

## TOPIC 9: Traffic management and its costs versus casualty savings

October 2010

Wp Ref Website/TOPIC 9 JUNCTION DELAYS

Over the past decade the traffic engineers have restricted capacity at the most critical points in the road network, namely the junctions. They have done that by a series of minor, almost insignificant, measures e.g.

- (1) Arranging matters so that all the traffic lights show red long after green would be sensible at least somewhere.
- (2) Setting stop lines back by two or three car lengths at signal controlled junctions. That reduces the number of vehicles that can exit when the traffic lights turn green so generating queues when none need exist.
- (3) Channelisation schemes that allocate a particular lane to each turning movement. The result is congestion for the major movements while lanes for the minor movements stand empty. [Click to see pictures](#)
- (4) Road markings and traffic islands that restrict the number of lanes at stop lines to the number on the approach roads thereby ensuring that perhaps only half the capacity of the intervening the links can be use.
- (5) Banning turns; even left and straight ahead turns are not immune from that. The consequences are substantial detours and overloading at other junctions.
- (6) The installations of thousands of signal controlled pedestrian crossings that show red long after a loan pedestrian may have crossed.
- (7) Bus lanes that often carry as little as one vehicle every 10 minutes.

There has also been a progressive lowering of speed limits so extending journey times. For example, the DfT Circular 01/2006 advises local authorities to set see limits at the median speed rather than, as hitherto, at the 85<sup>th</sup> percentile. The effect of that would be to reduce all speed limits by 5 mph and to ensure that half the population, instead of 15%, would be driving at a speed lower than they would otherwise choose.

The calculations in [Appendix 1](#) provide indicative costs associated with those measures along with the cash values of the casualty savings associated with speed reductions. Here is the summary where the price base is 2008 and where the costs exclude the fuel and other operating costs imposed on vehicles held stationary at junctions or in congested conditions.

**Delay:** One minute per thousand vehicles/day at a junction costs £83,700 per year. Two minutes added to all vehicle trips would cost £12 billion annually.

**Diversions:** Adding 1 km to 1,000 journeys per day, where the speed is 40 kph (25 mph), costs £189,000 per year. Adding 1 km at 40 kph to all vehicle trips would cost £13.5 bn annually. Since most journeys start or end in urban areas and since it is there that most diversions occur, 40 kph (25 mph) is reasonable.

**Speed:** Reducing the speed of 1,000 cars per day from 25 to 20 mph over 5 miles would cost £234,000 per year. The same speed reduction imposed on all cars and vans on urban roads would cost £12.0 bn per year and a 5 mph speed reduction on cars and vans on all roads would impose time costs of £16.5 bn.

**Casualty savings:** The cash value of the casualties saved by reducing speeds by 5 mph is only £3 billion, far below the £16.5 bn cost of the time delay.

**Comment:** The polices pursued these last 15 years have imposed delay costs on the nation that are far in excess of the value of any possible casualty saving. Since the values used by the DfT reflect the way people behave when faced with some small risk, the implication is that, rather than slowing us down, they should be speeding us up.

**Worse still,** the polices pursued these last 15 years appear to have sabotaged the long established downward trend in road deaths rather than accelerating that trend, see.

<http://www.transport-watch.co.uk/transport-speed-cameras.htm>

**Note on sources:**

Calculations are in Appendix 1. They depend on:

- (a) National data dealing with the value of time and vehicle operating costs as published in Unit 3.5.6 of the Department of Transport's Transport Appraisal Guidance, Web TAG at <http://www.dft.gov.uk/webtag/documents/expert/unit3.5.6.php>
- (b) The 2009 edition of Transport Statistics Great Britain, the TSGB
- (c) The 2006 National Travel Survey.

## Appendix 1 Calculations

### Delay:

- (a) The value of time at 2002 prices for the average vehicle, available from the DfT's Transport Analysis Guidance (WEB TAG) module 3.5.6. Paragraph 1.2.30, is £11.28 per hour <http://www.dft.gov.uk/webtag/documents/expert/unit3.5.6.php#012>. Inflating to 2008 using the RTPI adds 22% yielding £13.76 per hour. Hence the delay cost for as few as 1,000 vehicles/day delayed for one minute at a junction amounts to £83,700 per 365 day year
- (b) The 2006 National Travel Survey provides 430 car driver trips per head per year, NTS table 3.4. If we assume 55 million people then the total car driver trips per year amounted to circa 23.65 billion. Applying the average time cost for all vehicles (£13.76) to that and setting delay to two minutes yields £10.85 billion at 2008 prices. Cars account for 80% of traffic flow. However the journey lengths of other classes of vehicle may be longer and greater proportion of those trips may be in rural areas. Consequently those other vehicles will be less affected by traffic management measures. Hence in this calculation the delay cost of £10.85 billion suffered by cars is set to 90% of the delay to all vehicles, providing a total for all vehicles of £11.93 bn. (see spread sheet, sheet 1).

