Dear Team member

Thank you for the opportunity to provide comments on the SSD 7709 MOD 3.

This is one of those mutual obligation requests:

- We recognise that much care has gone into the documentation of the SSD 7709 MOD 3. We are therefore required to study many, many, pages before we find things that we are qualified to make comments on.
- My comments run over nineteen pages. I think it is only common courtesy if my comments are also given the same attention. My comments contain many images. Some have explanations. The English is not perfect, but the ideas do not change.
- It would be nice if in your response, you also comment on my comments – that way we will both know that we are serious about this issue.

I have lived in Chipping Norton, a suburb of Liverpool, for about forty years. For the last thirty years, I worked as a free-lance transport modeller through my own micro company "Transport Modelling". My company is on the ACT, NSW and QLD State Government modelling panels, since the inceptions of those panels. In other words, my colleagues in three States considered my modelling skills high enough to place me on their State's Government modelling panels. With this background, I believe that I can make valid comments on the traffic issues in my own back yard.

I believe that these modifications have not been thought through enough.

I understand that the market requirements have changed, and therefore more dangerous goods need to be stored on site.

The Willowtree Planning report it states can be achieved and in Section 6.3 Traffic and Transport, "The proposed modifications do not require any further consideration with respect to traffic generation. The proposal will remain consistent with the consolidated consent with respect to traffic."

This is last statement is true, **if, and only if**, the dangerous goods are not moved out of the warehouse at a greater rate than at the earlier consent date.

It would be odd if the changed market requirements only required a greater storage volume for more dangerous goods. It is purely for the sake of having a larger storage? Or, is there a little more to that.

Intuitively, that greater storage requirement reflects the implicit requirement for a higher turnover rate. That higher turnover rate requires more vehicle movements in and out of the warehouse. In other words, the greater storage requirement implicitly requires more vehicle movements, meaning an increase in the traffic generation rate. In short, there will be more intermodal traffic.

That higher number of vehicle movements of the dangerous goods, can only be neutralised if other vehicle movements are reduced by the identical number of vehicle movements.

To me, the sole purpose of MOD 3 of greater storage for dangerous goods does not make sense. It makes more sense to me, that the greater storage implies a higher turn-over rate. That is, more traffic movements.

Those higher traffic movements can be neutralised by reducing vehicle movements for other goods. If that were the case, that would have been THE major headline in this modification – if nothing else – just to appease the local residents.

Instead, there is a claim that there is no change in traffic generation.

Are we expected to believe that MOD 3 only going to increase the storage of dangerous goods and leave the goods there? Once that space is filled, what then?

Please note that I have used the words "vehicle movements". The current requirement is that only "truck movements" need to be reported. All the movements by the "little white Utes and vans" need not be reported.

It follows, that if it were possible to move all the freight by those "little white Utes and vans", that Moorebank can report that there are zero truck movements.

Therefore, by that definition, Moorebank Intermodal Terminal is not generating any traffic at all!

And, the NSW Government can boast that the largest intermodal in the southern hemisphere generates no traffic.

Would there be any Planner in the world, who would believe that?

Bigger picture – MOD 3

I am surprised that no one in the NSW Government, can see the headlines written on the wall. It is written with bright fluorescent orange and has the flashing lights – with sirens screeching. I would have thought that even colour-blind people should be able to see and those asleep at the wheel would wake up from all that noise. What is going on with Moorebank Intermodal Terminal?

- Moorebank Intermodal Terminal is Australia's show pony. It is the largest intermodal in the southern hemisphere! Witness the constant publicity stream, photo opportunities, sod-turning events etc. over more than ten years. Most recently, we had the PM recent ribbon cutting exercise.
- However, now, three years into the operation, it is operating at around 5% of its 100% capacity.

What a wake-up call!

This statistic compares poorly with the statistic of the Enfield Intermodal Terminal, which is running at around 18% of its 100% capacity after more than ten years into its operation.

Think back to the Enfield Intermodal Terminal. It was the NSW Government's show pony. This project was meant to show case how NSW would lead the world in intermodal design and operations.

Consider all the costs to the taxpayers and local community and the promises of the economic and environmental benefits that the Enfield Intermodal Terminal would bring. There was the local community's opposition, and yes, special legislation had to be passed through Parliament.

How do you rate that public investment given that now Enfield operates at 18% of its 100% capacity? How good is that investment? Was every dollar wisely spent?

The Moorebank Intermodal Terminal is currently operating at about 5% of its 100% capacity. In order to catch up with Enfield, Moorebank would have to double, and then double that doubled amount again, in the next seven-to-eight years.

- Do you think it is possible that Moorebank freight could double and then double that doubled amount again in such a short time?

- Even a more basic question - where would all that freight come from?
    - Would Moorebank take a bigger share from the existing market or
    - Would Moorebank take that freight from the "future" market?

What is the existing / future market?

When the initial planning for Moorebank was undertaken, it was anticipated that in the future, the freight through Port Botany was going to grow at a rate much higher than the population growth rate. In the case of the SIMTA EIS that freight growth rate was expected to be much higher still.

We can easily extrapolate the expected freight market for 2023/2024 from the SIMTA EIS and MICL EIS documents.

For 2023/2024 the anticipated TEUs

- from the SIMTA EIS – Port Botany should be handling about 7.5 million TEUs
- from the MICL EIS – Port Botany should be handling about 5.8 million TEUs

What is the existing market? – just Google it.

Now the obvious question is, what went wrong in the planning of the future TEUs? You will find very large sections of the EIS reports were allocated to the derivation of these freight growth numbers. That surely indicated that many resources were allocated to ensure accuracy in the numbers.

Back to MOD 3 - given the current scenario: – Moorebank Intermodal Terminal operating at 5% of its 100% capacity, what role does MOD 3 have in the overall performance?

Politics overruling science

In both the Enfield Intermodal Terminal and Moorebank Intermodal Terminal cases, politics overruled science. A more recent case of politics overruling science is in the Rozelle Interchange.

We have to ask: what are the legislated roles of government departments, and how is it possible that politics overrules science? In the case of intermodal terminals, the science was screaming at politics. Why has no one taken any notice? (Yes, Minister and Utopia)

Enfield Intermodal Terminal

The Enfield Intermodal Terminal was the NSW Government's show pony. This project was meant to show case how NSW would lead the world in intermodal design and operations.

First some over-simplified illustrations to convey complex concepts.

- Figure 1 shows the concept of the "last mile". Containers are railed to an intermodal and then trucks take the containers to their destinations in the "last mile".
- Figure 2 shows the geographic location of Enfield Intermodal Terminal. By inspection, Enfield Intermodal Terminal is right in the middle of existing industrial areas. Obviously, it is in an ideal geographic location, giving rise to the idea of "leading the world in its design and operations".
- Figure 3 illustrates a "short haul" trip, in which the truck-only trip is more economical than the more complex, but integrated, rail-truck trip.
- Figure 4 shows two geographic locations which are obviously more suitable for the "short-haul" mode.

