Summary Report

Greater Hobart Travel Speed Survey 2013

April 2014

Tasmanian Government

Contents

Introduction

The Great Hobart Travel Speed Survey (Survey) is a project undertaken by the Department of Infrastructure, Energy and Resources (DIER) to monitor the performance of the major road networks servicing the Greater Hobart area. The Survey uses actual travel times and speeds to identify periods of congestion and the locations that they occur.

In this Survey, congestion is measured using average travel time and speed (see Appendix 5 for definitions of these and other terms used in this summary). Congestion is generally most pronounced in the morning (AM peak) and late afternoon (PM peak), which largely reflects work and school start and end times.

Having an understanding of how the road network performs is critical to improving reliability and accessibility for road users. It is also important to inform policy, and operational considerations, regarding the ongoing and future management of road networks, initiatives and planning, and associated funding submissions.

Building on the work undertaken in previous years, this Survey analyses the congestion levels of three major routes servicing the Greater Hobart area, and the linking major roads in Hobart. The routes reviewed were:

- Brooker Highway (Pontville to Hobart);
- Tasman Highway (Sorell to Hobart);
- Southern Outlet Highway (Margate to Hobart); and
- Macquarie Street and Davey Street (major roads linking the Southern Outlet and Tasman Highways).

Two further routes will be surveyed in 2014. These are the South Arm Highway (Lauderdale to Hobart); and the East Derwent Highway (Bridgewater to Hobart).

All of these major routes were also surveyed in 2006 and 2011.

Summary of findings

The 2013 Survey found that traffic movement is at its slowest during the AM peak across all of the monitored roads. This is most notable in the 10 km section closest to the Hobart Central Business District, as intersections and interactions with other urban commuters increase.

The general trends from the 2013 Survey are summarised below.

Brooker Highway

- Inter-peak periods experienced a general increase in travel speeds across the highway, when compared to previous Surveys.
- Peak periods were largely consistent with performance in previous years, except for a reduction in travel speeds in the 10 km section closest to the CBD.
- Of the three highways surveyed, the Brooker Highway experiences the lowest travel speeds and highest deviation from sign posted speeds. However, the 2013 Survey indicated a general overall improvement in travel speeds following the commissioning of the Brighton By-pass.

Tasman Highway

- Travel speeds recorded were largely consistent with previous Surveys, however, there has been a slight downward trend in average travel speeds over time.

Southern Outlet

- Average travel speeds have increased across the day, particularly in the PM peak. This increase in travel speeds appears to reflect the impact of the Kingston By-pass on traffic movement, which has been commissioned since the last Survey.

Macquarie Street and Davey Street

- Generally, Macquarie and Davey Streets experience more delay than the surveyed highways across all time periods. A notable change from previous Surveys is an increase in delay for Davey Street in the AM peak.

At the whole of network[1] level, there has been a general improvement in traffic movement since the first Survey in 2006. As shown in Figures 1 and 2 below, there has been a small increase in average speeds and a decrease in average delays experienced.

[1] Network averages include Macquarie Street, Davey Street and the three highways included in the 2013. They do not include the South Arm Highway or the East Derwent Highway, which will be surveyed during 2014. Network averages will be updated when these highways have been surveyed.

Figure 1 – Network[1] Average Travel Speed

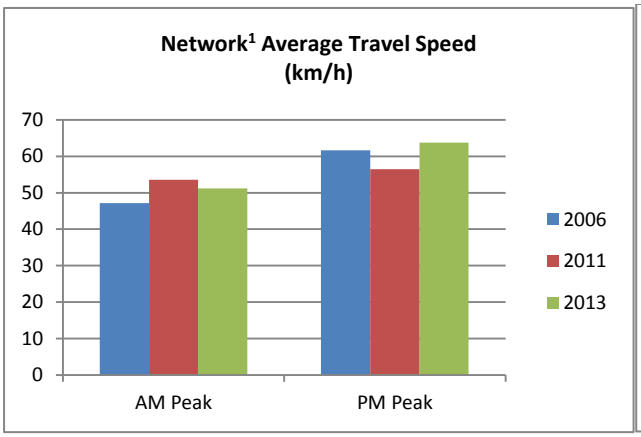
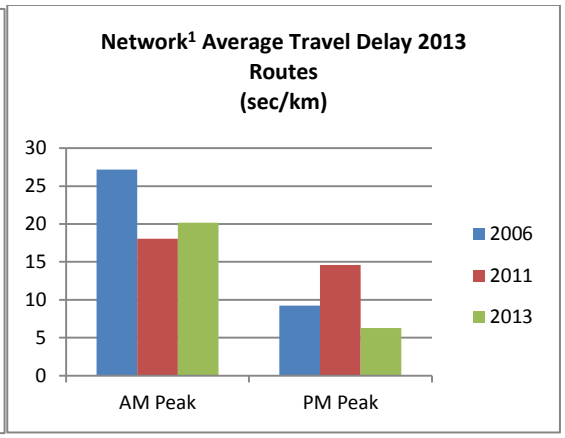


Figure 2 – Network[1] Average Travel Delay



The findings of the 2013 Survey are summarised in the Figures 3 and 4 on the following page.

These show:

- total travel time for each route;
- time taken to travel the inner 10 km sections;
- delay, as kilometres per hour below posted speed limit; and
- the difference between traffic flow during peak and inter-peak times.

More detail on each of the major travel routes monitored in the Survey is provided in the following sections.

Figure 3 – 2013 Inbound traffic during the AM peak

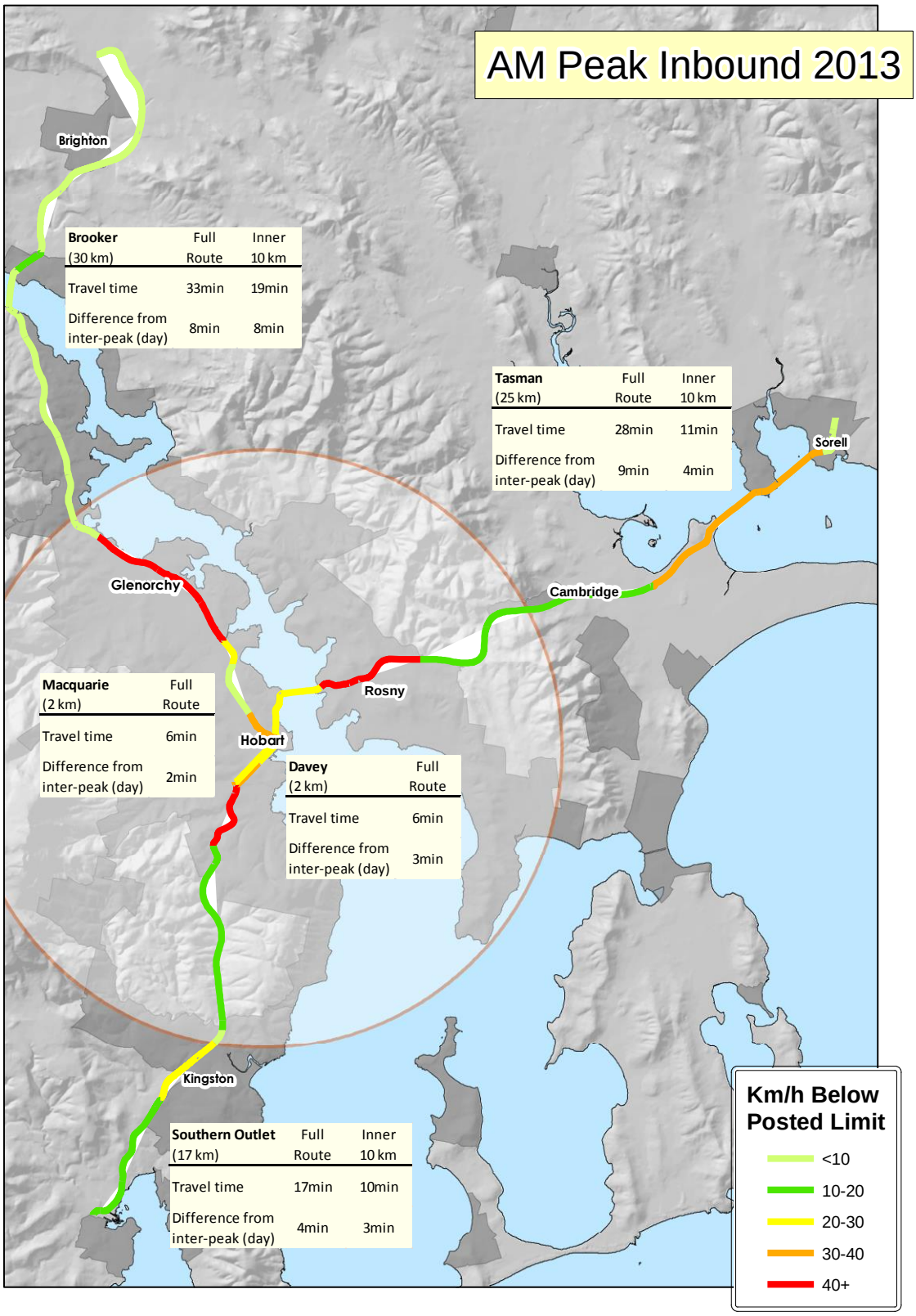
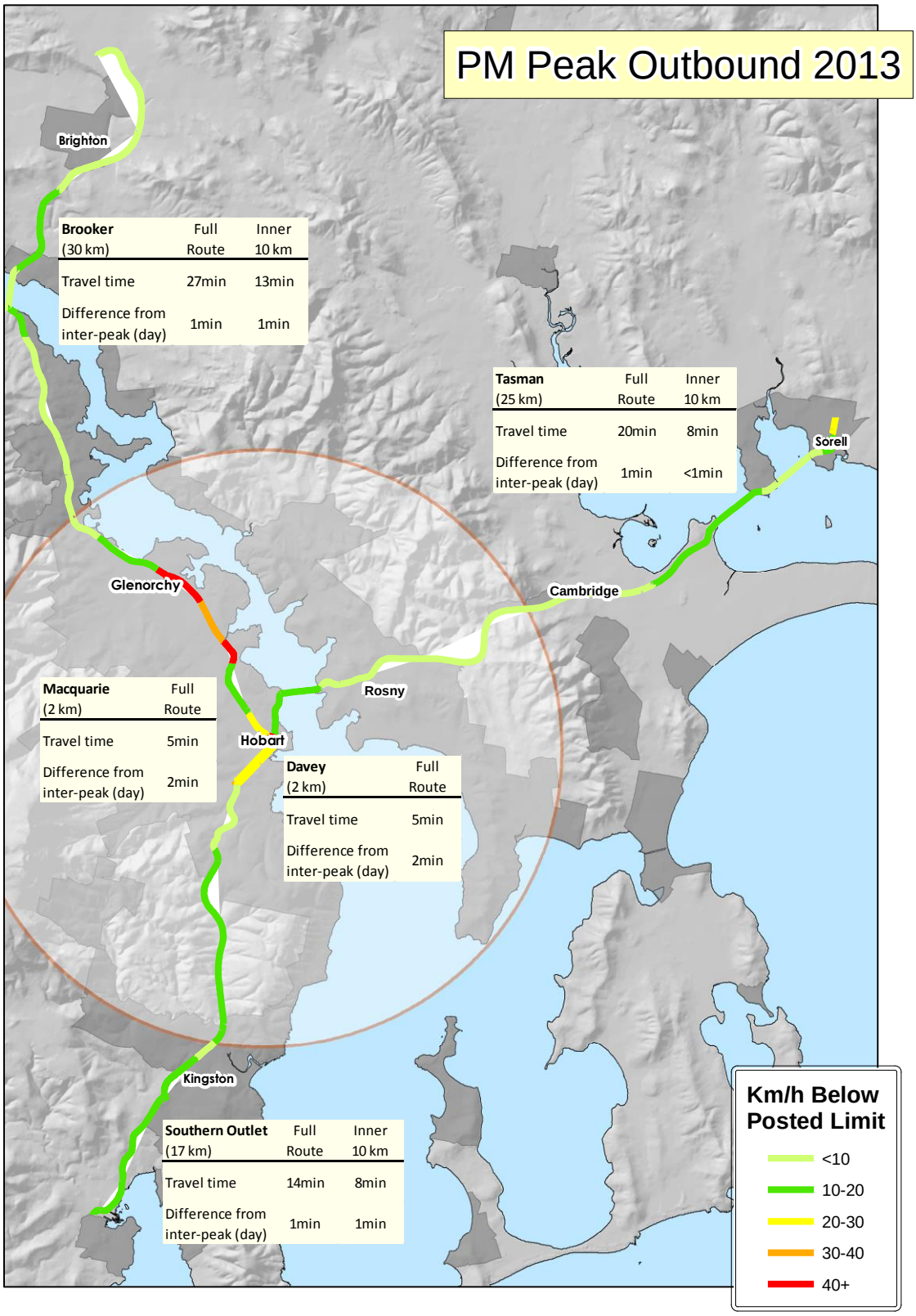