### Diversions:

- (a) WEB TAG provides formulae that generate vehicle operating costs. We used those to obtain the market price for those costs. Adding the time cost generated 51.88 pence per vehicle-km at 2008 prices including tax, see spread sheet, sheet 2. Multiplying by 1,000 vehicles/day and by the 365 days in the year yields £189,400 per km
- (b) If, as above, we take the 430 car driver trips per head per year and multiply by the population, here set to 55 million, and by 51.88 pence per veh-km we obtain an annual cost of £12.3 billion. Adding ten percent for other vehicles yields £13.5 billion.

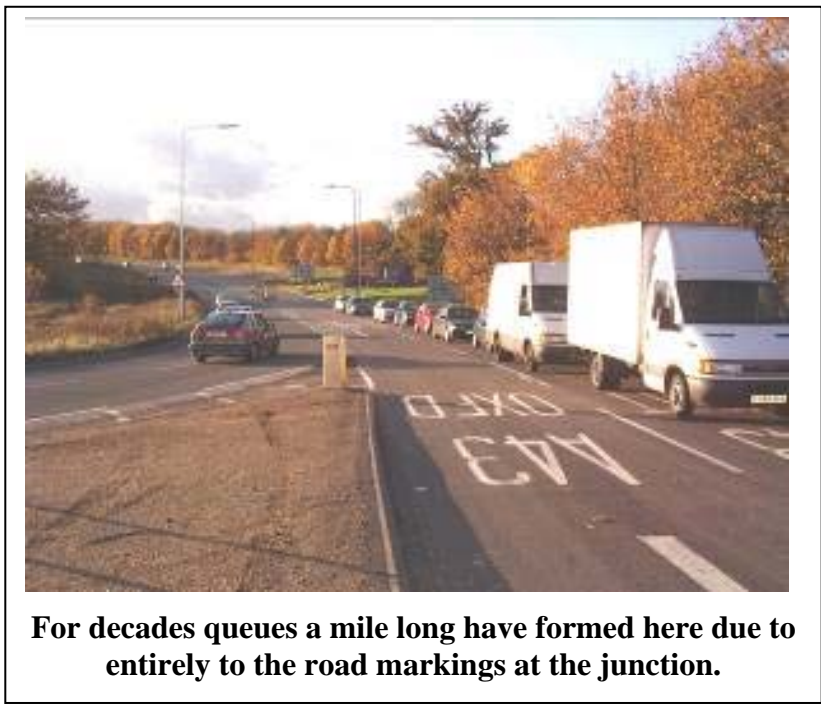
### Speed:

The WEB TAG value of time for cars at 2002 prices is £10.5 per hour. Inflating by the RTPI to 2008, 22%, yields £12.81. Hence the time cost of slowing 1,000 cars per day over 5 miles from 25 to 20 mph is  $£5 \times [(1/20) - (1/25)] \times 1000 \times 365 = £234,000$  per year.

In the table below the Vehicle-km are for cars and vans. The source data is from the 2009 TSGB. The speeds are those suggested by TSGB tables 7.10 and 7.11 except for "urban other" where 25 mph rather than 30 mph has been used as the initial speed. See spread sheet, sheet 1 for detail

**Casualty savings:** TRL reports 421 and 511 provide accident savings per mph of speed change. The calculations in spread sheet, sheet 3 use values based on those reports. The savings have a cash value of only £3bn. The table below summarises.

<b>Time cost of 5 mph speed reduction on cars and vans and The corresponding casualty saving</b>				
	Veh-km bn	Speed Mph	Time loss £bn	Casualty saving £ billion
Motorways	87.3	70	0.76	0.133
<b>A-roads</b>				
Rural Duals	32.3	69	0.29	0.695
Rural Singles	98.5	53	1.54	
Urban Duals	31.6	40	0.90	0.733
Urban Singles	44.6	30	2.36	
<b>Other roads</b>				
Rural	68.4	40	1.94	0.460
Urban	109.5	25	8.70	0.939
	<b>Sub total Rural</b>		2.231	1.155
	<b>Sub total - Urban</b>		<b>11.95</b>	1.672
		<b>TOTAL</b>	<b>16.48</b>	2.960



**For decades queues a mile long have formed here due to entirely to the road markings at the junction.**



**This leads to these queues.**

**Prescriptive road marking lead inevitably to needless delay. Rub out the arrows at left, encourage deference and good use of road space and the queues would vanish.**



**Sensible at last.**