

road safety issues

Auckland state highways

Land Transport New Zealand has prepared this road safety issues report. It is based on reported crash data and trends for the 2000–2004 period. The intent of the report is to highlight the key road safety issues and be a resource to identify possible ways to reduce the number of road deaths and injuries on Auckland state highways.

Apart from this front page, which has data for all of Transit New Zealand Region Two (TNZ Region Two), the body of the report refers to only those parts of TNZ Region Two not covered by the Auckland motorways issues report. Land Transport New Zealand has divided TNZ Region Two in this way as it is impossible to meaningfully compare the motorway system with the rest of the state highway network in the region.

This is the sixth road safety issues report for TNZ Region Two. In each new report, one year's data is added and the oldest dropped. It is therefore unlikely that the main issues for any road controlling authority will change radically from report to report. Issues chosen for this report are drawn from either the most common crash types or contributory factors or those that appear over-represented when TNZ Region Two is compared with similar Transit NZ regions.

Major road safety issues

Auckland state highways

Intersection crashes

Crashes on bends

Wet road crashes

Nationally

Speed

Alcohol

Failure to give way

Restraints



2004 road trauma for Auckland state highways



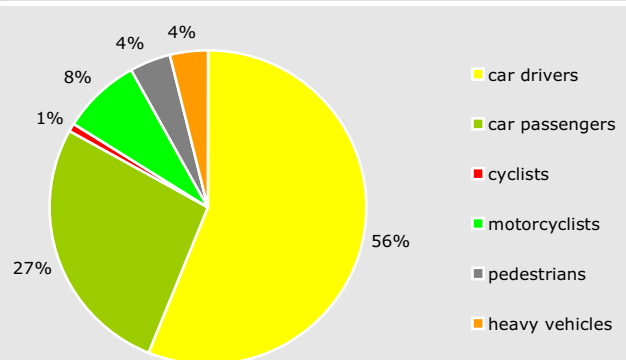
Deaths	21
Serious casualties	97
Minor casualties	757



Fatal crashes	20
Serious injury crashes	69
Minor injury crashes	535
Non-injury crashes	2,097

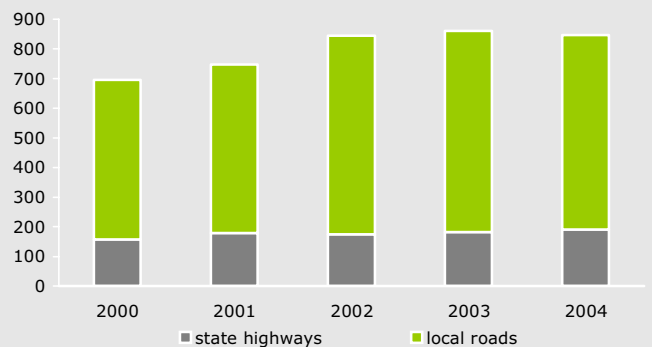
Fatal and serious casualties

User type 2000–2004



Estimated social cost of crashes*

Social cost (\$ million)



*The estimated social cost includes loss of life or life quality (estimated by the amount New Zealanders are prepared to pay to reduce their risk of fatal or non-fatal injury), loss of output due to injuries, medical and rehabilitation costs, legal and court costs, and property damage. These costs are expressed at June 2004 prices.

Regional overview

Transit New Zealand Region Two, exclusive of the motorway system, contains six state highways of significantly different character, both in geography and usage.

The following tables contain summaries of Police reported crash data for each highway for the five-year period 2000–2004 and for 2004.

