

Unit 45: Transport Systems and the Environment

Unit code:	Y/600/8604
QCF Level 3:	BTEC National
Credit value:	10
Guided learning hours:	60

● Aim and purpose

This unit aims to help learners to understand the environmental impact of transport systems and to examine alternatives which are less damaging to the environment.

● Unit introduction

This unit looks at current transport systems and how they affect the environment. It considers air pollution, noise pollution and visual intrusion. Current transport systems will be identified and the local and national policies in place to control their environmental impact examined. Alternative modes of transport and cleaner fuels will also be discussed. The emphasis is on managing of the environmental impact of transport systems and encouraging the use of newer, less polluting alternatives.

Finally the ways in which technology is changing the number of journeys people make and the distance travelled in relation to choice of route is considered.

The unit gives learners the opportunity to examine the importance and restrictions of transport policies on social and commercial life. It also allows them to explore alternatives and to examine the possibility of change in relation to modern working practices within the transport sector.

● Learning outcomes

On completion of this unit a learner should:

- 1 Understand national and local government policies relating to transport systems and the environment
- 2 Know current transport systems
- 3 Know environmental issues related to transport systems
- 4 Understand alternative methods of transport.

Unit content

1 Understand national and local government policies relating to transport systems and the environment

Local: traffic calming, bus lanes, cycle tracks, pedestrian precincts, out-of-town shopping centres; checks for pollution, speed restrictions, road pricing, subsidies for public transport, tram revival, park and ride, public awareness, encouraging walking to school

National: tax on vehicles and fuel, tax related to emissions, subsidies for public transport, public/private partnerships eg London Underground; restrictions on road building, advisory committees, pressure groups eg Transport 2000, Sustrans, Greenpeace, Friends of the Earth

2 Know current transport systems

Transport systems: private car; rail ie overground and underground; bus, coach, tram ie Manchester, Sheffield, Croydon, Nottingham; light rail eg Docklands Light Railway, Tyne and Wear Metro; air, sea, river, canal, cycling, walking

3 Know environmental issues related to transport systems

Issues: air pollution, noise pollution, visual intrusion; global warming, depletion of world resources; overcrowding, effect on physical and mental health

4 Understand alternative methods of transport

Methods: cleaner fuels eg low sulphur; alternative fuels eg liquefied petroleum gas, fuel from cooking oil, rape seed oil, sugar; alternative forms of energy ie electric vehicles; hybrid; Maglev, moving walkways

Initiatives: car sharing; home working; video-conferencing; mail order; internet ordering on transport use; other schemes such as cycle to work

Assessment and grading criteria

In order to pass this unit, the evidence that the learner presents for assessment needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria for a pass grade describe the level of achievement required to pass this unit.

Assessment and grading criteria		
To achieve a pass grade the evidence must show that the learner is able to:	To achieve a merit grade the evidence must show that, in addition to the pass criteria, the learner is able to:	To achieve a distinction grade the evidence must show that, in addition to the pass and merit criteria, the learner is able to:
P1 examine national and local government policies on transport and the environment [IE4]	M1 explain the role of pressure groups in the formulation of government policies on transport and the environment	D1 evaluate the effectiveness of government policies on transport and the environment recommending and justifying improvements, if appropriate
P2 outline current transport systems [IE2]		
P3 describe how transport systems may impact on the environment [IE3]	M2 analyse the impact of transport systems on the environment.	
P4 explain alternative methods of transport [CT1]		D2 evaluate the effectiveness of alternative systems of transport and other initiatives to reduce the environmental impact of transport.
P5 examine current initiatives to reduce the environmental impact of transport. [CT5]		

PLTS: This summary references where applicable, in the square brackets, the elements of the personal, learning and thinking skills which are embedded in the assessment of this unit. By achieving the criteria, learners will have demonstrated effective application of the referenced elements of the skills.

Key	IE – independent enquirers	RL – reflective learners	SM – self-managers
	CT – creative thinkers	TW – team workers	EP – effective participators

Essential guidance for tutors

Delivery

Tutors delivering this unit have opportunities to use a wide range of techniques. Lectures, discussions, seminar presentations, site visits, supervised practical activities, research using the internet and/or library resources and, the use of personal and/or industrial experience, are all suitable. Delivery should stimulate, motivate, educate and enthuse learners. Visiting expert speakers could add to the relevance of the subject.

Learners should be encouraged to read an appropriate range of documents and library/internet source material relating to the unit content. Overall delivery of the unit should be supported by the use of case studies and other industry-related documents.