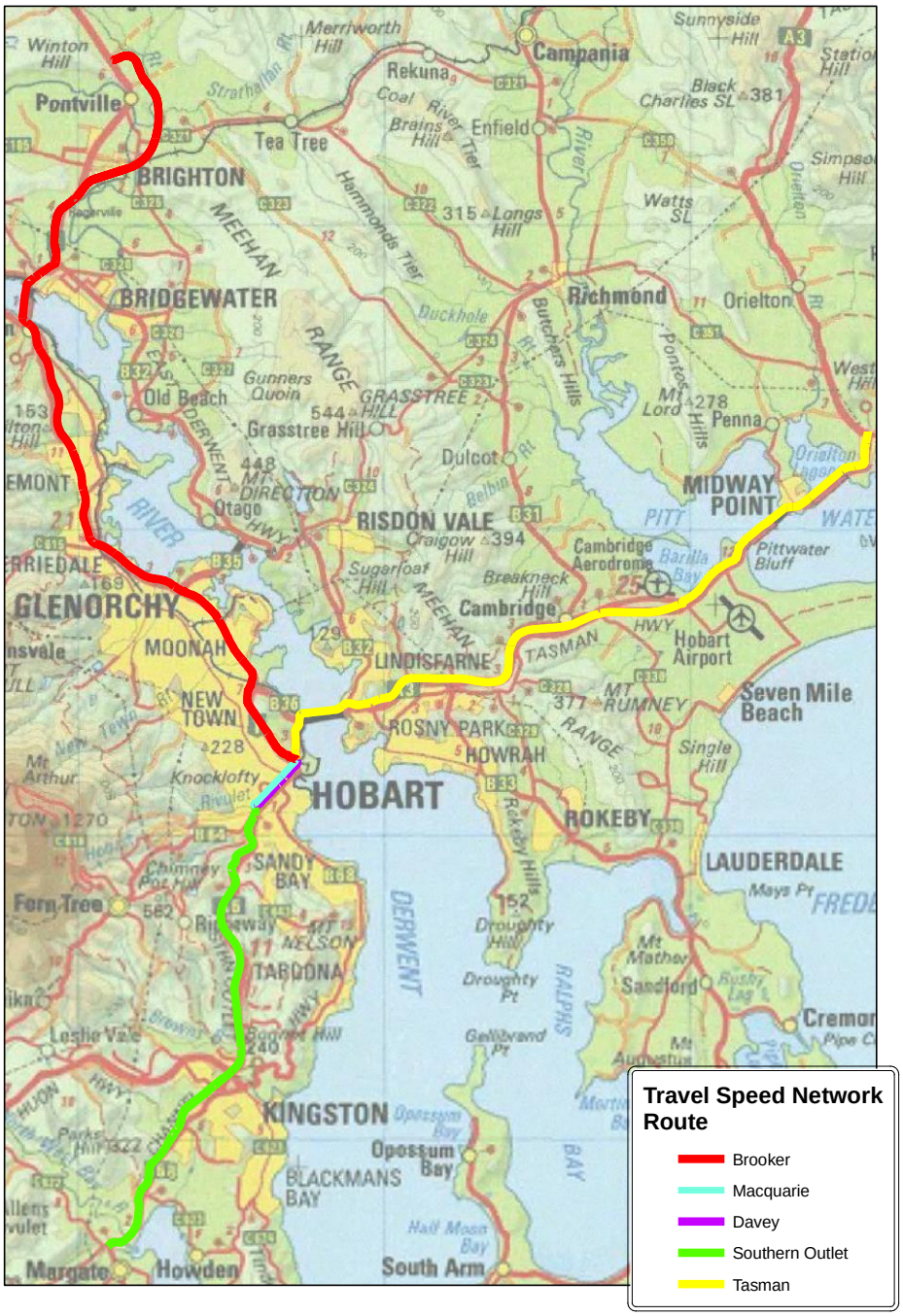
Figure 4 – 2013 Outbound traffic during the PM peak



Data collection

During 2013, three major routes feeding into the Hobart CBD, and the major roads linking these highways, were monitored. The sampled routes are shown in Figure 1.

Figure 5 - 2013 Travel Speed Survey Routes



Through the Survey, each of the monitored routes was driven at least five times in the direction of peak flow during the AM peak and PM peak periods; and in both directions in between these peaks.

The following measures have been taken to ensure the data collected and reported in this Survey is representative of the normal road conditions experienced on each of the sampled routes:

- Data collection runs were undertaken in 'normal' traffic conditions and during school terms.
- Data collected on runs impacted by major delays due to accidents, or other unplanned events, have been removed for the analysis in this summary.

Data was collected using:

- a GPS receiver to collect position data at five metre intervals along each route; and
- the "floating car" method, where the driver is required to maintain position and speed relative to surrounding traffic. This is consistent with the Austroads methodology used in other cities across Australia.

Analysis

Analysis of the travel speeds and times for each of the major roads has focused on two areas:

1. the entire length of the route; and
2. 10 km section closest to the Hobart CBD (excluding Macquarie and Davey Streets).

Review of the inner 10 km section of each route allows for targeted and comparative analysis of the most congested sections of the surveyed roads.

Travel speeds were also compared to nominal travel time and speed. This comparison provides a consistent measure to monitor changes in congestion and road conditions – see Box 1.

Box 1 Nominal travel time and speed

Nominal travel time is the time taken to travel a section of road at the posted speed limit.

N**ominal travel speed** is calculated from nominal travel time (where speed equals distance divided by time).

Nominal travel speeds and are not indicative of free flow conditions and do not consider traffic controls (such as roundabouts and traffic lights) and the driving environment along each route. However, they provide a consistent measure and are used in this study to provide an independent variable to consider changes on each road between time periods, irrespective of changes in distance or the posted speed limit.

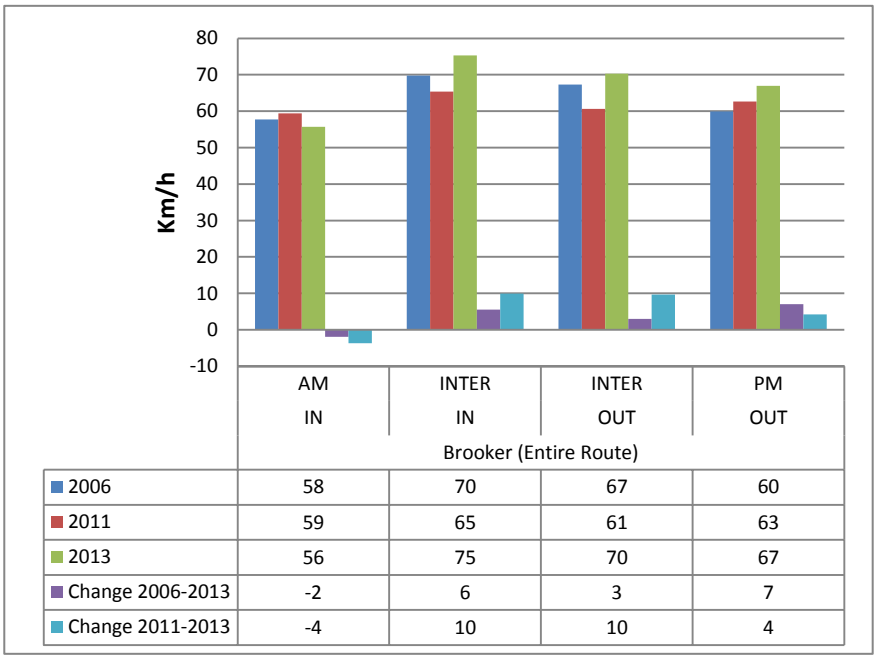
See Appendix 4 further information on indicators, values and terminology.

Brooker Highway

In 2013, the surveyed route varied from the one used in previous years. In the 2006 and 2011 Surveys, the Brooker Highway route monitored travel speed and time from Pontville to Hobart, passing through Brighton. This route changed in the 2013 Survey to travel on the Brighton bypass, which had since been built.

During 2013, average travel speeds were slowest during the AM peak, averaging 56 km/h for the entire route. Travel times were around 10 km/h faster during the PM peak and 15 to 20 km/h faster between peak periods.

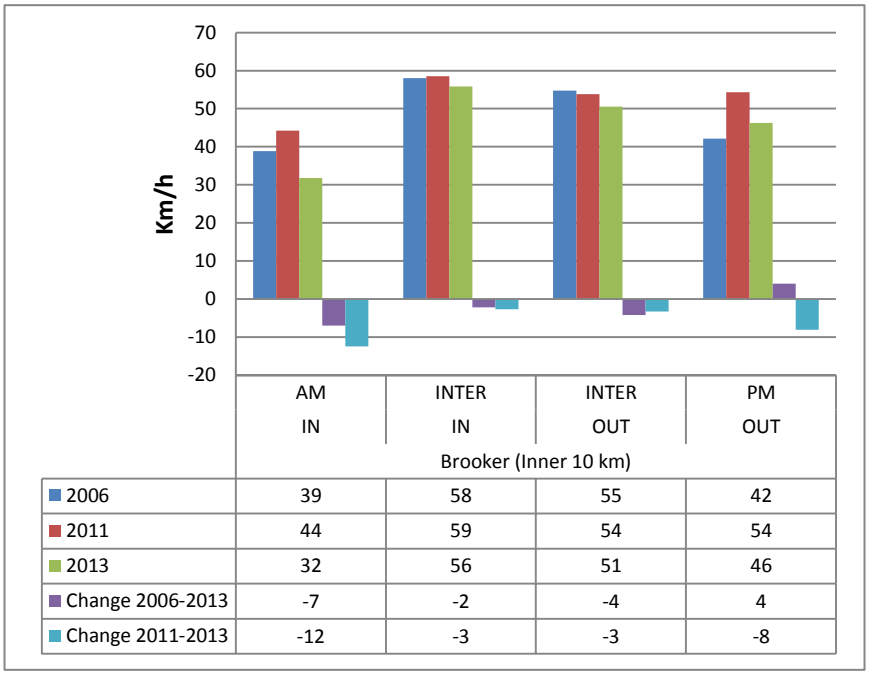
Average travel speeds on the Brooker Highway from the 2013 Survey are shown in Figure 6, with comparative results from the 2006 and 2011 Surveys.



	AM IN	INTER IN	INTER OUT	PM OUT
	Brooker (Entire Route)			
2006	58	70	67	60
2011	59	65	61	63
2013	56	75	70	67
Change 2006-2013	-2	6	3	7
Change 2011-2013	-4	10	10	4

Figure 6 – Brooker Highway average travel speed – Entire route (2006, 2011 and 2013)

Average travel speeds were notably reduced on the approach to the CBD. In the AM peak, average travel speeds for the inner 10 km section of the route were 32 km/h. This represents a drop of 24 km/h from the average speed across the entire route and is the slowest travel speed recorded in the inner 10 km section across the three Surveys completed to date. The PM peak, and inter-peak periods also experienced a reduction of travel speeds of around 20km/h from the average speed across the entire route, in the inner 10 km.



	AM IN	INTER IN	INTER OUT	PM OUT
	Brooker (Inner 10 km)			
2006	39	58	55	42
2011	44	59	54	54
2013	32	56	51	46
Change 2006-2013	-7	-2	-4	4
Change 2011-2013	-12	-3	-3	-8

Figure 7 – Brooker Highway average travel speed – Inner 10km (2006, 2011 and 2013)

Figure 7 illustrates these average travel speeds

Figure 8 illustrates the greatest deviation from nominal travel times was experienced in the AM peak. This was most notable in the 10 km section closest to the CBD where the average delay from nominal travel times was 66 sec/km. This delay was nearly halved for traffic in the PM peak.

As is to be expected, traffic was freer flowing in between these peak times.

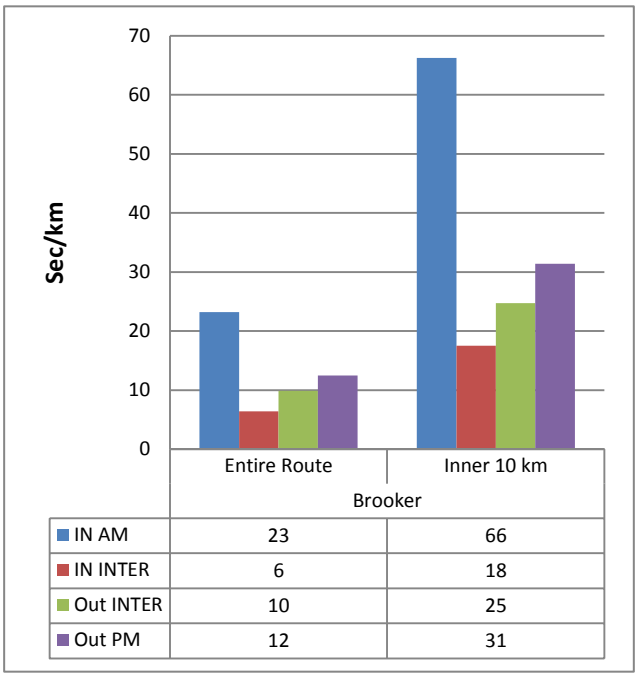


Figure 8 – Brooker Highway – delay from nominal travel times in 2013

In comparison to previous years, the 2013 Survey results indicate a general increase in travel speed and a reduction in delays to those experienced in 2006. However, Figure 9 shows there has been a decrease in travel speeds on the inner 10 km section since those recorded in 2011. This additional delay was most notable in the AM peak, resulting in a small increase in delay experienced when averaged across the entire route.

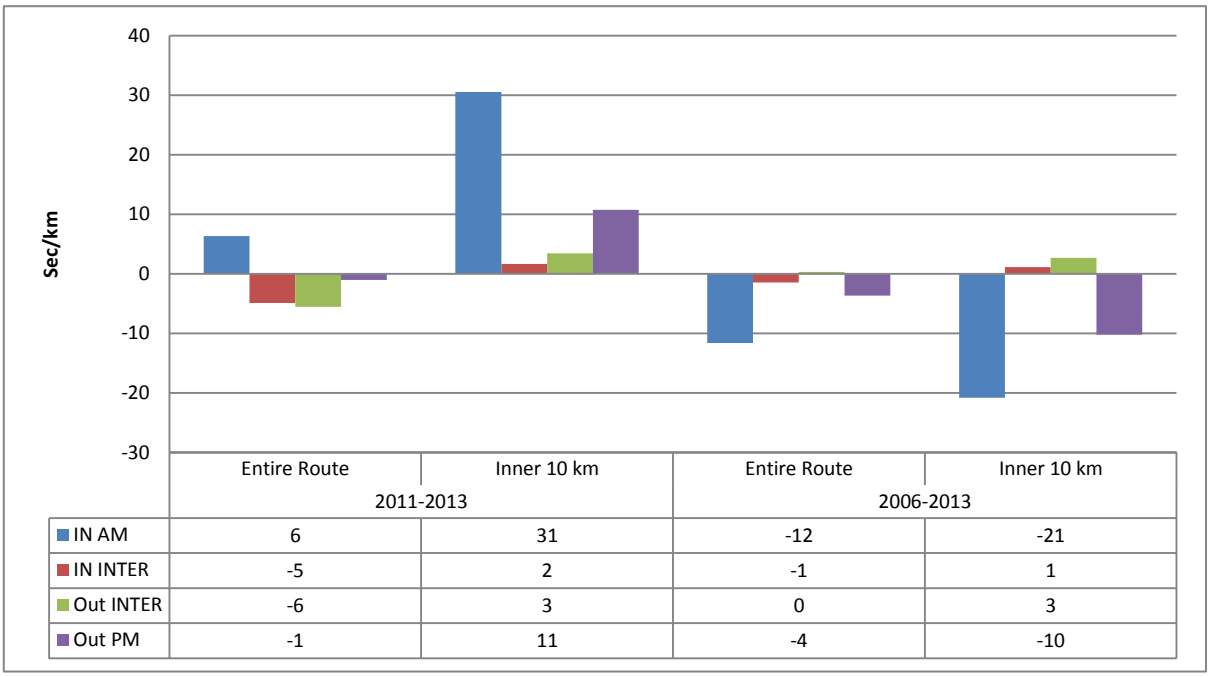


Figure 9 - Brooker Highway – delays experienced in comparison to 2006 and 2011 Surveys

Figures 10 and 11 compare travel speeds data from the 2011 and 2013 Surveys on the Brooker Highway route. These figures indicate the increase in overall travel speeds on the Brooker is a result of higher average travel speeds north of the Bridgewater Bridge, following the commissioning of the Brighton Bypass. The decrease in average travel speeds experienced on the inner 10 km sections is most likely a reflection of disruption to traffic flow as intersections and interactions with other urban commuters increase.

