Collaborate Create Communicate
Teaching guide and resources

hs2 engine for growth

Transport for London

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Contents

Project Overview

Workshop	Welcome to Smeaton (1.5 – 2 hours)	Understanding the environment and the community (1.5 – 2 hours)	Designing a crossing (1 hour)	Making the model (1 – 3 hours)	Creating a presentation (1 – 1.5 hours)	Talking to the community (1 hour)
						
What the students do	- Learn context of project and reason for crossing - Research crossing types - Role-play local people's views - Present findings	- Form project teams - Receive brief - Choose a crossing type	- Create design ideas for crossing - Hold a design team meeting - Choose a design	- Build a model of crossing - Use material costs to estimate cost of model	- Discuss what makes a good presentation - Decide on key points - Produce presentation	- Audience role-plays local people - Project team present their crossing design - Class votes on best design
Core subjects	- Geography - History - English	- Maths - Science	- Design and Technology - Science	- Design and Technology	- English - Art and Design	- Drama
Extension opportunities	- Investigate community issues local to your school	- Investigate what a brief is - Students to develop their own brief	- Investigate the design process - Investigate forces, and strength of structures	- Use CAD. - Use 3D printing	- Explore what makes a good presentation - Produce multimedia for presentation - Discuss what makes good branding	- Invite local council planning/ transport professionals to attend

Workshop 01
Welcome to Smeaton

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Narrative

In this workshop students are introduced to Smeaton, a fictional city chosen as the site for a new high-speed rail terminus. A river crossing is being proposed to better incorporate the station into the city. Students will research crossing types, role-play local people's (stakeholders') views and then present their findings to the rest of the class.

How this workshop fits into the project

This workshop can be run either as a stand-alone session, or as the first session in a six-workshop project.

As a stand-alone workshop

Teachers running this workshop as a stand-alone session should plan to spend two hours delivering the session, leaving plenty of time for the final roundup.

As the first of six workshops

This workshop introduces information about the town of Smeaton that students will need in later workshops. It is therefore important that the students engage with all of the resources relating to Smeaton in this workshop.

In this workshop, you will split students into research groups. Each group will research a different aspect of Smeaton and the project requirements.

In Workshop 02 you will split the students into project teams so that each project team has at least one member from each research group from Workshop 01. In this way, the information that the separate research groups discover in the first workshop can be effectively shared with all the students.

During Workshop 03 the students design their crossings. Students make models of their crossings during Workshop 04, and in Workshop 05 they prepare presentations.

Workshop 06 is a community consultation. Each project team will present its proposal for the river crossing. The rest of the students will make up the audience. While sitting in the audience, the students will take on the role of the stakeholder groups that they researched in Workshop 01 and will be asked to critique the proposals they hear from the point of view of the stakeholder they researched.

Curriculum links

Geography – explore the idea of sustainable development and recognise its implications for people, places and environments and for their own lives.

English – evaluating content, viewpoints and evidence.

Teacher's tips

Teachers find it helpful to make links with their local area to help contextualise the issues faced by the people of Smeaton.

It may feel like there are a lot of resources to present in this workshop; however each research group only deals with a small portion of the material – in subsequent workshops they transmit this information to each other in their project teams. Students will also use the information they research today about a particular stakeholder group to help them role-play that stakeholder during the community consultation in Workshop 06.

Resources

Materials

- A3 sheets of sugar paper x 5
- Post-it notes x 5 packs

Handouts:

- 1.1 Vocabulary/ Definitions (one between two)
- 1.2 Map of Smeaton (one between two)
- 1.3 Smeaton Information (one between two)
- 1.3.1 Smeaton information (reduced text) for EAL learners
- 1.4.1 Ecologists' Alliance x 3
- 1.4.2 Confederation of Businesses x 3
- 1.4.3 Smeaton Housing Coalition x 3
- 1.4.4 Smeaton Tourism Board x 3
- 1.4.5 Smeaton City Council x 3
- 1.5.1 Cable Car data sheet x 3
- 1.5.2 Ferry crossing data sheet x 3
- 1.5.3 Suspension bridge data sheet x 3
- 1.5.4 Concrete viaduct data sheet x 3
- 1.5.5 Tunnel data sheet x 3

Solutions

- 1.6 Smeaton solutions
- 1.7 Stakeholder groups – teacher notes

Starter – 10 mins

Hand out 1.1, 1.2 and 1.3/1.3.1, which provide students with background information about Smeaton and the new high-speed rail terminus. Ask them to read the text and discuss the questions on 1.3.

Go through the questions with the class. Solutions are on 1.6. Establish what the people of Smeaton will need to get from the east side of the river to the new Zoom Rail Station.

Introduction – 5 mins

Explain that a foot-passenger crossing is going to be proposed. In today's workshop they are to decide which crossing, if any, the people of Smeaton would want.

Local concerns – 20 mins

Explain to students that any group of people who are interested in a project are called stakeholders. Elicit stakeholder groups. e.g. people who live nearby, or local businesses.

Put students into five research groups. Hand out Post-it notes, A3 pieces of paper and resources 1.4.1 – 1.4.5, giving each group a different sheet. They should follow the sheet instructions and role-play the stakeholder on it, coming up with concerns and aspirations for the new crossing in Smeaton. They should write their outputs on Post-it notes, which they can stick on an A3 piece of paper to present later.

If a group is struggling you can use the support resource 1.7 to offer them ideas.

Types of crossing – 20 mins

Bring students back as whole class. Elicit possible crossing types.

Explain that students will be given information on one crossing per group. They will need to read the information, then use the Post-it notes to sort it into advantages and disadvantages. They should choose their most important three advantages and most important three disadvantages, and stick them to their poster. They will be presenting their findings to the class later.

Hand out Resources 1.5.1 – 1.5.5, giving a different sheet to each group.

Prepare presentation – 5 mins

Explain to students that they will use their A3 posters and Post-it notes to present to the class their findings on both the crossing type and the stakeholder views. They will now have a short time to discuss who will say what and what information they think they should read out. The presentations will be 4 minutes each.

Presentations – 25 mins

Carry out the presentations. During the presentation ask students to make notes on which stakeholders agree or disagree and about what.

Workshop roundup – 10 mins

As a roundup activity you should encourage students to discuss the crossings from the point of view of the stakeholder they researched. A suggested method is to have a vote. Remind students in which area of the room each type of crossing group worked. Ask them to go to the area of the room indicating the type of crossing their stakeholder would prefer, or stay in the centre if they would not want a crossing. Use this to spark debate by highlighting students in the same stakeholder group who disagree.

If a majority decision is reached, ask students to consider two compromises to the minority view that could be factored in to the design of the crossing.

Questions to debrief students – 5 mins

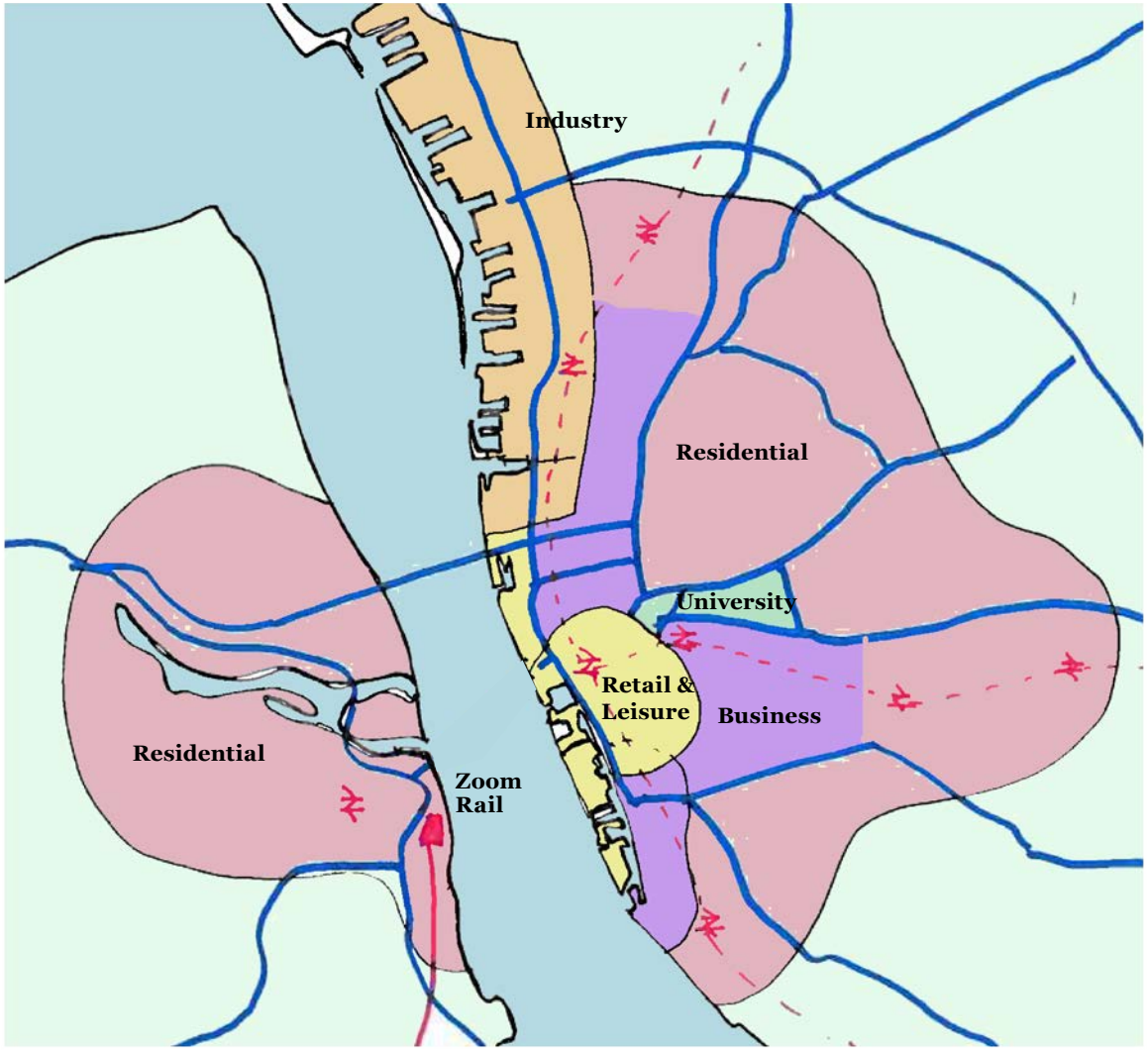
1. Which crossing would be the cheapest?
2. What makes someone a stakeholder?
3. Why should local people be asked about this project?