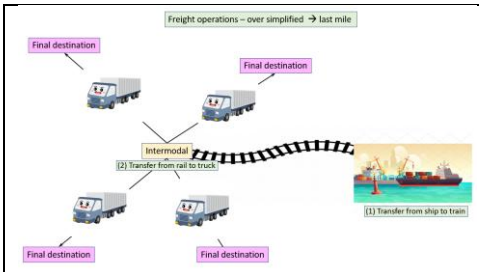


Figure 1 Schematic illustration of the "last mile"

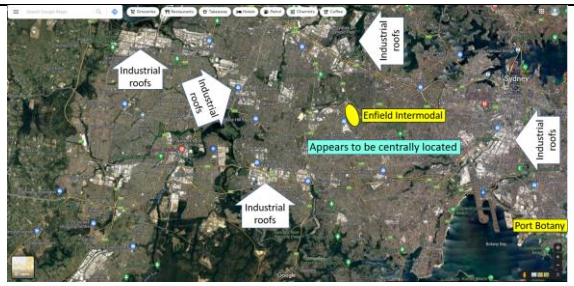


Figure 2 Geographic location of Enfield Intermodal Terminal in the centre of industrial areas

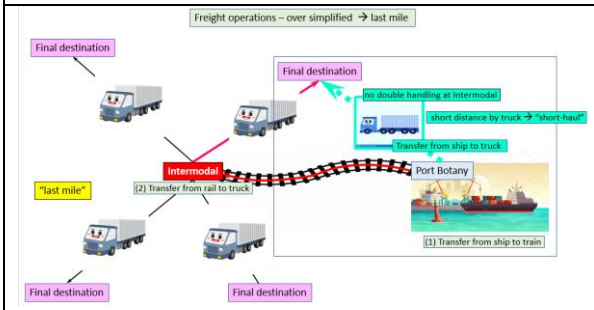


Figure 3 Schematic illustration of a "short haul"

Figure 4 Geographic locations of the short haul trips

This short-haul freight catchment area could have been obtained using simple back-of-the-envelope calculations, before any serious modelling was undertaken by the community, proponent and NSW Government.

The simple back-of-the-envelope calculation is based on the 80-20 percent rule. With 20% of the knowledge, we can usually calculate answers with about 80% accuracy. Any person with some numerical skills will be able to determine the approximate geographic location of the break-even boundary for the "truck-only" and "rail-truck" trips for the Enfield Intermodal Terminal.

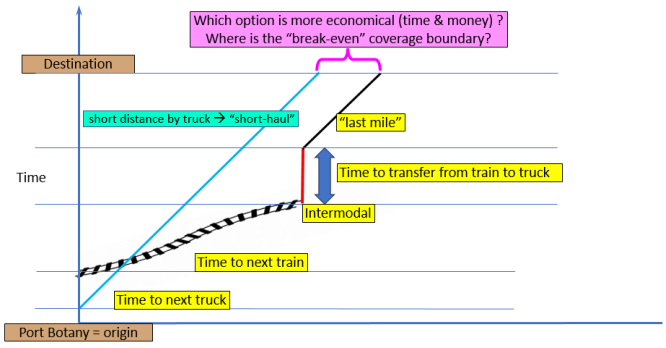


Figure 5 Conceptual steps in calculating the break-even coverage for the short-haul trips

Simply:

1. Google the average costs and travel times for the truck mode and rail mode.
2. On a Google map draw four travel time bands for truck-only distance from Port Botany – say, use 15-, 30-, 45- and 60-minutes time circles. Convert these time bands to costs by multiplying the travel time by the operating cost of the truck.
    - The "time-to-next-bus" needs to be incorporated and converted to a cost – make a big assumption – we are only trying to get an approximate result.

    These limits are for the "generalised-cost" of truck-only trips.

3. The rail distance from Port Botany to Enfield is fixed. This fixed time for the rail segment to Enfield and be calculated and converted to a cost.
    - The "time to next train" is similar to the step done for the truck mode.
    - We need to convert the train-to-truck transfer-time to costs. The operational cost for that activity must also to be included.

    This total is the fixed time/cost for trips from Enfield.

    - Now the "last-mile"

        On the same Google map, use a different colour, draw concentric circles using smaller time/cost slices – but starting from Enfield for the truck-only last-mile segment and convert the travel time to costs.

4. When we see these circles, we can interpret the geographic location of break-even boundary. In may be clearer if we choose different travel time bands for the trucks-only from Port Botany. The aim is to hit those industrial areas in the Sydney region.
    - Remember, this is a back-of-the-envelope calculation and accept that the result is "80% accurate".
    - Even if the numbers were very approximate and the boundary was only 60% accurate, it will still give a fairly good explanation of the Enfield Intermodal Terminal's 18% of its capacity.

This calculation can also be done for the Moorebank Intermodal Terminal, and that would be handy for what follows.

Remember, that a vast number of resources were spent on modelling the Enfield Intermodal Terminal. The community, proponents and NSW Government each had their own models and all the models showed different results – because each party had their own assumptions.

Think what happened before the new legislation was passed for Enfield to happen.

In summary - how useful was all effort for Enfield with its 18% of the 100% operational capacity? It there anything to learn from that experience?

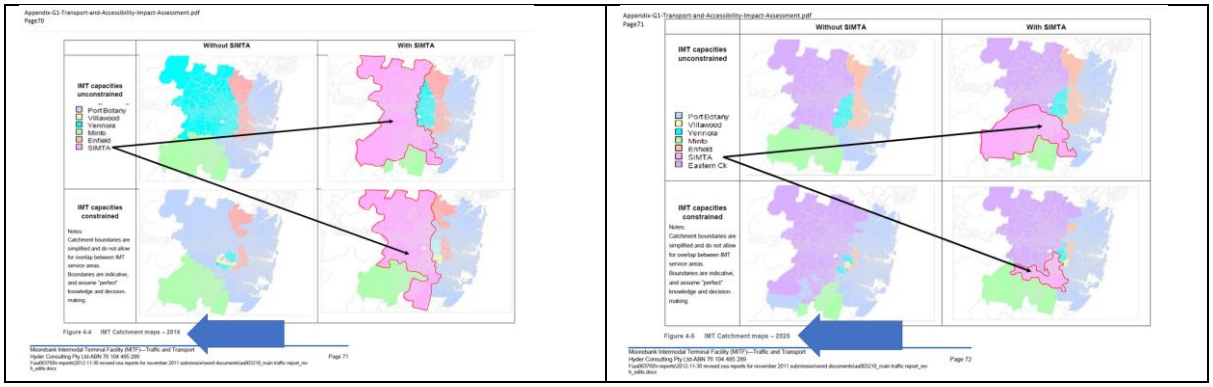
In most cases, a simple back-of-the-envelope work can sometimes be very useful – even if it is only 80% accurate, or in the worst case it may be 60%. Getting someone in with expertise, for minimal costs the accuracy can easily be raised to 80%. In most cases that level of accuracy is often good enough for decision making. In the Enfield case, it could have saved many resources.

Moorebank Intermodal Terminal

Background: About half of all the Port Botany trucks are destined for Wetherill Park – which was specifically developed as Sydney's industrial area. Right from the beginning, the NSW Government had plans to develop Eastern Creek Intermodal Terminal to support Wetherill Park. Once Eastern Creek Intermodal Terminal was operating, about half of the Port Botany's trucks would disappear.