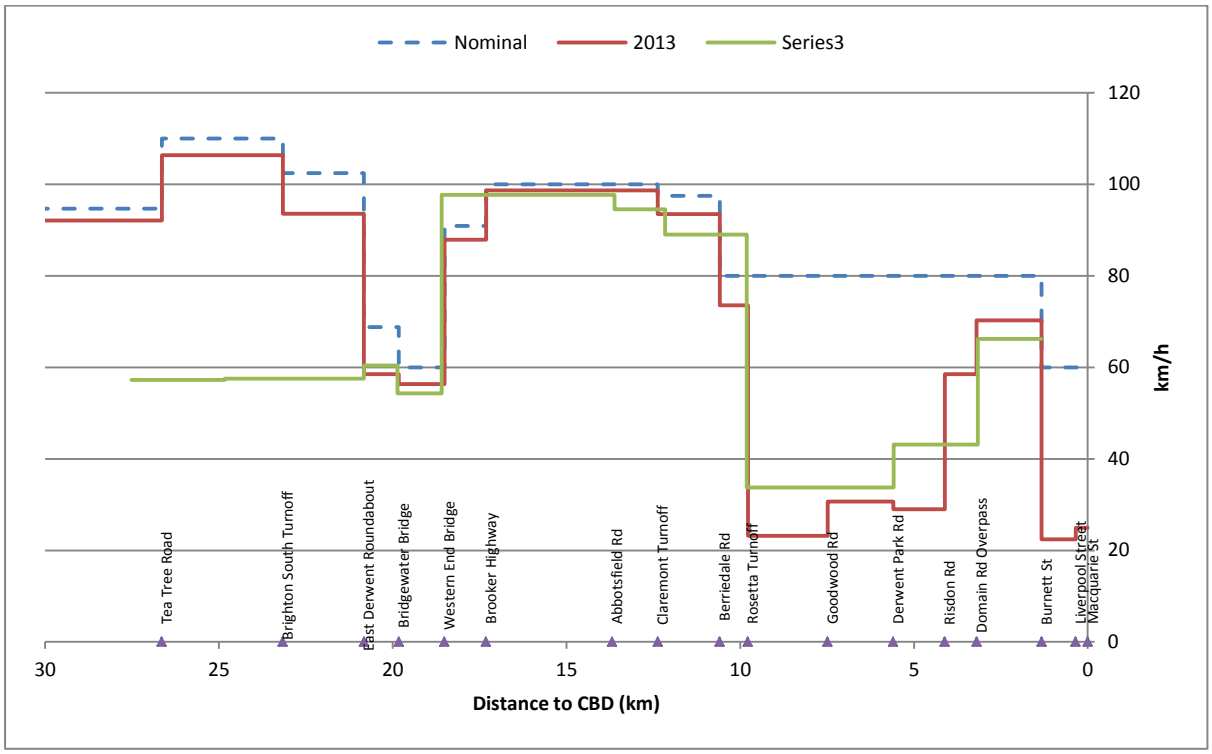


Figure 10 – Brooker Highway – AM peak travel speed (2011 and 2013 compared to nominal)

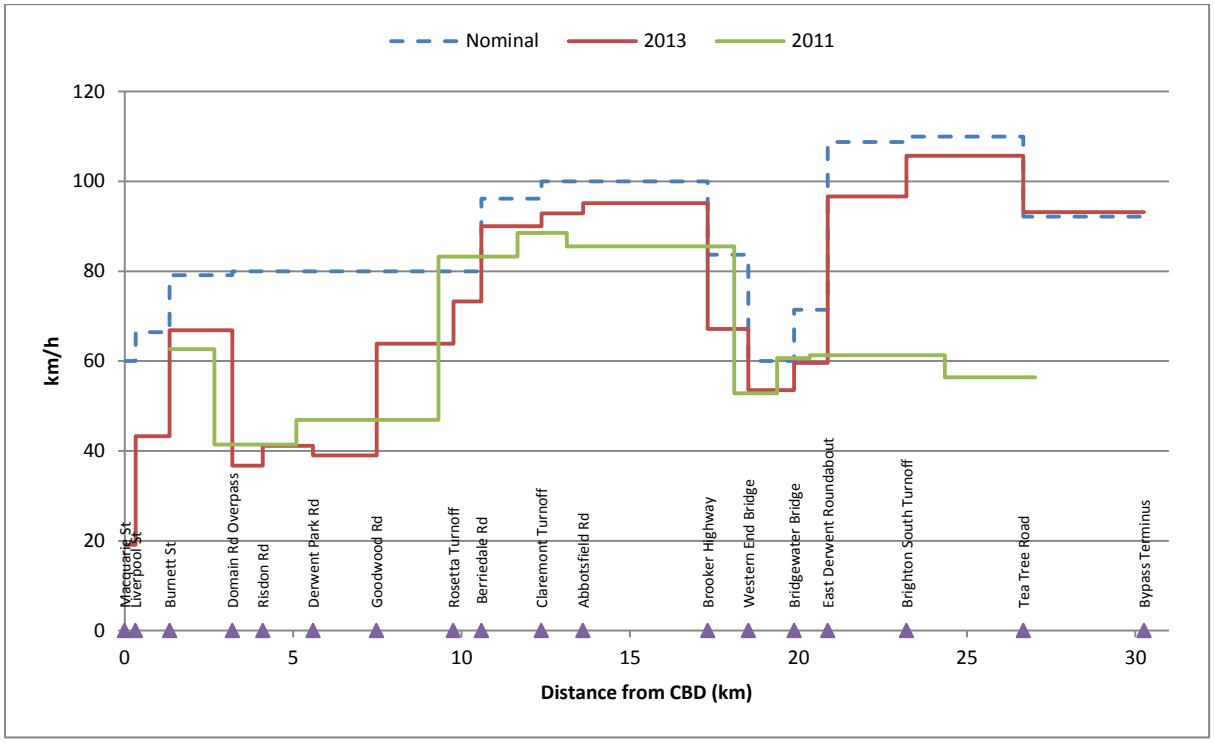
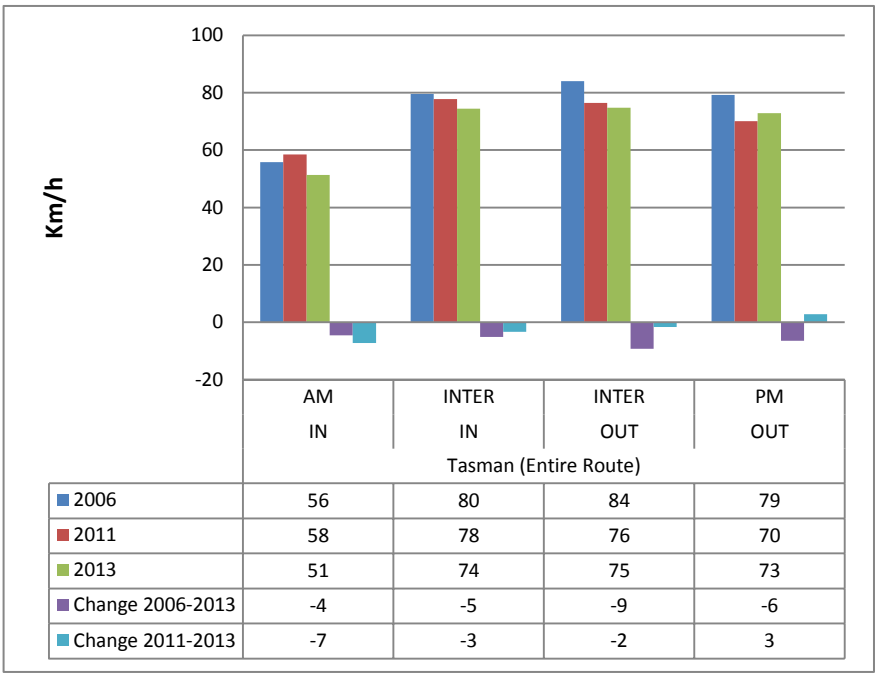


Figure 11 – Brooker Highway – PM peak travel speed (2011 and 2013 compared to nominal)

Tasman Highway

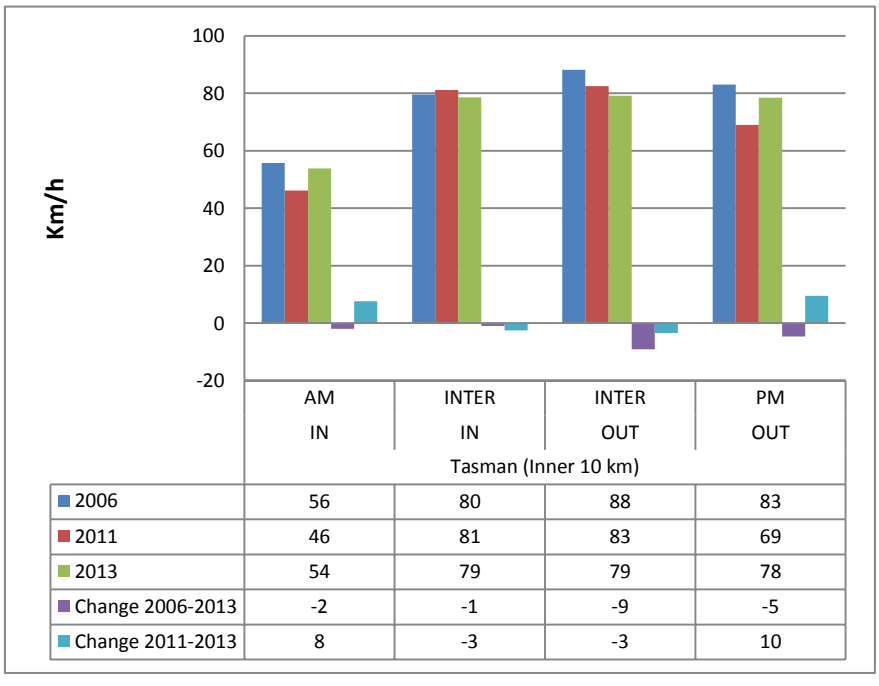
The Tasman Highway is surveyed from the junction with Brooker Avenue in Hobart through to the Junction with the Arthur Highway in Sorell (See Figure 1, page 3). The route was consistent across the 2006, 2011 and 2013 Surveys.



	AM IN	INTER IN	INTER OUT	PM OUT
	Tasman (Entire Route)			
2006	56	80	84	79
2011	58	78	76	70
2013	51	74	75	73
Change 2006-2013	-4	-5	-9	-6
Change 2011-2013	-7	-3	-2	3

Figure 12 – Tasman Highway average travel speed – Entire route (2006, 2011 and 2013)

Travel speeds in 2013 were largely consistent across the Tasman Highway throughout the day. The exception to this was during the AM peak, where travel speeds were on averaging 20 km/h slower than other times of the day. As shown in Figure 12, this pattern is consistent with the travel speeds recorded in the 2006 and 2011 Surveys, however, there has generally been a slight downward trend in travel speeds across all periods over time.

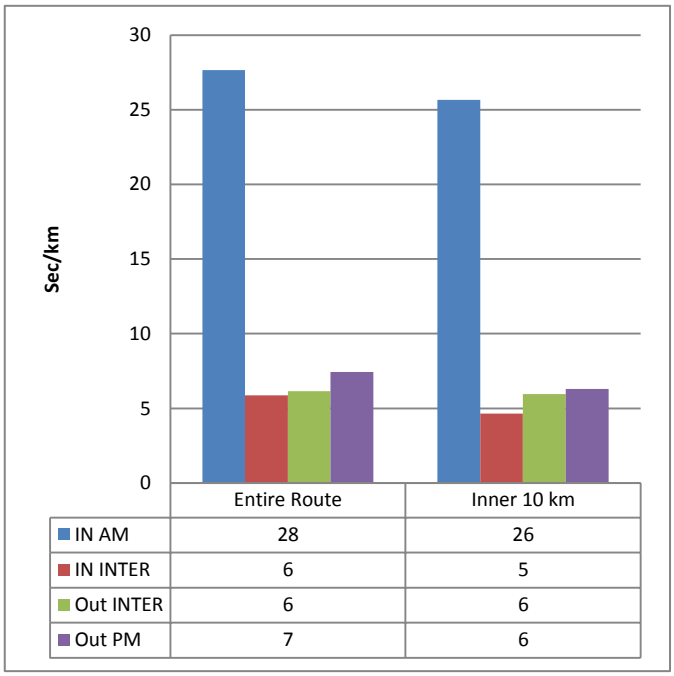


	AM IN	INTER IN	INTER OUT	PM OUT
	Tasman (Inner 10 km)			
2006	56	80	88	83
2011	46	81	83	69
2013	54	79	79	78
Change 2006-2013	-2	-1	-9	-5
Change 2011-2013	8	-3	-3	10

Travel speeds recorded in the inner 10 km section of the Tasman Highway were consistent with the speeds across the entire route, experiencing the slowest average speed during the AM peak and relatively consistent speeds during other times of the day. However, average travel speeds for the inner 10 km were between 2 and 6 km/h faster than average travel speeds for the entire route.

