BY 2050 THE number of cars in the world is expected to double to 2 billion or more. This reflects the predicted growth of the world population to 9 billion in 2050, of which three-quarters will live in urban areas. Although car use is decreasing in many large cities in Europe, North America and Australia, it has grown rapidly in the expanding economies of newly industrialised countries (NICs), especially China and India.

This unit focuses on traffic issues within the UK and specifically Cambridge and its surrounding area, to outline a wide range of approaches to the problems of traffic congestion and the move towards an integrated, efficient and sustainable transport system.

Tackling congestion in the UK
In 1950 road travel in the UK totalled 33 billion vehicle miles. By 2010 it had reached ten times that figure. On average, British drivers sit idle in traffic for 46 hours a year – twice as long as in the United States. The proportion of roads in the UK subject to delay is three times that in Germany and five times that in France. London is more congested than any other UK or European city. The cost to businesses of traffic congestion nationally is estimated at between £7 billion and £8 billion, a figure that will more than double by 2025.

The past thirty years have seen many initiatives in British cities aimed at managing traffic flows, improving public transport and reducing the impact of air, noise and visual pollution associated with vehicles. Light rail or tram systems, such as the Manchester Metrolink, Sheffield Supertram and Croydon Tramlink, have been built in several major cities but have been criticised as being too costly and underused. London introduced its congestion charging scheme in 2003, though similar plans for cities like Manchester and Edinburgh have been rejected. The Barclays Cycle Hire scheme, brainchild of London mayor Boris Johnson, began in 2010 and was extended two years later. Johnson has also overseen development of a new Routemaster bus, now operating in central London, and the construction of a cable car across the Thames at Greenwich.

Case Study

Cambridge
The city of Cambridge, 80 km north of London in East Anglia (Figure 1), is central to one of the country’s fastest-growing regions. Its population of 121,000 grew by 10% between 2001 and 2011, while the county of Cambridgeshire expanded by a similar percentage over the decade to reach 613,000. Cambridge serves a multitude of functions as a commercial, retail, entertainment and administrative centre, a major tourist destination, a centre of prestigious higher education institutions and a focus for high-technology industry, research and development. Its world-famous university, dating back 800 years, created a medieval town plan of narrow streets and historic colleges that survives to this day. The surrounding countryside consists of rich, productive farmland, traditional small market towns and attractive villages which are among the most desirable residential environments in the UK. Good rail and road links (M11, A1M) make commuting to Greater London, Hertfordshire and Essex perfectly practicable, as well as to other places within Cambridgeshire.

The region’s popularity as a place to live, work and study has given rise to many planning and transport issues which have far-reaching implications for the local environment. There are plans for the construction of 40,000 homes around Cambridge in the next two decades, as well as 10,000 in the
new town of Northstowe, approved for development in 2012. A range of strategies has been adopted to cope with the demand for new housing and the transport requirements of all the county’s inhabitants, especially when travelling into Cambridge.

Park & Ride
Cambridge’s historic layout makes it particularly prone to traffic congestion, with an irregular street plan and tightly packed buildings, many of which are too old and important to alter in any way. Tourist coaches are excluded from the central area and must drop visitors at designated points on the inner ring road. A pedestrian zone exists around the market square and main retail precinct, with multi-storey car parks incorporated into the major shopping malls and leisure facilities. Elsewhere on-street parking is expensive and limited during the working day, deterring people from commuting by car. Even so, 180,000 vehicles travel in and out of Cambridge every day, causing long rush-hour queues on arterial roads. To reduce the weight of car traffic, five Park & Ride bus services run into the city centre from the outskirts (Figure 2). Each route has a large free car park on cheaper land at the city edge, from which fare-paid buses leave every ten minutes throughout the day. The journey is made quicker by dedicated bus lanes along sections of every Park & Ride route.

The guided busway
The most recent, and controversial, development in Cambridgeshire’s public transport system is the guided busway, which opened in August 2011 (Figures 3 and 4). Linking Huntingdon and St Ives with Cambridge, buses run on a 26 km concrete ‘guideway’ – the world’s longest – which for much of the route follows the line of an old railway track. The busway service uses ordinary roads for a further 13 km within the urban areas at each end and connects with Cambridge railway station and the city’s Park & Ride facilities. Buses run every ten minutes between 7am and 7pm, six days a week, and the journey time from St Ives to central Cambridge is 40 minutes. One firm operating on the busway, Stagecoach, has also introduced a fleet of 23 ‘biobuses’ which run on carbon-neutral biodiesel fuel made from used cooking oil and animal fat – both essentially waste products.

In September 2012 a survey found that 44% of passengers used the guided busway on a daily basis and that a quarter of passengers had switched from car travel. Six months later, the total number of journeys on the busway reached 4 million, though critics pointed out that this included short urban trips outside the guided section of

Figure 2: Cambridge’s Park & Ride scheme
Source: Cambridge County Council

Figure 3: The Cambridge busway system
Source: Cambridge County Council
the route. The predicted passenger numbers for 2013 were 3 million, half a million more than for 2012. However, there has been sharp criticism of the quality of the service and the potential expense to local taxpayers. Construction of the guided busway began in 2008 but the project was eventually completed two years later than planned. Delays, defects, escalating costs and legal disputes with the contractor could see the council facing a final bill of £230 million – twice the original budget funded by the government and local house-building firms.

