

A REVIEW OF THE NORTHERN BEACHES TRAFFIC PROBLEM
AND
WHY THE PROPOSED BEACHES LINK TUNNEL WILL NOT FIX IT

Prepared by

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1. INTRODUCTION

Expertese

- 1.1 The author of this review is not an expert in road management or tunnelling but is a scientist with around 45 years experience reviewing and analysing technical documents and data.
- 1.2 In preparing this review, I welcome any comment or criticism from anyone who has suitable qualifications/experience in traffic management and or transport infrastructure.

General Tunnel Background

- 1.3 In July 2018, a proposed Beaches Link tunnel Project Update document was produced by the NSW Government/RMS.

This document showed indicative layouts for the various tunnel sections plus other general information.

- 1.4 The Northern Beaches Council along with local politicians have and continue to support this proposed Beaches Link tunnel.
- 1.5 As one of many residents who is going to be severely affected by the Beaches Link tunnel, the author has taken the time to examine the available RMS traffic data with a view to understanding exactly how a Beaches Link Tunnel would help the traffic problems faced by Northern Beaches residents.
- 1.6 In preparing this review the author has relied on:
 - (a) RMS traffic data which is available on the RMS website.
 - (b) Other RMS documentation.
 - (c) A Northern Beaches commissioned survey.
 - (d) Published population data.
 - (e) Other research carried out by the author.
- 1.7 For ease of explanation, an annotated map is contained in **Annexure 1**.

2. EXECUTIVE SUMMARY

2.1 A proposed Beaches Link tunnel will have a profound impact on a number of Northern Beaches residents, particularly those in the suburb of Balgowlah and surrounding suburbs as follows:

- (a) A number of these residents will lose their homes as the result of compulsory acquisitions.
- (b) For around seven years or more these residents will be surrounded by a tunnel construction process that includes:
 - (i) Tunnel boring and the associated vibration
 - (ii) Massive truck movements
 - (iii) 24/7 ongoing dust dirt and noise
 - (iv) Ongoing disruption to traffic movements associated with road and bridge reconfigurations.
 - (v) Loss of amenity for those immediately surrounding the Balgowlah Golf Course.
 - (vi) Significant loss of property values as a direct result of the tunnel project.
- (c) At the end of the tunnel construction process the residents of Balgowlah and the surrounding suburbs will be faced with:
 - (i) An unfiltered stack very close to homes and schools.
 - (ii) A large loss of green space associated with a Link Road and the tunnel plant facilities.
 - (iii) A huge loss of flora and fauna associated with the relocation of the Burnt Bridge creek.

2.2 In supporting the Beaches Link the federal Minister for Warringah Mr Tony Abbott MP has stated in Parliament that:

- (a) He is *“120% behind the tunnel”*
- (b) *“This tunnel will cut out 17 sets of traffic lights between Manly Vale and the City alone”*
- (c) *“It will reduce travel time from Manly Vale to the City by about 10 minutes.”*

(d) The tunnel “*will also enable Military and Spit Roads to go back to being Suburban thoroughfares. It will restore Mosman, Cremorne and Neutral Bay to their residents*”

2.3 The residents of Balgowlah and surrounding suburbs stand to be totally devastated by a Beaches Link Tunnel and the evidence contained in this review indicates that:

- (a) The Beaches Link tunnel would not solve the Spit Bridge problem.
- (b) The Beaches Link tunnel has extremely undesirable consequences for the traffic in Manly Vale.
- (c) Contrary to the wishes of the Northern Beaches residents, the Beaches Link tunnel contains absolutely no public transport components and no capacity for any future public transport components.
- (d) Based on the very small overall reductions in traffic volumes on the Northern Beaches as noted in this review and the 14 Billion cost of the Western Harbour/Beaches Link tunnel, it is extremely difficult to believe that an independent and comprehensive review of the Beaches Link tunnel could possibly conclude that this tunnel is justified.
- (e) If an independent review was to indicate the need for an under harbour tunnel to better link the Northern Beaches to other parts of the city, there appears to be other more suitable design options available.