If you are completing the six-part project then explain that in the next workshop students will be put into a project group. They will be proposing and designing a crossing for Smeaton. They will build a model of their design and finish by presenting their design to a 'community consultation'.

Vocabulary/Definitions

Term	Description
Bill of Quantities	A shopping list of required materials.
Budget	The amount of money available for a project.
Cost	The amount of money needed to build a project.
Ecology	Ecology is the scientific analysis of organisms and their environment.
Estimating	An accurate determination of the cost of the project before construction begins.
Elevation	An elevation is a view of an object seen from one side.
Engineer	A person who applies her/his understanding of science and mathematics to creating things for the benefit of humanity and our world.
Engineering	Applying scientific and mathematical principles to practical ends such as the design, manufacture and operation of efficient and economical structures, machines, processes and systems.
Estimating	An accurate determination of the cost of the project before construction begins.
Plan	A plan is a view of a 3-dimensional object seen from vertically above.
Stakeholder	Individuals, groups or organisations that are affected by the activity.
To be accountable	To be required to justify your actions or decisions.

Map of Smeaton



Smeaton Information

Lord Mayor of Smeaton

I'm going to begin with a little information on Smeaton.

Smeaton was once the beating heart of British industry. Perfectly placed as a port for the Americas, it developed its iconic tagline 'Gateway to the World!'

The city has two football teams. West of the river they support Smeaton F.C. East of the river it's Smeaton United. Smeaton still attracts the stars, solo singer Smith Samuels visited last year. Ever since, a steady stream of adoring fans have come to have their picture taken in the same spot where Smith played, by the river.

The River acts as a natural barrier to our communities. There are fewer jobs on the west side of the river and people complain there is a lack of investment. On the east side people complain property prices are too high and that crime is a problem in the centre at night.

Transport for Smeaton control all the transport in the city. It is their job to make sure that the buses and Metro run smoothly and make sure all Smeatoners can access education, entertainment, services and leisure facilities. They are also responsible for maintaining our existing transport infrastructure.

Chief engineer for Zoom Rail

High-speed rail is the latest innovation in train travel. High-speed trains travel at speeds in excess of 200 mph. The UK government has decided to build another high-speed network. The name of this network is Zoom Rail.

We need high-speed rail because the railways in the UK are crowded and are becoming even busier. More people use trains for travelling to business meetings, visiting friends and family or going on holiday. The Government wants to improve train travel but just adding more trains doesn't create enough extra room.

A new, super-fast railway between cities would benefit passengers on the new trains. They would no longer be taking up space on the smaller trains that stop at towns in-between. There would be more space for everyone. Journeys would be faster and more comfortable. People and businesses would be more likely to earn and spend money in areas with new stations and better connections.

We are proud to announce we will be connecting the network with Smeaton. A new Zoom Rail station will be situated on the mostly residential southwest side of the River Smea, where there is an available brownfield site that can be redeveloped. Due to environmental and spatial concerns only essential parking will be available. The station is to be accessed by foot or by public transport.

Questions:

1. What is the value of high-speed rail?
2. Why is Zoom Rail coming to Smeaton?
3. Why was the station built on the west side of the river?
4. Can you see any issues with the placement of the station?
5. Are there any similarities between Smeaton and your local area?
6. Are there any big projects going on in your local area like the ones in Smeaton? What do you think about those local projects?

Extension:

Research the UK government's plans for the new high-speed rail network

Smeaton Information

Lord Mayor of Smeaton

Smeaton was a port for the Americas.

There are fewer jobs on the west side of the river and people complain that not enough money is being spent.

On the east side people complain property prices are too high and that crime is a problem in the centre at night.

Transport for Smeaton control all the transport in the city.

Chief engineer for Zoom Rail

High-speed rail trains travels at speeds of more than 200 mph. The UK government has decided to build another high-speed network. The name of this network is Zoom Rail.

We need high-speed rail because the railways in the UK are crowded and are becoming even busier.

High-speed rail will make journeys faster and more comfortable. People and businesses would be more likely to earn and spend money in the areas with new stations and better connections.

We will be connecting the network with Smeaton. A new Zoom Rail station will be built on the southwest side of the River Smea. This is where an available brownfield site can be redeveloped. The station is to be accessed by foot or by public transport.

Questions:

1. What is good about high-speed rail?
2. Why is Zoom Rail coming to Smeaton?
3. Why was the Station built on the west side of the river?
4. Can you see any problems with the location?
5. Are there any similarities between Smeaton and your local area?
6. Are there any big projects going on in your local area like the ones in Smeaton? What do you think about those local projects?

Extension:

7. Research the UK government's plans for the new high-speed rail network

Ecologists' Alliance

The Ecologists' Alliance is a group of local environmental campaigners and scientists.

The Ecologists' Alliance is having a meeting to discuss what they want from the new crossing and what they are concerned about.

You are going to role-play this meeting by brainstorming what you think they would say. You may like to write down what you think on separate Post-it notes.

For example you might think that the Ecologists' Alliance would be concerned about the pollution caused by the construction vehicles.

Gather your Post-it notes on a single sheet of A3 paper, which you can present to the rest of the class later.

2. Image by U.S. Navy, licensed under Public domain

Smeaton Housing Coalition

The Smeaton Housing Coalition is a group of local homeowners.

The Smeaton Housing Coalition is having a meeting to discuss what they want from the new crossing and what they are concerned about.

You are going to role-play this meeting by brainstorming what you think they would say. You may like to write down what you think on separate Post-it notes.

For example, you might think that the Smeaton Housing Coalition would be concerned about the impact to disabled residents in the area.

Gather your Post-it notes on a single sheet of A3 paper, which you can present to the rest of the class later.

Smeaton Tourism Board

The board is a group in charge of increasing tourism in Smeaton.

The board is having a meeting to discuss what they want from a new crossing and what they are concerned about.

You are going to role-play this meeting by brainstorming what you think they would say. You may like to write down what you think on separate Post-it notes.

For example you might think that the board would be interested in the visual impact of the new crossing.

Gather your Post-it notes on a single sheet of A3 paper, which you can present to the rest of the class later.

Image by Man vyi, licensed under Public domain

Smeaton City Council

The council are elected officials in charge of the day-to-day running of Smeaton.

The council is having a meeting to discuss what they want from the new crossing and what they are concerned about.

You are going to role-play this meeting by brainstorming what you think they would say. You may like to write down what you think on separate Post-it notes.

For example you might think that the council would be concerned about how well the crossing links to the current Metro stations.

Gather your Post-it notes on a single sheet of A3 paper, which you can present to the rest of the class later.

4. Image by Boing! said Zebedee, licensed under CC BY-SA 3.0

Confederation of Businesses

The Confederation of Businesses represents over 300 companies that operate in Smeaton.

The Confederation of Business is having a meeting to discuss what they want from a new crossing and what they are concerned about.

