Perth Freight Link: Good Idea, Wrong Port

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Photo by Chris Hadfield, NASA Commander

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Port Operations and Freight Movement in the Perth Metropolitan Region

Summary

The Perth Freight Link (PFL) has been announced as a major transport opportunity to solve the heavy goods truck problems in Perth. By taking trucks via a toll road around an extended Roe Highway, through Stock Road and Leach Highway to the Fremantle Inner Harbour it has been proposed to alleviate the current congestion and match the expected increase in truck traffic over the coming years. This paper takes a contrary view by analyses and suggests that the PFL is very poor planning; it is likely to harm the city of Fremantle and damage the operations of the port. The findings demonstrate the real need is to create good road and rail connections to a new container port in the Fremantle Outer Harbour.

For several decades the freight strategy in Perth has been to reduce the impact of trucks on Fremantle by increasing rail freight and shifting the growth in containers to the Fremantle Outer Harbour. This will now be undermined by the PFL as: 1. It will mean deliberately not investing in the Outer Harbour because it will be necessary to extend the life of the container port in the Inner Harbour to enable the PFL to be paid off using the tolls on trucking; 2. Rail growth in container movements will be undermined to the Inner Harbour as longer tucks will be approved for the design speed of this PFL and in order to enable truck tolls; and 3. No funding will be available to enable the Outer Harbour to be built as no capital dollars will remain to build the required access road or rail connections.

Fremantle will be left with a potential five times increase in trucks passing through the urban area with some alleviation due to fly-overs and underpasses, but a massive swathe through the suburbs, a significant impact on the North Fremantle area and degrading of Fremantle's growing knowledge/services/tourism economy.

A strategy to transfer the freight to rail will not work due to the size of the task involved -– some 90 trains a day would be needed. The Federal Grant should be redirected to the Outer Harbour and a Cap and Transition strategy undertaken that will keep trucks – along with modest improvements to problem intersections - at their current level in the Inner Harbour, expand rail opportunities and transition all growth in containers to a new Outer Harbour container facility.

Introduction

Moving freight in cities is mostly done by trucks as they can deliver from multiple origins to multiple destinations. However trucks do impact on cities due to their noise, diesel pollution, and disruption to traffic. This especially apparent where the economy of the metropolitan region and wider economic hinterland focus at the point of trade: the ports. To overcome the issues and to create a smoother flow of goods,

most cities in the developed world – and developing - have created strategies to deal with excessive truck movements. Two key strategies are involved: 1. Shift the container port away from the main urban area where freight-related economic activity can thrive without disturbing the more productive parts of the city involved in knowledge and services-oriented economic activity; and 2. Increase the use of freight on rail by creating freight terminals where trucks can feed containers onto highly efficient rail systems. This approach is outlined and accepted across Australia in Infrastructure Australia's National Port Strategy (2010).

In the developed world there are no major cities that have left their container port in the centre of major urban activity (Please see relevant section below for a comparison of various international ports). By shifting it to a better site it is possible to improve road and rail connections and thus greater freight efficiencies are created. As well new technologies are utilised in the new container and shipping operations. Thus freight-intensive productivity is increased as well as people-intensive urban productivity is increased in areas freed up from trucks.

Fremantle's Inner Harbour is a little different to other cities as it was always away from the centre of Perth (unlike Melbourne, Sydney and Singapore for example) and thus the pressure to move the port has not been so great. However it is in the centre of Fremantle. As Fremantle Inner Harbour grew in trucks and the Fremantle CBD transformed into a knowledge and services centre, the need to reconsider the site of the container terminal grew. The pressure to move to a new Outer Harbour container facility has thus been on the agenda for several decades as has the need to increase the proportion of freight going to rail.

The Fremantle Port Authority in their most recent Annual Report (2014) made the following comment:

> *'Fremantle Port's Inner Harbour container trade is expected to reach optimal capacity within the next 10 to 15 years, with the timing dependent on trade trends and other factors. When this occurs, additional facilities will be needed to cater for further growth. Significant planning for these has been undertaken over many years and the WA Planning Commission has been tasked subsequently with assessing and making recommendations to State Cabinet on the optimal location and design'. (p28)*

The expected transition is set out in the planning scenario in Figure 1 showing the growth in containers to the Fremantle Inner Harbour being capped at around 1000 million TEU and the transition to an Outer Harbour container terminal taking off from 2022.

At the same time the number of containers transferred from trucks to trains was expected to increase as has been the case in recent years. See Figure 2 from the Fremantle Port Authority Annual Report in 2014.

The proportion has been increasing very slowly but the total number of containers on rail has been growing steadily and was expected to increase further as the rail access at North Fremantle has recently been improved. Ultimately

