PCU55417

To:	From:
Director – Infrastructure Projects Department of Planning and Environment Application number – SSI 13_6136 Major Project Assessment GPO Box 39 Sydney NSW 2001.	David Law. A Resident in West Pennant Hills. Email Address: davlawnwt@gmail.com
Ref: S20140901a Total 2 pages	Date: 1st Sept 2014
Subject : 1. Tunnel Truck path in NorthConnex Southern Interchange 2. Air Quality Ventilation Outlet at Southern Interchange Attached tw0 submissions – Ref S20140828a and S20140805a	

Dear Directors and Project Teams,

I tried to upload two attached submissions via DP& E on-line submission in related to 1. NorthConnex Southern Interchange for the truck path and 2. Air Quality – Ventilation Outlet at NorthConnex Southern Interchange. However, the DP& E on-line submission doesn't indicate the attached two submissions whether it have been submitted success or not. As such, the two attached submissions had to send you once again via the normal post.

The traffic has a huge improvement in the hills region (West Pennant Hill, Beecroft and Pennant Hill Road) when M2 operation. Particular the Hill bus runs to city cut down to 30 min. I hope the NorthConnex project success in all decision making (not the situation as M5 East tunnel required further improve after operation).

The Hill terrain at the NorthConnex southern interchange is complicate. Within 1 KM surrounding area (see Figure1), relative to the (0m) height at southern ventilation outlet, it has 22m height at 1 Aiken road, more than 30m height at Thompsons corner and –20m height in Dehlson ave (West pennant hill Val).
Can the high concentrated pollutant be distributed out into the air within this 1KM area and maintaining good (2014) Air Quality standard? The answer is not clear yet till the real operation (but it is too late). As such, two detail models proposed in the attached request for further detail simulation the impact of real environment within 1KM surrounding area at southern interchange. Also, please, reserve the sufficient space to build the air treatment at the (southern interchange) ventilation outlets planning for the possible solution to improve the air quality if it failed to maintain the (2014) Air Quality Standard within 2KM surrounding area.

Best Regards,

Department of Planning
Received
2 SEP 2014
Scanning Room

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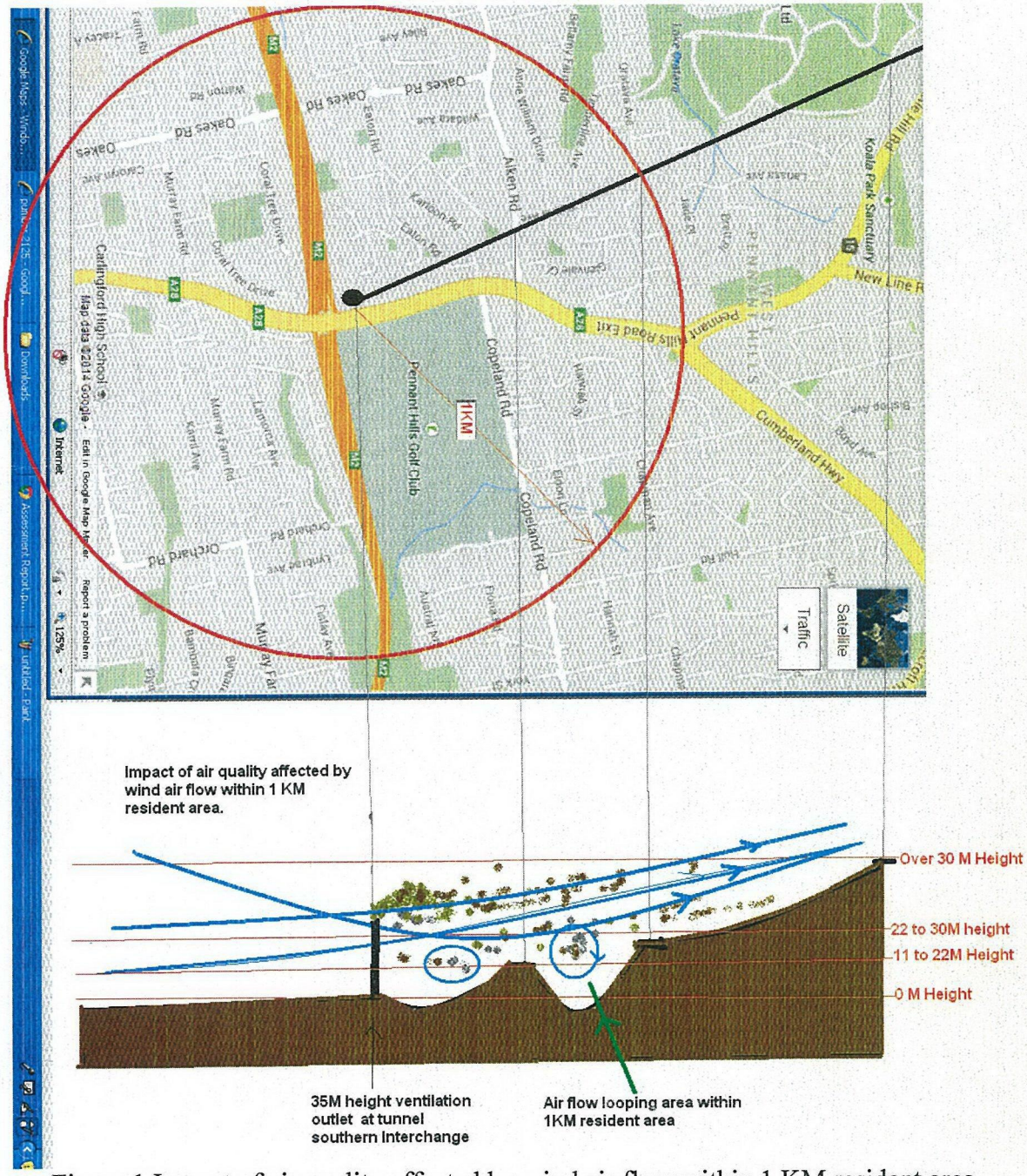

