Cristina Torres-Machi, Ph.D.

Assistant Professor and Beavers Professorship of Construction Engineering

University of Colorado Boulder

1111, Engineering Drive, Campus Box 428, Boulder, CO 80309-0428, United States
ORCID ID: 0000-0002-4334-4474 ◦ Scopus ID: 55622193900 ◦ Researcher ID: G-3210-2015
Phone: (+1) 303-735-4609 ◦ Email: cristina.torresmachi@colorado.edu

Education

Postdoctoral Studies

Dep. of Civil and Environmental Engineering, University of Waterloo, Canada	2016-2017

Advisor: Prof. Susan Tighe

Doctor of Philosophy (Dual Ph.D.)

Civil Engineering and Urban Planning, Polytechnic University of Valencia, Spain	2015
Engineering Science, Catholic University of Chile, Chile	

Advisors: Prof. Alondra Chamorro, Prof. Eugenio Pellicer, and Prof. Victor Yepes

Master of Science

Master of Science in Planning and Management in Civil Engineering, Polytechnic University of Valencia, Spain	2012

Advisors: Prof. Eugenio Pellicer, and Prof. Victor Yepes

Bachelor of Science

Civil Engineering, Polytechnic University of Valencia, Spain	2008

Professional Experience

Assistant Professor

Dep. of Civil, Environmental and Architectural Engineering, University of Colorado, Boulder, USA	2017-present

Research Associate

Dep. of Civil and Environmental Engineering, University of Waterloo, Canada	2016-2017

Assistant Professor

Dep. of Construction Engineering, Polytechnic University of Valencia, Spain	2011-2016

Research Assistant

Dep. of Eng. and Construction Management. Catholic University of Chile, Chile	2012-2015

Structural Engineer

CMD Domingo y Lázaro Ingenieros, S.L. Valencia, Spain	2009-2011

Assistant Site Manager

Dragados, S.A. Valencia, Spain	2007-2009

Awards, Recognitions & Scholarships

◦ Ross B. Corotis Engineering Endowment (2022 – current)
◦ Beavers Professorship of Construction Engineering (2021 – current)
◦ Frontiers of Engineering, US-EU Symposium Participant, National Academies of Engineering (2022)
◦ Early Career Award, Dept. Civil, Environmental, and Architectural Eng., CU Boulder (2022)
◦ Erasmus + KA107 mobility grant for short exchange at Polytechnic University of Valencia (2021)
◦ Outstanding Reviewer, ASCE Journal of Infrastructure Systems (2020)
◦ Young Resilience Fellowship, 4TU Centre for Resilience Engineering, The Netherlands (2020)

◦ Faculty Success Grant, LEAP (Leadership Education for Advancement & Promotion), CU Boulder (2019)
◦ ASCE Excellence in Civil Eng. Education (ExCEEd) Teaching Fellowship (2019)
◦ PhD Excellence Award, Polytechnic University of Valencia, Spain (2017)
◦ Abertis International Award on Transportation Research, Barcelona, Spain (2016)
◦ Abertis National Award on Transportation Research, Santiago, Chile (2016)
◦ PhD Excellence Award, Catholic University of Chile, Chile (2016)
◦ Best Paper Award, 10th Annual Inter-University Symposium on Infrastructure Management (2014)
◦ PhD Scholarship for International Students, National Commission for Scientific and Technological Research (CONICYT), Santiago, Chile (2013-2015)
◦ Ibero-American Grant for Young Professors and Researchers, Santander Universities (Santander Bank), Madrid, Spain (2012-2015)

Publications

Underline denotes Torres-Machi's student advisee (Primary Advisor or Co-Advisor)
*Denotes student Torres-Machi advised (non-primary advisor)
†Denotes Torres-Machi's PhD Advisor

Peer-Reviewed Journal Articles Published

[J34] Evers, E.; **Torres-Machi, C.** (2024) Impacts of Increased Prediction Accuracy in Management Decisions: A Study on Full Depth Reclamation Pavements. *Journal of Infrastructure Systems.* 30(1), ID 04023037, DOI: 10.1061/JITSE4.ISENG-2400.

[J33] Montalban-Domingo, L.; **Torres-Machi, C.**; Sanz-Benlloch, A.; Pellicer, E.†; Molenaar, K. (2023) Green Public Procurement in Civil Infrastructure Construction: Current Performance and Main Project Characteristics. *Journal of Construction Engineering and Management*, 149(9), ID 04023089, DOI: 10.1061/JCEMD4.COENG-13502.

[J32] Bashar, M.; **Torres-Machi, C.** (2023) Machine Learning to Enhance the Management of Highway Pavements and Bridges. *Infrastructure Asset Management, special issue 'Contemporary factors, challenges and opportunities around digital aspects of civil infrastructure project and asset management'.*, DOI: 10.1680/jinam.22.00031.

[J31] Bashar, M.; **Torres-Machi, C.** (2023) Quantifying the Value of Satellite-Based Pavement Monitoring in Partially Observable Stochastic Environments. *Journal of Computing in Civil Engineering*, 37(3): 04023004. DOI: 10.1061/JCCEE5/CPENG-5108

[J30] Valles-Valles, D.; **Torres-Machi, C.** (2023) Deterioration of Flexible Pavements Induced by Flooding: Case Study Using Stochastic Monte Carlo Simulations in Discrete-Time Markov Chains. *Journal of Infrastructure Systems*, 29(1): 05022009. DOI: 10.1061/JITSE4/ISENG-2109

[J29] Bashar, M.; **Torres-Machi, C.** (2022) Deep Learning for Estimating Pavement Roughness using Synthetic Aperture Radar Data. *Automation in Construction*, 142, 104504, DOI: 10.1016/j.autcon.2022.104504

[J28] Montalban-Domingo, L.; García-Segura, T.; Sanz-Benlloch, A.; Pellicer, E.†; **Torres-Machi, C.**; Molenaar, K. (2022) Assessing Corporate Social Responsibility in Public-Works Procurement: Data Envelopment Analysis-Benefit of the Doubt Approach. *Environmental Impact Assessment Review*, 96: 106844, DOI: 10.1016/j.eiar.2022.106844

[J27] Seites-Rundlett, W.; Corotis, R.; **Torres-Machi, C.** (2022) Development of a Protocol for Engineering Applications of Evidence Theory. Submitted to: *ASCE-ASME Journal of Risk and Uncertainty in Engineering Systems, Part A: Civil Engineering,* 8(3): 04022036, DOI: 10.1061/AJRUA6.0001241.

[J26]   Seites-Rundlett, W.; Bashar, M.; **Torres-Machi, C.**; Corotis, R. (2022) Combined Evidence Model to Enhance Pavement Condition Prediction from Highly Uncertain Sensor Data. *Reliability Engineering & System Safety*, 217, 108031, DOI: 10.1016/j.ress.2021.108031

[J25]   Santos, J.; **Torres-Machi, C.**; Morillas, S.; Cerezo, V. (2022) A fuzzy logic expert system for selecting optimal sustainable life cycle maintenance and rehabilitation strategies for road pavements. *International Journal of Pavement Engineering*, 23(2), 425-437, DOI: 10.1080/10298436.2020.1751161.

[J24]   Gaikwad, S.*; Calahorra-Jimenez, M.; Molenaar, K.; **Torres-Machi, C.** (2021) Challenges in Engineering Estimates for Best-Value Design-Build Projects: An Analysis of Bid-Dispersion in US Highway Projects. *Journal of Construction Engineering and Management,* 147(7), 04021065, DOI: 10.1061/(ASCE)CO.1943-7862.0002104. [1]

[J23]   Bashar, M.; **Torres-Machi, C.** (2021) Performance of Machine Learning Algorithms in Predicting Pavement International Roughness Index. *Transportation Research Record: Journal of the Transportation Research Board,* 2675(5) 226–237, DOI: 10.1177/0361198120986171.

[J22]   Calahorra-Jimenez, M.; **Torres-Machi, C.;** Chamorro, A.†; Alarcon, L.F.; Molenaar, K. (2021) The Importance of Non-Cost Criteria Weighting in Best-Value Design-Build U.S. Highway Projects. *Journal of Management in Engineering*, 37(4), 04021027. DOI: 10.1061/(ASCE)ME.1943-5479.0000912.

[J21]   Tracy, A.*; Javernick-Will, A.; **Torres-Machi, C.** (2021) Human-Induced or Natural Hazard? Factors Influencing Perception of Actions to be Taken in Response to Induced Seismicity. *International Journal of Disaster Risk Reduction*, 57, 102186, DOI: 10.1016/j.ijdrr.2021.102186

[J20]   Beesam, V.; **Torres-Machi, C.** (2021) Input Parameters for the Mechanistic-Empirical Design of Full Depth Reclamation Projects: Aligning Predicted and Actual Deterioration. *Transportation Research Record: Journal of the Transportation Research Board*, 2675(11), 384-396, DOI: 10.1177/03611981211017916

[J19]   Calahorra-Jimenez, M.; Molenaar, K.; **Torres-Machi, C.;** Chamorro, A.†; Alarcon, L.F. (2020) Structured Approach for Best-Value Evaluation Criteria: US Design-Build Highway Procurement. *Journal of Management in Engineering*, 36(6), 04020086, DOI: 10.1061/(ASCE)ME.1943-5479.0000857.