You are going to role-play this meeting by brainstorming what you think they would say. You may like to write down what you think on separate Post-it notes.

For example, you might think that the Confederation of Business would want possible clients from other cities to be able to visit easily.

Gather your Post-it notes on a single sheet of A3 paper, which you can present to the rest of the class later.

Cable car data sheet

Task

1. Decide for each bullet point if it is either an advantage or a disadvantage.

2. Decide on the most important three advantages and most important three disadvantages. Write these onto Post-it notes and stick them onto your A3 sugar paper to present later.

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Considerations

Planning

- Changes to the skyline might make it difficult to get planning permission
- Has to be very high up
- Most of it will not interrupt everyday life
- The supports go a long way inland causing some disruption

Budget

- High-cost project
- The spectacle can bring in tourism, which helps pay for the project
- Sponsorship could be used to secure the budget

Design

- Not many engineers have designed a cable car. Might have to get specialists from another country
- An opportunity to build something iconic
- Requires a skilled designer

Construction

- High cost of construction
- Huge piles to be buried in the river
- Supports extend far into the city and may block some roads
- Some temporary disruption to the shipping lanes

Crossing capacity

- Not very quick to cross
- Does not get delayed
- Open 12 hours per day

Weather

- Heavy rain, high winds, and snow might stop the service

Operational costs

- High, some of this can be recuperated from ticket sales and sponsorship

Ferry data sheet

Task

1. Decide for each bullet point if it is either an advantage or a disadvantage.

2. Decide on the most important three advantages and most important three disadvantages. Write these onto Post-it notes and stick them onto your A3 sugar paper to present later.

Considerations

Planning

- Ferry has low impact on surroundings
- River pedestrian path closed during construction
- People are concerned about the diesel fumes from the ferry

Budget

- Cost is low because: construction happens on land; ferry terminal buildings are small
- Sponsorship could be used to secure budget

Construction

- It does not need to work over water
- It does not need tunnelling
- It has a short construction time
- Quick to implement
- Not much infrastructure required

Operational costs

- Running costs considerable for fuel
- Money coming in from tickets could be enough to keep the ferry open
- High staffing required
- Servicing the ferries
- Saving up to replace old ferries
- Disruption to shipping routes, which could potentially be very costly

Crossing capacity

- If pedestrians get their timing right, they can walk straight on to the ferry without waiting
- There can be hold-ups
- Open 14 hours per day

Weather

- Most of the time the weather is good enough for the ferry to stay open
- High winds, heavy rain and floods cause the ferry to close

Suspension bridge data sheet

Task

1. Decide for each bullet point if it is either an advantage or a disadvantage.

2. Decide on the most important three advantages and most important three disadvantages. Write these onto Post-it notes and stick them onto your A3 sugar paper to present later.

Considerations

Planning

- Bridge changes the skyline; long ramps can be unsightly
- River pedestrian path closed during construction
- Some damage to river banks
- Less disruption to the shipping lanes than the concrete viaduct

Budget

- Construction of a bridge will cost less than tunnelling
- Bridge is expensive compared to ferry and concrete viaduct
- Expensive construction materials
- Foundations can be difficult to build

Design

- Civil engineers have lots of experience designing this sort of bridge
- Bridge needs to be high to go over the shipping lanes

Construction

- Construction is quicker than for the tunnel
- Construction over water is difficult because of the risk of falling into the water
- Temporary disruption to shipping lanes

Operational costs

- The bridge does not cost much money to keep open
- Some maintenance of the bridge is needed including: resurfacing the deck; repainting

Weather

- May be closed in high winds

Concrete viaduct data sheet

Task

1. Decide for each bullet point if it is either an advantage or a disadvantage.

2. Decide on the most important three advantages and most important three disadvantages. Write these onto Post-it notes and stick them onto your A3 sugar paper to present later.

1. Image by Jim – Flickr, CC BY 2.0

Considerations

Planning

- Bridge changes the skyline; long ramps can be unsightly
- River pedestrian path closed during construction
- Some damage to river banks
- Extra supports disrupt shipping lanes (causes greater disruption than the suspension bridge)

Budget

- Construction of a bridge will cost less than tunnelling
- Bridge is expensive compared to the ferry
- Expensive construction materials
- Cheaper to build than the suspension bridge

Design

- Civil engineers have lots of experience designing this sort of bridge
- Lower clearance than a suspension bridge
- Requires many river piers (feet)
- Bridge must be high to go over shipping lanes

Construction

- Construction is quicker than for the tunnel
- Construction over water is difficult because of the risk of falling into the water

Operational Costs

- Does not cost much money to keep open
- Resurfacing the deck

Crossing Capacity

- Lots of people can cross the bridge at once
- For pedestrians and cycles
- Open 24 hours per day

Weather

- The bridge is not usually affected by the weather
- The bridge may be closed in high winds

Tunnel data sheet

Task

1. Decide for each bullet point if it is either an advantage or a disadvantage.

2. Decide on the most important three advantages and most important three disadvantages. Write these onto Post-it notes and stick them onto your A3 sugar paper to present later.

Considerations

Planning

- No visual impact
- Uses up less land

Budget

- Tunnelling is very expensive due to: high material and construction costs; and the length of the tunnel compared to other crossing types
- It is difficult to borrow large amounts of money to build this project

Design

- Civil engineers have no experience of tunnelling in Smeaton, there may be unknown technical challenges
- Design takes a long time

Construction

- Soil from the tunnelling needs to be taken away using boats and lorries
- Tunnelling is time consuming

Operational costs

- The tunnel does not cost much money to keep open
- Some maintenance of the tunnel is needed including: resurfacing; checking the tunnel for cracks; ventilation

Crossing capacity

- The tunnel has a quick crossing time: pedestrians or cyclists can go straight through
- Open 24 hours per day

Weather

- The tunnel is hardly ever affected by the weather
- If the area around the tunnel floods, then the tunnel has to close

Smeaton Solutions

1. What is the value of high-speed rail?

Greater network capacity – more room for more trains to move more people; more jobs to create the new network and operate it; better connections between cities.

2. Why is Zoom Rail coming to Smeaton?

Zoom Rail is coming to Smeaton as part of a high-speed rail network. It aims to create new opportunities for people in Smeaton and connect the city better to the rest of the UK so that its residents can do business and catch up with friends and family more easily.

3. Why was the station built on the west side of the river?

The availability of a brownfield site. Students could also infer that it was due to an opportunity for development in an underdeveloped area. It is an opportunity to rebalance Smeaton.

4. Can you see any issues with the placement of the station?

Retail and leisure facilities, the business district and the industrial areas of Smeaton are on the other side of the river.

5. Can you think of any similarities between Smeaton and your local area?

Example topics could include: house prices; crime; football teams; under-development.

6. Are there any big projects going on in your local area like the ones in Smeaton? What do you think about these local projects?

Stakeholders teacher's notes

Use the following as suggestions for groups that are having difficulty.

Ecologists' Alliance

- The impact on the scenery
- The river harbour contains vegetation and animals
- The pollution caused by the construction of a crossing
- The pollution caused by the running of the crossing
- The impact of the crossing to net car use within the city
- The impact on the Zoom Rail network reducing the number of cars driving long distance across the country

Smeaton Housing Coalition

- Impact on local schools
- Use of small local roads by large vehicles during construction
- Impact on house prices
- Impact on congestion
- Will there be a charge to travel across the river? If so would there be a discount for local people?
- Being priced out of the centre by business people from other cities
- Pollution from the construction and the running of the crossing
- Access for blind residents

Smeaton Tourism Board

- Disabled accessibility
- Disruption to Smith Samuels' picture spot
- Local football club – helps fans get to the stadium
- Bikes on the crossing
- The capacity of the new crossing
- If it will bring people to the city (be visually striking)
- If the crossing runs on bank holidays etc

Smeaton City Council

- Improving the ability of the workforce to travel from one side of the city to the other
- Cost for the city
- Links to the existing Smeaton train stations and the new Zoom Rail station
- People should be able to get from the centre to the Zoom Rail site as easily as possible
- The crossing should support economic growth through tourism
- Accessibility for the elderly
- Smeaton's sphere of influence in the UK
- To have a new iconic structure in Smeaton

The Confederation of Businesses

- Increased foot traffic in the centre of town
- Concern residents will shop in other cities
- Building time and impact on local roads and businesses
- Views across river disturbed
- Local building firms used for the construction
- Reduction of commute
- Support economic growth
- Accessibility for workers with poor mobility
- Potential increase in client/employee base due to faster links with other towns and cities.
- River closures stopping business that rely on the river
- The pollution caused by the construction/ running of the crossing

Workshop 02
Understanding the environment and the community

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Narrative

Students choose a project role and are given their brief. They will evaluate the crossing types against the brief and decide which crossing they will design and build in the subsequent workshops.

