

Report Card on Pacific Highway Upgrade

November, 2009

NRMA Motoring & Services



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Glossary

DoTaRS	Australian Department of Transport and Regional Services, now Department of Infrastructure.
Duplicate	Widen a road by constructing a new road adjacent to it with a median separating the new and old portions.
kms	Kilometres
RTA	NSW Roads and Traffic Authority
MVKT	Million Vehicle Kilometres Travelled



Executive summary

This year marks the twentieth anniversary of the Grafton and Kempsey coach crashes on the Pacific Highway. It is a fitting time to review the progress of the upgrade of this critical highway linking Sydney and Brisbane. While the official designation of the Pacific Highway starts in Hexham, just outside Newcastle, and travels through NSW to the Tweed, then into Queensland and Brisbane, it is a critical link between two of the largest economies in Australia, a route of choice for motoring tourists and a key lifeline to town services for the communities that border NSW's northern Pacific Coast.

The primary purpose of this Report Card is to identify, using available information, the progress of the Pacific Highway upgrade in the twenty years that have elapsed since the Grafton and Kempsey coach crashes. It also attempts to track the progress of completing upgrade projects. This is particularly relevant given the Australian and NSW Governments' currently-stated objective of completing the duplication by 2016.

Additionally, it attempts to assess what safety benefits have been delivered by completed upgrade projects and the cost to the community in road trauma – namely those lives lost and injuries received that could have been avoided if improvements had been in place.

The importance of the upgrade was recognised through the formation of the Pacific Highway Taskforce comprising 18 North Coast Councils and NRMA Motoring & Services to highlight the critical safety needs in the region.

The Australian and NSW Governments ultimately agreed to a 10 year funding agreement to upgrade and duplicate the route between 1996 and 2006. This was extended by a further \$160 million in the three years to 2009 to bring the total spent and committed programs on the Pacific Highway upgrade to \$1.3 billion.

The Australian Government in 2008 offered a Memorandum of Understanding to NSW to extend the program between 2009 and 2014 with an additional commitment of \$2.45 billion in order to complete the upgrade. However, given the funds available to the NSW Government, an annual matching program is all that it has been able to commit to, but in 2008/09 it increased the rate available for the Pacific Highway by 37%. 15% of the State's road construction budget goes to the Pacific Highway.

Key report card findings

1. Overview of the Upgrade

In the 20 years since 1989, over \$3.5 billion has been spent on 93 projects covering a total distance of 821 kilometres between Hexham (near Newcastle) and the Queensland border. This length is greater than that of the Highway itself as it includes widenings, bypasses and realignments that may be duplicated in a total length.

2. Progress of the Upgrade to date

(a) Of the 93 projects:

56 projects or 59% have now been completed; and

37 projects or 41% are still to be completed (including projects currently underway).

(b) “Promised Completion” dates versus “Actual Completion” dates for projects:

In relation to the promised completion dates for the 25 projects i.e. where 8 were early and 17 (approximately 70%) were late.

(c) Of the 821 kilometres of road project lengths identified between Hexham and the Queensland border:

410 kilometres, or 50% of total project length, has been upgraded

411 kilometres, or 50%, is still to be upgraded (including projects currently underway).

3. The 2016 completion deadline identified by the Australian and NSW Governments

(a) On 20 October 2009, the Secretary of the federal Department of Infrastructure, Mike Mrdak, confirmed in a Senate Budget Estimates hearing that the government target for the Pacific Highway upgrade was still completion by 2016.

(b) Currently 50% of the route remains to be upgraded. At the present rate of expenditure, government forecasts estimate route duplication could be between 80 and 85% complete by 2014.

(c) The 2016 completion target is unlikely to be achieved without an injection of accelerated funding.

4. Impact of the upgrade on crashes and fatalities

(a) Despite the improvements provided by the upgrade, and better knowledge of accident treatments, crashes have increased due to the growth in Pacific Highway traffic volumes, especially since 2005. While there has been a general trend in fatality reduction, increased traffic volumes and protraction of works has kept crash numbers at a steady level.

(b) Human suffering, lost productivity and property damage from Pacific Highway crashes represent a significant cost to the community. Accident savings from the improvements are dramatic. Where project completion data is available for analysis, projects that were completed early were valued as saving \$4.2 million for the community. However, the cost to the community of delayed upgrades, has been calculated as \$67.3 million.

