BABEȘ-BOLYAI UNIVERSTY

FACULTY OF POLITICAL, ADMINISTRATIVE AND COMMUNICATION SCIENCES

DOCTORAL SCHOOL IN ADMINISTRATION AND PUBLIC POLICIES

Doctoral Thesis

EVALUATION OF THE ACTIVITY AND NEEDS OF THE BABEȘ-BOLYAI UNIVERSITY VEHICLE FLEET SERVICE FOR THE PURPOSE OF DESIGNING AN EFFICIENCY OPTIMIZATION PROGRAM

– SUMMARY –

SCIENTIFIC COORDINATOR:

Dr. Raluca-Ioana ANTONIE, Associate Professor

DOCTORAL STUDENT:

Oliviu STOICA

Cluj-Napoca

2025

TABLE OF CONTENTS OF THE DOCTORAL THESIS

Public administration has undergone an unprecedented development, increasingly taking on responsibilities in areas not traditionally under its purview—mobility being one of them. The way we move (in the broad sense of the word) is increasingly becoming a matter of public accountability. The current thesis is grounded in the idea that public institutions are duty-bound to develop and implement solutions that meet the emerging changes in mobility. This necessitates an evaluation framework for transport services and the design of a program to increase their efficiency. That was the overarching perspective guiding this doctoral thesis, in a context in which mobility is undergoing profound transformations.

Chapter I explores the concept of strategic management in relation to the transportation sector. It presents not only the most relevant aspects related to the concept, but its practical utility as well. It explains that transportation, as a continuously expanding domain, is strongly influenced by two main forces: legislation and economic aspects. Both of these so-called forces are presented in detail, using legal texts and statistical data. This first chapter of the thesis also addresses digitalization in transportation, which exerts specific pressures on public administration and is closely linked to "clean," "green," and "electric" transportation.

Chapter II deals extensively with the topic of public sector evaluation, which is actually the central topic of the thesis. Evaluation is essential as it determines the degree and quality of project implementation and its impact. This chapter draws on academic literature to argue that evaluation should be scientifically grounded—both *ex-ante* and *ex-post*—to ensure objectivity and credibility. It also highlights that while evaluations should be based on evidence: "information-based" (Kononenko & Bratko, 1991), "evidence-based" (Sanderson, 2003) or "fact-based" (Xue et al., 2025), public perceptions must not be ignored, as they reflect important sensitivities. The chapter outlines major paradigms in public sector evaluation, including the *cost-benefit* analysis, while advocating for a broader assessment spectrum that incorporates economic development, environmental impact, political and governmental factors, international interactions, safety, and infrastructure. A comparative multi-criteria evaluation framework is also presented.

Research shows that transport not only is influenced by, but also significantly influences the economy, environment, and society. Interestingly, many projects underestimate indirect costs that are less visible at first glance. The thesis presents key evaluation indicators for transport, such as sustainability, vehicle life cycles, and socio-economic development.

Chapter III details the research methodology, based on a case study of the Vehicle Fleet Service at Babeș-Bolyai University (UBB). The central Research Question is: *How can the activity of UBB's Vehicle Fleet Service be optimized?* The empirical analysis includes evaluating the operations of the service and designing a program to improve it. The research employs a mixed-methods approach using both quantitative (e.g., surveys on perceptions of green mobility, statistical data from UBB archives) and qualitative methods (e.g., content analysis of interviews with representatives from other university fleets).

Chapter IV starts with a historical overview of UBB's fleet service, based on archival documents dating back to 1968. I complemented this historical perspective with a content analysis of the Strategic Plans that have guided the development of Babeș-Bolyai University between 2008 and 2024. The importance that UBB assigns to its own transport services has become increasingly evident—both in the documents analyzed and in the actual evolution of its vehicle fleet. In this section, I also assessed the needs of UBB's vehicle fleet based on the data collected. Subsequently, I conducted a comparative analysis of the fleet management services of a number of Romanian universities. The case studies include the vehicle fleets of the *Technical University of Cluj-Napoca*, the *West University of Timișoara*, the *"Grigore T. Popa" University of Medicine and Pharmacy in Iași*, the *"Ion Ionescu de la Brad" University of Life Sciences in Iași*, the *"Gheorghe Asachi" Technical University of Iași*, and *Babeș-Bolyai University in Cluj-Napoca*. Vehicle fleets represent a crucial component in the operational mechanisms of these universities, ensuring not only the mobility of people and goods, but also organizational flexibility.

