Geografia

Capability Statement

About Geografia

The global benchmark for thoughtful economic, demographic, and spatial solutions.

We understand the complexities of urban and regional environments and leverage our deep expertise in demography, economics, and spatial analytics to solve their challenges. Our evidence-based approach allows us to forecast population change, analyse economic functions, and interpret spatial patterns to deliver forward-thinking solutions and impactful outcomes we can be proud of for years to come.

Our permanent team of 13 is regularly augmented through collaboration with other experts, including Dr Tom Wilson, one of Australia's leading demographers; Liz Grainger, who specialises in strategic business case development and financial analysis; Tim Nott, a highly experienced economic geographer; and Marianne Stoettrup, an economist specialising in major infrastructure impact assessment.

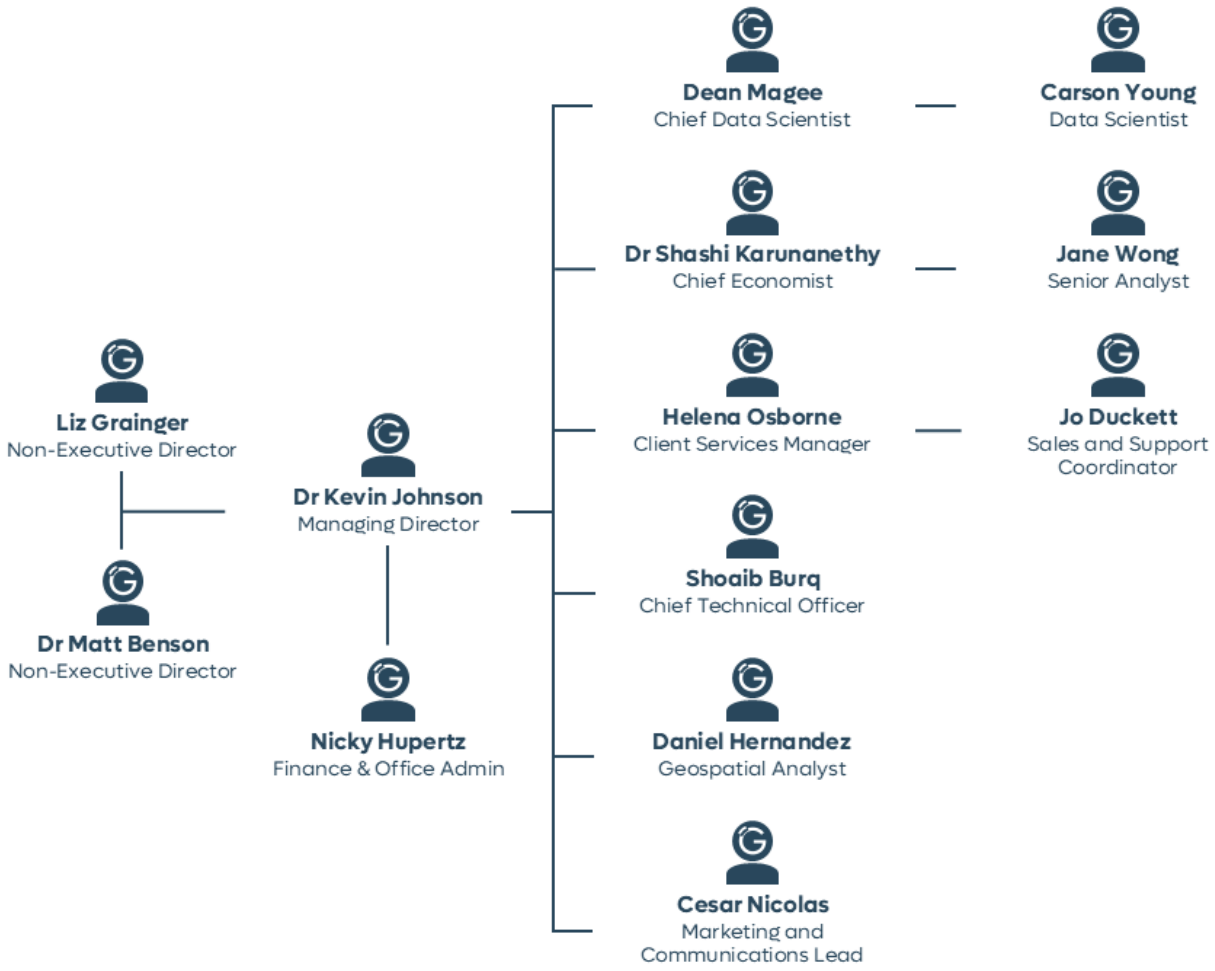


Figure A: Geografia Organisation Structure

Skilled People

Dr Kevin Johnson
PhD, BSc(Hons), Grad Cert (Econs)