(c) For the 25 projects where target and actual completion dates were known, the cost in surplus road trauma to the community amounted to \$64 million (even when the early completion of 8 projects was taken into account).

(d) The safety benefits to motorists of completing the upgrade are massive. This also means that if the upgrade is not completed by 2016, the cost in human suffering, lost productivity and property damage will be significant.

1. History of the Pacific Highway upgrade

1.1 The government funding program

The Australian Government in 2008 offered a Memorandum of Understanding to NSW to extend the program between 2009 and 2014 with an additional commitment of \$2.45 billion in order to complete the upgrade. However, given the funds available to the NSW Government, an annual matching program is all that it has been able to commit to, but in 2008/09 it increased the rate available for the Pacific Highway by 37%. 15% of the State's road construction budget goes to the Pacific Highway. With that level of commitment, it is expected that by 2014, at the current rate, the route duplication could be between 80% and 85% complete. Given the number of kilometres remaining and the planning process to get to construction stage, it is unlikely that the duplication will be achieved by 2016. Infrastructure stimulus funding has given a bump to the current stages of the project, but on-going commitments are more difficult to predict, especially with the State election in 2011.

1.2 Conditions on the Pacific Highway

Traffic levels on the Pacific Highway are reported by RTA in its publications over time. The most recent publicly available text reports average daily traffic levels through to 2004 (RTA, website). By selecting three locations at the southern, middle and northern sections of the route, we can understand something of the history of the route.

Table 1-1 Average annual daily traffic at 3 locations since 1986

Count location	1986	1988	1992	1998	2001	2004
South – Hunter River	19227	21476	25419	31688	33275	37781
Central – Macksville	7381	8371	9309	11656	11984	14078
North - Terranora*	20568			30400	34300	42724

*Average of last two counters – all figures from axle counts

The annual growth rates varied, but growth was consistent as can be seen in Figure 1-1.

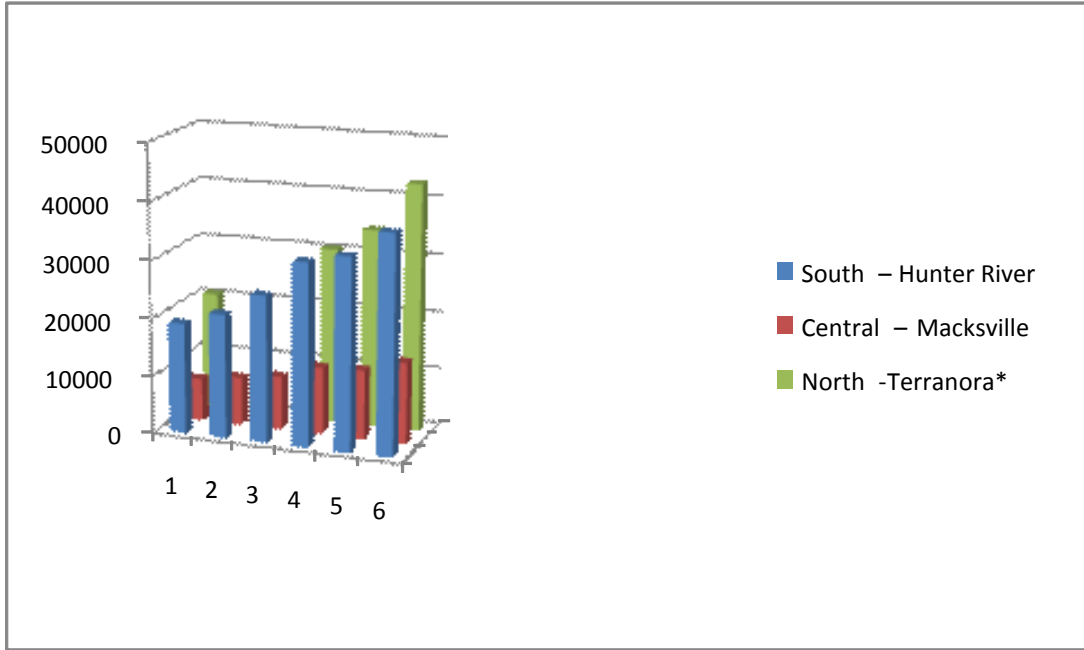


Figure 1-1 Traffic flow since 1986 at three locations on Pacific Highway

Locations in built up areas grow faster as the local traffic from the town also uses the Highway, but on average the historical growth rates from the three sites were 2% per year for the southern and central locations, but 10% for the fast growing northern area.