Figure 13 – Tasman Highway average travel speed – Inner 10km (2006, 2011 and 2013)

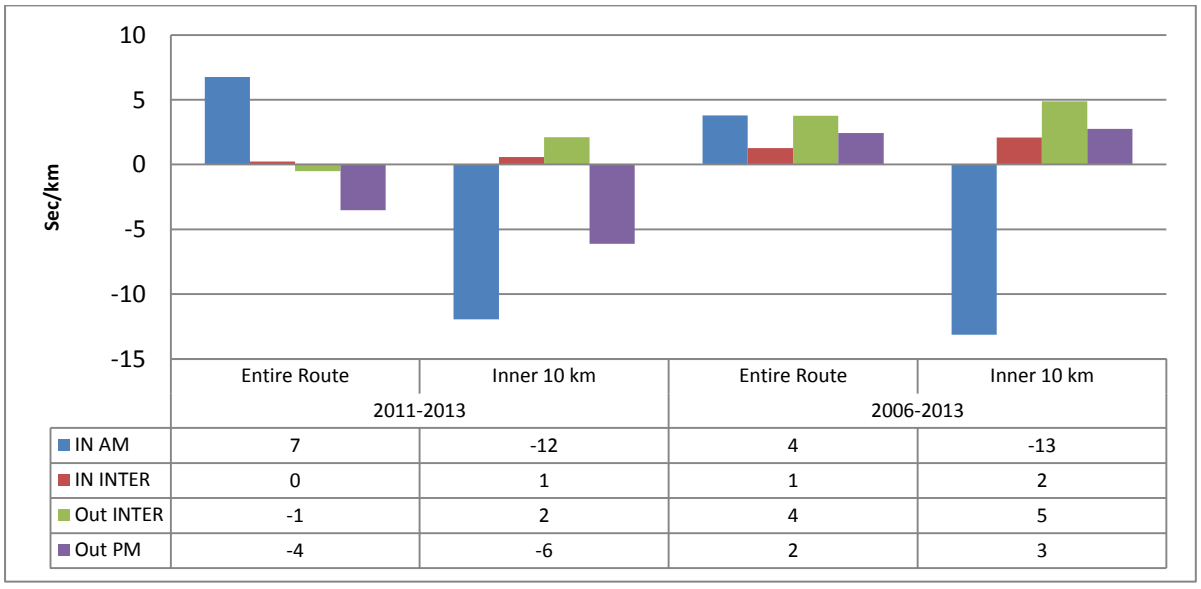
Consistent with the findings above, the greatest deviation from nominal travel times on the Tasman Highway occurred in the AM peak, recording an average delay of 28 sec/km for the entire route. The delay for the 10 km section from the CBD was 26 sec/km. Traffic was relatively free-flowing in all other time periods with delays of no more than 7 sec/km (Figure 14).



	Entire Route	Inner 10 km
IN AM	28	26
IN INTER	6	5
Out INTER	6	6
Out PM	7	6

Figure 14 – Tasman Highway– delay from nominal travel times in 2013

Variations from nominal travel times recorded in the 2013 Survey were largely consistent with the results from 2006 and 2011 Survey. The only material change is to delays experienced in the inner 10 km section of the highway, where there has been a reduction of over 10 sec/km, as shown in Figure 15. This change was evident when compared to both the 2006 and 2011 Survey results.



	2011-2013		2006-2013	
	Entire Route	Inner 10 km	Entire Route	Inner 10 km
IN AM	7	-12	4	-13
IN INTER	0	1	1	2
Out INTER	-1	2	4	5
Out PM	-4	-6	2	3

Figure 15 – Tasman Highway – delays experienced in comparison to 2006 and 2011 Surveys

Figures 16 and 17 indicate the slight decrease in overall travel speed in the AM peak is a result of slower travel times from Sorell to the South Arm Highway. This change is likely to be a reflection of variable speed signage. While the use of these signs may have caused a slight decrease in average travel speeds across the highway, the resulting smoother traffic flows appear to have reduced congestion in the inner 10km section of the route.

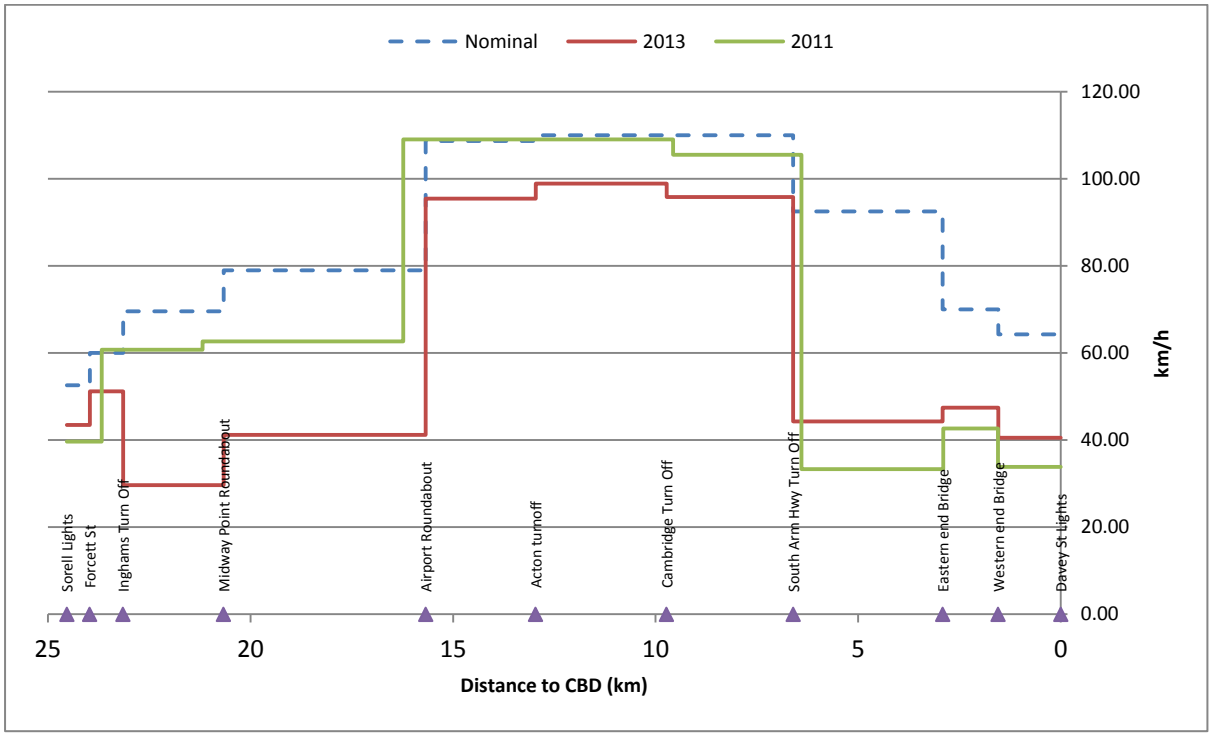


Figure 16 – Tasman Highway – AM peak travel speed (2011 and 2013 compared to nominal)

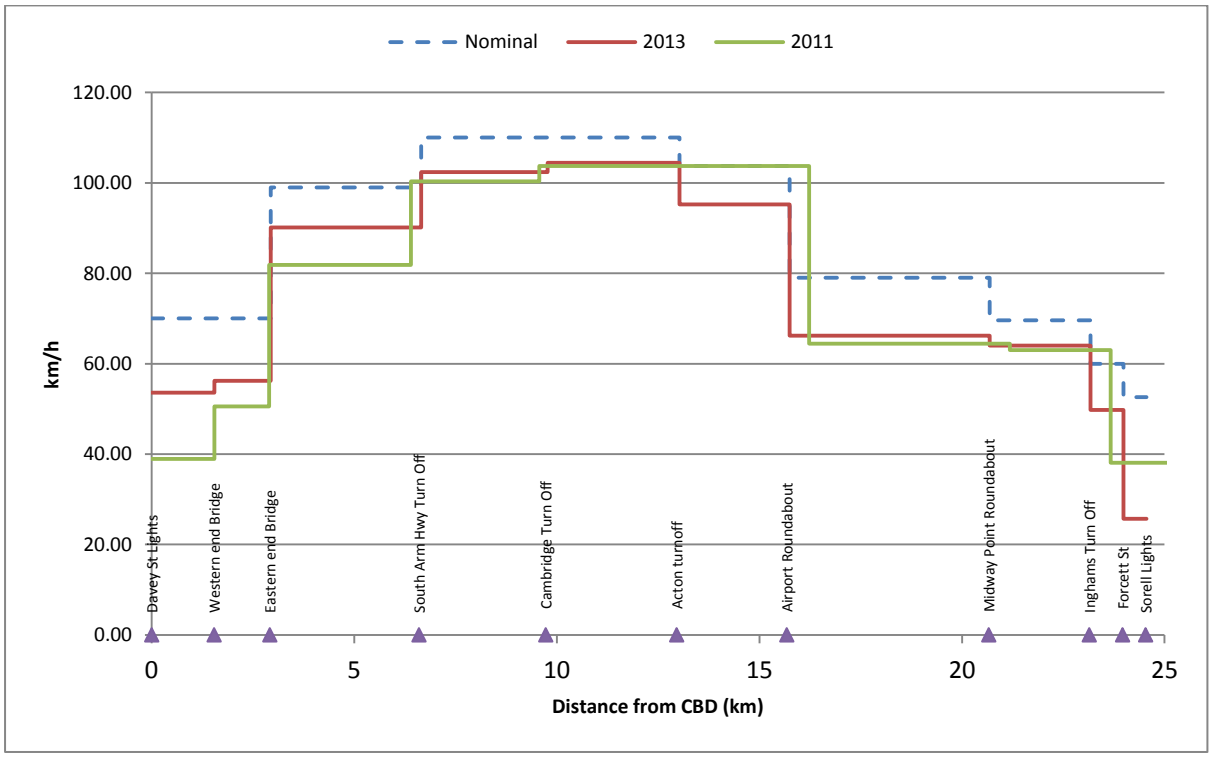
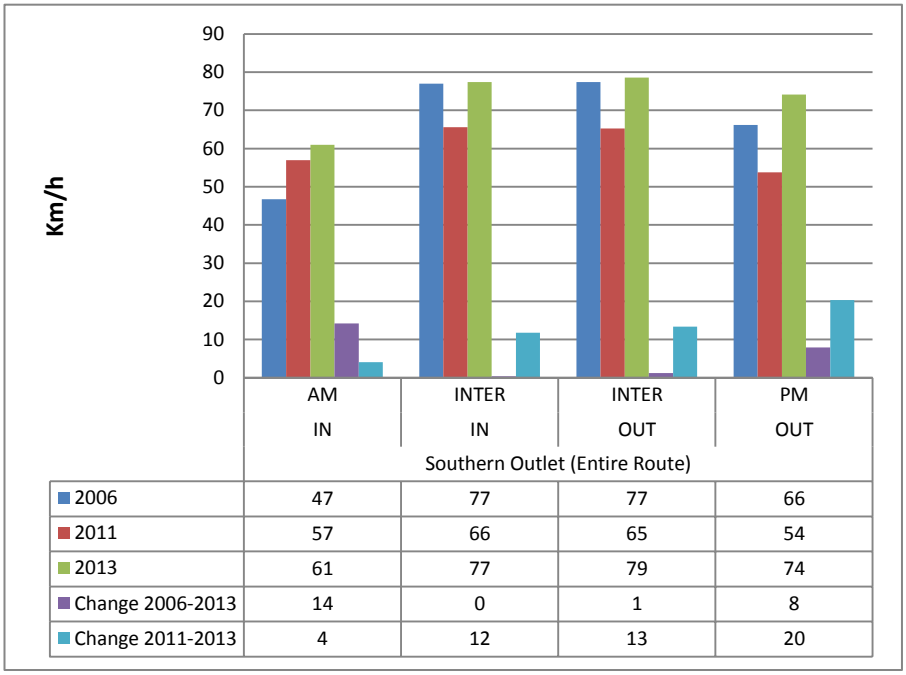


Figure 17 – Tasman Highway – PM peak travel speed (2011 and 2013 compared to nominal)

Southern Outlet

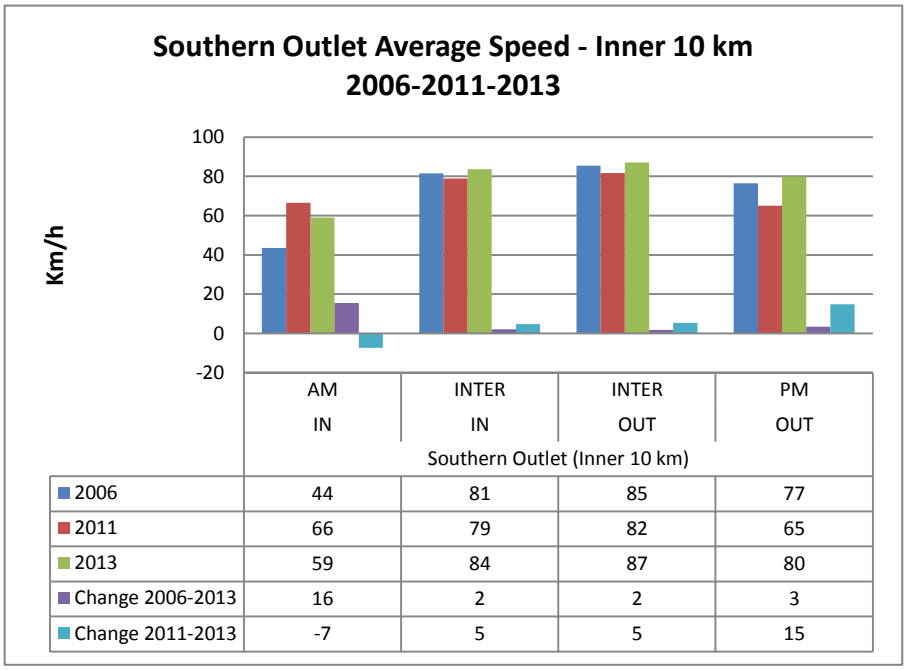
In 2013, the Southern Outlet was surveyed from the junction with Davey Street through to the Junction with Sandfly Road in Margate. The 2013 Survey varied from the routes monitored in 2006 and 2011 to include the Kingston Bypass, which has since been built.



	AM IN	INTER IN	INTER OUT	PM OUT
2006	47	77	77	66
2011	57	66	65	54
2013	61	77	79	74
Change 2006-2013	14	0	1	8
Change 2011-2013	4	12	13	20

Figure 18 – Southern Outlet average travel speed – Entire route (2006, 2011 and 2013)

Travel speeds on the Southern Outlet were generally consistent across the day in 2013, with the exception of the AM peak, where travel speeds were on average around 15km/h slower. However, in comparison to previous Surveys, Figure 18 indicates average travel speed during the AM and PM peaks improved in 2013. Most notably in the PM peak with an average increase of 20 km/h on 2011 travel speeds.

