

# **Towards Intelligent and Sustainable Mobility: a Comparative Study of Transport Systems in Four African Countries**

**Sohaib Chengaou<sup>1</sup>**

<sup>1</sup> IA Laboratory, Faculty of Sciences Meknes  
Moulay Ismail University  
Meknes, Morocco  
[Sohaib.chengaou@gmail.com](mailto:Sohaib.chengaou@gmail.com)

**Kenza Oufaska<sup>2</sup>**

<sup>2</sup> TICLab Laboratory, College of Engineering & Architecture  
International University of Rabat  
Rabat, Morocco  
[kenza.oufaska@uir.ac.ma](mailto:kenza.oufaska@uir.ac.ma)

**Achraf HAIBI<sup>1,2</sup>**

<sup>1</sup> IA Laboratory, Faculty of Sciences Meknes  
Moulay Ismail University  
Meknes, Morocco  
[achraf.haibi@gmail.com](mailto:achraf.haibi@gmail.com)

**Khalid El Yassini<sup>1</sup>**

<sup>1</sup> IA Laboratory, Faculty of Sciences Meknes  
Moulay Ismail University  
Meknes, Morocco  
[khalid.elyassini@gmail.com](mailto:khalid.elyassini@gmail.com)

## **Abstract**

The transport sector is one of the vital sectors in all countries, representing the lifeline of the economy, and requires more importance, maintenance, and development to keep people and business mobile. This paper presents a comparative study on conventional transport systems in four African countries (South Africa, Senegal, Kenya, and Morocco), in addition to the new projects implemented (or being implemented) to develop the public transport sector and overcome its challenges.

## **Keywords**

Mobility management, IoT, Comparison, Smart city and ITS

## **Biographies**

**Sohaib Chengaou** received his Bachelor's degree in Net Businesses from Polydisciplinary Faculty of Tetouan - Abdelmalek Essaâdi University, Morocco in 2015 and subsequently he obtained his Master's degree in Computer Networks and Embedded Systems from Faculty of Sciences of Meknes in 2017, Moulay Ismail University, Morocco. He is currently a PhD student in Computer Science at Moulay Ismail University (UMI). His main research interests are transport intelligent, Real-time systems and Internet of Things.

**Kenza Oufaska** is assistant professor at International University of Rabat- Morocco within « Ecole Supérieure d'Informatique et du Numérique » and member of TICLab Laboratory. She obtained a PhD in Mathematics (Operations Research and Logistics) from Moulay Ismail Meknes University. Her research work focuses on multi-objective mathematical programming applied to various fields such as intelligent transportation, intelligent mobility, optimization of supply chains, green and sustainable logistics and humanitarian logistics.

**Achraf Haibi** received the bachelor's degree in computer networks and telecommunications from the Polydisciplinary Faculty of Errachidia, Moulay Ismail University (UMI), Morocco, in 2014, and the master's degree in computer networks and embedded systems from the Faculty of Sciences of Meknes, UMI, in 2017, where he is currently a Ph.D. candidate in computer science in collaboration with the International University of Rabat (UIR). His research interests include radio frequency identification, real-time systems, big data technologies, and the Internet of Things.

**Khalid El Yassini** holds a PhD and MSc in Mathematics (Operations Research) from University of Sherbrooke - Canada (2000 and 1994). Previously, he had a bachelor's degree in Applied Mathematics (Statistics) at Abdelmalek Essaadi University - Morocco (1991). During his academic career, he has taught in several Canadian institutions such as University of Sherbrooke, University of Québec at Rimouski or St-Boniface University at Winnipeg; and in various Moroccan institutions such as Moulay Ismail University, International University of Rabat, ENSAK, ESTM, ENSAM or Royal Military Academy. He has taught various courses in mathematics, computer science, operations research and logistics. His current research activities focus on mathematical programming, artificial intelligence, information systems, security in computer networks, telecommunications, intelligent systems, and logistics engineering with applications in hospital field or medication domain. Currently, he is a Professor at the Faculty of Sciences - Moulay Ismail University, Morocco. His main current research activities focus on mathematical programming (linear and multiobjective optimization), artificial intelligence, information systems, security in networks, telecommunications, intelligent systems (smart cities and smart vehicles), logistics engineering, and green logistics with applications in hospital field or medication domain.