<u>Private industry</u>

Initially, private industry saw the Moorebank Intermodal Terminal as a quick-buck making exercise – before Eastern Creak Intermodal was built. This was made very clear in the SIMTA EIS. See below.



Even before the SIMTA EIS was released, every Liverpool Councillor openly discussed the benefits of what could be done with the Moorebank Intermodal site, once the Moorebank Intermodal Terminal was removed. That land is very close to the Liverpool CBD. "The whole area '*on the other side of the Georges River*' would then be developed around the river." The Technology Park idea could be resurrected – but more closely integrated with the Liverpool hospital, and the potential site to service the 'fast-rail station' around Holsworth. (The fast rail project only appears around election times).

<u>Federal & State Governments</u>

The NSW and Federal Governments had other ideas – their main concern was to remove the trucks from the Port Botany area - immediately.

It is important to appreciate that the issue around trucks movements in Port Botany was self-made.

- When the freight operations moved from White Bay to Port Botany, there were both sea-side and land-side capacity constraints for Port Botany. The "cap" of 3 million TEUs was based on those capacity constraints.
- It was assumed that land-side infrastructure improvements would be made so that the capacity of 3 million TEUs to be reached.
- But those land-side infrastructure improvements were not made.
    - Therefore, the trucks movements issue in Port Botany was a direct result of not implementing the planned landside infrastructure improvements.

That "cap" was removed when Port Botany was privatised. The sea-side capacity was improved by the dredging operations.

But very little was done to implement the assumed infrastructure plans to achieve the 3 million TEUs – let alone to have the additional capability required for a much, much, higher TEU limit.

The way the Port Botany truck movements issue was solved, was extra ordinary simple.

- **<u>Assume</u>** that Moorebank Intermodal Terminal already exist and is served by 3,300 daily truck movements from Port Botany.
- If a rail bridge was built across the Georges River, then, those 3,300 trucks would immediately be removed from the Port Botany area and they would travel on the M5 Motorway between Port Botany and Moorebank.
- Built-into the assumption was that the road infrastructure around the Moorebank Intermodal Terminal already existed. Therefore, the only additional cost would be upgrading Moorebank Avenue about fifteen years after the rail bridge was built.

- About 75% of the $10 billion of economic benefits would come from removing those 3,300 trucks.

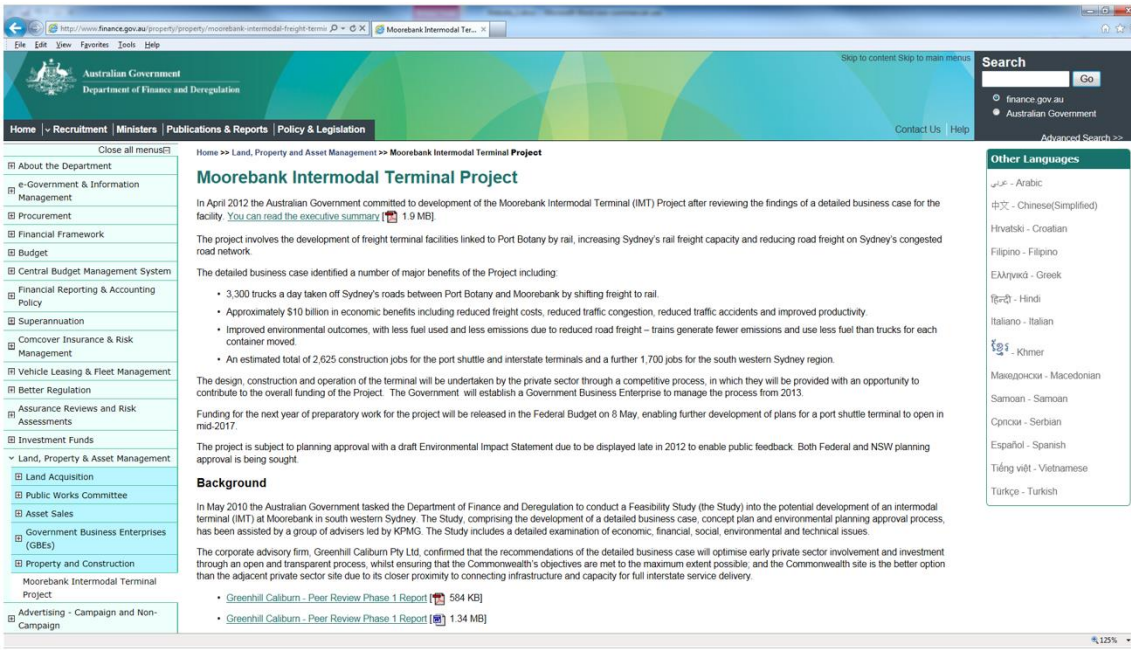


Figure 7 Federal Government solution to solve the truck movements at Port Botany

However, not everyone was convinced of this approach. One of the big "nay-sayers" was the Infrastructure NSW. See Figure 8Figure 9. At that time, Infrastructure NSW was concerned with the "short-haul" freight trips, and Enfield was only just starting its operation.

