

S19-2: Travel Distances in Recreational League Play – An Analysis of 317 Football Teams Playing More Than 4,000 Games

Karim Abu-Omar¹, Tobias Völk¹, Antonina Tcymbal¹, Peter Gelius², Sven Messing¹

¹ Friedrich-Alexander University of Erlangen-Nürnberg, Erlangen, Germany

² University of Lausanne, Lausanne, Switzerland

Purpose: Globally, about 30% of CO₂ emissions are caused by travel. In order to comply with calls of the United Nations and the European Commission, the sport sector needs to reduce its emissions caused by travel to tournaments and league games in professional and amateur sport. To this date, no clear mechanisms exist on how to do this. The presentation shows how an algorithm based solution from optimisation science can help sport federations reduce travel distances in any type of league or tournament play.

Methods: Using algorithms from optimisation science, travel distances for recreational league play in football (adults, lowest recreational leagues) were mapped and analysed for one full season of game play. Carbon emissions were calculated using established standards. For three regions of Germany, a total of 317 teams playing 4,048 matches were included in the analysis. Two different scenarios were tested to keep the number of games teams play constant, but potentially reduce travel distances.

Results: The teams travelled a combined 157,103 km to travel to away games, causing 46 k/T of carbon emissions for each car travelling the distance. Estimating that each team uses an average of 3.5 cars to transport players and coaches, the total emissions are 161 k/T of CO₂. Travel distances per game were in average longer in the more rural compared to the more urban areas. In most instances, travel distances could be shortened by re-arranging teams into groups based on geographical location. A further reduction of travel distances is achieved if all teams are placed in one league and play only against opponents close by.

Conclusions: Travel distances in recreational sport are a significant source of CO₂ emissions. Algorithm based optimisation of league play to reduce travel distances has high potential to reduce the carbon footprint of the sport sector. However, barriers remain on how to implement changes in game formats and league play.

Support/Funding Source: No external funds.

