



Australia's National
Science Agency

GISERA | Gas Industry Social and Environmental Research Alliance

Progress report

Mapping future transport passages and volumes for improved
planning and operation



QGC



Santos



Department of Industry, Science,
Energy and Resources



Supported by
**Government of
South Australia**



Progress against project milestones

Progress against milestones/tasks are approved by the GISERA Director, acting with authority in accordance with the [GISERA Alliance Agreement](#).

Progress against project milestones/tasks is indicated by two methods: Traffic light reports and descriptive Project schedule reports.

1. Traffic light reports in the Project Schedule Table below show progress using a simple colour code:

- **Green:**

- Milestone fully met according to schedule.
- Project is expected to continue to deliver according to plan.
- Milestone payment is approved.

- **Amber:**

- Milestone largely met according to schedule.
- Project has experienced delays or difficulties that will be overcome by next milestone, enabling project to return to delivery according to plan by next milestone.
- Milestone payment is withheld.
- Milestone payment withheld for second of two successive amber lights; project review initiated and undertaken by GISERA Director.

- **Red:**

- Milestone not met according to schedule.
- Problems in meeting milestone are likely to impact subsequent project delivery, such that revisions to project timing, scope or budget must be considered.
- Milestone payment is withheld.
- Project review initiated by GISERA Director.

2. Progress Schedule Reports outline task objectives and outputs and describe, in the 'progress report' section, the means and extent to which progress towards tasks has been made.

Project schedule table

TASK NUMBER	TASK DESCRIPTION	SCHEDULED START	SCHEDULED FINISH	COMMENT
1	Produce baseline and indicators	Jul-20	Aug-20	
2	Mapping of logistical processes and supply chains for construction and operational phases of shale and gas industry in Beetaloo Basin	Aug-20	Oct-20	
3	Transport impacts of shale and gas in Beetaloo Basin, including additional indicators	Nov-20	Jan-21	
4	Validation of results and identification of interventions	Jan-21	May-21	
5	Modelling of intervention options and submission of final report	Mar-21	Aug-21	

Project schedule report

TASK 1: Produce baseline and produce indicators

BACKGROUND

To understand the transport related impacts for shale and gas in the NT Beetaloo Basin, a “pre” baseline needs to be produced showing what is the current freight across the road and rail network.

TASK OBJECTIVES

To produce a baseline of freight and personnel transport in the Beetaloo Basin, for comparison with ‘peak’ construction and production scenarios.

TASK OUTPUTS AND SPECIFIC DELIVERABLES

Baseline of current freight movements across the NT road/rail network, including critical link analysis of supply chains into other states/territories. The baseline analysis will consist of a range of road and rail freight maps for NT, along with transport economics of each commodity class. The freight maps will show the number of vehicles and rail wagons along each segment of the network, including direction, vehicle type, supply chain leg, etc. This will provide stakeholders with a common understanding of what is currently moving around the NT road and rail networks. TraNSIT already contains the freight movements by commodity for all trips in, out and through the NT. By consulting with industry and government, other key transport-related indicators (e.g. road damage, dust, connectivity for other road users and communities, sensitive freight paths) will be identified and methods for including in TraNSIT.

PROGRESS REPORT

This milestone is 100% complete

A draft baseline of current freight movements (road/rail) across the GISERA study area (Beetaloo sub-basin) was produced for all commodities combined, and for key ones (e.g. cattle, minerals, fuel) separately. Corresponding economics data was also produced. The map and economics outputs were reviewed by the TraNSIT team and some errors in placement of some key enterprises in the broader region were identified and fixed. The baseline was re-run based on the updated data and maps were created and emailed to relevant TRG members (NTG, NT Road Trains Assn, DITRDC) and some additional specific industries (Minerals Council, NT Cattlemen's Association, NT Farmers, NT Chamber of Commerce), asking for feedback. Useful feedback was received from some of these. Additional contextual information was received from the team relating to social and environmental impacts of gas development (through discussions with GISERA researchers).

