WestConnex EIS Submission

The Chairman of the WestConnex Delivery Authority, Tony Shepherd, is reported as saying that without WestConnex and its supporting works, Sydney roads will grind to a halt by the end of this decade. Both the Premier of NSW and the Prime Minister of Australia have endorsed it as part of a "congestion busting" mission. This submission concludes that the case for WestConnex is less compelling.

The EIS for Stage 1 of WestConnex takes a more informative approach in its description of the existing road network performance. It notes that congestion impacts adversely on business productivity and city liveability, and advises that the annual cost of congestion is expected to rise from $5.1 billion at present to $8.8 billion by 2020 if measures to improve the situation are not taken. This issue is also illustrated by a road assignment by time period using the Strategic Travel Model with an assumption of using only the existing transport network and "do minimum" scenarios. Separately, this same Model has also been used in the February 2012 publication by the Bureau of Transport Statistics to present travel forecasts from 2006 to 2036 based on a set of modelling assumptions used for forward planning that include M4 and M5 extensions/expansions (as does WestConnex) and other changes.

The assignment output of the Model using "do minimum" that is presented as Figure 4-5 in Appendix D to the EIS shows that the modelled decline in road speeds would be quite dramatic, with a fall of over 10 km/h in peak periods, over 5 km/h in the inter peak, and more than 1 km/h during the evening/night. The all day averages have not been shown but can be calculated from adding the total hours and total distance for each time period. To do this, the road travel distances have been extracted from the BTS 2012 Model run for the Sydney Statistical Division (which has transport network enhancements), and the travel times then derived using the speeds taken from Figure 4-5. Annex 1 to this submission more fully explains how the following projected all day road speeds, that show a 25% fall of 8.7 km/h from 2012 to 2031, have been derived.

	2012 (Existing)	2021 (Base)	2031(Future)
All day average road speed	34.6 km/h	30.6 km/h	25.9 km/h

Returning to the BTS 2012 Model run, this shows road network speeds declining much less rapidly with all the transport network enhancements that have been assumed. Calculating from the all day assignments for time and distance shows a 1.7 km/h decline from 33.6 km/h in 2011 to 31.9 km/h in 2031. Further examination of this run shows that the impact of this 5% decline in road speed is mostly offset by a modal shift to rail and by higher rail speeds such that the average travel time per person, a proxy for liveability, is increased by only 1% as derived in Annex 1.

Separately, the EIS notes that WestConnex will deliver average speed improvements of about 1 km/h across the Sydney network, a figure that is consistent with 100,000 hours being saved per day as advised in the newspaper placement to announce the EIS. This figure, along with speed information from both the "do minimum" and the BTS 2012 Model enables the claimed speed improvements from WestConnex to be put in context with those speed improvements that can be implied from the other changes that have been modelled. The table below shows the contribution from these other changes to be six times as large as that from WestConnex.

	Change in average all day network road speed from 2011 to 2031
Do minimum	-8.7 km/h
WestConnex	1.0 km/h
Other changes (implied)	6.0 km/h
BTS 2012 Model	-1.7 km/h

The above shows that WestConnex will contribute only 14% (one seventh) of the modelled network speed improvements over "do minimum" for its $11.5 billion (around $400 million per km) capital requirement plus ongoing lighting and ventilation costs, suggesting that "Australia's largest transport project" will have a much lower impact per dollar than the other transport network changes that are envisaged in the BTS 2012 Model.

A similar conclusion to the above can also be drawn from considering congestion. The Business Case identifies three items related to direct transport cost savings that total $21.1 billion in present value terms. Assuming a dividing factor of 15 (5% discount over 30 years) would convert this to an annual saving of $1.4 billion per year attributable to the completed project. Only part of this saving can be compared with the projected $3.7 billion increase in congestion cost by 2020 if nothing is done, suggesting that the WestConnex contribution would be around 20% of what is needed at that time.

Although the Model shows an 8.7 km/h decline in the average road network speed by 2031 under "do minimum" scenarios, the additional travel time would not be accepted in practice. Instead, behavioural preferences would be overridden by collective measures, with ride sharing to take advantage of unused car occupancy being an obvious example, to help restore the status quo. Such action is presumably beyond the scope of the Strategic Travel Model. Accordingly, the real world benefits of WestConnex could be considered to be much less than claimed in the Business Case, because much can be achieved by other means at low cost. This simple possibility, particularly if it can be made temporary as discussed later, makes "grind to a halt" look like hyperbole.

