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Figure 3. High temporal resolution of trip distribution (Ali et al., 2016).

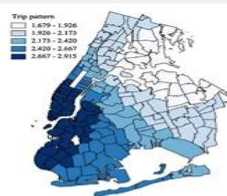
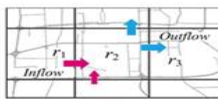
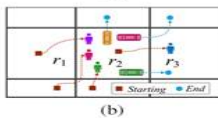


Figure 7. Spatial distribution of the coefficient of urban trip patterns variables (Bao et al., 2018).



(a)



(b)

Figure 3. Regional mobility inflow and outflow (a) and measurements (b). (Zhang et al., 2017).

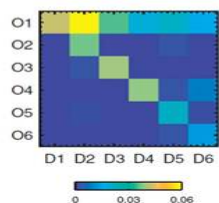


Figure 4. Spatial interactions based on distinct origin-destination for spatio-temporal patterns (Sun et al., 2016).

## Review

# Spatio-Temporal Understanding and Representation of Transformative Urban Mobility and Trip Patterns, A Review.

Behradfar A and Mohammadi S.

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### **Abstract**

The rapid development in transport system monitoring provide planners and researchers with new opportunities to understand the trends of mobility patterns in urban areas, known as transformation of urban mobility. It brings businesses and cities together to implement system-level integrated initiatives to conducting urban mobility and transport system toward a more efficient future. As a result, identification of the trip patterns and spatio-temporal dependencies in urban areas requires a comprehensive understanding of high-dimensional human mobility dynamics. These emerging trends need a framework to identify urban mobility patterns from a spatio-temporal perspective that includes various visualized representation of mobility patterns and travel behaviour. The main purpose of this study is to investigate different data sources and methods used in the literature to obtain the proposed patterns in urban areas. The spatio-temporal models evaluated in this review can be used in a wide range of mobility studies suggesting trip patterns and related variables are significantly affected by spatial and non-spatial impacts.

**Keywords:** Transformation of urban mobility, Mobility flows, Trip patterns, spatio-temporal dependencies, spatial analysis

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