The team has obtained ethics permission from CSSHREC for this project.

Task 2: Mapping of logistical processes and supply chains for construction and operational phases of shale and gas industry at the NT Beetaloo Basin

BACKGROUND

Before the transport impacts of shale and gas can be estimated, there needs to be an understanding of the volumes and types of materials that are needed at the wells for construction and operational phases. This can only be identified through discussions with the key industry stakeholders

TASK OBJECTIVES

To develop a supply chain map of freight for the pre-and peak phases of shale and gas industry at the NT Beetaloo Basin, which can then be used to parameterize the inputs for TraNSIT.

TASK OUTPUTS AND SPECIFIC DELIVERABLES:

Meetings held with industry (Origin Energy, Santos and Pangaea) and government to identify volumes and timing of each type of material and waste to be transported between origins and destinations, including planned use of rail, backloading, and any special freight path and vehicle type restrictions. This will likely involve movements into and out of NT, and across three modes of transport. Sensitive freight will be identified along with special considerations with approved freight paths, transport methods. A freight and supply chain conceptual map will be produced and validated with industry and ready for implementation into TraNSIT.

PROGRESS REPORT

This milestone is complete.

Team held discussions with Origin and NTG and received useful data around gas supply chains and logistical processes from both. Supply chains for both construction and operational phases have been mapped using this data. We have decided to validate these with stakeholders at the same time as the first model outputs, i.e. as part of Task 3. The data is being used to parameterize and model transport movements for both construction and operational phases (part of Task 3).

Task 3: Transport impacts of shale and gas industry at the NT Beetaloo Basin

BACKGROUND

The Transport Network Strategic Investment Tool (TraNSIT) will be used for the analysis. TraNSIT has a long track record of informing infrastructure investments in the NT and across Australia, and the TraNSIT team has developed a strong rapport with senior management in the key NT departments, particularly the Department of Infrastructure, Planning and Logistics. TraNSIT has previously been applied to CSG construction phase in Queensland, which was of benefit to the Queensland Department of Transport and Main Roads. The conceptual map of freight and personnel movements from Task 2 will be an input to this transport analysis.

TASK OBJECTIVES

To derive and communicate the transport related impacts from shale and gas industry

TASK OUTPUTS AND SPECIFIC DELIVERABLES:

Application of TraNSIT to peak construction and operational phases, showing impacts of freight volumes, economics and other indicators compared to the before scenario. This includes number of vehicle (freight and personnel) and rail movements across the transport network by time of year, transport costs. Critical link analysis showing the extent of the supply chains into other states. Pinch point analysis to identify transport bottlenecks or inefficiencies from the construction or operational phases. Outputs will include a variety of spatial freight mapping, transport economics and analysis for each of the identified indicators. An interim report will be produced for communication of results.

PROGRESS REPORT

This milestone is complete.

TraNSIT has been applied to derive draft movements for both construction and operational phases of the gas industry in the Beetaloo Basin – these have been produced for road usage only, as our discussions with the gas industry suggest rail will not be used as a means of transport. Draft maps and economic outputs have been produced, and critical link and pinch point analyses have been undertaken. These have been written up within an interim report which has been forwarded to NTG (Roads) and Origin Energy for validation – the two parties which have been the key providers of data to date.

A copy of the draft interim report has been provided to the GISERA Director's Office.

Task 4: Validation of results and identification of interventions

BACKGROUND

A large range of graphical and tabular outputs will be produced from the TraNSIT analysis of shale and gas industry in the NT. Before testing interventions, these outputs need to be validated to ensure confidence and support is secured for the intervention options.