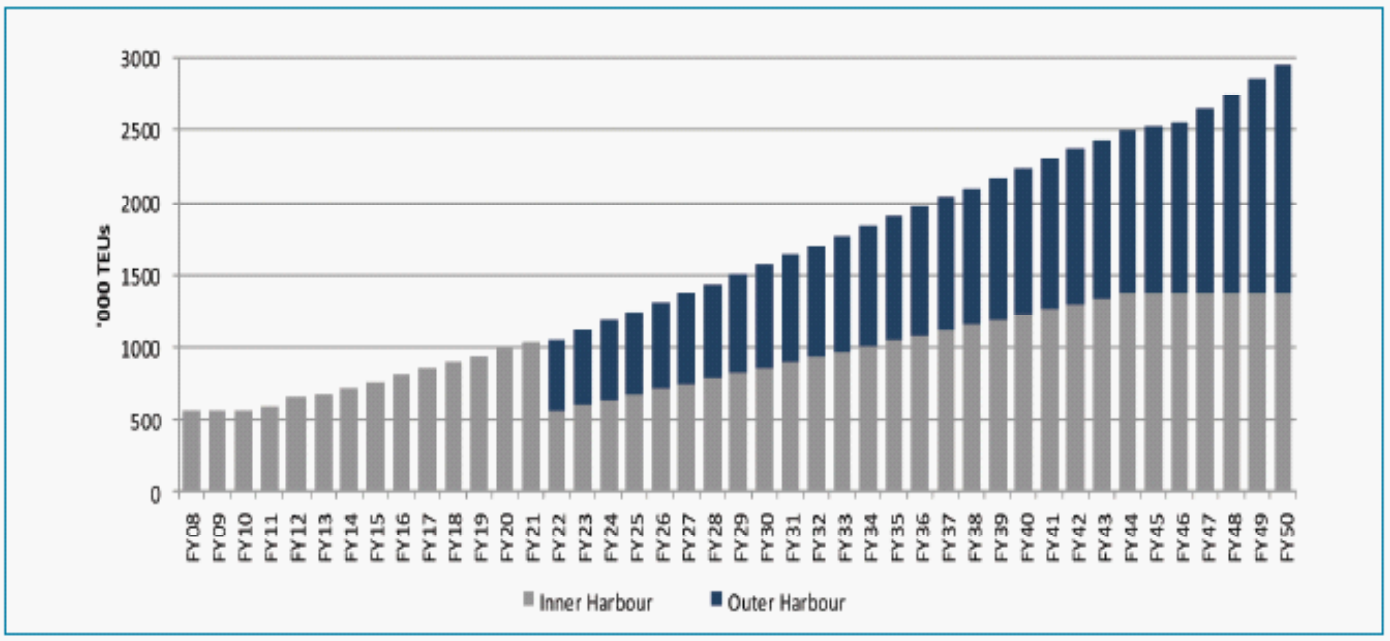

Figure 1: Indicative scenario for the Inner and Outer Harbour transitioning arrangements. Source: Perth Freight Link, Business Case Executive Summary

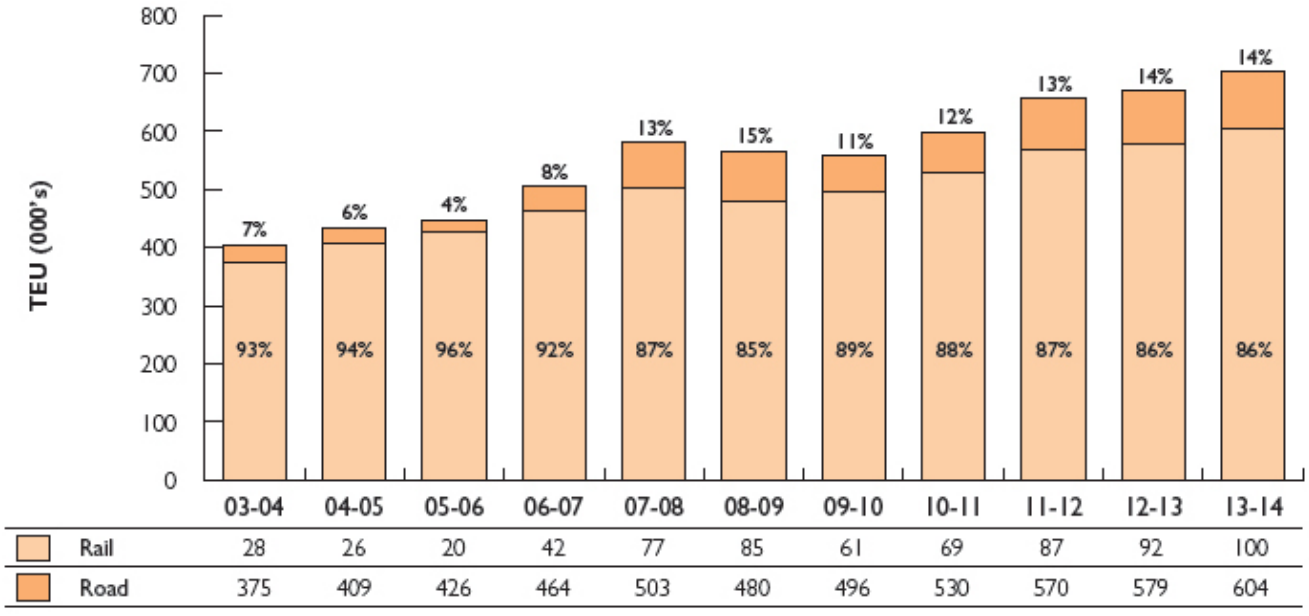

Figure 2: The number and proportion of containers on road and rail reaching the Inner Harbour, 2003/4 to 2013/14. Source: Fremantle Port Authority Annual Report, 2014.

the freight strategy was designed to take 30% of trucks with containers off the road and replace them with highly efficient train freight.

Thus despite the Inner Harbour being a constrained site it appeared that the Outer Harbour and increased use of rail would mean that truck numbers could be managed despite there being issues in the approaches along Leach Highway and especially in North Fremantle where the trucks are focussed.