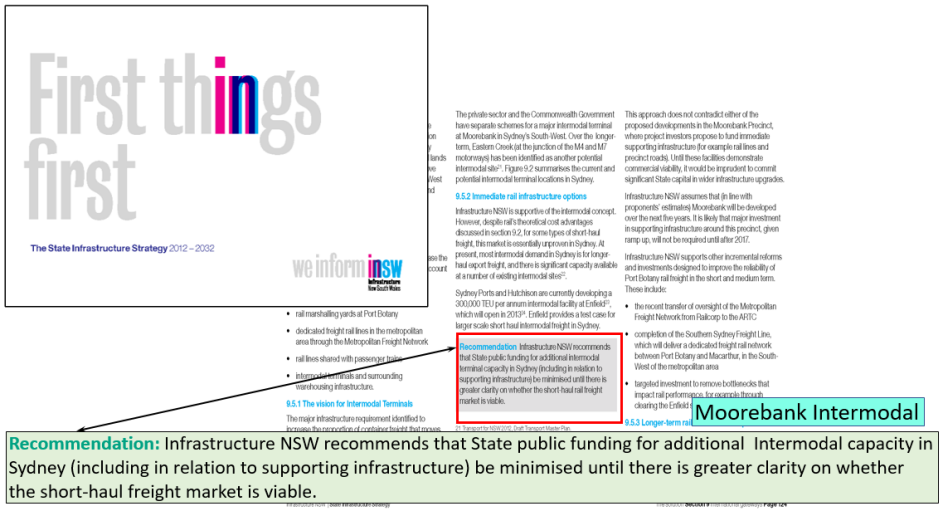


Figure 8 Infrastructure NSW

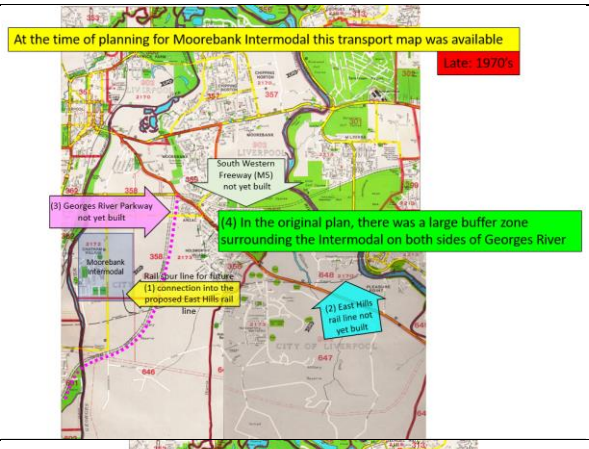
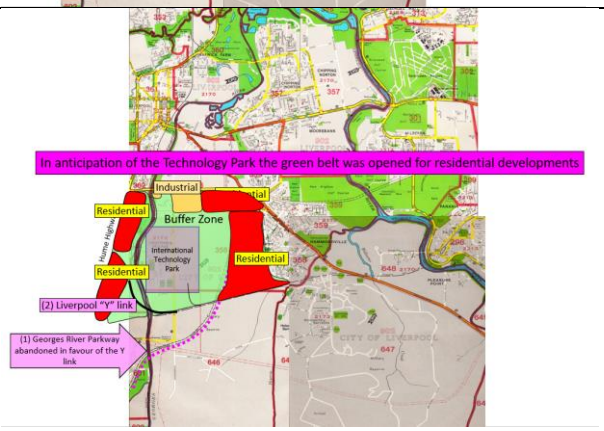
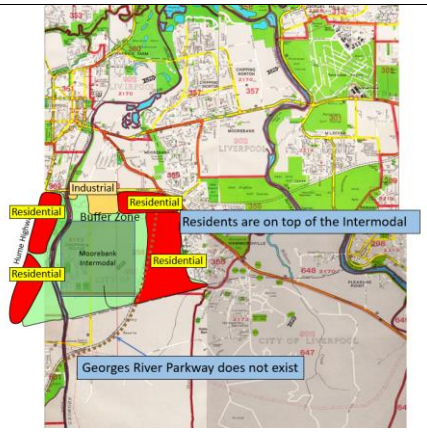
Moorebank Intermodal Terminal - the big white elephant in the room

When the rail bridge was built over the Georges River, those 3,300 trucks did not disappear from the Port Botany area. The trucks did not come off the M5 Motorway and therefore those $10 billion if economic benefits did not start to roll in.

Why not?

Because it was **assumed** that Moorebank Intermodal Terminal existed. It still had to be built.

Here is an extremely abbreviated history of the site.

	In the mid 1070's when the Defence relocated their heavy artillery, the internal railways were removed, but the most southernly spur line was left [see yellow arrow marked (1)] so that the future intermodal could be connected to the proposed East Hills line when it was to be extended [See blue arrow marked (2)]. The major feature was the Georges River Parkway. It would provide for a Liverpool bypass in the north-south direction [See pink arrow marked (3)]. A large green belt was planned to surround the Intermodal [see green box marked (4)].
	In the late 1990's with the concerns about the lack of employment in and around Liverpool, the emphasis changed. The Intermodal plan was abandoned and replaced with the International Technology Park. The green belt was opened up for residential areas to provide the management levels of the workforce for the technology park. A new shopping village was planned to be integrated in the residential area. That whole area is now called Wattle Grove. The Georges River Parkway was therefore no longer required [see pink arrow marked (1)]. It was replaced with the Liverpool Y link, which had a station right in the middle of the technology park, providing public transport access for the technology park [see pink box marked (2)]. The Y link would provide great benefit for the operations of the Sydney railway system allowing trains to loop around the system.
	The latest land use change resurrected the Intermodal plan. However, now the Georges River Parkway has disappeared from all the planning maps. Therefore, all that traffic has to be carried on the M5 Motorway. The technology-park-workforce is now within walking distance from the Intermodal. The latest publicity describes the highest possible level of automation. This implies that much of the work will be carried out by AI and technology. At the same time, there will be 6,800 new jobs. Really? 6,800 people – (il)legally "working" – in the truck village? Presumably, all under "hospitality and retail"? If that is the case, you would need the largest intermodal in the southern hemisphere as a façade to hide those 6,800 workers.

Now, the NSW Government is discovering that for the Moorebank Intermodal Terminal there is a far bigger elephant in the room than the "short-haul" trips.

- The **assumed position** was that since Moorebank Intermodal Terminal already existed, and the implied assumption that the intermodal road infrastructure existed. Therefore, no changes had to be made to the transport infrastructure.
    - But the Moorebank Intermodal did not exist.
    - And the existing infrastructure was not designed for the intermodal traffic
    - ***And the Georges River Parkway was gone***.
- Since the land used changed the green belt was opened up for residential development to supply the technology park with the workforce.
    - this workforce is literally on top of the Moorebank Intermodal Terminal site.

Transport infrastructure

- The Georges River Parkway was planned to bypass the north-south trips around the Liverpool CBD.
- This north-south traffic would then split over - what is now called the M5 Motorway, for the *long trips* and the Newbridge Road for the *short trips*.
- The Moorebank Avenue section between the M5 Motorway and Newbridge Road was planned to be a 3-lanes-each-way road to carry all the additional traffic.

However, now,

- all that north-south (Georges River Parkway traffic) has to travel on Hume Highway and the M5 Motorway, and
- Moorebank Avenue is still two-lane each-way.

The current regional and local traffic is schematically shown in Figure 10. The image only shown the westbound flows to illustrate the capacity constraint on the M5 Bridge.

Figure 10 Westbound regional flows

To fact check on the seriousness of this issue: open Google Maps and count the number of approach lanes and count the number of lanes on the M5 Bridge.

These traffic issues are well documented in the 2013 and 2018 NSW Freight and Ports Strategy reports.

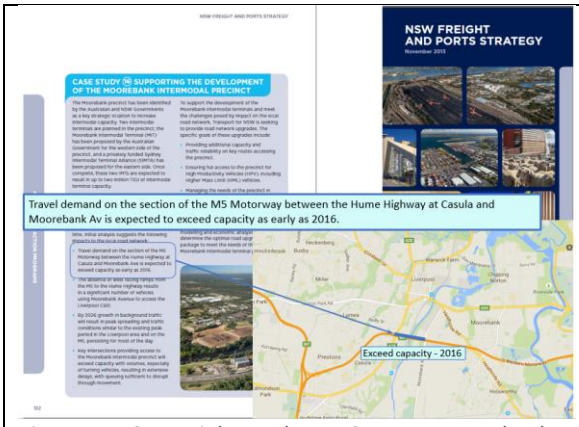


Figure 11 NSW Freights and Ports Strategy Moorebank Intermodal Precinct 1

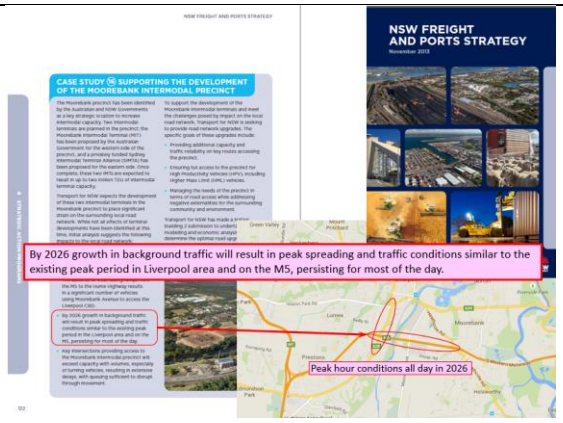


Figure 12 NSW Freights and Ports Strategy Moorebank Intermodal Precinct 2

In summary - there is way too much traffic on the M5 Motorway and the Hume Highway, because the Georges River Parkway does not exist. These North-South movements now sit on the M5 Motorway and Hume Highway – as an "add-on" traffic. Since Moorebank Avenue has not been widened the 3-lane each way, Moorebank Avenue is similarly stretched.

