



Appendix E A570 Accident Plots













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Appendix F Accident Rate Calculation

30/01/2012 21/02/2012

M58 to Southport Corridor Study

A570 Accident Rate Calculation

1. Purpose

To compare the observed number of accidents on the A570 with the number predicted by published default accident rates.

2. Methodology

The observed number of Personal Injury Accidents (PIAs) was compared with the number of PIAs predicted by national default accident rates. This analysis was undertaken on the A570 between the M58 junction and the B5276 roundabout near Southport.

National default accident rates were taken from COBA, the industry-standard DIT software for predicting accident numbers during transport appraisals. COBA accident rates vary depending on the speed limit of the road and its classification (e.g. Modern Dual-Carriageway, Motorway, Older Single-Carriageway). This analysis therefore involved splitting the A570 into several different sections, depending on its characteristics.

Accident rates in COBA are quoted in accidents per million vehicle-kilometres (Veh-Km). Veh-km are derived by multiplying the length of a road by its flow. To derive the number of predicted accidents it is therefore necessary to know the Veh-Km - this is simply the length of road multiplied by its flow. The length of each of section of road was measured using Google Earth, and the flow was extracted from Automatic Traffic Count (ATC) sites at the locations shown in Figure 6. The ATC flow data, which is shown in Table 2, was provided in Average Annual Daily Traffic Flow (AADT) - this was multiplied by 365 to derive the traffic over a whole year.

TABLE 1						
		Speed Limit	Distance (km) (A)	Representative ATC Site ID	2-way AADT Flow (B)	Annual Veh-Km (C = A x B x 365)
Section 1:	M58 to University (Slack House Fm entrance)	60mph	3.65	6317	14834	19,762,121
Section 2:	University to start of town centre loop	30/40mph	0.96	6317	14834	5,197,708
Section 3:	A570, Town Centre one-way loop	30/40mph	0.88	7066	30092	9,665,599
Section 4:	End of town centre loop to Heskin Ln (north of Ormskirk)	30/40mph	1.28	5396	12598	5,885,776
Section 5:	Heskin Ln to Pinfold (outside United Utilities Works)	60mph	2.41	5396	12598	11,081,813
Section 6:	Pinfold to B5276 roundabout	40mph	6.02	5396	12598	27,681,542

TABLE 2 - ATC AADT flows

			2009-2010
ATC site	2009	2010	average
6317	15103	14564	14834
7066 (one-way flow)	15451	14641	15046
5396	12929	12267	12598

NB. The 1.76km one-way system with 15,000 flow per direction was treated as a 2-way road with half the length (i.e. 0.88km 2-way road with flow 30,000 flow). This is because all COBA rates are for 2-way roads.

The purpose of this analysis was to compare the predicted number of accidents with the observed number of accidents. Observed accident data was collected for 5 years between 2006 and 2010. To compare, it was therefore necessary to calculate how many accidents would be predicted to occur over 5 years based on COBA's accident rates. To derive this, the 5-year Veh-Km for each section of road was multiplied by the relevant COBA accident rate (taken from Table 4/1 in Part 2 of the COBA manual). This is calculated in Table 3, below. Note that COBA accident rates are based on data from 2000, but is known that accident rates fall over time. COBA therefore provides factors to convert from 2000 accident rates to rates for any other year. These factors are provided in Table 4/1 of the COBA manual, with the methodology stating how to use these factors directly preceding the table. As the A570 observed accident rate was based on 2006-2010 data, COBA accident rates were calculated for 2008 (the central year of 2006-2010).

TABLE 3 - Predicted and Observed Accident Numbers

Section	Road	Annual Veh-Km (from Table 1) (A)	5 year Veh-km (B = A x 5)	Road Type (see Table 4/1 in Pt. 2 of the COBA manual)	Default Acc Rate per mvkm (2000 base)	Default Acc Rate per mvkm (2008) (C)	Predicted Accidents over 5 years (D = B x C)	Observed Accidents over 5 years
1	M58 to University (Slack House Fm entrance)	19,762,121	98,810,604	Older S2 A road - over 50mph	0.381	0.306	30	20
2	University to start of town centre loop	5,197,708	25,988,542	Older S2 A road - under 50mph	0.844	0.742	19	7
3	A570, Town Centre one-way loop	9,665,599	48,327,994	Older D2 road	1.004	0.882	43	75
4	End of town centre loop to Heskin Ln (north of Ormskirk)	5,885,776	29,428,882	Older S2 A road - under 50mph	0.844	0.742	22	24
5	Heskin Ln to Pinfold (outside United Utilities Works)	11,081,813	55,409,066	Older S2 A road - over 50mph	0.381	0.306	17	26
6	Pinfold to B5276 roundabout	27,681,542	138,407,710	Older S2 A road - under 50mph	0.844	0.742	103	58
NB. COBA does not include an accident rate for one way roads. Therefore, the A570 one-way system (Section 3) has been coded as a dual carriageway to reflect the fact that traffic is segregated.							234	210

COBA can also be used to predict the severity of accidents. Table 4 calculates how many accidents are predicted to fall within each class of severity (fatal, serious and slight). This is based on proportions taken from Table 3/2 of Part 2 of the COBA manual. In a similar way to the change in accident numbers over time discussed above, the severity of accidents also changes over time. Table 4 calculates the number of accidents of each severity type based on data from 2000, then adjusts these to 2008 proportions based on the factors in Table 4/1 of Pt 2 of the COBA manual.

The methodology stating how to use these factors are found in paragraph 3.3 of Pt 2 of the COBA manual.

TABLE 4 - Predicted and Observed Accident Numbers by Severity

Section	Predicted Accidents over 5 years (from Table 3)	Predicted Fatal Accs (based on 2000 severity proportions)	Predicted Serious Accs (based on 2000 severity proportions)	Predicted Slight Accs (based on 2000 severity proportions)	Predicted Fatal Accs (based on 2008 severity proportions)	Predicted Serious Accs (based on 2008 severity proportions)	Predicted Slight Accs (based on 2008 severity proportions)	Observed Fatal Accs	Observed Serious Accs	Observed Slight Accs
1	30	1	6	23	1	5	24	0	1	19
2	19	0	2	17	0	2	17	0	0	7
3	43	0	5	37	0	4	38	0	11	64
4	22	0	3	19	0	2	19	0	2	22
5	17	1	4	13	1	3	14	0	5	21
6	103	1	13	89	1	11	90	2	12	44
TOTAL	234	3	33	197	3	28	203	2	31	177

3. Results

A summary of the 2006-2010 predicted and observed accident rates is provided in Table 4, below.

	Total Accidents	Fatal Accidents	Serious Accidents	Slight Accidents
Predicted	234	3	28	203
Observed	210	2	31	177

TABLE 4 - SUMMARY OF 2006-2010 PREDICTED AND OBSERVED ACCIDENT RATES