Crashes reported 2000–2004

SH	Total	Injury	Non-injury	Fatal	Serious	Minor
16	495	178	317	13	53	211
17	161	55	106	4	22	68
18	388	127	261	7	39	158
1A	24	3	21	0	0	7
1N	1,031	293	738	30	130	322
22	156	59	97	2	12	62

Crashes reported in 2004

SH	Total	Injury	Non-injury	Fatal	Serious	Minor
16	101	36	65	1	13	46
17	31	16	15	0	6	22
18	58	23	35	0	11	28
1A	10	1	9	0	0	2
1N	200	57	143	7	24	72
22	41	14	27	2	4	11

Number of injury crashes by year

SH	2000	2001	2002	2003	2004
16	31	35	39	37	36
17	11	4	8	16	16
18	17	21	32	34	23
1A	1	1	0	0	1
1N	51	67	66	52	57
22	7	15	7	16	14

Percentage of crash characteristics by highway, all crashes 2004

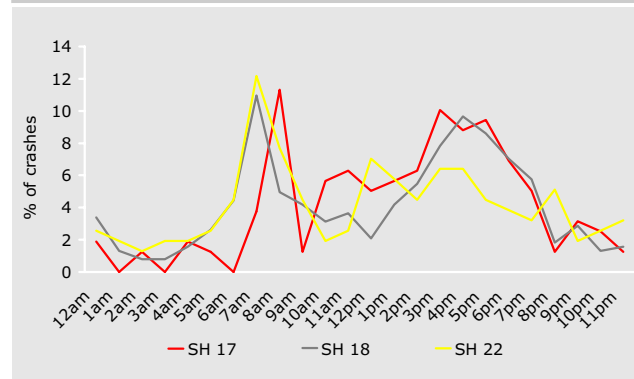
SH	Wet	Dark	Rural*	Intersection
16	25.7	23.7	72.2	36.6
17	38.7	22.6	48.4	61.3
18	31.0	29.3	13.8	32.7
1A	30.0	40.0	90.0	10.0
1N	36.5	27.5	79.5	25.5
22	39.0	39.0	82.9	26.8

* Rural is classified as a road with a speed limit of 80 km/h or more.

The differing characters of the highways can be illustrated in a number of ways, however, using the time of day of crashes it seems that the highways fall into two main groups.

The crash distribution by time of day is similar for State Highways 17, 18 and 22, while 16 and 1N are similar. (SH 1A has too few crashes to make this comparison).

Crash times on SH 17, SH 18 and SH 22 2000–2004



State Highways 17, 18 and 22 (above) show a crash pattern which reflects their usage as commuter routes, while State Highways 1N and 16 (below) show a more even distribution, with a bias toward the afternoon and early evening.