Managing Director
Statistical, economic and demographic modelling

Dean Magee
MEco, BCom(Hons)

Chief Data Scientist
Data, statistics, and machine learning

Shoaib Burq
BEng (Hons), BSc (Computer Science)

Chief Technology Officer
Spatial data visualisation and interactive website development

Dr Shashi Karunanethy
PhD, MEco, BCom

Chief Economic Analyst
Urban economics, modelling and forecasting specialist

Jane Wong
Master of Urban Planning, BAppSc

Senior Analyst
Land use planning and economic analysis

Helena Osborne
BPESS

Client Services Manager
Product management and client liaison

Daniel Hernandez
MEng (Spatial), BSc (Env Eng)

Geospatial Analyst
Mapping and geospatial analysis

Cesar Nicolas
Master of Urban Planning, BEnvs

Marketing and Comms Lead
Social media and promotional activities

Nicolette Hupertz
BComm

Finance and Office Administrator
Office management and financial reporting

Carson Young
Masters of Data Science, BSc

Data Scientist
Statistical analysis, product automation and AI

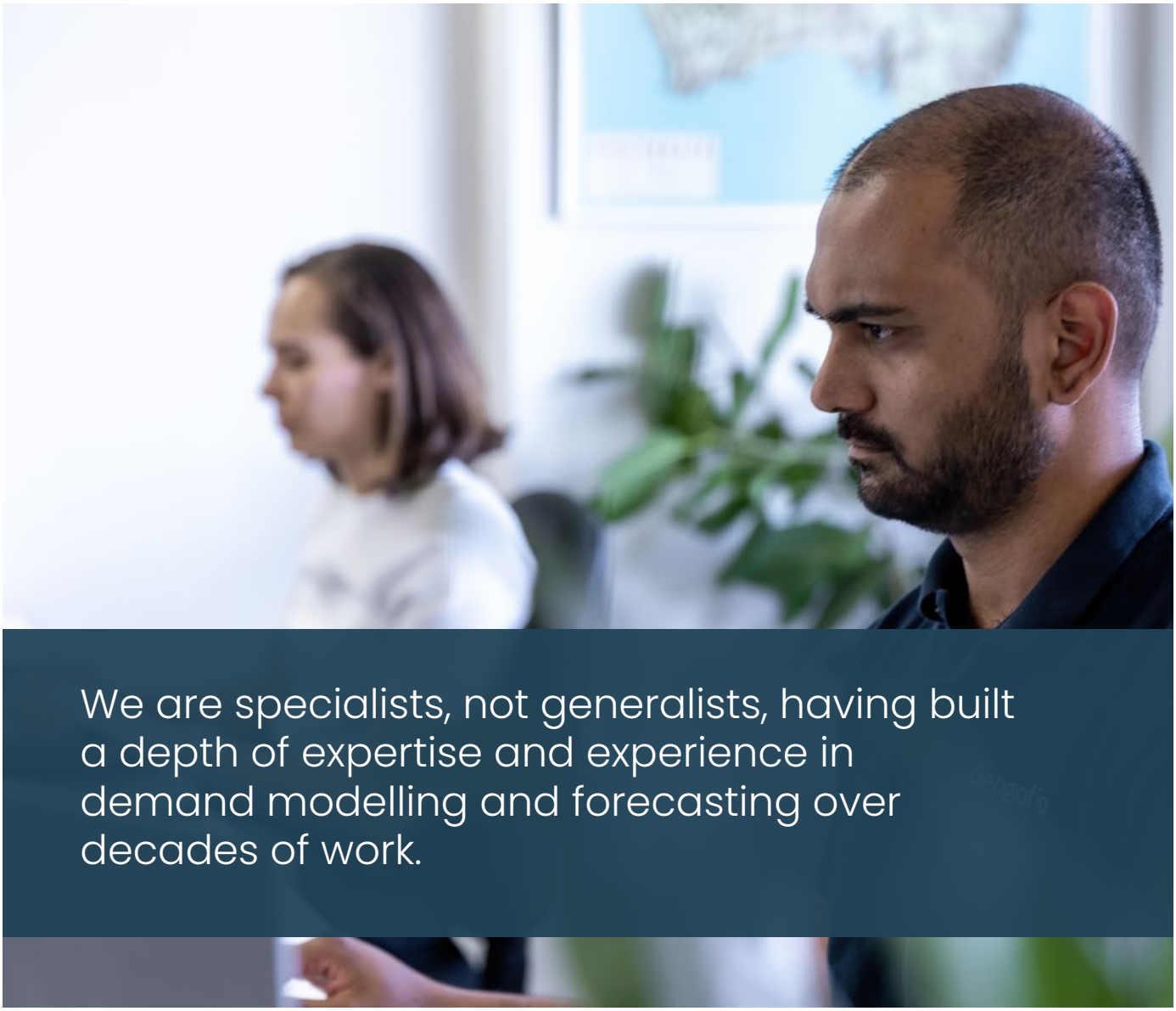
Jo Duckett
BSc (Psychology)