2.4 Given the massive adverse impact to the residents of Balgowlah and surrounding suburbs, these residents need to know that in making this sacrifice:

- (a) A project of this scale is supported by our politicians on a basis that it is 100% in the best interests of ALL Northern Beaches residents.
- (b) This project is in no way being driven by Transurbans desire for greater profits.
- (c) This project is in no way being driven by any one group of residents for an improvement in their own amenity.

2.5 Based on the evidence presented in this review, the author of this review believes that the large number of residents calling for a halt to the Beaches Link Tunnel until it is independently fully reviewed and costed, is fully justified and required.

3. TUNNEL BASICS

- 3.1 Based on the authors research, there appears to be two very basic but fundamental underlying principles that apply to the construction of new motorways or tunnels.

Induced Demand

- 3.2 If you build a new road or tunnel for private vehicles with no additional complementary public transport infrastructure, vehicle numbers will increase until the tunnel infrastructure is at capacity within a very short period of time.

Complementary Public Transport Infrastructure

- 3.3 To avoid *induced demand*, new road or tunnel infrastructure should be complemented by increased Public Transport infrastructure of a similar capacity to that of any new road or tunnel.

According to the literature, this principle appears to significantly slow down the process of reaching capacity through *induced demand*.

4. THE POLITICS OF NEW TUNNELS

Who Builds Sydney's Tunnels?

- 4.1 All new tunnels in Sydney are being built by Transurban, a publicly listed company on the Australian stock exchange.
- 4.2 The more tunnels that are built and tolls collected, the greater the dividends for the Transurban share holders.
- 4.3 The contracts for tunnel construction are complicated and although the author has no expertise in tunnel contracts it appears obvious that:
 - (a) If a Beaches Link tunnel is constructed, there will be political and financial imperatives to force as many toll paying vehicles into the tunnel as humanly possible.

This is why the NSW Government offers free registration if you are a regular user of tolled roads in a privately owned vehicle.
 - (b) The consequences of low toll collections would be a financial burden to all NSW residents.
- 4.4 For politicians, building tunnels is much easier than investing in public transport infrastructure because:

Building a tunnel

The primary task of politicians and public servants is to find companies such as Transurban who believe their involvement will make money for their shareholders and to convince residents that this is in their best interest.

Investing in Public Transport requires:

- (a) A commitment to the best interests of the constituents
- (b) Lateral thinking
- (c) Extensive research
- (d) A combination of roads plus, active transport such as bicycle/walking paths and mass transit systems consisting of anything from a train to a 10 seater bus.

5. FEDERAL MEMBER FOR WARRINGAH

5.1 The Federal member for Warringah Mr Tony Abbott MP has stated in parliament that:

- (a) He is *“120% behind the tunnel”*
- (b) *“This tunnel will cut out 17 sets of traffic lights between Manly Vale and the City alone”*
- (c) *“It will reduce travel time from Manly Vale to the City by about 10 minutes.”*
- (d) The tunnel *“will also enable Military and Spit Roads to go back to being Suburban thoroughfares. It will restore Mosman, Cremorne and Neutral Bay to their residents”*

5.2 These statements by Mr Abbott suggest a belief on his part that there are three primary justifications for a Beaches Link tunnel and the author expects that a large number of residents on the Northern Beaches would be asking some very obvious questions as follows:

Traffic Lights

Noting that:

- In fact, including pedestrian crossings with traffic lights, from the Southern side of the Spit Bridge to the Harbour Bridge on ramps, there are 19 sets of traffic lights.
- Of these 19 traffic lights, 17 are in the last 3.7km stretch from around the top of Parriwi Road to the Harbour Bridge on ramps which equates to approximately 4.6 sets of traffic lights per km.
 - (a) *Has Mr Abbott considered the possibility that with some modifications to local roads and some pedestrian overpasses/underpasses, a number of these traffic lights could be removed?*

Travel Time

Noting that:

- Currently, the cost estimates for a Western Harbour tunnel plus the Beaches Link tunnel is 14 Billion dollars.
 - (b) *Does Mr Abbot believe that this level of investment can be justified in part on the basis that a relatively small number of residents from around Manly Vale and a couple of surrounding suburbs could save 10 minutes or less on their daily*

commute.