However this has now all been completely subverted by the announcement of the $2billion Perth Freight Link (PFL) that was dropped into the transport planning system suddenly in February 2014. For the State of WA it is hard to react negatively to a substantial Federal Grant when the state coffers are struggling, but this particular project has so many inadvertent and serious impacts there should be a complete reconsideration of the value of the project.

Below we will outline:

1. The PFL Strategy and why it will undermine the whole freight strategy that was accepted as a bipartisan long term scenario for the Fremantle Inner and Outer Harbours;
2. An alternative strategy based on rail freight taking the growth in containers, which is unlikely to work; and
3. An alternative strategy that evokes the accepted Cap and Transition strategy adopted for several decades.

The Perth Freight Link Strategy

Perth has a need to bring trucks from a variety of areas to the port and out again. Mostly they come to and from Kewdale, Osborne Park, Kwinana and Malaga as well as those that need to travel to the Pilbara. At present they move mostly along Leach Highway although there is also a significant proportion that come on other roads from the north and south and east.

Why the PFL?

The PFL was created to solve the problem of trucks going along Leach Highway. The solution to this issue had been sought for decades as outlined above but after a campaign by the City of Melville to take trucks around their city boundaries, and some marginal seat politics around Leach Highway trucks, the new strategy has been developed.

The Economics

These stages are estimated to cost $1.5b. The final stage to get through to North Fremantle has not been announced but is likely to cost at least $0.5b as it will most likely involve doubling Stirling Bridge and providing large overpasses to miss lights around Tydeman Road. The total is thus more likely to be around $2b.

A Benefit Cost Ratio (BCR) for the PFL has been estimated at 2.8 which is a very good figure compared to many like the East-West Link in Melbourne which was going to only have a BCR of 0.4 and like the PFL was a Federal Government top-down project. However the BCR of 2.8 assumes a lot; most of the benefits

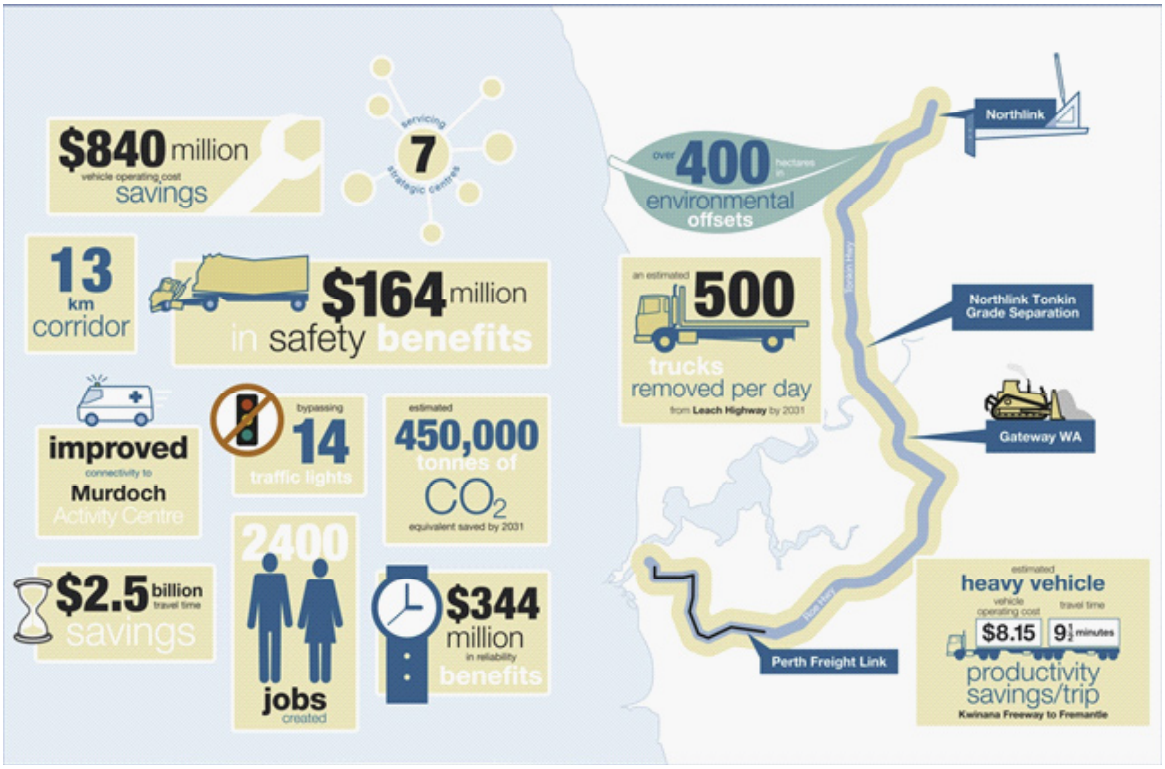

Figure 3: Map of PFL as it relates to other major freight links being built. Source: Perth Freight Link, Business Case Executive Summary

Figure 4: Stages of the Perth Freight Link, main area. Source: Perth Freight Link, Business Case Executive Summary

Figure 5: The PFL avoiding the City of Melville and some sensitive state seats instead of running directly to the port down Leach Highway. Why would a heavy goods truck take a longer tolled route? Source: Perth Freight Link, Business Case Executive Summary

are based on a 10 minute time savings by trucks, despite there being no solution to the traffic at North Fremantle yet. A faster route around the city may be possible but in the end it will not save time if trucks are stuck in truck jams in East Fremantle and North Fremantle. The benefit cost ratio is thus illusory and misleading.

