

Submission
By James D. McCredie
to
Review of F3 to M7 Corridor Selection.
April 2nd 2007. April 12th 2007

1. Were the 2004 Link Study ASSUMPTIONS & DATA valid & reasonable?

a. Was SKM analysis & methodology appropriate?

The analysis of the traffic split between Pennant Hills Road and the Pacific Highway failed to account for traffic using Pennant Hills Road and also the M2 between Pennant Hills Road and Sydney CBD, the airport & Port Botany and other eastern destinations. For example, SKM Main Report Figure 4.4 does not enumerate this flow. During a visit to Federal Roads Minister Jim Lloyd in Gosford, he told me that he himself, and many others from his Gosford electorate, travel to Sydney by the Pennant Hills Road – M2 route, because the Pacific Highway south of Wahroonga is saturated and a slower route. The overflow traffic from the Pacific Highway is a major factor in the rapid rise of traffic volumes and accident rates, which are only able to increase in the brief, unpopular off-peak travel times, with a 24 hour traffic growth of about 1% per year. Most intersection traffic lights on the Pacific Highway have the lowest (Category F) rating used by RTA. The Pacific Highway traffic lights have their phasing set to maximise the proportion of the 2.5 minute cycle to through Highway traffic, allowing only two or three turning vehicles at the highway. The result is queues of traffic in side streets waiting 15 or more minutes to access their only local main road.

The traffic flow to the east on Beecroft Road/ Epping Road is similarly ignored.

The selection of “origin & destination” catchment boundaries confounds southern and south-western areas. Changes mentioned in heading (2) below are affected.

b. Appropriateness of the options selected.

There was only a passing mention of the milestone “NORTH WEST SECTOR ROAD NEEDS STUDY, Analysis of the area bounded by the Pacific Highway, Pennant Hills Road, Beecroft Road, and Epping Road”, published by the RTA in 1988. The six page pamphlet published then to accompany an “Invitation to Comment” form, considered nine surface routes. The best option then was the “B3” route, which had an expected construction cost of \$117.8 million, and a benefit/cost ratio of 4.1. This former best option should have become the benchmark for comparison with the latest options. This option followed the original planned route of the F3 Freeway (which was reserved from about the 1940’s) for its northern half, then adopted a new line west of housing to Vimiera Road, to reduce the loss of open space from 58 ha. To 41 ha., and reducing properties affected from 42 to 39. Minimising impact was a major criterion for this route. Considering much lower benefit/ cost ratios for the more recent options, (see remarks in (3) below) this option should still be by far the best.

The choice of tunnels only for the SKM study is merely pandering to environmentalists, who want to preserve weed infested fire hazard regrowth trees in the Lane Cove Valley. Most of the freeway route was near clear felled early in the 20th century, and partly dug up later to install sewerage and storm drain systems.

The location of tunnel stacks, and filtering tunnel air, is already creating neighbourhood unrest in the Kuring-gai area. The tunnels have to be longer than surface routes and include steep 6 % grades on which trucks will labour smokily at 30 km./hr. Tunnels may generate 30% more exhaust fumes than an evenly graded surface road.

Fire risk in tunnels is high, especially two or one lane tunnels. The SKM documents don't analyse the Mont Blanc & St. Gothard tunnel fires. "Dangerous Goods" not allowed in long tunnels must include margarine and used tyres that caused the afore mentioned infernos, along with PVC which emits hydrochloric acid, and styrene foam packaging which yields cyanide, which excludes most boxed farm produce and household whitegoods and computing/ communications/ TV categories. The Melbourne Burnley Tunnel fire was a lucky escape, and was moderated by the absence of a massive chimney draft that would drive the flames along the tunnel. The proposed tunnels have a couple of hundred metres height difference between the portals, which will generate a hurricane in the tunnel when it is filled with hot combustion gases a quarter of cold air density.

Finally, emergency services are better able to access and deal with catastrophic collisions, fires, and terrorist events in the open, using cranes & helicopters. Casualties and walking escapees have a better chance in the open than in a tunnel that may experience a "flashover" inferno fire.

c. Validity of the models used.

