

M
MOTT
MACDONALD



Fast Trackers Student Workbook A



Welcome

Mott MacDonald and Network Rail would like to welcome you to the project element of Fast Trackers. This project will see you participate in a series of activities, culminating in a team presentation of your combined design for a new station complex at Euston Station, London and a new high speed rail link between Birmingham and Euston.

You will be part of a team of 10 students. This workbook provides an overview of the project, the objectives you are working towards and some questions to steer your initial research.



Project Overview

Your team of 10 will be responsible for presenting a combined design for the new station complex and the new high speed rail link to a team of industry professionals. Each team will be split into two groups of 5, one focusing on the station design, the other on the new high speed rail link. It is essential that you work as a collaborative team of 10 to produce the best overall presentation.

Your first activity is a research based task (minimum of 4-6 hours per student is expected), all of the information you need to undertake this research is provided in this booklet.

This workbook provides an overview of the entire project and it is recommended you read the design objectives for both areas of the design to gain an overall understanding. You are however only required to complete the research for the project team you have been assigned to (either Euston Station or the high speed rail route).

Further information, activities and tasks will be briefed throughout the programme, but it is essential that you utilise all of your experiences during Fast Trackers to produce the final presentation.





Objectives

You and your fellow students are part of an exciting and unique opportunity to work with professionals from across the industry. We encourage you to maximise what you get out of the event and demonstrate your full potential, as our next generation of industry professionals.

Throughout the programme we will be setting you tasks and challenges that will require you to demonstrate a variety of skills that align with the objectives of the Industrial Cadets Award.

Take some time now to read through the objectives below, outlining the skills and behaviours we require to see from all students during the event. Following these objectives, will help you to show the competencies required to achieve the Industrial Cadets Silver Award. Most importantly, these objectives will help you to make the most out of the experience and we hope you enjoy taking part.

1 Careers Motivation & Awareness

How do I meet it?

Speak to as many different career professionals as you can throughout the event.

What will I learn from this?

Increase your knowledge and understanding of the industry, as well as the future career opportunities available to you.

Useful Advice

Prepare a couple of questions in advance, that you may be interested in asking and bring these along to the residential with you?

2 Creativity & Innovation

How do I meet it?

Think of new and exciting ideas that other teams may not think of, whilst presenting these ideas in a way that engages your audience.

What will I learn from this?

Demonstrate that you can look at a problem from different perspectives. Focus on developing an idea that can be competitive in the industry.

Useful Advice

At the beginning of your project, take some time as a group to collate ideas. Don't always choose ideas you are familiar with, taking some risks can pay off!



3 Communication, Collaboration & Teamwork

How do I meet it?

Demonstrate good listening skills when working in a team, clear and confident presentation skills when speaking to your team or an audience. A good balance of leadership and teamwork skills and appropriate communication methods for different audiences.

What will I learn from this?

Improve your confidence in communicating with different audiences using different methods for effective communication. This will also help you to understand what is important for effective teamwork and leadership.

Useful Advice

If you see someone in your team who does not appear to be as involved as the rest of the group, give them a confidence boost and encourage them to join in.

4 Organising & Planning

How do I meet it?

Consider time management and budgeting during the event.

What will I learn from this?

Improve your knowledge and understanding of how you can manage a project and risks to a project when things don't go according to plan.

Useful Advice

It is each team's responsibility to be organised and complete their tasks on time. If parts of the team start falling behind, have a discussion on what can be done to bring the project back on track.

5 Critical Thinking & Problem Solving

How do I meet it?

Explain how you have reached key decisions on your project and provide logical reasoning for any problems solved.

What will I learn from this?

Understand the importance of clear decision making and explain how you have solved a problem and the methods you have used.

Useful Advice

Don't forget to make use of the professionals around you to answer any questions you may be unsure of.

6 Personal & Interpersonal Development

How do I meet it?

Identify what your personal strengths and skills are, and those that require further development. We would encourage you to share your strengths with your team when allocating roles for your project.

What will I learn from this?

This will help increase your awareness of your personal strengths and development areas so you can identify ways in which you can focus on improving these skills.

Useful Advice

Speak to people outside of your normal friendship groups to practice building up your social and professional network. We would also encourage you to pick one skill you would like to improve and challenge yourself to take part in an activity during the event that will help you develop in this area.

