Urban Mobility | Student Sheets

1. Carsharing

Sharing is caring

Traditional forms of urban mobility is an increasing challenge in Europe's growing major cities, with over 80% of Europeans now living in an urban environment. With congestion problems and pollution being concentrated in these areas, many city dwellers are open to new and innovative ways of getting around - sustainable mobility solutions.

In 2015, 590,000 European city dwellers used DriveNow, a carsharing service provided by the BMW Group where instead of owning a car, users of the service can choose from over 4,000 DriveNow vehicles. DriveNow vehicles are parked in central locations across ten European cities, and can be booked with a smartphone app at a fraction of the cost of purchasing and maintaining a privately owned car.

The scheme's creators are calling carsharing the future of urban mobility, and it is a key example of how urban mobility patterns are changing. 30% of those using the service in 2015 were not car owners. With privately owned vehicles being used for an average of one hour a day and having to be parked for the rest it is easy to see why carsharing is becoming appealing.

Going electric

Whilst the BMW Group created the service to reduce parking congestion, over 20% of the DriveNow fleet are electric vehicles, with the world's largest all-electric DriveNow fleet being in Copenhagen, Denmark, comprising of 400 vehicles from the BMW i3 range. The BMW i3's thermoplastic parts are made from over 25% natural and recycled materials, and over its life-cycle emits up to 50% less CO_2 than a conventional vehicle. The BMW i3's sophisticated digital integration directs drivers away from traffic, and even suggests alternative public transport routes.

Changing Patterns

With organisations like the BMW Group committing to sustainable mobility, patterns in urban mobility are changing in many European cities. Use of the Drivenow service is expected to increase six-fold by 2020. With a growing trend towards digitalisation and electromobility in cars, DriveNow shows that consumers are becoming more open to sustainable mobility choices.

1. Carsharing

1. What are the main challenges currently associated with existing forms of transport in large cities?

2. What are the difficulties faced by car owners in urban areas?

3. How has the BMW Group sought to make DriveNow Carsharing appealing to use?

4. Why might the BMW Group be optimistic about the future of the service?

5. Suggest ways in which DriveNow Carsharing contributes positively towards sustainable urban mobility. Consider the social, environmental and climatic suitability of the service.

6. In 2015, the BMW i3 won the Green Car of the Year Award, and is an example of sustainable design. Explain how the i3 can be described as a sustainable design. You can conduct some online research about the BMW i3 to find out more about it.

2. Fossdyke's Ice-cream Company | Support Student Activity

Jim Fossdyke runs a small ice-cream manufacturing and distribution company in a major European city. Jim knows that his consumers prefer brands that care about sustainability. Jim employs 70 workers, and distributes his ice-cream all over the city, where it is sold from his own ice-cream vans and in cafes and restaurants.






1. Join the problems to the solutions to help Jim make his business more sustainable

Jim's ice-cream vans run on diesel fuel and contributes to air pollution	Jim could make his ice-cream packaging from recycled card.
Jim's workers travel to work in their own cars and cause congestion	Jim could install a wind turbine on his factory.
Jim's ice-cream uses a lot of milk, and cows contribute to carbon monoxide (CO_2) pollution	Jim could make his ice-cream dairy free.
Jims factory uses a lot of electricity	Improving working conditions, protecting the health and safety of his employees, introducing recruitment practices to ensure gender balance.
Poor working conditions e.g. disproportionately male workers, poor sanitation.	Jim could transport his workers using a company bus.
The paper in Jim's ice-cream packaging comes from unsustainable forests	Jim could replace his vans with hybrid or electric vehicles.
Jims plastic ice-cream tubs cannot be recycled	Jim could replace his ice cream tubs with recyclable plastic ones.

2. Fossdyke's Ice-cream Company | Support Student Activity

2. Can you think of any other challenges Jim may encounter – for example, how can Jim make sure the sources and suppliers of the ingredients for his ice cream are sustainable? What other solutions do you have for Jim?

2. Fossdyke's Ice-cream Company | Student Activities





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1. Acting as a sustainability advisor, suggest ways that Jim could make his business more sustainable. Present this as a sustainability plan for the company. You can use a variety of formats to produce this report, for example, a plan for re-designing the factory and a written report.

   You may wish to consider:

- The movement of his workers
- The energy consumption of his factory
- The distribution of his products
- The supply chain of his product
- Working conditions in the factory

3. Calculating CO_2 | Student Activities

This table shows the amount of CO_2 produced per passenger for each type of transport.

Mode of Transport	Small Petrol Driven Car	Large Petrol Driven Car	Bus	Train
Kilograms of CO_2 produced per kilometre	0.1276	0.257	0.089	0.06

1. Jerry is making a journey in London. He uses a travel app to examine his urban mobility choices. The app gives him several different routes using public transport or his own small petrol driven car. By calculating the amount of CO_2 released for each journey, suggest the most sustainable route that Jerry can take.

Route A : Start Point → Car (8.2km) → End Point = **[kg]**

Route B: Start Point → Train (5.2km) → Bus (2.9km) → End Point = **[kg]**

Route C: Start Point → Bus [6km] → Bus (2km) → Walk (0.75km) → End Point= **[kg]**

Explain why route x is the most suitable:

2. Aside from the choices given to him on the travel app, what other more sustainable urban mobility choices does Jerry have for moving around the city?