The Tollway toll

The project is designed as a Tollway. This is a key element that has not been considered properly and is more than likely going to cause inadvertent issues which could undermine the whole port freight strategy. Instead of creating a more efficient port it is likely to reduce its overall functionality and at the same time create significant economic impacts on the city and suburbs of Fremantle.

There are two major factors that are likely to cause these failures:

1. The Outer Harbour project is likely to be postponed as the $2b assigned to this project would mean that the chances of a similar amount for the Outer Harbour are next to zero. If the Outer Harbour was to begin taking containers in 2022 it would need to be fully planned very quickly and earthworks begin within a few years. The Outer Harbour preparations for its road and rail access would need to be done in the period of the next few years as the PFL is being built. This is not happening and all of the State's resources will now be directed into the PFL. Thus the Outer Harbour will be postponed.

2. The clear implication in establishing a toll on trucks using the PFL is that the route will need to have as many trucks using it as possible. This would mean the abandonment of any further use of the rail for freight as any assistance to them would undermine the toll revenue. Rail will be seen as uncompetitive and inefficient once the special truck route is completed. It is more than likely that B-triples would be approved for the PFL also. This would completely remove the rail option for freight to the Inner Harbour.

The Impact

There are many impacts that are likely to follow from the PFL as announced. The key infrastructure impacts will be that there will be: no Outer Harbour and no rail to Inner Harbour, as we have predicted; and that the numbers of trucks becomes a serious exercise in logistics and impact assessment. Please see "The Maths" tables on the last page of this report.

The Fremantle Inner Harbour now takes 700k TEU containers a year (in 2014) with 100k of these coming by rail. This was planned to move in 2050 to 3000k TEU containers with half going to the Inner Harbour and half to the Outer Harbour. 900k of these were anticipated to be on rail (30% is the goal for rail). If split equally this would mean 1,050 TEU on trucks going to each Harbour. Thus the Inner Harbour would only have gone from 600k TEU containers on trucks in 2014 to 1,050 k TEU in 2050, an increase of 57% but a substantially managed increase.

With no Outer Harbour and no rail to the Inner Harbour there would be by 2050 a total of 3,000k TEU containers going through the Inner Harbour, all by truck. This is three times higher than had been originally planned and is an increase from 2014 of 500% or 5 times increase.

What this means in terms of trucks per day is that instead of around 3000 trucks per day on a weekday in 2014 entering the Fremantle container port area, there would be 13,200 trucks per day. The consequences of such growth - mostly caused by the PFL - and its lucrative truck toll - inadvertently undermining the Outer Harbour container facility and the freight rail is likely to be substantial.

The Problems

1. The environmental impacts

The construction of the Roe 8 through the Beeliar wetlands and Banksia woodland has been a controversial environmental issue for 40 years. It was once assessed by the EPA and rejected but has now been approved with the Main Roads new approach to constructing an elevated roadway. It remains deeply controversial as this is among the last of wetlands in the south metropolitan region and remains an important ecological 'stepping stone' for many rare species.

The increased number of trucks traversing the route to Fremantle can be alleviated to some degree by the use of crossovers and underpasses and trenches but the total pollution caused by these trucks will be substantially increased. In particular diesel pollution (known as particulates) will be greatly increased and these fine particlesy are a growing concern in the global health community as they cause cancer as well as other breathing-related diseases like asthma

(Raaschou-Nielsen et al, 2013).

The WHO have confirmed the link between diesel particulates and cancer. Speaking about this the director of New York's Clean Fuels and Vehicles Project, Rich Kassel said:

> *"The pollution that we care about from diesel - buses, trucks and other diesel engines - is technically called particulate matter. We all know it is soot. It's fine, fine particles that are small enough to get past our throat, past our lungs into the deepest part, the deepest of our lungs, where they trigger asthma attacks, bronchitis, emphysema, heart disease and now of course we've learned cancer." (Metherell, 2012)*

Fine particles of diesel smoke can travel some distance from their source and the route of the PFL through the suburbs of Perth and finally through highly adjacent housing in Fremantle is not a trivial issue. The number of trucks increasing five times would suggest that a proper assessment of health impacts should be considered.

2. The social and urban impacts

The large convoy of trucks will cut a swathe through Fremantle as it swings down Stock Road, Leach Highway, Stirling Highway and Tydeman Road. There are some design elements of the PFL that have solved earlier suggested large scale overpasses in the Leach Highway section but little can be done about the sheer number of trucks and the presence of a largely impassable cutting that will divide the City of Fremantle.

This is the kind of road that no city is building anymore through a heavily built up area (Newman and Kenworthy, 2015). As Enrique Penalosa, the former Mayor of Bogota said at a Perth Symposium:

> *'New freeways are like poisonous rivers.. You can't live next to them, you can't walk alongside them – and they don't solve congestion problems they are meant to fix. It is so weird that you in Perth continue to build new roads and new freeways when the rest of the developed world has stopped'. (The West Australian, April 16th, p9).*

3. The Inner Harbour impacts

The numbers of trucks coming to Fremantle are already over-stretching the transport system in Fremantle but are manageable within the Fremantle Inner Harbour operations. The port continues to improve its productivity (FPA Annual Report, 2014). However its growth was always going to reach limits after its 'optimal capacity' was achieved when the number of containers reached around 1000 TEU. This was expected sometime in the next 10 to 15 years.