The blue & purple options and the red option with bridge were the only attempts to consider part surface roads in the "A" options.

The difference in the tunnelling cost between the red options with & without bridge appeared to be far too low, not proportional to the length of tunnel, resulting in a higher cost for the bridge option. This reduced the benefit of incremental cash flow in Working Paper 7 Page 18 Table 3.2

I believe "origin and destination" data collection is usually regarded as low in reliability, due to the tiny percentage of driver responses to distribution of origin & destination forms on the traffic route being investigated. I consider it should now be possible to collect data from mobile phone companies simply by requesting route drivers to keep their mobile phones switched on throughout their trip. The phone companies already automatically record the sequence of cells occupied by each mobile phone. It would only require a software patch to accumulate journey statistics for users of a particular central cell. This would provide a much larger & arguably more valid sample.

A more extensive range of discount figures should have been used in the benefit/cost calculations. The discount rate is the most critical factor where costs are mostly in the first few years and the benefits are spread over 30 or many more years.

d. Accuracy & appropriateness of assumptions

The principal prejudicial assumption is that a surface freeway on the “B3” route should not be included in the options, because of local community objections. This assumption has been utterly debunked within this area, through the process of approving and building the M2 motorway. Opponents persuaded a judicial inquiry that the M2 should not be built, for the same reasons advanced against the surface “B3” route. There was no economically viable alternative to the M2, and it was finally built, over active local protests. The M2 was finally approved and built, and community response as a whole has been highly approving.

In the case of the M3 south of Lucinda Avenue, extension was halted by powerful negotiation by Premier Nick Greiner with his appointee Roads Minister Bruce Baird. By having Pennant Hills Road classified as a “National Highway” The State obtained Federal funds to support widening Pennant Hills Road. This widening, together with the completion of the M2, created the detour round the Pacific Highway. Subsequently, the Pacific Highway has been a State Road without Federal funding. Mr. Greiner had bought a family home in the freeway-affected locality of Lucinda Avenue, and he was reported to have assured his neighbours that the freeway would not be extended south during his term of office. (In recent years, Mr. Greiner sold the family home, no longer devalued by the freeway, thereby arguably gaining private benefit from his public office.) There can be little doubt that the “Lucinda Avenue enclave” may have access to political and bureaucratic influence to back options with a tunnel entrance well away to their north. As for the sagacity of Mr. Greiner in selecting optimal route options for freeways, one must examine his role as director & Chairman of companies involved in the Cross City Tunnel.

I was unable to find out if the tunnels were to be excavated by Tunnel Boring Machines or road headers. Road headers are much more expensive to operate, but will be necessary wherever three lanes are required, and where weathered or unsound rock conditions occur. They contributed greatly to the cost increase of the Lane Cove Tunnel from early optimistic estimates of \$400 million to actual cost over \$1000 million. The history of local tunnel costs indicates the concept stage cost is about 40% of the actual cost. This is validated by the NSOOS sewer overflow tunnel and the Parramatta Rail Link Tunnel. There doesn't appear to be a “concept to reality cost factor” in the calculations.

I was unable to establish what geological hazards were expected along the route, such as weathered broken rock areas that might cause collapse of buildings overhead. I believe the ridge top to contain the blue & purple option tunnels is deeply cracked & weathered, and also contains areas of volcanic dyke which could require “cut and cover” construction involving closure for lengthy periods of Pennant Hills Road or the Main Northern Line or demolition of quite a few buildings.

e. Accuracy & appropriateness of data.

Traffic forecasts are always open to criticism, and are critical to financial success of such road tunnel projects. The Cross City Tunnel, and criticisms of traffic forecasts for the Lane Cove Tunnel disclosed in “freedom of information” requests by members of the Lane Cove Tunnel Action Group, indicate that professional forecasters of tunnel patronage should be treated with scepticism. For

the present case, this Review is occurring partly as a result of the Transurban F3M2 Traffic Forecasts Comparison focussed on comparative usage for the purple and yellow options, which differ by a decisive amount from the figures adopted by SKM.

f. Other models of data that were available.