Euston Station

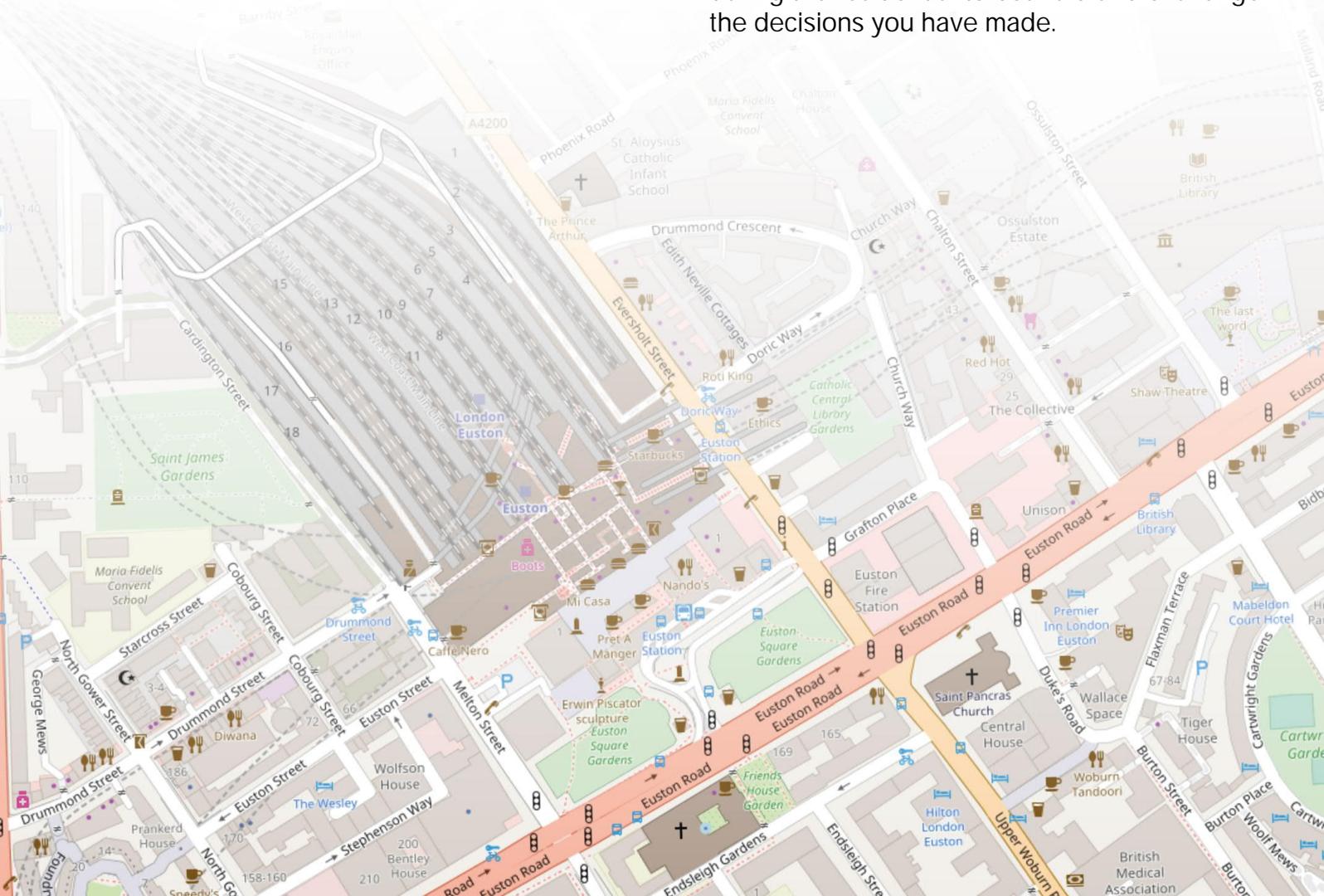
The Euston area needs to be rejuvenated and changes are required to develop the area into a local hub of activity whilst providing a gateway to London. This will be done through creating a world class transport interchange at Euston Station. A transformational development above and around the station is required.

By redeveloping the station, this will improve the connections between communities to the north, south, east and west. New homes, businesses, shops, community facilities, schools, new and improved open spaces are needed to transform the area. Existing businesses such as those on Drummond Street and surrounding residential communities at Regent's Park, Somers Town and Mornington Crescent will flourish from the investment in the area.

A network of clear and convenient streets should connect key attractions and green spaces in the area. Critical to this will be new and improved links through, above and around a redeveloped station and an improved greener environment along Euston Road. Euston Road should no longer be a barrier to pedestrian and cycle movement and onwards journeys from the station. Euston has long been too polluted – the proposals put forwards will help make it less so.

A comprehensive redevelopment of Euston Station will best help to achieve this vision and the plan objectives set out across the page.

You will need to bring all your findings with you to London, as this will form the basis of your design. There will be extra information available during the residential to both aid and challenge the decisions you have made.



