Submission to Sustainability Unit

Long Distance Land Transport Concept

Introduction

The submission outlines a concept for a standard gauge rail connection from Perth to Darwin via Katherine serving coastal communities and industries en route.
West, northwest and north coastal regions of Western Australia, need to be connected together and to Australian transport networks with appropriate surface transport infrastructure. The northern climate makes coastal regions more liveable than inland areas. Major towns are on or near the coast. The trend seems unlikely to change.

Need for permanent transport infrastructure

Developing isolated areas need physical transport connections so that they can readily interact symbiotically with each other and with distant markets. State shipping is limited to ports served. It cannot supply services to a standard that land transport can deliver.
Road transport is well organised with powerful lobby groups aiming to ensuring that substantial sums of public money are allocated to road construction and maintenance. Permissible vehicle sizes, lengths and axle loadings, have increased to an extent worrying to other road users, to reduce running costs. However, they increase road construction and maintenance costs. Drivers spend long hours at the wheel to cover great distances. Driver fatigue is a constant danger. Roads are inappropriate for moving large tonnages over long distances. Rail infrastructure would assist in establishing appropriate new industries based upon not insubstantial resources of the regions.
Present rail construction from Darwin to Alice Springs is a refreshing indication of changes in national attitudes towards rail transport as are plans under consideration to construct a railway from the eastern states to connect with the Darwin to Alice Springs rail route at Tennant Creek.
Development should not be exploitative, with industries largely aiming to exhaust resources involved within a limited time and then to move out. The state needs to demonstrate that development, employment and facilities are here to stay.
It seems to be a chicken and egg situation. What should come first: developments or supporting infrastructure? There seems to be little doubt that, in this case, infrastructure should not wait for developments. Developments are more likely to occur if infrastructure needed is already in place. Individual new developments seem unlikely to justify the capital outlay.
Connection to a national port at Darwin with direct links established to countries to the north would increase opportunities for diversified overseas trading. New export industries such aquaculture in the Kimberley region using termites as feedstock for fish exports to world markets may be worth investigating.
A northern connection to Australia's rail network would increase trading opportunities with other Australian states. An example of mutual advantage is an idea by the late Lang Hancock for a northern railway to Queensland to establish iron smelting in each state using Queensland coal and Pilbara iron ore.

Potential major bulk traffic could be phosphate rock from the Mt Isa area of Queensland to a superphosphate industry located near the Burrup Peninsular. It could reduce the need to import overseas phosphate rock to Western Australia.
Empty ore wagons returning from the Pilbara Region to Queensland may well encourage a Queensland industry to smelt iron using Pilbara iron ore.

National defence capability should improve with a capacity to move large tonnages rapidly around the northern half of the country at short notice. The Commonwealth Government should have an interest in supporting a Darwin to Perth rail concept.

Proposed route

Perth – Geraldton

The route envisaged would follow the existing railway to Gingin and then head directly towards Geraldton roughly following the Brand Highway with deviations where needed to minimise rise and fall.
The present road distance is approximately 424 km.

Geraldton – Carnarvon

The route would roughly follow the North West Coastal Highway. The old railway route through Northampton to Ajana seems unlikely to be appropriate. It may be better to leave Geraldton initially following the Chapman River valley and then to climb to the east of Northampton before continuing northward.
The present road distance is approximately 474km.

Carnarvon – Port Hedland

The route envisaged would generally following the North West Coastal Highway to South Hedland. It may be worth initially heading for Cape Cuvier for protection from cyclone floods by Lake MacLeod before rejoining the highway north of Minilya Roadhouse.
The present road distance is approximately 670km.

Port Hedland – Derby

The route would generally follow the Great Northern Highway.
The present road distance is approximately 756km.

Derby – Kununurra

To minimise distance and rise and fall, the topography of the intervening countryside needs to be closely studied. A possible route could be to head for the Fitzroy River gap through the King Leapold Ranges via the watershed separating the Lennard and Fitzroy rivers, then, topography permitting, to follow the Fitzroy and Chamberlain rivers heading towards the mouth of the Pentecost River before generally following the Victoria Highway route to Kununurra.
The present road distance is approximately 861km.

Kununurra – Katherine

The route envisaged would continue to generally follow the Victoria Highway with deviations where needed to reduce rise and fall.
The present road distance is approximately 511km.

Motive power

5 to 10MW methanol or ammonia fuel cells for motive power, augmented with battery capacity for regenerative braking and, possibly, a standby generator, should be considered. With an ammonia plant at the Burrup Peninsular now more likely, ammonia could be a fuel option, producing zero carbon dioxide emissions. Further down the road, instead of using natural gas, ammonia could be made from renewable energy without requiring any hydrocarbons for its production.

Operation

Container trains with accommodation on-board for train crews rostered in watches, like ships at sea, with substantial time off between long trips are envisaged for general traffic. Crews would include operators to transfer containers to and from trains at wayside stations. Crew accommodation could possibly be extended to allow for a number of passengers on a self-service basis with accompanying vehicle carrier wagons. While journey times would be longer than for passenger trains, they may appeal to sight seeing tourists and be more relaxing than driving for motorists.

Door to door service

Containers developed over the last half-century allow door-to-door services combined with long distance rail haul. The concept envisages that continued development of container handling equipment will take place so that containers can be transferred, with minimum delay, between trains and railside trestles at wayside stations without using external equipment. Corresponding continued development of container carrying road vehicles may be needed so that they can readily transfer containers between railside trestles at wayside stations and premises served.

Design standards

Design speeds and ruling gradients should be considered when trial locations are made on paper, using existing topographic contour mapping. Safety would be of paramount importance. Heavy rail construction standards could reduce track maintenance. Cyclone flooding would need special attention.

Track maintenance

Track recording equipment, mounted upon at least one traffic train each day, to log rail track horizontal, vertical and transverse alignments is envisaged so that track faults can be identified immediately they start to develop. Mobile mechanised track maintenance units would use the information to maintain track to design speed standards and to apply temporary speed restrictions where needed.

Conclusion

The distance from Perth to Katherine is approximately 3,700 km. The overall cost of a railway is unlikely to be recoverable from services in the foreseeable future. However, State and Commonwealth Governments should see it as a necessary investment needed to provide basic services for communities and industries to develop. Established industries and financiers may wish to be involved in the investment.

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