

Understanding and Modeling Urban Transport Systems

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Abstract

Keyword:

An efficient, resilient, scalable and properly planned Rapid Transit System (RTS) is critical in creating a ‘liveable’ city. This is of particular interest in land-scarce Singapore where there is a strong push for its people to use public transport. As RTS can cater to a greater volume of commuters with a higher throughput, it can significantly reduce congestions along road networks and decrease total carbon footprint and pollution. Coupled with good energy efficiency, RTS offers a green and sustainable transport option. We discuss in this presentation the models and the resulting interactive platforms we have developed to help transport planners examine “what-if” scenarios and other proposed policies related to this complex system. In particular, we have characterized the route choices and travel patterns of commuters in Singapore’s Rapid Transit System (RTS) by developing an integrated set of methodologies — mathematical methods and statistical mechanics, to network analysis and agent-based modelling. The resulting techniques are useful in identifying bottlenecks that can cause service degradation, and in establishing insights into how disruptions can possibly be managed. The ultimate aim is to provide a versatile approach for transport planners to make quantifiable policies that optimally balance cost and convenience for a growing city.

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References

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