

The Society for Location Analysis



Undergraduate Awards 2015

By submitting an entry to this competition, you confirm that you meet the terms and conditions of entry: (1) During the 2014/15 academic year, you are/were a registered final year undergraduate student at a UK University and (2) the work to be submitted was completed for dissertation/project assessment during the 2014/15 academic year. If unsure as to your eligibility, please contact us.

Please complete all fields below to enter the 2015 SLA award competition. All text boxes are expandable.

Full name (student):	Taylor Day	Email address (student):	taylorjwday@gmail.com
Full name (supervisor):	Dr Jim Wright	Email address (supervisor):	J.A.Wright@soton.ac.uk
Programme of study:	BSc Geography	University:	University of Southampton

Please provide the full title of your dissertation/project below:

A Multidimensional Study Analysing the Urban-Rural Differences in Ambulance Access in South-West England

Please provide a brief synopsis of your dissertation/project below. This should be in the form of an abstract and should discuss general aims/direction and research rationale (maximum of 300 words).

The South-Western Ambulance Service Trust (SWAST) was consistently failing to reach the national Category A response targets, of attending to 75% of incidents within 8 minutes and 95% within 19 minutes, following its adoption of a neighbouring trust. The rurality of its catchment ensures that the provision of an efficient ambulance response remains difficult. This research aimed to analyse ambulance access, using a multidimensional approach, to investigate the urban-rural differences between Dartmoor and Exeter, south-west England.

Within ArcGIS 10.2.2, the first dimension, accessibility, was analysed by calculating ambulance response times to each Population-Weighted Centroid (PWC) and road traffic collision using the 'Closest Facility' tool. This revealed that response times were greater in Dartmoor and that 75% of Category A incidents were not responded to within 8 minutes, thus failing to achieve the national target. Using the 'Location-Allocation' tool, standby ambulances were placed at strategic locations to reduce response times in Dartmoor by 3.8 minutes and allowing the national target to be achieved.

The second dimension, availability, was analysed using the Enhanced Two-Step Floating Catchment Area (E2SFCA) and the Two-Step Floating Catchment Area (2SFCA) methods: a concept not previously applied to ambulances. A value was derived for each PWC, which is a function of the number of ambulances which can access each PWC, and the number of people these ambulances can reach, within 19 minutes. These methods successfully identified areas which appeared to have either an insufficient or abundant number of available ambulances.

Combined, analysing the two dimensions of access is integral for ambulance services struggling to achieve the national targets. Abundant ambulances in one area, highlighted by the availability analysis, can be redistributed to the standby locations, depicted during the accessibility analysis, to improve ambulance response times.

Finally, please provide a short overview of the main findings of your research that may be of interest to SLA members; these may be listed in bullet point format if preferred (maximum of 200 words).

- This dissertation employed a series of location analysis tools within ArcGIS to identify key differences and similarities to two proximal areas in south-west England.
- The research found that there was an urban-rural difference between Dartmoor and Exeter, with Dartmoor experiencing longer response times,

attributable to its larger area and rural road network.

- This dissertation successfully reduced ambulance response times in Dartmoor so that the National target could be achieved, this is important to reduce transit time to time-sensitive incidents and ultimately save lives.
- The dissertation outlined a two-step floating catchment methodology which can be used to identify areas with abundant or insufficient resources so that ambulances can be redistributed to reduce response times.
- Although predominantly applied to the public sector, there might be potential to use the enhanced two-step floating catchment models in retail and other commercial applications.
- In a commercial context, such analyses could be employed to examine the impact of competitor stores, in addition to assessing potential new store locations which minimise customer transit times.

Please submit the completed application form to: Ruth Holdroyd, SLA Secretary, at info@thesla.org by the deadline date. Informal enquiries can be made to Dr. Luke Burns at L.P.Burns@leeds.ac.uk.

The deadline for entries is **Friday, 19th June 2015, 5pm**. Submissions after this time will not be accepted. The recipients of the Gold, Silver and Bronze awards will be announced by Friday, 19th July 2015 and certificates circulated soon after. Winners will also be invited to attend an upcoming SLA event to meet members and present their work. Good luck!