The learning outcomes are linked and form a logical, consistent and progressive structure, starting with government policies at local and national level followed by current transport systems and related environmental issues. This unit ends with an investigation of alternative methods and current initiatives.

This unit should highlight the importance of transport systems not only in terms of personal convenience but also in economic terms. Being able to travel to work and move goods from place to place has an impact on the location of an industry. Likewise being able to access leisure and tourism facilities has an impact on the national economy. Learners should be made aware of the drawbacks to present systems in terms of the effects on the environment. Local and national effects and the effects on the planet as a whole should be emphasised.

Learners should be given the opportunity to see transport systems in action and be aware of their role in the local community. Visits to railway and bus stations or other facilities, preferably with an expert speaker, would be of considerable help. Visiting speakers from transport and other organisations could put the case forward for the importance of the present systems. However, learners should also have the opportunity to hear from local environmental health officers and members of transport pressure groups.

Learners should be encouraged to examine the environmental effects of transport in their local area and to produce plans for viable alternatives. They should study local transport plans which are available from the local authority. The issues appear frequently in the press and on television and press cuttings and videotapes can be a valuable source of information and can stimulate inspiration for group discussions.

The use of role play, discussion groups and presentations will give learners an opportunity to bring the topic to life. Real-life case studies should be used to illustrate all aspects of distribution, transport, storage and the impact of problems or issues.

Group activities are strongly recommended, but tutors will need to ensure that individual learners are given equal experiential and assessment opportunities.

Outline learning plan

The outline learning plan has been included in this unit as guidance and can be used in conjunction with the programme of suggested assignments.

The outline learning plan demonstrates one way of planning the delivery and assessment of this unit.

Topic and suggested assignments/activities and/assessment
Tutor explanation: introduction to the unit.
Tutor explanation/class discussion: what is a policy and how it is formed?
Tutor input: policy formulation at national level.
Tutor input: policy formulation at local level.
Tutor input: policy formulation – role of pressure groups.
Learner activity: individual research exercise on national and local policies followed by short presentations to the class – tutor to facilitate.
Class exercise: group work – influence of pressure groups on national and local policies followed by short in-class presentations – tutor to facilitate.
Tutor explanation/class discussion: case studies – role of pressure groups.
Tutor explanation/class discussion: current transport systems.
Tutor input: public transport systems and their application.
Class exercise: group work: 'Transport systems – how to use these efficiently' followed by short presentations to the class – tutor to provide briefs and facilitate.
Tutor explanation/class discussion: environmental issues.
Tutor input: environmental issues and their impact.
Learner activity: investigating possible problems followed by a brief group discussion – tutor to facilitate.
Tutor explanation – case studies: impact of transport on environment.
Guest speakers: from a logistics organisation, local council, Environment Agency and/or other public and non-governmental organisations – environmental impact of transport.
Learner activity: visit to town/city centre, railway station etc, or sites where impact is being measured/monitored.
Tutor explanation/class discussion: alternative methods.
Tutor input: alternative fuels.
Tutor input: alternative vehicle types.
Learner activity: investigating into alternative methods followed by a brief group discussion – tutor to facilitate.
Tutor explanation/class discussion: what are other possible ways?
Tutor input: initiatives to reduce environmental impact.
Learner activity: investigating current local and national initiatives followed by short presentations to the class – tutor to facilitate.
Guest speakers: from a range of sectors – alternative fuels, methods and work patterns to reduce the environmental impact of transport.
Preparation for assignment.
Assignment 1: Transport Systems and the Environment – covering P1, P2, P3, P4, P5, M1, M2, D1 and D2
Review of unit delivery and assessment.

Assessment

Although there is a great deal of theory in this unit it should still be treated as a practical subject for assessment purposes. Role plays, debates and group discussions can be used in several ways. They encourage learners to research the issues and to appreciate opposing points of view. They also teach the need for cooperation and compromise, rather than confrontation, to successfully create change. It would be useful if local transport providers and users could help set assignments or take part in discussions.

If resources are limited, formal reports can be used for assessment but an oral presentation of their findings, with suitable audiovisual aids, would be a much richer experience for learners.

It is important, wherever possible, to involve learners in local transport issues transport and the environment. There are more opportunities for data collection and passenger surveys and learners feel more 'ownership' of local issues than with something which is seen as remote and theoretical.

Evidence for this unit may be gathered from a variety of sources, including well-planned investigative assignments, case studies or reports on practical assignments.

There are many suitable forms of assessment that could be used, and centres are encouraged to consider and adopt these where appropriate. Some examples are suggested below. However, these are not intended to be prescriptive or restrictive, and are provided as an illustration of the different forms of assessment evidence that would be acceptable.