TASK OBJECTIVES

Report back to industry and government with the draft results and gaining their expert input with regards to any errors. This will also socialise the results across the stakeholders and help understand the types of interventions that would be effective and/or supported by government

TASK OUTPUTS AND SPECIFIC DELIVERABLES:

Communication of results to industry and government stakeholders for range of indicator outputs, identifying any transport, safety, environment, or community issues in the vicinity of the transport network. This will be done with one-on-one meetings with industry and government, and a round table discussion with broader stakeholders. Identification of infrastructure, regulatory or operational interventions that may reduce transport costs (e.g. use of rail, road improvements, hub and spoke, etc) or generate co-benefits for communities and tourism. Specific details of the intervention options will need to be obtained so that the logistics can be accurately incorporated into TraNSIT. For example, if rail was to be used for some inputs, we would need to know which commodities, where are they loaded, rolling stock requirements, etc.

PROGRESS REPORT

This milestone is complete

An interim report containing draft baseline, projected future density (under construction and operational phases of gas development), critical link and pinch point analyses was drafted and sent to relevant stakeholders for validation. Follow-up video-conference meetings with all stakeholders were held in the weeks of Feb 22, May 3 and May 17 to discuss the results, to seek feedback/validation and discuss potential intervention scenarios for future modelling. We received further feedback from some stakeholders. The modelling was re-run and new outputs were re-validated by stakeholders in the weeks of July 19 and July 26. We arranged to hold these discussions face-to-face (mainly in Darwin), but COVID outbreaks and lockdowns forced a re-plan, meaning they had to be run via video-conference. Re-validation and scenario discussions with all stakeholders were complete by July 30. Further intervention options for modelling were identified during these meetings, for modelling and validation early August.

Task 5: Intervention options and report

BACKGROUND

Once the intervention options are identified they can be evaluated in TraNSIT

TASK OBJECTIVES

Evaluate the intervention options using TraNSIT, presentation of outputs to stakeholders and path to implementation. Upon request, some intervention options can be evaluated earlier than March 2021, provided they have been defined by stakeholders.

TASK OUTPUTS AND SPECIFIC DELIVERABLES:

Application of TraNSIT to the range of intervention options, to identify transport cost savings, freight volume impacts by mode and benefits to the other indicators (e.g. dust, emissions, connectivity to communities, traffic shifted to rail). Results of interventions communicated to the industry, Australian and NT Government and used in business cases as evidence-based information for infrastructure improvement programs. Key groups in the NT Government and Australian Government (DITCRD), e.g. Infrastructure Investment Division, will be included in the presentation of the methodology and results.

Case studies will also be communicated to Infrastructure Australia and the National Freight and Supply Chain Strategy, to demonstrate how infrastructure investments in shale and gas can provide national level benefits. Results from the project will be included in TraNSIT Web for ongoing use by NT Government and Australian Government. Final report submitted.

PROGRESS REPORT

This milestone is complete.

The TraNSIT model was applied to three intervention options (two network changes, one supply chain change), plus three critical link analyses were undertaken – to identify network constraints due to projected construction phase freight movements. These and all previous modelling results were written up in a report, the project and results were then presented to key stakeholders during the KTS organised by GISERA late September 2021.



The final report titled *Mapping future transport passages and volumes for improved planning and operation* has been publicly released and is available on the GISERA website.

Variations to Project Order

Changes to research Project Orders are approved by the GISERA Director, acting with authority, in accordance with the [GISERA Alliance Agreement](#). Any variations above the GISERA Director's delegation require the approval of the relevant GISERA Research Advisory Committee.

The table below details variations to research Project Order.

Register of changes to Research Project Order

DATE	ISSUE	ACTION	AUTHORISATION
11/06/21	Delays with validation and stakeholder feedback	Milestone 4 extended from end Feb 2021 to end May 2021	
11/06/21	Consequential delays from earlier task	Milestone 5 extended from end June 2021 to end August 2021	

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Contact us

1300 363 400
+61 3 9545 2176
csiro.au/contact
csiro.au

For further information

1300 363 400
gisera.csiro.au

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.