The BTS 2012 Model reflects a number of value assumptions, starting with road congestion being endemic and gradually increasing as time passes, but with overall travel times little changed as previously noted. This is achieved by an induced modal shift to rail and by higher rail speeds that compensate for the lower road speeds. Measures such as community supported public transport fares, bus priority and transit lanes all help achieve this outcome, although the radial nature of the rail network would limit the shift that can be achieved. Overall, the BTS 2012 Model shows the road system continuing to be operated at a moderate level of suppressed demand that is at odds with the "congestion busting" mission.

While overall travel times are little changed in the BTS 2012 Model, those that need to use the road network for long distances, such as commercial vehicles and those for which Sydney's legacy CBD centric rail network does not provide an alternative, would be most disadvantaged under the moderate and gradually increasing level of suppressed demand that has been modelled. The advocacy of WestConnex is naturally addressed to such users, however reducing the level of suppressed demand on the east west corridor can be expected to unwind the modal shift away from road use that otherwise could be achieved.

Building WestConnex will also tend to reinforce the present high traffic demand that is a consequence of the western and south western employment deficit. This deficit is reflected in the Household Travel Survey data that shows commute trips to be twice the distance of the average for all other purposes in Sydney. The economic cost of this additional travel is comparable to the cost of congestion, so real savings in either would help make Sydney more competitive and liveable.

Rather than congestion busting by road building, with its at best unconvincing track record, congestion avoidance provides an alternative way forward through the aim of reducing the need for long road trips. A grid of rail lines with effective interchange can do this in two ways, by providing an alternative for many more road commutes than is possible with the present CBD centric rail network, and by making many nodes more accessible, to facilitate opportunities for closer-to-home knowledge industry jobs that depend critically on agglomeration; with more service jobs to follow. Shanghai, one of Sydney's competitors, has built such a network in just 20 years. Congestion avoidance still leaves a core of long distance road users whose needs can be addressed by dedicated infrastructure and/or priority measures on a case by case basis.

Sydney has received much visionary advice on the need for a city of cities, with emphasis on the regional centres of Parramatta, Liverpool and Penrith, to help with liveability, prosperity and sustainability, but execution has been lacking. At various times, Parramatta-Epping and Hurstville-Strathfield rail links, and a mesh public transport network concept for Sydney's inner areas, have been proposed that would contribute towards a grid, but nothing has eventuated. Seemingly, current forecasting models show insufficient demand to justify these links while other more pressing transport problems command the attention of a finite budget. Ironically, addressing these problems tends to reinforce the present overly CBD centric structure of Sydney that is behind them, and to shut out the polycentric vision to another time.

The previously mentioned ride sharing has potential as a circuit breaker. Its introduction would help make the prospects of increasing congestion less pressing and enable the release of funds from curtailing WestConnex to be used for the infrastructure that is needed to support the more visionary city of cities structure. This would be based on a community consensus for ride sharing to be largely a temporary measure to ease congestion ahead of the structural changes needed, and itself act as an incentive for achieving more appropriate home-work relationships to lessen the need for ride sharing.

In conclusion, this submission has shown that the WestConnex project is founded on three key issues:

- Long road commutes,
- Low vehicle occupancy, and
- Expensive road construction.

None of these is a direct help for Sydney to be competitive with its Asian neighbours, although each may have its place in moderation. To depend strongly on all three as proposed for such a large project, with its consequent financing challenges, can only be described as indulgent.

Peter Mills
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Annex 1

24 hour Road Speeds

The Figure 4.5 below has been extracted from Appendix D of the WestConnex Stage 1 EIS and shows the average speed by time period. To calculate the 24 hour average speeds it is necessary to know the total distance and the total time. The total distance for each time period is shown on the Road Assignment Statistics for the Sydney Statistical Division in the published BTS 2012 Model run and attached to this Annex. Times for each period can then be calculated from these distances using speed estimates to one decimal place that have been taken from Figure 4.5.