Figure.1 Impact of air quality affected by wind air flow within 1 KM resident area.

Att: Director –Infrastructure Projects
Department of Planning and Environment
Application number –SSI 13_6136
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Dear Project Directors,

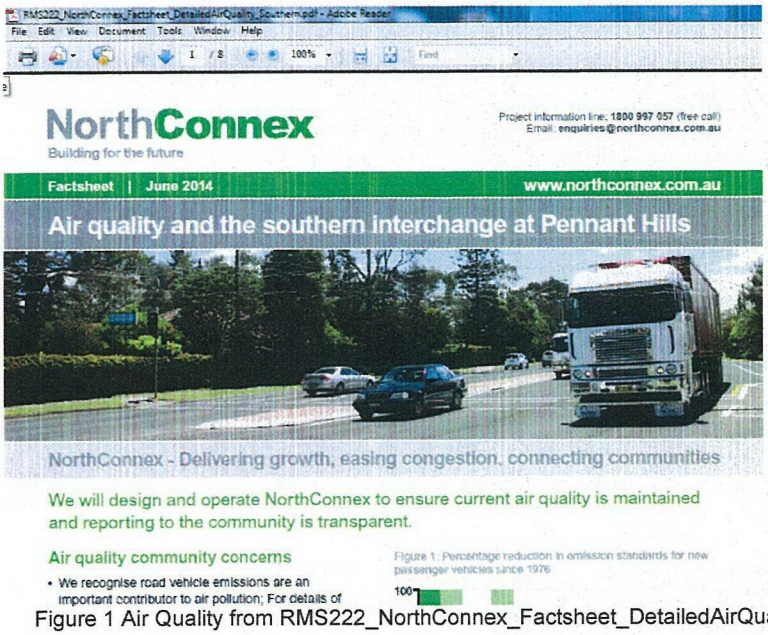


Figure 1 Air Quality from RMS222_NorthConnex_Factsheet_DetailedAirQuality_Southern.pdf

Figure 1 is the Fact sheet (June 2014) Air Quality proposed solution by NorthConnex for Southern Interchange. Dual (one upward and one downward/reversed) Air flow tunnels (9.2 KM) will be built from southern interchanges (144M Aust Height Datum) to northern interchange (180M Aus Height Datum). An estimated 4,000vehicles/hr will pass through the tunnel. High concentrated pollutant (bad air quality) generated by In-tunnel vehicles and will be drawn away by moving traffic and then extraction through a (30~35) M height ventilation outlet at both entries. Filtration technology (M5 East Tunnel filtration plant) will NOT be used.

