Submission to Inland Rail Inquiry – Meeting the 24 hour Transit Time a Furphy

The Federal Government and ARTC have consistently refused to assess the route of the Inland Rail as they have stated that this is the only route that will allow them to meet the invented 24-hour Melbourne to Brisbane transit time.

The route chosen has some fatal flaws (ARTC have steadfastly refused to undertake any fatal flaws assessment, probably because of the number of flaws that would be identified would stop the project), a summary of these follow for the Inner Darling Downs:

Constraints of the Inner Darling Downs Flat Straight Rail Lines

ARTC have said they must meet an artificial service offering of 24 hours. Their advice is that to meet this deadline the track must be flat and straight. The line from Pittsworth to Gowrie meet neither of these criteria.

HEIGHT

It would be very obvious to all that topography would be a prime consideration in the selection of the route for a major infrastructure project such as a railway.

Railways are built to carry heavy loads so an absolute fundamental is, if possible, the avoidance of steep terrain in planning the alignment. This alignment fundamental is critical for three major reasons -

A The construction COST of building a railway over steep, undulating terrain is **SUBSTANTIALLY GREATER** than over flatter areas where slope is much more gentle. More level routes eliminate much excavation, embankment, and bridging work which is inescapable through hilly terrain.

B The **ONGOING OPERATIONAL COSTS** of diesel engines traversing routes through hills and valleys is much more than through gentle slopes. Despite major construction items such as cuttings and embankments being built to reduce slope, trains still have to travel **UPHILL** from point A to point B - with a directly proportional increase in fuel usage and exhaust emissions. Once a line route is chosen to traverse hilly country, the die is cast for **ONGOING** and **NEVER ENDING** excess diesel fuel usage.

C TIME delays because of necessary slower locomotive speeds are inevitable. Rail freight is all about hauling very heavy loads and, whilst hilly country poses no major time issue for passenger cars, speeds attainable by trains grossing thousands of tonnes and travelling uphill will be significantly reduced - this is just common sense !

BENDS

Selection of rail routes through hilly country will always have issues in endeavouring to "level out" the line. But there is very likely to be more **CURVES** in hilly terrain as surveyors attempt to select a route which will minimize major earthworks. Sometimes this will be impossible so compromises will be made between curvature and gradient.

The friction between locomotive and rolling-stock flanged wheels and the rails **INCREASES** on curves where the wheel flanges contact the rails. Friction causes heat and more engine power is required to overcome the frictional forces associated with curving alignments.

Inland Rail has strict specifications regarding track curve radius in order to reduce friction, noise, and for safety reasons as well. But, if the rails are curved , friction cannot be eliminated of reduced to that of running on straight lines .

So again, as with gradient, curving alignments will require locomotives to use more fuel and travel slower than on straight alignments.

The above comments on both altitude and curvature and their effect on initial construction cost, operational cost, and time may well have been the thoughts of Mr Richard Wankmuller when he addressed the ARTC conference at Parkes in July. Richard is the C.E.O. of Inland Rail Program for ARTC and **TWICE** during his speech he stated that Inland Rail must be built "**VERY STRAIGHT and VERY FLAT"**. This was necessary, he said, for the locomotives to be able to complete the Melbourne-Brisbane journey within 24 hours. This was the time interval demanded by industry and freight forwarders alike when the business case for the Inland Rail project was being developed.

So, their message to ARTC was clear. If the trip could be completed in less than 24 hours, they would use rail. This, in turn, was Mr Wankmullers message to the Parkes audience - in order to do the trip under 24 hours, this line must be "**very straight and very flat**"!

With the above facts in mind, it is difficult to understand just why the rail alignment was chosen to traverse the Inner Downs ridges and valleys between Brookstead and Gowrie via Pittsworth, Southbrook, and Athol - particularly when less sloping alternatives were available . This is puzzling because it would be almost impossible to select an alignment which had more variation in gradient than the one chosen by Minister Chester in September 2017!