The 24 hour average speed calculation can be simplified by expressing the distance for each time period as a portion (or weight) of the total, noting that these portions vary very little over time, dividing by the speed for that period, and then summing to give the inverse of the 24 hour average speed. The numbers used and the calculated 24 hour averages are tabled below.

Time Period	Distance weight	2011/2012	2021	2031
AM	0.18	31.2 km/h	25.5 km/h	20.1 km/h
Inter peak	0.34	36.3 km/h	33.0 km/h	29.4 km/h
PM	0.24	31.6 km/h	26.6 km/h	20.6 km/h
Evening/night	0.24	38.7 km/h	38.0 km/h	37.4 lm/h
24 hour		34.6 km/h	30.6 km/h	25.9 km/h

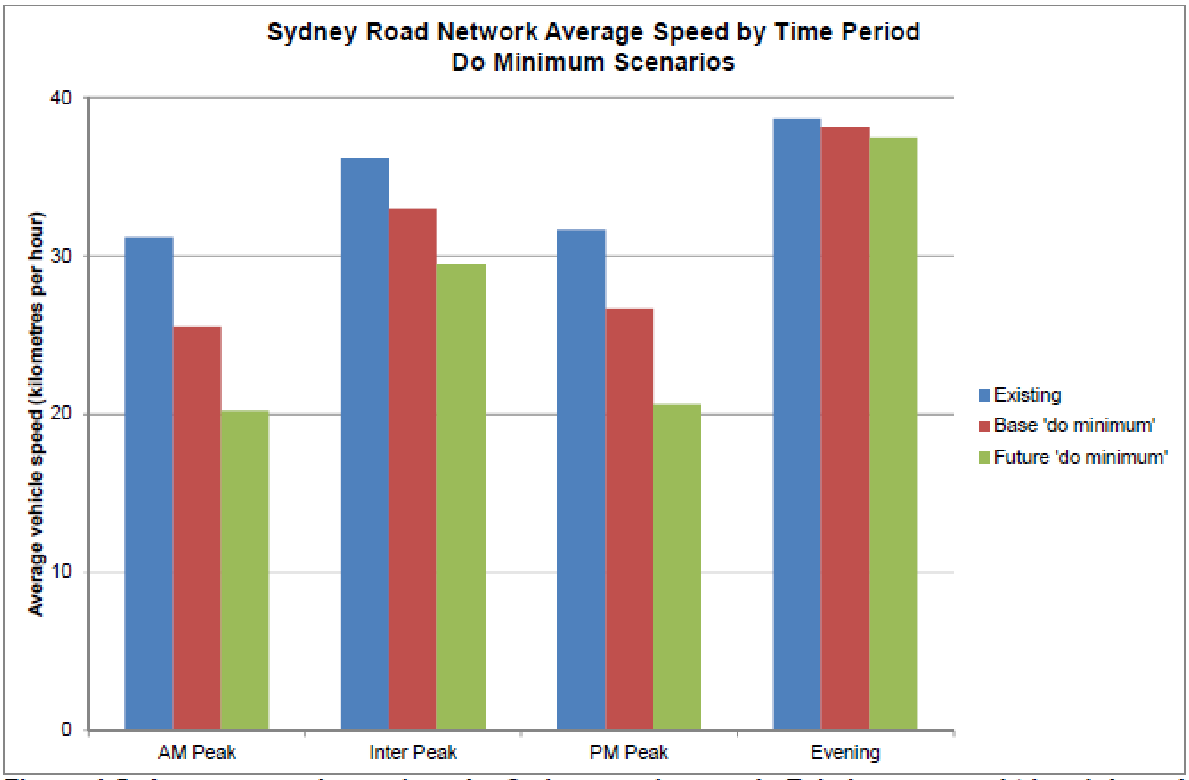

Figure 4-5: Average travel speed on the Sydney road network, Existing case and 'do minimum' scenarios

Total Travel Time

The most recent Household Travel Survey from the Bureau of Transport Statistics provides information on past trends and present day travel conditions for the Sydney Statistical Division (SSD). It reports an almost steady average of 79 minutes of daily travel time per capita over the last 10 years.