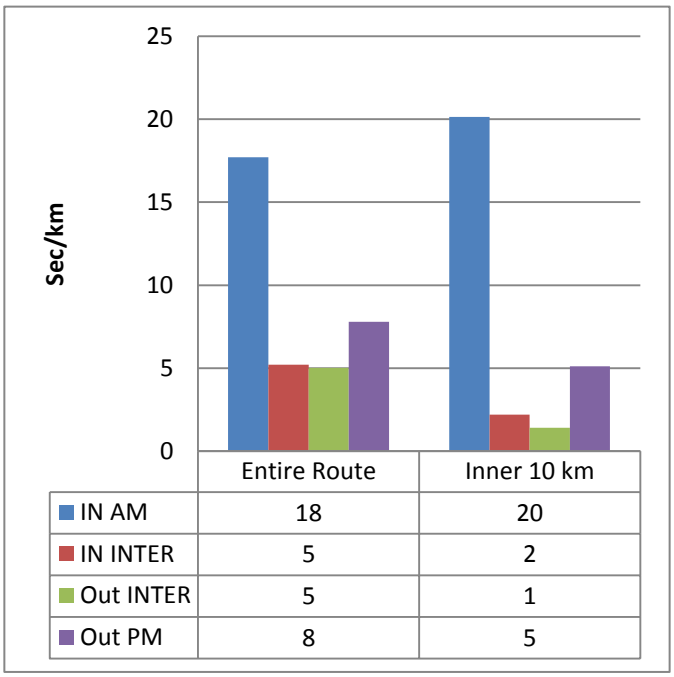


	AM IN	INTER IN	INTER OUT	PM OUT
2006	44	81	85	77
2011	66	79	82	65
2013	59	84	87	80
Change 2006-2013	16	2	2	3
Change 2011-2013	-7	5	5	15

Figure 19 – Southern Outlet average travel speed – Inner 10km (2006, 2011 and 2013

In the inner 10 km section, average speeds for the AM period decreased marginally, however, there was an increase in travel speeds across the rest of the day, most notably in the PM peak (Figure 19).

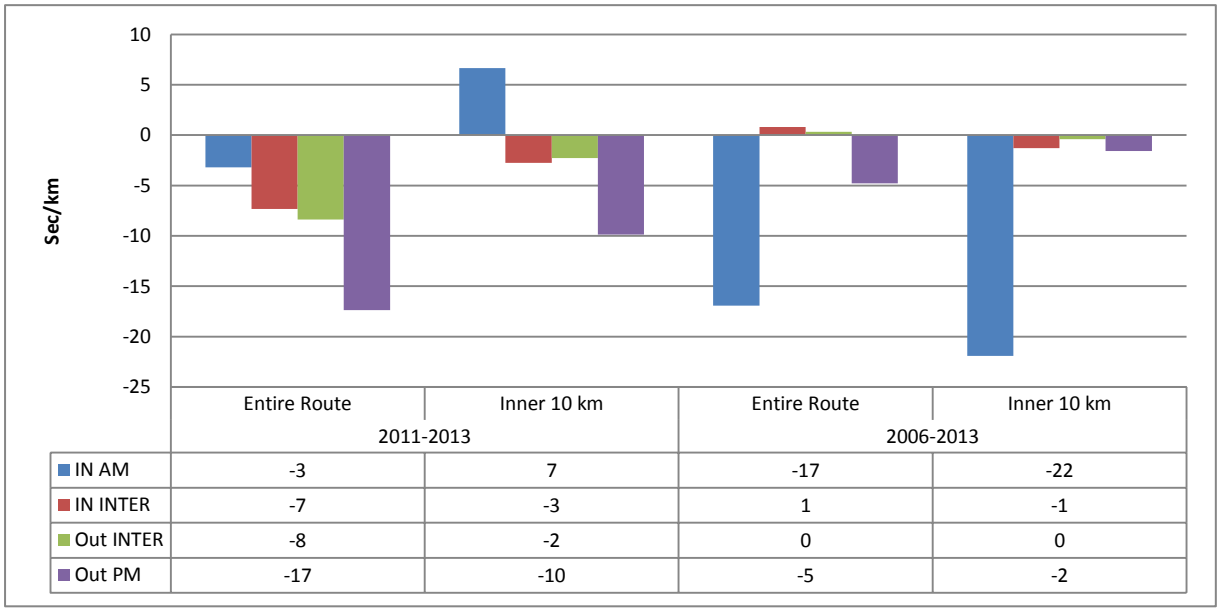
When compared to nominal travel time, the greatest variation was in the AM peak, with a delay of 18 sec/km for the entire route, and 20 sec/km for the 10 km section closest to the CBD. Variation from nominal travel times were less than half of these for all other time periods (Figure 20).



	Entire Route	Inner 10 km
IN AM	18	20
IN INTER	5	2
Out INTER	5	1
Out PM	8	5

Figure 20 – Southern Outlet – delay from nominal travel times in 2013

In comparison to previous Surveys, travel times on the Southern Outlet in 2013 generally improved, with the greatest reductions in delay occuring in the PM peak when compared to the 2011 Survery, and AM peak since 2006. Figure 21 indicates a minor increase in delay in the AM peak in the inner 10km section of the route, however, across the Southern Outlet there was a slight increase in travel speeds.



	2011-2013		2006-2013	
	Entire Route	Inner 10 km	Entire Route	Inner 10 km
IN AM	-3	7	-17	-22
IN INTER	-7	-3	1	-1
Out INTER	-8	-2	0	0
Out PM	-17	-10	-5	-2

Figure 21 – Southern Outlet – delays experienced in comparison to 2006 and 2011 Surveys

The overall increased travel speeds across the Southern Outlet are the result of faster travel times between the Huon Highway and Margate, following the commissioning of the Kingston Bypass. However, Figure 21 indicates that these increased speeds are offset in the AM peak by lower travel speeds closer to the CBD as traffic reaches a common location causing a bottle neck. Figure 22 indicates this not the case in PM peak traffic, where outbound traffic diffuses.

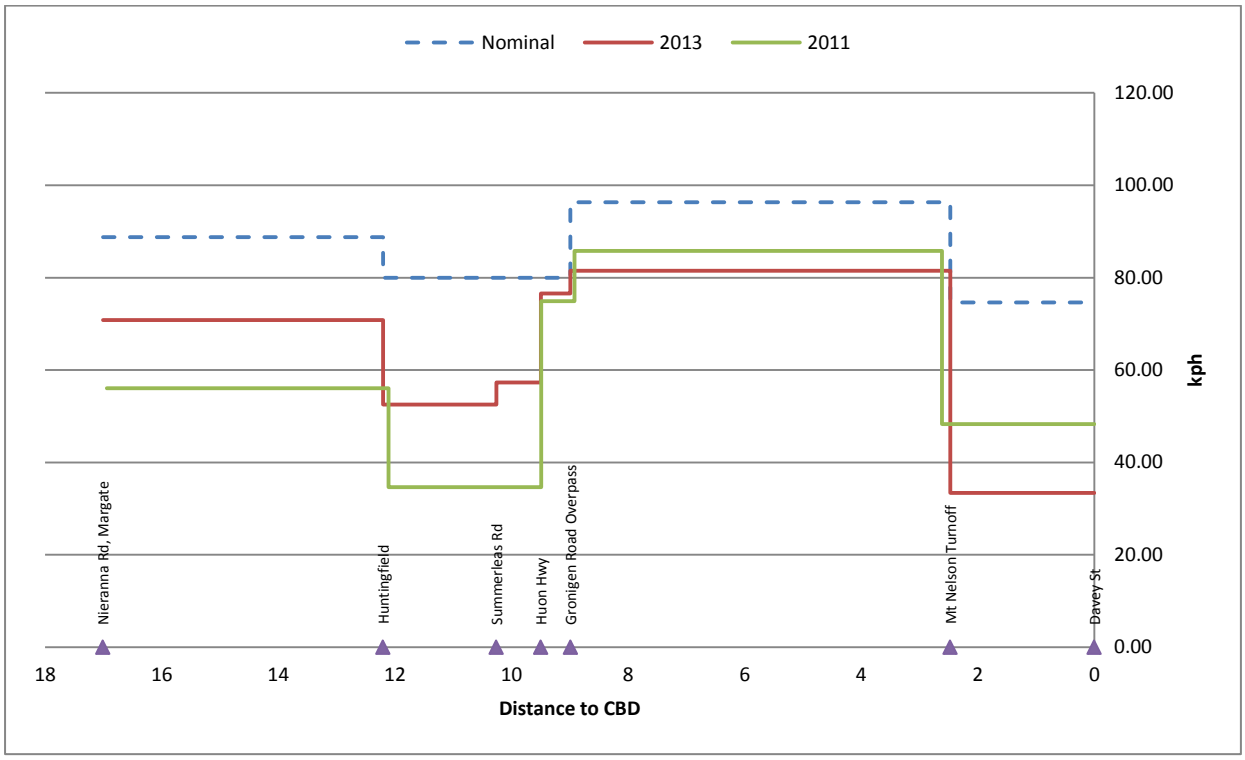


Figure 21 – Southern Outlet – AM peak travel speed (2011 and 2013 compared to nominal)

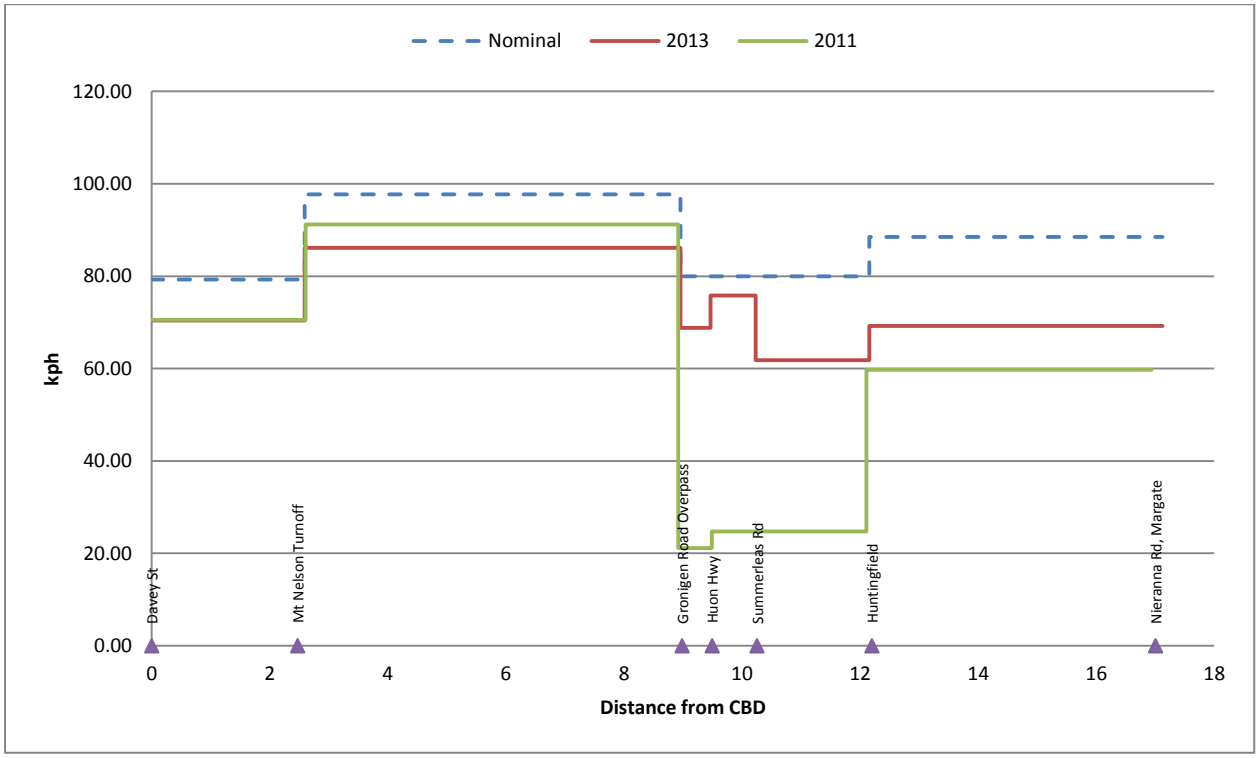
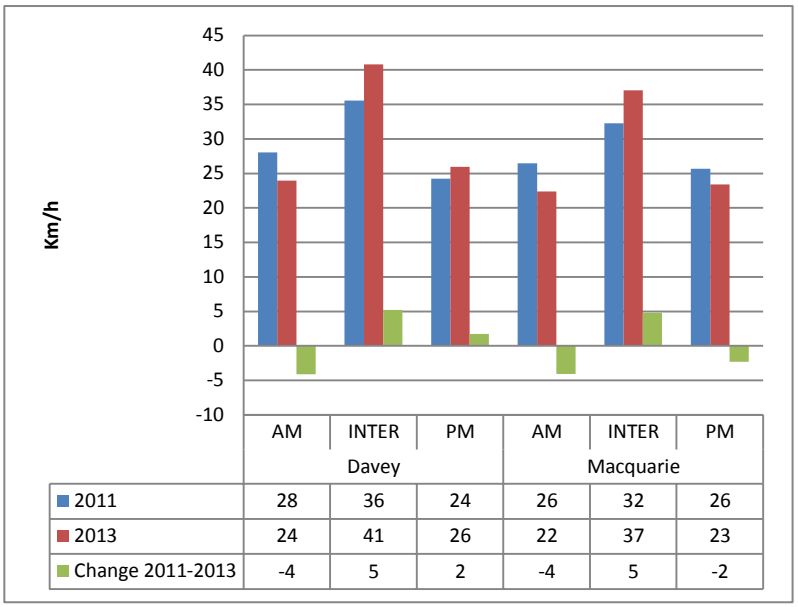


Figure 22 – Southern Outlet – PM peak travel speed (2011 and 2013 compared to nominal)

Macquarie and Davey streets

Macquarie and Davey streets provide the connection to, and through, Hobart for traffic travelling on the other surveyed routes. These streets were monitored as part of the 2013 and 2011 Surveys.

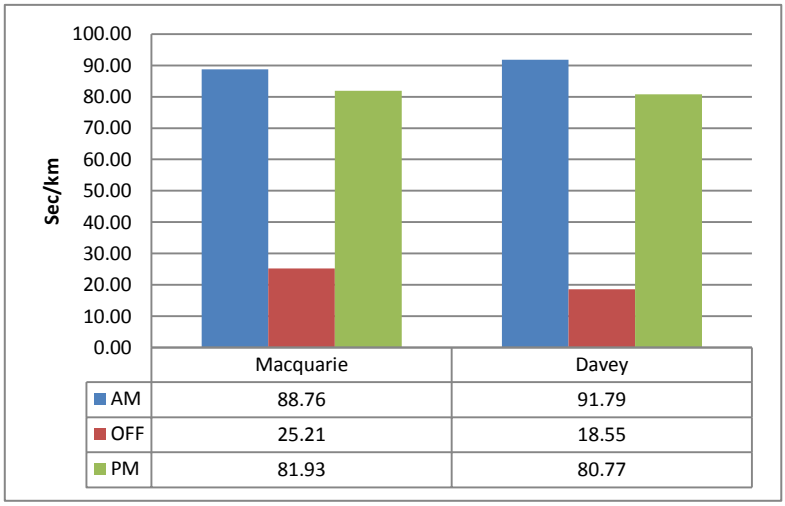
Average travel speeds on Davey and Macquarie streets experienced slightly higher variation between the peak periods and other times than those recorded in 2011, with slightly slower travel speeds during peak periods and slightly faster travel speeds at other times.