How this workshop fits into the project

In this workshop students begin their project in earnest. They are given job roles in a team which over workshops 02, 03, 04 and 05 will be creating a detailed proposal for a crossing in Smeaton. They will then show their proposal to the rest of the class who will be role-playing the local stakeholders they researched in workshop 01.

Students will balance information from the previous workshop and this workshop to decide on which crossing they will propose.

Curriculum links

Mathematics – Use mathematical knowledge to interpret and solve problems; gradients; and scale drawings, trigonometry.

Science – Interpreting observations and data, making inferences and drawing conclusions.

English – working effectively in groups of different sizes and taking on required roles.

Workshop objectives

- Evaluate environmental factors, existing site conditions and identify constraints resulting from these.
- Identify a type for the proposed crossing.

Employability skills

Negotiation; communication; and problem solving.

Teacher's tips

Most of the costing calculations are determined by the length of the crossing. This is not the width of the river. Students use the maximum elevation and the minimum height/depth restriction to calculate how long their entire crossing will need to be.

The advanced and support costing information sheets will return similar answers but not exactly the same.

It is a good idea to give each group a folder to keep their loose sheets in. Make sure each group has 1.1 and 1.2 from the previous workshop in that folder.

Make sure that students understand that they will be choosing a crossing to work on for the rest of their project.

They can choose any of the crossings as long as they make a good case; however you may wish to discount the tunnel since it is difficult to model.

Extension

You could use this context to teach how to write a brief. If so students could use 2.3, 2.5 and 2.2.1 to help write their own brief.

You could ask very able students to investigate the effect of compound interest on the cost of the project.

Students could investigate the effect of ticket pricing changes on the budget and community satisfaction.

You could use the project roles as a starting point to investigate related careers using:
www.plotr.co.uk/transportcareers

Resources

- Card

Handouts

- 2.1 Project roles x 5
- 2.2 Brief x 5
- 2.2.1 Brief template
- 2.3 Further Smeaton information
- 2.4 River Smea not-to-scale cross-section x 5
- 2.5 Zoom Rail information
- 2.6 Data review sheet x 5
- 2.7 River Smea scale cross-sections [print as required]
- 2.8.1 Costing information (green) [print as required]
- 2.8.2 Costing information (red) [print as required]

Solutions

- 2.9 Data review sheet solutions

5. Image by M.O. Stevens, licensed under CC BY-SA 3.0

Starter

Ask the students – who is needed to build a crossing?

Project teams and roles – 15 mins

Explain to students that today is the start of their project. They are role-playing representatives of Zoom Rail and Transport for Smeaton and are collaborating to create a detailed proposal for the Smeaton Crossing. They will have to choose the crossing, design it, build a model of it, and then present their proposal in a community consultation.

First they must choose their job roles. You may like to discuss the job titles and what students think they mean.

- Project Director (runs project)
- Transport Planner (integration with existing transport networks)
- Quantity Surveyor (cost)
- Civil Engineer (design)
- Stakeholder Manager (stakeholders and local communities)
- Environmental Consultant (environmental impact)

Put the students into their groups. Try to make sure the groups have at least one student from each of the workshop 01 research groups. Hand out 2.1 and some card. Ask the students in their teams to divide up the job roles listed on 2.1 between them. They can then cut out their own job description, mount it on card and use it as their business card for the rest of the project.

For more information about these jobs and careers view the plotr Transport and Infrastructure World www.plotr.co.uk/transportcareers

The brief – 10 mins

Hand out 2.2. Give students time to read it properly. Ask them to discuss in their teams what they have to do. Check to see if students have any questions about the brief before continuing.

Use 2.3 and 2.5.

Evaluating crossing properties – 40 mins

Explain to students they will soon receive costing information for the crossings. Today they need to calculate the costing and capacity of their river crossings. They will then balance that with all the other information they have. Emphasise that although cost is a key driver they should think about the stakeholder views from Workshop 01.

Higher ability – Use 2.4 and 2.8.2 which involve using trigonometry to calculate how long their crossings will be (if students struggle to use trigonometry you can simplify it by telling them all slopes are 1 in 20, and then give them 2.7.). They will then use a wide ranging set of information to calculate the total cost of each crossing.

Lower ability – Use 2.4, 2.7, and 2.8.1 to calculate how long their river crossings will be. They will then use a restricted set of information to calculate the total cost of each crossing.

All teams can use 2.6 Data review sheet to help lay out their findings.

Choosing a crossing – 10 mins

Explain to students that they should use all the information they have received on Smeaton so far to decide which crossing type they will choose. Remind them to consider what someone with their job role would think. If they cannot agree in their group the project director has the final say.

Encourage each member of the group to write some quick notes on their decision with reference to their role. This will be useful for the last two workshops.

Ask each team to announce which type of crossing they have chosen.

Workshop roundup – 10 mins

Ask students to pair up with someone from a different group. They have to take it in turns to ask questions to work out what the other person's job role is. The only answers they can give are 'yes', 'no' or 'irrelevant'.

Explain that in the next workshop they will be designing the crossing they have chosen today.

Project Roles

1. Read through the duties of each job role. Agree on each member's job role.
2. Cut out your job card and fill in your name. You might like to stick it to a sheet of card. You will use this many times during the project.
3. You are responsible for these duties. If at times you don't have anything to do for these duties you should help other members of your team.

Community Manager (managing relationships with stakeholders and local communities)

Name: .....

I must consider:

- Local businesses
- Local council
- Shipping
- Leisure boats
- Considering effects on the local population

Quantity Surveyor (cost)

Name: .....

I'm in charge of:

- Working-out how much material it will take to build each crossing
- Working-out how much time it will take to build each crossing
- Assessing other financial and non-financial costs
- Overall budget

Civil Engineer (design)

Name: .....

I'm responsible for:

- The design of the crossing
- Choosing the right materials for creating the crossing
- Making sure the crossing is strong enough
- Making sure the crossing is safe
- Constructing the crossing

Environmental Consultant (environmental impact)

Name: .....

I must consider:

- Managing the sustainability of the project
- Reducing environmental effects
- Work with the Community Manager

Project Director (runs project)

Name: .....

I'm responsible for:

- The finished project
- Allocating team members jobs
- Giving time to speak to each member of the team
- The final say on the design choice

Transport Planner (integration with existing transport networks)

Name: .....

I must consider:

- The existing transport networks
- Zoom Rail
- Transport for Smeaton
- The type of crossing
- Effect on traffic around the city

Smeaton crossing brief

Your team is made up of representatives from Zoom Rail, Transport for Smeaton and an independent environmental consultant. Together, you will collaborate to create a detailed proposal for the Smeaton Crossing.

Refer to the Zoom Rail and Station information on 2.5.

Your proposed crossing should:

- Serve the users of the Zoom Rail station, both pedestrians and cyclists.
  - Be accessible to all people.
  - Help people get to the appropriate entrance.
  - Be open 5am Monday – Saturday, and 8am Sunday to close of service. Last arrival is no later than 23.59.
  - Serve up to 1,000 people per hour at peak times
  - Be in keeping with the new Zoom Rail station design, see figure 1.
- Be within a budget of £15,000,000, which includes the running costs for 50 years.
- Be structurally sound.
- Limit the environmental impact on the crossing.
- Take into account local concerns and considerations from both the majority and the minority views.
- Not disrupt the shipping lanes. This means that the central 100 m of the river should have a clearance of 8 m, see resource 2.4.
- Keep the damage to the banks at a minimum. The bank of the River Smea has been declared a Site of Specific Scientific Interest (SSSI) due to its unique ecology.
- Be in-keeping with the heritage of the city, see figures 2 and 3.

If you do not meet the brief in full you will need to make a strong case why not in the community consultation during the final workshop.