This submission split into five parts in order to identify how the high air quality (2014) standard can be maintain/monitor/control within 2 KM surrounding resident area when the high concentrated pollutant emitted from both (35M height) ventilation outlets for NorthConnex tunnel operation in 2019:

A. Understanding of existing good Air Quality (AQ) and Healthy Standard within 2KM surrounding area from both ventilation outlets.
B. Calculation pollutant generated in the 9.2KM tunnel based on the Vehicle Emission Standards and the impact of pollutant released at two ventilation outlets.
C. Requirement to limit the pollutant concentration released from the tunnel ventilation outlets.
D. Penalty if the existing Air Quality standard (2014) failed to be maintained within 2 KM surrounding area at two tunnel ventilation outlets.
E. Two simple models propose to simulate the (real environment) affects within the 2KM area centre from both ventilation outlets

Part A. <u>Understanding the existing Air Quality (AQ) and Healthy Standard within 2KM surrounding (West Pennant Hills) area from both ventilation outlets</u>.

A1. The web links given in ref [1,2,3,4,5,6] has provided the good data indications how the good Air Qualify existing in the West Pennant Hills area and region..

A2. Australia has good Air Quality record ranking - the 2nd best in the world.

A3. Compare the AQ standard setting in the world (European countries, USA, NZ and Australia).

Part B <u>Calculation pollutant generated in the 9.2KM tunnel based on the Vehicle Emission Standards and the impact of pollutant released at two ventilation outlets.</u>

B1. The web links given in ref [7] has provides the vehicle emission standards. This can be used to calculate/estimates how much of pollutant produces in the tunnel and the amount of high concentrated pollutant released from the ventilation outlet.

B2. The basic formula to calculate the total amount pollutant released at the ventilation outlet = Vehicle Emission standards/KM * 9.2 KM * 4000 number of vehicle passing through the tunnel /hour.

B3. Without the NorthConnex project, the total amount of pollutant is evenly distributed along the pennant hill road, the good AQ maintains. With NorthConnex project, the total amount of tunnel pollutant is centralise and released at two spot of ventilation outlets. As such, the overall AQ is not improved. It just collecting (Pennant Hills road path) bad AQ to be released at two spot of ventilation outlets and make worst (Bad AQ) within 2KM surrounding resident area from two ventilation outlets.

Part C <u>Requirement to limit the pollutant concentration released from the tunnel ventilation outlets.</u>

C1. Refer to web links ref [8, 9], below summaries the requirement to set up the limit of pollutant concentration emitted from the tunnel ventilation outlets:

C2 use of air quality index (AQI) calculation - http://www.environment.nsw.gov.au/AQMS/dataindex.htm

C3. The range of Air Quality (Ozone, NO2, Visibility, CO, CO2, SO2, PM10, and PM2.5) should be set within the very good ranges (blue colour indication) in according to the Air quality data shown in http://www.environment.nsw.gov.au/AQMS/hourlydata.htm

Air quality data readings - updated hourly

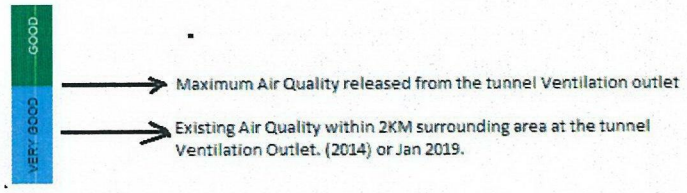
NSW map | Upper Hunter map | Newcastle map | NSW index values | NSW data readings | Sydney forecast | Alerts | Subscribe

Wednesday
27 August 2014
3 - 4 pm (AEST)
Previous | Next | Select
Show index values