[J18]   Calahorra-Jimenez, M.; Alarcon, L.F.; **Torres-Machi, C.**; Chamorro, A.†; Molenaar, K. (2020) Improving cost performance in design-bid-build road projects by mapping the reasons for cost overruns into the project phases, *Revista de la Construccion (Journal of Construction)*, 19(2), 334-345, DOI: 10.7764/RDLC.19.2.334

[J17]   Ballent, W.; Corotis, R.; **Torres-Machi, C.** (2020) Dempster-Shafer Theory Applications in Post-Seismic Structural Damage and Social Vulnerability Assessment. *Sustainable and Resilient Infrastructure*, 5(4), 201-213, DOI: 10.1080/23789689.2019.1583488

[J16]   Seites-Rundlett, W.; Garcia-Bande E.; Alvarez-Mingo, A.; **Torres-Machi, C.**; Corotis, R. (2020) Social Indicators to Inform Community Evacuation Modeling and Planning. *ASCE-ASME Journal of Risk and Uncertainty in Engineering Systems, Part A: Civil Engineering*, 6(3):03120001, DOI:10.1061/AJRUA6.0001069.

[J15]   Sutrisna, M.; Pellicer, E.†; **Torres-Machi, C**; Picornell, M. (2020) Exploring Earned Value Management in the Spanish Construction Industry as a Pathway to Competitive Advantage. *International Journal of Construction Management*, 20(1), 1-12*.* DOI: 10.1080/15623599.2018.1459155

---

[1] Editor's choice paper

[J14] <u>Ballent, W.</u>; Corotis, R.; **Torres-Machi, C.** (2019) Representing Uncertainty in Civil Engineering with Dempster Shafer (Evidence) Theory. *Sustainable and Resilient Infrastructure*, 4(4), 137-151. DOI: 10.1080/23789689.2018.1542213

[J13] **Torres-Machi, C.**; Nasir, F.; Achebe, J.; Saari, R.; Tighe, S. (2019) Sustainability Evaluation of Pavement Technologies through Multicriteria Decision Techniques. *Journal of Infrastructure Systems (ASCE)*, 25(3), 04019023.[2]

[J12] **Torres-Machi, C.**; Osorio-Lird, A.; Godoy, P.; Chamorro, A.†; Mourgues, C.; Videla, C. (2018) Sustainable Management Framework for Transportation Assets: Application to Urban Pavement Networks. *KSCE Journal of Civil Engineering*, 22(10), 4095–4106. DOI: 10.1007/s12205-018-1314-x

[J11] **Torres-Machi, C.**; Osorio-Lird, A.; Chamorro, A.†; Videla, C.; Tighe, S.; Mourgues, C. (2018) Impact of environmental assessment and budgetary restrictions in pavement maintenance decisions: Application to an urban network. *Transportation Research Part D: Transport and Environment*, 59, 192-204. DOI: 10.1016/j.trd.2017.12.017.

[J10] Osorio-Lird, A.; Chamorro, A.†; Videla, C.; Tighe, S.; **Torres-Machi, C.** (2018) Application of Markov Chains and Monte Carlo Simulations for Developing Pavement Performance Models for Urban Network Management. *Structure and Infrastructure Engineering,* 14(9), 1169-1181*.* DOI: 10.1080/15732479.2017.1402064.

[J9] **Torres-Machi, C.**; Pellicer, E.†; Yepes, V.†; Chamorro, A.† (2017) Towards a Sustainable Optimization of Pavement Maintenance Programs under Budgetary Restrictions. *Journal of Cleaner Production*, 148, 90-102. DOI: 10.1016/j.jclepro.2017.01.100.

[J8] Barreto, U.; Pellicer, E.†; Carrión, A.; **Torres-Machi, C.** (2017). Barriers to the Professional Development of Qualified Women in the Peruvian Construction Industry. *Journal of Professional Issues in Engineering Education and Practice*, 143(4), 05017002. DOI: 10.1061/(ASCE)EI.1943-5541.0000331.

[J7] Picornell, M.; Pellicer, E.†; **Torres-Machi, C.**; Sutrisna, M. (2017). Implementation of Earned Value Management in Unit-Price Payment Contracts. *Journal of Management in Engineering*, 33(3), 06016001. DOI: 10.1061/(ASCE)ME.1943-5479.0000500.

[J6] Yepes, V.†; **Torres-Machi, C.**; Chamorro, A.†; Pellicer, E.† (2016) Optimal Pavement Maintenance Programs Based on a Hybrid Greedy Randomized Adaptive Search Procedure Algorithm. *Journal of Civil Engineering and Management*, 22(4), 540-550. DOI: 10.3846/13923730.2015.1120770.

[J5] **Torres-Machi, C.**; Chamorro, A.†; Yepes, V.†; Pellicer, E.†; Videla, C. (2015) Sustainable Pavement Management: Integrating Economic, Technical and Environmental Aspects in Decision Making. *Transportation Research Record: Journal of the Transportation Research Board*, 2523, 56-63.

[J4] **Torres-Machi, C.**; Chamorro, A.†; Yepes, V.†; Pellicer, E.† (2014) Current Models and Practices of Economic and Environmental Evaluation for Sustainable Network-Level Pavement Management. *Revista de la Construccion,* 13(2), 49-56. DOI: 10.4067/S0718-915X2014000200006.

[J3] **Torres-Machi, C.**; Chamorro, A.†; Videla, C.; Pellicer, E.†; Yepes, V.† (2014) An Iterative Approach for the Optimization of Pavement Maintenance Management at the Network Level. *Scientific World Journal,* Volume 2014, ID 524329. DOI: 10.1155/2014/524329.

[J2] **Torres-Machi, C.**; Yepes, V.†; Alcalá, J.; Pellicer, E.† (2013). Optimization of High-Performance Concrete Structures by Variable Neighborhood Search. *International Journal of Civil Engineering*, 11(2), 90-99.

---

[2] Editor's choice paper

[J1]   **Torres-Machi, C.**; Carrión, A.; Yepes, V.†; Pellicer, E.† (2013). Employability of Graduate Students in Construction Management. *Journal of Professional Issues in Engineering Education and Practice ASCE*, 139(2), 163-170, DOI: 10.1061/(ASCE)EI.1943-5541.0000139.

Peer-Reviewed Journal Articles Submitted

[JS1]   Contreras, F.; **Torres-Machi, C.** Methodology to Quantify Traffic Resilience: An Application on Communities Impacted by Flooding. Submitted to: *Transportation Research Part C.* Submission: December 2023.

Working Papers

[WP1]   Seites-Rundlett, W.; **Torres-Machi, C.**; Corotis, R. (2022) Influence of Social Demographics on Evacuation Traffic Using Mobile Location Data. Target journal: *International Journal of Disaster Risk Reduction.* Submission: Spring 2024.

[WP2]   Frey, M.; Williams, S.; **Torres-Machi, C.**; and Srubar, W. Fresh-State Properties and Biodeterioration Resistance of Sustainable Alternative Asphalt Binders from Agar. Target journal: *TBD*. Expected submission: Spring 2024.

[WP4]   Evers, E.; Baker. K.; **Torres-Machi, C.** Impacts of Power Failure on Traffic Patterns: A Time Series Approach to Crowdsourced Location Data. Target journal: *Transportation Research Part C.* Submission: Summer 2024.

[WP5]   Saftner, D.; Palomo, M.; Fleischmann, C.; Ozis, F.; **Torres-Machi, C.** Participants' perception remote ExCEEd. Target journal: *Journal of Civil Engineering Education.* Expected submission: Summer 2024.

[WP6]   Crayton, L.; **Torres-Machi, C.** Does pavement recycling compromise long-term performance? A comparative analysis of Full Depth Reclamation and mill and overlay. Target journal: *Transportation Research Record: Journal of the Transportation Research Board.* Expected submission: Summer 2024.

Research Reports and Other Work

[RR4]   Frey, M; **Torres-Machi, C.**; Srubar, W. (2023) Agar-Based Binders for Use in Pavement Applications. Colorado Department of Transportation.

[RR3]   **Torres-Machi, C.;** Bashar, M. (2022) Condition Assessment of Ancillary Roads from High-Resolution Aerial Imagery. Minnesota Department of Transportation.

[RR2]   Molenaar, K.; **Torres-Machi, C.** (2020) Efficiency Study of Design-Build Program. South Carolina Department of Transportation, Report No. FHWA-SC-20-05.