	Davey			Macquarie		
	AM	INTER	PM	AM	INTER	PM
2011	28	36	24	26	32	26
2013	24	41	26	22	37	23
Change 2011-2013	-4	5	2	-4	5	-2

Figure 23 – Davey Street and Macquarie Street average travel speed (2011 and 2013)

As shown in Figure 23, travel speeds during the AM peak were 17 km/h slower than travel between peak periods on Davey Street and 15 km/h slower on Macquarie Street. Similar delays were experienced in PM peaks.

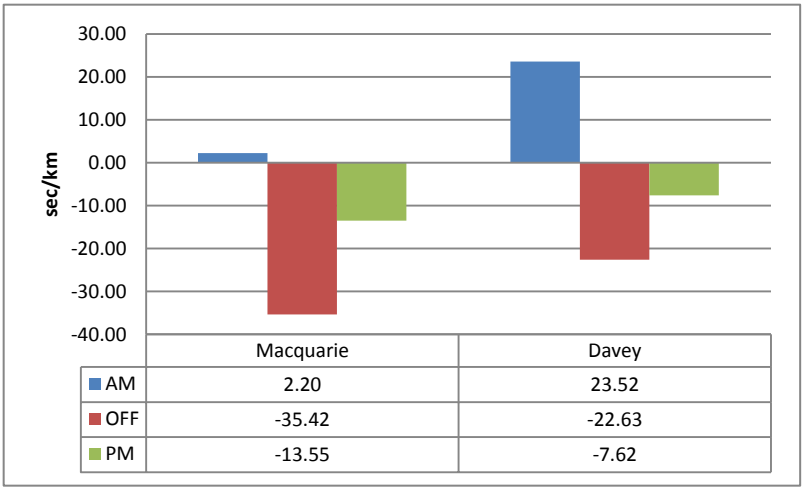


	Macquarie	Davey
AM	88.76	91.79
OFF	25.21	18.55
PM	81.93	80.77

Figure 24 – Davey Street and Macquarie Street – delay from nominal travel times in 2013

In 2013, for both streets the greatest variation from nominal travel time was experienced in the AM peak, with a 7 to 9 sec/km reduction in that delay in the PM peak (Figure 24). Traffic flows were notably smoother during these periods.

Figure 25 indicates there was notable increase in the delay to travel times on Davey Street in the AM peak between the 2013 and 2011 Surveys, with only a minor increase on Macquarie Street.



	Macquarie	Davey
AM	2.20	23.52
OFF	-35.42	-22.63
PM	-13.55	-7.62

Figure 25 – Davey Street and Macquarie Street – delays experienced in comparison to 2011 Survey

Appendices

Appendix 1 – Link Descriptions and Nominal Travel Speed

			IN			OUT		
Link	Start	End	Distance (Km)	Nom TT (Sec)	Nom Speed (Km/h)	Distance (Km)	Nom TT (Sec)	Nom Speed (Km/h)
	Southern Outlet							
1	Nierinna Rd, Margate	Huntingfield	4.81	194.94	88.76	4.97	202.24	88.48
2	Huntingfield	Summerleas Rd	1.94	87.49	80.00	1.92	86.53	80.00
3	Summerleas Rd	Huon Hwy	0.76	34.41	80.00	0.77	34.49	80.00
4	Huon Hwy	Gronigen Road Overpass	0.51	22.79	80.00	0.51	22.89	80.00
5	Gronigen Road Overpass	Mt Nelson Turnoff	6.52	243.53	96.34	6.37	234.80	97.68
6	Mt Nelson Turnoff	Davey St	2.47	119.30	74.60	2.59	117.66	79.24
Total			17.01	702.46	87.18	17.13	698.60	88.27
10Kms			10.00	408.31	88.17	10.00	399.23	90.17
	Tasman Highway							
1	Sorell Lights	Forcett St	0.57	38.87	52.58	0.57	38.87	52.58
2	Forcett St	Inghams Turn Off	0.82	49.14	60.00	0.82	49.14	60.00
3	Inghams Turn Off	Midway Point Roundabout	2.48	128.53	69.59	2.48	128.53	69.59
4	Midway Point Roundabout	Airport Roundabout	4.99	227.26	78.98	4.94	225.23	78.98
5	Airport Roundabout	Acton Turn Off	2.71	89.92	108.66	2.71	94.18	103.73
6	Acton turnoff	Cambridge Turn Off	3.23	105.84	110.00	3.26	106.71	110.00
7	Cambridge Turn Off	South Arm Hwy Turn Off	3.12	102.25	110.00	3.12	102.01	110.00
8	South Arm Hwy Turn Off	Eastern end Bridge	3.69	143.55	92.48	3.72	135.12	99.01
9	Eastern end Bridge	Western end Bridge	1.37	70.68	70.00	1.39	71.35	70.00
10	Western end Bridge	Davey St Lights	1.54	86.32	64.28	1.55	79.64	70.00
Total			24.53	1042.37	84.73	24.56	1030.78	85.76
10Kms			10.00	411.71	87.44	10.00	395.67	90.98
	Brooker Highway							
1	Tea Tree Road	Bypass Terminus	3.61	137.19	94.69	3.58	139.93	92.16
2	Bypass Terminus	Brighton South Turnoff	3.48	113.94	110.00	3.46	113.37	110.00
3	Brighton South Turnoff	East Derwent Roundabout	2.33	82.02	102.43	2.34	77.45	108.78
4	East Derwent Roundabout	Bridgewater	1.01	52.71	68.80	1.00	50.23	71.43
5	Bridgewater Bridge	Bridgewater Bridge	1.31	78.56	60.00	1.36	81.57	60.00
6	Western End Bridge	Brooker Highway	1.20	47.55	90.94	1.20	51.83	83.67
7	Brooker Highway	Abbotsfield Road	3.62	130.43	100.00	3.70	133.37	100.00
8	Abbotsfield Rd	Claremont Turnoff	1.32	47.37	100.00	1.23	44.38	100.00

9	Claremont Turnoff	Berriedale Rd	1.78	65.83	97.46	1.78	66.67	96.16
10	Berriedale Rd	Rosetta Turnoff	0.81	36.42	80.00	0.83	37.54	80.00
11	Rosetta Turnoff	Goodwood Rd	2.30	103.38	80.00	2.28	102.64	80.00
12	Goodwood Rd	Derwent Park Rd to	1.88	84.81	80.00	1.88	84.76	80.00
13	Derwent Park Rd	Risdon Rd	1.49	66.83	80.00	1.49	67.09	80.00
14	Risdon Rd	Domain Rd Overpass	0.92	41.26	80.00	0.90	40.72	80.00
15	Domain Rd Overpass	Burnett St	1.87	84.12	80.00	1.86	84.62	79.13
16	Burnett St	City Roundabout	0.98	58.76	60.00	1.01	54.97	66.44
17	Liverpool St	Macquarie St	0.35	20.93	60.00	0.32	19.33	60.00
Total			30.25	1252.10	86.98	30.26	1250.47	87.11
10Kms			10.00	469.92	76.61	10.00	465.07	77.41
	Davey Street							
1	Tasman Hwy	Murray St	0.77	55.30	50.00			
2	Murray St	Harrington St	0.26	18.86	50.00			
3	Harrington St	Southern Outlet	1.07	76.97	50.00			
Total			2.10	151.13	50.00			
	Macquarie Street							
1	Southern Outlet – Davey St Lights	Southern Outlet – Macquarie St Lights	0.11	7.85	50.00			
2	Southern Outlet	Murray St	1.27	91.73	50.00			
3	Murray St	Brooker Avenue	0.73	52.34	50.00			
Total			2.11	151.92	50.00			

Appendix 2 – Actual travel time, speed, delay from nominal and change over time

Travel time, speed and delay for monitored routes

Route	Period	Travel Time mm:ss			Speed km/h			Delay sec/km		
		2006	2011	2013	2006	2011	2013	2006	2011	2013
Brooker	AM Peak In	35:36	29:32	32:34	46	55	56	35	21	23
	Inter-Peak In	23:22	26:21	24:06	70	62	75	8	14	6
	Inter-Peak Out	24:14	26:54	25:49	67	61	70	10	15	10
	PM Peak Out	27:13	27:38	27:07	60	59	67	16	17	12
Southern Outlet	AM Peak In	21:52	17:58	16:44	47	57	61	35	21	18
	Inter-Peak In	13:17	12:56	13:11	77	79	77	4	3	5
	Inter-Peak Out	13:13	15:41	13:05	77	65	79	5	13	5
	PM Peak Out	15:27	19:02	13:52	66	54	74	13	25	8
Tasman	AM Peak In	26:56	25:42	28:41	56	58	51	24	21	28
	Inter-Peak In	18:54	19:20	19:46	80	78	0	5	6	6
	Inter-Peak Out	17:53	19:40	19:42	84	76	75	2	7	6
	PM Peak Out	18:58	21:27	20:13	79	70	73	5	11	7
East Derwent	AM Peak In	31:26	29:43		49	52		27	23	
	Inter-Peak In	21:48	23:57		71	64		4	9	
	Inter-Peak Out	21:33	23:47		71	65		4	9	
	PM Peak Out	23:47	24:19		65	63		9	10	
South Arm	AM Peak In	25:22	22:43		43	48		37	28	
	Inter-Peak In	15:06	16:12		72	67		3	7	
	Inter-Peak Out	15:47	16:09		70	69		5	6	
	PM Peak Out	16:42	18:14		66	61		8	13	

Travel time, speed and delay for surveyed routes for the inner 10 km section

Route	Period	Travel Time mm:ss			Speed km/h			Delay sec/km		
		2006	2011	2013	2006	2011	2013	2006	2011	2013
Brooker	AM Peak In	22:08	14:58	18:53	27	40	32	87	44	66
	Inter-Peak In	10:20	11:40	10:45	58	51	56	16	24	18
	Inter-Peak Out	10:58	12:29	11:52	55	48	51	22	29	25
	PM Peak Out	14:14	12:40	12:59	42	47	46	42	30	31
Southern Outlet	AM Peak In	13:47	09:02	10:10	44	66	59	42	13	20
	Inter-Peak In	07:22	07:30	07:10	81	80	84	3	4	2
	Inter-Peak Out	07:02	07:21	06:53	85	82	87	2	4	1
	PM Peak Out	07:51	09:13	07:30	77	65	80	7	15	5
Tasman	AM Peak In	13:11	12:59	11:08	46	46	54	39	15	26
	Inter-Peak In	07:09	07:24	07:38	84	81	0	3	4	5
	Inter-Peak Out	06:48	07:16	07:35	88	83	79	1	4	6
	PM Peak Out	07:13	08:42	07:39	83	69	78	4	12	6
East Derwent	AM Peak In	18:38	15:58	00:00	32	38		63	47	
	Inter-Peak In	09:05	10:33	00:00	66	57		5	14	
	Inter-Peak Out	09:08	10:19	00:00	66	58		5	12	
	PM Peak Out	11:29	11:06	00:00	52	54		19	17	
South Arm	AM Peak In	17:21	11:38	00:00	35	52		60	25	
	Inter-Peak In	08:04	10:39	00:00	74	56		4	20	
	Inter-Peak Out	08:07	08:06	00:00	74	74		6	6	

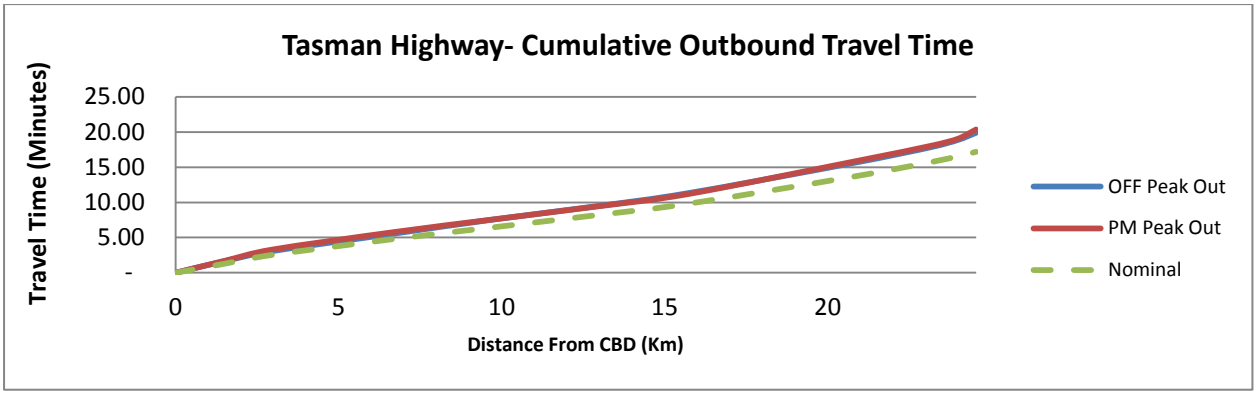
	PM Peak Out	09:03	09:51	00:00	66	61		12	17	
Davey	AM Peak	03:22	04:28	05:44	37	28	22	36	68	92
	Inter-Peak	03:29	03:32	03:10	36	36	40	40	41	19
	PM Peak	04:45	05:10	05:21	26	24	24	76	88	81
Macquarie	AM Peak	05:41	04:37	05:17	21	26	24	108	76	78
	Inter-Peak	03:55	03:47	03:06	31	32	41	56	52	16
	PM Peak	05:06	04:45	04:52	24	26	26	90	80	67