Chapter V addresses another central aspect of this thesis, namely: the assessment of the university vehicle fleet's needs, employing a SWOT analysis (also testing the scenario of introducing vehicle leasing) and a sociological perspective. As such, this chapter examines public perceptions of mobility, including attitudes towards so-called "traditional" public transport (with carbon-emitting vehicles), low-emission vehicles, hybrid vehicles, and fully electric vehicles. For

this purpose, I analyzed an original dataset (*N = 2,527*) collected online, offering insights into how the public perceives developments in transport, with particular emphasis on the social potential of green mobility. The analyzed data revealed a somewhat surprising finding: in Romania, green mobility appears to be a topic with significant potential for social polarization. Although until relatively recently it was considered an almost unanimously accepted solution for reducing pollution and combating climate change, green mobility no longer enjoys a homogeneous public perception. The data used in this chapter suggest that the transition to a more sustainable transport system may generate tensions between different population segments. There is a category of individuals who reject the shift toward electric vehicles; nevertheless, the trend toward sustainability in transport persists, fluctuating in line with levels of support for the European Union.

Building on all of these results, ***Chapter VI*** presents a program design aimed at improving the efficiency of university fleet operations, along with an evaluation framework for assessing the efficiency of a university fleet. This framework was developed with the intention of having broad applicability, extending beyond the institution serving as the case study for the current thesis. The program design follows an integrated approach, offering a proposal that meets both *administrative needs* - enhancing the process of collecting service requests - and *user needs*, enabling requests to be submitted as easily as possible. The design includes both the back-end and front-end components, developed in collaboration with specialists from the *Information and Communications Technology Directorate* of Babeș-Bolyai University. Additionally, I developed an evaluation framework for assessing the efficiency of a vehicle fleet, which includes a set of indicators. As shown in Figure 1 (below), these indicators are grouped into two categories: one referring to the *operational component* (reflecting a more traditional approach) and the other to the so-called *green component*, examining how the number of eco-friendly vehicles can contribute to optimizing fleet expenditures (with references also to the digitalization of requests).

Indicator	Indicator components	Efficiency
Operational component	**Fuel**	$$C = \left(\frac{\text{value of expenses for fuel}}{\text{total value of operational expenses}} \right) \times 100$$
	Vehicle insurance	$$A = \left(\frac{\text{cost of vehicle insurance}}{\text{total value of operational expenses}} \right) \times 100$$
	Repairs and maintenance	$$R = \left(\frac{\text{value of expenses for vehicle repairs}}{\text{total value of operational expenses}} \right) \times 100$$
"Green" component	**Acquisition of 'green' vehicles**	$$V = \frac{(E \times 50\%)}{N}$$
	Digitalization of requests	*Elimination of documents in physical format*

Figure 1. Model of evaluation indicators for improving the efficiency of university vehicle fleets.

The ***Conclusions*** of this thesis look towards the future: evaluation programs for transport services will very likely need to take into account the development of predictive models for aligning transport supply/capacity with the demand coming from staff and goods transportation. At the same time, the strategic management of transport - even at the level of university vehicle fleets - will most likely need to develop the ability to integrate alternative transport options, at least for those users (even if currently rather limited in number) interested in such solutions, who are more sophisticated or demanding, particularly in the context of projects that align with the concept of a "smart city". Similarly, for individuals who, for various reasons (disability, certain health conditions etc.), will require personalized transport solutions (Stark & Gebhardt, 2025). Moreover, recent academic literature indicates that transport systems are strongly shifting toward "user-centric" models, and the future seems to hold the emergence of "super-applications" ("super-apps") that will become valuable not only from a governance perspective but also as an option for organizational development (Weiss & Hasselwander, 2025). Other studies urge us to consider the potential benefits and challenges of human-robot interaction, including the emergence of autonomous vehicles ("self-driving cars") with open navigation routes, which are increasingly used across various sectors and which - beyond transport efficiency - raise significant debates around trust in such systems (Holden et al., 2020; Zilahy & Mester, 2024).