[RR1]   **Torres-Machi, C.**; Beesam, V.; Galotti, V. (2020) Residual Strength of Full-Depth Reclamation. Colorado Department of Transportation, Report No. CDOT-2020-09.

Book Chapters

[B3]   Calahorra-Jimenez, M.; Molenaar, K.; **Torres-Machi, C**. (2023) Correcting the Fallacy in Best-Value Competitive Procurements for Design-Build Highway Projects. Book chapter 8 in: *Building a Body of Knowledge in Construction Project Delivery, Procurement and Contracting.* DOI: https://doi.org/10.1142/11952

[B2]   Montalban-Domingo, L.; **Torres-Machi, C.**; Sanz-Benlloch, A.; Pellicer, E.† (2021) *Chapter 18: How are sustainability criteria Included in the public procurement process?* in "Project Management and Engineering Research, Lecture Notes in Management and Industrial Engineering". Edited by Ayuso Munoz et al., Springer Nature, Switzerland. Springer, 253-262. DOI: 10.1007/978-3-030-54410-2_18

[B1]   Chamorro, A.†; Videla, C.; Mourgues, C.; Tighe, S.; Gillmore, R.; Osorio, A.; **Torres-Machi, C.**; Godoy, P.; Alzamora, M. (2017) Chapter 8: *Socio-economic evaluation of urban pavement*

networks in "Contributions to the Current System for the Social Evaluation of Projects" (Benefit-Cost Evaluation) / Aportes al Actual Sistema de Evaluación Social de Proyectos". Edited by de Solminihac, H.; Gonzales, L.E., Centro Latinoamericano de Politicas Economicas y Sociales Clapes UC. Santiago, Chile.

Peer-Reviewed Conference Proceedings Submitted or Accepted

[CS2]   Seites-Rundlett, W.; Corotis, R.; **Torres-Machi, C.** (2024) Reliability of Mobile Location Data and the Influence of Social Demographics on Evacuation Traffic. *18th World Conference of Earthquake Engineering,* Milan, Italy. Submission: October 2023.

[CS1]   Curtis, S.; Montagu, J.; Crozier, C.; **Torres-Machi, C.;** Baker, K. (2024) Trends in Equitable Electric Vehicle Adoption and Impacts on Pavement Condition and Electric Power Infrastructure. *ASCE Construction Research Congress (CRC 2024)*, Des Moines, Iowa. Organized by: American Society of Civil Engineers (ASCE). Submitted: May 2023. *Accepted.*

Peer-Reviewed Conference Proceedings Published

[C49]   Frey, M.; Williams, S.; **Torres-Machi, C.**; Srubar, W. (2023) Biobased Alternative Binders from Agar for Civil Engineering Applications: Thermal, Biodeterioration, and Moisture Sorption Properties. 5th International Conference on Bio-Based Building Materials (ICBBM-2023), RILEM Bookseries, 45, 665-675. DOI: 10.1007/978-3-031-33465-8_51

[C48]   Shorey, M.; Bashar, M.; **Torres-Machi, C.** Computer Vision for Infrastructure Health Monitoring: Automated Detection of Pavement Rutting from Street-Level Images. *ASCE International Conference on Computing in Civil Engineering (ASCE i3ce)*. Organized by: American Society of Civil Engineers (ASCE). Submitted: March 2023. *Accepted.*

[C47]   Contreras, F.; **Torres-Machi, C.** Impacts of Flooding on Traffic Functionality from Crowdsourced Location Data. *ASCE International Conference on Computing in Civil Engineering (ASCE i3ce)*. Organized by: American Society of Civil Engineers (ASCE). Submitted: March 2023. *Accepted.*

[C46]   Eli Evers, Atithi Shrestha, Erick Garcia, Haechan Cho, Mohammad Z. Bashar, **Cristina Torres-Machi**, Kunhee Choi, Hwasoo Yeo, Yunlong Zhang. Prediction of Rutting Depth using Random Forest Methods in Full-Depth Reclamation Asphalt Pavements. *Joint conference ASCE Construction Research Congress and Canadian Society of Civil Engineering*. Submitted: February 2023. *Accepted.*

[C45]   **Torres-Machi, C.**; Bielefeldt, A.; Lv, Q. (2022) Work in Progress: The Strategic Importance of Data Science in Civil Engineering: Encouraging Interest in the Next Generation. *2022 ASEE Conference*, Minneapolis, MN, USA, June 26-30, https://peer.asee.org/40713. Organized by: American Society Engineering Education (ASEE).

[C44]   Estes, A.; Salyards, K.; Saviz, C.; Clayton, P.; Davis, J.; Fleischmann, C.; Nilsson, T.; Omur-Ozbek, P.; Ozis, F.; Palomo, M.; Rodak, C.; Rutherford, C.; **Torres- Machi, C.**; Coward, D.; Nolen, L. (2022) ASCE's Response to the Pandemic: Execution of a Remote ExCEEd Teaching Workshop. *2022 ASEE Conference*, Minneapolis, MN, USA, June 26-30, pp. 108-115. Organized by: American Society Engineering Education (ASEE).

[C43]   Bashar, M.; **Torres-Machi, C.** (2022) Exploring the Capabilities of Optical Satellite Imagery to Evaluate Pavement Condition. *Construction Research Congress (CRC 2022)*, Arlington, VA, USA, March 9-12, pp. 108-115. Organized by: American Society of Civil Engineers (ASCE).

[C42]   Metayer, G.; **Torres-Machi, C.**; Bastias, A. (2020) A Proposed Framework for the Integrated Management of Municipal Infrastructure. *Construction Research Congress (CRC 2020)*, Tempe, Arizona, USA, March 8-10, pp. 846-855. Organized by: American Society of Civil Engineers (ASCE).

[C41]   Santos, J.; **Torres-Machi, C.;** Morillas, S.; Cerezo, V. (2020) Multiple objective optimization of sustainable pavement maintenance and rehabilitation strategies: a clustering procedure for

selecting preferred Pareto optimal solutions. *Transportation Research Arena (TRA2020)*, Helsinki, Finland, April 27 - 30. Organized by: Transport Research Arena. Conference cancelled.

[C40]   Calahorra, M.; **Torres-Machi, C.**; Molenaar, K. (2020) Information Exchange in the Procurement Process of Design-Build Transportation Projects: Digging into the What, the When, the Who, and the How. *Transportation Research Board 99th Annual Meeting*, Washington, D.C., January 12-16. Organized by: Transportation Research Board of the National Academies.

[C39]   Bashar, M.; **Torres-Machi, C.** (2020) Artificial Intelligence in Transportation Asset Management: Current Practice, Challenges, and Opportunities. *Transportation Research Board 99th Annual Meeting*, Washington, D.C., January 12-16. Organized by: Transportation Research Board of the National Academies.

[C38]   Calahorra, M.; **Torres-Machi, C.**; Molenaar, K. (2020) Alignment between Project Goals and Evaluation Criteria in Best-Value Procurement. *Transportation Research Board 99th Annual Meeting*, Washington, D.C., January 12-16. Organized by: Transportation Research Board of the National Academies.

[C37]   Galotti, V.; **Torres-Machi, C.** (2019) Local Calibration of Stiffness Modulus for Full-Depth Reclamation Design. *2019 International Airfield and Highway Pavements Conference*, Chicago, IL, USA, July 21-24, pp. 255-262. Organized by: American Society of Civil Engineers (ASCE). DOI: 10.1061/9780784482452.025

[C36]   Santos, J.; **Torres-Machi, C.;** Morillas, S.; Cerezo, V. (2019) Sustainable Evaluation of Optimal Pavement Maintenance and Rehabilitation Strategies Using a Fuzzy Logic System. *Transportation Research Board 98th Annual Meeting*, Washington, D.C., January 13-17. Paper 19-1227. Organized by: Transportation Research Board of the National Academies.

[C35]   Ballent, W.; Corotis, R.; **Torres-Machi, C.** (2018) Belief and Basic Evidence Theory for Combining Expert Seismic Risk Assessments. *U.S. National Conference on Earthquake Engineering (11 NCEE)*, June 25-29, Los Angeles, California. Organized by: Earthquake Engineering Research Institute.

[C34]   Serra, J.R.; **Torres-Machi, C.**; Garcia-Segura, T.; Montalban-Domingo, L.; Pellicer, E.† (2018) Challenges and needs in sustainable management of urban infrastructure. *XXII International Congress on Project Management and Engineering*, July 11-13, Madrid, Spain, pp. 525-435. Organized by: Asociación Española de Dirección e Ingeniería de Proyectos (AEIPRO).

[C33]   Serra, J.R.; Guaita, B.; **Torres-Machi, C.**; Pellicer, E.† (2018) Design and feasibility of an urban pavement management system for the city of Valencia, Spain. *Construction Research Congress (CRC 2018)*, April 2-5, New Orleans, Louisiana, USA, pp. 476-485. Organized by: American Society of Civil Engineers (ASCE). DOI: 10.1061/9780784481295.048.