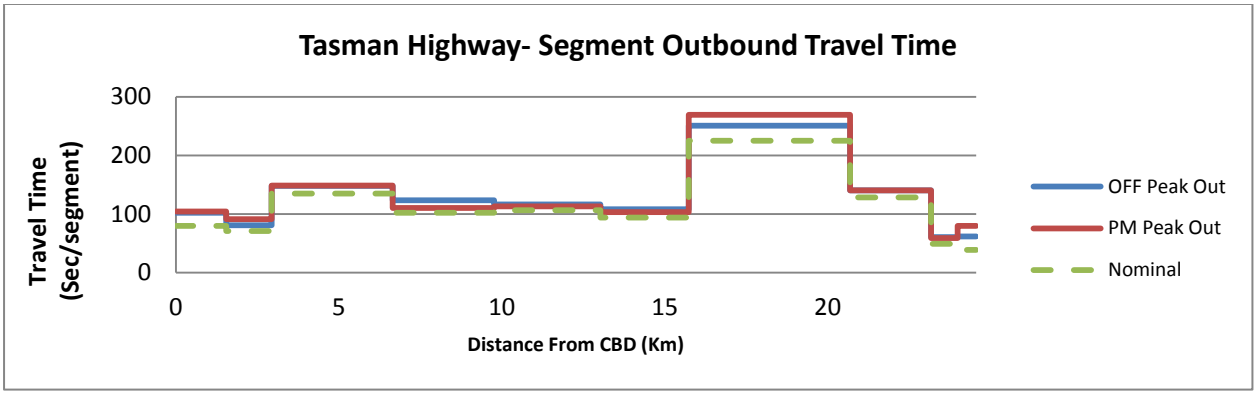
Change in travel time

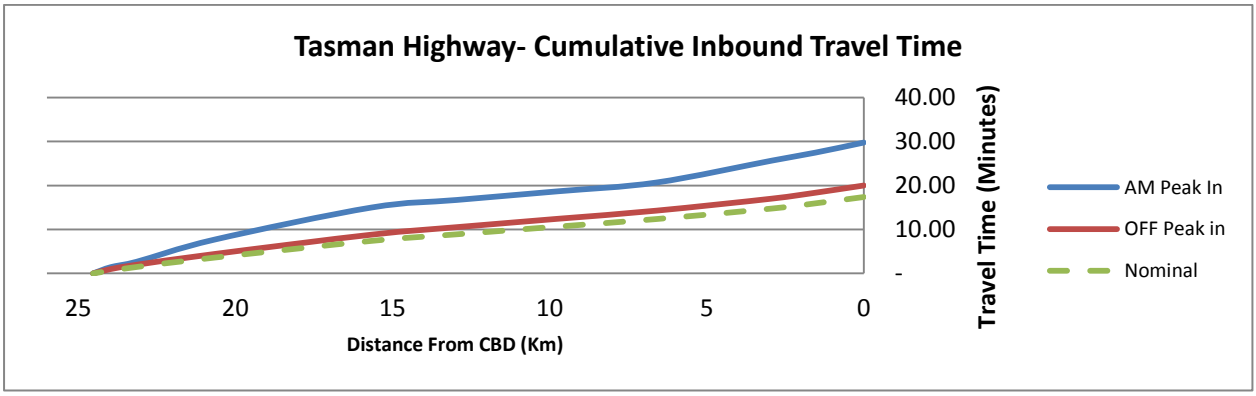
Route	Period	2006-2011	2011-2013	2006-2013
Brooker	AM Peak In	-07:10	03:55	-03:15
	PM Peak Out	-01:34	00:19	-01:15
Southern Outlet	AM Peak In	-04:46	01:08	-03:38
	PM Peak Out	01:23	-01:43	-00:20
Tasman	AM Peak In	-00:12	-01:51	-02:03
	PM Peak Out	01:29	-01:03	00:25
East Derwent	AM Peak In	-02:40		
	PM Peak Out	-00:22		
South Arm	AM Peak In	-05:43		
	PM Peak Out	00:48		
Davey St	AM Peak	01:07	01:16	02:22
	PM Peak	00:25	00:10	00:35
Macquarie St	AM Peak	-01:05	00:40	-00:24
	PM Peak	-00:21	00:08	-00:13

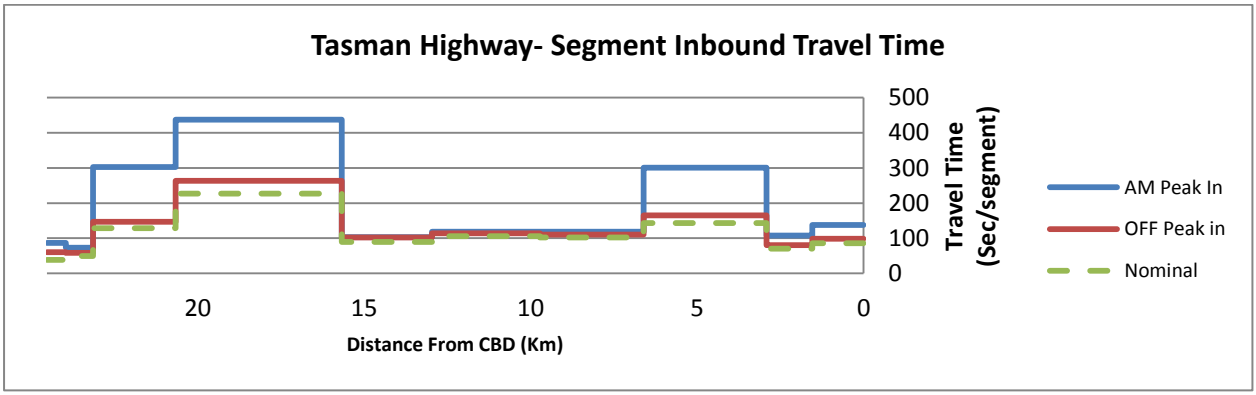
Appendix 3 – Cumulative and segment travel times