Recent tunnelling experiences in building the Cross City Tunnel, NSOOS sewer tunnel and the PRL rail tunnel and station excavations should have been analysed by audit processes and contingency factors included directly related to these recent experiences.

Mobile telephone corporate data access and use for traffic origin and destination data could have been attempted.

A Bayesian statistical approach could have been adopted to determine the value of conducting experiments to resolve matter of uncertainty.

g. The consultation process, and the incorporation of input provided.

The introductory stage of consultation involved displays of information in major shopping centres. I visited the most easterly display, which was in the Macquarie Centre, Herring Road Marsfield. There was no display in the Pacific Highway area. Later, I attended a Focus Group, meeting in Pennant Hills. I was the sole representative of the Pacific Highway area, and my attempt to have the needs of this community considered were virtually ignored. The only compromise considered was to evaluate adding ramps to the eastward side of the M2 at the M2 intersection with Pennant Hills Road at Carlingford. This would take highway traffic much further from the Pacific Highway, and subject them to full toll on the M2 as well as any toll (another \$3.50?) on the F3 extension to the M2. Suggestions that a Focus Group be held in the Pacific Highway area fell on deaf ears. Suggestions that the fire hazard & stack issues for tunnels should be considered and compared with the surface "B3" route were ignored. Subsequently, petitions favouring the yellow and red tunnel options were collected in the Chatswood Pacific Highway vicinity by local residents and presented in State Parliament by Willoughby MP Gladys Berejiklian. This petition text was delivered to Federal Roads Minister Jim Lloyd in Gosford. It may have contributed to the establishment of this Review.

2. Do changes since the 2004 report publication affecting land use and transport flows in Western Sydney support any significant changes in these projections?

There have been significant changes. The Port Botany Master Plan relied on building a dedicated freight railway from Port Botany to the Liverpool area to transport about 40% of containers from the Port to a massive goods train marshalling yard and associated container filling & unloading warehouses. The voters in responsible Minister Carl Scully's electorate opposed the truck concentration centre. Chris Corrigan gave up in frustration and sold out to Toll Holdings.

Meanwhile, the rapidly growing international logistics & freight forwarding companies, such as Federal Express and DHL, have not been idle. DHL, for

example, now have many large office blocks, freight sorting & loading facilities throughout the Botany & Mascot area. One of their terminals has replaced the earlier Virgin terminal at the entrance to the Kingsford Smith Domestic Terminal precinct. The freight businesses would be better served by inward extensions of the F3 & F6 freeways from coastal city growth to meet at the airport.

With the development of "Just-in-time" manufacturing and logistics systems, it is unrealistic to imagine the delays to containers by interposing unwanted rail transshipment will be acceptable in future, except for storable bulk goods such as grain, coal, and ores.

In recent years there have been press reports of marked slowdown in growth in Sydney "west of Canterbury". Preferred living areas appear to be in the lower Hunter Valley, the central coast (ask Jim Lloyd), and the Illawarra Dapto areas. Port developments in Newcastle & Port Kembla support this "Sea Change" growth pattern.