Crash times on SH 1N and SH 16 2000–2004

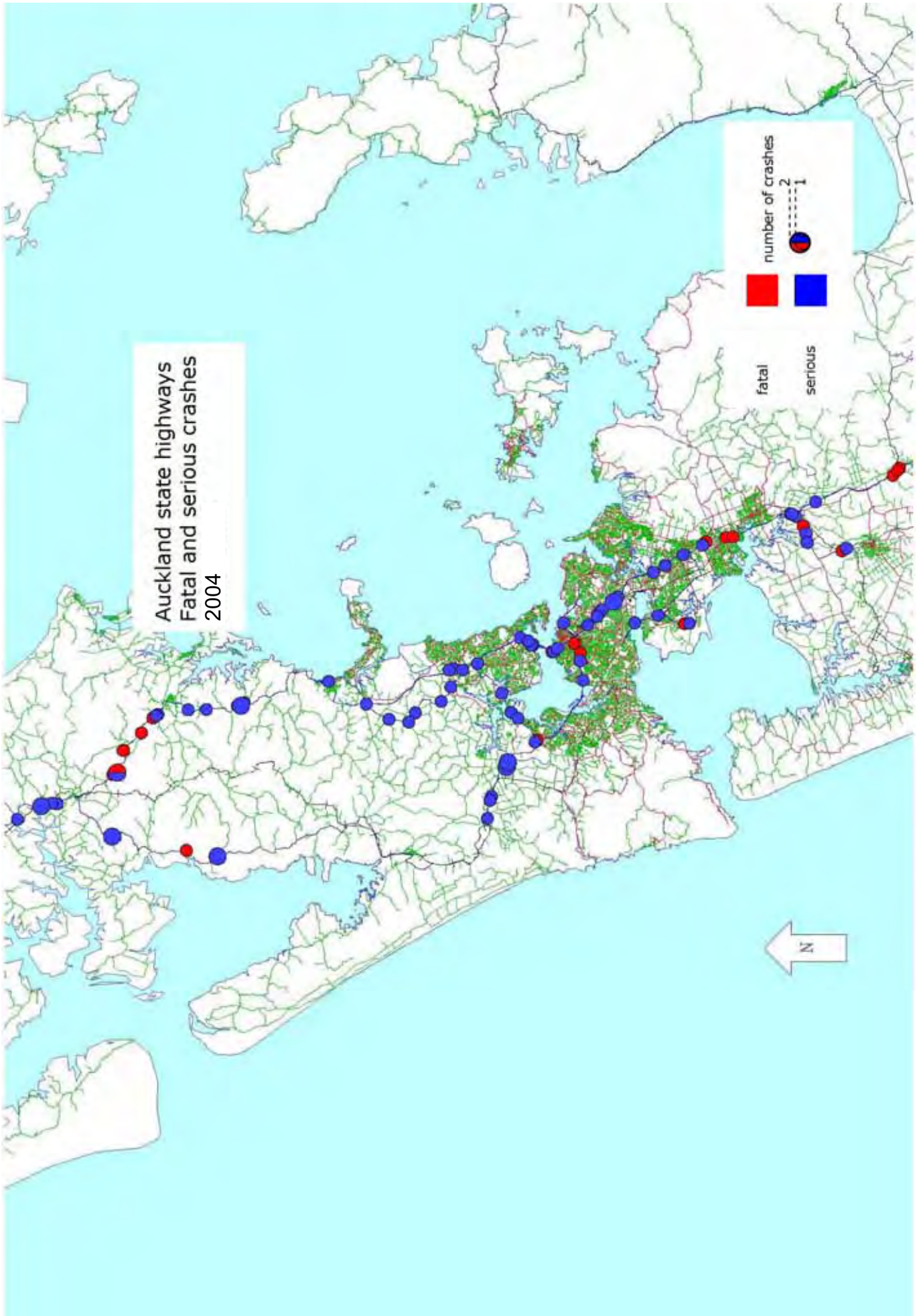


From 2000 to 2004, a total of 1,060 roadside objects were struck in crashes. This included 106 poles and 94 trees, as well as 142 ditches and 164 cliffs or banks.

Across all six highways the most common injury crash type was loss of control at a bend (35 percent), followed by crossing and turning crashes (often at intersections) at 21 percent.

Contributory factors to crashes as reported by Police included the usual errors of judgement, such as not checking properly before proceeding at an intersection or before overtaking or lane changing, travelling too fast for the conditions and alcohol.

The distribution of these factors differed between highways and is discussed in the rest of this document.

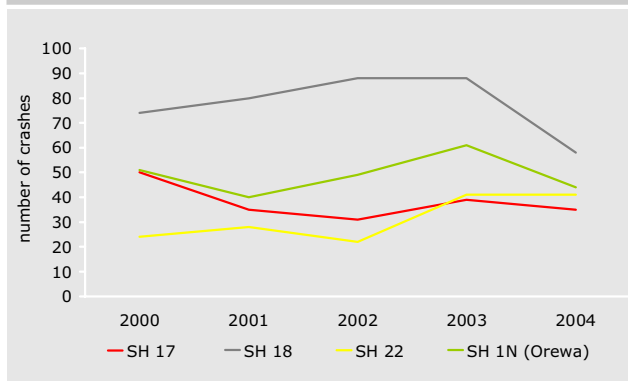


Issues 2004

As described in the overview section, it appears that SH 1N (north of Orewa) and SH 16 have similar travel patterns while SH 17, SH 18 and SH 22 are similar. For the purposes of this report we will refer to SH 1N (north of Orewa) and SH 16 as trunk highways and SH 1N (at Orewa), SH 22, SH 17 and SH 18 as commuter highways, fully accepting that no highway is entirely one or the other.