Note:

- (i) In fact, it will be shown later in this review that a very large percentage of the traffic which currently crosses the Spit Bridge during peak hour actually comes from the surrounding suburbs from Manly through to North Balgowlah and not from the suburbs of Manly Vale and to the North and that
- (ii) These surrounding suburbs from Manly through to North Balgowlah, the suburbs that are about to be devastated by the Beaches Link tunnel, will have very limited access to the tunnel.

Suburban Thoroughfare

Noting that:

- According to the ABS (Australian Bureau of Statistics), the population of Mosman plus Cremorne plus Neutral Bay is around 50,000 or around 19% of that of the Northern Beaches.
- Cremorne (half way between Mosman and Neutral Bay) is approximately 7 km from the centre of the City meaning that the daily road commute for these residents is likely to be a fraction of that of residents on the Northern Beaches.
- The suburbs from Mosman to Neutral Bay are serviced by 6 ferry wharves.
- The suburbs from Mosman to Neutral Bay are serviced by a very regular bus service from Spit Junction onwards plus other buses from the Northern Beaches.
- Given the small distance to the city centre, the residents of these suburbs also have the relatively cost-effective option to use a taxi service.

(c) *In returning Military Road (3 lanes each way) from the Spit Bridge to Neutral Bay back to the residents of Mosman, Cremorne and Neutral Bay for a suburban thoroughfare, does Mr Abbott consider this to be a justifiable use of public infrastructure for a group of residents who are very well serviced by a number of transport options?*

(d) *If a Beaches Link tunnel is built with a tunnel portal (entrance) in the middle of the Burnt Bridge Creek Deviation, does Mr Abbott believe that Condamine Street, the road from Manly Vale to Brookvale will be returned to the residents of Balgowlah, Manly Vale and Brookvale?*

6. COMMUNITY ENGAGEMENT REPORT

- 6.1 In June 2018, a community engagement report, commissioned by the Northern Beaches Council, “*Move Northern Beaches Transport Discussion Paper*” was released.
- 6.2 This paper covered the results of resident surveys on the Northern Beaches, specifically with respect to traffic.

The following statements can be found in this report.

- (a) *“Public and community transport options were mentioned frequently by participants throughout the engagement process. Participants expressed that encouraging increased public transport use was the best way to address current traffic congestion.”*
- (b) *“Participants indicated that they are eager to consider alternative travel options, such as public and active transport, to reduce current road congestion.”*
- (c) *“Council continuing to advocate for the Beaches Link Tunnel was supported by participants if public transport lanes were included to discourage private vehicle use.”*
- 6.3 Surprisingly, the proposed Beaches Link tunnel contains absolutely no infrastructure within the tunnel that is dedicated to public transport.
- 6.4 Referring to the Community Engagement Report, by supporting the proposed Beaches Link tunnel, the Northern Beaches Council appears to have totally ignored the wishes of the residents of the Northern Beaches where there is a clear desire for public transport options.

7. NORTHERN BEACHES DEMOGRAPHIC

Population

- 7.1 The population estimates for the Northern Beaches as of June 2017 was 268,666 which is approximately 5% of the Greater Sydney population,
- 7.2 Of the Northern Beaches population, approximately 75% lives North of Freshwater.
- 7.3 The suburbs that make up the remaining 25% South of and including Freshwater are:
Manly, North Manly, Queenscliff, Fairlight, Balgowlah, Balgowlah Heights, Seaforth, North Balgowlah and Manly Vale.
- 7.4 Unless you are a resident of the Northern Beaches, when you drive into the Northern Beaches, sooner or later you are going to have to drive out, probably via the same way you came in.
- 7.5 People cannot drive into the Northern Beaches in order to get to some other part of Sydney.