[C32]   **Torres-Machi, C.**; Achebe, J.; Tighe, S. (2017) Evaluating Innovative Pavement Sustainability Tools for Pavement Management. *International Conference on Maintenance and Rehabilitation of Constructed Infrastructure Facilities (MAIREINFRA)*, July 19 - 21, Seoul, South Korea. Organized by: International Society for Maintenance and Rehabilitation of Transportation Infrastructures.

[C31]   Alyami, Z.; Nahidi, S.; **Torres-Machi, C.**; Tighe, S. (2017) Cross-Asset Management for Transportation Infrastructure Systems. *CSCE Annual Conference and Annual General Meeting*, May 31 – June 3, Vancouver, Canada. Organized by: Canadian Society for Civil Engineering.

[C30]   Osorio-Lird, A.; **Torres-Machi, C.**; Godoy, P.; Chamorro, A.; Mourgues, C.; Tighe, S.; Videla, C. (2017) Development of an Urban Pavement Management System. *World Conference on Pavement and Asset Management, WCPAM 2017,* June 12-16, Milan, Italy. Organized by: Politecnico di Milano.

[C29]   Liu, Q.; **Torres-Machi, C.**; Zhong, J.; Pickel, D.; Chen, Y.; Tighe, S.L. (2017) Field Monitoring and Analysis of the Early Performance of Unbonded Concrete Overlay Using Strain Gauge Readings. *World Conference on Pavement and Asset Management, WCPAM 2017,* June 12-16, Milan, Italy. Organized by: Politecnico di Milano.

[C28]   Montalban, L.; Sanz, A.; **Torres-Machi, C.**; Pellicer, E.† (2016) Procurement and Delivery Methods Applied to Infrastructure Operation and Maintenance: An International Review. *VII Encuentro Latinoamericano de Gestión y Economía de la Construcción (Elagec2016)*, November 15-18, Bogota, Colombia. 417-426. Organized by: Universidad de los Andes, Colombia. ISBN: 978-958-48-0212-5.

[C27]   Osorio, A.; **Torres-Machi, C.**; Godoy, P.; Chamorro, A.†; Mourgues, C.; Tighe, S.; Videla, C. (2016) Desarrollo de un Sistema de Gestión de Pavimentos Urbanos. *12° Congreso Internacional PROVIAL*, August 8-12, Valparaiso, Chile.

[C26]   Casapino, M.A.; Pellicer, E.†; **Torres-Machi, C.**; Ballesteros-Pérez, P. (2016) Análisis de los Procesos de Licitación Pública del Sector de la Construcción en el Perú. *XX Congreso Internacional de Dirección e Ingeniería de Proyectos (AEIPRO)*, July 13-15, Cartagena, Spain, pp. 731-743. Organized by: Asociación Española de Dirección e Ingeniería de Proyectos (AEIPRO). ISBN: 978-84-617-4180-9.

[C25]   Carbajal, P.M.; Pellicer, E.†; Santos-Fonseca, S.; **Torres-Machi, C.**; Ballesteros-Pérez, P. (2019) Planning and Control of Civil Engineering Works in Peru: Current State and Improvement Proposal. In J. L. Ayuso Muñoz, J. L. Yagüe Blanco, & S. F. Capuz-Rizo (Eds.), *Project Management and Engineering Research – AEIPRO 2017*, pp. 51–65. Springer International Publishing.

[C24]   Yepes, V.†; Segado, S.; Pellicer, E.†; **Torres-Machi, C.** (2016) Acquisition of competences in a master degree in construction management. *Proceedings of the 10th International Technology, Education and Development Conference INTED 2016*, March 7-9, Madrid, Spain, pp. 718-727. Organized by: International Academy of Technology, Education and Development (IATED). ISBN: 978-84-608-5617-7.

[C23]   **Torres-Machi, C.**; Pellicer, E.†; Sierra, L.A.; Sanz, A. (2016) Integration of transversal competences acquisition in a master course in project management. *Proceedings of the 10th International Technology, Education and Development Conference INTED 2016*, March 7-9, Madrid, Spain, pp. 621-627. Organized by: International Academy of Technology, Education and Development (IATED). ISBN: 978-84-608-5617-7.

[C22]   **Torres-Machi, C.**; Osorio, A.; Godoy, P.; Chamorro, A.†; Mourgues, C.; Videla, C.; Tighe, S. (2016) Incorporating Sustainability into Pavement Asset Management: Application to an Urban Network. *Transportation Research Board 95th Annual Meeting*, Washington, D.C., January 10-14. Paper 16-6277. Organized by: Transportation Research Board of the National Academies.

[C21]   Sanz, A.; Lozano, A.; **Torres-Machi, C.**; Pellicer, E.† (2015) Teaching occupational risk prevention for undergraduate courses in civil engineering. *Proceedings of the 9th International Technology, Education and Development Conference INTED 2015*, March 2-4, Madrid, Spain, pp. 4971-4976. Organized by: International Academy of Technology, Education and Development (IATED). ISBN: 978-84-606-5763-7.

[C20]   **Torres-Machi, C.**; Dahan, A.; Yepes, V.†; Pellicer, E.† (2015) Comparative study of employability between Spanish and French students in civil engineering. *Proceedings of the 9th International Technology, Education and Development Conference INTED 2015*, March 2-4, Madrid, Spain, pp. 5060-5067. Organized by: International Academy of Technology, Education and Development (IATED). ISBN: 978-84-606-5763-7.

[C19]   **Torres-Machi, C.**; Chamorro, A.†; Pellicer, E.†; Yepes, V.† (2014) Optimizacion heuristica para la gestion de infraestructuras: Aplicacion a una red de pavimentos urbanos en Chile. *11º Congreso Internacional Provial*, Valdivia, Chile, Oct. 20-24.

[C18]   **Torres-Machi, C.**; Chamorro, A.†; Pellicer, E.†; Yepes, V.† (2014) Sustainable pavement management: How to integrate economic, technical and environmental aspects in decision-making. *10th Annual Inter-University Symposium on Infrastructure Management*, Virginia, USA, June 20-21.[3]

[C17]   **Torres-Machi, C.**; Yepes, V.†; Pellicer, E.†; Chamorro, A.† (2014) Application of simple and hybrid local search heuristics for the long-term optimization of pavement maintenance strategies at the network level. *Transportation Research Board 93rd Annual Meeting*, Washington, D.C., January 12-16. Paper 14-2247. Organized by: Transportation Research Board of the National Academies.

[C16]   **Torres-Machi, C.**; Pellicer, E.†; Yepes, V.†; Picornell, M. (2013). Impact of the economic crisis in construction: a perspective from graduate students. 2nd Cyprus International Conference on Educational Research – CY-ICER 2013, *Procedia - Social and Behavioral Sciences*, *89*, 640-645. DOI:10.1016/j.sbspro.2013.08.908. ISSN: 1877-0428.

[C15]   **Torres-Machi, C.**; Pellicer, E.†; Yepes, V.†; Chamorro, A.† (2013). Heuristic Optimization Model for Infrastructure Asset Management. Congreso de la Asociación Española de Inteligencia Artificial (CAEPIA 2013), *Advances in Artificial Intelligence*, September 17-20, Madrid, Spain, pp. 300-309. Organized by: Asociación Española para la Inteligencia Artificial. ISBN 978-3-642-40642-3.

[C14]   **Torres-Machi, C.**; Chamorro, A.; Videla, C.; Pellicer, E.†; Yepes, V.† (2013) Optimization and prioritization methods for pavement network management. *Transportation Research Board 92nd Annual Meeting*, Washington, D.C., January 13-17. Paper 13-5057. Organized by: Transportation Research Board of the National Academies.

[C13]   **Torres-Machi, C.**; Yepes, V.†; Pellicer, E.†; Chamorro, A. (2013) Modelo de optimización para la gestion del mantenimiento de una infraestructura de edificacion. 2º Congreso Nacional – La enseñanza de las matematicas en Ingenieria de Edificacion, Valencia, Spain, July 18-19, pp. 323-332. Organiza: Universitat Politècnica de València. ISBN: 978-84-8363-992-4.

[C12]   **Torres-Machi, C.**; Sanz, A.; Pellicer, E.†; Catalá, J. (2013). A course in civil engineering projects adapted to ABET's accreditation. *Proceedings of the 7th International Technology, Education and Development Conference INTED 2013*, March 4-6, Valencia, Spain, pp. 6554-6561. Organized by: International Academy of Technology, Education and Development (IATED). ISBN: 978-84-616-2661-8.

[C11]   Sutrisna, M.; Pellicer, E.†; Picornell, M.; **Torres-Machi, C.** (2012) Analyzing the potential application of the earned value management (EVM) in the Spanish construction industry - an initial review of the dataset. *I Australasia and South-East Asia Structural Engineering and Construction Conference (ASEA-SEC). Research, Development, and Practice in Structural Engineering and Construction*, Nov. 28 - Dec. 2, pp. 1003-1008, Perth, Australia. DOI: 10.3850/978-981-08-7920-4 CPM-15-0257. Organized by: International Structural Engineering and Construction Society. ISBN: 978-981-07-3677-4.