3. Do significant changes to these projections alter the conclusions of the F3 to Sydney Orbital Study of April 2004?

- The Richmond "Review of future provision of motorways in NSW" (December 2005) in Section 6.5.6 proposes that a future policy be established that requires that there is an arterial road available as an alternative route to the toll road, and that once the toll road opens, the arterial road has at least the same number of general traffic lanes as it had prior to the opening of the toll road. It should be a genuine alternative arterial road, not just village main streets joined end-to-end (as "Gordon Road" once joined the rail-stop villages of the North Shore Line). Cost alone suggests these public alternatives must be surface roads, not tunnels. The minimal surface arterial route between the F3 and the Orbital is the "B3" route.
- **Severe cost implications** follow from the rise in venture interest rates based on risk multiples of the US 10 year Bond Rate. (The US Treasury abandoned issuing 30 year Bonds about 2002). The year-end US 10 year Bond Rate was 8.11% at 1988 at the time of the North West Needs Study advocating the "B3" route; it was 3.13% at 2003 for the SKM options; it is now about 4.5% and rising, under the pressure of US war debt and US low-doc loan insolvencies. The risk multiple for all the tunnel routes requires adjustment. None of the tunnel routes has a benefit/cost ratio above 1.0, after the discount rate is increased to current values (post the failures of the Airport Railway and the Cross City Tunnel, and the exodus of low interest Hong Kong billionaire money, junk bond discount rates well above 10% will be needed.) Refer to www.dotars.nsw.gov.au SKM F3-M2 Working Paper No 7, page 16, Table 3-1, which shows for a 10% discount rate that a dual three lane no-toll tunnel on either the yellow or purple routes will have a benefit/cost ratio of only 0.8, which is unacceptably low by State Government criteria. Placing a \$3.50 toll on the tunnel would reduce the ratio to 0.5 ! In contrast, the 1988 RTA "B3" benefit/cost ratio of 4.1 was calculated at a time when long term bond rates were much higher than at present, so an updated ratio for the "B3" would now be substantially greater than 4.1.

- **Environmental and heritage considerations:** Just as legal precedents must be born of an unprecedented event, new arterial roads are the backbone of the community land use and physical communication structure we are creating for future generations. Several past generations have sought to plan for the long-term future, with limited success. Other generations have sanctimoniously sponged off the romantic past, as an ennoblement of idleness. Progress amounts to respect for the good of past generations, and ensuring that our contribution is a genuine improvement on anything to be replaced. In a world with unsustainable population growth and fuel and water consumption, the existing road system can only support local traffic, and new arterial routes are essential on the ground to permit any further local area growth mandated in the Metropolitan Strategy.
- **Societal effects, including health impacts:** Stacks don't solve community anguish over new arteries. Stack location creates community divisions, and Government may need to buy up residences within hundreds of metres of each stack to abort catastrophic class action suits. The volume of pollution from tunnel stacks may be as much as 30% more than from an even graded surface freeway, when the surface road grade is 2% and speed 80 km/hr, compared with a tunnel with grades up to 6%, up which the truck slow lane labours at 30km/hr. Lack of tunnel filtration will result in long-term growth of cancers & dust diseases of the lung alveoli of stack neighbours & tunnel users. An important societal benefit of surface roads is their usefulness as control lines during bushfires, protecting residential areas and speeding fire-fighting access. The "B3" route is particularly apt for this purpose, for the western side of North Shore Line suburbs.
- **Provision of public transport:** Tunnels prevent buses inside from stopping within convenient pedestrian access of the destinations bypassed. Underground trains are more suited to dense urban areas, provided there are well-distributed routes so all locations are within half a kilometre of a station, as in Paris. It appears the tunnels in the SKM study will only serve express buses bypassing inner suburb destinations .
- **Economic indicators/benefits:** The Richmond Review of future provision of Motorways in NSW Section 6.2.1 recommends that benefit/cost analysis be given more explicit consideration and weighting as an evaluation criterion. State Government previously has required Benefit/cost ratios greater than 1.0 As stated earlier, at real discount rates of 10%, benefit/cost ratios for all tunnels are below 0.8 without tolls (delivered as Design & Construct (D&C) projects), and below 0.6 for tolls of \$3.50 (for Build Own Operate Transfer (BOOT) projects) Reference: SKM Working Paper No.7, pages 16 &17. As stated above, the discount rate risk multiplier will be near junk bond interest, following the insolvency of the cross city tunnel & the Airport rail line, and following the exodus of the main Hong Kong billionaire shareholder from the Lane Cove Tunnel.. The basic US 10 year Bond Rate is also expected to increase. In contrast, the surface "B3" route will now have a benefit/cost ratio well above 4.1 Current advice should be obtained on the discount rate to be expected at date of contracting all funds for each option, including the 1988 options, which will contain far lower construction risk than tunnelling.