This mean that there is clearly absolutely no need for any transport infrastructure to facilitate the movement of people into or around the Northern Beaches in order to get to another destination.

8. TRAFFIC PROBLEMS

8.1 There appear to be essentially two fundamental traffic problems on the Northern Beaches:

Local Roads

(a) Problems associated with moving about on local roads is largely due to the fact that, over many years, the population on the Northern Beaches has increased and vehicle numbers per residence have increased with very few improvements to the local road infrastructure.

Getting to Work

(b) For many years the Northern Beaches residents have been faced with ever increasing traffic problems during peak hours.

(c) The worst of these traffic problems appear to be:

The Spit Bridge where traffic mainly feeds in from:

- The surrounding suburbs of Manly through to North Balgowlah.
- Manly Vale with a few vehicles from the North and to the East of Manly Vale.
- The Wakehurst Parkway through Seaforth.
- Along the length of Warringah Road and Wakehurst Parkway.

Note:

In recent years, a large percentage of the problems for Warringah Road and the Wakehurst Parkway appear to have been associated with the construction of the Northern Beaches Hospital and the associated roadworks and this work is nearing completion.

9. DRIVER STATISTICS

9.1 According to the 2016 ABS (Australian Bureau of Statistics).

- (a) 54.5% of the Northern Beaches residents travel to work in a car as a driver.
- (b) 11.2% of the Northern Beaches residents travel to work in a bus.
- (c) 3.4% of the Northern Beaches residents travel to work in a car as a passenger.

9.2 Based on these ABS statistics and peak hour traffic numbers of around **2,834** vehicles per hour (Source RMS Traffic Data) crossing the Spit Bridge during morning peak hour:

- (a) Around 6% of these vehicles contain more than one occupant.
- (b) If around 70% of the drivers in the single occupant vehicles were moved onto public transport, around **1,081** vehicles per hour would be instantly removed from the Spit Bridge traffic and the resulting traffic would probably flow.

An interesting statistic is that, if the drivers of these **1,081** vehicles per hour travelled on a single decker bus, with a typical seating capacity of around 50 seats per bus, these **1,081** vehicles per hour could be replaced by around 22 single decker buses per hour.

There are a very large number of zeros in a billion and the author has not worked out how many buses 14 billion dollars would buy.

9.3 Anecdotally, most Northern Beaches residents who drive to work do not need their car once they get to work.

9.4 The likely reason that most Northern Beaches residents drive to work is that there are very limited public transport options.

10. SPIT BRIDGE MYTH

10.1 There is an ongoing mistaken belief by many residents of the Northern Beaches plus probably most Northern Beaches councillors and local politicians, that the Spit Bridge problem is primarily a result of Northern Beaches traffic that comes up the Burnt Bridge Creek Deviation from the peninsula and then onto the Spit Bridge.

They therefore also believe that *Section C* (from Wakehurst Parkway across to the Burnt Bridge Creek Deviation), as shown in Annexure 1, of the proposed Beaches Link tunnel would solve all their traffic problems.

This could not be further from the truth.

10.2 As shown in the following Section 12, RMS traffic data clearly shows that for the worst peak hour days at 7.00AM, of the **2,834** vehicles per hour that crossed the Spit Bridge:

- (a) **1,586** of these came from the surrounding suburbs from around Manly to North Balgowlah and
- (b) Only **813** came up the Burnt Bridge Creek Deviation.
- (c) Only **435** came via the Wakehurst Parkway though Seaforth.

10.3 All the above numbers make sense because, according to Council population data, the combined population of Manly Vale, North Manly and Freshwater is approximately 7% and these residents would obviously make up a large percentage of the **813** vehicles per hour residents coming up the Burnt Bridge Creek Deviation in peak hour.