[C10]   Sutrisna, M.; Pellicer, E.†; **Torres-Machi, C.**; Picornell, M. (2012) Enabling implementation of earned value management in the Spanish construction industry. *RICS International Legal Research Symposium (COBRA 2012)*, Sept. 11-13, Las Vegas, USA. Organized by: Royal Institution of Chartered Surveyors (United Kingdom). ISBN: 978-1-84219-840-7.

---

[3] Best presentation award

[C9] Sutrisna, M.; Pellicer, E.†; **Torres-Machi, C.**; Picornell, M. (2012) A proposed methodology for studying the potential application of earned value management in construction projects in Spain. *CIB International Management of Construction Research to Practice (MCRP) Conference*, June 26-29, pp. 799-809, Montreal, Canada. Organized by: International Council for Research and Innovation in Building and Construction. ISBN: 978-2-9813355-1-7.

[C8] **Torres-Machi, C.**; Pellicer, E.†; Yepes, V.†; Picornell, M. (2012). Excelencia e innovacion en el proceso de aprendizaje del proceso proyecto-construccion en la ingenieria civil. *IX Foro Internacional sobre la Evaluación de la Calidad de la Investigación y de la Educación Superior (FECIES).* Santiago de Compostela, Spain, June 12-15, pp. 296-300. Organized by: Universidad de Granada. ISBN: 978-84-695-6734-0.

[C7] Picornell, M.; Yepes, V.†; Pellicer, E.†; **Torres-Machi, C.** (2012). El estudio de caso como estrategia didactica y de coordinacion de competencias entre asignaturas de un posgrado de gestion en ingenieria civil. *IX Foro Internacional sobre la Evaluacion de la Calidad de la Investigacion y de la Educacion Superior (FECIES).* Santiago de Compostela, Spain, June 12-15, pp. 256-260. Organized by: Universidad de Granada. ISBN: 978-84-695-6734-0.

[C6] **Torres-Machi, C.**; Yepes, V.†; Alcalá, J.; Pellicer, E.† (2013). Integracion de investigacion y docencia de posgrado a traves del diseño eficiente de estructuras. *Modelling in Science Education and Learning*, 6(3), 89-100. ISSN: 1988-3145. Presented at: *III Jornadas de Modelizacion Matematica*, June 7-8, Gandia, Spain. Organized by: Universitat Politecnica de Valencia. DOI: 10.4995/msel.2013.1986

[C5] Carrión, A.; **Torres-Machi, C.**; Yepes, V.†; Pellicer, E.† (2012) Gaps that impede construction graduates entering the Spanish labour market. *Proceedings of the 6th International Technology, Education and Development Conference INTED 2012*, March 5-7, Valencia, Spain, pp. 5616-5625. Organized by: International Academy of Technology, Education and Development (IATED). ISBN: 978-84-615-5563-5.

[C4] Yepes, V.†; Picornell, M.; **Torres-Machi, C.**; Pellicer, E.† (2012). Motivation of postgraduate students enrolled in a master degree in construction management. *Proceedings of the 6th International Technology, Education and Development Conference INTED 2012*, March 5-7, Valencia, Spain, pp. 5626-5633. Organized by: International Academy of Technology, Education and Development (IATED). ISBN: 978-84-615-5563-5.

[C3] **Torres-Machi, C.**; Pellicer, E.†; Yepes, V.†; Picornell, M. (2012). Habilidades demandadas por el mercado laboral para los profesionales de la construccion. *XVI Congreso Internacional de Ingenieria de Proyectos*, July 11-13, Valencia, Spain. pp. 2368-2398. Organized by: Asociación Española de Dirección e Ingeniería de Proyectos (AEIPRO). ISBN: 978-84-616-0047-2.

[C2] Picornell, M.; Pellicer, E.†; Sutrisna, M.; **Torres-Machi, C.** (2012). La gestion de proyectos en las empresas constructoras: estado del arte y tendencias actuales. *XVI Congreso Internacional de Ingenieria de Proyectos*, July 11-13, Valencia, Spain. pp. 163-174. Organized by: Asociación Española de Dirección e Ingeniería de Proyectos (AEIPRO). ISBN: 978-84-616-0047-2.

[C1] **Torres-Machi, C.**; Pellicer, E.†; Yepes, V.†; Eaton, D. (2011). An evaluation of an international academic exchange programme in construction management. *Proceedings IV Encuentro Latino-Americano de Gestión y Economía de la Construcción ELAGEC*, pp. 68, October 4-5, Santiago, Chile. Organized by: Catholic University of Chile. ISBN: 978-956-14-1216-3.

Other Conference Presentations and Posters

[OC14] Contreras, F.; **Torres-Machi, C.** (2023) Traffic disruptions induced by flooding: An analysis of community resilience. *Transportation Resilience 2023*, Washington D.C., November 13-15. Organized by: Transportation Research Board of the National Academies.

[OC13] Contreras, F.; **Torres-Machi, C.** (2023) Quantifying transportation resilience to flooding: A focus on community mobility. Invited talk at *the National Conference on Transportation Asset Management*, Boston, July 8-12. Organized by: Transportation Research Board of the National Academies.

[OC12] Bashar, M.; **Torres-Machi, C.** (2023) Looking at the big picture: Opportunities and challenges of using satellite data in pavement condition evaluation. Invited talk at *the National Conference on Transportation Asset Management*, Boston, July 8-12. Organized by: Transportation Research Board of the National Academies.

[OC11] Seites-Rundlett, W.; **Torres-Machi, C.;** Corotis, R. (2023) Influence of Social Demographics on Evacuation Traffic Using Mobile Location Data. *Poster presented at 102nd Transportation Research Board Annual Meeting*, Washington D.C., Jan. 8-12. Organized by: Transportation Research Board of the National Academies.

[OC10] Evers, E.; Bashar, M.; **Torres-Machi, C.** (2023) Improving the Prediction of Full-Depth Reclamation Pavements' Performance using Random Forests. *Poster presented at 102nd Transportation Research Board Annual Meeting*, Washington D.C., Jan. 8-12. Organized by: Transportation Research Board of the National Academies.

[OC9] Bashar, M.; **Torres-Machi, C.** (2022) Road Surface Condition Assessment Using High Resolution Satellite Imagery. *11th International Conference on Managing Pavement Asset (ICMPA)*, Chicago, IL, June 7-10. Organized by: Transportation Research Board of the National Academies.

[OC8] Frey, M.; Williams, S.; **Torres-Machi, C.**; and Srubar, W. (2022) Exploring the Use of Agar as an Alternative for Petroleum-Based Asphalt Binders. *Transportation Research Board 101st Annual Meeting*, Washington, D.C., January 9-13. Paper TRBAM-22-00856. Organized by: Transportation Research Board of the National Academies.

[OC7] Bashar, M.; **Torres-Machi, C.** (2022) Quantifying the Value of Uncertain Satellite Data in Optimal Monitoring Strategies. *Poster presented at 101st Transportation Research Board Annual Meeting*, Washington D.C., Jan. 9-13. Organized by: Transportation Research Board of the National Academies.

[OC6] Frey, M.; Williams, S.; **Torres-Machi, C.**; and Srubar, W. (2021) Biobased Alternative Asphalt Binders from Agar: Baseline Properties and Future Directions. *2021 International Airfield and Highway Pavements Conference*, on-line, June 6-9. Organized by: American Society of Civil Engineers (ASCE).

[OC5] Bashar, M.; **Torres-Machi, C.** (2021) Quantifying the Value of Uncertain Satellite Data in Optimal Monitoring Strategies. *16th Annual Inter University Symposium on Infrastructure Management (AISIM)*, on-line, July 17-18. Organized by: University of Texas at Austin.[4]

[OC4] Seites-Rundlett, W.; Corotis, R.; **Torres-Machi, C.** (2021) Evidence Theory Extensions and Assumptions for Multiple Expert Opinions. *Engineering Mechanics Institute (EMI) Conference and Probabilistic Mechanics and Reliability Conference,* virtual event. May 25-28. Organized by: American Society of Civil Engineers (ASCE).

[OC3] Shorey, M.; Bashar, M.; **Torres-Machi, C**. (2021) Automated Detection of Rutting in Asphalt Pavements Using Street-Level Images. *National Conference on Undergraduate Research (NCUR)*, April 12-14. Organized by Council on Undergraduate Research.

[OC2] Seites-Rundlett, W.; Corotis, R.; **Torres-Machi, C.** (2020) Uncertainty Analysis for Decision-Making with Respect to Natural Hazards. *11th Forum on Engineering Decision Making* (IFED

---

[4] Best presentation award

2019), Dec 11-14, Manly, Australia. Organized by: International Forum on Engineering Decision Making.