Issues for SH 17, SH 18, SH 22 and SH 1N (at Orewa)

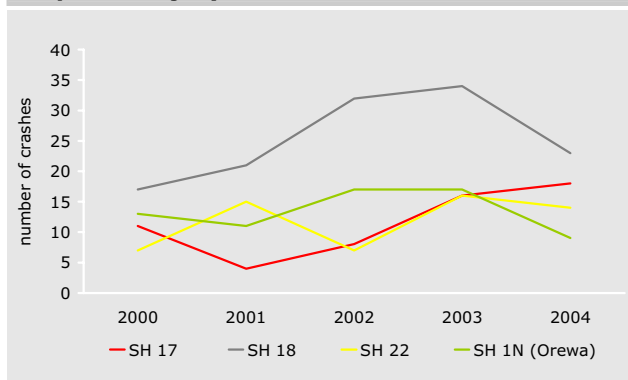
Reported crashes 2000–2004



When comparing these highways and looking at the total number of crashes reported between 2000 and 2004, only SH 22 showed a rising trend.

However, as the chart below indicates, all highways except SH 1N at Orewa showed a gradual rise in the number of injury crashes reported, with SH 17 showing the steepest rise (although the differences are not great).

Reported injury crashes 2000–2004



Overall, except on SH 1N at Orewa, between 40 and 50 percent of crashes on these highways occurred at bends.

With the exception of SH 22, a high proportion of crashes on these highways occurred at intersections. In particular, SH 17 with 65 percent of crashes at intersections was highly represented.

State Highway	Bends	Intersections
17	43%	65%
18	41%	45%
1N (at Orewa)	23%	54%
22	52%	33%

Intersection crashes

Between 2000 and 2004, there were 476 crashes at intersections on this network, including 130 injury and 346 non-injury crashes. Overall, the percentage of crashes that resulted in an injury has risen steadily, from 15 percent in 2000 to 34 percent in 2004. Some of this rise may be accounted for by a change in the overall reporting rate of crashes, however, there have also been greater increases in the number of crash types likely to result in injury than those that do not.

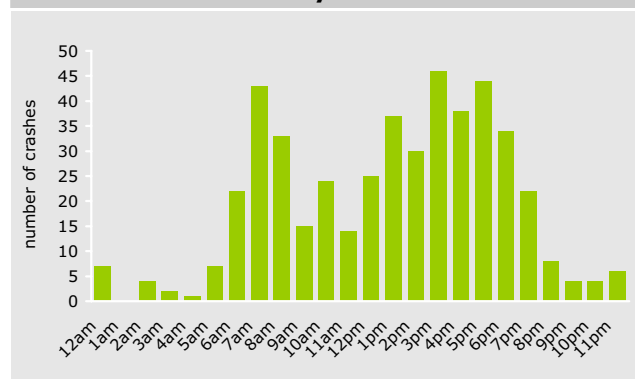
The most common crash types at intersections were either a vehicle turning right into a side road being hit by an oncoming vehicle or a vehicle turning right at a junction being struck by a vehicle approaching from the right.

There were 15 intersections on this network with 10 or more crashes reported from 2000 to 2004. Representing almost 46 percent of the total number of crashes, the top 10 intersections are listed below.

Intersection	Crashes	Overall crash trend
SH 17/Tawa Dr	38	Rising
SH 1N/Wainui Rd	25	Rising
SH 1N/Silverdale St	22	Falling
SH 18/Unsworth Dr	20	Falling
SH 18/Albany H'Way	18	Rising
SH 1N/West Hoe Rd	18	Rising
SH 1N/Red Beach Rd	18	Falling
SH 18/Caribbean Dr	16	Falling
SH 18/Brigham Creek Rd	16	Rising
SH 17/Oteha Valley Rd	14	Rising
SH 17/Coatesville-Riverhead Rd	13	Falling

Most crashes (78 percent) occurred during the hours of daylight, with a strong bias towards afternoon and early evening.

Intersection crashes by hour 2000–2004



Almost 60 percent of these crashes occurred in urban areas, which are classified as having a speed limit of 70 km/h or less.

The most common intersections involved were T junctions, recording over 70 percent of crashes. Crossroads were the next most common with only 10 percent of crashes.