**Demand Responsive Transport**
At a time when Cambridgeshire County Council is looking to save £1.2 million annually by cutting all rural bus subsidies, it has proposed a minibus scheme called Demand Responsive Transport (DRT). This is for rural residents with limited or no access to conventional scheduled public transport. DRT would be run by professional, independent transport firms on a not-for-profit basis. Passengers call a booking line and transport is arranged on a door-to-door basis, with bookings up to seven days in advance and a maximum of two live bookings at any one time. In some areas DRT would operate in the middle of the day, while scheduled bus services would provide regular transport during the morning and evening rush hours. Cambridgeshire already has a large number of local community car schemes and several Dial-a-Ride minibus services.

**Cycle network**
Cambridge is already one of the most cycle-friendly cities in the UK, with an average of 24 cycling trips per person per year, over an average distance of 2.9 km. In May 2013 the council launched bold proposals to double the proportion of journeys in Cambridge made by bike to 40%, comparable with levels in Dutch cities. For the first time a network of on-road cycle lanes would be established, 2.1 metres wide and separated by kerbs, with priority over side routes. The network would run along three main roads leading to the city centre and would also cross the city on a trail following the railway line. An application for £4.1 million to the government’s ‘Cycle City Ambition Grant’ fund would be matched by an equivalent amount from the council to pay for the scheme.

**Electric car charging**
In September 2010 Cambridge City Council installed electric car charging stations in two central multi-storey car parks. The power is free, but normal parking fees still apply. However, in the first two years of operation fewer than fifty motorists plugged in to the charging points.

**Citywide 20 mph zone**
For several years Cambridge had imposed a 20 mph speed limit in a restricted area of small residential streets close to the city centre. The council decided in May 2013 to extend the 20 mph zone in stages to cover the whole city.

**Infrastructure developments**
In 2011 a new access road to Addenbrooke’s Hospital, linking it to the A10 and M11, was completed at a cost of £26 million. Land on either side of the road is being developed as a major area of new housing called Great Kneighton. A second railway station for Cambridge is under construction in the north of the city, close to the Science Park. Due to open in 2015, it will allow rail travellers to avoid city centre traffic and will provide 450 car parking bays and spaces for 1,000 bicycles.

**A14 toll road**
The A14 trunk road runs eastwards from its junction with the M1 and M6 motorways in Northamptonshire to the container ports of Felixstowe and Harwich on the east coast, passing close to Huntingdon and Cambridge. Commuters join large volumes of heavy lorry traffic, causing chronic traffic jams and frequent road accidents. In July 2012 the government announced a scheme to widen and improve a twenty-mile stretch in Cambridgeshire, including a new Huntingdon by-pass. Two roads for local traffic would be built parallel to the A14 north of Cambridge. The entire project would be funded by tolls on the main carriageway – the first example of motorists paying to use an existing road in the UK. Work could begin by 2018.

**Summary**
Cambridge and its surrounding area is a rapidly growing urban area. Its historic centre attracts many visitors from far and wide, adding to the already congested traffic infrastructure. A number of new traffic management schemes have been introduced: some are more successful than others – and some are more controversial than others.
1. Describe four ways in which Cambridge has attempted to reduce the number of people using cars to travel into the city.

2. Work in groups to make a list of situations that can cause traffic congestion.

3. Figure 5 shows the average distances that people travel to reach different types of facility. Choose six of these and find out how far you would have to go to reach each destination from your home. Is the pattern of distances you would travel similar to the average pattern? If not, try to explain reasons for the differences.

4. Table 5: Average distance travelled from home (km)

<table>
<thead>
<tr>
<th>Facility</th>
<th>Distance (km)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary school</td>
<td>2.1</td>
</tr>
<tr>
<td>Secondary school</td>
<td>5.0</td>
</tr>
<tr>
<td>Gym/health club</td>
<td>5.0</td>
</tr>
<tr>
<td>Supermarket (main grocery shop)</td>
<td>5.6</td>
</tr>
<tr>
<td>DIY store/garden centre</td>
<td>8.3</td>
</tr>
<tr>
<td>Garage (car repairs)</td>
<td>8.5</td>
</tr>
<tr>
<td>Cinema</td>
<td>10.9</td>
</tr>
<tr>
<td>Job</td>
<td>13.0</td>
</tr>
<tr>
<td>Clothes shopping</td>
<td>14.1</td>
</tr>
<tr>
<td>Car showroom</td>
<td>21.6</td>
</tr>
<tr>
<td>Move house</td>
<td>21.6</td>
</tr>
</tbody>
</table>

Source: Geographic mobility report, Performance and Innovation Unit

5. Listed below are a number of possible solutions to traffic congestion. Make sure you understand what each one involves. Choose the five that you think would be best for the environment and, in each case, explain your reasons.

- Park & Ride (Figure 8)
- Ring roads
- Trams/light railways
- Bus lanes
- Multi-storey car parks

(b) Now read the information provided in Figure 7 about Nottingham and suggest why it has the least dependence on cars.
(c) Can you explain why London is in the least car dependent category when it is also the most congested city in the UK?

4. Figure 6 gives the results of a 2010 survey which rated nineteen English cities according to their dependence on car travel. The survey, carried out by the Campaign for Better Transport, assessed the cities on three criteria:

- Accessibility and planning
- Quality and uptake of public transport
- Walking and cycling.

(a) Plot each city on a map of England and colour code them in the following categories:

- Least car dependent
- Less car dependent
- More car dependent
- Most car dependent

5. Listed below are a number of possible solutions to traffic congestion. Make sure you understand what each one involves. Choose the five that you think would be best for the environment and, in each case, explain your reasons.

- Park & Ride (Figure 8)
- Ring roads
- Trams/light railways
- Bus lanes
- Multi-storey car parks

(b) Now read the information provided in Figure 7 about Nottingham and suggest why it has the least dependence on cars.
(c) Can you explain why London is in the least car dependent category when it is also the most congested city in the UK?