[OC1]   Ballent, W.; Corotis, R.; **Torres-Machi, C.** (2018) Generalized Information Theory for Engineering and Sociological Risk Assessments. *10th Forum on Engineering Decision Making* (IFED 2018), May 6-9, Lake Louise, Canada. Organized by: International Forum on Engineering Decision Making.

Invited Professional Presentations

[P15]   Federico Santa Maria University, Chile, "Leveraging the power of data to inform optimal asset management decisions", *Seminar on Transportation Asset Management*, October 23, 2023.

[P14]   University of Delaware, "Deterioration Modeling", *Advanced Infrastructure Asset Management Bootcamp*, June 8, 2023.

[P13]   Iowa State University, "Evaluating Pavement Condition from the Space: Crazy or Worth it?", *Seminar on Infrastructure Asset Management*, April 7, 2023.

[P12]   Transportation Research Board Workshop on Leveraging Machine Learning and GIS for Roadway Data Collection, "SAR-C: A Machine Learning Tool to Estimate the Condition of Ancillary Roads from Satellite Data", *TRB 102th Annual Meeting*, Washington D.C., USA, January 8, 2023.

[P11]   University of Twente, The Netherlands, "Innovation for Resilient Infrastructure: Exploring the Value of Satellite Information in Pavement Condition Assessment", *Seminar on Sustainable Transportation Infrastructure*, October 18, 2022.

[P10]   Northwestern University Transportation Center. "Can Satellite Data be Used to Estimate Pavement Roughness?", *4th International Symposium on Infrastructure Asset Management*, June 4-5, 2022.

[P9]   Federal Highway Turner-Fairbank Highway Research Center. "Estimating Pavement Condition Using Synthetic Aperture Radar Data", *1st International Data Science for Pavements Symposium*, March 23, 2022.

[P8]   Polytechnic University of Valencia, Spain. "Innovative Approaches to Assess Infrastructure Condition", *Seminar on Maintenance Management*, November 9, 2021.

[P7]   Polytechnic University of Valencia, Spain. "Research Methods used in Construction Engineering and Management Research: Examples from the University of Colorado Boulder", *Master of Science in Planning and Management in Civil Engineering*, November 9, 2021.

[P6]   University of Delaware, "Deterioration Modeling", *Advanced Infrastructure Asset Management Bootcamp*, June 30, 2021.

[P5]   University of Texas at El Paso & Universidad de Piura, Peru, "Innovation for Resilient Infrastructure", *Summer 2020 – Global Sustainable Engineering and Leadership International Practices*, June 26, 2020.

[P4]   Transportation Research Board Workshop on Developing Performance Prediction Models, "Model Evaluation and Validation", *TRB 99th Annual Meeting*, Washington D.C., USA, January 12, 2020.

[P3]   Colorado State University, "Infrastructure Asset Management: Incorporating Long-Term Analysis in the Management of Infrastructure", Fort Collins, CO USA, Oct. 30, 2019.

[P2]   Inter-American Development Bank, "*Models for the Sustainable Management of Road Networks*", *Transportation Week on Technology in Low Traffic Roads*, Washington D.C., USA, September 24-25, 2019.

[P1]   Catholic University of Chile, "Multidimensional Approach in Decision-Making for Transportation Asset Management", *Seminar on Social Vulnerability in the Event of Natural Hazards*, Santiago, Chile, October 2018.

Research Support

Current

[R20]   Value and Potential of Satellite-Based Inspections to Inform Transportation Asset Management Decisions. PI Torres-Machi. *Minnesota Department of Transportation*. September 2023 – January 2025. $173,517 Total CU.

[R19]   Integrating geotechnical risk models in decision-making frameworks for resilient transportation infrastructure. PI Torres-Machi. *Interdisciplinary Research Theme in Resilient Infrastructure with Sustainability and Equity, Seed Grant College of Engineering and Applied Science CU Boulder*. April 2023 – June 2024. $12,000 Total CU.

[R18]   Graduate Assistance in Areas of National Need (GAANN): Resilient and Equitable Infrastructure through Inclusive Engineering. *Office of Postsecondary Education (OPE), US Department of Education*. PI Javernick-Will, Co-PIs: Liel, Kasprzyk, Thomas, Baker, Dashti. Senior Personnel: Linden, Torres-Machi, Livneh, MacDonald, and Corotis. August 2021 – August 2024. $1.1 million Total CU.

[R17]   EAGER Strengthening American Infrastructure: Understanding Social and Cultural Processes to Improve Transportation Infrastructure Planning. *National Science Foundation - Social, Behavioral, and Economic Sciences*. PI Van Boven, co-PI Torres-Machi. Sept. 2021 – Aug. 2024. $299,988 Total CU.

[R15]   Life-Cycle Cost and Sensitivity Analysis of Pavement Rehabilitation Alternatives: A Comparative Analysis of Full Depth Reclamation and Traditional Mill and Overlay. PI Torres-Machi. *Colorado Department of Transportation*. July 2021-December 2023. $90,000 Total CU.

[R14]   Novel Agar-Based Binder Materials for Use in Flexible Pavement Applications. PI Torres-Machi, co-PI Srubar. *Colorado Department of Transportation*. June 2021-December 2023. $83,000 Total CU.

[R13]   Graduate Assistance in Areas of National Need (GAANN): Integrative Reengineering of Infrastructure for Tomorrow's Communities. *Office of Postsecondary Education (OPE), US Department of Education*. PI Liel, Co-PIs: Baker, Cook, Dashti, Javernick-Will, Kasprzyk. Senior Personnel: Corotis, Srubar, Torres-Machi and Wham. September 2018 – August 2023. $1.2 million Total CU.

Submitted – Under Review

[RS1]   Efficient, Accessible, & Resilient Transportation for a Heathly Environment (EARTHE). PI Torres-Machi (CU Boulder), co-PIs: Dashti and Senseney (CU Boulder), Kockelman and Karner (U Texas at Austin), Sperling (National Renewable Energy Laboratory), Alipour (Iowa State Univ.), Dix (ICF International). *US Department of Transportation, Research Initiative on Climate Change and Transportation*. Jan. 2024 – Dec. 2024. $3.75M Total ($2.5M federal, $1.25M cost share), $2.4M total CU ($1.5M federal, $0.9M cost share).

[RS2]   Value of Machine Learning in Predicting Pavement Condition. PI Torres-Machi. *Colorado Department of Transportation*. May 2023 – May 2025. $134,000 Total CU.

Completed

[R12]   Condition Assessment of Ancillary Roads from High-Resolution Aerial Imagery. PI Torres-Machi. *Minnesota Department of Transportation*. December 2020 – June 2022. $93,126 Total CU.

[R11] Data analysis and civil engineering: Can we use smartphones and machine learning to learn about pavement deterioration? PI Torres-Machi, Co-PIs: Bielefeldt, Lv. *Interdisciplinary Research Theme in Engineering Education and Artificial Intelligence, Seed Grant College of Engineering and Applied Science CU Boulder*. December 2020 – August 2022. $11,558 Total CU.

[R10] Electric vehicle adoption and associated impacts on infrastructure and society. PI Baker, Co-PIs: Torres-Machi, Javernick-Will, Crozier. *Interdisciplinary Research Theme in Resilient Infrastructure with Sustainability and Equity, Seed Grant College of Engineering and Applied Science CU Boulder*. December 2020 – August 2021. $8,500 Total CU.

[R9] Efficiency Study of Design Build Program. *South Carolina Department of Transportation*. PI Molenaar, Co-PI Torres-Machi. March 2018 - December 2020. $262,440 Total CU.

[R8] Data Collection and Reduction of Strain Gauge Information. PI Torres-Machi. *Colorado Department of Transportation*. August 2018 - August 2020. $30,000 Total CU.

[R7] Residual Strength of Full-Depth Reclamation. *Colorado Department of Transportation*. PI Torres-Machi. April 2018 - June 2020. $145,000 Total CU.

[R6] Project-Based Learning Applied to an Undergraduate Course on Transportation Systems. *New Assistant Professor Program (NAPP) Course Development Grant*. PI Torres-Machi. June 2018 - July 2018. $4,000 Total CU.

[R5] Implementation of an Urban Pavement Management System (FONDEF VIU15E0077). *National Commission for Scientific and Technological Research (CONICYT), Chile.* PI: Osorio-Lird, Co-PI: Torres-Machi. Developed at the Catholic University of Chile. Dec. 2016 - Jan. 2018. $46,000 Total Catholic University of Chile.

[R4] Performance of Cold In-Place Recycling Techniques Using CIR and CIREAM. *Ministry of Transportation Ontario*. PI: Susan Tighe, Research Associate: Torres-Machi. Developed at the Centre for Pavement and Transportation Technology, University of Waterloo, Canada. Sept. 2016 - June 2017.