Modelled future trends are available from the BTS 2012 Model for the SSD that are attached, with statistics for 2011 and 2031 being used below. This publication presents travel forecasts from 2006 to 2036 produced by the Sydney Strategic Travel Model based on a set of modelling assumptions used for forward planning. Estimates of total travel time cannot be read directly, but need to be calculated from the distance for each main mode divided by the speed of that mode. This process understates the total time, as the slower secondary modes are not identified, e.g. feeder bus or walking to rail as the main mode, and the rail mode is also likely to be slower in off peak times. Accordingly, an additional calibration time would be required to match the two sources. The total distance and time changes from 2011 to 2031 are summarised below, noting that speeds for bicycle, walk and taxi of 15, 4 and 20 km/h respectively have been nominated by this writer.

	Distance (km/capita)			Time (min/capita)		
	2011	2031	Change	2011	2031	Change
Car Driver	18.19	17.75	-0.44	32.46	33.38	0.92
Car Passenger	5.83	5.29	-0.54	10.40	9.95	-0.45
Rail	4.29	5.09	0.80	6.14	6.66	0.52
Bus/Light Rail	1.47	1.47	0.00	4.62	4.73	0.11
Bicycle	0.07	0.07	0.00	0.28	0.28	0.00
Walk	0.63	0.60	-0.03	9.49	9.03	-0.46
Taxi	0.14	0.14	0.00	0.43	0.43	0.00
Total	30.62	30.41	-0.21	63.82	64.46	0.64
% change			-0.69%			1.00%
HTS total	30.80			79.00		

Thus the 1.7 km/h (5.1%) decrease in road network speed over the 20 year period shown in the BTS 2012 Model leads to only a 1% increase in time per capita. This is achieved by modest per capita modal changes; a shift from car passenger to rail, rail becoming faster, car drivers covering slightly less distance in a longer time, and less distance walking. The increase in rail patronage comes at a cost due to rail trips becoming longer, as shown in the BTS 2012 Model. The radial nature of the rail network appears to be behind these longer trips, due to the limited opportunities for a modal shift to rail that this imposes, and maybe help to explain why the per capita distance covered by car drivers falls only slightly.

BTS Transport Statistics

The Transport Supply and Demand Forecasts for the Sydney Statistical Division for the BTS 2012 Model have been image copied from the original d2012_02_v2 spreadsheet source document onto the next page. The following notes apply to these forecasts:

(a) Notes:
Validation of ferry estimates has not been completed at the time of publication, therefore, these data are not featured here.
Total trips do not equal the sum of the mode components as estimates for ferry and other minor modes are not included.