The improvement of the road would also attract traffic as congestion is relieved and road conditions improved. Counts conducted at Kempsey during the EIS found heavy vehicle traffic was growing even faster than general traffic as commercial drivers found the route preferable to the New England Highway for more trips.

With the growth in traffic, crash rates have not declined with the national averages. The peak in fatalities in 1989 is associated with the 56 fatalities in the coach crashes, but subsequently fatalities have been relatively stable to declining. The annual fatalities are 46.5 per year, with the coach crashes included, 40.7 deaths per year in the subsequent years.

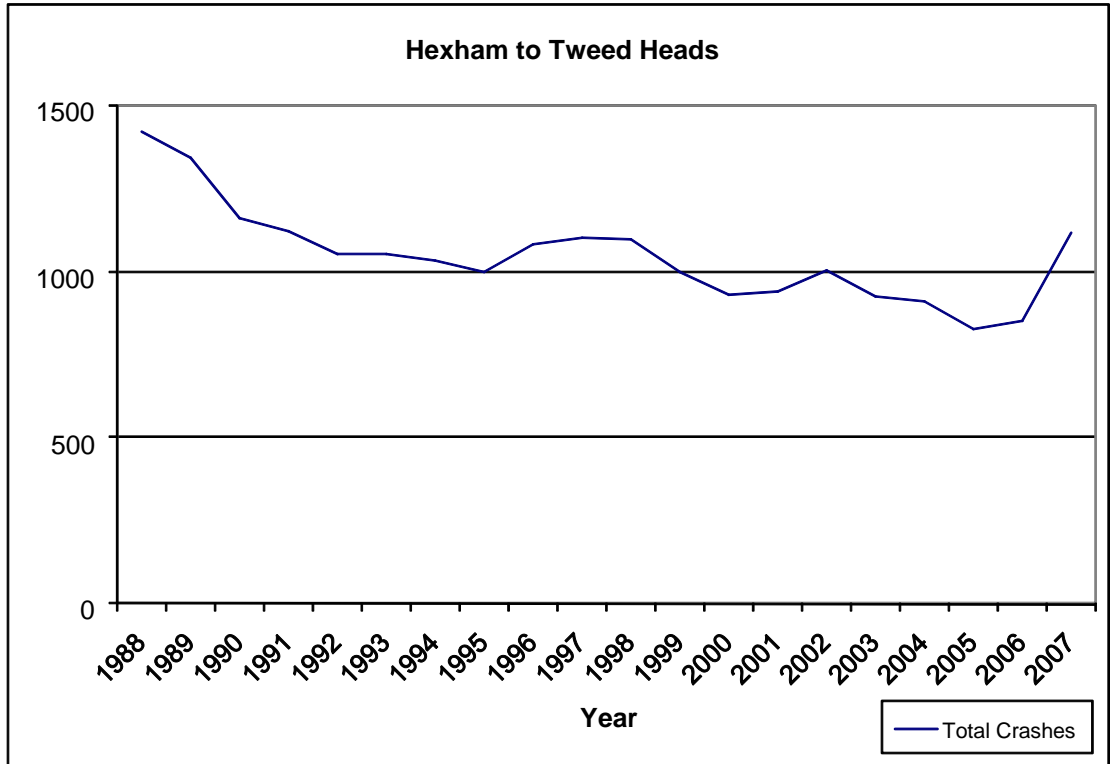


Figure 1-2 Crashes on the Pacific Highway per year

Looking more closely at the fatalities only, the general trend is positive with the expenditure, making completion of the duplication a critical factor in reducing the rate of accident severity, especially given the growth the route is experiencing.