Sales and Support Coordinator
Client support and training

The Geografia Difference

Demography

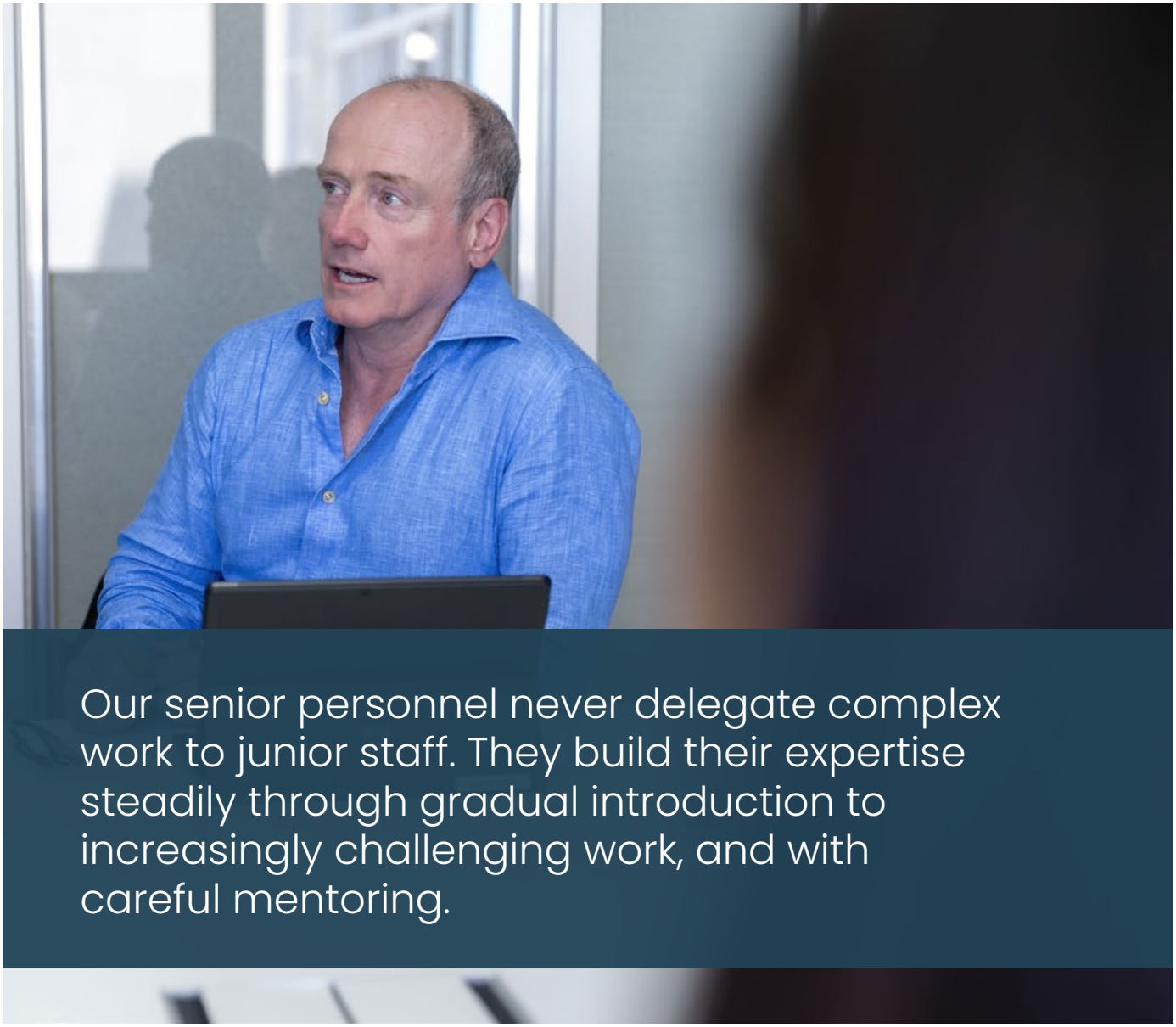
Our demography services provide insights into population dynamics to support informed decision-making. We analyse and forecast population changes, offering clarity on demographic trends that impact communities and regions. Our expertise helps you understand the demographic factors essential for strategic planning and policy development, helping you to anticipate and adapt to future needs effectively.