Figure 01

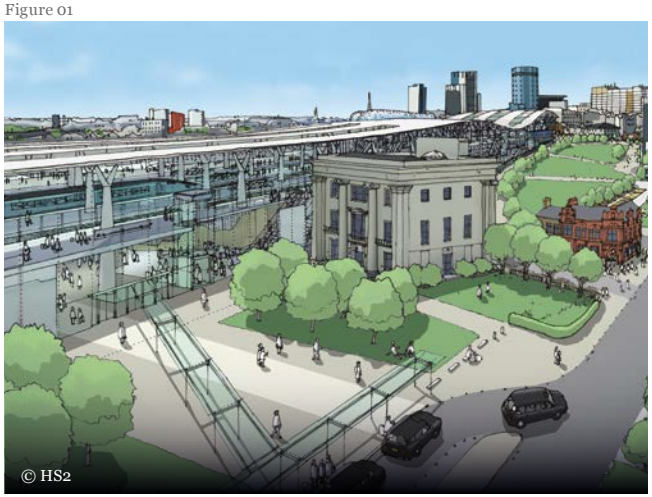

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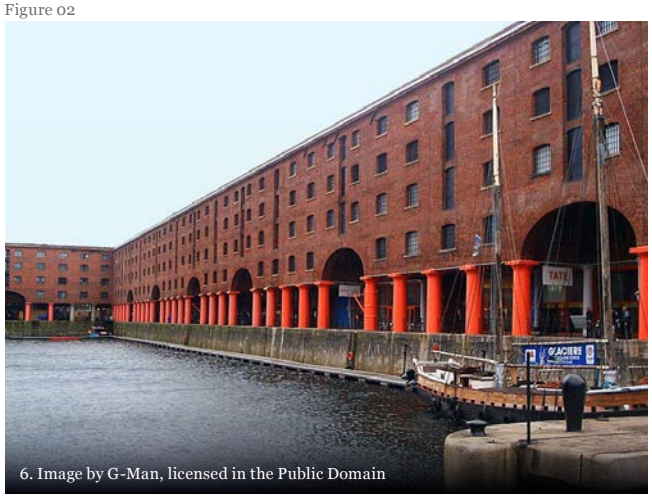
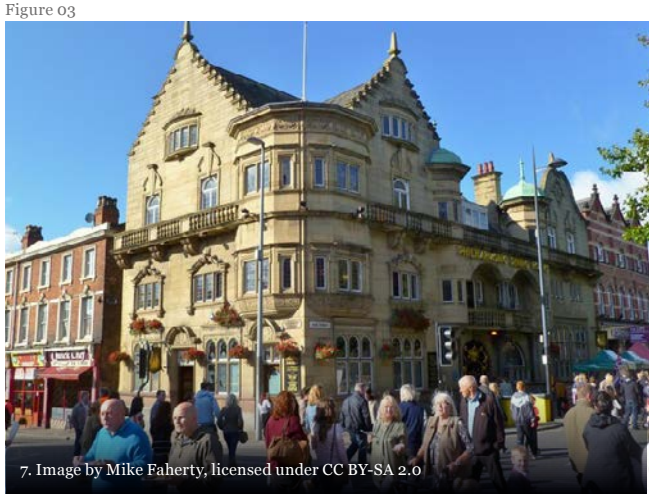
Figure 02



6. Image by G-Man, licensed in the Public Domain

Figure 03



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- Who does it serve?

- What is the budget?

- What does it do?

- What are the constraints?

Further Smeaton Information

"This is a great day for Smeaton and will enable us to bring the benefits of Transport for Smeaton to all Smeatoners."

Today the Lord Mayor of Smeaton allocated a budget for the Smeaton crossing matched by central Government, giving a total of £15,000,000. This includes the running costs for 50 years. She said that a special case would have to be made if a team proposed a crossing that was more expensive than this.

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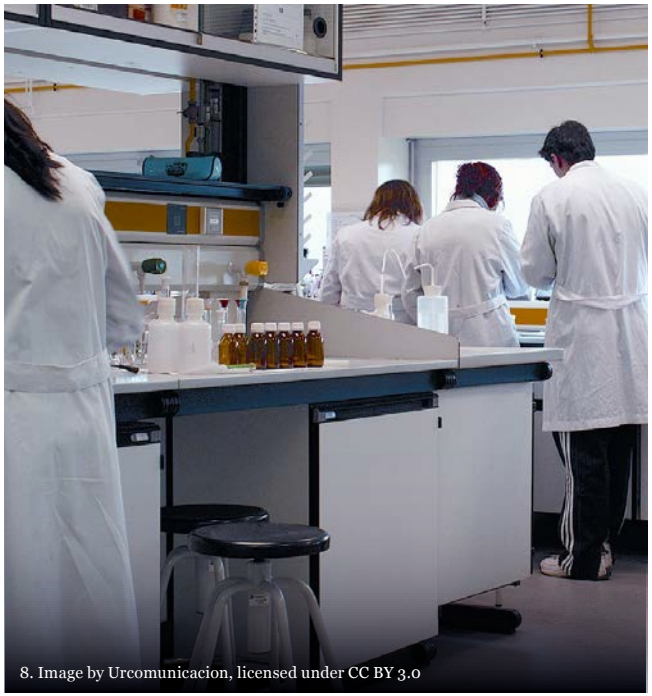
Other recent developments

Recent years have seen huge developments in Smeaton's infrastructure. In 2013 an extension to the east, Smeaton Metro, connected the university and commercial sector in the north to the rest of the town. This has led to warehouse conversions and restaurants, pop-up exhibitions, live music and a new school. Also, in 2012 smart tickets were introduced for use on the Metro, and bus ridership is up 25%.



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Site of Specific Scientific Interest (SSSI)

The Smeaton shoreline has been declared a Site of Specific Scientific Interest due to its 'unique ecology'.

A scientist involved with a study told The Daily Smea:

"Ships have travelled to Smeaton docks for hundreds of years, in that time they have brought with them more than just goods. When we surveyed the microbiology we found material from all over the planet. Thus we applied for Smeaton docks to be designated an SSSI."

Becoming an SSSI means that any new structure around the river must justify and minimise any damage done to the shoreline.

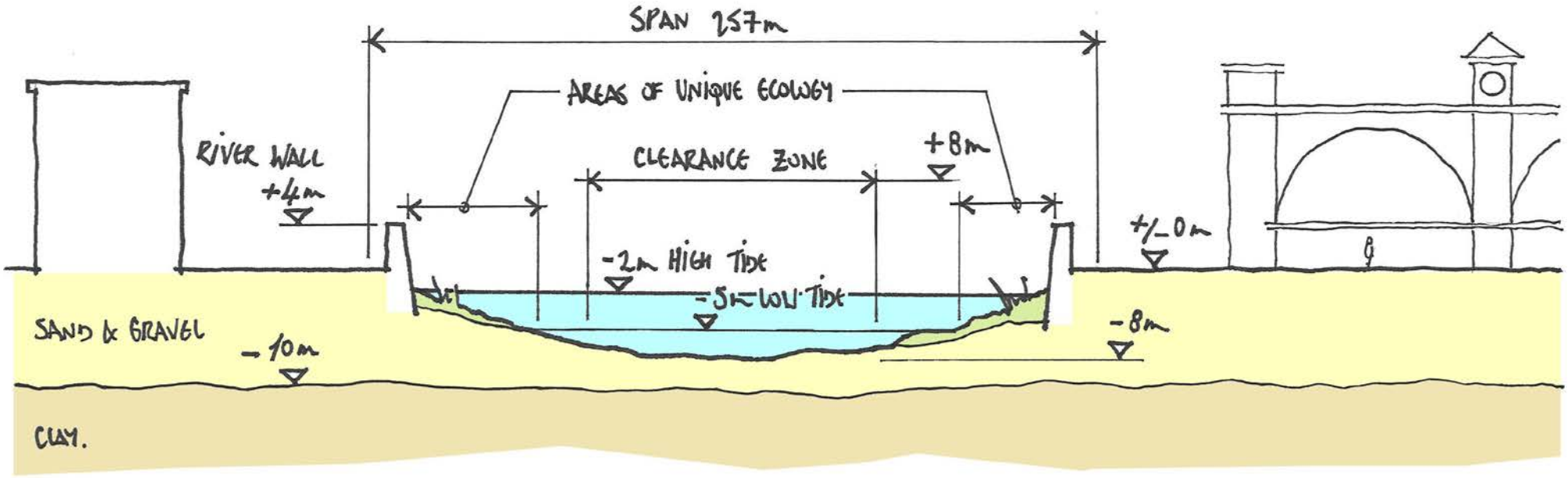
Smeaton Docks – A booming Industry

In 2014 Smeaton was the United Kingdom's sixth largest port by tonnage of freight handled. The freight tonnage of the port is set to rise substantially with the opening of the Smeaton container terminal in early 2016.

Compensation for river closures - £2,000 per day.

The freight ships require a clearance of 8 m for the central 100 m of the river.

River Smea cross-section (not to scale)



Zoom Rail Information

Line Speed

- Route alignment designed for up to 250 mph
- Initial technologies and trains designed for up to 225 mph

Train length and size

- Up to 400 m long – similar length to a Eurostar train
- Will carry up to 1,100 people
- Platforms on the classic network can currently accommodate one 200 m section

The number of trains per hour in each direction on Zoom Rail

- Day one maximum = 14 trains per hour (today's proven technology; significant classic network through-running)
- Ultimate future maximum = 18 trains per hour (technology development; operation over largely dedicated high-speed network)

Hours of operation:

- Start of service – first departure no earlier than 05.00 Mon – Sat, 08.00 Sun
- Close of service – last arrival no later than 23.59

Station Information

The station and the infrastructure will be built on the south-west side of the river Smea. The whole site is around 900 m long.

