PATREC

Data Analytics in Action: RailSmart

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Outline

- Background
  - What is PATREC?
  - What is RailSmart?
- Methodology
  - Travel Behaviour Analysis
  - Accessibility Tool
  - GIS Analysis
- Link to Dashboard and Questions

What is PATREC?

- The **P**lanning **a**nd **T**ransport **Re**search **C**entre
  - *“a collaboration amongst the University of Western Australia, Curtin University, Edith Cowan University, Department of Transport, Main Roads Western Australia and the Western Australian Planning Commission”…*
  - *“to conduct collaborative, applied research and teaching in support of policy in the connected spaces of transport and land use planning.”*
- Many PATREC projects involve the analysis of large datasets from sensor networks – e.g. road traffic counters, SmartRider gates, bus location data – to generate insights from existing data for decision makers or to generate predictive models to ensure the efficiency of networks into the future.

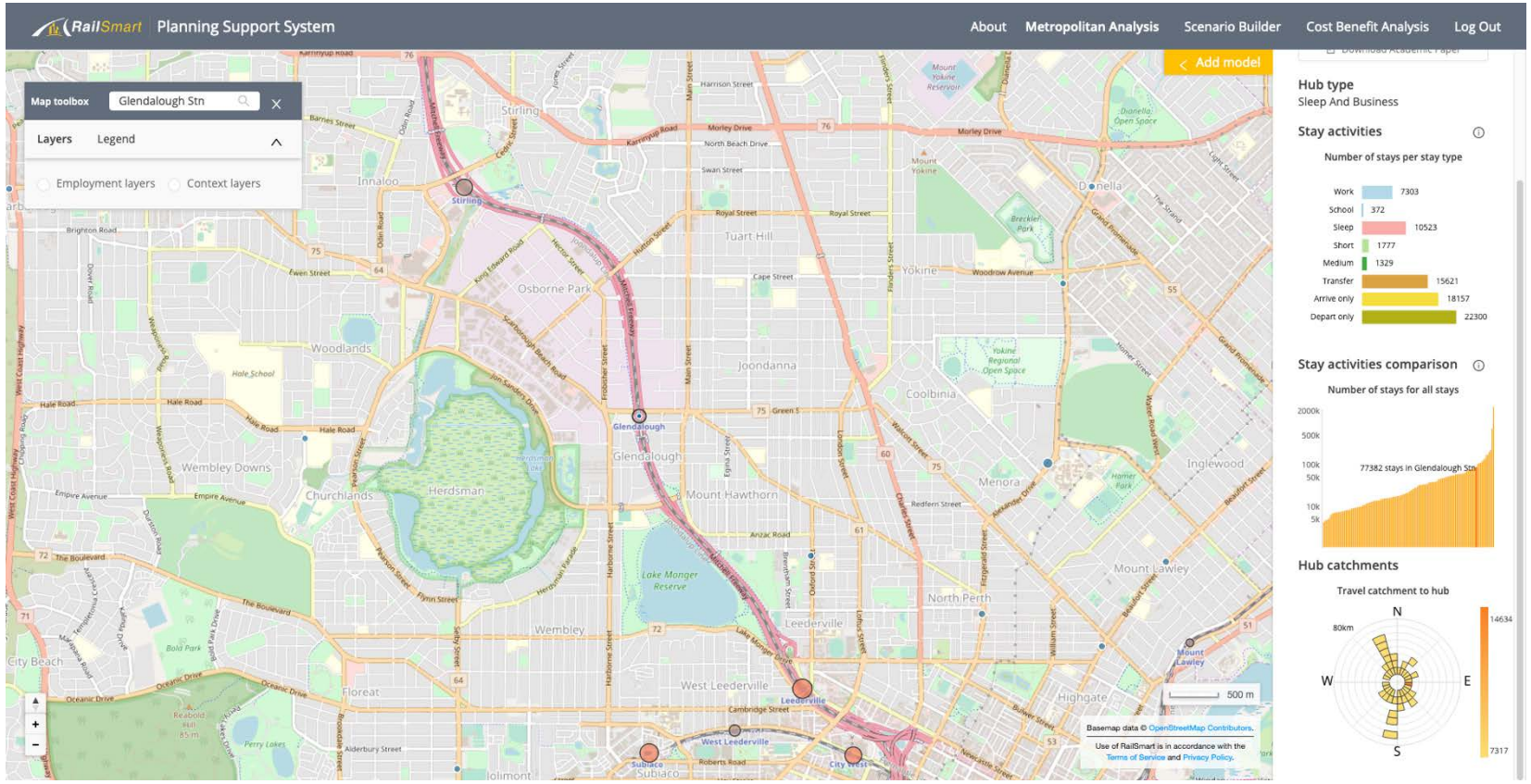
What is RailSmart?