We are specialists, not generalists, having built a depth of expertise and experience in demand modelling and forecasting over decades of work.

Economics

Our economic consulting leverages detailed analysis and modelling to unravel the intricacies of economic functions within communities and regions. We provide insights to guide policy making, investment decisions, and strategic planning, helping stakeholders understand and capitalise on economic opportunities. Our approach ensures that solutions are not only viable but also sustainable, driving growth and enhancing community well-being.



Our senior personnel never delegate complex work to junior staff. They build their expertise steadily through gradual introduction to increasingly challenging work, and with careful mentoring.

Spatial Analytics

We use advanced data techniques to reveal spatial patterns and trends, aiding in optimised land use and enhanced service delivery. By analysing geographic data, we equip governments and organisations with the insights needed to make informed decisions, driving sustainable development and ensuring solutions are perfectly aligned with the spatial dynamics of each community.

We are transparent. We share our methodology and assumptions so that our clients can be confident we are making the right technical decisions on their behalf.

Project Examples

Court Services Demand Modelling

Objective
Develop robust forecasts of in-court demand for each of the seven primary court jurisdictions of Victoria. Forecasts to be generated by small area and factoring in future population growth scenarios and potential policy impacts on court service delivery.

Method
Geografia used historical court activity data to construct a geospatial Bayesian model forecasting court activity to 2031 by region and court jurisdiction. It factored in demographic influences on court activity (e.g. age, gender, income) and the influence of long-term policy and others changes on court service provision. The results were used to inform a comprehensive court service provision plan.

Solution
Bayesian modelling was used to develop the model as this approach is particularly useful when significant changes have been observed (including in other jurisdictions). This provides observable evidence for changing probability assumptions about service or facility use. In the case of the court demand modelling, it was used to adjust prior assumptions of the impact of changes to two input variables: population growth and court service delivery type. Under scenarios of different population growth rates and alternative service delivery (i.e., video conferencing), forecasts were generated for each court jurisdiction for each court region. A Monte Carlo model was then applied to run these scenarios thousands of times to produce a robust set of final estimates.

School Demand Model

Objective
Develop forecasts for new school facilities in the Greater Brisbane area for each of the seven primary court jurisdictions of Victoria. Forecasts were required that would estimate future primary and secondary school demand accounting for other school provision, 'catchment cannibalisation' and the impact on school choice of the provision of new road and public transport networks.

Method
Geografia designed its first school demand model for the Victorian Department of Education in 2010. The original methodological approach was refined and improved over several iterations, including for the Department's alternative education programs. Subsequent models were developed for the Catholic Education Offices (CEO) in Newcastle and Greater Brisbane. Existing (albeit often patchy) enrolment data was used to derive the propensity to enrol in certain school types and, at the aggregate national level, an overall shift towards non-government providers was built into the model.

Solution
Given the data gaps in enrolment data in most jurisdictions, the overall approach used a method called kernel density estimation. It smooths out data gaps and generates more reliable estimates for spatial models. Back casting was used to ensure the model could reliably predict known past enrolment levels. The results were used by the CEO to inform land and facility purchase planning.

