
Reflections on Collaborating with Local Government on School Transportation

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Abstract

School transportation services help to ensure universal access to education. They also contribute to safety, reduce traffic congestion, and support working parents. In many countries, local governments are responsible for providing transport for eligible students. Typically, it is provided to all children who attend their nearest suitable school but live beyond a specified distance. Provision must also be made for students with special educational needs or disabilities and, in some cases, for those from low-income families.

This talk reflects on our collaborative work with several local authorities in Wales. The primary objective has been to reduce costs by minimising fleet sizes and fuel use. At the same time, we have sought to improve service levels by limiting walking and in-vehicle travel times and by increasing schedule reliability.

The work has raised both technical and political challenges. Technical issues include computing very large distance matrices, accounting for vehicle arrival and departure directions, identifying suitable pick-up points, and dealing with inaccuracies in mapping data. We also note that travel times are inherently stochastic and exhibit dependencies across road segments, causing delays to propagate through routes. Finally, the underlying optimisation problem is NP-hard and multi-objective, requiring the development of specialised heuristics.

Requirements also vary across councils. Some seek to avoid large gatherings of students at pick-up points, while others see them as acceptable or beneficial. Approaches to supporting students with additional needs also differ, with some using larger buses and others using taxis. Rural areas present further challenges, including differing views on what constitutes a safe walk and an acceptable travel time.

These and related issues will be discussed in the presentation.

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