In 2012, we presented the traffic issues to Dr Nariida Smith, who at that time was the Director of the Bureau of Freight Statistics within the NSW Department of Transport. Her reaction was "I knew that traffic in Liverpool was bad, but not that bad." Her chief modeller assured her "We can land people on the moon. We can solve Moorebank", and I thought "Sure, if you have the same budget".

While the traffic issues have been well documented, the NSW proposed solutions to solve the traffic issues simply do not pass the BS test. Rather than the "land people on the moon" thinking, the NSW Government is using the "let's paint the rocks white" approach – that way people can see that we are doing something.

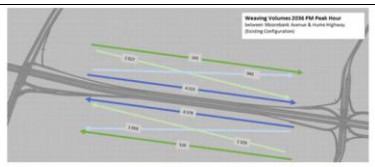
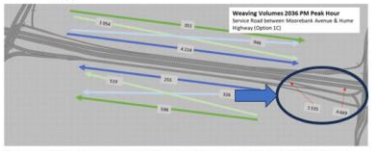
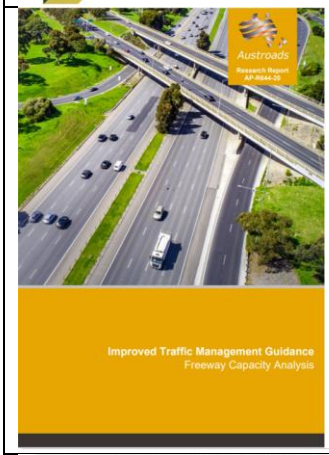
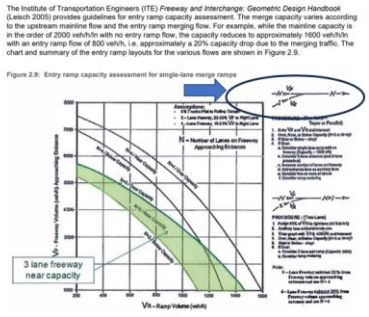
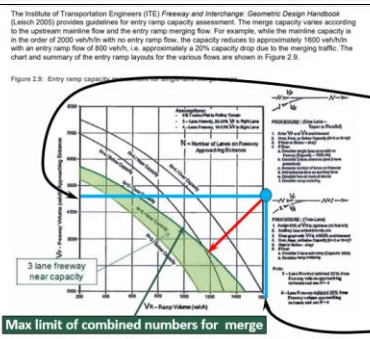
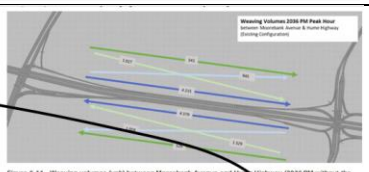
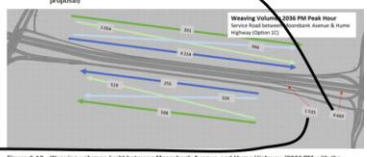
(1) Proposed new westbound bridge over the Georges River, in parallel to the M5 Bridge

In the first SIMTA EIS, their traffic consultants stated that the eastbound traffic was a more challenging task to resolve.

It is therefore interesting to find that the NSW Government is proposing a westbound bridge. Are there any plans for the more challenging movements of the eastbound direction?

In the community, this westbound bridge is referred to as the 'Colin Langford's Mickey Mouse Bridge' because it resolves only one of many issues on the M5 Bridge.

The following illustration shows how deep the proposed westbound bridge wallows in BS.

  Figure 6-11 Weaving volumes (vph) between Moorebank Avenue and Hume Highway (2036 PM without the proposal)  Figure 6-12 Weaving volumes (vph) between Moorebank Avenue and Hume Highway (2036 PM with the proposal)	This data comes from the Aurecon report for the future movements, shown as stick diagrams in the report. We will take the 2036 AM westbound flows.
 	This is the Austroads report which shows how the merge movement can be calculated.
  Figure 6-11 Weaving volumes (vph) between Moorebank Avenue and Hume Highway (2036 PM without the proposal)  Figure 6-12 Weaving volumes (vph) between Moorebank Avenue and Hume Highway (2036 PM with the proposal)	If we were to plot the Aurecon data points, we find that these flows exceed the maximum limit of the combined numbers. By inspection, the plotted data point for the 2036 AM westbound flow is outside the graphing area! What modelling results do we expect?

The study area did not include the traffic on Cambridge Avenue, which is planned to be upgraded to carry the heavy Moorebank Intermodal Terminal trucks, that is, those A-Doubles and B-Doubles trucks.

Fortunately, the expected traffic volume on Cambridge Avenue can easily be calculated. Under the Freedom of Information process, another member of the community obtained the RMS' estimated future westbound flows over the M5 Bridge.

If the Aurecon flows were subtracted from the RMS' total, then the remainder can be added to the published future flows on Cambridge Avenue. This simple calculation shows that the expected flows are about 40% higher than the Cambridge Avenue capacity.

Why on earth would the NSW Government "solve" the Moorebank Intermodal Terminal traffic issues by building only the westbound bridge and

- show the public that for the main M5 Bridge, the merging traffic issue for the westbound traffic is so far outside the Austroads limit, and
- upgrading Cambridge Avenue for a special heavy-duty truck route that can expect to have 40% more traffic than its capacity?

But wait there is more …

In the MICL EIS their traffic consultants modelled many intersections. These plots contain the modelled results, together with the geographic locations of those intersections. We have added the interpretations to illustrate the traffic issues highlighted in these modelling results.

(2) Moorebank Avenue

These images come from the MICL EIS.
First look at Figure 13, which shows the modelled results for Moorebank Avenue.

