



14 June 2020

To whom it may concern,

I would like to take this opportunity to apply for the AITPM Western Australian Young Professional Award 2020. I have recently graduated from Curtin University with a Bachelor of Engineering (Civil and Construction) with first class honours and am currently working as a Graduate Engineer at Main Roads Western Australia (MRWA).

I have been extremely interested in transportation for a long time, and I initially wanted to pursue a career in town planning and urban design. After developing an interest for mathematics in high school, I finally settled on civil engineering, and chased a career in Transportation Engineering. The traffic and transportation engineering units at Curtin University cemented my interest in transport engineering, and I have enjoyed my short career so far.

History in the Traffic/Transport Engineering Field:

Early in my university career, I joined Mining and Civil Geotest as a Junior Lab Technician, performing standard tests on pavement materials, sparking my initial interest in road design. During my 1.5 year period in this company, I learnt how to conduct various soil tests, and the techniques used to upgrade and construct roads. I have found this experience invaluable in my current role at MRWA, in determining constructability concerns and innovative solutions in constrained sites.

In 2017, I took the opportunity to join MRWA on their Engineering Cadetship, which included two periods of vacation work for my final years of study. My first placement was in the Infrastructure Delivery Directorate, assisting in the delivery and opening of Northlink Southern Section, including Tonkin Highway's interchanges with Collier Road and Morley Drive. The latter was the first full-size roundabout constructed as a freeway interchange in Western Australia. After dealing with a few minor operating issues at the roundabout, I was impressed by the perceived safety of the interchange, based on reduced driver speeds and slightly restricted sight distances for drivers approaching from the Tonkin Highway ramps.

My second rotation was in the Road and Traffic Engineering branch, where I learnt about Austroads standards and MRWA's supplements. The most interesting aspect of this rotation was completing SIDRA modelling of a significant number of intersections, including proposing changes that would increase operational efficiency with minimal civil works.

I am now working as a Graduate Engineer in the Project Development team under Craig Wooldridge, and am overseeing the development of a number of projects in the metropolitan area. This includes the recently announced duplication of Thomas Road east of the Kwinana Freeway for an anticipated future commercial sector development. One of the most interesting projects has been a feasibility study alongside the Public Transport Authority for a potential bus lane alongside one of the most constrained roads in the Perth network. From a people-moving perspective, this has been a very interesting project, particularly with the perceived potential negative impact from a vehicle movement perspective.



Achievements and Interest in Traffic/Transport Units from Undergraduate Studies:

My 2019 university project looked at the saturation flow rate of traffic through Perth intersections. The motivation behind this research was to see which saturation flow rate models work best in Perth, and whether they could be adapted/combined to better reflect Perth traffic. This involved analysing video survey footage for 64 approach lanes at 16 metropolitan intersections, and measuring the saturation flow rate of traffic. This was compared to geometric conditions of the intersection (lane width, gradient, turn radius) to develop predictions based on Australian, UK, USA and Canadian prediction models to determine the best fit.

I am now working to convert my thesis into a journal article to publish my results. My research showed a general increase in saturation flow rate over time, and a reduction in the influence of approach grade. I was able to create a new model based on the existing Australian and USA adjustment factors, which was able to predict the saturation flow rate within $\pm 5\%$ in 86% of cases, and $\pm 10\%$ in 98% of all observed cases. Most importantly, the average variance was only $\pm 2.5\%$ which was significantly better than all other tested models.

For my research, Curtin University in conjunction with the Road Engineering Association of Asia and Australasia have awarded me the “2019 Road Engineering Association of Asia and Australasia Award for Best Road & Traffic Engineering Research Project”, alongside the Curtin University “Most Outstanding Graduate Prize for Best Overall Performance during the Degree”.

Benefits expected from attending the 2020 AITPM National Online Conference:

I was extremely lucky to be selected to attend the 2018 AITPM National Conference in Perth as the recipient of the University Student Prize, and attended alongside four other students from Curtin University. The conference was the catalyst for shifting my view of transportation engineering away from vehicle moving, towards people moving concepts.

I really enjoyed the “Safety on Our Streets” presentation chaired by Craig Wooldridge, as part of the Traffic and Transportation Engineering stream. This presentation looked at Perth’s Safe Active Streets, and the challenges of implementation against a relatively strict framework. I am impressed by the recent deliberate and careful moves away from standards by MRWA, and look forward to seeing additional steps taken to improve overall intersection safety, away from just vehicular crash mitigation.

I believe AITPM is the best placed organisation to share and celebrate these steps forward, and I would be extremely interested to see the additional measures other jurisdictions have taken to promote safe and effective people movement. This is extremely important now to begin planning for a post-COVID world, where we can reverse some of history’s major planning mistakes in Perth. I believe I am in a valuable position at MRWA to advocate for these changes with our other young engineers and planners, and believe attendance at the 2020 AITPM National Conference would be a major catalyst.

Willingness to sit on the State Branch Committee as a Young Professional representative for a period of one year following receipt of the award:

Throughout my time at university, I made a conscious effort to participate in club/association activities, which I thoroughly enjoyed. I was the 2018 Treasurer of the Curtin Civil Engineering Association, a then newly established club affiliated with the Curtin Student Guild. During my time on the executive committee, I oversaw the development of the association from a small, relatively unknown club to a major presence in the Curtin engineering club space. This included a tripling of membership, and the addition of two new sponsors that allowed us to run larger events with larger companies/associations.



After the 2018 AITPM National Conference, I was invited to join the Young Professionals Network by Dylan Melsom, a previous winner of this award. Whilst I enjoyed meeting with the members and was impressed by their work, I stopped attending prior to commencing my Curtin research project. Now that I am comfortable in full time employment, I believe I am ready to take a step up again and take an active role in a very important technical institute.

I trust the above details match the assessment criteria, and the overall details show my passion and continued interest to pursue a career in the traffic and transportation engineering field. If you have any questions or would like further clarification, please don't hesitate to contact me using the below details.

Yours sincerely,

A handwritten signature in black ink, appearing to read 'L Baker'.

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