VERY GOOD | GOOD | FAIR | POOR | VERY POOR | HAZARDOUS

Pollutants		Ozone O3	Ozone O3	Nitrogen dioxide NO2	Visibility NEPH	Carbon monoxide CO	Sulfur dioxide SO2	Particles PM10	Particles PM2.5
Averaging Periods		1-hour average	rolling 4-hour average	1-hour average	1-hour average	rolling 8-hour average	1-hour average	rolling 24-hour average	rolling 24-hour average
Sydney East	Randwick	3.0	3.1	-0.1	0.15		0.0	20.8	
	Rozelle	2.8	2.6	0.4	0.12	0.1		14.1	
	Lindfield	2.9	2.7	0.3	0.11		0.0	10.8	
	Chullora	2.0	2.1	1.0	0.14	0.2	0.0	12.1	5.5

C4. Within the very good (blue colour) Air Quality indication, the requirement to set up the limit of pollutant concentration released from the tunnel ventilation outlets are:



Part D. <u>Penalty if the existing Air Quality standard (2014) failed to be maintained within 2 KM surrounding area at two tunnel ventilation outlets.</u>

The penalty rate should be set in according to the level of air quality range between the maximum (very good AQ blue colour range) and the existing Air Quality (2014 or Jan 2019) within 2Km surrounding area at tunnel ventilation outlets.

The penalty will charge 30% the tunnel annual profits if AQ reach Max of very good (blue colour) range monitoring from the 2KM surrounding area. The rate of penalty is proportional to the level starting from the existing AQ (2014) standard within 2kM surrounding area. Such penalty, 50% will be used to improved the facility for the tunnel air quality released from the ventilation outlets and other 50% penalty will be used to compensate the resident within 2km surrounding area from the tunnel outlet ventilations.

The penalty will charge 50% the tunnel annual profits if AQ get into good (green colour) range monitor within 2KM surrounding area.

Part E. Two simple models propose to simulate the (real environment) affects within the 2KM area centre from both ventilation outlets.

If NorthConnex tunnel project team does not have confident to achieve the limit/requirements (see Part C), NorthConnex should re-design the tunnel ventilation outlet or alternative solutions or stop the NorthConnex project.

The result of AQ mathematic model used in the M5 tunnel East was not as predicted. It required a lot of M5 tunnel improvements. The result of AQ mathematic model simulated in Appendix G - Technical working paper - Air quality - Part 1 Vol.3 (http://northconnex.com.au/library.php) was a conception simulation (Not a real environment simulation). The windy data should be taken from 2KM surrounding area from the ventilation outlet (Not the whole Sydney). Such AQ simulation could not resolve the un-predictable risk for AQ (2014) maintain within 2KM surrounding resident and could not achieve the AQ standard specified in part C.

Two simple (models) solutions proposes for the real environment simulation how the aero-dynamics Design to improve the (real) Air flow within 2KM surrounding resident area from the (35M height) tunnel ventilation outlets:-

E1. **Real simulation model 1.** Hire a (long range arm) truck to carry a smoke generator and elevates it up to 35M height at the proposed tunnel ventilation outlet. It simulates the wasted gas emitted from a chimney at the (fire) power station. If wind air flow (all direction) push smoke upward to the sky. The solution of tunnel ventilation outlet is accepted. If Not, it need to design the tunnel aero-dynamics to enable the air flow upward to the sky without affect 2km surrounding resident area or alternative air treatment should be improved at the ventilation outlets.

E2. **3D simulation model 2**. Use a 3D printer to produce 2km surrounding resident area model. Air flow is simulated in difference direction point to the (smoke) ventilation outlet point. Improve/modify the tunnel ventilation outlet aero-dynamics design to enable the smoke air flow upward to the sky without affect 2km surrounding resident area.

Both simulations might be provided the possible better solution in the tunnel design (such as reserve space for air treatment) at the ventilation outlet.