By contrast, the combined population of Eastern Hill, Manly, Queenscliff, Fairlight, Balgowlah, Balgowlah Heights, Seaforth and North Balgowlah makes up approximately 20% of the Northern Beaches population.

Ironically, these **1,586** vehicles per hour that come from the surrounding suburbs from Manly to North Balgowlah would have a very limited access to the Beaches Link tunnel as shown in following Sections.

11. PROPOSED TUNNEL DESIGN

TUNNEL SECTIONS

11.1 The proposed Beaches Link tunnel is made up of three Sections plus a Link Road as follows:

Section A

The 3 lane under-harbour tunnel identified in Annexure 1.

Note:

- (a) It is extremely important to note that, contrary to the understanding of a large number of residents on the Northern Beaches, this is the only section of the Beaches Link tunnel that has three lanes each way.

Section B

The 2 lane tunnel from *Section A* to half way up the Wakehurst Parkway identified in Annexure 1.

Section C

The 2 lane tunnel from *Section A* to the Burnt Bridge Creek Deviation identified in Annexure 1.

Link Road

A single lane each way road through the Balgowlah Golf Course joining Sydney Road to The Burnt Bridge Creek Deviation as identified in Annexure 1.

Note:

- (b) The Link Road starts off as 2 lanes each way but reduces through the middle section down to one lane each way.

11.2 The proposed Beaches Link tunnel does not specify traffic lights for the Link Road but there would have to be at least one set at the bottom and probably a set at the top.

11.3 Deceptively:

- (a) The Beaches Link Project updates refer to the tunnel (Camberay to Balgowlah) as “*Main tunnels three lanes each way*” AND
- (b) The Beaches Link Project updates depict buses travelling through the tunnel in the left lane where in fact:

- The indicative layouts in the project updates clearly show that there are only **two lanes** into the tunnel at the Burnt Bridge Creek Tunnel portal AND
- There is actually no dedicated bus lane or ever could be because if one of these two lanes became a dedicated bus lane, this would leave only one lane for private vehicles which would very quickly be at capacity.

11.4 The only reference to any integrated public transport components of the proposed Beaches Link Tunnel are:

- (a) A single bus lane on the Burnt Bridge Creek Deviation that actually bypasses the tunnel sending these buses across the Spit Bridge.
- (b) A length of bike/walking track along the Wakehurst Parkway to the new Northern Beaches Hospital.
- (c) A very short length of bike/walking track through Balgowlah Golf Course.

12. RMS TRAFFIC DATA ANALYSIS

12.1 The RMS traffic data for 6 collection points across and surrounding the Northern Beaches was examined.

12.2 This data is freely available and has been taken directly from the RMS website.

Data Filtering Methodology

12.3 Noting that the Burnt Bridge Creek Deviation and the Wakehurst Parkway feed directly onto the Spit Bridge in the morning, the six traffic data collection points looked at were:

- (a) The Spit Bridge.
- (b) The Burnt Bridge Creek Deviation.
- (c) The Wakehurst Parkway 80m South of Judith Street, North Balgowlah.
- (d) Military Road
- (e) Roseville Bridge
- (f) Eastern Valley Way

12.4 The worst weekday traffic congested days of 2018 for 7.00 AM heading towards the City were identified noting that:

- (a) A number of days were excluded mainly as the result of incomplete RMS data, public holidays and school holidays.

Results

12.5 Based on the RMS data, the average vehicles per hour for these weekdays were:

- (a) Spit Bridge **2,834** vehicles per hour
- (b) Burnt Bridge Creek Deviation **813** vehicles per hour
- (c) Wakehurst Parkway **435** vehicles per hour
- (d) Local Traffic (by subtraction) **1,586** vehicles per hour
- (e) Military Road **1,594** vehicles per hour
- (f) Roseville Bridge **1,229** vehicles per hour
- (g) Eastern Valley Way **616** vehicles per hour

12.6 These numbers obviously vary on a daily basis but, for discussion purpose, these are the vehicle numbers per hour that will be referred to in the rest of this review.