Design Objectives

1. Prioritising local people's needs

To ensure that new development meets local needs by ensuring homes, jobs, businesses, schools, community facilities and open space lost or affected by the station redesign and new high speed rail route, are reprovided in the Euston area.

2. Securing excellent design

To work to ensure that any new station and development is of excellent integrated design, easy access, complements the character and heritage of the area and helps to improve the image and function of the Euston area.

3. Making the best use of new space

To make sure any new development and regeneration in the wider plan area provides a mix of homes, shops, jobs, open space, services, education and leisure facilities that benefits existing and future residents, businesses and visitors.

4. New streets above the station and tracks

To create new green streets above and around the station and railway tracks to make it easier for people to move between Somers Town and Regent's Park and from Euston Road to Mornington Crescent, which is currently made difficult by the existing Euston Station building.

5. Boost the local, wider London and national economy

To provide new spaces for existing and new businesses and shops and encourage new and innovative business sectors in the Euston area.

6. Creating sustainable development

To plan for carbon free sustainable development and enhance the quality and sustainability of the local environment.

7. Improving the environment along Euston Road

To create new and improved crossing points across Euston Road and improve the pedestrian and cyclist experience through greening and measures to reduce air and noise pollution.

8. Promoting sustainable travel

To promote walking and cycling in the area, through encouraging improvements to the streets and enhancing facilities for pedestrians and cyclists and those using the station, along with existing and new residents and workers in the area.

9. Enhancing existing public transport

To provide improvements to Underground services, station, bus and taxi facilities and particularly new entrances into the station to the north, east and west.

10. Planning for future public transport

To ensure that if a new station is developed, adequate improvements to the Underground services and new transport links, such as Crossrail 2 are provided to prevent congestion and overcrowding of the Underground trains.

11. Deliver a new world class Euston station and integrated development

To ensure that the redevelopment of Euston Station helps to transform the image of Euston as a nationally important high quality transport interchange whilst raising the quality of the local environment and townscape.

Research Suggestions

A 21st Century Transport Hub and its Uses

What do you think the role of a 21st century transport hub should be for its users and as a neighbour?

What can the new station offer the surrounding community?

What uses would you most like to see delivered at Euston?

What aspects of the existing character of the area do you think need to be reflected in any new development?

Open Space and Getting Around

What should the character of new open spaces around the station be like?

How can Euston Station Gardens be improved? How should they be reinstated or should we consider rearranging their layout notwithstanding their protected London Square status?

What should the nature of new and upgraded routes across and around the station be?

What are your priorities for taxi, cycle and bus provision at Euston?



Notes



High Speed Rail Route

The UK has a long history of large scale transport engineering projects. Our Victorian predecessors had the vision and ambition to connect our cities by rail, moving coal and supplies around the country. The network that was created then, still forms a large percentage of today's railway.

The railway has been upgraded and modernised many times over the decades. There have been changes to the primary power from steam, to diesel, to electric. Each one providing cost and environmental benefits over the previous one.

Today, we have trains that travel up to speeds of 125 mph on this existing infrastructure. However, the route between London and Birmingham is very congested and working close to maximum capacity.

