsevier, Oxford, UK, 640 p. 2007. This book was translated to Chinese by the Tsinghua publication press, Beijing, China, 2010; 2<sup>nd</sup> edition *Public Transit Planning and Operation: Modeling, Practice and Behavior*, CRC Press, Taylor & Francis, London, UK, 742 p.2016. This 2<sup>nd</sup> edition was translated to Chinese (2017) and to Korean (2018); (2) First modeling of vehicle scheduling graphical person-computer interactive approach based on a step (deficit) function. The associated software is optimizing more than a few public-transport systems by saving large number of buses especially in Europe and Hong Kong, e.g., KMB agency, using this model, has been able to save more than 20 double-decker buses; (3) Development of the first method for constructing practical design of an efficient public-transport network of routes. This problem is known to be complex; (4) First development of prudent public-transport timetables that optimize the correspondence of vehicle-departure times with passenger demand; and (5) First formulation and solution of the public-transport route-choice dilemma.

### Career Achievements

His practical science-based significant achievements to date are: (1) developed new traffic control center and its modeling and software for the entire city of Haifa with ½ million inhabitants (appear in **10 Journal (10-J) papers**); (2) developed modeling of scheduling for the EGGED agency of 4000 buses (**12-J papers**); (3) developed modeling and methods from which the entire Hong Kong Ferry network was constructed (**2-J papers**); (4) approved, helped and pursued the project of the Hanging Gardens of Haifa, known as Terraces of the Baha'i Faith, on behalf of the Mayor of Haifa Arie Gurel, alongside Architect Fariborz Sahba (**1-J paper**); (5) developed innovative scheduling software methods for OPTIBUS software used in several countries in the world (**20-J papers**); (6) developed the modeling and simulation of a smart bus shuttle service for the Bay Area Transit System (BART) in California (**6-J papers**); and (7) worked on future development of the public-transport control center of Beijing, built for the 2008 Olympic games with US\$ 25 million dollar project controlling 5000 GPS-equipped buses (**2-J paper**). Received the 1<sup>st</sup> Best-paper Award at CASPT2022 (**1-J paper**), and Lifetime Contribution Award by the Transportation Research Board (TRB), USA, in January 2024.

### International Recognition

Published so far **8** professional books, **1** narrative book, **8** scientific-book chapters, **over 220** refereed papers in scientific journals from which **51** - as a **sole author**, and over **100** in the **past 10-year** (2013-2023).

Was invited to be a keynote/plenary/distinguished speaker 38 times in the last 20 years in prestige international conferences, from which 25 Keynote Lectures are of the last 15 years, [EXPO, 2008, Saragossa], [BRT, 2008, Santiago], [CASPT, 2009, Hong Kong], [RAIL, 2009, Seoul], ["7+1" Forum, 2010, Beijing], [14<sup>th</sup> EWGT and the 26<sup>th</sup> Mini EURO, 2011, Poznan], [The XVIII International SIDT, 2011, Venice], [15<sup>th</sup> Total Logistic Management Conference, 2011, Zakopane], [1<sup>st</sup> and 2<sup>nd</sup> series "111 China's National Project", 2012-2014, Beijing], [Joint Symposium of Korea Land and Transport Ministries, 2013, Seoul], [ISTTT, 2013, Noordwijk, Netherlands], [ICTTS'2014, Shaoxing, China], [TransITS - COST, Paris, 2015], [COTA'2015, Beijing, China], [6<sup>th</sup> IPTF, Seoul, Korea, 2016], [COTA'2016, Shanghai, China], [KOTI 30<sup>th</sup>. Sejong, Korea, 2016], [5<sup>th</sup> hEART'2016, Delft, The Netherlands], [1<sup>st</sup> VOM International Conference, Hiroshima, Japan, 2017], [Transport Summit DTU, Copenhagen 2017], [COTA'2017, Shanghai-Tongji Uni, China], [5<sup>th</sup> China-Korea Joint Seminar, Daejeon, Korea, 2018], [TUMCREATE Symposium 2018, NUS, Singapore], [2<sup>nd</sup> VOM International Conference, Hiroshima, Japan, 2019], [5<sup>th</sup> World Transport Forum, BTI, Beijing, China, 2019], [China International Public Transport Conference, BPTC, Beijing, China, 2021], and [CEE Distinguished Seminar Series, Nanyang Technological University (NTU), Singapore, 2023].

Serving currently as **Senior Editor** and **Associate Editor** of international Journals; **Member** of two prestige international conferences steering committees; **Chairperson**, and sole editor of a book, of the 14<sup>th</sup> International Symposium on Transportation and Traffic Theory (ISTTT) in 1999; and **Chairperson** of the 15<sup>th</sup> Conference on Advanced Systems in Public Transport (CASPT), known as CASPT2022, Tel Aviv, Israel (06-10 November 2022).

