

ACARP PROJECT C22021
PUBLISHED 1/06/2014



THE CUMULATIVE IMPACT OF GROWTH ON REGIONAL TRANSPORT INFRASTRUCTURE: CENTRAL QUEENSLAND CASE STUDY

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***The cumulative impact of growth on regional
transport infrastructure:
Central Queensland case study***

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June 2014



Executive summary

An effective transport network is essential to both ongoing growth of the resources sector, as well as to the sustainability of the regions that host resource development activity. For mining companies, modern and efficient transport infrastructure is necessary in order to move its product from mine to market; to enable easy, safe and effective employee access; and to provide for the non-coal freight supply to both construction and operations activities. However, whilst extensive datasets are available to inform future planning, expansions and upgrades for coal freight systems, much less information is available to support decision-making around workforce and non-coal freight movements within regional transport networks. This can result in inefficiencies and potentially costly delays or interruptions to construction, maintenance and operations activities. Regional communities can also be negatively impacted through poor transport conditions and pressures on small businesses. These problems are often magnified where multiple resource sector operations are located in close proximity, and where development occurs rapidly.

This research aimed to identify the key issues for regional transport systems (air and road) arising from the cumulative impacts of resource sector growth, using a case study focus on the northern Bowen Basin region in central Queensland. Specifically, this included:

1. identifying and reporting on the cumulative impacts of resource sector development on road and air transport systems within Central Queensland;
2. identifying the potential strategic responses to these challenges, especially those based on collaborative and innovative solutions involving consultation with key stakeholder groups and the community; and
3. modelling the likely outcomes of different options and future scenarios based on the above information.

The project was based on an approach using whole-of-region stakeholder consultation to focus on finding strategic solutions to emerging transport issues, from the perspectives of resource industries, as well as other business sectors and the communities themselves.

It is important to note that this project had a restricted scope. Furthermore, despite sustained efforts to raise response rates, the data collection exercise was frustrated by small sample sizes, which affected the feasibility of modelling and mapping components. These exercises have still been delivered wherever practicable, but necessarily, the research relied heavily on qualitative data and analyses to identify the non-infrastructure related strategies that might be brought to bear on the regional transport challenges currently being experienced in the Northern Bowen Basin.

It is also of note that this project was undertaken during a period of slowdown within the resources industry, related to the broader economic climate in Australia and globally. This may have impacted stakeholders' perceptions with respect to the nature and importance of various transport impacts. Nevertheless, the resource industry is characterised by cyclical trends in activity, so it is equally important to interpret this research in the context of the current climate, as it is to consider the implications for regional transport systems when the industry returns to a strong growth position.

1.1 Key findings: transport impacts associated with current and proposed developments

In order to set the context for primary data collection, information on regional transport impacts was collated from the Environmental Impact Statements of 16 coal development projects that have been proposed within the Northern Bowen Basin and Galilee Basins since 2009. This high-level analysis revealed that the EIS approvals process already includes detailed provisions for describing regional transport impacts. The evaluation highlighted that the nature and extent of impacts that a particular development may have on the regional transport system is influenced by a complex range of factors, and this variation makes it difficult to generalise across coal development projects. It was also observed that variation in the level of detail provided by each proponent, as well as differences in the style of presentation, compounds this problem. For example, it was not always easy to distinguish amongst heavy loads, wide loads and liquid/fuel transport loads within the figures quoted for transport movements. Finally, it was also noted that the current EIS process appears to place a much greater focus on anticipating and addressing regional road transport issues, compared with air transportation challenges: many EISs failed to give useful information about impacts to commercial flight routes, and none mentioned the interaction between the resource development sites and existing air freight services.

The social – and often ‘cumulative’ – impacts of resource development on the regional transport system were typically described in terms of impacts on population centres close to the project site(s). With respect to the suite of planned projects in the Northern Bowen Basin, the recurrent themes for social impacts included concerns about transport delays and congestion; safety and risk; and increased pressure on existing transport infrastructure. Where cumulative impacts were identified, these typically related to increased traffic volumes and their associated impacts to risk profiles, pavement damage, and other social and economic impacts.

There is an extensive range of strategies used by proponents to address regional transport and traffic concerns, including those directed by the relevant authorities as part of the conditions for development approvals. Such conditions typically include activities to be undertaken by the resource proponent itself, although activities involving a range of stakeholders working together are also commonly featured (for example, working with local government and the Queensland Department of Transport and Main Roads on infrastructure agreements).

1.2 Key findings: community consultation

The community consultation phase involved primary data collection by way of three instruments: a travel survey with households, a travel survey with non-resident employees, and telephone-based interviewing with stakeholders from regional business, industry, government and the community. Unfortunately, as already noted, the consultation exercise was thwarted by consistently low response rates, despite considerable effort being put towards awareness-raising of the project, and incentivising participation. There was no clear explanation for this low participation rate, rather, it this appeared to result from a mixture of poor awareness, ‘consultation fatigue’, and/or the perception that the research process was unlikely to trigger any material change in the regional transport situation.