- PATREC applied for (and was granted) funding from the *Smart Cities and Suburbs Program* with partners City of Wanneroo and Department of Transport.
  - Proposal was to develop a dashboard which operationalises analysis and modelling previously completed by PATREC and applies it to the precincts surrounding the Yanchep Rail Extension of METRONET.
  - Hence, despite the name RailSmart it is really ‘PlanSmart’.
- A total of six tools were developed for the system, some of which we will explore now.

Travel Behaviour Analysis

- Cardell-Oliver & Povey (2018) published an analysis regarding the data mining of SmartRider (public transport fare card) data, used to identify and typify ‘hubs’ within the Perth metropolitan area.
  - A ‘hub’ is considered a group of stops that has attracting characteristics;
  - This was determined by analysing ‘stays’; this is the time between finishing a journey and starting a new one.
  - While many hubs were railway stations, some of the most popular hubs were only serviced by bus (e.g. UWA in Crawley, QEII in Nedlands).
  - Not only did this analytics enable the identification of the hubs, it also helped determine how they were used – workers, residents, students, visits.

Travel Behaviour Analysis



Accessibility Tool

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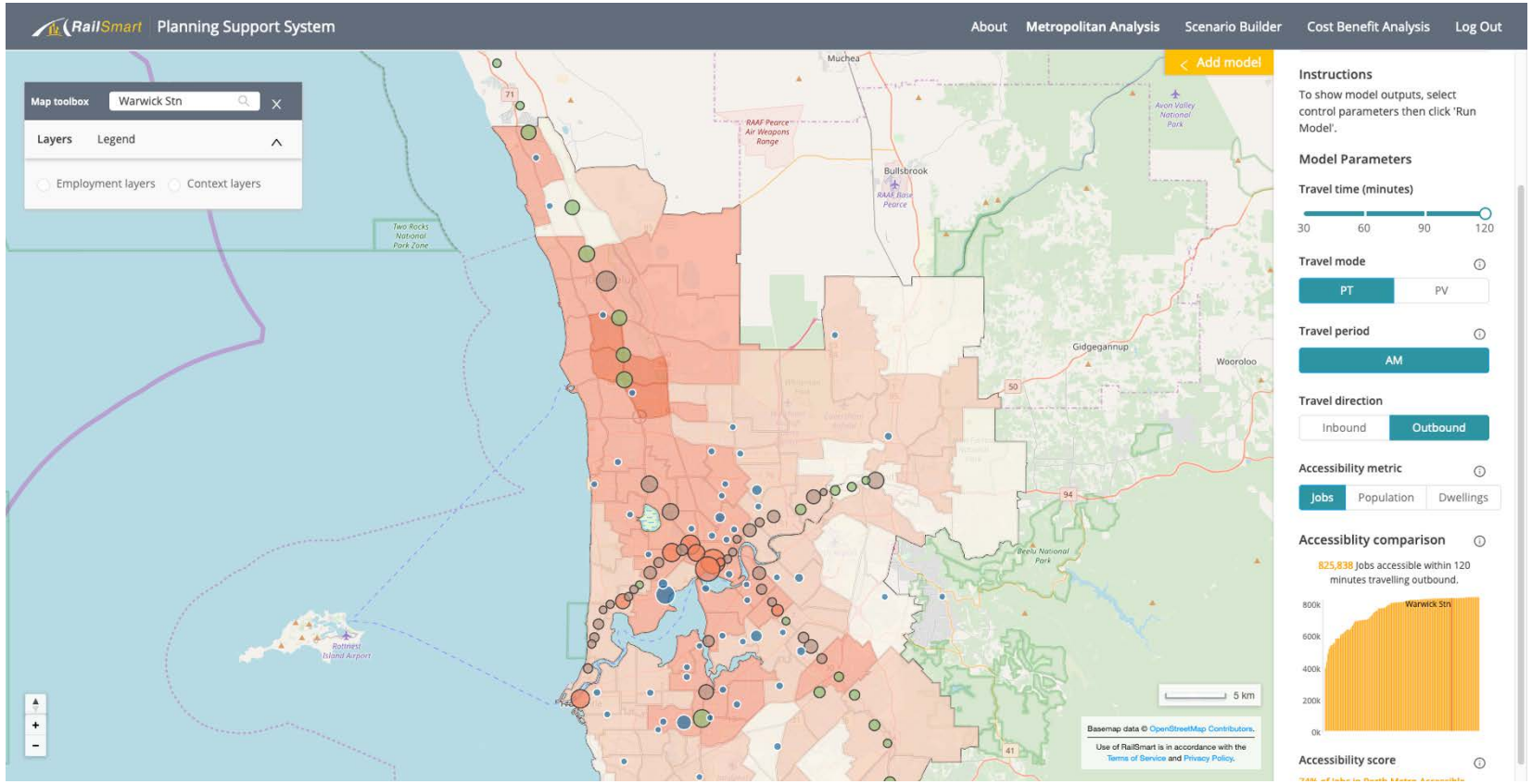
- Sun et. al. (2017) devised a methodology to determine accessibility between zones (spatial regions/areas) using a combination of bespoke programming and COTS tools.
  - Uses both STEM model matrices and public transport timetables.
  - Allows comparison between modes and times-of-day.
  - Cross-referenced to Census data (how many jobs?).
  - Possible extensions to consider “DIY” routing (using existing tools and congestion data).