### Inspiring Young Researchers

Has enjoyed mentoring so far **54** graduate students, with **101** out of **216** journal papers with supervised students. Twelve are with PhD: **Tharakan,G.**-Dept Head at the World Bank, NYC; **Marguier,P.**-Dept Head of Air France, Paris; **Israeli,Y.**-Assoc Prof in Hagalil College, Israel; **Sarvi,M.**-Prof and Chair, The University of Melbourne, Australia; **Hadas,Y.**-Senior Lecturer in Bar-Ilan University, Israel; **Chowdhury, S.**-Senior Lecturer in the University of Auckland, NZ; **Hassold,S.**-OR analyst at AirNZ airline; **Nesheli,M.**-Post-Doc at the University of Toronto, Canada; **Amiripour,M.**-Principal at Auckland Transport, NZ; **Tang,C.**-Assist. Prof at the Dalian Maritime University, China; **Liu,T.**-Assoc. Prof Southwest Jiaotong University, Chengdu, China (won the 2017 Vice-Chancellor's Prize for Best Doctoral Thesis in the University of Auckland); and **Dimitrov,S.** System analyst, Auckland (this was his 2<sup>nd</sup> PhD degree in Transport). In addition, has received **Excellence-in-Teaching** awards at the Faculty (2003) and University (2004) levels at the Technion, and at the Faculty of Engineering (2011) at the University of Auckland.