[R3] Performance Evaluation of High-Performance Asphalts. *Private contractor*. PI: Dr. Susan Tighe, Research Associate: Torres-Machi. Developed at the Centre for Pavement and Transportation Technology, University of Waterloo, Canada. Sept. 2016 - June 2017.

[R2] Effect of Warm Mix Additives on Tensile Strength of Compacted Asphalt Mix. *Ministry of Transportation Ontario*. PI: Susan Tighe, Research Associate: Torres-Machi. Developed at the Centre for Pavement and Transportation Technology, University of Waterloo, Canada. Sept. 2016 - June 2017.

[R1] Research and Development of Solutions for Urban Pavement Management in Chile (FONDEF D09I1018). *National Commission for Scientific and Technological Research (CONICYT), Chile*. PI: Videla, Research Assistant: Torres-Machi. Developed at the Catholic University of Chile. July 2012 - Jan. 2015. $1,060,000 Total Catholic University of Chile.

Teaching

New Course Development and Major Revisions

◦ Spring 2019, *CVEN 5836 Special Topics: Infrastructure Asset Management*, Graduate Elective, 3 credit hours. Created a new course for students focusing on infrastructure asset management. This course focuses on the fundamentals of infrastructure asset management, combining engineering principles, business practices, and economic theory to facilitate a more organized and logical approach to decision-making.

◦ Fall 2018, *CVEN 3602 Transportation Systems*, Undergraduate Elective, 3 credit hours. Redeveloped a course for students that introduces project-based learning as the teaching methodology. In the new course design, students work in groups to develop projects based on real-work scenarios.

Course Instruction at the University of Colorado Boulder, USA

Course Number	Course Name	Type of Class	Semesters	Number of Students
CVEN 3602	Transportation Systems	Undergraduate Elective	Fall 2023	10
			Fall 2022	10
			Fall 2021	13
			Fall 2020	25
			Fall 2019	23
			Fall 2018	20
			Fall 2017	19
CVEN 3227	Probability and Statistics in Civil Eng	Undergraduate Requirement	Spring 2023	106
AREN 4506	Pre-Construction Estimating & Scheduling	Undergraduate Elective	Spring 2022	34
			Spring 2021	15
			Spring 2020	21
CVEN 5446	Infrastructure Asset Management	Graduate Elective	Fall 2023	18
			Fall 2022	16
			Fall 2021	16
			Fall 2020	12
			Spring 2019	19

Course Instruction at the Polytechnic University of Valencia, Spain

Course Number	Course Name / Role (if other than main instructor)	Type of Class	Semesters	Number of Students
33538	Maintenance and Preservation of Structures *Co-Instructor*	Graduate Requirement	Spring 2016	64 Section 1
				14 Section 2
			Spring 2015	80 Section 1
				53 Section 2
12869	Infrastructure Maintenance Management *Co-Instructor*	Undergraduate Elective	Spring 2016	14
			Spring 2015	42
			Spring 2014	33
32261	Project Management *Co-Instructor*	Graduate Requirement	Fall 2016	40

Course Number	Course Name Role (if other than main instructor)	Type of Class	Semesters	Number of Students
12857	Finance and Management in Construction Firms *Co-Instructor*	Undergraduate Elective	Spring 2014	29
5606	Integrated Project Management	Undergraduate Elective	Fall 2012 Fall 2011	19 9
5340	Computer Methods Applied to Project Management	Undergraduate Elective	Spring 2013 Spring 2012	21 28

Other Instruction

◦ Assistant Mentor in Remote ExCEEd (Excellence in Civil Engineering Education) Teaching Workshop organized by ASCE. Summer 2021.

Student Advising

All titles shortened for brevity
*Collaborative Advisor; ''Co-Principal Advisor; [1]MS thesis option; [2]MS report option

Current Graduate Students – Principal Advisor (Final dates referred to expected graduation)

Contreras, Francisco	PhD	Mobility impacts of flooded pavements	2021 – 2025
Evers, Elijah	PhD*	TBD	2021 – 2025
Schmidt, Jonathan	PhD*	TBD	2022 – 2027
Rahman, Istiakur	PhD	Mobility impacts of flooded pavements	2023 – 2027

Former Graduate Students – Principal Advisor

Frey, Melissa	PhD*	Biopolymeric Binders in Civil Engineering	2019 – 2023
Seites-Rundlett, William	PhD*	Uncertainty and Social Aspects in Transportation	2019 – 2022
Bashar, Mohammad	PhD	New Technologies to Assess Pavement Condition	2019 – 2022
Calahorra, Maria	PhD*	Best-Value Procurement for Highways Projects	2018 – 2020
Beesam, Vignan	MS[1]	Mechanistic-Empirical Pavement Design	2018 – 2019
Ballent, Wendy J.	MS[1]''	Dempster-Shafer Theory Applications	2017 – 2018
Girish, Ashnil	MS[1]''	Management of Horizontal Asset Portfolios	2017
Guaita, Borja	MS[1]*	Benefits of Pavement Management, UPV	2015 – 2016
Serra, Jose R.	MS[1]*	Framework Urban Pavement Management, UPV	2015 – 2016

NOTE – UPV: students advised at the Polytechnic University of Valencia, Spain

Current Graduate Committee Participation (other than primary advisor)

Thallapureddy, Sreeja	PhD	Bias in construction accidents investigation	2022 – current
Galotti, Victor	PhD	Design-Build Risk Transfer and Project Harmony	2021 – current

Former Graduate Committee Participation (other than primary advisor)

Sagisi, Erin	MS[1]	Bearing Capacity in Airfield Pavements	Graduated 2023
Tucker, Joseph	MS[1]	Graphene Oxide Modified Asphalt Binders	Graduated 2023
Albalawi, Rakan	PhD	Multiskilling in the Construction Industry	Graduated 2023
Dicks, Evan	PhD	Risk identification and relationships	Graduated 2023
Goldwyn, Briar	PhD	Informal Construction	Graduated 2022
Oguz, Elif	PhD	Predicting Serious Injury and Fatalities	Graduated 2022
Salas, Rico	PhD	Evidence-Based Construction Safety	Graduated 2020

Tracy, Andrew	PhD	Community Networks for Induced Seismicity	Graduated 2020
Welfare, Katherine	PhD	Perceptions and the Human Factor Climate	Graduated 2020
Alruqi, Wael	PhD	Predicting Construction Safety Performance	Graduated 2019
Al-Haddad, Sara	PhD	Construction Eng. and Inspection Consultants	Graduated 2019
Gaikwad, Suraj	MS[1]	Engineering Estimates in Design-Build Hwy Projects	Graduated 2019
Nevett, Guillermo	PhD	Duration Estimators and Productivity Metrics	Graduated 2019
Therrien, Alan	MS[1]	Alternative Project Delivery Methods Performance	Graduated 2018

Undergraduate Research Advising

Crayton, Lisee	DLA	Life-Cycle Cost Analysis of Pavement Rehabilitation	2023 – current
Jirous, Scott	URA	Students Perception of Data Science	2020 – 2021
Shorey, Mark	DLA	Street Level Images for Pavement Condition	2019 – 2021
Adrianzen, Gustavo	DLA	Google Maps for Pavement Condition Assessment	2018 – 2019
Alvarez, Alejandra	IS*	Hurricane Transportation Evacuation	2018 – 2019
Garcia, Elena	IS*	Impact of Social Aspects on Evacuation Behavior	2018 – 2019
Zhou, Haoran	IS	Traffic Jams in Houston	2019
Kerrisk, Rebecca	IS	Traffic Jams in Houston	2019
Metayer, German	IS	Integrated Asset Management, Visiting student	2019

NOTE – DLA: Discovery Learning Apprenticeship Program; IS: Independent Study; URA: Undergraduate Research Assistant

Undergraduate Thesis Report Advising at the Polytechnic University of Valencia

Sebastia, Clio	BTR*	Industrial Construction for Recreational Use, UPV	Graduated 2016
Aparicio, Javier	BTR	Industrial Construction for Recreational Use, UPV	Graduated 2016
Escriche, Enric	BTR*	Urbanization Project, UPV	Graduated 2015
Gonzalez, Javier	BTR	Nuclear Waste Storehouse, UPV	Graduated 2014
Lara, Juan	BTR	Underground Parking Construction Project, UPV	Graduated 2014
Martinez, Alejandro	BTR	Gas Station Construction Project, UPV	Graduated 2014

NOTE – BTR: Bachelor's Thesis Report

Student Awards and Scholarships

Seites-Rundlett, William	TA Spalding award, CU Boulder	2022
Bashar, Mohammad	TA Spalding award, CU Boulder	2022
Bashar, Mohammad	Best presentation, Annual Symposium Inf. Mgt., U Texas Austin	2021
Calahorra, Maria	Abertis National Award on Transportation Research, Chile	2021
Bashar, Mohammad	Outstanding RA – Graduate & Professional Student Gov., CU Boulder	2021
Frey, Melissa	WTS Colorado – Helene M. Overly Memorial Scholarship	2021
Kerrisk, Rebecca	Ex-aequo First Prize Mathematical Competitive Game	2019
Zhou, Haoran	Ex-aequo First Prize Mathematical Competitive Game	2019

Service Activities

Committee Participation

National

- Vice-chair, Transportation Research Board (TRB) on Transportation Asset Management (AJE30) (2020 – present); member (2019 – present).
- Vice-chair of Executive Committee, ASCE Construction Research Conference, Construction Institute (Summer 2023 – present); previously served as secretary (2022 – summer 2023).
- Vice-chair, ASCE Infrastructure Systems, Transportation & Development Institute (2019 – 2022); member (2017 – present).