Tasman Highway

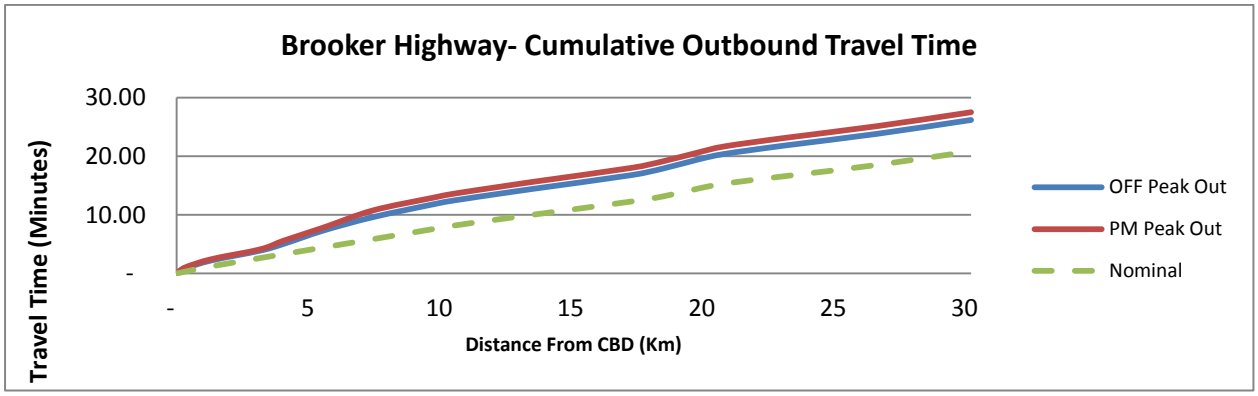


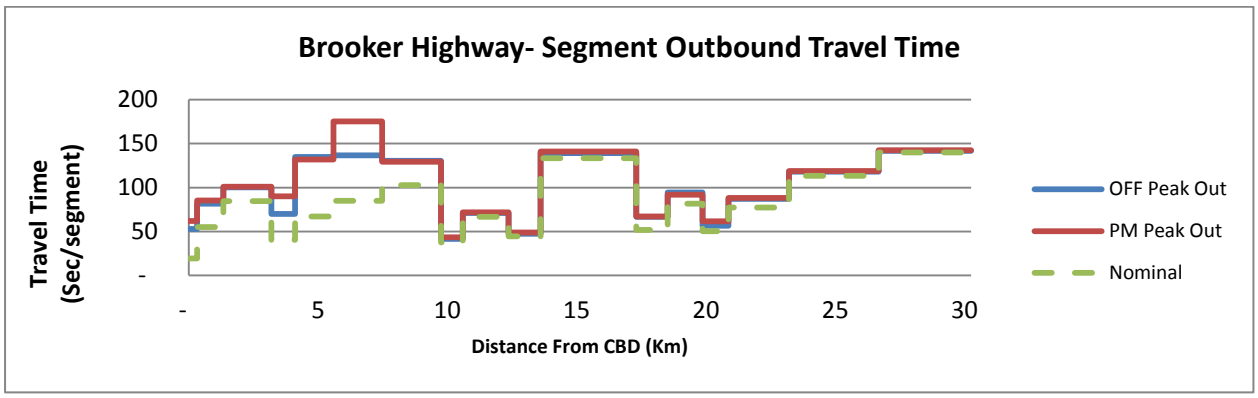


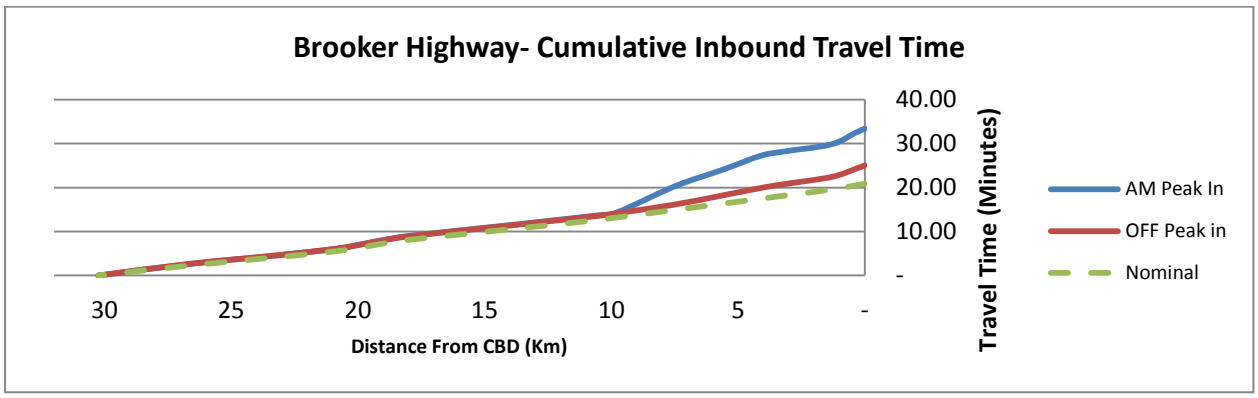


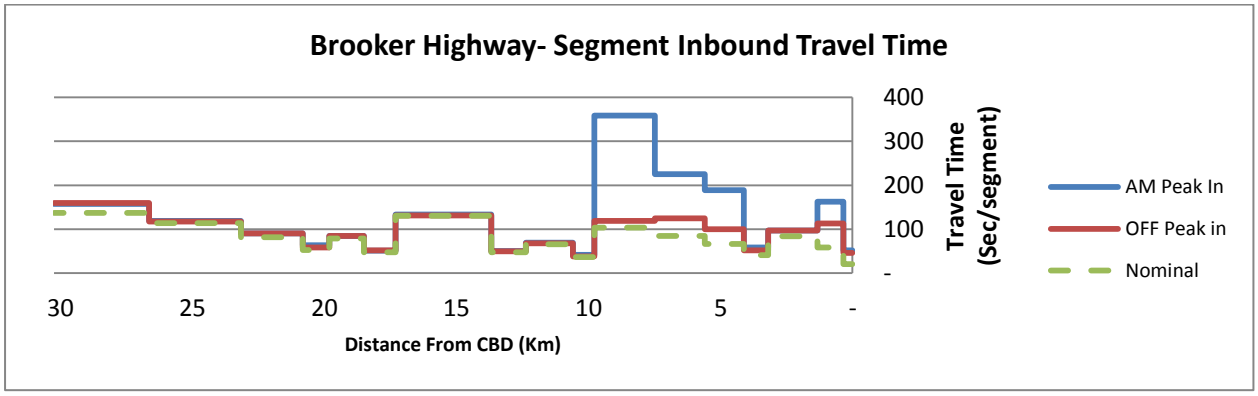


Brooker Highway

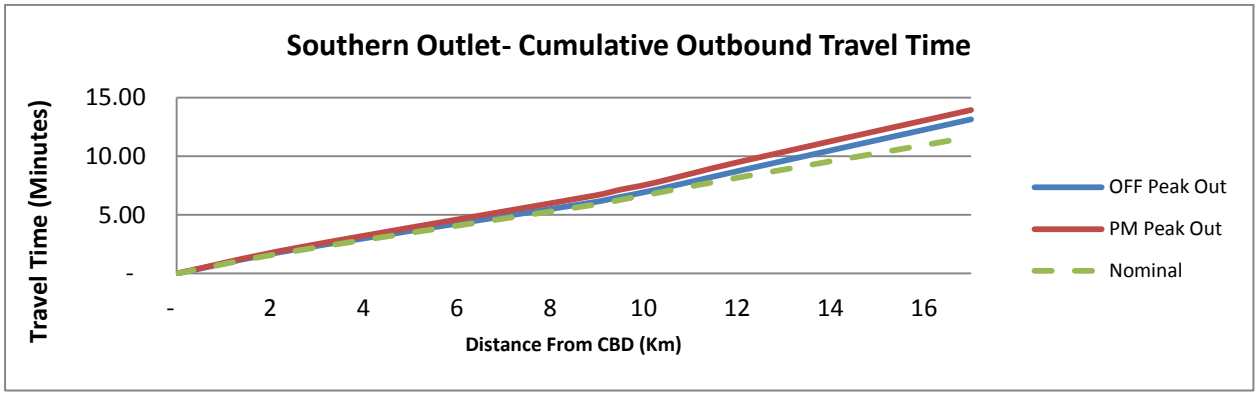


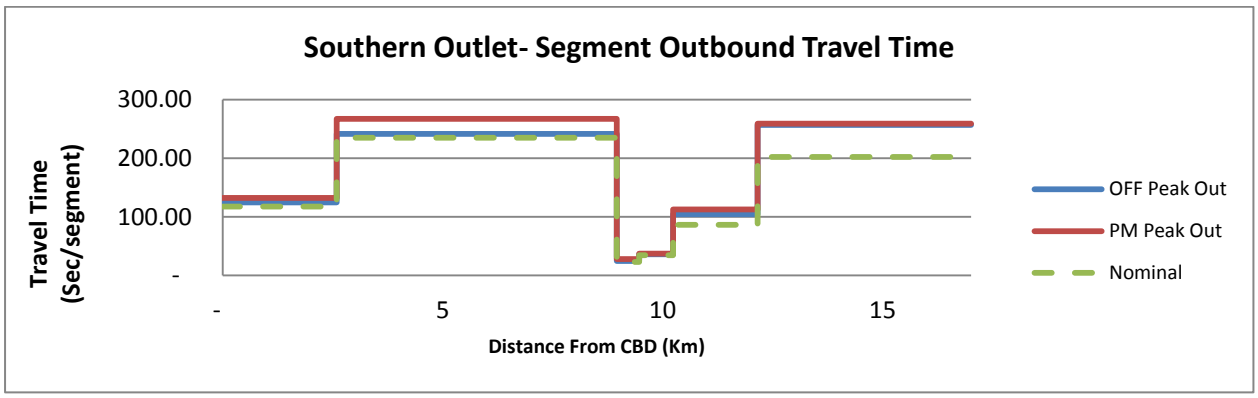


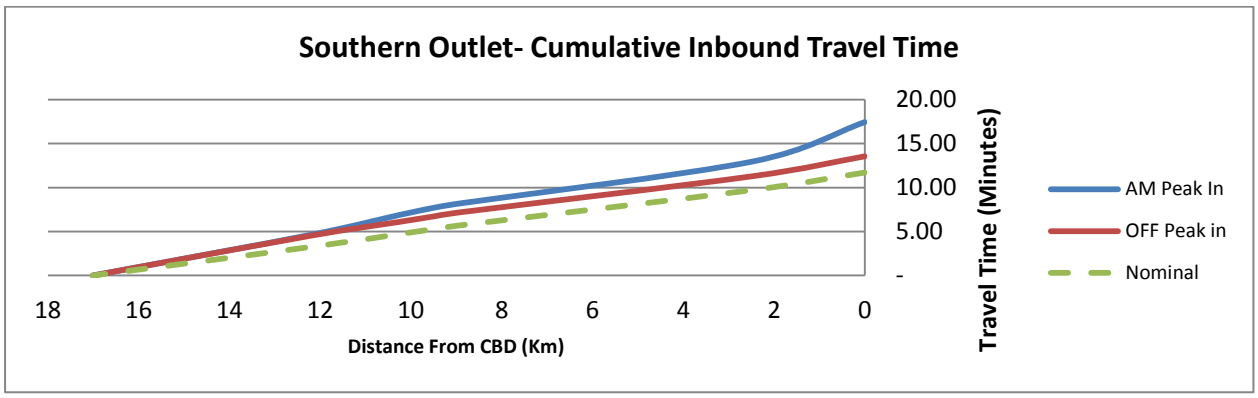


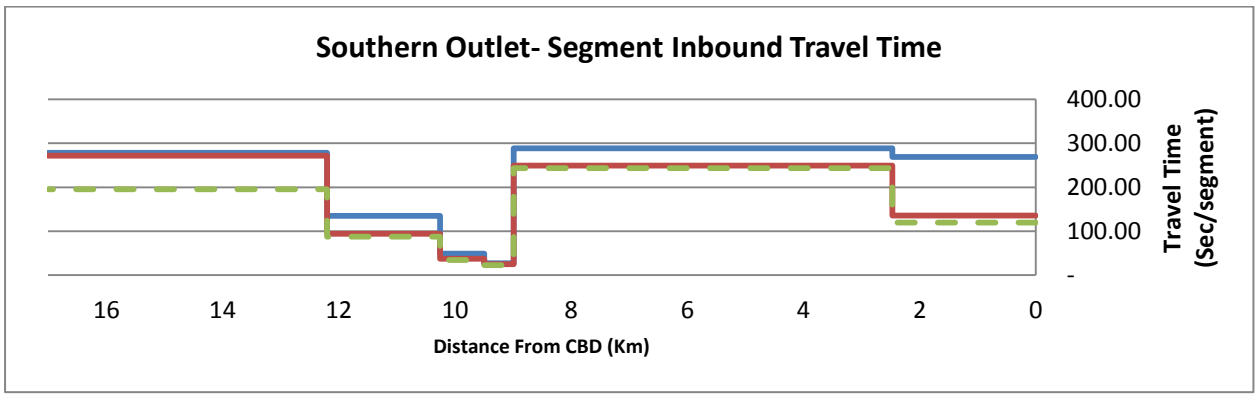


Southern Outlet



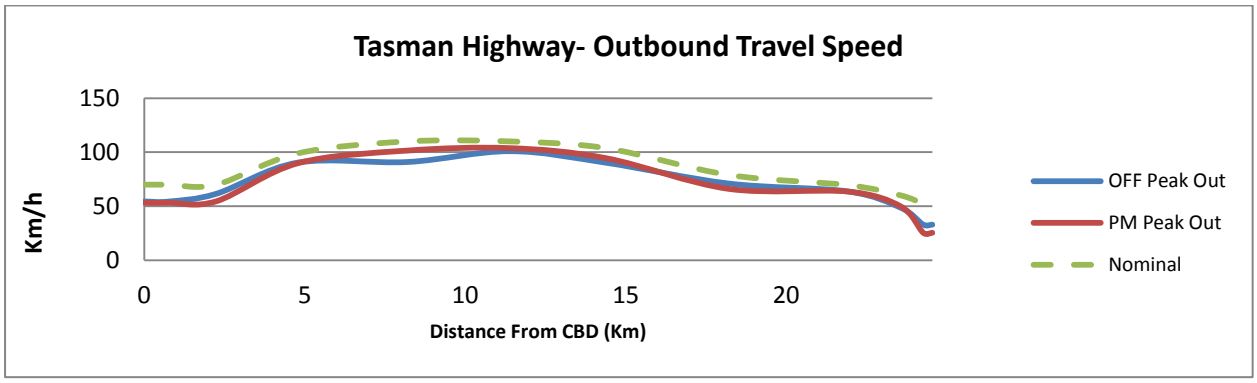


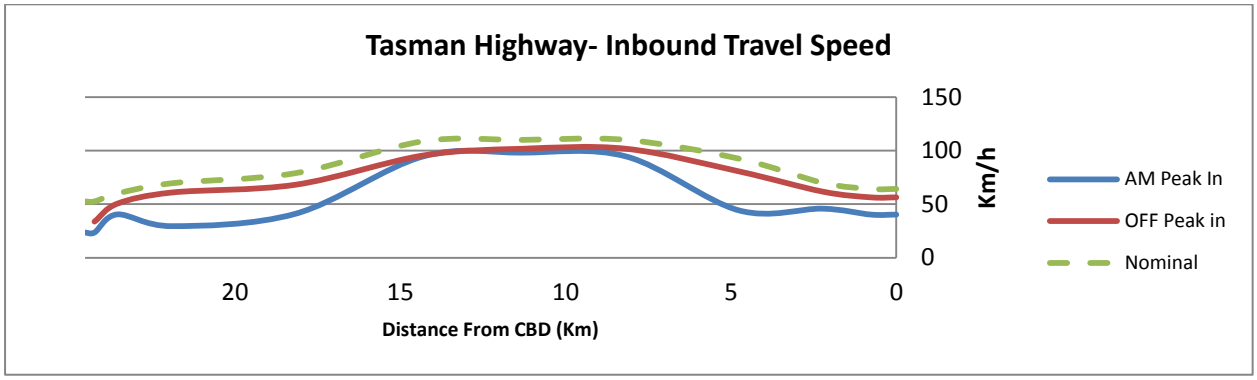




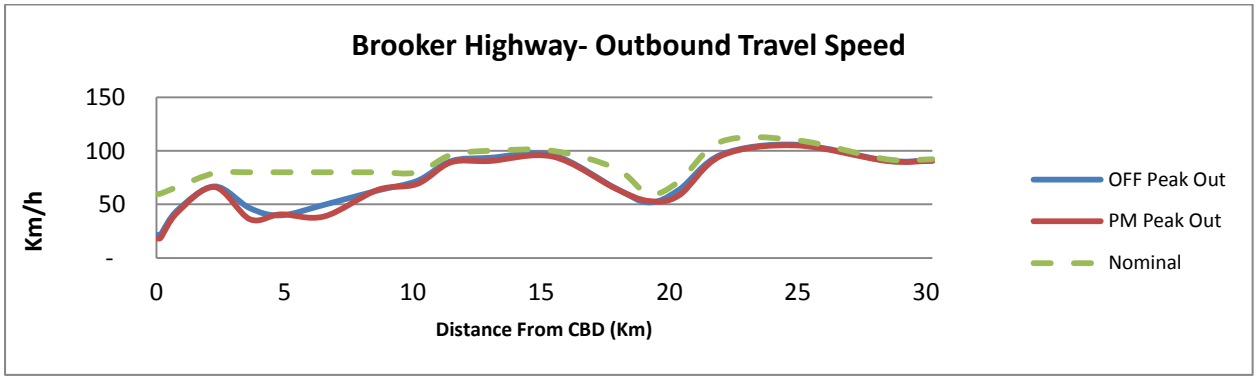
Appendix 4 – Cumulative and segment travel speeds

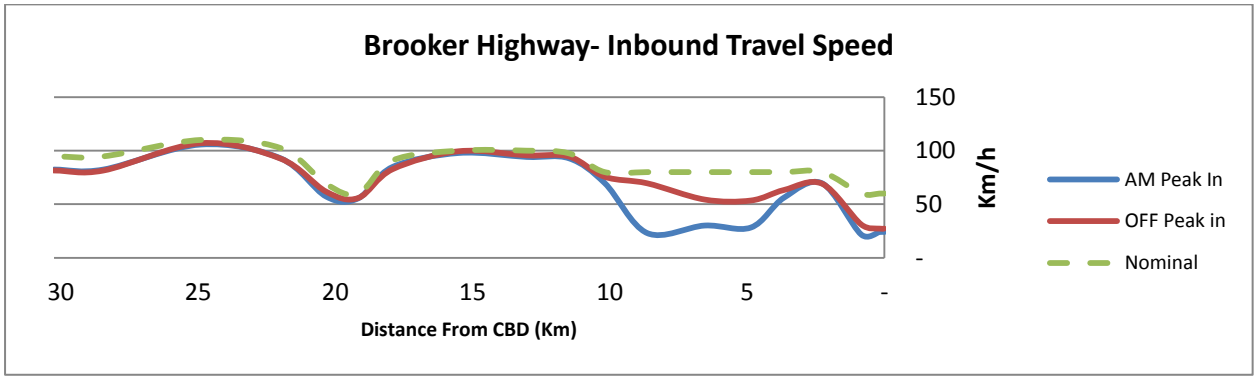
Tasman Highway



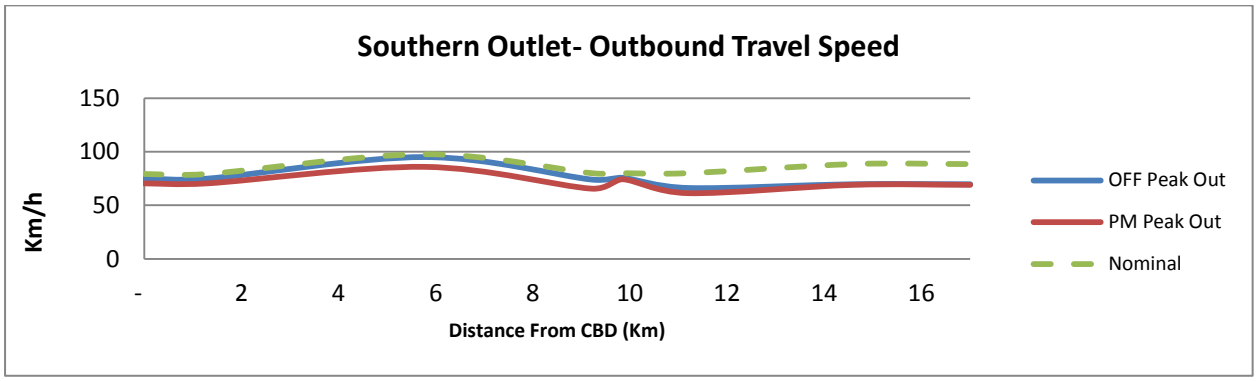


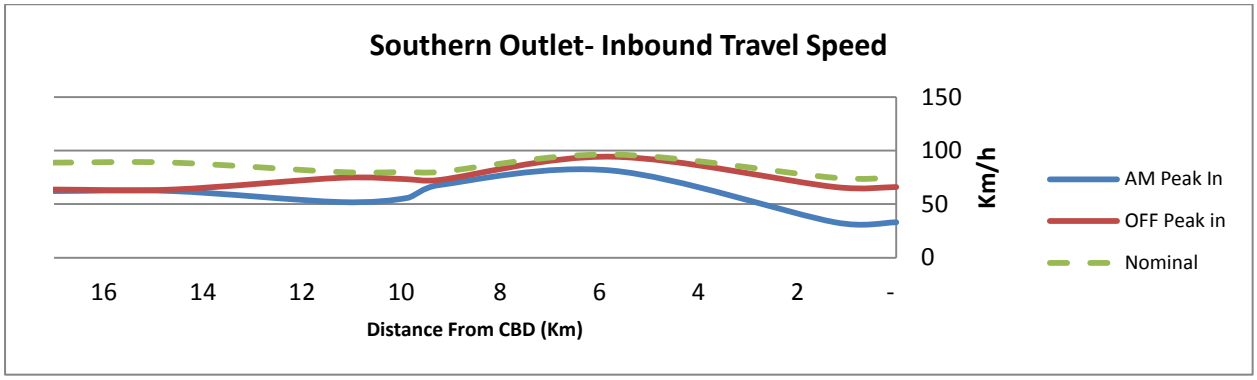
Brooker Highway





Southern Outlet





Appendix 5 – Calculated values and indicators

The values and indicators used in this Survey are detailed in the table below. Most indicators are based on Austroads methodology; however the following distinction is noted:

> **Austroads Indicators** provide a single aggregated value based on a representative sample of the network.
> **DIER Indicators** provide a value based on the entire route, a specified distance boundary (eg 10km from CBD) or network segment.

Value/Indicator	Unit	Description	Comment
Actual Travel Time	mm:ss sec/km	Actual travel time refers to the recorded time during the Survey.	Time-stamped GPS data is collected at regular intervals to calculate time and speed values for specific routes
Average Travel Time (ATT)	mm:ss sec/km	Provides an average travel time for the length of route under review.	Representative aggregate used as Austroads Indicator
Average Travel Speed (ATS)	kph	Provides an average travel speed for the length of route under review – calculated as distance divided by time.	Representative aggregate used as Austroads Indicator
Nominal Travel Time (NTT)	mm:ss sec/km	Travel time for uninterrupted travel at the posted speed limit.	Representative aggregate used to calculate Austroads Congestion Indicator
Nominal Travel Speed (NTS)	kph	Travel speed for uninterrupted travel at the posted speed limit – calculated as distance divided by time.	Representative aggregate used as Austroads Indicator
Delay – AM, PM and inter-peak travel time compared to nominal travel time	mm:ss sec/km	Based on Austroads Congestion Indicator (CGI, where CGI=ATT-NTT)	Austroads Congestion Indicator is a representative aggregate Sec/km indicator provides the most reliable measure of change over time irrespective of changes to route length and alignment and changes to posted speed limit

Delay AM and PM vs inter-peak	mm:ss sec/km	Similar to Austroads CGI but using “inter-peak” instead of nominal travel time	Not used by Austroads or by other states Has interest value but problematic as congestion indicator – not comparable over time and does not provide a base line for comparison

Infrastructure Strategy Branch

Department of Infrastructure Energy and Resources

GPO Box 936, Hobart 7001

Ph: 1300 135 513

Visit:www.dier.tas.gov.au