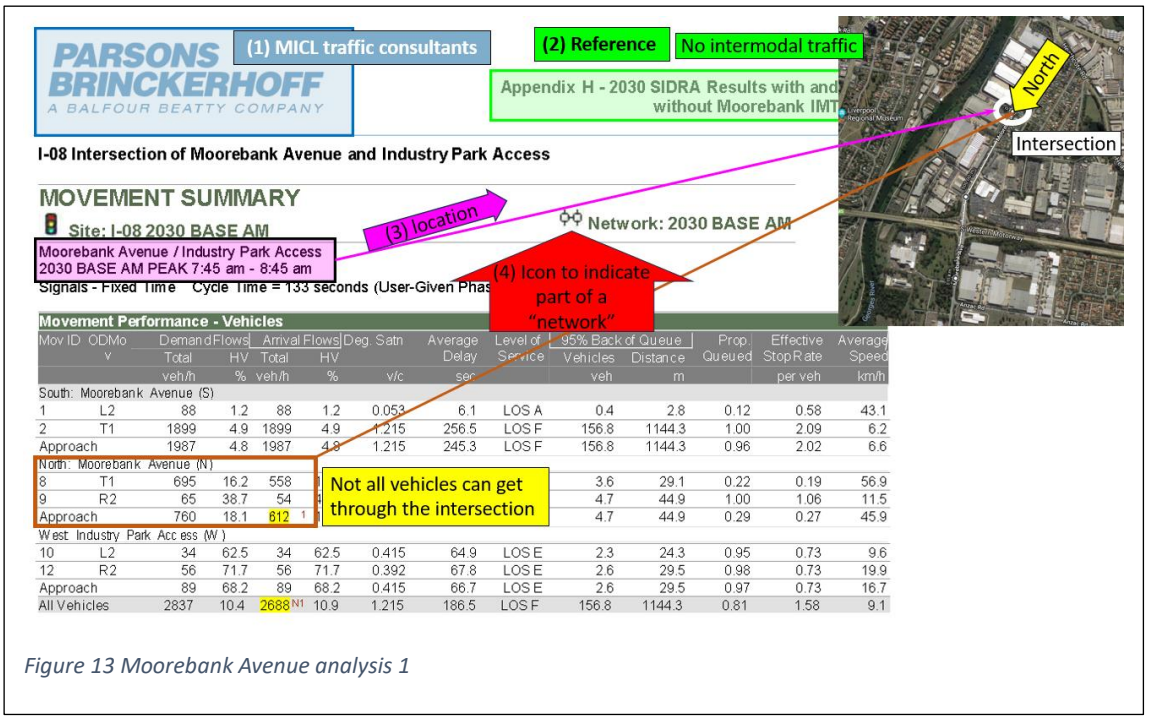


Figure 13 Moorebank Avenue analysis 1

This description is for a first-time viewer of an intersection analysis.

- Blue box marked (1) MICL traffic consultants.
- Green box marked (2) Reference. These results apply to the "no Moorebank traffic" case.
- Pink Arrow marked (3) Location. We have added the Google Map image to show the location of the signalised intersection. The results are for 2030 AM peak – no intermodal traffic.
- Red arrow marked (4) Icon to indicate that this intersection is part of a "network of intersections".
    - In a "network of intersections" model, we can see that if a queue spills back far enough, it can impact the operation of its upstream intersection.
    - For example, imagine traffic coming out of an intersection and has to join the queue from the next intersection. It has to stop and wait for the car in front to move. The car behind must do the same. The cars cannot freely exit the intersection – because of the blocked road.
    - This is like a tiny "grid-lock" situation between two intersections.

- It is not hard to imagine that such grid-lock situations can spread through a wider network. This illustrate the popularity of modelling intersections that are networked.

Now the examination. The blown box around the data block: “North Moorebank Avenue (N)” contains the number 612 highlighted in yellow. This block applies to the traffic on Moorebank Avenue from the north – travelling south.
Look at the headings in the green block marked “Movement Performance – Vehicles”
Focus on the row with the yellow number

Column 1-2 – contains “Approach”
Column 3 - contains 760 – in the column heading: Demand Flows / Total / veh/h. This means that the total number of vehicles per hour that want to travel through this intersection is 760.

Column 4 – contains 18.1 – in the column heading HV / %. The proportion of Heavy Vehicles is 18.1% of that total – but is not important for this discussion (it is a very large industrial complex).

Column 5 – contains the yellow highlighted 612 – in the column heading: Arrival Flows / Total / veh/h. This is the number of vehicles that can get through the intersection.

- Sometimes, the software is not able to optimise the signals to allow all the traffic through the intersection. In those cases, the mathematics in the software is able to get only a smaller number through the intersection, and highlights the smaller number in yellow.
- The Arrival flow of 612 *(cars getting through the intersection)* is less that the Demand flow of 760 *(cars wanting to travel through the intersection)*.
- In summary, this yellow highlight is a warning. In this case it is for the traffic stream coming from the north. This is shown in the Google map image.

Now look at another even more serious issue. See Figure 14. Note the brown boxes.

PARSONS BRINCKERHOFF
A BALFOUR BEATTY COMPANY

No intermodal traffic

Appendix H - 2030 SIDRA Results with and without Moorebank IMT

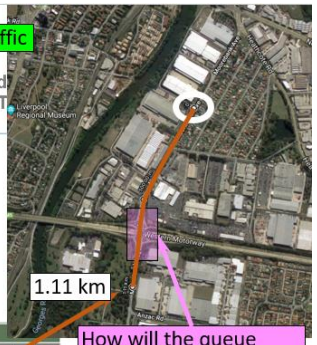
I-08 Intersection of Moorebank Avenue and Industry Park Access

MOVEMENT SUMMARY

Site: I-08 2030 BASE AM

Network: 2030 BASE AM

Moorebank Avenue / Industry Park Access
2030 BASE AM PEAK 7:45 am - 8:45 am
Signals - Fixed Time Cycle Time = 133 seconds (User-Given Phase Times)



How will the queue impact the operation of the M5 Motorway – Moorebank Avenue?

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Moorebank Avenue (S)													
1	L2	88	1.2	88	1.2	0.053	6.1	LOS A	0.4	2.8	0.12	0.58	43.1
2	T1	1899	4.9	1899	4.9	1.215	256.5	LOS F	156.8	1144.3	1.00	2.09	6.2
Approach		1987	4.8	1987	4.8	1.215	245.3	LOS F	156.8	1144.3	0.96	2.02	6.6
North: Moorebank Avenue (N)													
8	T1	695	16.2	558	17.6	0.193	2.5	LOS A	3.6	29.1	0.22	0.19	56.9
9	R2	65	38.7	54	41.1	1.017	119.3	LOS F	4.7	44.9	1.00	1.06	11.5
Approach		760	18.1	612 [1]	19.6	1.017	12.7	LOS A	4.7	44.9	0.29	0.27	45.9
West Industry Park Access (W)													
10	L2	34	62.5	34	62.5	0.415	64.9	LOS E	2.3	24.3	0.95	0.73	9.6
12	R2	56	71.7	56	71.7	0.392	67.8	LOS E	2.6	29.5	0.98	0.73	19.9
Approach		89	68.2	89	68.2	0.415	66.7	LOS E	2.6	29.5	0.97	0.73	16.7
All Vehicles		2837	10.4	2688 [N1]	10.9	1.215	186.5	LOS F	156.8	1144.3	0.81	1.58	9.1

Figure 14 Moorebank Avenue analysis 2

The large brown box applies to the movements from the south - travelling northbound: "South: Moorebank Avenue (S).

Focus on the row with the brown box marked 1144.3 and look at the headers:

Column 1 – Mov ID = 2

Column 2 – OD Mov = T1 – description of the movement in this case straight ahead (**Through**)

Now look at the little brown box under the 95% Back of Queue / Distance / m = 1144.3.