Mosman Data

12.7 The **2,834** vehicles per hour that cross the Spit Bridge, surprisingly turns into **1,594** vehicles per hour along Military Road.

Note:

- (a) These number indicate that at around **1,240** vehicles per hour have disappeared into Mosman or Cremorne.
- (b) The author believes that the likely explanations for these figures are:
 - (i) A number of these **1,240** vehicles per hour contain tradesmen carrying out work in the Mosman area.
 - (ii) A number of these **1,240** vehicles per hour contain Northern Beaches residents who normally work in or around Mosman.
 - (iii) A number of these **1,240** vehicles per hour contain Northern Beaches residents who are utilising the public transport infrastructure that is available in Mosman.

13. BEACHES LINK PROJECT UPDATES

13.1 Referring to “*less traffic on North Shore Roads*” the project updates note:

- (a) Spit Bridge – 40% less
- (b) Roseville Bridge – 25% less
- (c) Eastern Valley Way – 35% less
- (d) Military Road – 15% less

13.2 The above percentages equate to:

Spit Bridge – 1,134 less vehicles per hour

Note:

- (a) Referring back to Section 9.2, this is a similar number of vehicles that could be removed with 22 single decker buses per hour.
- (b) Referring back to Section 12.5:
 - (i) The **1,134** vehicles per hour is very close to the total number of vehicles per hour (**813 + 435 = 1248**) predicted to be captured in the two tunnel portals on Burnt Bridge Creek Deviation and the Wakehurst Parkway.
 - (ii) This is consistent with the authors prediction that the vehicles from Manly through to North Balgowlah will have very limited access to the tunnel.

Roseville Bridge –307 less vehicles per hour

Eastern Valley Way – 216 less vehicles per hour

Military Road – 239 less vehicles per hour

13.3 The author notes that the predicted reductions in traffic on the Roseville Bridge, Eastern Valley Way and Military Road are incredibly small for a **14 Billion Dollar** piece of infrastructure.

14. BEACHES LINK TRAFFIC CATCHMENT

Catchment

14.1 Based on the proposed Beaches Link tunnel design, one would expect that the intended catchment area for *Section C* of the Beaches Link tunnel is Manly to North Balgowlah, Manly Vale and a few surrounding suburbs.

Note:

(a) All the other Northern Beaches traffic, Brookvale to the North, would have a more direct route to the tunnel via Allambie Road, Warringah Road, Wakehurst Parkway, Forest Way and directly up to the proposed Wakehurst Parkway tunnel entrance.

14.2 Unfortunately, the **1,586** vehicle per hour from Manly through to North Balgowlah, which currently cross the Spit Bridge, would have very limited access to the tunnel.

This is because effectively their main access to the tunnel would be a single lane **Link Road** going through the Balgowlah Golf course from Sydney Road and down to the Burnt Bridge Creek Deviation.

Note:

(a) The local traffic from Balgowlah through to Manly is already congested so rat-running through these suburbs to access the Burnt Bridge Creek Deviation is an unrealistic option.

Link Road

14.3 Any vehicles that do go down this single lane Link Road:

(a) Would have to compete with the Burnt Bridge Creek Deviation traffic to get into the 2 lane tunnel on the Burnt Bridge Creek Deviation and,

(b) With traffic lights, if more than a handful of vehicles go down the Link Road in no time this traffic would be backed up onto Sydney Road.

14.4 Not surprisingly, a number of residents including the author, have been told by RMS representatives that;

"The RMS does not expect much traffic to go down this Link Road".

14.5 Clearly, because these current **1,586** vehicles per hour from the surrounding suburbs would have very limited access to *Section C* of the tunnel, they would continue across the Spit Bridge as they do now.

15. SPIT BRIDGE TRAFFIC

15.1 It appears that a majority of the vehicles that would have access to *Section C* of the tunnel are the current **813** vehicles per hour coming from around Manly Vale and up the Burnt Bridge Creek Deviation.