Some criteria could be assessed directly by the tutor during practical activities. If this approach is used, suitable evidence from guided activities would be observation records or witness statements. Guidance on the use of these is provided on the Edexcel website.

Evidence for the learning outcomes can be produced through well-planned assignments and projects. These will usually be carried out individually but it is possible to introduce elements of teamwork in the collection or collation of data or in simulations of the planning process such as public consultation or inquiry. Where available, workplace evidence can be incorporated provided that it is appropriate and authenticated as the learner's own work. Integrative assignments will help to link this unit with other units. The volume of evidence required for each assessment should take into account the total number of assessments being in the programme and the design of the overall teaching programme.

Formative assessments should be used throughout the unit, giving learners the opportunity to receive developmental and constructive guidance and feedback. This will allow them to gain an understanding of their personal achievement and the methods they can use to develop their learning.

Formative assessment should consider diverse sources of evidence. These may come from activity-based projects, observation and questioning, peer/tutor/logistics organisation witness testimony or personal statements. Group or individual planning and implementation documents are also an invaluable source of evidence.

The structure of the unit suggests that the grading criteria can be addressed fully by using one assignment covering P1, P2, P3, P4, P5, M1, M2 and D1.

To achieve a pass grade, learners must meet the five pass criteria listed in the grading grid.

For P1, learners must be able to examine national and local government policies on transport and the environment. This should be concise and take into account a range of issues addressed by the policies. Evidence for this criterion could be a report supported by suitable examples.

For P2, learners must be able to outline current transport systems. This should include both private and public systems, overground and underground systems, transport over water and in the air, as well as other systems such as trams and the DLR. Suitable evidence approaches are the same as for P1.

For P3, learners must be able to describe how transport systems may impact on the environment. They should be able to describe clearly various issues such as air and noise pollution as well as less obvious ones such as visual intrusion and effects on mental health. Evidence for this criterion could be a report/presentation and/or oral questioning.

For P4, learners must explain alternative methods of transport. This should include systems widely used today as well as those being developed. Evidence for this criterion could be a report/presentation and/or oral questioning.

For P5, learners must be able to examine current initiatives to reduce the environmental impact of transport. This should include both local and national initiatives. Evidence for this criterion could be a report/presentation and/or oral questioning.

To achieve a merit grade, learners must meet all of the pass grade criteria and the three merit grade criteria.

For M1, learners must explain the role of pressure groups in the formulation of government policies on transport and the environment. A number of instances and case studies can be included. This can be set as an extension to P1. Suitable evidence approaches are the same as for P1.

For M2, learners must analyse the impact of transport systems on the environmental. They should include long-and short-term impact as well as the local, national and global effects of these issues. This can be set as an extension to P3. Suitable evidence approaches are the same as for P3.

For M3, learners must explain the effectiveness of current initiatives to reduce the environmental impact of transport. This should include initiatives at individual, organisational, local and national level. This can be set as an extension to P5. Examples of suitable evidence approaches are the same as for P5.

To achieve a distinction grade, learners must meet all of the pass and merit grade criteria and the two distinction grade criteria.

For D1, learners must be able to evaluate the effectiveness of government policies on transport and the environment, recommending and justifying any improvements. The brief provided should give learners opportunities to carry out this evaluation. Learners should also include some real world examples. This can be set as an extension to P1/M1. Suitable evidence approaches are the same as for P1.

For D2, learners must be able to evaluate the effectiveness of alternative systems of transport, and other initiatives, to reduce environmental impact of transport. The brief provided should give learners opportunities to carry out this evaluation. Learners should also include some real world examples. This can be set as an extension to P4/P5/M3. Suitable evidence approaches are the same as for P1.

Programme of suggested assignments

The table below shows a programme of suggested assignments that cover the pass, merit and distinction criteria in the assessment and grading grid. This is for guidance and it is recommended that centres either write their own assignments or adapt any Edexcel assignments to meet local needs and resources.

