File Note

Project	**A40 Llanddewi Velfrey to Penblewin Improvements**
Subject	Review of Accident Data
File Reference	A40LVP-ARP-VTR-SWI-FN-TR-0001
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1.1 Purpose of this document

1.1.1 Philip Thiele (traffic & economics expert witness) referred to additional information about the forecast accident analysis undertaken as part of the economic appraisal while giving evidence at the Public Local Inquiry on Tuesday 10 March 2020.

1.1.2 The purpose of this Public Inquiry document is to provide written evidence of this additional information because it is not captured at this level of detail in the Traffic Forecasting Report (Doc. 4.05.03) and Economic Assessment Report (Doc. 4.05.05).

1.1.3 This note concludes that the monetised accident benefit is conservative on the basis of the severity split assumption that has been applied to the proposed Wide Single 2+1 (WS2+1) road.

1.2 Additional information about accident analysis

1.2.1 COBALT (COst and Benefit to Accidents – Light Touch) is a computer program developed by the Department for Transport (DfT) that facilitates an analysis of the impact on accidents as part of the economic appraisal for a road scheme. COBALT allows users to carry out economic appraisals in accordance with the DfT's Transport Analysis Guidance (WebTAG).

1.2.2 COBALT forecasts the number of accidents using traffic volumes output from the traffic model and accident rates, which vary by link type. It also uses information about severity splits of accidents categorised into fatal, serious and slight accidents. In order to allow for monetisation of accident savings the software includes monetary costs related to the each of the three casualty severities, as well as costs associated with insurance administration, damage to property and police costs. Figure 1 outlines the process used within COBALT

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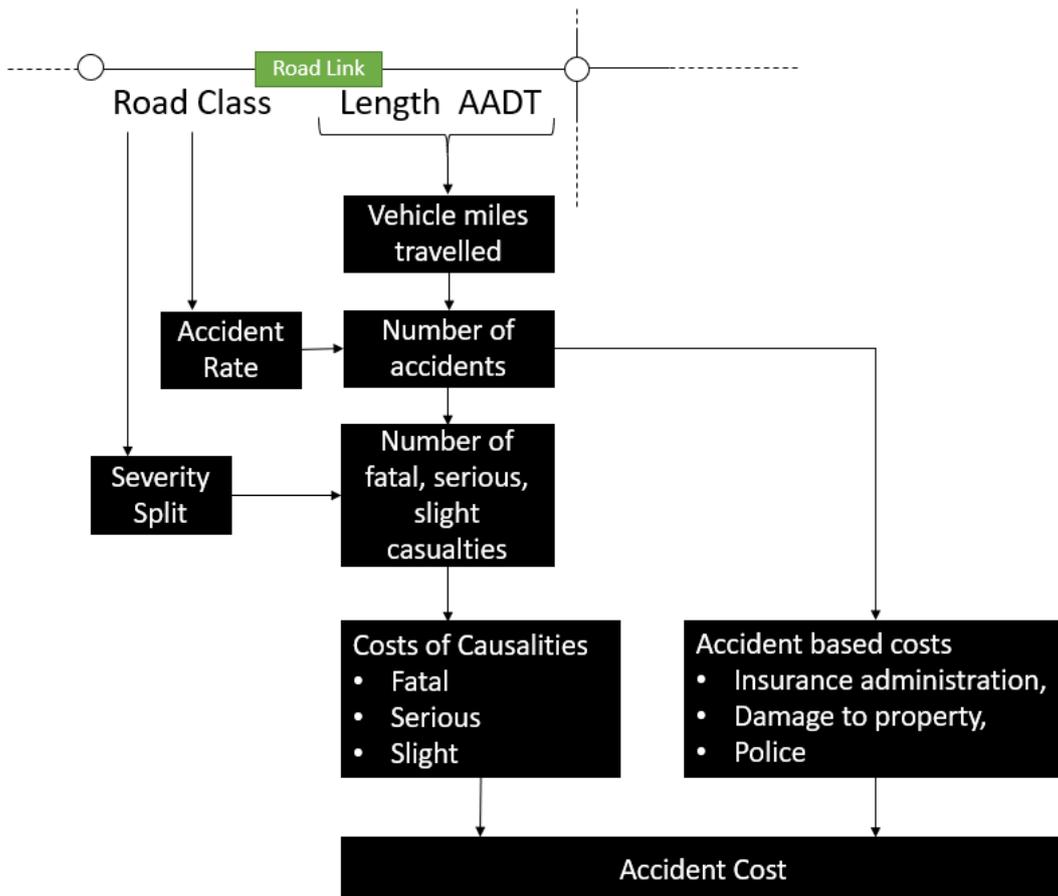to derive monetised accident benefits.