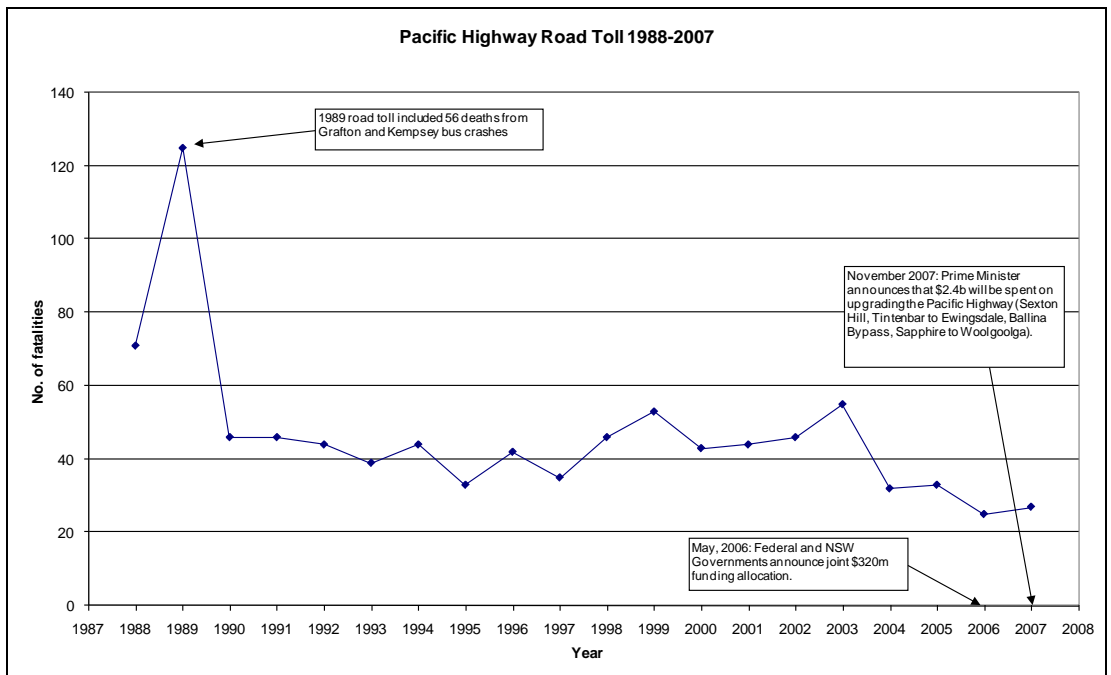


Figure 1-3 Annotated graph of fatalities on the Pacific Highway, Hexham to Tweed

1.3 The upgrade program

In the tables that follow, the upgrade program is described and analysed. On the following pages, Figures 1-4 through 1-10 are maps that locate all the projects along the Pacific Highway and show the six regions we have aggregated the individual projects into for some easier comparisons.

In total 93 projects have been identified, but following the projects through the last twenty years has been a challenge, as they have been modified, rebadged and aggregated. Some projects were superseded by latter developments. Sources for the project definitions, allocated and actual expenditure have been the official government publications, such as budget papers and annual reports. Forecast dates for planning and construction were freely given at the beginning of the process, but as the program extended, these were frequently not provided but left as “to be determined.” Some reported and actual opening dates have been taken from press releases and local newspaper reporting when no other sources were available.

Table 1-2 (see pages 11-13) summarises the program since financial year 1988/89 to the latest figures available. The first column contains a project number that correlates to the maps in Figures 1-4 through 1-10. The second column is the title of the project. The next is a brief description of the kind of upgrade involved. The fourth lists the length of each project in kilometres. The next column helps split the costs between allocations promised in budgets and actual expenditure. The next twenty columns are the financial year dollar amounts in dollars of the day. The “Committed Completion” is the date nominated for completion of the project, and the next column gives the actual year of completion. The subsequent column “Time Gap” refers to the difference between the two completion dates rounded to the nearest year, so if a project was scheduled for completion in 1990/91 and finished in 1992/93, the gap would be two years regardless of the month of opening. Negative gaps indicate that the project opened earlier than forecast. The final column has some comments on the project.

Project information was obtained from:

- the Department of Planning website
- Roads and Traffic Authority (RTA) Pacific Highway project websites
- New South Wales Budget Papers from 1988-1989 to 2009-2010
- press releases from the Pacific Highway Taskforce and federal and state government agencies about various projects.

When project lengths were not available, PB’s historic Pacific Highway GIS layer was used to measure the length of the project when clear landmarks were identified, i.e. cross streets. When available, cost allocation and expenditure were divided on an annual basis.

