

Traffic Data Worksheet Activity

Transport Scotland has installed a number of Automatic Traffic Counters (ATCs) on Trunk Roads across Scotland, including at various locations on the A9. These count each vehicle that passes over a sensor embedded in the carriageway and records the number of vehicles using the road on a particular day. The number of vehicles using the A9 varies depending on the time of day, day of the week and month of the year.

One way to count traffic is as an **Annual Average Daily Traffic (AADT) flow**. This is the number of vehicles that use the road on an average day. It is calculated by totalling the traffic on the road for all days of the year and dividing by the number of days in that year (usually 365).

Another way to count traffic is the **Annual Average Weekday Traffic (AAWT) flow**, which is the average across Monday to Friday, ignoring the weekends.

Both AADT and AAWT are normally two-way flows.

The Table below summarises the average number of vehicles per day on part of the A9. The data shows traffic flow by month and direction.

The seven day average shows traffic across all seven days of the week.

The five day average shows traffic across the five weekdays (Monday to Friday) of a week.

5 Day Average				7 Day Average			
Month	North	South	Days	Month	North	South	Days
Jan-10	2,940	3,016	21	Jan-10	2,840	3,146	31
Feb-10	3,718	3,698	20	Feb-10	3,686	3,748	28
Mar-10	4,132	4,128	23	Mar-10	4,119	4,188	31
Apr-10	5,179	5,042	22	Apr-10	5,154	5,096	30
May-10	5,044	5,202	21	May-10	5,211	5,304	31
Jun-10	5,361	5,457	22	Jun-10	5,429	5,690	30
Jul-10	5,905	5,909	22	Jul-10	6,137	6,168	31
Aug-10	6,235	6,312	22	Aug-10	6,425	6,806	31
Sep-10	5,330	5,469	22	Sep-10	5,434	5,717	30
Oct-10	5,053	5,130	21	Oct-10	5,128	5,281	31
Nov-10	3,954	3,996	22	Nov-10	3,848	3,965	30
Dec-10	3,178	3,007	23	Dec-10	2,899	2,762	31

1. **Calculate the Annual Average Daily Traffic (AADT) flow at this location**

Hint: use the 7 Day Average data and take account of the differing number of days in each month.

2. **Calculate the Annual Average Weekday Traffic (AAWT) flow at this location**

Hint: use the 5 Day Average data and take account of the differing number of weekdays in each month.

3. **The highest traffic volumes on the A9 are typically in August. Note that the 7 Day Average is higher than the 5 Day Average, which indicates that during the summer more traffic uses the A9 at the weekend than during the week.**

Calculate the Average weekend traffic flow in August 2010.

Hint: calculate the total volume of traffic that used the road in August using the 7 Day Average data, subtract the total volume of weekday traffic using the 5 Day Average data and divide by the number of weekend days.

4. **During which months did the A9 carry more traffic than the Annual Average (Both AADT and AAWT)?**

Answers

- The Annual Average Daily Traffic (AADT) flow is 9,526 vehicles per day**
 $(2,840 + 3,146) * 31 + (3,686 + 3,748) * 28 + (4,119 + 4,188) * 31 + \dots = 3,476,976$ vehicles per annum. Divide 3,476,976 by 365 to derive 9,526 vehicles on an annual average day.
- The Annual Average Weekday Traffic (AAWT) flow is 9,371 vehicles per day**
 $(2,940 + 3,016) * 21 + (3,718 + 3,698) * 20 + (4,132 + 4,128) * 23 + \dots = 2,445,918$ vehicles per annum (on weekdays – Monday to Friday). Divide 2,445,918 by 261 (ie 21 + 20 + 23 + ...) to derive 9,371 vehicles on an annual average weekday.
- The Average weekend traffic flow in August 2010 was 14,903 vehicles per day**
 The total number of vehicles to traverse the road in August 2010 was $31 * (6,425 + 6,806) = 410,161$ vehicles. The total number of vehicles to traverse the same section on a weekday in August 2010 was $22 * (6,235 + 6,312) = 276,034$ vehicles. The number of vehicles to traverse this section at a weekend was therefore $410,161 - 276,034 = 134,127$ vehicles. The number of weekend days in August 2010 was $31 - 22 = 9$ days. Therefore the average traffic flow on a weekend day in August 2010 was $134,127 / 9 = 14,903$ vehicles.
- Between April and October, traffic levels on the A9 are higher than the Annual Average**
 The data in the worksheet table is presented graphically below. This shows the two-way traffic flow in each month compared to the AADT and AAWT as calculated above.