This 'optimal capacity' was based on projections where rail kept increasing its load and then the Outer Harbour took over the extra growth. But as pointed out above both of these are not going to happen: the rail will be closed down as it cannot be accepted competing with a toll road that is meant to pay off a State Government funding commitment; and the Outer Harbour will be shelved indefinitely as the possibility of funding another $2b road and rail access system to the Outer Harbour is most unlikely.

These inadvertent implications in the PFL will

have serious repercussions for the operations in the Inner Harbour. More trucks will be arriving at the port much sooner than anticipated as the PFL is due to begin in 2018. But the problem will quickly spin out of control as the 'optimal capacity' of the port is breached. Is it possible to consider the arrival, on every working day, of 5 times the number of trucks that are now passing through the Inner Harbour port operations?

4. The Fremantle Economic impacts

After a period of slowdown in its economy Fremantle has been rapidly growing in recent years as a major activity centre with a particular emphasis on knowledge economy jobs, services and tourism (City of Fremantle, 2011). Over $1b in new redevelopment projects are in the final stages of delivery ushering in a new era of urban productivity for the historic city (City of Fremantle, 2015).

Much of this future is placed under threat as it depends on Fremantle continuing to be a place people will want to visit. Fremantle with an increase in truck traffic of five times will not be a place that is easy to access. As is well known in Fremantle container trucks use almost every road in the city as well as the main route of Leach Highway. This will increase every year with dispersed trucks impacting heavily on all aspects of the people-based urban economy.

The PFL will create a barrier around the city, particularly in the North Fremantle and East Fremantle area. This will eventually impact on investment in the city. It makes Fremantle a truck city not a people-oriented city. It will become more like Port Adelaide which remains a city dominated by freight with few of Fremantle's people-oriented attractions and amenity. Fremantle's long term future will be to have an urban economy based around tourism, knowledge and other services.

Figure 6 sets out how the PFL harms both the Fremantle people-based economy and the freight-based economy of the Kwinana area. And Figures 7-8 sets out how both can be improved by building the Outer Harbour and enabling improved freight productivity and improved urban productivity-related activity.

Achieving A Successful Freight Link for all, and for Future Generations

Alternative 1: Increasing Rail Freight Dramatically

The first alternative future for such a large increase in trucks in Fremantle is to not just enable a 30% proportion of freight on rail but increase this to 50%. This will require the government to mandate use of rail instead of the large truck-based highway that is proposed. This would mean increasing rail from 14% to 50% over the next few decades. This will mean taking half of the 13,2000 truck movements every working day off the road and putting them on trains. Some simple calculations would suggest the following. At present there are 100k TEU per year being carried by 7 trains per day. Each train typically carries 40 TEUs. Taking half of 3000k TEU per year would thus mean just over 100 trains per day. Please see last page for a table titled “The Maths”.

The present freight rail system would of course not cope with anything like 100 trains a day. The idea that 100 trains a day would pass around the intensively used Fremantle foreshore (especially around the Round House corner) and indeed the many suburban areas close to the rail line, is beyond imagination.

The alternative of a tunnel to take the railway under the city has been proposed.

Measurements show a tunnel of around 9km would be needed. The Airport Railway tunnel has recently been estimated to cost $260 million per km to build. This would mean a cost of $2.3b would be required for the tunnel. It would also require much greater investment out in the suburbs of Perth to complete the kind of Freight Terminals with their marshalling yards in order to make 15,000k TEU of containers each year to be carried by rail.

This will not happen. The 50% rail option will not happen as a tunnel under Fremantle nor would it really solve the problems as the other half of the TEUs on trucks - around 1,650,00 per year - would still be coming through Fremantle. A much better solution is needed.

Alternative 2: The Cap and Transition Strategy

The only way forward is to return to the sensible planning that was being done before and complete the Cap and Transition process. Fremantle will always be stunted by trucks unless it enables a cap on the growth of trucks to little more than happens now. This will need continued growth in the proportion and total number of containers reaching the Inner Harbour and by accelerating the transition to the Outer Harbour.

Figure 6-8 sets out the Cap and Transition Strategy. It will need a rapid planning process to complete the preferred siting and access for the Outer Harbour. It will need funding of the access to link it into a Perth Freight Link that goes right around the city with both road and rail systems optimised. Such a system would be a much better use of the Federal Government grant.