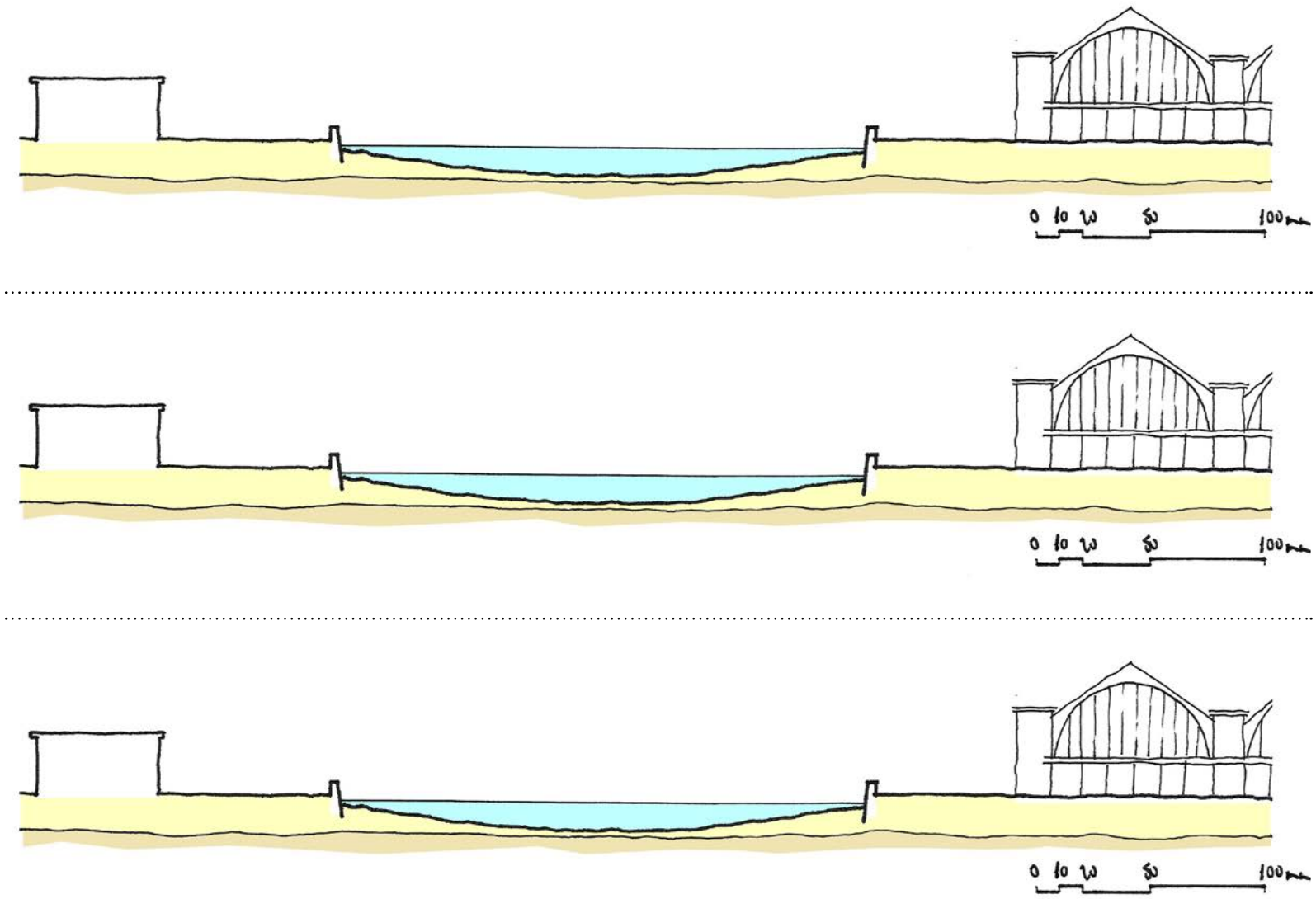
The Zoom Rail terminus station in Smeaton will be one of the largest new stations built in Britain in 100 years. An estimated 25,000 passengers will use it each day in 2026. This will increase to 66,000 in 2041, as other parts of the super-fast network are developed.

The majority of passengers using the Zoom Rail station are forecast to access the station on foot. They will arrive either by the proposed crossing or by Transport for Smeaton's bus and Metro connections, which are anticipated to be able to keep up with demand.

Data review sheet

	Cost if it were to run for 50 years	Environmental impact	Stakeholder considerations	Other factors
Suspension Bridge				
Concrete Viaduct				
Tunnel				
Cable Car				
Ferry				

Scale River Smea cross-sections



Compensation for river closures – £2000 per day

Crossing Type	Maximum slope	Cost per metre of crossing width	Additional building costs	Maintenance cost (per year)	River Closures	Depth/Height restrictions	Other
Suspension bridge	1 m in 20 m	£16,000		£73,000	2 days	8 m clear of the central 100 m of the river.	
Concrete viaduct	1 m in 20 m	£20,300		£73,000	50 days	8 m clear of the central 100 m of the river.	
Tunnel	1 m in 20 m	£20,000		£73,000		10 m below the river bed.	
Cable car	1 m in 2 m	£12,000	Each car costs £50,000.	Basic running cost £200,000 and £75,000 per car.	8 days	Minimum 85 m above the entire river.	Potential sponsorship £3,000,000 per year. Tickets cost £3 per ride. It takes 15 mins to cross. Each car takes 12 people. Estimated average usage is between 200 and 600 passengers per day.
Ferry	N/A	N/A	Ferry port cost £2,000,000. Cost of ferry is £150,000 and the ferry must be replaced every 20 years.	Basic running cost £100,000. £130,000 extra per ferry.	8 days. During operation, equivalent to one day closure of the shipping lane for every four days of operation of the ferry.	N/A	Potential sponsorship of £1,000,000 per year. Each ferry holds a maximum of 150 passengers. The ferry takes approximately 10 minutes to cross and 10 minutes to unload/load. Tickets cost £3 per ride. It will run 7am – 7pm Monday – Saturday. 10am – 4pm Sunday. Estimated average usage is between 200 and 600 passengers per day.

Crossing types costs

Equipment	Rent £/day
Small crane	£1500
Tunnel boring machine	£8000
Large crane	£3000

Material	Cost £/tonne
Concrete	£300
Steel	£2000

Compensation for river closures – £2000 per day. River pier costs £1,000,000 in compensation for river disruption

Staff Wages

- Wage per hour = £25
- Hours worked a day = 8
- Number of people employed in the building team = 22

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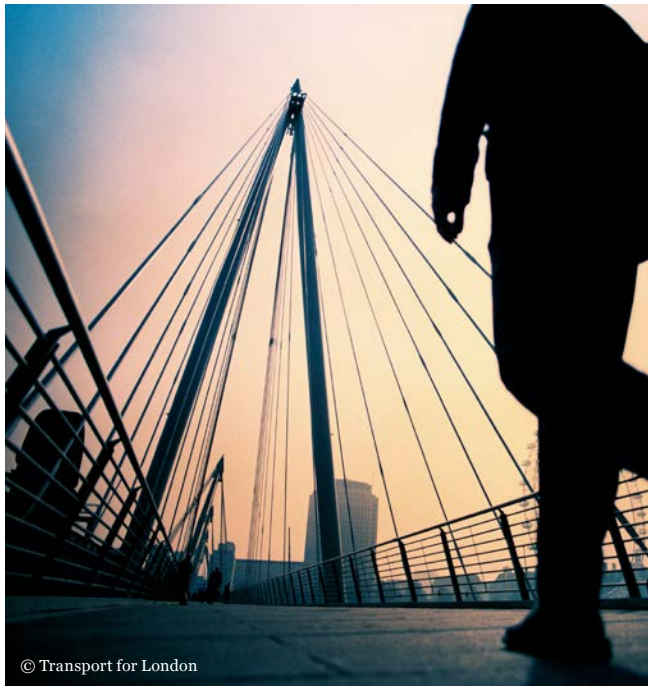
Suspension Bridge

- Maximum elevation of 2.8°
- It can be constructed at a rate of two metres of crossing length per day
- It will require the use of a large crane for the entire construction period
- It will need 5 tonnes of steel per metre
- It requires 1 full time member of staff for maintenance
- 1 in every 100 days of construction will require the river to close
- A pier is required every 200 m