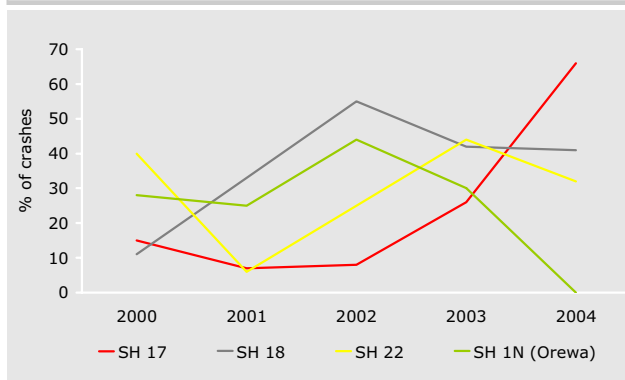
The most common crash causes were errors of judgement, not checking adequately for approaching vehicles, inattention and diverted attention. Positive alcohol tests were returned in four of the 130 injury crashes.

Crashes on bends

Between 2000 and 2004, there were 381 crashes at bends on these highways – 121 injury and 260 non-injury crashes.

During this period the number of injury crashes at bends remained relatively constant, however, the number of reported non-injury crashes generally decreased.

Injury crashes on bends 2000–2004



The trend on SH 17 should be of concern as the crash distribution is significantly different from the other highways in this group for this type of crash.

Injury crashes on bends on SH 17 were concentrated between Horseshoe Bush Road and around 650 metres south of Pine Valley Road and between The Avenue (at Albany) and 500 metres north-east of Potter Road.

The distribution of injury crashes on SH 18 and SH 22 was spread relatively evenly along their lengths while those on SH 1N were largely concentrated around the Silverdale area.

State Highway 17 and SH 1N both recorded around 20 percent of crashes on bends at night while SH 18 and SH 22 had around 40 percent at night.

All four highways had lower rates of wet road crashes than the rural average across all state highways (37 percent). For crashes on bends, this ranged from 18 percent on SH 17 to 33 percent on SH 18.

A significant number of crashes on bends were also at intersections, emphasising the additional problems motorists have in determining the approach speed of vehicles.

The table below illustrates this point for the most commonly represented crash groups. (Values are the percentage of this crash type in bend-related crashes).

Type of crash	SH 22	SH 1N	SH 18	SH 17
Overtaking/lane change	4%	14%	8%	13%
Head-on (swinging wide etc)	6%	9%	12%	4%
Cornering (usually single vehicle)	61%	21%	38%	30%
Rear-end (eg approaching traffic control)	2%	24%	15%	10%
Turning – same direction (eg rear of right turning vehicle)	5%	2%	5%	17%
Crossing (eg right turn from side road)	4%	7%	8%	10%

These figures show that if crash numbers at bends are to be reduced, many factors, apart from keeping the through vehicle on the road, need to be considered.

As might be expected, a wide variety of contributory causes were reported by Police in relation to these crashes, which varied between highways.

Type of factor	SH 22	SH 1N	SH 18	SH 17
Alcohol tested over the limit	21%	0%	9%	7%
Too fast for the conditions	24%	13%	20%	35%
Cutting corner or swinging wide	0%	0%	7%	6%
Lost control turning	9%	13%	18%	12%
Fatigue or illness (sudden or ongoing)	6%	7%	29%	18%

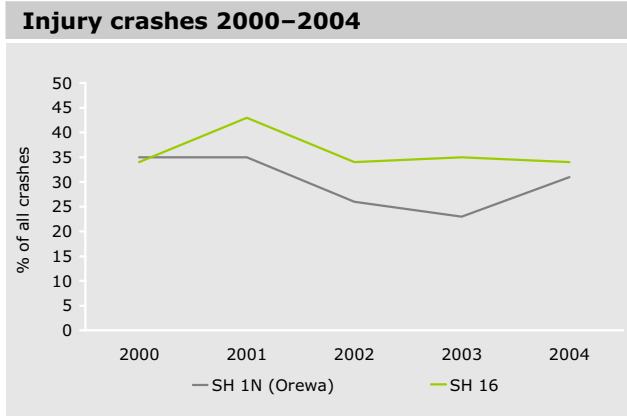
Perhaps what is surprising here is the high number of positive alcohol test results on SH 22; overall, alcohol was considered a factor in 26 percent of bend crashes on this highway.