Transport Supply and Demand Forecasts for the Sydney Statistical Division

	2006	2011	2016	2021	2026	2031	2036	Change 2006-2036	AAGR 2006-2036
Land Use Data									
Population	4,215,000	4,476,000	4,744,000	5,020,000	5,301,000	5,583,000	5,863,000	39.1%	1.1%
Employment	2,092,000	2,207,000	2,337,000	2,523,000	2,628,000	2,735,000	2,854,000	36.4%	1.0%
Transport Supply Statistics									
Road length (km)	23,783	24,046	24,083	24,099	24,144	24,175	24,239	1.9%	0.1%
Lane length (km)	28,007	28,376	28,583	28,819	29,199	29,361	29,521	5.4%	0.2%
PT Statistics (1-hr AM Peak)									
Rail - Services	125	171	184	210	274	290	290	132.0%	2.8%
Rail - Hours	172	203	232	260	328	332	332	93.2%	2.2%
Rail - Kms	6,989	8,499	10,198	11,571	15,051	15,213	15,213	117.7%	2.6%
Rail - Speed (km/h)	40.6	41.9	43.9	44.5	45.9	45.8	45.8	12.7%	0.4%
Light Rail - Services	10	10	12	36	36	36	36	260.0%	4.4%
Light Rail - Hours	4	4	7	14	14	14	14	258.9%	4.4%
Light Rail - Kms	62	62	142	244	244	244	244	293.2%	4.7%
Light Rail - Speed (km/h)	15.9	15.9	19.6	17.4	17.4	17.4	17.4	9.6%	0.3%
Bus - Services	2,651	2,994	3,490	3,526	3,495	3,531	3,549	33.9%	1.0%
Bus - Hours	1,926	2,478	3,070	3,157	3,103	3,185	3,255	69.0%	1.8%
Bus - Kms	34,120	47,446	58,835	59,868	58,499	59,498	60,349	76.9%	1.9%
Bus - Speed (km/h)	17.7	19.1	19.2	19.0	18.9	18.7	18.5	4.6%	0.2%
Demand Statistics for a 24-hr Average Workday (TRIPS) (a)									
Number of Trips by Main Mode									
Car Driver	8,096,000	8,601,000	9,154,000	9,723,000	10,298,000	10,921,000	11,438,000	41.3%	1.2%
Car Passenger	3,353,000	3,483,000	3,628,000	3,788,000	3,969,000	4,148,000	4,349,000	29.7%	0.9%
Rail	730,000	753,000	810,000	882,000	964,000	1,029,000	1,079,000	47.8%	1.3%
Light Rail	3,000	4,000	8,000	19,000	18,000	20,000	20,000	520.7%	6.3%
Bus	665,000	737,000	782,000	803,000	826,000	858,000	899,000	35.2%	1.0%
Bicycle	100,000	104,000	107,000	111,000	116,000	121,000	128,000	27.8%	0.8%
Walk	3,089,000	3,212,000	3,339,000	3,482,000	3,627,000	3,801,000	4,012,000	29.9%	0.9%
Taxi	100,000	104,000	109,000	115,000	121,000	127,000	133,000	33.8%	1.0%
Total trips	16,175,000	17,048,000	18,007,000	19,003,000	20,036,000	21,131,000	22,160,000	37.0%	1.1%
Trip Distances (km) by Main Mode									
Car Driver	78,161,000	81,426,000	85,275,000	89,270,000	94,355,000	99,084,000	102,396,000	31.0%	0.9%
Car Passenger	25,418,000	26,091,000	26,798,000	27,496,000	28,772,000	29,546,000	30,583,000	20.3%	0.6%
Rail	17,826,000	19,185,000	20,999,000	23,114,000	26,108,000	28,394,000	30,123,000	69.0%	1.8%
Light Rail	59,000	68,000	167,000	437,000	423,000	449,000	458,000	670.2%	7.0%
Bus	5,651,000	6,504,000	7,028,000	7,217,000	7,439,000	7,754,000	8,184,000	44.8%	1.2%
Bicycle	309,000	317,000	329,000	342,000	353,000	371,000	394,000	27.6%	0.8%
Walk	2,719,000	2,830,000	2,947,000	3,071,000	3,194,000	3,350,000	3,529,000	29.8%	0.9%
Taxi	626,000	645,000	672,000	704,000	743,000	775,000	804,000	28.5%	0.8%
Total trips	131,431,000	137,716,000	144,772,000	152,002,000	161,811,000	170,118,000	176,921,000	34.6%	1.0%
Mean Trip Distances (km) by Main Mode									
Car Driver	9.7	9.5	9.3	9.2	9.2	9.1	9.0	-7.3%	-0.3%
Car Passenger	7.6	7.5	7.4	7.3	7.2	7.1	7.0	-7.2%	-0.2%
Rail	24.4	25.5	25.9	26.2	27.1	27.6	27.9	14.4%	0.4%
Light Rail	18.2	17.6	20.0	23.4	23.0	22.9	22.6	24.1%	0.7%
Bus	8.5	8.8	9.0	9.0	9.0	9.0	9.1	7.1%	0.2%
Bicycle	3.1	3.1	3.1	3.1	3.1	3.1	3.1	-0.2%	0.0%
Walk	0.9	0.9	0.9	0.9	0.9	0.9	0.9	-0.1%	0.0%