Criteria covered	Assignment title	Scenario	Assessment method
PI, P2, P3, P4, P5, MI, M2, DI	Transport Systems and the Environment	<p>You have recently joined a national logistics organisation. Your organisation is quite vocal in supporting policies and initiatives aimed at reducing the environmental impact of transport systems.</p> <p>You are working as a junior researcher in the Research and Development section. Your manager has asked you to produce a detailed information pack for new researchers joining the section.</p>	<p>A portfolio/report containing a description of policies, transport systems, environmental issues and alternative systems to reduce the impact of transport on the environment.</p> <p>For higher level achievement, analysis and evaluation of systems and initiatives in terms of their effectiveness will be included.</p>

Links to National Occupational Standards, other BTEC units, other BTEC qualifications and other relevant units and qualifications

Achievement of the learning outcomes of this unit will contribute towards the skills, knowledge and understanding of several units of the National Occupational Standards for:

- Supply Chain Management
 - ◇ Unit M24: Select transportation methods for supplies.
- Traffic Office
 - ◇ TO1: Contribute to the maintenance of a healthy, safe and productive working environment
- Logistics Operations Management
 - ◇ Unit LOG2: Promote and maintain health, safety, and security in logistics operations
 - ◇ Unit LOM2: Promote compliance of logistics operations with legislation, regulations, and organisational procedures
 - ◇ Unit LOM6: Utilise transport modes in logistics operations
 - ◇ Unit LOM9: Improve the quality of logistics operations.

Essential resources

Learners will benefit from having access to logistics outlets and sufficient library and/or internet resources to allow them to research the current activities of logistics organisations.

Visits to and/or visiting speakers from a range of organisations will be helpful. Learners should have access to a learning resources centre with a good range of logistics trade journals, local and national newspapers and specialist periodicals.

Tutors will need to ensure that learners have up-to-date information regarding local and national logistics organisations.

Health, safety and welfare issues must be considered at all times and risk assessments should be undertaken for all site visits used in the delivery or assessment of the unit. Access to suitable development sites may require permission from the owner, especially if learners need to visit the site for research.

Employer engagement and vocational contexts

The use of vocational contexts is essential in the delivery and assessment of this unit. Much of the work can be set in the context of case studies of local employers. All learning outcomes lend themselves to investigating industrial practices.

Indicative reading for learners

Textbooks

Cox P – *Moving People: Sustainable Transport Development: Challenging Expectations* (Zed Books Ltd, 2009) ISBN 9781848130036

European Environment Agency – *Transport at a crossroads: TERM 208, indicators tracking transport and environment in the European Union (EEA report)* (Office for Official Publications of the European Communities, 2009) ISBN 9789291679911

Hensler D and Button K – *Handbook of Transport and the Environment, illustrated edition* (Elsevier Science, 2003) ISBN 9780080441030

Learners must have access to newspapers, magazines and the internet. Leaflets from local and national government and transport pressure groups should be collected.

Journals

Coach and Bus Week (Rouncy Media)

Commercial Motor (Temple Press Limited)

International Railway Journal (Applegate Directory Ltd)

Railnews (Railnews Limited)

Websites

www.defra.gov.uk	Department for the Environment, Food and Rural Affairs
www.dft.gov.uk	Department for Transport
www.direct.gov.uk/en/index.htm	Government departments
www.rcep.org.uk	Royal Commission on Environmental Pollution
www.sustrans.org.uk	Sustrans (National Cycle Network)
www.transport2000.org.uk	Transport 2000

Delivery of personal, learning and thinking skills

The table below identifies the opportunities for personal, learning and thinking skills (PLTS) that have been included within the pass assessment criteria of this unit.

Skill	When learners are ...
Independent enquirers	analysing the impact of transport systems on the environment evaluating Government policies using reasoned arguments and supporting conclusions
Creative thinkers	evaluating the effectiveness of alternative systems and initiatives explaining the effectiveness of current initiatives.

Although PLTS are identified within this unit as an inherent part of the assessment criteria, there are further opportunities to develop a range of PLTS through various approaches to teaching and learning.

Skill	When learners are ...
Team workers	working on and presenting joint research outcomes
Reflective Learners	appraising and improving their own work.

● Functional Skills – Level 2

Skill	When learners are ...
ICT – Find and select information	
Select and use a variety of sources of information independently for a complex task	investigating local and national policies
Access, search for, select and use ICT-based information and evaluate its fitness for purpose	investigating the environmental impact of transport systems
ICT – Develop, present and communicate information	
Enter, develop and format information independently to suit its meaning and purpose including: <ul style="list-style-type: none"> • text and tables • images • numbers • records 	preparing reports and presenting the results of their research
Bring together information to suit content and purpose	presenting the results of their investigations
Present information in ways that are fit for purpose and audience	presenting information using a variety of methods
Speaking and listening – make a range of contributions to discussions and make effective presentations in a wide range of contexts	explaining alternative transport methods
Writing – write documents, including extended writing pieces, communicating information, ideas and opinions, effectively and persuasively	explaining the role of pressure groups.