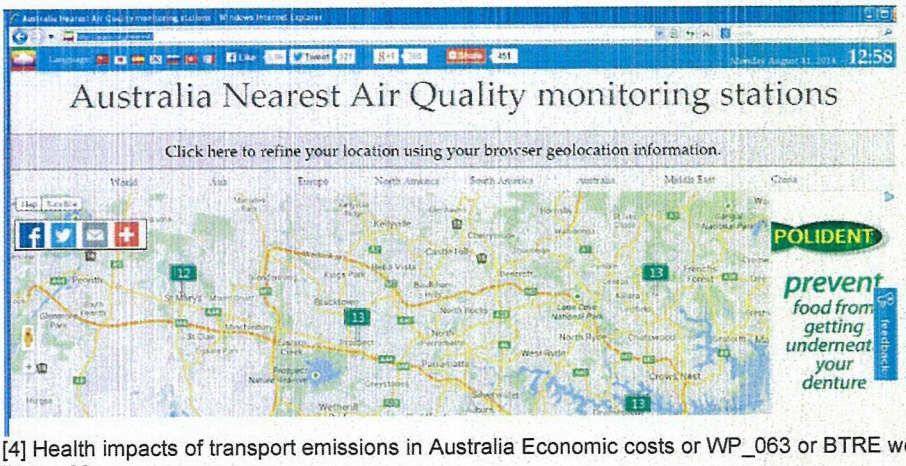
E3. Hot air produced by vehicles will move upward from south to the north side, the aero dynamics to push the tunnel air flow down from North interchange to South interchange is not a good idea.

Appendix - Web Links

A. Standard of existing Air Quality and Healthy in West Pennant Hills and Regions
[1] Existing (Air Quality) environment (Page 17 to 30 in Appendix G - Technical working paper - Air quality - Part 1 Vol.3 (http://northconnex.com.au/library.php)

[2] RMS222_NorthConnex_Factsheet_DetailedAirQuality_Southern.pdf (8 pages) via Google search

[3] Australia Nearest Air Quality Monitoring Stations shows good Air Quality Data via web
http://aqicn.org/nearest/



[4] Health impacts of transport emissions in Australia Economic costs or WP_063 or BTRE working Paper 63 -- http://www.google.com/url?url=http://www.bitre.gov.au/publications/2005/files/wp_063.pdf&rct=j&frm=1&q=&esrc=s&sa=U&ei=AaD7U4j_GNbi8AWuxoCAAQ&ved=0CDkQFjAG&usg=AFQjCNHTJUchXHu3uChP-qj2I822xKvjQA

[5] U.S.A. NAAQS standard -- http://www.epa.gov/ttn/naaqs/

[6] USA CDC Centre Disease Control and Prevention. http://ephtracking.cdc.gov/showHome.action

[7]Vehicle Emission Standards - http://www.infrastructure.gov.au/roads/environment/emission/

[8]Air quality index (AQI) calculation - http://www.environment.nsw.gov.au/AQMS/dataindex.htm

[9]Range of AQ -http://www.environment.nsw.gov.au/AQMS/hourlydata.htm

Comment and Solution to the Southern Interchange
Ref: S20140805a

Date: 5th August 2014
Total pages: 3

Att: **Director –Infrastructure Projects**
Department of Planning and Environment
Application number –**SSI 13_6136**
Major Projects Assessment
GPO Box 39 Sydney NSW 2001.

Dear Project Directors,

Figure 1 is the Fact sheet (July 2014) proposed solution by NorthConnex for Southern Interchange. An estimated (1480/day) heavy tunnel trucks will drive through the proposed **Suburban Streets (from Aiken Road, Oakes Road, Karloon, Eaton Road and back to Eaton Southern Tunnel Site)** during the tunnel construction for next 3.5 years (mid 2015 to end 2018).