- **Transport mix and flows;** There is a major component of tidal traffic flows; it may be better to build three two-lane bored tunnels, instead of two three-lane road-header cut tunnels. Three tunnels also confer better operating flexibility and disaster recovery capability than two tunnels (check the Channel Tunnel fire incident). As stated earlier, there is a far more extensive range of truck cargoes that are catastrophically unsafe in tunnels, which are only moderately hazardous on the open road. It is probable that only a few trucks could be permitted in the tunnel, the rest would continue to make the surface roads unpleasant for motorists. The arterial motorists might retreat into the tunnel, but local frequent-turning car traffic would continue to mingle with speeding long distance truckies.
- **Toll arrangements:** The benefit/cost table indicates tolls will substantially reduce tunnel usage. Economic analysis by the federal Bureau of Transport Economics is quoted by SKM, and there are published reports by the Bureau over many years indicating the maximum tolls that drivers will be prepared to pay. I recall one Report that indicated a maximum toll in Sydney Northern suburbs of about \$3.50 . The Masson Wilson Twiney Figure 8 dated 21 March 2006 indicates their concept of tolls that would make the yellow option attractive to many drivers; tolls for the purple option would substantially discourage use of the F3 to orbital eastbound route, and minimise the traffic diversion from the Pacific Highway route. The result in comparative traffic volumes is conveyed by the Transurban Traffic Forecasts Comparison of the purple & yellow options, by SKM, Transurban Dec0225 and IMIS/Keith Long Consulting.
- **Surrounding Networks:** These effects are presented in the 2006 Interim Report. As reported earlier, the Pacific Highway is at RTA capacity level 1.2 and many of its intersections are at RTA category F for a great part of the day, with a few brief periods of relief. One problem may be that the (Lane Cove Tunnel (LCT) plus reduced width Epping Road) traffic capacity was originally restricted to the capacity of Epping Road carried before the Lane Cove Tunnel. Adding traffic diverted from the F3 to the Orbital from the Pacific Highway was deliberately not contemplated during LCT Focus Groups I attended before the contract was let. I hope the correction of this capacity limit is one result of all the extra money spent on the LCT. Building the surface “B3” freeway extension would remove the “Jim Lloyd rat-runner clique” off Pennant Hills Road and reduce its capacity problems substantially.
- **Demographics:** A Richmond Report Recommendation (under Government Decision Making Processes) is that before formal community consultation,... projects are to be assessed against ...broader strategies including the Metropolitan Strategy ...”The Metropolitan Strategy released last Christmas requires higher density population along the North Shore Line, and will result in massive added local traffic generation. The Strategy also envisages many tens of thousands of jobs created within the “Crescent” including North Sydney, St. Leonards, Chatswood & North Ryde. For example, the consolidation of Optus activities at North Ryde alone poses massive traffic issues already, without the use of the Chatswood to Epping rail line. The Pacific Highway unaided may slow up dramatically as these people arrive. The North West Rail Link Environmental Assessment and Concept Plan, by GHD

consultants to Transport Infrastructure Development Corporation, forecasts car average speeds between Chatswood and the Hills District will fall from about 28 km/hr at present, to about 15 km/hr by the time the North West Rail Link is operational. The traffic forecasts in the GHD Concept Plan need to be integrated in the consideration of the other traffic forecasting. The extension of the options further west are also to be considered; it would be prudent to advise reservation of two routes, Option 9 and Option 12, to support infill development between the Dural-Galston corridor and the Windsor Line. These options must be planned to include the alternative untolled surface roads required by the Richmond Report on future tollways. The location of the Option 10 route in the Castle Hill town area is a matter of immediate urgency, as plans are in preparation for the nation's biggest shopping complex in the area. (See Sydney Morning Herald, March 9 2007, "Shopping Mall plans to be king of Castle... Plans have been lodged with Baulkham Hills Council to catapult Castle Towers – where some 20 million shoppers already spend \$650 million a year,, as a 170,000 square metre behemoth roughly the size of 15 football fields... with 17,000 specialty shops, 13,500 square metres of cinemas, and 8,674 parking spaces.... Queensland Investment Corporation has negotiated to buy Castle Street and Castle Place from the Council...") The arterial road route and this centre should be laid out to be symbiotic rather than mutually obstructive.