Figure 1 – Methodology for calculating monetised safety benefits in COBALT software

1.2.3   COBALT requires the following inputs for the calculations: road classification with speed limit, length of each road link representing a homogenous section of the network, and Annual Average Daily Traffic (AADT) on each link for each forecast year for both Do Minimum (without Scheme) and Do Something (with scheme) scenarios.

1.2.4   By default, COBALT applies national average accident rates by road class from WebTAG based on the road classification input. The national average accident rates (accidents per million vehicle-kilometres) can be overridden with locally derived rates based on STATS19 accident records (police records of all personal injury accidents). Local accident rates are more reflective of the specific circumstances within the study area and therefore it is commonplace to derive these to override national default values. This was the case in the forecast accident analysis for this Scheme.

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1.2.5   The number of casualties resulting from accidents is split by severity into fatal, serious and slight. The basis for the severity splits are national averages by road type taken from WebTAG. It is currently not possible to apply a locally derived severity split within COBALT and historically the advice in COBA (a now superseded software package that included functionality for accident analysis) was to use national severity splits even when applying local accident rates. This recommended approach has been adopted for this Scheme.

1.2.6   The severity split used in COBALT is therefore based on the national average by road type. Nonetheless, locally derived severity splits are included in this note to illustrate how they compare to the national averages that have been used in the monetisation of accident benefits.

1.2.7   Given that the Wide Single 2+1 (WS2+1) road type does not exist within the COBALT software, the severity split for a single carriageway > 40mph has been used as the closest available equivalent road type. This makes the results of the COBALT accident analysis conservative on the basis that the locally observed severity split applicable to WS2+1 roads calculated along A40 St Clears to Haverfordwest section shows a lower percentage of fatalities and serious injuries than the national average for single carriageway roads, as shown in bold and grey highlighting in Table 1.

Table 1 – Link and junction accident severity splits (average of years 2006 to 2015)

Location	Local observed			National average		
	Slight	Serious	Fatal	Slight	Serious	Fatal
Single carriageway > 40mph	81.0%	14.3%	4.8%	**79.2%**	**17.6%**	**3.2%**
Wide Single 2+1 > 40mph	**83.3%**	**16.7%**	**0.0%**	N/A	N/A	N/A

1.2.8   COBALT applies a cost per casualty as shown in Table 2 in order to calculate the monetary cost of accidents for both Do Minimum (without Scheme) and Do Something (with Scheme) scenarios. The comparison of the total accident costs in the Do Something against the Do Minimum give the accident benefit quoted in the economic appraisal.

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Table 2 – Cost per casualty

Severity	Cost per Casualty (£)
Fatal	1,556,244
Serious	174,878
Slight	13,481

1.2.9 Table 2 shows that the ratio of cost per fatality compared to serious and slight casualty is roughly 100:10:1. This means that even though the number of accidents is forecast accurately (due to the use of locally derived accident rates), the limitation of the COBALT software, which does not allow for local severity splits to be applied, has a negative impact on the overall accident benefits. This is because the COBALT software overestimates the proportion of fatal and serious accidents on the proposed WS2+1 road, because the severity split it uses is based on the national average for single carriageway roads with speed limits >40 mph.

1.2.10 Therefore, the monetised accident benefits included within the economic appraisal results represent a conservative value, because the saving in fatal and serious accidents would be higher than calculated in the analysis.

Approvals

Revision	Status	Role	Name	Date
P02	S4	**Author**	Gabor Jenei	12/03/20
		Checker	Philip Thiele	12/03/20
		Approver	Tom Edwards	12/03/20
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