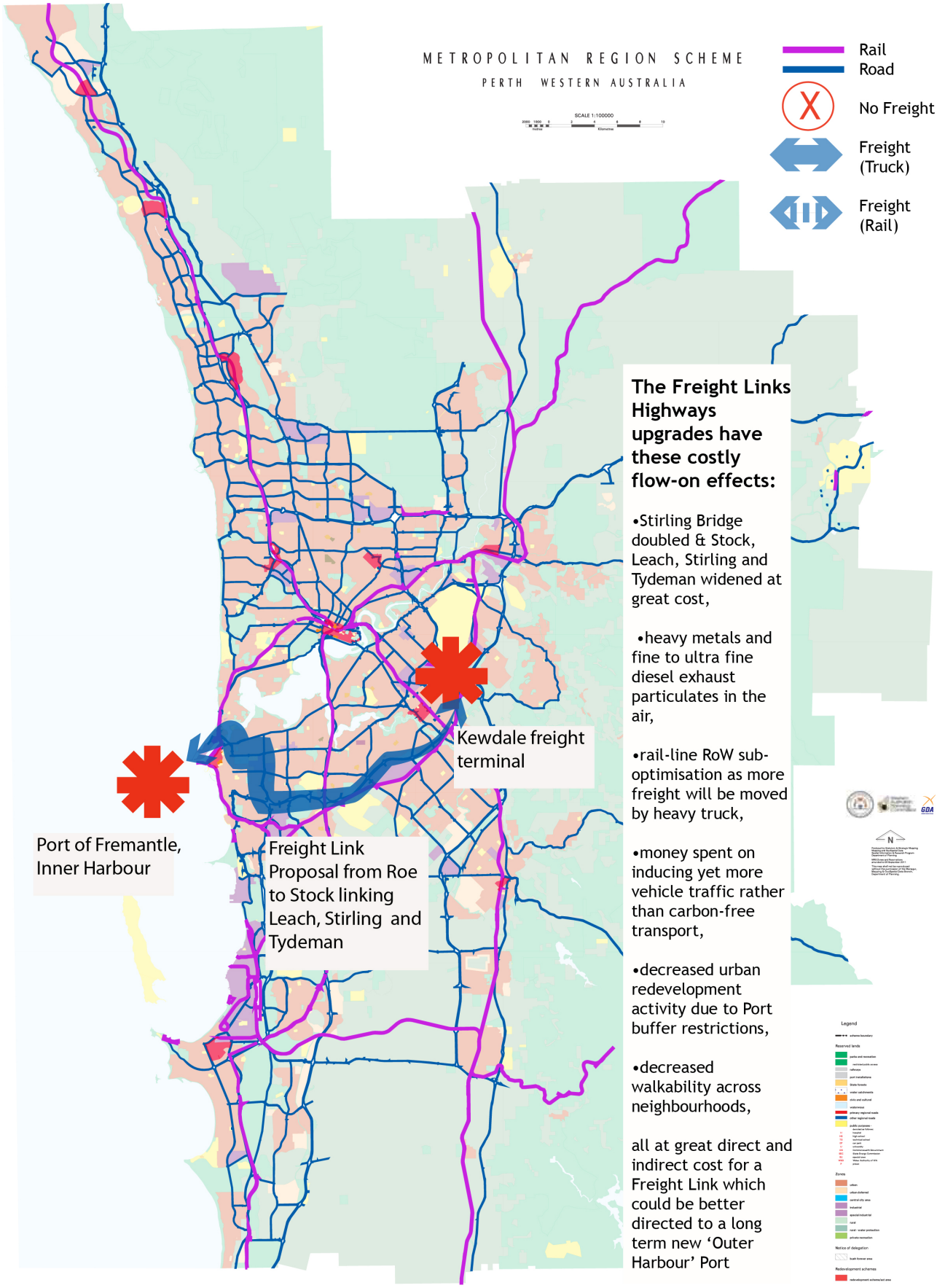

Figure 6: The PFL as proposed with all of its associated problems: bridges, tunnels, diesel particulates, undercuts rail, less money for public transport, limits good urban growth among other.

