1. Appendix

1.1. Comparison to the standard radius method

We compare the coverage area between our method and the existing standard method. We use the commonly defined coverage area radius (which is fixed to 400 meters) as the comparison. We plot the coverage area of both methods in Fig. 1; in this figure, the red areas are the common 400 meters radius catchments and the blue areas are our proposed demand-driven radius. We observe that 1300 bus stops have significantly smaller coverage areas than the 400-meter common coverage area while only 62 stops have bigger coverage areas than the 400 meter common coverage area. This indicates that multiple areas in the city will require a redesign with multiple new public transport stops that would meet the current travel demand. In addition, we calculated the union area of all the investigated bus stops for both methods. The standard 400 meter area coverage totals to an overestimated 116.12 square kilometers, but our proposed coverage areas estimated more accurately the catchment coverage at 67.344 square kilometers; this means that the standard estimation of the coverage area is traditionally overestimated by 42.01% in comparison to our proposed method which is more accurate to capture the needs of more exact bus users in the study area.

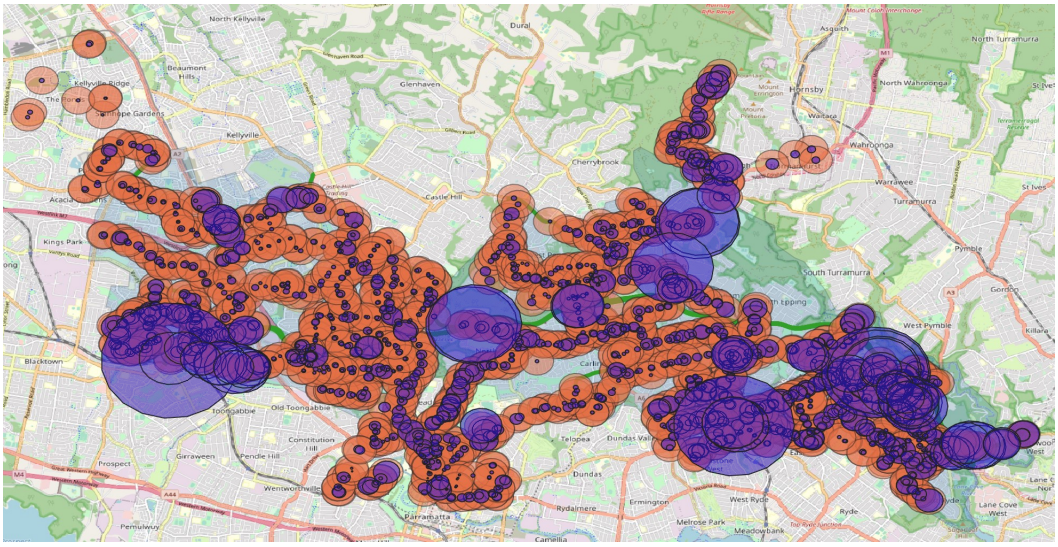

Figure 1: Comparison between the 400 meters standard radius (red) and our proposed radius (blue).