

## Authors' Response to Reviews of

# Evaluating the Impacts of Parameter Uncertainty in a Practical Transportation Demand Model

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Future Transportation, futuretransp-3339770

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RC: Reviewers' Comment, AR: Authors' Response, □ Manuscript Text

## 1. Reviewer #1

### 1.1. Introduction

**RC:** *Introduction should more clearly state objectives of this study, especially the specific issues regarding impacts of parameter uncertainty in traffic demand model on prediction results. The current description is a bit vague, and it is recommended to add more explanations on the importance and practical significance of the study.*

**AR:** We have added the following sentences to the Introduction to clarify the relationship between uncertainty and prediction

Systemic under- or over-prediction could lead to substantial over- or under- investment in the highway network (Hoque et al., 2021).

...

A detailed description of specifying mode choice model variables and nesting of error structures is given by Koppelman and Bhat (2006). This category includes deeper uncertainty issues such as unforeseen shifts in behavior.

### 1.2. Application Context

**RC:** *In literature review, authors are advised to cite relevant literature to expand the application context of traffic model. For example, doi.org/10.1016/j.physa.2024.12954.*

**AR:** The DOI link supplied by the reviewer was malformed, and we are therefore unable to respond to this comment.

### 1.3. Model Design

**RC:** *In Model Design and Methodology, author is advised to provide more detailed model construction process, assumptions, and specific application of the selected method (such as LHS).*

**AR:** This is not a clear comment to us. We have provided a detailed description of approximately 1400 words with an accompanying full-source GitHub repository; and this comment is not specific enough to lead to a response action. We did, however, note and correct a typo in an equation reference in this section.

These PA trips are converted into origin destination (OD) trips by multiplying the trips by corresponding time of day factors (see ~~#eq-trips~~[Equation 1](#)). These trips are calculated using Bentley's CUBE and the RVTPO model.

#### 1.4. Sampling Methodology

**RC:** *The authors selected the LHS and MC methods for uncertainty design, but did not describe the rationale and advantages of selecting these methods. It is recommended that the authors add a description of the study method selection process, including the consideration and rationale for the exclusion of other potential methods.*

**RC:** *This is a reasonable point. We have addressed it in the Methodology with an additional reference,*

Two common methods for parameter sampling include Monte Carlo (MC) simulation and Latin hypercube sampling (LHS). ~~In general~~, MC simulation draws independently from multiple distributions, while LHS makes draws that cover the parameter space more efficiently and can capture the joint distribution between two or more parameter values (Helton and Davis, 2003). As a result, LHS can reduce the number of draws needed to fully re-create the statistical variance in a model, but the amount of reduction is unknown and may not be universal to all problems (Yang et al., 2013). ~~And though more potential methods are being developed and employed in related research (e.g., Singh et al., 2024) this research only considers these two.~~

[Singh, A., Mondal, S., Pandey, R., Jha, S. K. \(2024\). Assessing Fourier and Latin hypercube sampling methods as new multi-model methods for hydrological simulations. Stochastic Environmental Research and Risk Assessment, 38\(4\), 1271–1295.](#)

**RC:** *and similarly in the limitations,*

~~Second, a different methodology of sampling might have produced a different result at the extremes than the results of LHS.~~

#### 1.5. Data collection

**RC:** *The source and preprocessing process of the data used are not clearly stated in this paper. It is recommended to add a detailed description of the data collection, cleaning, and processing methods.*

**AR:** We did not collect, clean, or process any data for this paper, and therefore the the paper does not describe these processes. Rather, the paper generates its own data Monte Carlo and Latin Hypercube Sampling, as described.