Note:

- (a) Any traffic from Brookvale to the north, would have a more direct route to the Beaches Link tunnel via the various arterial roads that lead to the Wakehurst Parkway tunnel entrance.

15.2 In the event that a Beaches Link Tunnel was completed in seven years time, most of the current **1,586** vehicles per hour from the surrounding suburbs from Manly to North Balgowlah would effectively have no choice but to continue crossing the Spit Bridge.

15.3 This **1,586** vehicles per hour is **1,248** less than the current **2,834** vehicles per hour that currently cross the Spit Bridge representing an approximate reduction of 44%.

Note:

- (a) This 44% is very close to the 40% reduction noted in the Project Updates.

15.4 This current **1,586** vehicles per hour would be added to by vehicles that bypass the two tunnel entrances using the single lane slip roads.

15.5 The likely reasons for bypassing the two tunnel entrances are:

Toll Avoidance

- (a) The tolls on the Beaches Link Tunnel are predicted to be around \$8-10 each way which adds up to around \$3,840- \$4,800 per year and there would be many drivers who take the decision to avoid a Beaches Link Tunnel and to continue across the Spit Bridge because of this cost.

Unsuitable Destination

- (b) Of the **813** vehicles per hour (Burnt Bridge Creek Deviation) and the **435** vehicles per hour (Wakehurst Parkway), many of these will have a destination somewhere between Mosman and St Leonards and referring to Section 12.7, currently around **1,240** vehicles per hour of the Spit Bridge Traffic disappears into the Mosman area. This unknown number of vehicles, which includes tradesmen, would obviously not be using a Beaches Link Tunnel.

- 15.6 If as little as 30% of the potential tunnel traffic bypasses these two tunnel entrances via the single lane slip roads for any of a number of reasons, based on the current RMS data, around **374** vehicles per hour would be added to the **1,586** vehicles per hour bringing the total for the Spit Bridge Traffic up to around **1,960** vehicles per hour.
- 15.7 If a relatively modest overall increase in vehicle numbers of 30% is assumed over the seven years of tunnel construction due to increased population density and ever-increasing vehicle numbers per household on the Northern Beaches, another **588** vehicles per hour would be added to the **1,960** vehicles per hour bringing the traffic trying to get across the Spit Bridge up to around **2,548** vehicles per hour.
- 15.8 The **2,548** vehicles per hour is only **286** vehicles per hour less than the current **2,834** vehicles per hour that cross the Spit Bridge.
- 15.9 If a Beaches Link Tunnel opened in seven years time, within a very short period of time, the Spit Bridge traffic would probably be back up to **2,834** vehicles per hour as it is now.

16. WEEKEND TRAFFIC

16.1 Current RMS Design Guidelines indicate that a well-designed 2 lane “Smart Motorway” (free flowing with properly designed off ramps and merging points etc.) will have the capacity to deliver up to **4,200** vehicles per hour to a destination.

This means that, in the unlikely event that the overall tunnel traffic in the under-harbour *Section A* of the tunnel is freely flowing and with a likely preferred destination of Manly to Dee Why, *Section C* of the tunnel would have the capacity to deliver up to **4,200** vehicles per hour directly into the centre of Manly Vale (refer to Annexure 1).

16.2 In reality, these **4,200** vehicles per hour would probably come to a grinding halt when they land in Manly Vale because, particularly on weekends, Manly Vale already cannot cope with the local traffic.

16.3 The return journey for these large number of vehicles on weekends would probably find them trying to enter the Beaches Link tunnel at the Burnt Bridge Creek Deviation or the Wakehurst Parkway with the very obvious traffic problems for the surrounding suburbs.

Slip Roads

16.4 The proposed Beaches Link tunnel shows a single slip lane for private vehicles plus a bus lane heading North and South down the Burnt Bridge Creek Deviation past the tunnel entrance meaning the Burnt Bridge Creek Deviation would be effectively reduced from three to two or one lane depending on whether or not one lane is a dedicated bus lane.