- ◦ Committee Member, Transportation Research Board (TRB) on Pavement Management Systems (AKT10) (2017 – present).
- ◦ Member of ASCE Construction Research Council (2018 – present)
- ◦ Member of the American Society of Civil Engineers (ASCE) (2018 – present)
- ◦ WTS International: Advancing Women in Transportation (2018 – present)

College

- ◦ College-wide Engineering Proposal Review Committee (EPRC), College of Engineering and Applied Science, University of Colorado Boulder (Spring 2020 – current).
  - Internal review AB Nexus Research Collaboration Grant Program (Fall 2020)

Department

- ◦ Member of Search Committee, Tenured/Tenure-track faculty in Construction Engineering and Management, Department of Civil, Environmental, and Architectural Engineering, University of Colorado Boulder (Fall 2022 – Spring 2023).
- ◦ Graduate Committee, Programs and Students, Department of Civil, Environmental, and Architectural Engineering, University of Colorado Boulder (Fall 2021 – present).
- ◦ Group Representative, Construction Engineering and Management, Department of Civil, Environmental, and Architectural Engineering, University of Colorado Boulder (Fall 2022 – present).
- ◦ Computer Committee, Department of Civil, Environmental, and Architectural Engineering, University of Colorado Boulder (Fall 2020 – Spring 2022).
- ◦ Graduate Committee, Recruiting and Admissions, Department of Civil, Environmental, and Architectural Engineering, University of Colorado Boulder (Fall 2018 – Spring 2022).
- ◦ CEAE Faculty Search Sub-Committee to assist in campus-wide faculty search, Department of Civil, Environmental, and Architectural Engineering, University of Colorado Boulder (Fall 2020 – Spring 2021).
- ◦ Search Committee, Instructor faculty in Construction Engineering and Management, Department of Civil, Environmental, and Architectural Engineering, University of Colorado Boulder (Fall 2019).

Conference Session Chair

Transportation Research Board

- ◦ 2023 Transportation Asset Management National Conference, Organized by the Transportation Research Board, Boston USA, Session co-Chair in session "*TAM Competition: Innovative Approaches in Transportation Asset Management: Ideas from the Next Generation of Asset Managers*".
- ◦ 2020 Transportation Research Board Annual Meeting, Washington DC, USA, Session Chair in "*Session 1171 - Pavement Management Optimization and Cost Assessment*".
- ◦ 2020 Transportation Research Board Annual Meeting, Washington DC, USA, Session Chair in "*Session 1171 - Pavement Management Optimization and Cost Assessment*".
- ◦ 2019 Transportation Research Board Annual Meeting, Washington DC, USA, Session Chair in "*Session 1671 - Pavement Management Performance Prediction*"

American Society of Civil Engineers

- ◦ 2023 ASCE International Conference on Computing in Civil Engineering (i3CE 2023), American Society of Civil Engineers, Oregon State University, Session Chair in "*Infrastructure Analysis and Maintenance*" and "*Artificial Intelligence*".
- ◦ 2020 ASCE Construction Research Congress, Tempe, Arizona, USA, Co-chair of Track in Project and Organizational Management and Planning, including Lean Construction.

◦ 2019 International Conference on Transportation & Development, American Society of Civil Engineers, Alexandria, Virginia, Session Chair in "*Asset Management in the Era of Smart Cities*" and "*Infrastructure Systems Resiliency and Interdependencies*".
◦ 2018 ASCE Construction Research Congress, New Orleans, LA, USA, Technical Committee & Session Chair

Others

◦ 2016 Elagec, VII Encuentro Latinoamericano de Gestion y Economia de la Construccion, Bogota, Colombia, Scientific Committee

Workshop and Proposal Panels

National Science Foundation

◦ Panel reviewer "Humans, Disasters, and the Built Environment (HDBE)", 2023
◦ Panel reviewer "Strengthening American Infrastructure (SAI)", 2023
◦ Panel reviewer "Strengthening American Infrastructure (SAI)", 2022
◦ Panel reviewer "Civil Infrastructure Systems (CIS)", 2021
◦ Panel reviewer "Small Business Innovation Research (SBIR)", 2020
◦ Panel reviewer "Civic Innovation Challenge (CIVIC)", 2020 and 2021
◦ Ad-hoc review "Humans, Disasters, and the Built Environment (HDBE)" Program, 2020.

National Cooperative Highway Research Program (NCHRP)

◦ National Cooperative Highway Research Program (NCHRP) Project 08-137 "*Digital Enhancements and Content for the AASHTO Transportation Asset Management Guide*". 2021-current
◦ Transportation Asset Management Strategic Action Planning Workshop. Organized by National Cooperative Highway Research Program (NCHRP) Project 20-123(01). Oct. 17-18, 2019. Irvine, CA, USA.
◦ National Cooperative Highway Research Program (NCHRP) Project 02-27 "*Making Targets Matter: Effective Practices by Transportation Agencies to Establish, Monitor and Adjust Performance Targets*". 2017-2022

Internal CU Boulder

◦ New Assistant Professor Program. New Course Development Grants. CU Boulder. April 2019
◦ Undergraduate Research Opportunities Program. CU Boulder. March 2018

Others

◦ External Evaluator of Research Initiation Grants (Fondecyt Iniciacion), National Research and Development Agency, Government of Chile. July 2022.
◦ Technical Paper Judging. ASCE student conference, Rocky Mountain Regional Competition. April 2019

Journal Review

◦ Automation in Construction
◦ Journal of Infrastructure Systems (ASCE)
◦ Journal of Construction Engineering & Management (ASCE)
◦ Transportation Research Part C: Emerging Technologies
◦ International Journal of Pavement Engineering
◦ Structure and Infrastructure Engineering
◦ Transportation Research Record
◦ Journal of Traffic and Transportation Engineering
◦ Journal of Performance of Constructed Facilities (ASCE)

- ◦ Infrastructure Asset Management
- ◦ Canadian Journal Civil Engineering
- ◦ Resources, Conservation & Recycling
- ◦ Journal of Cleaner Production
- ◦ Revista Ingenieria de la Construccion
- ◦ Revista de la Construcción
- ◦ Sustainability

Professional Development

- ◦ Participant in Game Changer Academies (CGCA) organized by the Civil, Mechanical and Manufacturing Innovation (CMMI) Division of the National Science Foundation. December 2022 – May 2023.
- ◦ Panel member in "Thriving in the First Year: What I wish I had Known". Panel organized by CU Boulder Faculty Affairs. September 2022. 2 hours.
- ◦ Participant in ExCEEd (Excellence in Civil Engineering Education) Teaching Workshop organized by ASCE. Summer 2019. 40 hrs.
- ◦ Faculty Success Program, National Center for Faculty Development & Diversity. Summer 2019. 60 hrs
- ◦ Leadership Education for Advancement and Promotion (LEAP) program. Jan. 8-9, 2019. 14 hours
- ◦ FTEP 2018 Summer Assessment Institute: Achieving Course Goals and Gathering Evidence about Student Learning. June 4-8, 2018. 35 hrs
- ◦ Using Evidence-Based Practices in the Classroom, Performing Educational Research, and Writing Strong Grant Proposals – Navigating through the New Instructor Zone. ASEE Conference at CU Boulder, March 25, 2018. 3 hrs
- ◦ Time management. Organized by the Faculty Teaching Excellence Program from CU Boulder and facilitated by Martha Hanna. Sept. 25, 2017. 1.5 hrs
- ◦ Intro to RIO. Sept. 15, 2017. 1.5 hrs
- ◦ Proposal budgeting 101. Oct. 25, 2017. 1.5 hrs
- ◦ Principal Investigator Academy, Fall 2017 Lunch Panel Discussion. Sept. 25, 2017. 1.5 hrs
- ◦ Communicating the Impact of Faculty Research, Scholarship and Creative Work. May 16, 2018. 1.5 hrs
- ◦ Navigating Resources for Research, Scholarship and Creative Work at CU. Sept. 7, 2018. 1.5 hrs
- ◦ Finding Funding. Oct. 26, 2018. 1.5 hrs
- ◦ Early Career Investigator Opportunities. Nov. 12, 2018. 1.5 hrs

Languages

- ◦ Spanish: Native
- ◦ French: Proficient User