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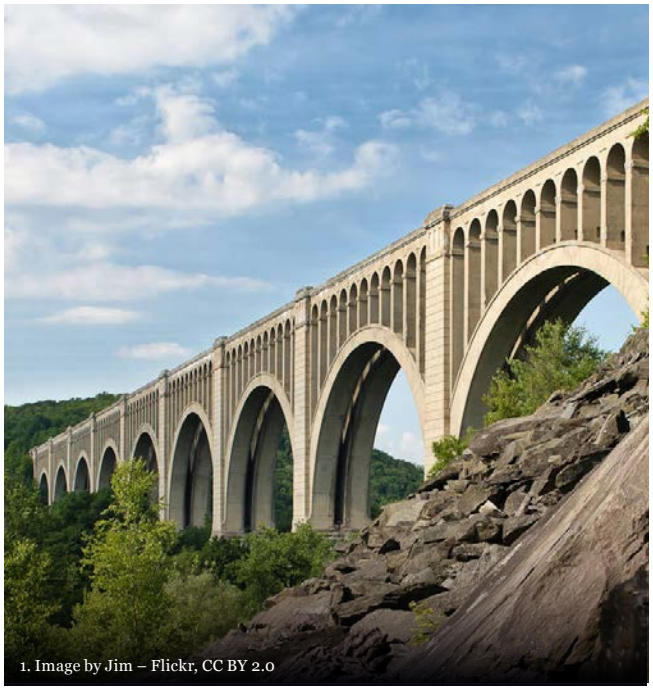
Concrete Viaduct

- Maximum elevation of 2.8°
- It can be constructed at a rate of two metres of crossing length per day
- A pier is required every 30 m
- A small crane for the entire project
- It will require 8.5 tonnes of concrete per metre of bridge
- Three in every one hundred days of construction will require the river to close
- 1 member of staff to maintain the bridge all year round



1. Image by Jim – Flickr, CC BY 2.0

Ferry

- Port construction will take 50 days, 300 tonnes of concrete and a small crane required for the entire build
- Fuel cost is £500 per day per ferry
- 6 people employed full time in the port
- Each ferry costs £150,000, is estimated to last for 20 years and requires two extra permanent members of staff
- The ferry crosses in 5 mins and requires 10 minutes to let people off and on
- Each trip holds a maximum of 100 passengers
- A single trip is £3
- It will run 7am – 7pm Monday – Saturday. 10am – 4pm Sunday
- The disruption to the shipping lanes is the same as a quarter day closure every day of operation
- Estimated usage is between 200 and 600 passengers per day

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Tunnel

- It must be 10 m below the river bed
- Its maximum elevation is 2.8°
- Can be constructed at 1.2 m of the crossing length per day
- It will require 2.5 tonnes of steel per m of tunnel
- It will require the use of a tunnel boring machine for the entire build
- One permanent member of staff to maintain the tunnel all year round


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Cable Car

- The clearance above the whole river is a minimum of 85 m
- The maximum elevation of the cable car is 27°
- It will require 300 tonnes of steel
- It can be built at a rate of 2.5 m of its crossing length per day
- Two in every 100 days of construction requires the river to close
- Two members of staff are required to operate the cable car
- Ticket cost £3
- A car takes 15 mins to cross and holds 15 people
- Each car costs £50,000
- It requires 2 piers
- It requires £500 fuel per day
- Estimated usage is between 200 and 600 passengers per day


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Data review sheet solutions

	Cost if it were to run for 50 years	Environmental impact	Stakeholder considerations	Other factors
Suspension Bridge	£11,306,800.00			
Concrete Viaduct	£15,173,500.00			
Tunnel	£19,786,250.00			
Cable Car	£13,161,000.00			
Ferry	£37,592,500.00			

Workshop 03
Designing a crossing

hs2 engine for growth

Transport for London

think up

Before you begin

Narrative

In this workshop students will develop the design of their crossing, making sure that it meets the brief. They will start by sketching lots of options then become more selective as they go.

How this workshop fits into the project

The students' designs will form part of their final presentation prepared in Workshop 05 and delivered in Workshop 06. In their presentation they will have to defend their design in front of other students who will be role-playing as stakeholders.

At the end of this lesson students will be asked to create a shopping list of the materials they need to build a model. You may want to read the Workshop 04 plan now, and check what materials you have available.

Curriculum links

Design Technology – Develop and communicate design ideas using annotated sketches, detailed plans, 3D and mathematical modelling, oral and digital presentations and computer-based tools.

Science – Investigate the forces in structures.

Mathematics – Scale drawing; plans and elevations of 3D shapes.

Workshop objectives

- Preliminary sketch proposals.
- Produce plan and cross-section of the proposed crossing.
- Gain understanding of different materials.

Employability skills

- Team working; brainstorming; handling pressure; and meeting deadlines.

Teacher's tips

Students can either focus on designing the entire crossing or the on/off ramps of the crossing, or both. See handouts 3.2 – 3.11. Tell students ramps must not be at a greater slope than 1 in 20.

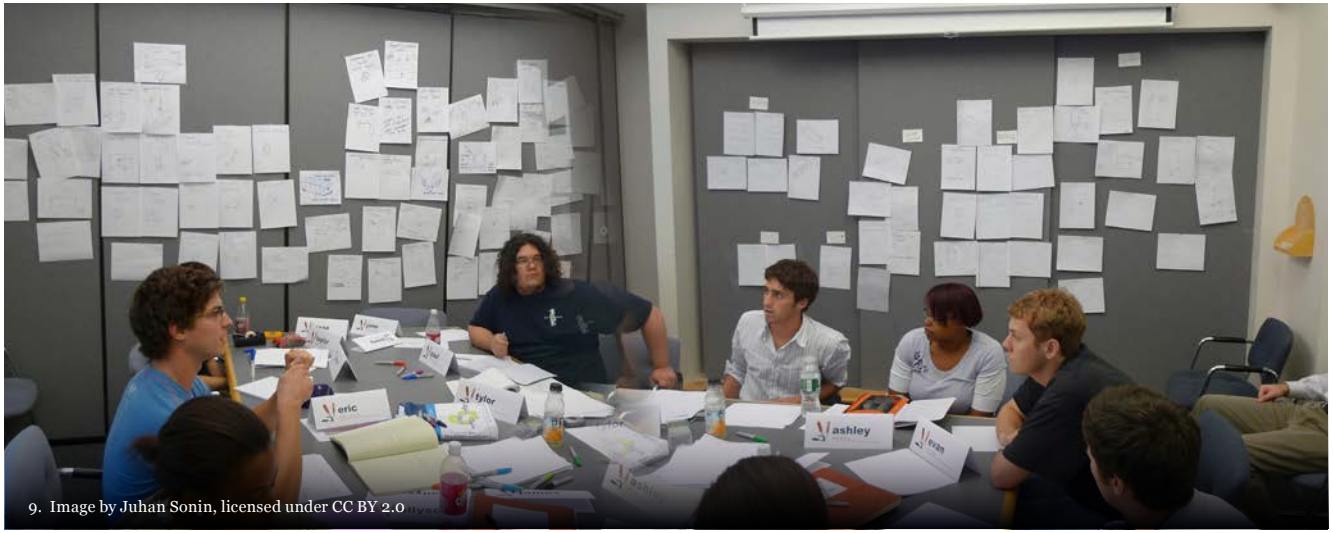
You might like to use this context to investigate the design process, in which case you could do pre-work with students about good practice for being creative.

Extension

Students could investigate whether parts of their structure would be under compression or tension. They could calculate the forces acting on the structure and design ways of strengthening it. Students could use the Engineer's toolbox found at: http://expeditionworkshed.org/the_engineers_toolbox/

Resources

- 3.1 Designing your crossing
- 3.2, 3.3 River plan and cross-section sheet
- 3.4 – 3.11 Bank plan and elevation sheets



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Starter – 5 mins

Ask students to think of a famous building that most people will know the name of.

What type of building is it? Why was it built? How did it come to be famous?

Ask them to describe the building to their partner without saying its name. Their partner should try to guess the name.

Introduction – 15 mins

Explain to students that today they will be designing their crossing and that there are many aspects to designing a structure of this size. They should re-familiarise themselves with the brief and their project roles and discuss in their teams what areas they should focus on in their design. Some areas they could focus on are:

- The visual aspect of the crossing
- Accessibility (the on/off ramps)
- How they can reach a compromise between stakeholder requirements
- (Extension)
  The forces and strength of the crossing

Sketching for ideas – 20 mins

Explain to the students that the best way of coming up with ideas is starting with many, and then becoming more selective.

They should spend: 5 minutes recapping the brief; 5 minutes discussing ideas; 10 minutes sketching ideas.

Design team meeting – 30 mins

Explain to students that they should now debate their different designs. They should remember their job roles. The final decision rests with the Project Director.

Once they have chosen, they should make sure they have drawn neat versions of their design.