The overarching ambition driving this scientific endeavor, concentrated in the current doctoral thesis, has had a dual dimension: on the one hand, an eminently scientific one; on the other hand, a professional one. My hope is that it can bring at least a modest contribution to improving university transport services - within Babeș-Bolyai University and beyond - so that the beneficial effects will be felt both at the administrative level (internal environment) and in the way that employees, institutional partners, and society at large (external environment) interact with these services.

SELECTIVE BIBIOGRAPHY

1. Albuquerque, F. D., Maraqa, M. A., Chowdhury, R., Mauga, T., &Alzard, M. (2020). Greenhouse gas emissions associated with road transport projects: current status, benchmarking, and assessment tools. *Transportation Research Procedia*, 48, 2018-2030.
2. Ansell, C., Sørensen, E., &Torfing, J. (2023). Public administrationandpoliticsmeetturbulence: The search for robust governanceresponses. *Public Administration*, *101*(1), 3-22.
3. Antonie R. (2013), *Evaluarea programelor*, Editura Tritonic Books, București.
4. Antonov, A. A. (2020). Digitization of processes of sea freight transportation. National Aviation University. https://er.nau.edu.ua/items/b776ad94-1ff8-46f3-8cbe-65ec55727393
5. Baba, Cătălin (2002). ”O nouă interacțiune cu mediul social-economic”, în Baba, Cătălin, Gorun, Adrian (editori). *Politici publice. Opțiuni ale dezvoltării unei democrații durabile*. Presa Universitară Clujeană, Cluj-Napoca.
6. Balogun, B., & Křížová, M. (2024). The varieties of European colonialism in Central and Eastern Europe: The Polish and the Czech Cases. *Interventions*, 1-19.
7. Bănică, A., Eva, M., & Iațu, C. (2019). Perceptions of green and smart urban transport issues in Romanian cities: A preliminary exploratory analysis. *Territorial Identity and Development*, 4(2), 58-75.
8. Baranauskienė, J. (2024). Evaluation of Public Projects in the Light of Sustainability. *Management Theory and Studies for Rural Business and Infrastructure Development*, 46(2), 174-182.
9. Belamkar, S., & Das, P. (2021). An Empirical SWOT analysis on passenger automobile leasing service with special focus on Indian Market. *International Journal of Advances in Engineering and Management (IJAEM)*, 3(1), 457-460.
10. Bilyalova, A., Vaslavskaya, I., Guskova, M., Egorova, L., & Khalturin, R. (2020, October). Digital Technologies in Transport Industry. In *International Conference on ComprehensibleScience* (217-226). Cham: Springer International Publishing.