Latter columns in the table refer to calculations regarding the accident implications of the difference in programmed and actual completion of upgrades. This is defined and discussed more fully in the next section.

This total project length is greater than that of the Highway itself as it includes widenings, bypasses and realignments that may be duplicated in a total length calculation.

Table 1-2 Pacific Highway major upgrade program: Summary of budget papers 1988-2009.

(Figures shown are cumulative dollar amounts in '000s)

Section	Planning Section	Upgrade Details	Length (km)	1988-1989	1989-1990	1990-1991	1991-1992	1992-1993	1993-1994	1994-1995	1995-1996	1996-1997	1997-1998	1998-1999	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	Committed Completion (A)	Actual Completion (B)	Time Gap (B-A)	Difference in stereotypical fatal crash rate	Traffic volume (veh/day) (C)	Total MVKT during time gap	Surplus Road Trauma	Total Financial cost of crashes	Comments		
5-1	Grafton to Ballina	Swan Creek Deviation	unk		1,670	8,826	11,026																		X	X	0	0.1	11,292	0	0	0				
5-2	Grafton to Ballina	Bypass of Ulmura and northbound overtaking lane (11.3-14.2 km north of Grafton)	2.9	396	3,068	1,856						533	1,500	2,500	3,900	4,900										X	X	0	0.1	12,601	0	0	0	May be related to the project listed in 5b.		
5-3	Grafton to Ballina	Tyndale realignment and regrading (26.3-28.3 km north of Grafton)	2											1,932												2000	2000	0	0.7	9,737	0	0	0			
5-4	Grafton to Ballina	Realignment and northbound overtaking lane Byrons Lane to Shark Creek (Tyndale) (32.6 to 36.7 km north of Grafton)	4										1,700	5,700	10,700											X	X	0	0.7	10,125	0	0	0			
5-5	Grafton to Ballina	Ulmura Bypass	4.8				241	482	2,519	4,619		508	1,799	2,314												X	X	0	0.7	12,601	0	0	0	Alignment under review		
5-6	Grafton to Ballina	Ulmura upgrade and bypass	4.8		5	5	5,699	5,958									1,400									X	X	0	0.7	12,601	0	0	0	Alignment under review		
5-7	Grafton to Ballina	Cowper Bypass	unk				3,200	10,800																		X	X	0	0.7	9,737	0	0	0			
5-8	Grafton to Ballina	Reconstruction and widening - Grafton to Maclean	unk			284	1,353		3,100																	X	X	0	0.7	10,125	0	0	0			
5-9	Grafton to Ballina	Wells Crossing to Iluka Road	71																		2,600	4,600	6,800	8,300	10,300	X	X	0	0.7	10,817	0	0	0	Prior to 2006-07 budget papers, this project was listed as two sections: (i) Wells Crossing to Harwood and (ii) Harwood to Iluka Road. Listed as a planning project up to 2009-10.		
5-10	Grafton to Ballina	Harwood to Iluka Road	unk																							X	X	0	0.7	10,817	0	0	0	Listed as a planning project up to 2006-07.		
5-11	Grafton to Ballina	Duplication of bridge over Clarence River (northern arm) Chatsworth	1			475	2,401	6,906																		1993	1993	0	0.7	10,817	0	0	0	No data available		
5-12	Grafton to Ballina	Realignment and upgrading at Mororo						47	555	6,760																1995	1995	0	0.7	10,817	0	0	0	No data available		
5-13	Grafton to Ballina	Iluka Road to Woodburn	35																		1,800	2,500	2,800	3,300			X	X	0	0.7	10,817	0	0	0	Listed as a planning project up to 2008-09.	
