

MSc Business Analytics Consultancy Project/Dissertation 2021-22

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Title of Project: ‘Socio-economic unfairness Index’ of Travel – Travel ticket purchasing behaviour as barriers to economic and social mobility at TfWM (Transport for West Midlands)

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Disclaimer:

I hereby declare that this dissertation is my individual work and to the best of my knowledge and confidence, it has not already been accepted in substance for the award of any other degree and is not concurrently submitted in candidature for any degree. It is the end product of my own independent study except where other acknowledgement has been stated in the text.

ABSTRACT

Travel has personal and societal implications. I explored socioeconomic differences in the travel behavior of TfWM's customers to develop an understanding of travel-related unfairness. TfWM (Transport for West Midlands) is a public body responsible for coordinating transportation in Westmidlands county of England. TfWM customers may purchase travel products with varying validity and product types via various sales channels. Inadvertently, this may result in a segment of customers not buying the cheapest, most suitable product for their needs and in the most convenient method available to them, Thereby, creating barriers for these customers in accessing the services they require to improve their economic and social circumstances. I conducted a mixed-methods systematic review and meta-analysis to understand the travel behavior by socioeconomic status, pricing, mode, and type of purchase. I synthesized real-time public travel data using machine learning models and integrated qualitative and quantitative strands using hypothesis testing, classification models (XG boost, random forests, decision trees), and K-means clustering for customer segmentation on different parameters. According to the findings, travel is: intertwined with socioeconomic status and location. The average spending capacity varied by ethnic group. Citizens of affluent places like Birmingham had a cost advantage since they could afford long-term products that reduced their overall costs. Their mean spending cost on travel was high in comparison to other cities, indicating that they use transportation effectively without worrying about other economic factors. It was discovered that online portals provided the best deals compared to payzone methods, which are used by 60% of clients; expected patterns were validated using quantitative data that showed broad support for these. A lack of analytical rigor focusing on the accessibility of travel in different social neighborhoods was one of the limitations of the research. Overall, I discovered that TfWM perpetuates socioeconomic disadvantage only to a point, which may be reduced with different marketing methods and incentives in low-income locations.