1. **Ceder, A.** “Public Transit Planning and Operation: Modeling, Practice and Behavior”, Second edition, CRC Press, Boca Raton, USA, 742 p. **2016**. This 2<sup>nd</sup> edition book was translated to Chinese by Tsinghua University press (**2017**) and to Korean by Cheong Moon Gak press (**2018**).
2. **Ceder, A.** and Perera, S. “Detecting and Improving Public-Transit Connectivity with Case Studies of Two World Sport Events”. *Transport Policy*, 33, 96-109, **2014**.
3. Hassold, S., **Ceder, A.** “Public Transport Vehicle Scheduling Featuring Multiple Vehicle Types”. *Transportation Research Part B*, 67, 129-143, **2014**.
4. Amiripour, M., **Ceder, A.**, Mohaymany, A.S. “Method for Designing Large-Scale Bus Network with Seasonal Variations of Demand”, *Transportation Research Part C*, 48, 322-338, **2014**.
5. Nesheli, M., **Ceder, A.** “Optimal Combinations of Selected Tactics for Public-Transport Transfer Synchronization”. *Transportation Research Part C*, 48, 491-504, **2014**.
6. **Ceder, A.** and Philibert, L. “Transit Timetables Resulting in Even Max-Load on Individual Vehicles”. *IEEE Transactions on Intelligent Transportation Systems*, 15(6), 2605-2614, **2014**.
7. Chowdhury, S., **Ceder, A.** and Schwalger, B. “The effects of travel time and cost savings on urban commuters’ perception of public transport routes involving transfers”. *Journal of Transport Geography*, 43, 151-159, **2015**.
8. Liu, T., **Ceder, A.** “Analysis of a New Public-Transport-Service Concept: Customized Bus in China”. *Transport Policy*, 39, 63-76, **2015**.
9. **Ceder, A.** Butcher, M., Wang, L. “Optimization of Bus Stop Placement for Routes on Uneven Topography”. *Transportation Research Part B*, 74, 40-61, **2015**.
10. Nesheli, M., **Ceder, A.** “A Robust, Tactic-Based, Real-Time Framework for Public-Transport Transfer Synchronization”. *Transportation Research Part C*, 60, 105-123, **2015**.
11. Nesheli, M., **Ceder, A.** “Improved Reliability of Public Transportation Using Real-Time Transfer Synchronization”. *Transportation Research Part C*, 60, 525-539, **2015**.
12. Dimitrov, S., **Ceder, A.** “A Method of Examining the Structure and Topological Properties of Public-Transport Networks”. *Physica A*, 451, 373 – 387, **2016**.
13. Chowdhury, S., **Ceder, A.** “Users’ willingness to ride an integrated public-transport service: A literature review”. *Transport Policy*, 48, 183 – 195, **2016**.
14. Nesheli, M.M., **Ceder, A.** and Estines, S. “Matching Public Transport Demand Using Tactic-Based Guidelines”. *Transport Policy*, 49, 125-136, **2016**.
15. Liu, T. and **Ceder, A.** “Deficit function related to public transport: 50-year retrospective, new developments, and prospective”. *Transportation Research Part B*, 100, 1-19, **2017**.
16. Liu, T. **Ceder, A.** “Integrated public transport timetable synchronization and vehicle scheduling with demand assignment: A bi-objective bi-level model using deficit function approach”. *Transportation Research, Part B*, 117, 935-955, **2018**.
17. Bagloee, S. A., **Ceder, A.**, Sarvi, M., Asadi, M. “Is it time to go for no-car zone policies? Braess paradox detection”. *Transportation Research Part A*, 121, 251-264, **2019**.
18. Cao, Z., **Ceder, A.** “Autonomous shuttle bus service timetabling and vehicle scheduling using skip-stop tactic”. *Transportation Research Part C*, 102, 370-395, **2019**.
19. Hall, C.H., **Ceder, A.**, Ekstrom, J., and Quttineh, N-H. “Adjustments of public transit operations planning process for the use of electric buses”. *Journal of Intelligent Transportation Systems*, 23(3), 216-230, **2019**.
20. Cao, Z., **Ceder, A.**, Li, D., and Zhang, S. “Optimal synchronization and coordination of actual passenger-rail timetables”. *Journal of Intelligent Transportation Systems*. 23(3), 231-249, **2019**.
21. Cao, Z., **Ceder, A.**, Zhang, S. “Real-time schedule adjustments for autonomous public transport vehicles”. *Transportation Research Part C*, 109, 60-78, **2019**.
22. Qi, G., **Ceder, A.**, Zhang, Z., Guan, W., Liu, D. “New method for predicting long-term travel time of commercial vehicles to improve policy-making processes”. *Transportation Research Part A*, 145, 132-152, **2020**.
23. Liu, T. and **Ceder, A.** “Battery-electric transit vehicle scheduling with optimal number of stationary chargers”. *Transportation Research Part C*, 114, 118-139, **2020**.
24. **Ceder, A.** and Jiang, Y. “Route guidance ranking procedures with human perception consideration for personalized public transport service”. *Transportation Research Part C*, 118, 102667, **2020**. <https://doi.org/10.1016/j.trc.2020.102667>
25. **Ceder, A.** “Urban mobility and public transport: future perspectives and review”, *International Journal of Urban Sciences*, 25(4), 455-479, **2021**. <https://doi.org/10.1080/12265934.2020.1799846>
26. Jiang, J., **Ceder, A.** “Incorporating Personalization and Bounded Rationality into Stochastic Transit Assignment Model”. *Transportation Research Part C*, 127, 103127, **2021**. <https://doi.org/10.1016/j.trc.2021.103127>
27. **Ceder, A.** “Syncing sustainable urban mobility with public transit policy trends based on global data analysis”. *Scientific Reports*, 11, 14597, **2021**. <https://www.nature.com/articles/s41598-021-93741-4>
28. Lee, K., Jiang, Y., **Ceder, A.**, Dauwels, J., Su, R., Nielsen O-A. “Path-oriented synchronized transit scheduling using time-dependent data”. *Transportation Research Part C*, 136, **2022**. <https://doi.org/10.1016/j.trc.2021.103505>
29. Cao, Z., Zhang, S., **Ceder, A.** “Novel coupling–decoupling strategy for scheduling autonomous public transport vehicles in overcrowded corridors”. *Applied mathematical Modelling*, 106, 299-324, **2022**. <https://doi.org/10.1016/j.apm.2022.01.020>
30. **Ceder A.** “Sustainable urban mobility: Data-based insights for a future with only seamless public transport”. *Research Outreach*, 129, **2022** (invited article). DOI: [10.32907/RO-129-2525679977](https://doi.org/10.32907/RO-129-2525679977)
31. He, D., **Ceder, A.**, Zhang, W., Guan, W., and Qi, G. “Optimization of rural bus service integrated with e-commerce delivery guided by a new sustainable policy in China”. *Transportation Research Part E*, 172, 103069, **2023**. <https://doi.org/10.1016/j.trc.2023.103069>
32. Wang, Y., **Ceder, A.**, Cao, Z., and Zhang, S. “Optimal public transport timetabling with autonomous-vehicle units using coupling and decoupling tactics”. *Transportmetrica A*, 2220423, **2023**. <https://doi.org/10.1080/23249935.2023.2220423>
33. Tang, C., Liu, J., **Ceder, A.**, Jiang, Y. “Optimisation of a new hybrid transit service with modular autonomous vehicles”. *Transportmetrica A: Transport Science*. 20(2), **2024**. <https://doi.org/10.1080/23249935.2023.2165424>
34. Feng, Y., **Ceder, A.**, Zhang, S., Cao, Z. “Bus routing fine-tuning for integrated network-based demand and bus bridging for disrupted railway system”. *Expert Systems With Applications (ESWA)*, 242, **2024**. <https://doi.org/10.1016/j.eswa.2023.122825>