11. Browne, D., & Ryan, L. (2011). Comparative analysis of evaluation techniques for transport policies. *Environmental Impact Assessment Review*, 31(3), 226-233.
12. Brunner, H., Hirz, M., Hirschberg, W., &Fallast, K. (2018). Evaluation of various means of transport for urban areas. *Energy, Sustainability and Society*, 8(1), 1-11.
13. Bruun, E., &Vanderschuren, M. (2017). Assessment methods from around the world potentially useful for public transport projects. *Journal of Public Transportation*, 20(2), 103-130.
14. Bryson, J. M., Berry, F. S., & Yang, K. (2010). The state of public strategic management research: A selective literature review and set of future directions. *The American review of public administration*, 40(5), 495-521.
15. Bueno, P. C., Vassallo, J. M., & Cheung, K. (2015). Sustainability assessment of transport infrastructure projects: A review of existing tools and methods. *Transport reviews*, 35(5), 622-649.
16. Colantone, I., Di Lonardo, L., Margalit, Y., & Percoco, M. (2024). The political consequences of green policies: Evidence from Italy. *American Political Science Review*, *118*(1), 108-126.
17. Degan, G., Braidotti, L., Marinò, A., & Bucci, V. (2021). LCTC ships concept design in the North Europe- Mediterranean transport scenario focusing on intact stability issues. *Journal of Marine Science and Engineering*, 9(3), 278.
18. Dobbs, M., Gravey, V., & Petetin, L. (2021). Driving the European Green Deal in turbulent times. *Politics and Governance*, *9*(3), 316-326.
19. Echeverría, L., Gimenez-Nadal, J. I., & Molina, J. A. (2022). Green mobility and well-being. *Ecological Economics*, 195, 107368.
20. Folęga, P., & Burchart-Korol, D. (2017). Environmental assessment of road transport in a passenger car using the life cycle approach. *Transport Problems*, 12.
21. Gavrilidis, A. A., Popa, A. M., Nita, M. R., Onose, D. A., & Badiu, D. L. (2020). Planning the "unknown": Perception of urban green infrastructure concept in Romania. *Urban Forestry & Urban Greening*, *51*, 126649.
22. Goldman, T., Gorham, R. (2006). Sustainable urban transport: Four innovative directions. *Technology in society*, 28(1-2).

23. Golzar, J., Noor, S., & Tajik, O. (2022). Convenience sampling. *International Journal of Education & Language Studies*, *1*(2), 72-77.
24. Govindan, K., Rajendran, S., Sarkis, J., & Murugesan, P. (2015). Multi criteria decision making approaches for green supplier evaluation and selection: a literature review. *Journal of cleaner production*, 98, 66-83.
25. Grechan, A., Kompanets, K., Bezuglyi, A., &Hroza, A. M. (2020). Strategic development and ensuring competitiveness of transport companies in the context of market digitization. *International Journal of Management (IJM)*, 11(6), 1124-1133.
26. Gubernat, R., & Rammelt, H. P. (2021). "Vrem o ţară ca afară!": How Contention in Romania Redefines State-Building through a Pro-European Discourse. *East European Politics and Societies*, 35(1), 247-268.
27. Hagaseth, M., Rødseth, Ø. J., Krogstad, T., &Bakke, M. (2023). A new architectural framework for digitalization of maritime Intelligent transport systems. *TransNav: International Journal on Marine Navigation and Safety of Sea Transportation*, 17(4): 769-780. DOI: 10.12716/1001.17.04.02
28. Hancock, L., & Nuttman, S. (2014). Engaging higher education institutions in the challenge of sustainability: sustainable transport as a catalyst for action. *Journal of cleaner production*, *62*, 62-71.
29. Haustein, S., & Hunecke, M. (2013). Identifying target groups for environmentally sustainable transport: assessment of different segmentation approaches. *Current Opinion in Environmental Sustainability*, 5(2), 197-204.
30. Haustein, S., & Nielsen, T. A. S. (2016). European mobility cultures: A survey-based cluster analysis across 28 European countries. *Journal of Transport Geography*, *54*, 173-180.
31. Hinţea, Călin Emilian (2007). *Management public*. Editura Accent, Cluj-Napoca.
32. Huang, H., De Smet, Y., Macharis, C., & Doan, N. A. V. (2021). Collaborative decision-making in sustainable mobility: identifying possible consensuses in the multi-actor multi-criteria analysis based on inverse mixed-integer linear optimization. *International Journal of Sustainable Development & World Ecology*, *28*(1), 64-74.