Taxi	6.3	6.2	6.1	6.1	6.2	6.1	6.0	-4.0%	-0.1%
Total	8.1	8.1	8.0	8.0	8.1	8.1	8.0	-1.7%	-0.1%
Demand Statistics by Time Period by Main Mode (TRIPS)									
Car Driver									
AM Peak (2hr)	1,364,000	1,439,000	1,525,000	1,615,000	1,706,000	1,809,000	1,892,000	38.7%	1.1%
Inter peak (6hr)	2,636,000	2,815,000	3,006,000	3,199,000	3,395,000	3,599,000	3,773,000	43.1%	1.2%
PM Peak (3hr)	2,124,000	2,254,000	2,398,000	2,545,000	2,695,000	2,858,000	2,993,000	40.9%	1.1%
Evening / night (13hr)	1,971,000	2,092,000	2,226,000	2,363,000	2,503,000	2,655,000	2,780,000	41.0%	1.2%
Total Trips	8,096,000	8,601,000	9,154,000	9,723,000	10,298,000	10,921,000	11,438,000	41.3%	1.2%
Rail									
AM Peak (2hr)	211,000	214,000	230,000	251,000	274,000	293,000	307,000	45.5%	1.3%
Inter peak (6hr)	142,000	151,000	163,000	178,000	194,000	205,000	215,000	51.2%	1.4%
PM Peak (3hr)	200,000	206,000	222,000	241,000	263,000	281,000	295,000	47.6%	1.3%
Evening / night (13hr)	177,000	181,000	196,000	213,000	233,000	250,000	262,000	47.9%	1.3%
Total Trips	730,000	753,000	810,000	882,000	964,000	1,029,000	1,079,000	47.8%	1.3%
Bus									
AM Peak (2hr)	205,000	221,000	232,000	237,000	243,000	252,000	264,000	28.5%	0.8%
Inter peak (6hr)	179,000	207,000	224,000	232,000	240,000	250,000	262,000	46.8%	1.3%
PM Peak (3hr)	199,000	217,000	229,000	235,000	242,000	251,000	263,000	32.4%	0.9%
Evening / night (13hr)	82,000	91,000	97,000	99,000	101,000	105,000	109,000	33.8%	1.0%
Total Trips	665,000	737,000	782,000	803,000	826,000	858,000	899,000	35.2%	1.0%
Road Assignment Statistics by Time Period									
AM Peak (2hr)									
Demand (Car+truck Trips in PCU)	1,529,000	1,624,000	1,730,000	1,847,000	1,957,000	2,080,000	2,186,000	42.9%	1.2%
Total Vehicle Travel Time (Hours)	644,000	675,000	727,000	788,000	843,000	915,000	973,000	51.1%	1.4%
Total Vehicle Travel Distance (km)	17,397,000	18,184,000	19,198,000	20,360,000	21,606,000	22,841,000	23,847,000	37.1%	1.1%
Inter peak (6hr)									
Demand (Car+truck Trips in PCU)	3,203,000	3,442,000	3,697,000	3,972,000	4,226,000	4,491,000	4,732,000	47.7%	1.3%
Total Vehicle Travel Time (Hours)	831,000	897,000	975,000	1,066,000	1,143,000	1,228,000	1,309,000	57.5%	1.5%
Total Vehicle Travel Distance (km)	30,826,000	32,949,000	35,265,000	37,912,000	40,516,000	42,965,000	45,161,000	46.5%	1.3%
PM Peak (3hr)									
Demand (Car+truck Trips in PCU)	2,273,000	2,423,000	2,588,000	2,763,000	2,933,000	3,115,000	3,271,000	43.9%	1.2%
Total Vehicle Travel Time (Hours)	748,000	793,000	854,000	922,000	986,000	1,061,000	1,121,000	49.9%	1.4%
Total Vehicle Travel Distance (km)	23,054,000	24,223,000	25,604,000	27,129,000	28,827,000	30,438,000	31,708,000	37.5%	1.1%
Evening / night (13hr)									
Demand (Car+truck Trips in PCU)	2,177,000	2,326,000	2,490,000	2,666,000	2,834,000	3,014,000	3,172,000	45.7%	1.3%
Total Vehicle Travel Time (Hours)	556,000	588,000	630,000	678,000	722,000	771,000	811,000	45.9%	1.3%
Total Vehicle Travel Distance (km)	22,612,000	23,899,000	25,374,000	27,052,000	28,831,000	30,530,000	31,934,000	41.2%	1.2%
All Day (24 Hr)									
Demand (Car+truck Trips in PCU)	9,183,000	9,815,000	10,505,000	11,247,000	11,950,000	12,699,000	13,361,000	45.5%	1.3%
Total Vehicle Travel Time (Hours)	2,779,000	2,952,000	3,186,000	3,454,000	3,694,000	3,974,000	4,215,000	51.6%	1.4%
Total Vehicle Travel Distance (km)	93,889,000	99,254,000	105,441,000	112,453,000	119,781,000	126,775,000	132,651,000	41.3%	1.2%