- This value represents the 95% length of the queue.
  - The queue length varies.
  - For example, when the lights first turn red, the queue would be short resulting from the few cars that stopped when the lights turned yellow.
  - The maximum length of the queue is when the lights turn green. The last car in the queue cannot move until the car in front moves first. In fact, the last car could stay there for quite some time if the queue of cars cannot clear quickly!
  - If the queue is long enough, the queue could block traffic from the side streets. That blocking of side streets may need to be considered in the traffic modelling analyses.

  The 95% value of the maximum length is used to consider the potential traffic impacts on the side streets.

When this distance of 1144.3 m is plotted on Google Maps the queue almost reaches Anzac Road. Please do your own fact-check.

By inspection, the M5 Motorway – Moorebank Avenue intersection, the most important intersection in the network, would have its performance severely impacted by this queue.

This queue-blocking issue for the most critical intersection in the network was very easily solved.

In the MICL EIS, this M5 Motorway – Moorebank Avenue was modelled as an isolated intersection.

In other words, the most important intersection in the network, is treated as the only intersection in the universe. Therefore, the intersection is free from the queue generated at the intersection just north of it.

Any guesses why the consultants did not include this intersection in their "network of intersections" model?

(3) Hume Highway intersections

The issues with the M5 Motorway – Hume Highway intersection have also been spelt out in great detail in the MICL EIS.

Figure 15 shows the results for the M5 Motorway – Hume Highway intersection and just 450 m north of this is intersection is Hume Highway – Reilly Street. This is shown in Figure 16. In both cases the results are for 2030 AM base year flows – no intermodal traffic.

Here is a brief explanation on how to interpret the results.

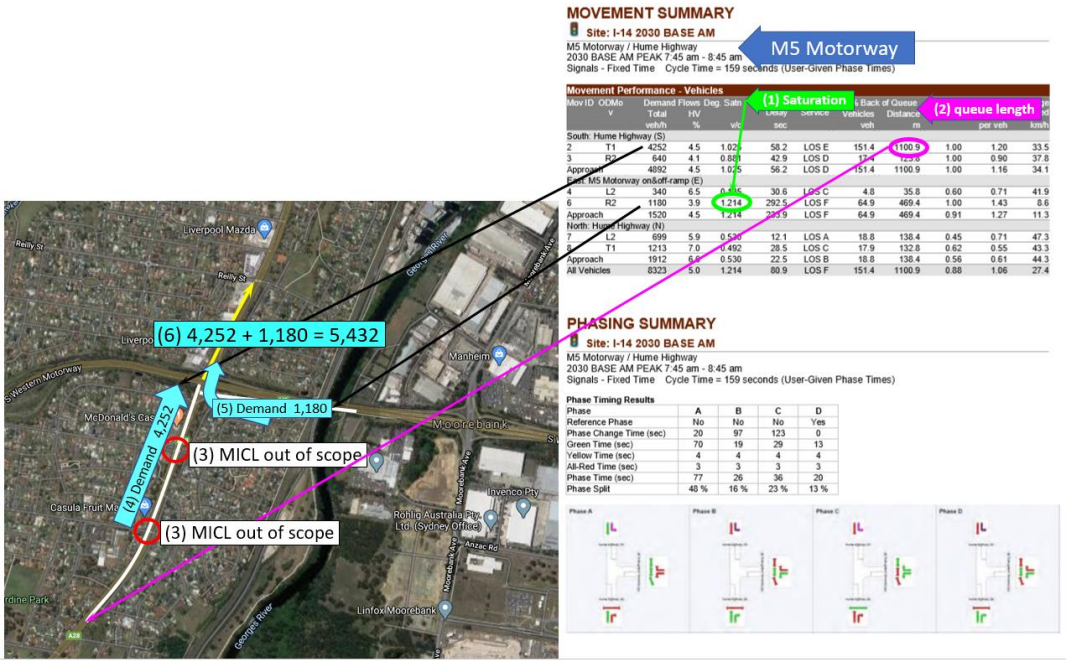


Figure 15 2030 AM Base year - M5 Motorway -Hume Highway

- The green arrow points to the number 1.214 in the column marked Satn and v/c.
    - There are many results shown but with space restrictions the headers have to be abbreviated. "Satn" is short for Saturation and v/c is short for the Volume over Capacity ratio.
        - **Saturation** - we all have a good idea when something is 100% saturated. Having something that is 121.4% saturated can only occur in mathematics. This number clearly represents an "over-capacity" situation.

        - **Volume over Capacity ratio** is another way of saying the same thing – but with a meaningful number. It is calculated by dividing the **V**olume by the **C**apacity. The result is the v/c ratio. In this case v/c = 1.214.
            - If the V/C = 1, it means that the Volume equals the capacity.
            - In this case, the Volume is 1.214 times higher than the Capacity. More simply there is 21.4% more traffic than the capacity.
    - This 1.214 value applies to the movement from the East: M5 Motorway on&off-ramp (E).
        - Focus on that row
            - Column 1 = 6 (Movement ID)
            - Column 2 = R2 (OD Mov = right-hand-turn)
            - Column 3 = 1,180 (Demand Flows Total veh/h)
            - Column 4 = 3.9 (% of Heavy Vehicles – clearly no Moorebank Traffic)
            - Column 5 = 1.214 (Saturation V/C)

        Mathematically, the intersection would not know if this traffic (1,180) came from the M5 Motorway off-ramp or from a new bridge.

            From the mathematical point of view, the important issues are: the traffic numbers and physical lay-out of the turning lanes. The physical road lay-out is already optimised, the proposed new bridge would have a similar set-up.

            In other words, Colin Langford's Mickey Mouse bridge would have zero impact on this oversaturated intersection.

    - The pink arrow points to the number 1,100.9. it is under the column: Back of Queue Distance (m) and in row 1 of the table. This number represents the 95% length of the queue for the movement Marked T1 (straight ahead - Through).
        - The queue length varies. For example, when the lights first turn red, the queue would be short resulting from the few cars that stopped when the lights turned yellow. The maximum length of the queue occurs when the lights turn green. If the queue is long enough, it could block traffic from the side streets and that could be considered in the traffic modelling analyses. The 95% value of the maximum length is used to consider the potential traffic impacts on the side streets.
    - This value of 1,100.9 applies to the traffic coming from the South: Hume Highway (S) Demand Flows / Total /veh/h of 4,252 vehicles.
        - This queue length is plotted on the Google map to give an idea of the side streets that could be impacted.
    - By inspection, the queue length blocks two signalised intersections. Those intersections were not studied because they were "outside the study area".
        - This means that, at these two intersections,
            - all those people wanting to travel north by making a right-hand-turn, are blocked because of the queue.
            - therefore, queues will develop on the side streets which will spill back into the residential areas. Then, people affected cannot leave their driveways.
- Now the analyses of the northbound movements. The northbound movement is made up of two components: the northbound travelling group and the right-hand-turning group that comes from

the M5 Motorway ramp. These two movements are shown – with the corresponding arrows for the actual numbers.