33. Hunold, C. (2005). Green political theory and the European Union: the case for a non-integrated civil society. *Environmental politics*, 14(3), 324-343.
34. Illahi, U., &Mir, M. S. (2020). Development of indices for sustainability of transportation systems: A review of state-of-the-art. *Ecological Indicators*, 118, 106760.
35. Jadhav, B., Kulkarni, A., Khang, A., Kulkarni, P., & Kulkarni, S. (2025). Beyond the horizon: Exploring the future of artificial intelligence (ai) powered sustainable mobility in public transportation system. In *Driving Green Transportation System Through Artificial Intelligence and Automation: Approaches, Technologies and Applications* (pp. 397-409). Cham: Springer Nature Switzerland.
36. Jiang, H., Lin, P., & Qiang, M. (2016). Public-opinion sentiment analysis for large hydro projects. *Journal of Construction Engineering and Management*, 142(2), 05015013.
37. Joumard, R., & Nicolas, J. P. (2010). Transport project assessment methodology within the framework of sustainable development. *Ecological Indicators*, 10(2), 136-142.
38. Kabeyi, M. (2019). Organizational strategic planning, implementation and evaluation with analysis of challenges and benefits. *International Journal of Applied Research and Studies*, *5*(6), 27-32.
39. Kafel, T., &Zięb icki, B. (2021). Dynamics of theevolution of the strategic management concept: Fromtheplanningschooltotheneostrategicapproach. *Journal of Entrepreneurship, Management andInnovation*, *17*(2), 7-28.
40. Kang, E., & Hwang, H. J. (2021). Ethical conducts in qualitative research methodology: Participant observation and interview process. *Journal of Research and Publication Ethics*, *2*(2), 5-10.
41. Karlsson, I. C. M., Mukhtar-Landgren, D., Smith, G., Koglin, T., Kronsell, A., Lund, E., ... & Sochor, J. (2020). Development and implementation of Mobility-as-a-Service–A qualitative study of barriers and enabling factors. *Transportation Research Part A: Policy and Practice*, *131*, 283-295.
42. Kepaptsoglou, K., Meerschaert, V., Neergaard, K., Papadimitriou, S., Rye, T., Schremser, R., & Vleugels, I. (2012). Quality management in mobility management: a

scheme for supporting sustainable transportation in cities. *International Journal of Sustainable Transportation*, *6*(4), 238-256.

43. Keseru, I., Bulckaen, J., & Macharis, C. (2016). The multi-actor multi-criteria analysis in action for sustainable urban mobility decisions: the case of Leuven. *International Journal of Multicriteria Decision Making*, *6*(3), 211-236.
44. Klophaus, R. (2025). AI-generated SWOT analysis of emerging technologies in air transportation: Potential and limitations. *Research in Transportation Business & Management*, *59*, 101316.
45. Knill, C., & Tosun, J. (2020). *Public policy: A new introduction*. Bloomsbury Publishing.
46. Kumar, R., Mishra, R. K., Chandra, S., & Hussain, A. (2021). Evaluation of urban transport-environment sustainable indicators during Odd–Even scheme in India. *Environment, Development and Sustainability*, 23, 17240-17262.
47. Lazăr D. T., Inceu A. M. (2000), *Managementul financiar al comunităţilor locale*, Editura Gewalt, Cluj-Napoca.
48. Lukács, József, Sabău, Claudia,Septimia (2023)*, Patrimoniul arhitectural al Universităţii Babeş-Bolyai. O incursiune în istorie oraşului*, Centrul de Studii Transilvane, Cluj-Napoca.
49. Macharis, C., & Bernardini, A. (2015). Reviewing the use of Multi-Criteria Decision Analysis for the evaluation of transport projects: Time for a multi-actor approach. *Transport policy*, 37, 177-186.
50. Mateichyk, V., Khrutba, V., Kharchenko, A., Khrutba, Y., Protsyk, O., &Silantieva, I. (2021). Developing a tool for environmental impact assessment of planned activities and transport infrastructure facilities. *Transportation Research Procedia*, 55, 1194-1201.
51. Naganathan, H., & Chong, W. K. (2017). Evaluation of state sustainable transportation performances (SSTP) using sustainable indicators. *Sustainable cities and society*, 35, 799-815.
52. Namugenyi, C., Nimmagadda, S. L., Reiners, T. (2019), 'Design of a SWOT analysis model and its evaluation in diverse digital business ecosystemcontexts', *Procedia Computer Science*, *159*, 1145-1154.