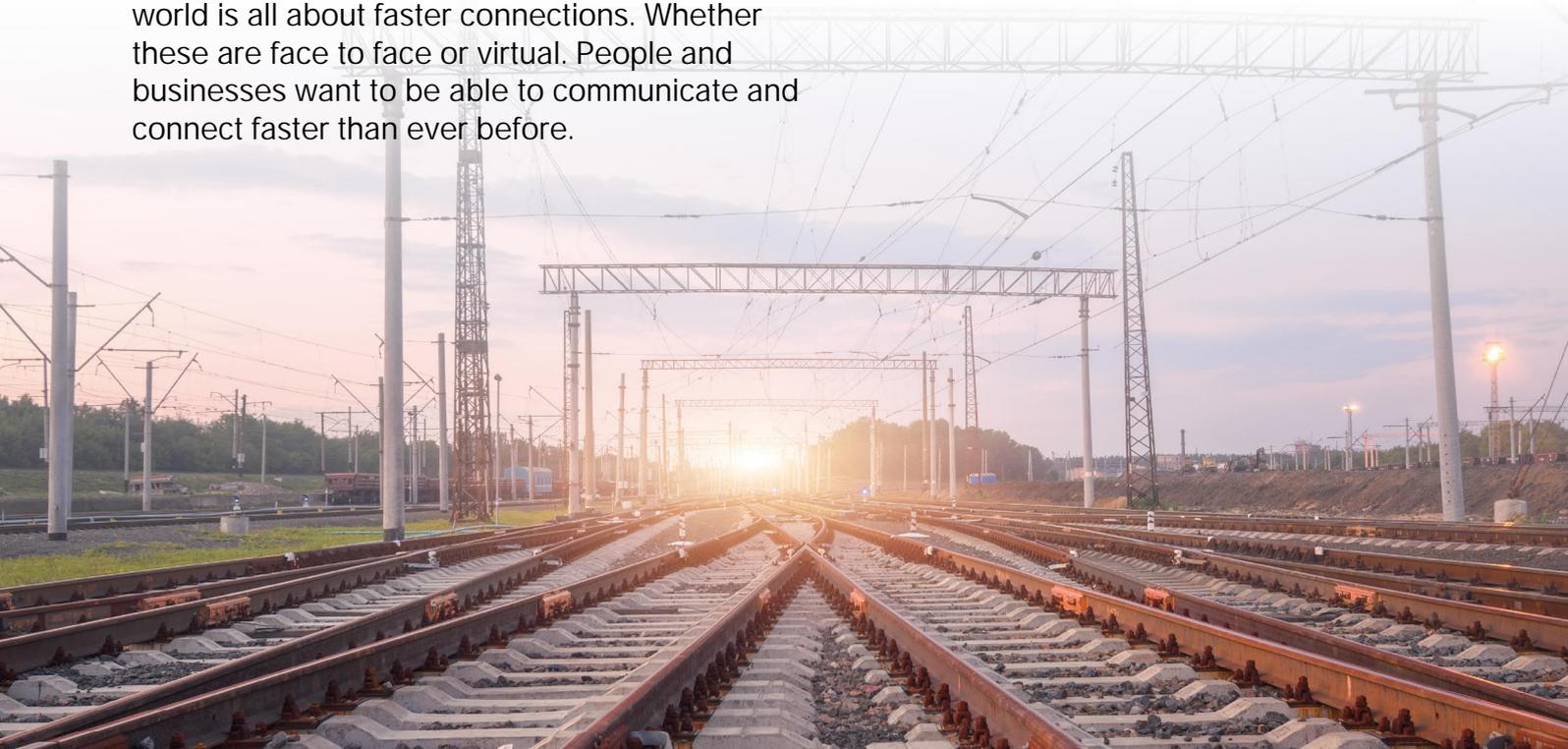
Over the coming years, rail travel is predicted to increase at a rate that will overwhelm the existing infrastructure. The new high speed rail route is aimed at increasing this capacity.

Whilst increased capacity is a major benefit of designing a new high speed rail route, today's world is all about faster connections. Whether these are face to face or virtual. People and businesses want to be able to communicate and connect faster than ever before.

Virtual connections are becoming faster and easier every year with new technology and faster internet speeds throughout the UK. The rail industry needs to facilitate making face to face connections faster as well.

As the next generation of potential engineers, you are being tasked with designing this high speed rail route between these two cities.

The next few pages are designed to help you find the information you need to consider for such a large project. The list of things to consider are not exhaustive and you are encouraged to expand upon these ideas. You will need to bring all your findings with you to London, as this will form the basis of your design. There will be extra information available during the residential to both aid and challenge the decisions you have made.



Design Objectives

1. Securing excellent design

Work to create a high speed rail route that is fully integrated across all railway disciplines. Enabling fast, comfortable and reliable journeys for passengers.

2. Significantly reducing travel times

The new rail route should be designed to drastically reduce the current journey times between Euston and Birmingham.

3. Consider the future

The design should not just be suitable for the here and now, it should be designed in a way that considers future expansion and changing societal needs.

4. Environmentally sensitive

Reducing the environmental impact of this new high speed rail route is critical to the project's success. The environment should be considered during all design decisions.