This means that:

- (a) On weekends, any traffic from Cremorne, Mosman, Seaforth, and Balgowlah Heights that are heading for any beach from Curl Curl and up the Peninsula will be forced into these two lanes (assuming access to the bus lane), instead of the current three lanes each way on the Burnt Bridge Creek Deviation.
- (b) It also means that traffic from any suburb North of Manly Vale (including Manly Vale) that is heading to Mosman, Neutral Bay etc. would also be forced into these two lanes, instead of the current three lanes on weekends.

The resulting likely congestion is obvious.

17. CONCLUSIONS

17.1 For a 14 Billion dollar project, the number of vehicles predicted to be taken off the arterial roads of the Northern Beaches by the Beaches Link tunnel appear to be unbelievably small

17.2 Contrary to best practice principles and also the wishes of the Northern Beaches residents, the Beaches Link tunnel has absolutely no complementary dedicated public transport components and no capacity for any future dedicated public transport components.

Tunnel Design

17.3 *Section C* (2 lanes each way from Wakehurst Parkway to the Burnt Bridge Creek Deviation) appears to be extremely problematic as follows:

- (a) It appears that this section will not solve the Spit Bridge problem.
- (b) It appears likely that, on weekends, *Section C* would flood Manly Vale with traffic that it cannot possibly handle.

17.4 Extending *Section A* (the three-lane under-harbor tunnel) further along and under the Wakehurst Parkway (refer to Annexure 1) to meet up with the new French's Forest intersection and eliminating *Section C* (Wakehurst Parkway to the Burnt Bridge Creek Deviation) appears to makes much more sense.

This option appears to have many advantages as follows:

- (a) The new well-designed Frenchs Forest intersection is a logical point to feed a three lane under Harbour tunnel into for gradual distribution of traffic across the Northern Beaches using the existing Warringah Road, Forest Way and Wakehurst Parkway.
- (b) There are only three lanes under the Harbour so you cannot get more than 3 lanes of traffic through this section of tunnel by feeding in four lanes of traffic.
- (c) By extending *Section A* of the tunnel up to the Frenchs Forest intersection as three lanes, any potential slowing of traffic associated with four lanes merging into three lanes would disappear.
- (d) The existing above ground Wakehurst Parkway from Seaforth to the Frenchs Forest intersection could be retained for local traffic forming part of the slip roads for the tunnel bypass lanes.

- (e) The Burnt Bridge Creek Deviation could be retained in its current three lane form for local traffic, avoiding the problem associated with single lane tunnel slip roads as discussed above.
- (f) There would be almost no additional loss of green space.
- (g) There would be no need for a second unfiltered stack adjacent to homes and schools.
- (h) There would be a reduced need for property acquisitions.
- (i) The Burnt Bridge Creek would not have to be relocated.
- (j) There would be a greatly reduced impact on all local residents during the construction phase.

Spit Bridge Problem

17.5 Given:

- (a) The extremely high number of single occupant vehicles crossing the Spit Bridge during peak hours.
- (b) *Section C* of the Beaches Link tunnel is unlikely to solve the Spit Bridge problem.

It appears that this is a problem that can only be solved through greatly improved public transport infrastructure from Manly Vale to the City, just like that provided for the residents of Mosman through to Neutral Bay

Future Proofing the Northern Beaches

17.6 If a well-researched review of the transport requirements for the Northern Beaches indicates that another road connection from the Northern Beaches to other parts of the city is required to *futureproof* the Northern Beaches, the only under harbour connection that appears to make any sense, is a 3 lane each way tunnel that goes under the Wakehurst Parkway and directly to the new Northern Beaches Hospital.

The new well-designed road intersections around the new hospital would provide the perfect point for distribution of traffic across the whole of the Northern Beaches via the many arterial roads that lead to this intersection.

17.7 In the authors opinion, there is enough evidence in this review to justify an immediate halt to the Beaches Link tunnel until an independent review of the design and the cost benefits have been carried out.