In addition, the high number of fatigue or illness-related crashes on SH 18 is a surprise. Interestingly, almost 90 percent of these were sudden illnesses (eg heart attacks) or ongoing illnesses (eg flu). Why this was so common on this particular highway is unknown.

The high number of crashes involving driving too fast for the conditions is predictable for crashes on bends.

Issues for SH 1N (north of Orewa) and SH 16

Between 2000 and 2004, there were a total of 1,183 crashes reported on these highways. On SH 1N there were 206 injury and 486 non-injury crashes while on SH 16 there were 176 injury and 315 non-injury crashes. (Note: these totals are a little different to the overview on page two, which does not divide SH 1N at Orewa).



The chart above shows the proportion of injury crashes on each highway. The proportion of injury crashes to all crashes reported can be taken as a proxy for the reporting rate when comparing similar roads. The higher the percentage of injury crashes, the lower the overall reporting rate generally is.

As the relative proportion of injury crashes on SH 16 is higher than that of SH 1N, it could be concluded that the overall reporting rate is lower on this highway. Therefore, it is important that in costing remedial measures for SH 16, this potentially lower reporting rate is taken into account.

While the most common type of crash on these two highways were crashes at bends, there were also a significant number of rear-end crashes or crashes with an obstruction.

Three quarters of crashes happened away from intersections and 28 percent occurred at night. Forty percent occurred in wet conditions, well over the 33 percent average for state highways in New Zealand.

Crashes on bends

Crashes on bends can be found along the entire length of these two state highways, however, those on SH 16 are numerically clustered between the end of the north-western motorway and Huapai.

On SH 1N, the highest number of crashes can be found between Wellsford and Orewa. As with SH 16's concentration, this is more likely related to traffic volume than highway quality.

The number of bend-related crashes and resulting injuries (2000–2004) are shown in the table below.

SH	Injury	Non-injury	Fatal	Serious	Minor
1N	139	309	18	82	156
16	82	131	8	28	85

Just over half of all crashes on bends on SH 1N and 34 percent on SH 16 occurred in wet conditions. Both of these values were above those for crashes on bends on the four commuter highways.

The very high proportion of wet road crashes on SH 1N bends suggests that frictional values on this highway are not keeping up with wear rates.

Unlike the crashes on bends on the commuter highways, only 10 percent of the on-bend crashes on these trunk highways were associated with an intersection. As a result, the most common crash type on both highways was single vehicle loss of control.

Type of crash	SH 1N	SH 16
Overtaking/lane change	8%	5%
Head-on (swinging wide etc)	20%	11%
Cornering (usually single vehicle)	56%	46%
Rear-end (eg approaching traffic control)	8%	5%
Turning – same direction (eg rear of right turning vehicle)	1%	9%

A wide variety of contributory causes were reported by Police in relation to these crashes.

These factors varied between the two highways as illustrated in the table below.

Type of factor	SH 1N	SH 16
Alcohol tested over the limit	3%	13%
Too fast for the conditions	29%	18%
Cutting corner or swinging wide	9%	6%
Lost control turning	14%	12%
Fatigue or illness (sudden or ongoing)	19%	12%
Slippery road surface *	26%	5%

*Note: the crash analysis system does not assume a wet road is slippery and this factor is only added when the reporting Police Officer makes special mention in their report.

What this table does reinforce is that in regard to the high numbers of wet road crashes on SH 1N, the Police are noting 'slippery road' as an issue at a considerably higher level than on other highways.

The high numbers for driving too fast for the conditions is an expected result for crashes on bends. However, the number of drivers crashing at bends when they are tired or sick is surprising.

Wet road crashes

During the years 2000 to 2004, a total of 131 reported crashes occurred in the wet on SH 16 and 338 on SH 1N, representing 27 and 49 percent of all crashes respectively.

The average rate of wet road crashes nationally on state highways was 33 percent for this period, making the value for SH 1N of considerable concern.