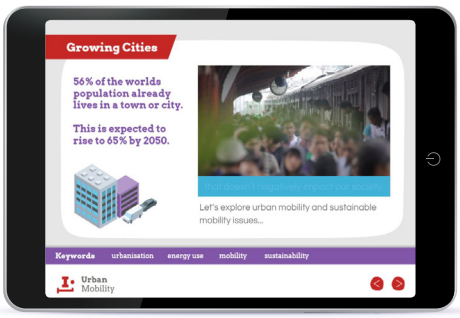
3. BMW is introducing a new line of plug-in hybrid car that has CO_2 emmissions of less than 0.05 kg/km. If Jerry used a new hybrid car instead of his petrol car, which route would be the most sustainable?

Additional Case Studies

A. Traffic problems, Beijing, China

With a population of 21.7 million people, Beijing faces major urban mobility challenges. Beijing's transformation into a megacity has meant that it has undergone rapid urbanisation and motorisation. In response to this growth, China has taken serious efforts to reduce congestion and greenhouse gas emissions as a result.

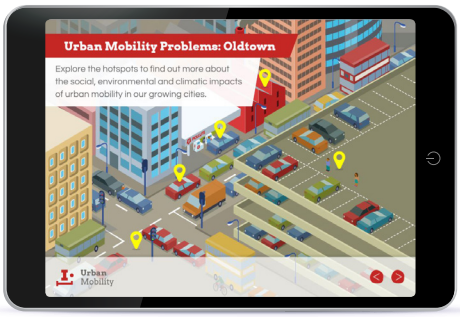
With a massive increase in car ownership across China, increased congestion has caused traffic jams, with motorists trapped for up to ten days in their cars. This has reduced air quality in the city, with smog becoming a major problem for the city's residents.



B. Air Quality, London, United Kingdom

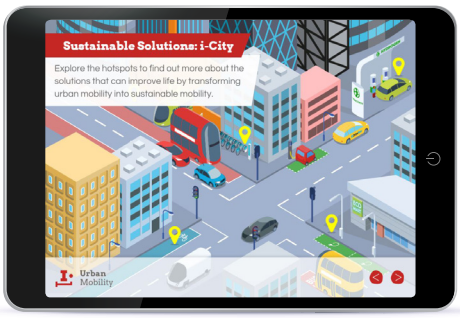
While air quality in London, another megacity, is not as poor as megacities like Beijing, London's air pollution problems are still significant. Approximately 12.5% of London's neighbourhoods have higher than legal levels of nitrogen dioxide particles in the air.

Nitrogen dioxide (NO_2) pollution has been linked to a rise in diesel powered vehicles in London, such as cars, taxis and buses. It has also been reported to be a more serious issue in deprived areas. Over a third of schools in London are affected by NO2 pollution, with around 328,000 school children exposed to unhealthy levels of NO_2. Unhealthy exposure to NO2 emissions has been linked to asthma, respiratory conditions and a lower life expectancy.



C. Integrated Public Transport: Vauxhall Interchange, London

Built in 2004, the Vauxhall Interchange in London provides users of public transport with direct access to buses, rail and tube services, offering London's commuters a fully integrated transport experience. The interchange has been designed to make it easy for pedestrians to move between services. Crossings, walkways and underpasses connect the bus station with Vauxhall Tube and National Rail stations.



The bus station itself has been designed sustainably. The station's cantilevered roof has 168 state of the art solar panels built into it, producing one third of the interchange's energy, and powering the station's digital displays, CCTV cameras and lights.

Although many buses that visit the interchange still rely on diesel fuel, Transport for London (TFL) has made significant steps to reduce emissions. For example, TFL have introduced energy efficient electric buses, the hybrid new Routemaster, and have reintroduced trams in nearby Wimbledon and Croydon.

Urban Mobility Quiz

1. Which of these definitions best describes Urban Mobility choices.

A. Urban Mobility is about which transport method we choose to get around our cities.

B. Urban Mobility is about how we choose to travel, from the mode of transport to the routes we take, to the sustainability of our choices. ✓

C. Urban Mobility can include cars, buses, taxis, trains and aeroplanes.

2. In our cities, sustainability should be considered in the way we approach living and working. Select the areas where sustainability can be applied:

- Generating power and using energy ✓
- Business operations ✓
- Transport ✓
- Producing food and products ✓
- Innovation and technology ✓
- Planning our cities ✓

3. Drag the paintbrush across the boxes to colour match each sustainability mobility solution to its definition and impact.

Solution	Definition	Impact
Carsharing Schemes	Using digital services to share vehicles	Reduces car ownership and lowers congestion
Digitalisation	Using digital apps to suggest the most sustainable mobility choices	Reduces congestion with the most sustainable option for your journey e.g. where to park
Integrated public transport	Joins services and mobility options together	Makes using more sustainable public transport easier and more appealing
Electromobility	The introduction of sustainably designed electric and hybrid cars, vans and buses	Reduces energy usage of vehicles

4. Place these urban mobility choices in order from the least carbon generating to the most.

1 Cycling or walking
2 Electric Car
3 Train
4 Bus
5 Petrol or Diesel Car