Impact of the NBN on Our Economy

Objective
Analyse the potential for the NBN rollout to accelerate local economic development through increased work from home rates.

Method
Modelled the effect of the NBN, then projected the impact of increased telecommuting.

Solution
Geografia completed two projects for Telstra, analysing the economic impact of the NBN in Greater Sydney and Greater Melbourne, the largest and second largest urban areas (by population) in Australia.

Focusing on the role of telecommuting, the projects used spatial analytics to assess how the NBN could influence house prices, reduce traffic congestion, and change the dynamics of urban living. By easing commuting pressures, the studies predicted a shift in spending patterns, with less money flowing into city centres and more being spent in local suburban areas. This shift suggested a potential revitalisation of suburban communities, with increased local spending helping to support small businesses.

Our findings showed that the NBN would not only make telecommuting more accessible, but also lead to tangible benefits for household budgets and urban infrastructure. In Melbourne alone, we found that around $4 billion in discretionary spending flowed from the suburbs into the city as a result of work commuting. With more work-from-home arrangements, much of that spending could be redirected to suburban areas. The insights gained from this project were used by Telstra to highlight the broader value of the NBN rollout, with a member of our team even making a TV appearance to talk about it.

Innovative Data for Measuring Quality of Life

Objective
Design a method to use mobility data to measure urban indicators for the UN-Habitat Quality of Life Index.

Method
Developed, tested and deployed four unique methods to track the behaviour of city residents accessing specific services and facilities. Examined mobility patterns, including nighttime neighbourhood walking, frequency of visits to cultural facilities, time spent at leisure and recreation locations and mobile internet penetration.

Solution
Geografia conducted a proof-of-concept study to explore how mobility data can be used to measure indicators from the UN-Habitat Quality of Life Index. Collecting spatial analytics data from five cities around the world, the study designed, tested, and deployed four unique methods to track various aspects of quality of life, such as how residents interact with local facilities and services. The metrics examined included behaviours like walking in neighbourhoods after dark, frequency of visits to cultural venues, time spent in recreation facilities, and preferences for visiting parks either locally or elsewhere in the city.

The mobility data collected was also used to validate an additional analysis measuring mobile internet speed and latency by suburb. These methods are now part of a larger initiative led by UN-Habitat to measure quality of life across nine urban domains, aiming to extend the project to 100 cities by 2025.

New South Wales Population Futures

Objective
Develop a population forecasting tool to support strategic planning throughout the State across various geographical scales.

Method
Worked with the State Government and leading Australian demographer Dr. Tom Wilson to develop a python-based tool capable of modelling the impacts of economic conditions, housing developments, and infrastructure investments.

Solution
Population forecasting is a complex task, especially in rapidly growing regions with small geographic areas, requiring assumptions about birth rates, migration patterns, and economic conditions to predict future population changes. These forecasts are essential for government planning, providing valuable data to help determine the future need for schools, hospitals, roads, and other services.

The Geografia team collaborated with Dr. Tom Wilson, one of Australia's top demographers, to develop a population forecasting and scenario modelling tool for the State of NSW, the largest (by population) State in Australia.

The forecasting tool allows for testing various economic, infrastructure, and housing investment scenarios, generating results across SA2, local government, and regional levels, as well as custom areas based on SA1s. Built in Python, the model is easily updated and incorporates machine learning to handle complex migration patterns, providing insights into how people move to, from, and within NSW.

Wodonga's Night Time Economy

Objective
Analyse night time escape spending patterns in Wodonga, estimate excess escape spend, and assess its impact on local jobs.

Method
Used Spendmapp data to quantify escape spend by comparing Wodonga's night time spending with regional benchmarks, and employed an economic impact model to estimate the potential job growth from reducing this excess spend.

Solution
Geografia was commissioned to investigate the extent of night time escape spend for the regional city of Wodonga, in Victoria, 300km NE of Melbourne. Escape spend is the economic leakage that occurs when residents spend money outside their local government area.

Using Spendmapp data, we quantified Wodonga's overall escape spend and compared it with other regional cities across Australia. Our deep dive into spending categories allowed us to identify areas where Wodonga's night time escape spend exceeded typical per capita levels, particularly in neighbouring municipalities.