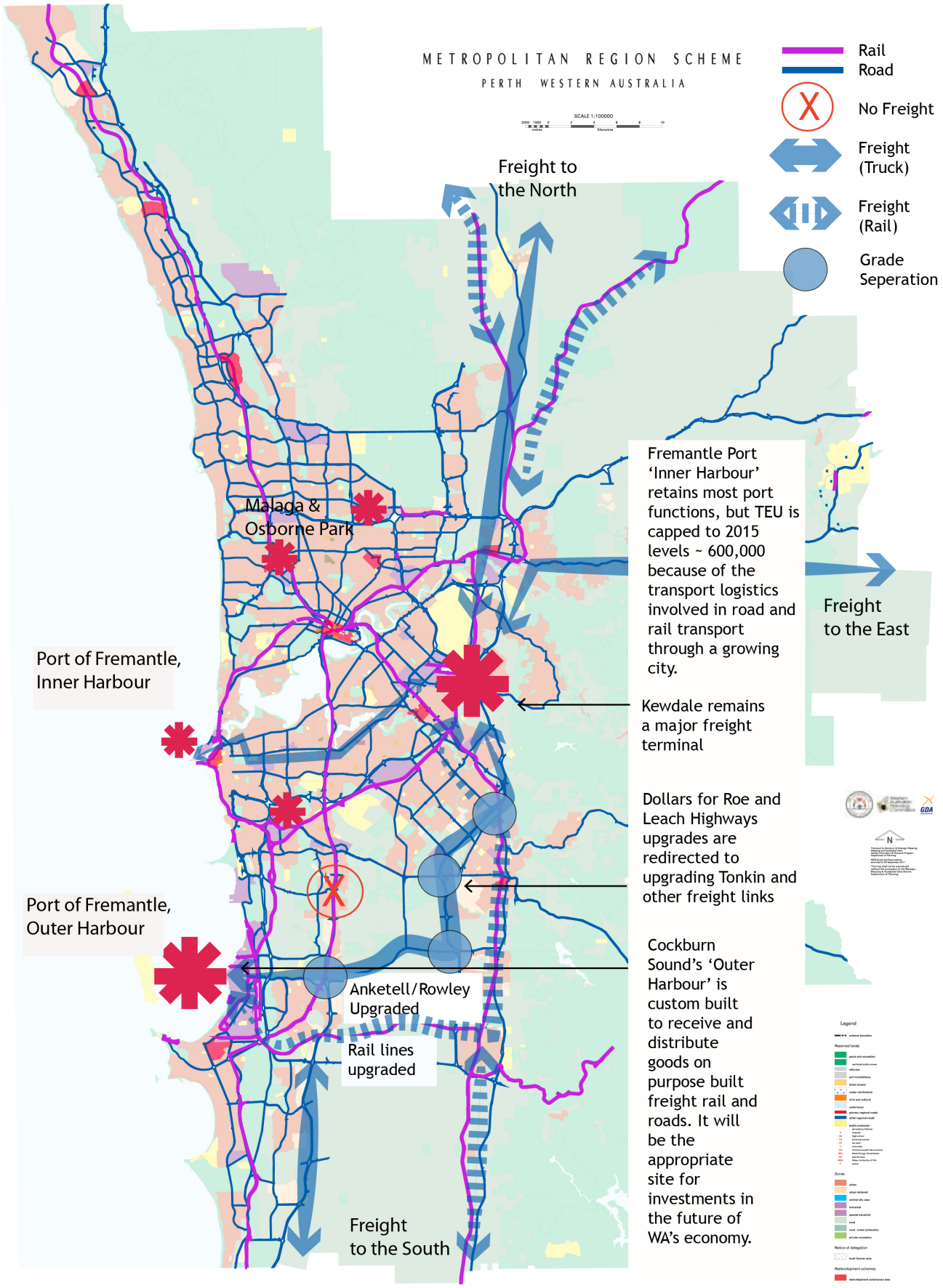

Figure 7: A Cap and Transition scenario with the Outer Harbour built along with road and rail upgrades

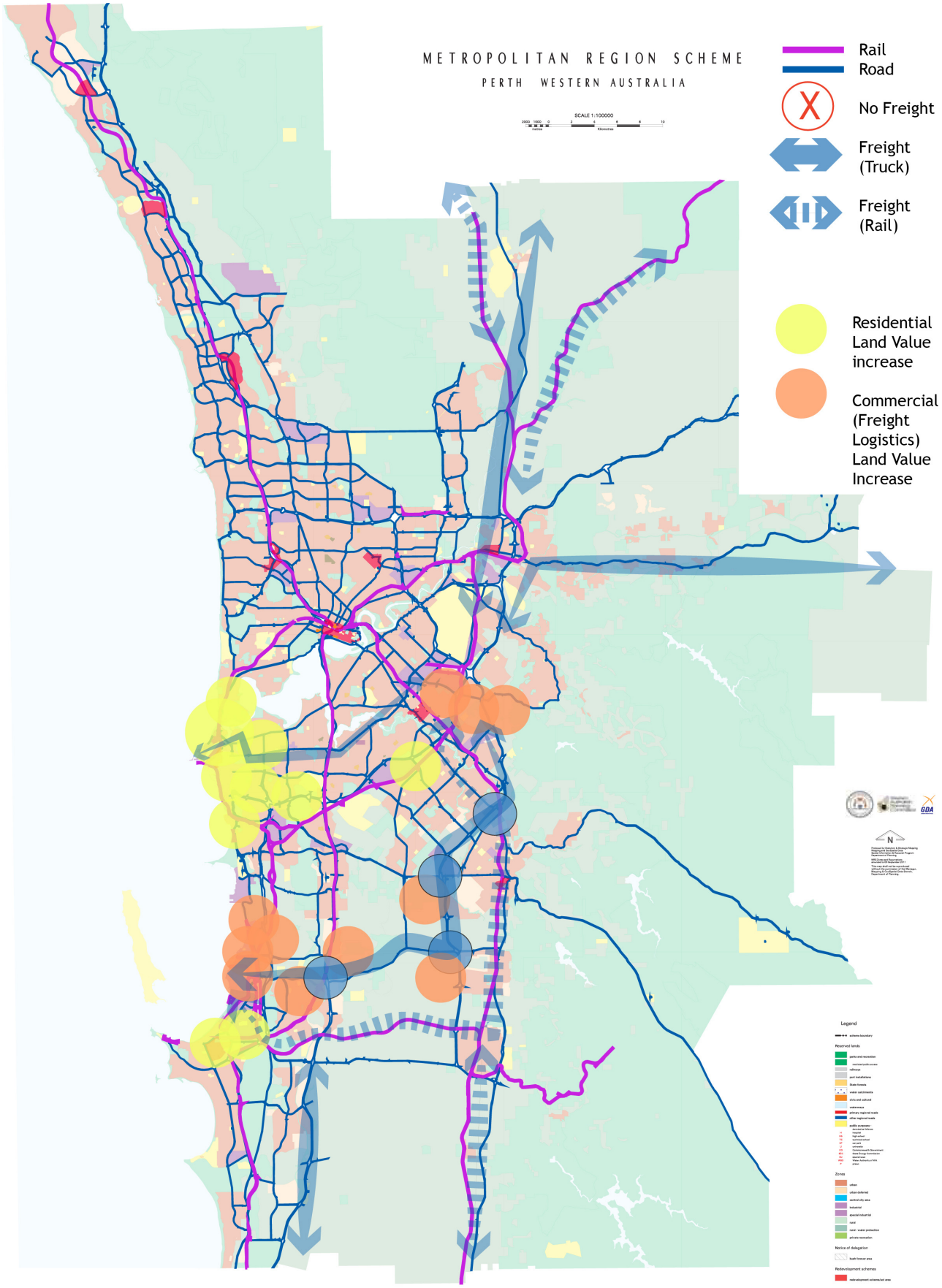

Figure 8: A Cap and Transition scenario will have vast increases in residential and commercial land values