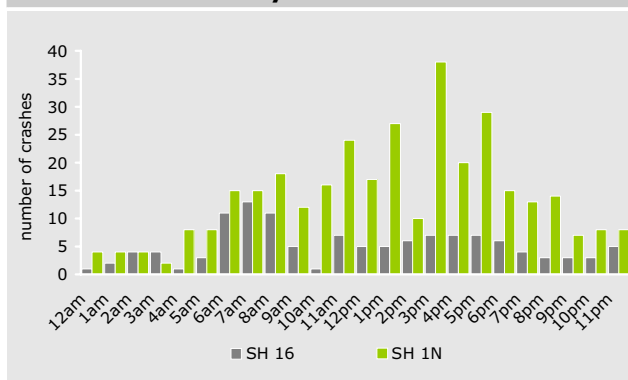
This issue has been noted in past issues reports and Transit Auckland have been considering options for dealing with the problem.

The specialist task force teams that are looking at high crash rate sections of highways are aware that this is a significant problem for SH 1N.

Wet road crashes on SH 16 were largely clustered on the section from the end of the north-western motorway to Helensville.

On SH 1N, wet road crashes were an issue along the whole length but in particular between Kaipara Flats Road and Ross Road and between Mahurangi West Road and 2 km north (the infamous Schedewys Hill, which has been a recognised and documented black spot for almost 25 years). There was also a concentration either side of Wairewa, another known black spot for almost 25 years.

Wet road crashes by hour 2000–2004



Crashes on SH 16 reached a peak in the morning while those on SH 1N climbed steadily toward the mid-afternoon, reducing in the evening.

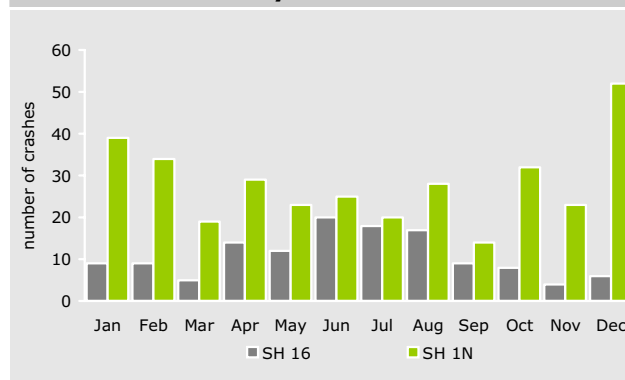
As the hours that these crashes occurred were generally not during prime drink-driving times, it was not surprising that only three drivers on SH 16 returned positive alcohol tests in injury crashes and only one on SH 1N.

Over half of the crashes involved loss of control at bends. However, a significant proportion (20 percent) involved a rear-end collision.

Interestingly, 15 percent of injury crashes on SH 16 involved travelling too fast for the conditions, while this figure was 34 percent on SH 1N.

The seasonal pattern of crashes on these highways is almost a mirror image of each other, with crashes on SH 1N reaching a peak in the summer months while those on SH 16 peaked during winter. It is not clear why this is so, however, it could give an indication as to the most effective time to reseal each highway.

Wet road crashes by month 2000–2004



On SH 16, 11 percent of crashes were (in the opinion of the reporting officer) contributed to by an issue with the road surface, such as being unusually slippery due to rain or loose material on the seal.

On SH 1N, surface issues were reported in a remarkable 31 percent of wet road crashes. Of this total, 16 percent involved the road being slippery due to fuel/diesel spillages, which was about three times higher than the expected value. Nationally, oil and diesel on the road accounted for 0.8 percent of all crashes while on SH 1N they accounted for 2.4 percent. This may be due to the differing terrain, a different vehicle mix (more of those likely to drop oil) or some operators who use this highway having less than optimal maintenance schedules.

Road environment

The Land Transport New Zealand crash reduction monitoring database shows that works implemented as a result of crash reduction studies have reduced crashes at the study sites by 43 percent on Auckland state highways.

Recommendations from recent studies should be implemented as soon as possible. Analysis of the crashes at all completed sites should be undertaken regularly to ensure that safety has been improved and sites re-examined if no improvement has occurred. Further crash reduction studies should be undertaken to continue the reduction of crashes.

Where to get more information

For more specific information relating to road crashes in Transit New Zealand Region Two, please refer to the 2000 to 2004 road safety data report, the Land Transport New Zealand crash analysis system or contact the office listed opposite.

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