Dear Fanie,

**Statement of contribution**

Please find along with this letter a revised manuscript titled ‘Development of a map-matching algorithm for dynamic-sampling-rate GPS signals to determine vehicle routes on a MATSim network’, by my co-author, Mr Jaco-Ben Vosloo, and myself, Prof Johan W. Joubert (corresponding author: johan.joubert@up.ac.za).

Thank you (and thanks to the reviewers) for the effort in reviewing the manuscript. I believe the revised manuscript is much improved as a result. Herewith a brief summary of changes made.

**Reviewer 1** made, mainly, editorial changes in the scanned copy. We decided to work consistently with ‘data set’ instead of ‘dataset’ in the revised manuscript. Proposed language errors were all fixed. I can only apologise: as I worked through the suggested changes I realised that our initial editing was actually a bit sloppy.

**Reviewer 2** made more specific suggestions and we respond to them next, in the same sequence as they were stated in the report.

1. We changed ‘5 s’ to ‘5 seconds’ in the abstract. In the rest of the document, however, we kept using the standard SI units.
2. Introduced MATSim again in Introduction.
3. In Section 2.1.2 we report on the work of Alt et al [1]. In the original source, the authors explicitly use (page 278) the notation $O(pq \log^2 pq)$. An alternative notation might rather be $O\left(pq (\log pq)^2\right)$, but we prefer to use the originally published notation.
4. IP was indeed introduced: last sentence of Introduction.
5. We removed the reference to ‘SA-Albers’ as it does not appear in literature. As the text states, it is adapted from the Albers equal-area conic projection.
6. The reviewer commented that “… The reason to using this utility function and its exact meaning is not entirely clear. Does this utility apply to all link segments $[l_1, l_2, \ldots, l_n]$? Why is the constant 1 used instead of any larger number, say, $M - l^{\text{length}}$, where $M \gg 1$…”

In just the next sentence where $l^{\text{length}}$ first appears, we explain that

“[s]ince the length of the link is the ST algorithm’s probability that the object traversed from the one candidate point to the other, i.e. the probability that it is the right route, Dijkstra’s algorithm is actually calculating the routes that is least likely to not be the wrong route.”
Since we are dealing with a probability, which cannot be more than 1, the suggestion to consider some $M \gg 1$ is not warranted.

7. Indeed, there were two mistakes here. We corrected this by, firstly, explicitly defining $F(c^j_{i-1} \rightarrow c^j_i)$ in the revised Section 3.5 and, secondly, correcting the notation to use the ‘$\rightarrow$’ instead of the comma.

8. In Section 3.3 (page 13 of the revised manuscript) we indicated that “...the final ST probability value should rather be viewed as a normalised score instead of a probability, per se, due to the low values. In this study the output of the ST function was still referred to as a ‘probability’.”

Even though these probability values are quite low in Table 3, the resulting accuracy of the algorithm remains (very) high (Table 4).

Again, thank you for affording us the opportunity to submit a revised manuscript. The inputs indeed made the paper more readable, and improved the quality and reproducibility of the work to be of value to others. We hope you find the changes we made both sufficient and satisfactory.

Regards,

Prof Johan W. Joubert, Pr.Eng.

johan.joubert@up.ac.za