5-14	Grafton to Ballina	Devils Pulpit Upgrade (Tabbimoble)	unk																					5,000		X	X	0	0.7	10,346	0	0	0	Listed as a planning project up to 2009-10.		
5-15	Grafton to Ballina	Realignment at Gap Road (southbound lane), Woodburn	4						508		708	3,708	8,708													X	X	0	0.7	11,977	0	0	0			
5-16	Grafton to Ballina	Woodburn to Ballina	36					0	140		213	3,247									2,000	2,000	2,000	4,000	2,000	X	X	0	0.7	11,977	0	0	0	Listed as a planning project up to 2009-10.		
6-1	Ballina to Border	Ballina Bypass (123 km north of Grafton to 13 km north of Ballina)	12.5									1,078	2,000	3,000	6,000	7,200	11,700	23,945	35,945	36,945	41,945	61,945	75,945	185,945	355,945	2002	2012	10	0.7	23,787	1085,281875	7,596973125	15,462,575,22	Listed as a planning/pre-construction project up to 2009-10		
6-2	Ballina to Border	Tintenbar to Ewingsdale	23																		2,300	6,800	18,900	25,600	34,500		X	X	0	0.7	13,516	0	0	0	Listed as a planning project until 2009-10.	
6-3	Ballina to Border	Bangalow Bypass (24.1-26.2 km north of Bangalow)	3			2,365	4,013	12,829	19,961	21,761																										
6-4	Ballina to Border	Duplication of Bangalow Bypass	3									4,151	1,700																							
6-5	Ballina to Border	Bangalow to St. Helena (26.2-31.0 km north of Ballina)	4.8											660	500												X	X	0	0.7	13,516	0	0	0		
6-6	Ballina to Border	Ewingsdale interchange (31.0-32.9 km north of Ballina)	1.9										1,005	4,200	20,600	26,200																				
6-7	Ballina to Border	Ewingsdale to Tyagarah (32.9-36.9 km north of Ballina)	4									7,108	9,000	11,500																						
6-8	Ballina to Border	Brunswick Heads Bypass	2.8		154	1,164	1,184					3,884	11,284																							
6-9	Ballina to Border	Tandys Lane Deviation (36.9-42.3 km north of Ballina)	5.4				21	232	344	332	332	1,411	1,332	6,932	30,932	53,332																				
6-10	Ballina to Border	Brunswick Heads to Yelgun (Billinudgel)	8.6									1,614	3,283	7,428	8,620	13,385	18,100	23,900	59,500	144,400	241,200															
6-11	Ballina to Border	Billinudgel to Chinderah	28.5							7,000																										
6-12	Ballina to Border	Yelgun to Chinderah	40.7									2,479	2,000	13,000	42,300	126,780	238,180	269,180	270,680	273,180	280,180															
6-13	Ballina to Border	Murwillumbah to Chinderah duplication	unk								250																									
6-14	Ballina to Border	Chinderah Bypass	5.2				2,145	12,085	23,898	34,498	59,498																									
6-15	Ballina to Border	Twin Bridges over Terranora Inlet	unk		1,798	2,478	8,144	22,141	28,382	53,382																										
6-16	Ballina to Border	Banora Point upgrade (including Sexton Hill)	2.5		204	2,796	3,996	5,196																												
6-17	Ballina to Border	Bangalow and Tweed Bypass	145.9			6,320	17,099	27,099	33,349																											
				17900	62662	103537.81	180258	251825	218410	241781	422693	433567	701101	986163	1010646	932852	970919	1030251	1184331	1401311	1321667	1445437	1673035	2349625	1427145	18347116.8										