53. Patton, M. Q. (2018). Evaluation science. *American Journal of Evaluation*, 39(2), 183-200.
54. Perra, V. M., Sdoukopoulos, A., & Pitsiava-Latinopoulou, M. (2017). Evaluation of sustainable urban mobility in the city of Thessaloniki. *Transportation research procedia*, *24*, 329-336.
55. Poliński, J., & Ochociński, K. (2020). Digitization in rail transport. *Problemy Kolejnictwa*, (188), 137-148.
56. Pu, S., & Lam, J. S. L. (2021). Greenhouse gas impact of digitalizing shipping documents: Blockchain vs. centralized systems. *Transportation Research Part D: Transport and Environment*, *97*, 102942.
57. Ramos, É. M. S., Bergstad, C. J., Chicco, A., & Diana, M. (2020). Mobility styles and car sharing use in Europe: attitudes, behaviours, motives and sustainability. *European Transport Research Review*, *12*, 1-12.
58. Rădulescu, C. Z. (2020). O abordare multi-criterială pentru selecția produselor software de simulare bazată pe metoda Matter Element. *Romanian Journal of Information Technology & Automatic Control/Revista Română de Informatică și Automatică*, 30(2), 27-40.
59. Rajsman, M., &Škorput, P. (2022). Methodological approach for evaluation and improvement of quality transport service in public road passenger transport. *Tehničkivjesnik*, 29(1), 139-148.
60. Rohács, J., & Rohács, D. (2020). Total impact evaluation of transportation systems. *Transport*, 35(2), 193-202.
61. Șandor, S. D. (2013), *Metode și tehnici de cercetare în științele sociale*, Tritonic, București.
62. Schofield, T. (2013)'Critical success factors for knowledge transfer collaborations between university and industry', 2013, *Journal of Research Administration*, *44* (2), 38-56.
63. Seppo, M., Lilles, A. (2012). 'Indicators measuring university-industry cooperation', 2012, *Discussions on Estonian Economic Policy*, 20(1): 204 – 225.
64. Shadish, W. R. (1998). Evaluation theory is who we are. *The American Journal of Evaluation*, 19(1), 1-19.

65. Singh, P. (2024). The Politics of Contagion: States, Societies, and the Control and Consequences of Infectious Diseases. *Annual Review of Political Science*, 27.
66. Stoica, O. (2023). Managementul strategic al parcurilor auto aparținând universităților. Un studiu comparat. *Revista Transilvană de Ştiinţe Administrative*, *25*(52), 65-76.
67. Valentin, V., & Bogus, S. M. (2015). Assessing the link between public opinion and social sustainability in building and infrastructure projects. *Journal of green building*, *10*(3), 177-190.
68. Valentin, V., Naderpajouh, N., & Abraham, D. (2018). Impact of characteristics of infrastructure projects on public opinion. *Journal of Management in Engineering*, *34*(1), 04017051.
69. Violato, R. R., Galves, M. L., & de Oliveira, D. D. G. (2014). Non-motorized mobility in central urban areas: application of multi-criteria decision aid in the city of Campinas, Brazil. *International journal of sustainable transportation*, *8*(6), 423-446.
70. Weiss, D., & Hasselwander, M. (2025). Super apps and the mobility transition. *Environmental Innovation and Societal Transitions*, *55*, 100955.
71. Xue, H., Zhang, J., & Zhang, X. (2025). Facts or Feelings? Leveraging Emotionality as a Fact-Checking Strategy on Social Media in the United States. *Social Media+ Society*, *11*(1), 20563051251318172.
72. Zalmanovitch, Y. (2014). Don't reinvent the wheel: the search for an identity for public administration. *International Review of Administrative Sciences*, *80*(4), 808-826.
73. Zilahy, D., & Mester, G. (2024). Factors Affecting the Adoption of Self-Driving Cars. *Interdisciplinary Description of Complex Systems: INDECS*, *22*(6), 732-737.
74. Żuk, P., & Żuk, P. (2024). Ecology for the rich? Class aspects of the green transition and the threat of right-wing populism as a reaction to its costs in Poland. *Sustainability: Science, Practice and Policy*, *20*(1), 2351231.