The household travel survey attracted a diverse profile of respondents (n=76), with many from the Moranbah and Emerald townships. The condition of regional roads was the primary issue raised by

residents, as well as concerns about safety and congestion issues associated with over-dimensional vehicles; and perceptions of poor driver behaviour, particularly around speed, inattention and fatigue. Two different statistical analyses applied to these 'satisfaction' data both showed that residents were more likely to be dissatisfied with the roads if they worked in trade occupations, if they worked full-time, and/or if they used the roads more frequently (e.g. 5 trips or more per week). By comparison, participants ranked their satisfaction with air travel more highly, with over half of respondents indicating they were satisfied or very satisfied, notwithstanding concerns about expensive flight costs, poor availability of routes, and frustration over regular flight cancellations and delays. In terms of solutions, many residents offered infrastructure-related suggestions, with very few examples of collaborative or 'softer' strategies that might be explored to help address regional transport concerns.

A total of 30 people completed the survey for non-resident employees; and compared with the resident's views, the non-resident employees appeared to have a more moderated perception of road and air transport in the Bowen Basin region, with a more even spread across the satisfied and dissatisfied response categories. Nonetheless, concerns about road travel in the region were similar to those reported for residents, with a focus on poor road quality, oversize loads, delays due to roadworks and concern about risky driver behaviour; whilst air travel concerns revolved around issues of flight scheduling and the costs of seats.

Some 29 stakeholders provided information about regional transport impacts; this highlighted a generally consistent understanding of what is meant by 'cumulative' impacts. The stakeholders were able to identify positive impacts relating to air travel (e.g. better flight accessibility) as well as local economic stimulation, related to the region's resource development activities. The concerns about road and air transport modes generally mirrored those already recorded from both the resident and non-resident cohorts. Importantly, the stakeholders indicated that more information is needed about labour force movements, wide loads, and road-air connectivity. Ideas for solutions included those to tackle road congestion and wide loads (e.g. an 'app' to track wide load movements in real-time); initiatives for strategic planning and collaboration, and directions for infrastructure and investment. For air transport, the focus was on collaboration to identify where user demand exists, and then use of this information to lobby airlines for more appropriate flight routes and scheduling.

Overall, the community consultation phase demonstrated that the region experienced some dichotomy with road transport impacts being perceived as mostly (though not always) negative; whereas air transport impacts were generally (though not always) positive. Whilst most research participants were able to define the types of transport problems being experienced in the region, these were rarely described in any quantitative sense, and participants were largely unable to offer ideas for practical, collaboratively-based solutions, outside of new infrastructure builds.

1.3 Key findings: travel demand modelling and mapping

The on-road travel demand in the Central Queensland region was predicted out to the year 2021. These predictions were prepared using a gravity spatial interaction model: this shows the relationships between existing and projected populations of towns, and the effect of distances between townships on people's propensity to travel. This method was based on information from the ABS Census (e.g. existing and projected population, past observed road travel demand) as well as primary data (e.g., distances between towns and other information) collected during this study. This

analysis compared six townships across the Northern Bowen Basin, and concluded that Mackay is predicted to experience the highest number of daily trips overall. Visual mapping was performed to illustrate the trends generated by the gravity-modelling. Under the medium growth scenario (the one considered most likely to eventuate), the demand for road travel is predicted to increase by 14.2% and 27.9% respectively, by 2016 and 2021. Furthermore, based on current road traffic profiling, up to one in four vehicles could be represented by wide load, heavy vehicles and commercial vehicles. Lastly, the model indicated that trip generation is largely driven by journeys *within* a particular township, rather than between towns in the greater region. Additional modelling of commodity-flows indicated that the Capricorn highway experiences large volumes of freight, including a high number of road-train movements. However, a clear relationship between road train load and the frequency of accidents along the highway section could not be established.

1.4 Recommendations

The key recommendations arising from the project included:

1. the need to develop and pursue a strategic engagement platform, which could address issues of communication, data sharing and transparency, clarification about responsibility for infrastructure funding, and the need to stimulate cultural change in the region in order to build local and regional collaborative responses to transport issues;
2. that the merit and likely success of collaborative initiatives around greater accessibility to, and use of, public transport, should be carefully considered;
3. that the regional transport network be examined holistically, including road-to-air linkages, and the role of rail and air in reducing freight burden on the road sector; and
4. that the above-mentioned 'soft' strategies need to be pursued in parallel with the ongoing repair, upgrade and development of hard infrastructure, particularly in priority growth areas such as in and around mining townships. Furthermore, a selection of the solutions put forward during the course of this research should also be ground-truthed for feasibility, such as a real-time 'wide-load app' (or GPS-integrated system).

A number of areas were identified for future research opportunities, including estimates of lost productivity and the proportion of road activity represented by the resource sector; explorations of shift-scheduling for the resource sector workforce; and projections of wide-load movements according to future growth expectations in the sector.



A road train overtakes a wide load on the Capricorn Highway, with a coal train passing nearby (May, 2014).

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