Figure 1-4 Pacific Highway - Hexham to Taree

Key





-  Town defining road section
-  Other towns on Pacific Highway
-  Intersection project
-  Reference to project in Table 1-2



Figure 1-5 Taree to Kempsey

Key





-  Town defining road section
-  Other towns on Pacific Highway
-  Intersection project
-  Reference to project in Table 1-2



Figure 1-6 Kempsey to Coffs Harbour

Key





-  Town defining road section
-  Other towns on Pacific Highway
-  Intersection project
-  Reference to project in Table 1-2



Figure 1-7 Coffs Harbour to Grafton

Key





-  Town defining road section
-  Other towns on Pacific Highway
-  Intersection project
-  Reference to project in Table 1-2



Figure 1-8 Grafton to Ballina

Key









-  Town defining road section
-  Other towns on Pacific Highway
-  Intersection project
-  Reference to project in Table 1-2



Figure 1-9 Ballina to Border

Key

-  Town defining road section
-  Other towns on Pacific Highway
-  Intersection project
-  Reference to project in Table 1-2



1.4 Progress to date

Using the data from Table 1-2, a summary of progress to date is given in Table 1-3.

Table 1-3 Summary of progress by regions along the Pacific Highway

Pacific Highway Section	# of Projects	Total km of projects	% of projects complete % of kms upgraded
Hexham-Taree	24	242	71/76.9
Taree-Kempsey	10	113	40/27.2
Kempsey-Coffs Harbour	15	145	53/29.5
Coffs Harbour-Grafton	11	79	46/30.1
Grafton-Ballina	16	165	63/14.2
Ballina-Tweed	17	145	71/70.6

In the final column of Table 1-3, the percentages in black are the proportion of projects that have been completed, but the figures in red show the proportion of kilometres improved. If you look by proportion of road lengths improved, the upgrade is further behind than if only the completed number of projects are considered.

Still there are gaps in the tabled information, key ones are listed below.

- Many projects did not have a "length of project" stated.
- Total cost for each section does not equate the sum of the costs for all projects in that section as cumulative figures are being quoted.
- Project completion dates were not specified for projects pre-1996.
- It is not always possible to differentiate between construction projects and planning projects.
- Some projects were renamed or there may have been cross funding. i.e. "Billinudgel to Chinderah" crosses the "Yelgun to Chinderah" project, but we have attempted to sort this as clearly as possible.
- Some project allocations were not discrete continuous sections of the Highway, i.e. "passing lanes from Hexham to Telegraph Point".

Some projects were discontinuous in funding. PB suspects that some of these were due to development costs followed by construction at a later date. Some appear to be substantial funding in both periods, indicating a break in construction.

- The program lists a project "Construction of Karuah Improvements" but also states that this is a planning project.

- Some of the projects span over a long section (i.e. Karuah to Bulahdelah) and as such would have been constructed in stages despite being funded under a single budget item. It is not possible to differentiate completion dates for individual sections within this project.
- Two projects not included in the table. These are Pacific highway "Noise Abatement Program" and "Accelerated Projects" as the former is not a safety based program and the latter would still have shown in the identified project list.

Adding up all the expenditures as reported from the government sources, we can distribute the works as follows:

Table 1-4 Total expenditure 1989 - 2009

Region	Reported expenditure
Hexham – Taree	\$1,171,700,000
Taree – Kempsey	\$531,100,000
Kempsey – Coffs Harbour	\$452,700,000
Coffs Harbour – Grafton	\$123,500,000
Grafton – Ballina	\$88,000,000
Ballina – Queensland border	\$1,095,500,000
TOTAL SPEND TO DATE	\$3,462,500,000

2. Accident savings

The objective Pacific Highway improvement program was safety, and while each life saved from injury or premature death is a personal triumph, it is possible to try and measure the collective impact of the program and the costs of delay in the program. Our process for doing this, with the data from the preceding Table 1-2, is explained below with our findings.

2.1 Calculation of surplus road trauma

Our approach to calculating the safety benefits of the Pacific Highway work is based on the methods employed by the RTA and other road authorities in assigning a value to those lives saved by better roads. Standard fatality accident occurrences have been established through research and defined by road classification and speed conditions. Stereotypical fatal crash rates were calculated based on the difference between the type of road before the upgrade and the road type produced by the upgrade. Standard formulas were then used to calculate total vehicle kilometres (MVKT) for each project during the time gap between the committed and actual completion dates. The completeness of this analysis can be constrained by the lack of available completion data in many cases.

The surplus road trauma was calculated by multiplying the MVKT by the stereotypical fatal crash rate per km. The total financial cost was then calculated by multiplying the stereotypical fatal crash rate for the project by the length of time in the project gap and the standard cost of a crash.

For example, in the first section of the Table, Project 1-3, the Raymond Terrace Bypass was scheduled for completion in financial year, 1996/97 but was completed in 1998/99. The annual difference in crash rates is calculated as 70%. The average daily traffic volume during that period was around 38,000. The project length was 5.1 km. So the comprehensive accident cost of the two year delay was just over \$2 million.

The accident savings from the improvements are dramatic. For example, the projects that were completed early were valued as saving \$4.2 million to the community, although this does assume it is a full 12 months early (part years are not entered into the calculations due to lack of data). On the other side of the coin, the cost of delayed upgrades has been calculated as \$67.3 million, which overwhelms the savings by a factor of 16. If the program does not complete the duplication by 2016, as is still the target, with the remaining half of the kilometres of duplication to go – the cost in human suffering, lost productivity and property damage will be significant, as the few projects that can be analysed demonstrate. The costs involved to the government are massive, but so are the benefits to all motorists using the ocean route from Sydney to Brisbane.