Amendment letter

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We really appreciate more useful comments from reviewer 1 and we are also glad to see we solved all the questions from reviewer 2. In the following paragraphs, we will thoroughly respond the new comments and questions.

**Reviewer 1**  
  
The authors have addressed all of my comments. The contribution of the paper is now more clearly articulated. I think, some minor improvements could be made to further enhance links with the journal’s themes.

1. The distinction between non-real time (or static) and real-time measures offers an interesting angle. I wonder if authors could expand on this further, also to highlight how these new data sources are transforming the urban transport sector, and what opportunities, obstacles and challenges this entails. One point that would be worth clarifying is the notion and value of temporal ‘accuracy’. In which way do static measures systemically deviate from actual time? Or is the issue rather temporal precision? I believe more discussion of the new, dynamic measures would be valuable to increase the noticeably expanded yet still limited engagement with the journal’s theme.
2. On p.15 ln.8, small data are still associated with ‘deliberate’, but as the examples of AVL or GTFS show, these are big yet deliberate.

Response: We apologize for the neglect, since all “deliberate” should be removed in the last draft. We deleted the word in this section, for we want to shift the focus from “deliberate versus byproduct” to “small versus big”.

1. The stated drawbacks of small data could be revisited slightly given that such data sources are often carefully sampled (p.15).

This is a good point. We added this to the text.

1. P.31 ln 13, I wasn’t sure if the authors refer to the frequency of the ‘generating’ service or the ‘receiving’ service. I would expect correlations between ‘transfer risk’ and the receiving service. Perhaps the authors could clarify which type of service they refer to.

This is a good question. We are using the average frequency of both generating and receiving services. We believe the correlation results between transfer risk and the receiving services is close, since at each stop each receiving trip in a transfer can also be a generating trip in another transfer. For example, transfer A consist of generating trip *a* (route 1) and receiving trip *b* (route 2); while transfer B consists of generating trip *b* andreceiving trip c (an later trip for route 1); and for most trips (except for the earliest and latest one), there are at least two counterparts: one with itself as generating trip and the other with itself as receiving trip. Therefore, compared with calculating the headway/frequency of generating/receiving trips alone, we are merely counting twice if we calculate the total average and the average will stay the same. And, our correlation analyses have a very coarse granularity: hourly analysis has 19 data points and daily analysis only has 3 data points. Therefore, we can say it will not change the results.

1. P.31 ln 38, I couldn’t follow why ‘transfer risk’ increases at night. I would expect that it reduces, in particular due to less traffic.

Yes, this is surely anti-intuitive. However, this will make more sense when we consider that the bus trips in operation are also changing. During the night, the percentage of transfers on the High Street (the major north-south thoroughfare in Columbus, indicated by a red circle in Figure 2 in the main text) is increasing since other bus trips involved with transfers will not run in late hours. As we introduced in the paper, the risk of missed transfer or transfer risk is relatively high on this road. Since these highly missed buses on the High Street are basically only buses in operation during the late night hours, the risk of missed transfers is surely higher.

1. On ‘transfer risk’, I still find the term somewhat misleading. Perhaps a more accurate term could be found, such as ‘risk of failed transfers’.

Per reviewer 1’s suggestion, we changed the term from “transfer risk” to “risk of missing transfers” and “TR” to “RoMT”. Please see the corresponding highlighted words in the paper. We believe the new term will be less misleading for new readers.

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