Accessibility Tool



GIS Analysis

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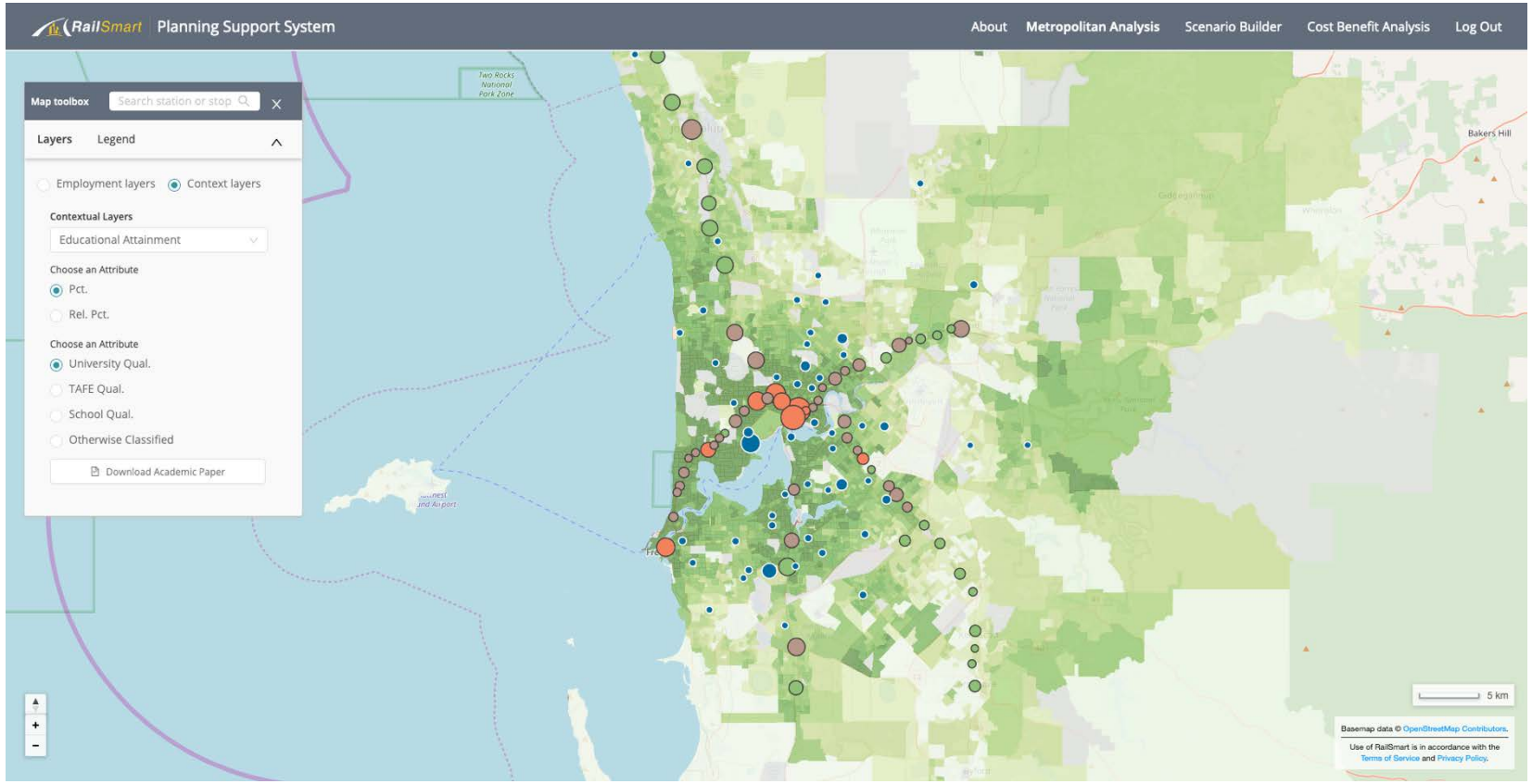
- Reed (2019) described a method to automation to extraction of descriptive analytics from ABS data and allow the dynamic manipulation of layer attributes within a Web dashboard.
  - Each layer can be manipulated to combine and ‘pivot’ attributes.
  - Generation of each layer is automated as far as practicable.
  - Uses a web service that ‘splits’ GeoJSON into attribute data and spatial data (sounds like Shapefiles…)

GIS Analysis



Check it Out!

- Free to register at https://railsmart.patrec.org/.
- Not a one-shot but a base for future research.

Questions?

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