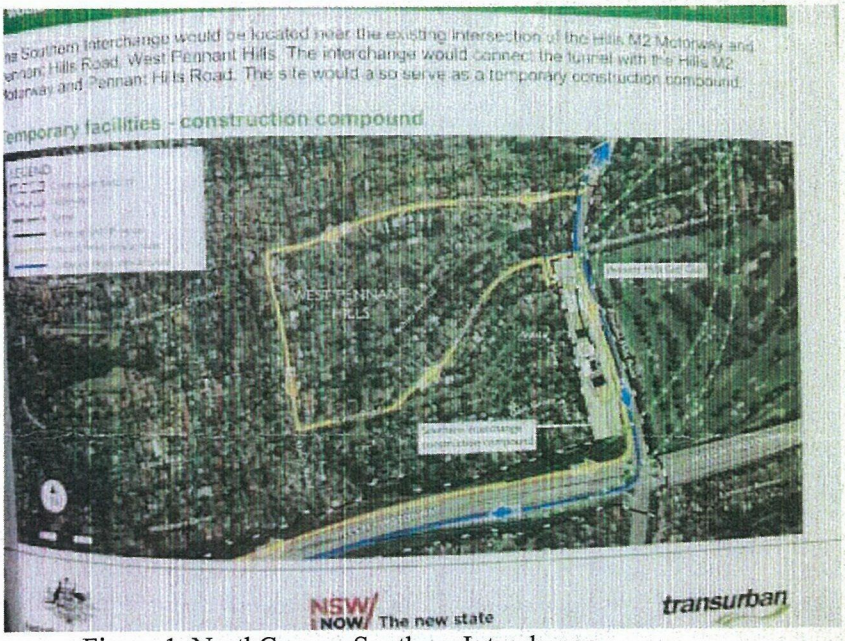


Figure 1. NorthConnex Southern Interchange

A. Comments to (Figure 1) NorthConnex Proposal below:

A1. The Impacts/Risks to the hill's resident area are:

1. **Impact of further overloading the road Traffic** – existing traffic is being overloading in the said suburban streets during the peak/busy hours. How could the said suburban streets further overloading the additional (1480/day) heavy tunnel trucks and (330/day) small cars.
2. **Impact of (high dB) truck Noise/Min** – High dB noise (each min) produced by each tunnel heavy truck pass through said suburban streets. And high impulses of truck's break stop noise.
3. **Impact of Air pollution created by the truck/min to the resident.**
4. **Impact of Soil dust** affects all resident for each heavy tunnel truck passing the said suburban streets.
5. NorthConnex requires paying construction cost to enlarge the turning space for the tunnel trucks driving a (90 deg) angle turning from Oakes road into Eaton road.

6. **Maintenance cost**. Road (suburban streets) damaged required high Maintenance cost (to be paid by NorthConnex)
7. **Impact of vehicles type change**, Council classified the type of heavy truck (more than 3 tones) is restricted to pass through the said suburban streets. The purpose is reduced noise to the resident.
8. **Waste of truck oil consumption**. Each day (1480) heavy Trucks drive on the proposed suburban streets. How much cost will be waste in the truck Oil consumption if it can be avoid.
9. **Waste of truck operation cost**. Each day, (1480) heavy trucks run through the suburban streets. How much cost/time will be spend on the Truck driver to delivery soil on the road. The operation cost can be reduced if it can be avoid.

10 more will be coming…etc.

A2. From the NorthConnex view, good work and project benefits are:

1. **NorthConnex save project time without proper planning.** It doesn't fix all the side effects/impacts to the hills residents such as environment and further overloading to existing overloaded road traffic in the **proposed suburban streets,**.
2. **NorthConnex save project cost** – It uses the existing road facility without spending additional cost to update the road facility.
3. **NorthConnex save cost to fixing the (suburban streets) damages during next 3.5 years tunnel construction.** There is a potential damage in the suburban streets by the (1480/day) tunnel heavy trucks. The cost of fixing all damaged suburban streets will be paid by RTA or Government.

B. Existing traffic condition inspects at Eaton Road Junction – Figure 2 is the road inspection at 5:00pm (busy hour in week day)

