

Peer Review

Review of: "Integrating Travel Behavior Forecasting and Generative Modeling for Predicting Future Urban Mobility and Spatial Transformations"

Neha Sharma¹

1. ECE, Delhi Technological University, New Delhi, India

- The paper claims novelty in combining low-dimensional tabular data with GANs for spatial synthesis, but StyleGAN-style tabular conditioning is not new. There is also no baseline comparison with other conditional GAN approaches (e.g., cGAN, TabGAN).
- The rationale for why satellite imagery is the most informative or actionable output of future urban planning is not justified. It's not clear how planners are expected to interpret or use these generated images. Provide concrete examples of use cases (e.g., "This helps identify probable high-density corridors or displacement zones").
- All experiments are confined to California census tracts, and the model is trained on a single region's data. Clarify how generalizable this model is across diverse geographies (e.g., developing cities with sparse data). Discuss transfer learning or zero-shot generation capabilities.
- The TFT model is compared to basic baselines (RNN, LSTM), but no comparison with more advanced architectures (e.g., N-BEATS, TCNs, or Transformer-based regressors).
- Many hyperparameters are loosely reported or absent (e.g., latent vector initialization range, dropout rates, optimizer parameters for GAN training). Provide a full training regimen, preferably as a table or appendix, or publish code for reproducibility.
- The manuscript references historical planning failures (e.g., I-95 in Miami) but does not connect to existing simulation tools like UrbanSim, MATSim, or CityGAN. Acknowledge where this work complements or improves upon existing urban simulation tools.
- The paper should also discuss how its macro-scale mobility forecasts could inform micro-level applications such as pedestrian movement prediction. As noted in recent surveys (e.g., Pedestrian

Intention Prediction for Autonomous Vehicles, Neurocomputing, 2022), incorporating behavioral and environmental context is essential for human-centered systems like autonomous navigation and traffic safety. A brief discussion of how the proposed framework could support such applications would enhance its broader relevance.

Declarations

Potential competing interests: No potential competing interests to declare.