Through the application of an economic impact model, we estimated how reducing this excess escape spend could boost local spending and create more jobs in Wodonga. The findings were used to inform the City's strategies to activate the night time economy, keeping more residents spending locally and reducing the economic drag caused by excess leakage.

Human Development & Infrastructure Gap Analysis

Objective
Compare HDI values for the Torres Strait Region with the rest of Australia and identify service and infrastructure gaps underlying the disparity.

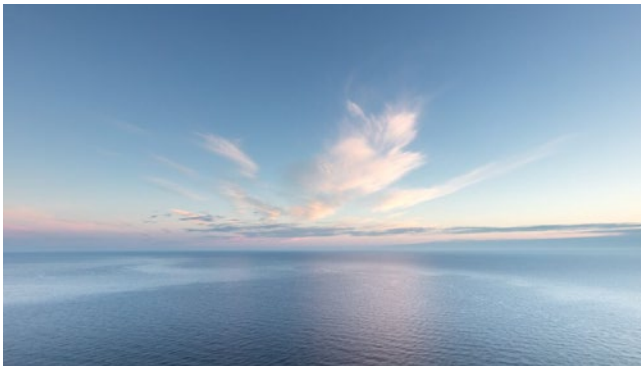
Method
Developed a method to calculate the UN Human Development Index values for all Australian LGAs and used this as the monitoring framework to evaluate the gap between service supply and demand for the Torres Strait Region. This is being used to advocate for greater investment in transport, telecommunications and other services.

Solution
The UN Human Development Index compiles data on life expectancy, education and income to compute a comparative index of development for countries. The Geografia team developed a method to deploy this at LGA level, and then match Australian LGAs with countries at the same HDI level. We found that the Torres Strait Region was on par with the lesser developed parts of the Pacific Islands.

Following on from this, a set of methods were deployed to determine the critical supply gaps in infrastructure. This included root cause analysis, interviews with regional stakeholders and network analysis to pinpoint the underlying causes of the lower development levels.

The results are being used to advocate for increased investment in critical infrastructure to bring it more in line with the rest of Regional Australia.

Offshore Windfarm Economic Impact Study



Objective
Measure the potential impact on construction and operational jobs, GRP and value add from the Star of the South Offshore Windfarm.

Method
A Vector Auto Regressive (VAR) model was used to quantify the likely direct and indirect impacts of the construction and operational phases of the Star of the South project on jobs and Gross Regional Product. Estimates were produced under different scenarios depending on work locations and the use of drive-in-drive-out (DIDO) workforces. These were calculated at local, regional, State and National scales.

Solution
A VAR model produces the most reliable estimates for job impacts at localised and regional geographies where the relative scale of activity may crowd out other investments. Multiple iterations under different construction and operational workforce counts were analysed over the years of planning for the project.

George Town Conurbation Spatial Strategy

Objective
Develop a set of core recommendations for the long-term land development priorities for 1.5 million square kilometre George Town Conurbation, including the island of Penang and the coastal urbanised parts of the State of Pulau Pinang

Method
Site visits, interviews, land use analysis, population and people movement estimations to derive a set of development scenarios in which different locations would be the focus of future development.

Solution
Ten priorities were identified for focusing development around economic clusters on the island and mainland parts of the Conurbation. The intention was to encourage concentration of complementary activity and more effective transport routing.

Civic Park and Lidcombe Town Centre Improvement Project

Objective
Using mobility and spend data, analyse the impact of completed and recently commenced infrastructure upgrades on important community spaces in the City. The findings are to be used to evaluate the value of the revitalisation works.

Method
Analysis of people movement and spending behaviour before, during and after upgrades (park and town centre revitalisation projects) to determine the change in: visitor volumes, dwell times, visitor origins and destinations and the scale and scope of economic activity.

Solution
For the park enhancements (completed in May 2024), the data analysis revealed that work (which included upgraded pathways, play areas and other amenities) led to an increase in visitor numbers, particularly during non-work hours. They also increased the size of the catchment area from which visitors were drawn, extended the dwell time and activated the more under-used parts of the location.

For the Town Centre upgrades, which commenced in late 2024, the analysis creates a baseline for evaluating the longer-term impacts on spending by day of week and time of day, visitor numbers and dwell time.