- **Industry and Freight/Logistics:** This has been dealt with earlier, citing the example of the international freight forwarder & logistics firm DHL. The Port Botany and Kingsford Smith Airport would be best served by inward extensions of the F3 & F6 Freeways to meet near Kingsford Smith Airport, with a short connection inwards of the M4 to meet the inward F3 extension near Great North Road & Ramsay Road.
- **Land Use:** There are "boundless plains to share" in Australia, but Freeway reservations that were neglected or disposed of by improvident State Governments will mostly have to be reclaimed in future decades, if population density and resulting traffic continue to increase. All such reclamations should be several blocks wide, to provide space for efficient construction and future widening options, and in addition aim for rezoning of resumed land along freeway slip roads for high density redevelopment. This rezoned land would revitalise the adjoining neighbourhoods, and its resale would significantly offset the cost of the Freeway projects. On the broadest scale, planning should accommodate growth of a linear city along the coast, rather than bloating out over the Nepean flood plain. Refer to Masson Wilson Twiney page 9 Land Use: change in balance between Cumberland Plain & Central Coast, and page 16 employment in 2011, and page 21; and the Metropolitan Strategy 2006 sections on Newcastle & Illawarra regions.

In conclusion, as an analogy, I would describe the blue and purple options as the Rolls-Royce and Bentley options; the yellow and red options as the Mercedes Benz and BMW options; and the RTA "B3" 1988 route as the Holden option, the best from the 1988 route selection. It is easy to be distracted by arguments as to which of these cars is the best, and which design features are of most importance. The undeniable fact is that the vast majority of road users opt to buy the Holden and invest the savings

elsewhere. A luxury car salesman would be reluctant to sell a Holden instead, and would downplay the argument that the loan interest rate had become unaffordable following numerous luxury car repossessions. Major road building contractors, and their “millionaires’ factory” financiers, may consider the RTA “B3” option financially less attractive to themselves than an expensive tolled tunnel. The RTA “B3” option may nevertheless be the best option for the State, arterial road users, and local road users. Richmond’s Review (December 2005, section 6.2.1, and Conclusions bullet point 7) “considered the issue of value for money is not adequately recognised and weighted, and recommends this issue become a higher order evaluation criterion in future.”

If despite these sound objections, one of the “A” tunnel options must be preferred, the Pacific Highway users and local communities would select the Red option. Recognising that portion of the route also carries western traffic, which would improve tollway volumes & economics, The Yellow route would be preferred over the Blue & Purple routes. If either the Red or Yellow routes are preferred, then they should be redesigned to include open air embankment & bridge sections at stream and river crossings, to eliminate steep gradients, and long detours (merely included to avoid surfacing) that waste construction resources and time & operating costs of tunnel users. A sequence of shorter tunnels may greatly reduce ancillary ventilation and filtration underground construction, outcries over stacks, and long term health consequences. Local hostility to this modification can be confronted by the example of the short M2 tunnel under Epping, and subsequent changes in real estate valuations in that locality. It would be desirable to re-visit the findings of the judicial inquiries of Kirby in 1981 & 1982, and Woodward in 1992 that aborted early plans for the M2, and have a “reality check” on whether their predictions of dire results have eventuated, now that the M2 has been operating for a long time.

Finally, as most of the Government funds for this project are to be provided under the AUSLINK Federal Transport Plan, it is appropriate to consider whether the ratio of four federal dollars for each State dollar could be expected to create an efficient highway system. This ratio was resoundingly rejected in the USA in the 1956 Eisenhower “National Interstate and Defense Highway” program, and the ratio of nine federal dollars to one State dollar was imposed. Previously only a few of the highways needed had been built, and some states resorted to tollways, which created many problems with ramps, congestion, & temporary narrow sections. With greater US Federal funding, few US toll roads were built thereafter. A review of the Australian Federal funding ratio must be recommended as the foundation stone for building the AUSLINK 2 five year plan, which is due to be issued later this year.

Note: Attachments with previously submitted Draft.