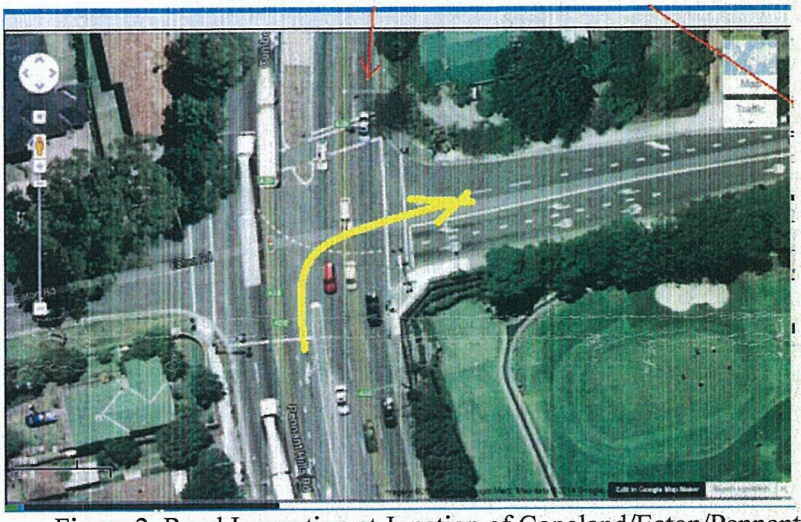


Figure 2. Road Inspection at Junction of Copeland/Eaton/Pennant Hill Roads

B1.Vehicles North Bound (Parramatta -> Hornsby) – 1min 10sec
B2.Vehicles South Bound (Hornsby->Parramatta) – 1 min
B3. Vehicles allow left turn from pennant hill road in to Copeland road (15sec).
B4. Vehicles from Eaton road to Copeland road or left/right turn to pennant hill road (10 ~15sec).
B5. Vehicles from Eaton road to Copeland road to Eaton road or left turn to pennant hill road. (10 ~15sec).

C. Proposing solution to fix the Impacts/Risks for all parties.

Target to achieve - All tunnel trucks allow to access (In/Out) Eaton road tunnel site with less impact to the hill resident.

C. Solution –

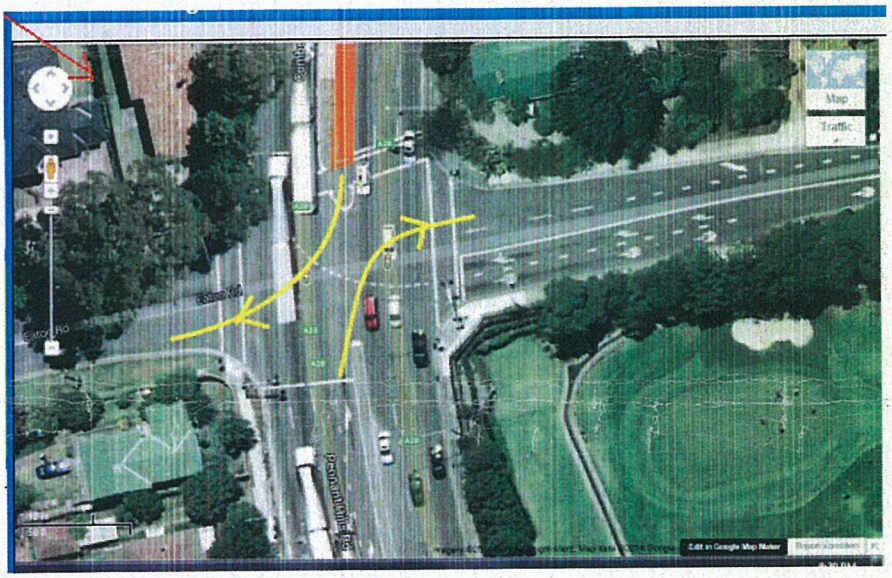
C1. **Build an additional (Tunnel) Truck Link**. Closed to the junction of Eaton road and Pennant hill road, there is a large (Safety Island) area along the middle of pennant hills road (between Aiken and Eaton road. It has enough space to building an additional heavy truck link that delicates only used by the heavy (tunnel) truck to turn left from pennant hill road to Eaton road.

C2. **Time schedule for the truck turning to Eaton Site**. Refer to the traffic timing schedule (B3), when the vehicles take (15 sec) to left turn from pennant hill road into Copeland road. It should allow the heavy tunnel truck to turn left turn from pennant hill road into Eaton road at the same time.

C3. **Cost to build the Link**. See A1 (5) NorthConnex requires construction cost to improve the road for the truck turning (90 dgs) angle from Oakes road to Eaton road. Why not spend the cost to build an additional truck link specified in C1?

C4. **Benefit of this proposal.**

1. It minimized all impacts specified in A1.
2. NorthConnex minimized/save operational cost,
3. Truck performance to remove soil is highly improved and more efficiently.



My Dear Director –Infrastructure Projects, Department of Planning and Environment, Would you please consider this proposal ?