To illustrate the extreme variation in gradient between Brookstead and Gowrie,the altitude differences between these two localities (and of points in between) are shown below --

Location	**Height**
BROOKSTEAD	390 m
PITTSWORTH (NORTH EAST)	570 m
SOUTHBROOK (WEST)	590 m
ATHOL	540m
WESTBROOK CREEK	435 m
WARREGO HWY	480 m
GOWRIE	460 m

The above data shows quite clearly that this route has an altitude variation from Brookstead to Southbrook of **200 METRES** and from Athol to Westbrook Ck of **115 METRES**. In layman terms, the line would go from Brookstead **UPHILL** to the inner Downs ridges between Southbrook and Athol, then descends **DOWNHILL** to Westbrook Creek. During this section of the ARTC route, the line follows a 'brownfield" existing rail line for ONLY 12 km.

Comparatively, the original "Base Case "route, which follows 40 km of "brownfield" railway corridors between Brookstead and Gowrie, has the following gradient variations --

Location	Height
BROOKSTEAD	390 m
MT TYSON	425 m
PURRAWUNDA	440 m
AUGBIGNY	420 m
KINGSTHORPE	440 m
GOWRIE	460 m

These second set of altitude figures clearly indicates that, in the 90km of route from Brookstead to Gowrie, there is a variance of **ONLY 70 metres** -with 20 metres increase occurring in the last 10 km!

With construction as well as resumption costs in mind, it appears difficult to rationalize just why a route utilizing 40 km of "brownfield" corridor and with an altitude variance of only 70 m, would have been rejected in favour of a route using only 12 km of "brownfield" and traversing land with altitude variances of 200 m and 115 m!!

There are other issues such as the complexities of the Westbrook/Dry Creek floodplain involving 4 major high bridges and the 15 m high curving viaduct to Gowrie Creek-as well as more acute social and environmental effects - which impact more dramatically with the ARTC route. The clear message about the ARTC route via Pittsworth is that it is anything but "very flat and very straight "!

The choice of this route past Pittsworth totally ignores this basic fundamental requirement in railway construction, will cause on-going extra train operating expenses, and will, with absolute certainty, increase train journey time.

(Attachment 1 Route Height Comparisons)

Winds and Double Stacked Trains

Another issue that will reduce the travel time through the Inner Downs is the amount of strong winds experienced. Double stacked freight trains blow over in high winds.

This is significant to train travel times as the configuration of multiple vehicles with double stacked containers provides a large side surface area that is susceptible to high wind forces. Adding to this are numerous 12m plus high embankments creating a disaster in the making.

Wind speeds only need be greater than 60 km/hr to necessitate trains to slow to less than 70km/hr so they don't blow over.

The wind data from the Wellcamp airport, as an example show that wind gusts regularly get to 90km/hr. In the period 30 Aug to 15 wind gusts over 70km/hr were recorded in excess of 100 times So this would have been 100 opportunities for these trains to blow over.

To meet the 24-hour service offering the train needs to travel at 115km/hr through this section of the line. Therefore the 24-hour timeframe won't be met as the trains can only travel at 70km/hr through here. In

addition, the recommended speed of less than 70km/hr applied to trains on flat ground not 12m above the ground, so they would have to go slower again, further jeopardizing the 24hr service offering.

Curfews

Brisbane has curfews during the am and pm peaks there is a five hour curfew applied which means that operations are limited to 19 hours, five days per week. Weekend operations must not impact on timetabled services. This will limit the 24 hour transit time

Conclusion

The 24-hour transit time is doomed for failure if the current route persists. The travel speed will be severely compromised by the route chosen which is neither straight nor flat. Existing rail corridors in Queensland are available for use and these are straight and flat and should have been the first option for the line.

In addition, external factors such as wind speed and curfews will compromise travel times

If so, much money is to be invested, surely there is an obligation to provide a route that may come close to meeting the transit times set in the service offering.

Why the government insists on a line which will ensure that IR fails cannot be understood.

V Battaglia

Biddeston