Conclusions

The Perth Freight Link is a troubling project. It is absolutely necessary to enable freight to be taken efficiently to and from a city's port. The process of doing this has been well handled in Perth and its recent growing pains only reinforce the long term strategy which had been well accepted by both sides of politics and was accepted as a priority by all levels of government. This has been changed by a 'captain's call' from Canberra.

The analysis in this paper suggests that the PFL decision will set back the long term process of managing containers in Perth. It has been decided on very narrow political grounds to solve a 'truck problem' in one part of the city and to off-load it onto another. But worse than this the PFL inadvertently will undermine the use of rail to the Inner Harbour and the planning and delivery of the Outer Harbour development. This is very poor planning.

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In a recent article in The Conversation, Professor Graeme Hodge commented on the poor planning associated with the $10b East-West tunnel which was similarly dropped on Melbourne by the Federal Government in much the same way the Perth Freight Link was dropped on Perth. He concludes that:

> *'Independent institutionalised professional planning needs to be reintroduced into the picture, not sidelined. Consultation needs to be undertaken. And priorities need to be re-established so that debates around medium and long-term project options, alternatives and relative timing can occur. Not just the immediate personal choices of ministers as if they were purchasing something in a retail shop'. Graeme Hodge (The Conversation, 17 April, 2015)*

The politicising of infrastructure is always hard to overcome, especially when it seems that the public service is not able to produce a solution that can be delivered. However the planning for the Outer Harbour and the increased use of rail to the Inner Harbour were well under control and were proceeding until this project was dropped on Perth by a Federal Government decision. The throwing of money at a large scale road project through the centre of a city is bound to cause major issues. The East-West Link in Melbourne has now been stopped through the political process. Graeme Hodge suggests that:

> *'We need to get on and re-professionalise for a more democratic approach to medium and long-term infrastructure success. And quickly.'*

The Perth Freight Link suffers from the same problems. It has substantial impacts that are now obvious and which were not part of the planning process due to the rush to accept the Federal largesse. This cannot be accepted

by those who are impacted in Fremantle and the adjacent suburbs close to the PFL. It also should not be accepted by the wider public of Western Australia as it is a waste of public money that does not enable the productivity improvements to the freight industry that would have flowed from the Outer Harbour and it does not improve the productivity of people-intensive urban economic activity in Perth's second major activity centre: the City of Fremantle.

References

City of Fremantle (2011) Fremantle Economic Development Strategy, 2011-2015, City of Fremantle, Fremantle.

City of Fremantle (2015) Fremantle 2029, City of Fremantle, Fremantle.

Fremantle Port Authority (2014) FPA Annual Report, Fremantle Port Authority, Fremantle.

Main Roads WA (2015) Perth Freight Link Business Case Summary, Main Roads WA, Perth.

Metherell L (2012) 'WHO Confirms Diesel Fumes Carcinogenic', ABC News The World Today, 13 June, 2012

Newman P and Kenworthy J (2015) The End of Automobile Dependence: How Cities are Moving Beyond Car-Based Planning, Island Press, Washington DC.

Raaschou-Nielsen O, et al. (2013). "Air pollution and lung cancer incidence in 17 European cohorts: prospective analyses from the European Study of Cohorts for Air Pollution Effects (ESCAPE)". The Lancet Oncology 14 (9): 813–22. doi:10.1016/S1470-2045(13)70279-1. PMID 23849838

The Maths		
Under PFL:		
Current: 700,000 TEUs in 2014	100,000 on train 14% of TEUs	7 trains per day 40 TEUs per train
	3000 trucks per work day x 250 working days per year	750,000 trucks per year or 1.1 trucks per TEU
Future: 3,000,000 TEU in 2050	14% maintained = 420000 TEU on train	= 29 trains per day
	50% = 1,500,000 TEU on train	=103 trains per day on 40 TEUs per train
	1.1 trucks per TEU	3,300,000 trucks per year or 13,200 per 250 working days

With Rail Tunnel:		Total
Airport Rail Tunnel = 8.5 km	$260 million /km	$2.21 billion
Proposed Freight Tunnel = 9 km	$260 million/km	$2.34 billion
Marshalling yards for trains	Unknown, but certainly expensive and expansive	
Number of Trains per day	50% of 3,000,000 TEU at 40 TEU per train	103 trains per day

Under Cap and Transition :		
Inner Harbour	30% on rail of 600,000= 180,000 TEU	12 trains a day 40 TEU each
	70% on truck of 600,000 = 420,000 TEU	462,000 trucks per year or 1848 per working day (250 days per year)
Outer Harbour	30% on rail = 720,000 TEUs to move	33 trains per day with **60** TEU per train oer 49 trains per day at 40 TEU
	70% by truck = 2,100,00 TEU to move	2,310,000 trucks per year or 9240 per working day (250 days per year)

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