- South Hume Highway (S) in column [1] movement code = 2 and in column [2] the movement description = T1 (straight Through) and finally in column [3] Demand Total veh/h = 4,252.
  - See blue arrow marked (4) Demand 4,252 for the straight-ahead movement
- East: M5 Motorway on&off ramp (E) in column [1] movement code = 6 and column [2] movement description = R2 (the right-hand-turning movement) and in column [3] is the value 1,180
  - See the right-hand-turn arrow marked (5) Demand 1,180
- We add these two numbers up, see blue box marked (6) 4,252 + 1,180 = 5,432

Intuitively, traffic flowing out of an intersection, would arrive at the next intersection. This is not the case here. By inspection 5,432 leave one intersection but only 3,229 arrive at the next intersection. See arrow from the Hume Highway - Reilly Street analysis.

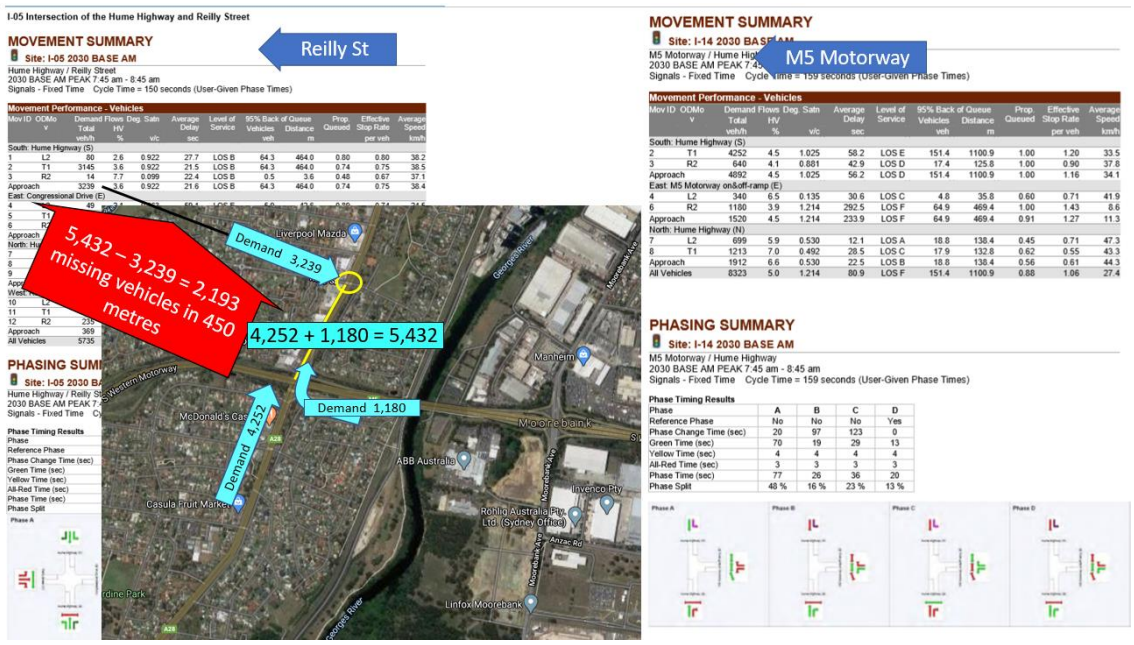


Figure 16 2030 AM Base year - Hume Highway - Reilly St

Somehow, there are 2,193 vehicles that have disappeared between these two intersections – and this is for the same scenario 2030 AM peak Base year – with no Moorebank Intermodal traffic.

To give sense of magnitude of these missing vehicles:

- In ideal conditions, the maximum departing flow from a signalised intersection is around 1,950 vehicles per hour per lane.
- Here, we have more than a full lane of traffic that has disappeared between the M5 Motorway and Reilly Street.
- The maximum 1,950 vehicles apply when that traffic flow receives 100% of the green time. The fundamental reason for placing signals at intersections is to interrupt flow from one direction to give time to the flow from the conflicting direction(s).

- For example, if a flow receives only 50% of the green time, then only 50% of the traffic flow can get through the intersection: numerically, 50% * 1,950 = 975 vehicles.
- in this scenario, 2,193 additional vehicles need to be pushed through the Hume Highway – Reilly Street intersection.

And this is just not only for this intersection, but what about all the other intersections further along the route?

Without doing any modelling, intuitively,

- if those 2,193 vehicles were added to that Hume Highway – Reilly Street intersection, the least we would anticipate is that it would create a (very long) queue.
- With these high flows and intersections so close together, it would be expected that the queue from Reilly Street would easily interfere with the M5 Motorway – Hume Highway intersection. And remember, the M5 Motorway – Hume Highway intersection happens to be the second most important intersection in the network, is already over-saturated.
    - The M5 Motorway – Hume Highway intersection's performance capacity would be restricted by that queue blocking the exiting northbound traffic.
- Therefore, the queue from the M5 Motorway – Hume Highway (discussed above) would be much longer and would block even more intersections.

Why were the M5 Motorway – Hume Highway and Hume Highway – Reilly St intersections not "networked"? Indeed, why were all the intersections, including those outside the study area, not networked?

Remember, the M5 Motorway – Moorebank Avenue and the M5 Motorway – Hume Highway intersections are the two most important intersections in the whole network!

All the above modelling work would have been examined by internal and external transport modelling auditors. They would have scrutinised every detail.

- Does anybody really think that it was "a junior modeller", who made the mistake of modelling Moorebank Avenue – M5 Motorway intersection as an isolated intersection and have "typos" for the approach numbers at the Hume Highway – Reilley Street intersection?
- Or, is it possible that something more sinister has occurred?

Colin Langford promised Narelle and myself that he would provide a traffic model in six-or-twelve months' time that would show that Moorebank Intermodal would work. That promise was made almost three years ago. We have not seen anything.

We have seen the public documents of the Aurecon report for the proposed westbound bridge. That Aurecon report was so bad that Paul wrote to the NSW Premier to point out some of the fundamental issues in the 2018 base model. As an example, see Page 10 above that shows the results from the Aurecon model which wallows in BS.

We believe that the NSW Government will not show us a Moorebank traffic model, because it would make the Rozelle Interchange look like Paradise.

Suggested next steps

Obtain a budget "that can land people on the moon" so that the infrastructure around Moorebank can be developed in a proper way and not make Rozelle interchange look like Paradise.

If that is unsuccessful, may be carry out real planning, as in Planning 101.

At the moment private industry is developing a suburb in Western Sydney that is about twice the size of Brisbane. May be, such a large suburb requires sewage treatment plants, graveyards, water treatment plants etc. Private industry is not known for incorporating sewage treatment plants, graveyards, water treatment plants, partly, because they are not required to do that.

It may even require to handle freight - about twice the size of Brisbane's freight task. In that planning process consider the potential role of Moorebank Intermodal Terminal.

May be, the workers for this new suburb would like jobs nearby, instead of travelling to the "Global City" which would be 40-to-50 km away, as outlined in the First things First document see Figure 8.

I remember learning that Canberra was planned as a self-contained city, with jobs for people and all their conveniences. And, doing an assignment for Prof John Black to minimise the journey-to-work travel time by distributing population and employment. Since he came from the ANU, we had to use the Canberra numbers. May be some of those Planning 101 principles could be applied to the new suburb.

As I am signing off, I can hear the toll road operators scream from here. "All the infrastructure is in place. Where are those Moorebank trucks? They should have been operating since 2015. Each year, we are losing so much revenue! Do something!"