



SOCIAL AND ECONOMIC IMPACTS AND OPPORTUNITIES

GISERA | Gas Industry Social and Environmental Research Alliance

Mapping future transport for improved planning and operation in the Beetaloo

CSIRO researchers have mapped possible impacts of road and rail network development in the Beetaloo Sub-basin. The research aimed to improve understanding of potential changes in freight volumes during the construction and operation of onshore gas development.

Project scope

The Beetaloo Sub-basin lies south-east of Katherine in the Northern Territory and spans an area of about 30,000 square kilometres. One of the most prospective areas for shale gas in Australia, it contains an estimated resource of 178,200 petajoules (PJ) of gas.

Construction of onshore gas projects can impact regional road networks through increases in the type and number of vehicles along many roads. This can result in road damage, especially to local roads, and increased noise and dust.

The Scientific Inquiry into Hydraulic Fracturing in the Northern Territory recommended the impact of any heavy vehicle traffic associated with the onshore shale gas industry be assessed and required planning to mitigate any impacts.

This project addresses that recommendation and provides information to support informed decision making by government, industry and communities.

Researchers analysed road and rail freight costs, flow and impacts for identified sites in the Beetaloo Sub-basin using the Transport Network Strategic Investments Tool (TraNSIT) developed by CSIRO.

Researchers considered both construction and operational phases, and developed a range of interventions to demonstrate TraNSIT's ability to investigate potential 'what if' scenarios.



An exploration well pad in the Beetaloo Sub-basin, Northern Territory.

Key points

The modelling assumed a site hub each within three drilling fields in the Beetaloo Sub-basin.

For the year 1 construction stage, 483,675 tonnes of freight would be transported in or out of the Beetaloo Sub-basin, at a total annual cost of \$38 million.

Compared with the current baseline tonnes modelled in TraNSIT, this represents a 20% increase on existing annual freight volumes, although the increase varies significantly across major roads.

The peak operational stage would have a similar freight demand to the construction year 1 stage but a higher annual transport cost of \$49 million due to longer-distance freight movements.

The research also examined three hypothetical scenarios to compare how costs and routing of future freight flow could change due to different transport network and supply chain conditions.

These scenarios, developed in consultation with stakeholders, were:

- freighting of pipes by road from Townsville Port to all national pipeline demand locations
- congestion of key roads between the Darwin Ports and Humpty Doo resulting in a doubling of travel time along these sections of road
- closure of a number of roads in the Beetaloo region due to wet season flooding.

The impact of road closures during the wet season was most significant, with closures resulting in longer trips (up to 2.5 times hypothetical future base flow) and greater than 150% increases in freight costs.

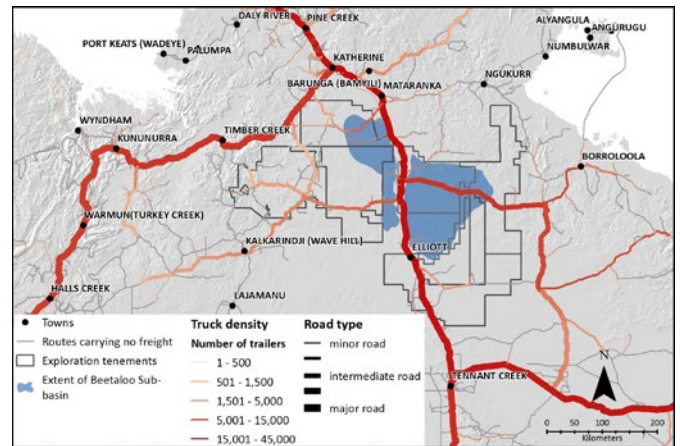
Next steps

This research program is part of a suite of GISERA studies being undertaken in the Northern Territory.

Robust, evidence-based scientific analysis provided by this research assists the community, government and industry to make informed transport management decisions and plan interventions that can reduce the traffic impacts from additional onshore gas development in the region.

As development scenarios become more certain, future work could examine further supply chain or road and rail network change scenarios, look at issues around placement of access roads to and within drilling fields, or analyse the impact of bottlenecks where infrastructure capacity may be insufficient for projected freight increases.

There is also potential for further analysis of dust impacts on the region's livestock, native flora and fauna, and road safety.



Baseline annual trailer volumes of current freight along the road network in and near the Beetaloo Sub-basin

How was the TraNSIT tool used?

TraNSIT has been developed by CSIRO over the past decade, with input from over 400 industry organisations, associations and government agencies.

At the time of the study, TraNSIT had mapped supply chains for over 140 commodities in Australia, accommodating 520,000 enterprises and nearly a million supply chain paths.

The tool has been used to inform road and rail investments by estimating the impacts of freight transport.

For this research, a baseline map was first produced to determine current freight volumes across the road and rail network. The baseline analysis was used to derive costs for measuring and comparing benefits to transport and logistics under different transport scenarios during gas development construction and operational phases. Three hypothetical future scenarios were also examined with different transport network and supply chain conditions, and a model for dust generation on unsealed roads was tested.

More information

This project was co-funded by the Federal and NT Governments, CSIRO, Origin Energy, Santos and Pangaea Resources.

More information about the project, including the final report, is available [online](#).

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GISERA is a collaboration between CSIRO, Commonwealth and state governments and industry established to undertake publicly-reported independent research. The purpose of GISERA is to provide quality assured scientific research and information to communities living in gas development regions focusing on social and environmental topics including: groundwater and surface water, greenhouse gas emissions, biodiversity, land management, the marine environment, and socio-economic impacts. The governance structure for GISERA is designed to provide for and protect research independence and transparency of research.