5. World leading

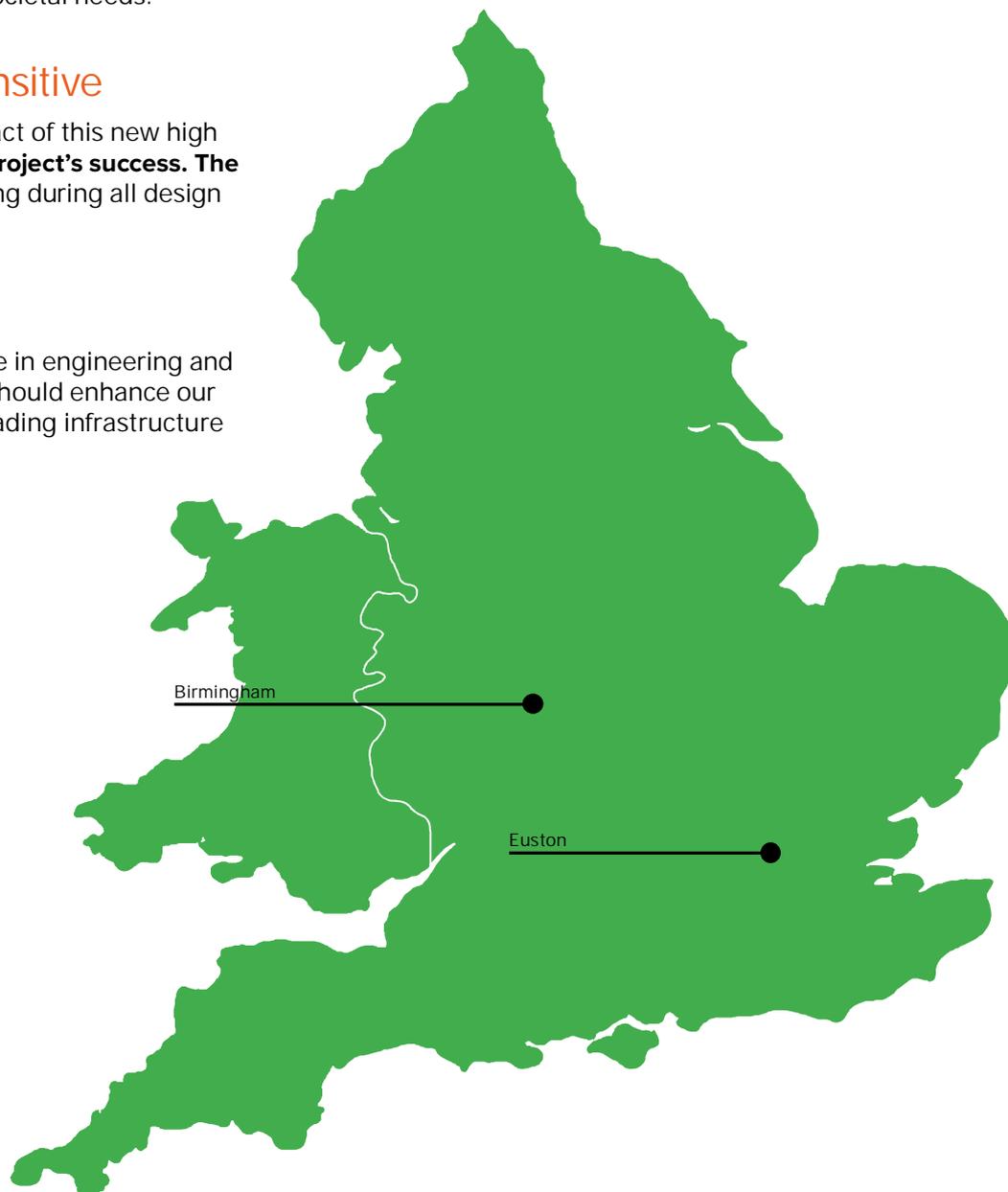
The UK is known for its excellence in engineering and construction, this new rail route should enhance our reputation for delivering world leading infrastructure projects.

6. Exceptional user experience

This rail route should prioritise passenger needs and ensure an exceptional service both in terms of safety, comfort and reliability.

7. Considerate of local needs

Building a new high speed rail route will impact multiple communities, the design should be considerate to local concerns.



Research Suggestions

Transport

What are the current transport options for travelling between London and Birmingham? How do these options compare with price/travel time/accessibility etc?

What future technologies could pose a threat to high speed rail and can high speed rail compete?

How long would it take to build a station, lay track, procure trains? Which of these tasks would have to be done first?

What are the risks and safety issues associated with a large infrastructure project like this?

Trains

What trains do other countries use on their high-speed lines? And what speeds do they travel at?

What services are currently available on trains? And what services do you want to include on the high-speed route?

What signalling technologies are there for trains?

Track

What are the advantages and disadvantages of upgrading and using the existing lines, compared to building completely new routes? What impact will the speed of the trains have on the track design?

Are there any areas between the two cities where you might need to build tunnels or bridges?

Power

What options are there for powering a high-speed train?

How could these options be made any more environmentally friendly? And would it be cost effective to do so?

Sustainability

Is there any land that needs to be avoided? Or will you need to demolish any roads, buildings, houses, or any landmarks (man-made or natural)?

What concerns might occur along the route and how might they differ between the countryside and towns or villages? How can these concerns be mitigated?

What be the impact on economic growth of the towns along the route? Will it help or hinder tourism? Will it create or remove employment opportunities?



Notes



Notes

Notes