Bill of Quantities – 15 mins (optional)

Explain that in the next workshop they will be creating a model of their crossing.

Ask students to produce a Bill of Quantities (shopping list) of materials required for creating the model in workshop 4.

Go round and discuss the materials they wish to use for the model.

Workshop roundup – 10 mins

Ask students to come up with two advantages of their design and one disadvantage.

Designing your crossing

Having chosen your crossing you need to design how it will look, and how it will connect to the existing infrastructure.

Your crossing could look like the pictures from workshop 1 or you might like to create your own style!

Either by creating your own, or by asking the teacher for templates, use plans and cross-sections to design your crossing.

Every member of the team should spend: 5 minutes recapping your brief; 5 minutes discussing ideas; 10 minutes sketching ideas.

Remember your job roles! For instance, the quantity surveyor might produce a design that would keep costs lower, whereas the civil engineer will be concerned with safety.

Try and come up with the weirdest and wackiest design at first, then become more selective in your design team meeting.

You will have a design team meeting afterwards to decide which design you will go for.

For hints of how to sketch follow this link http://expeditionworkshed.org/workshed/ucl-drawing-gym/

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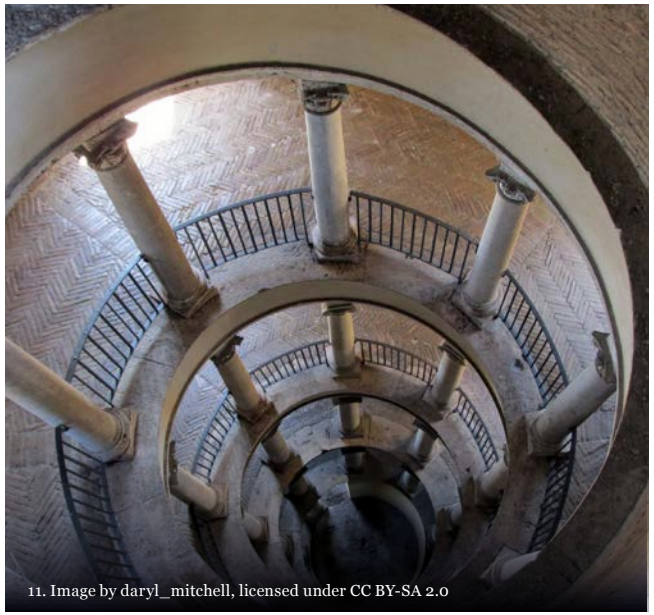

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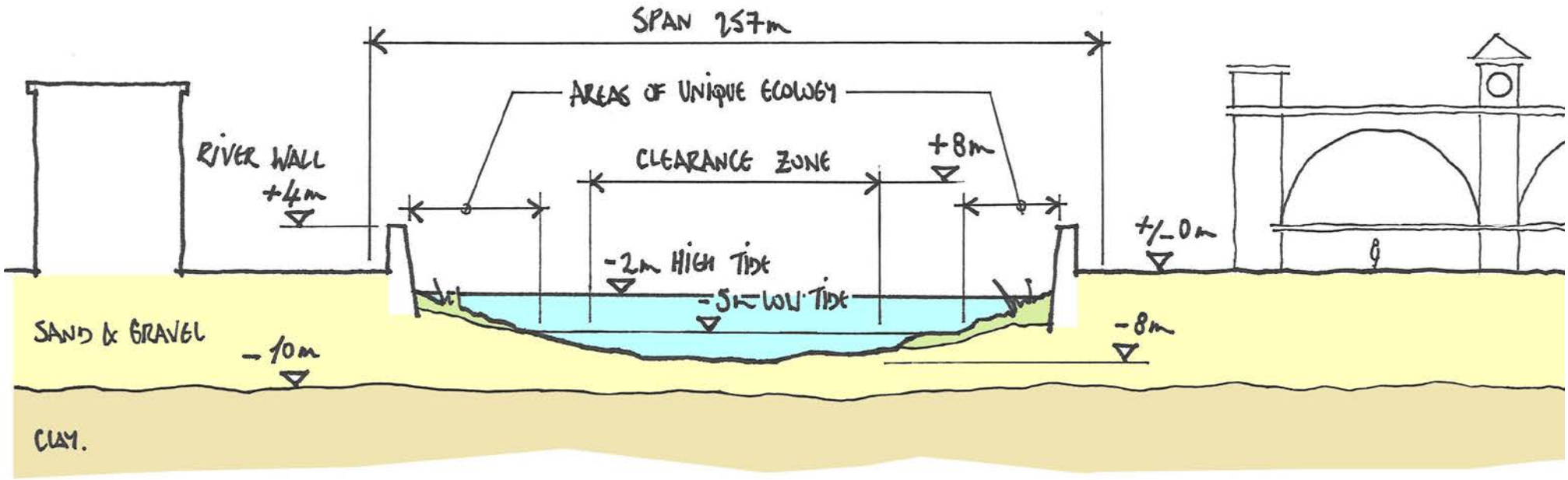
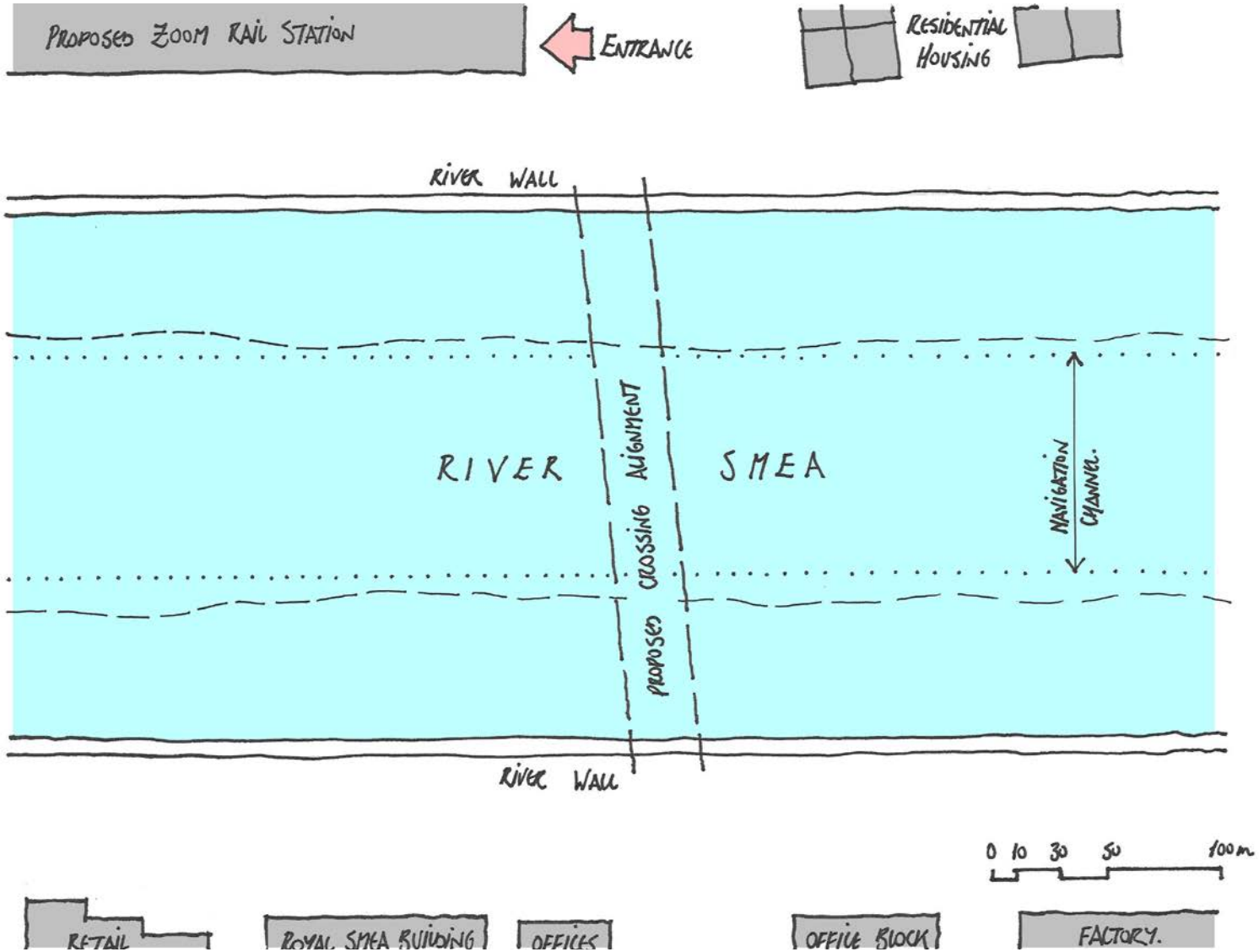
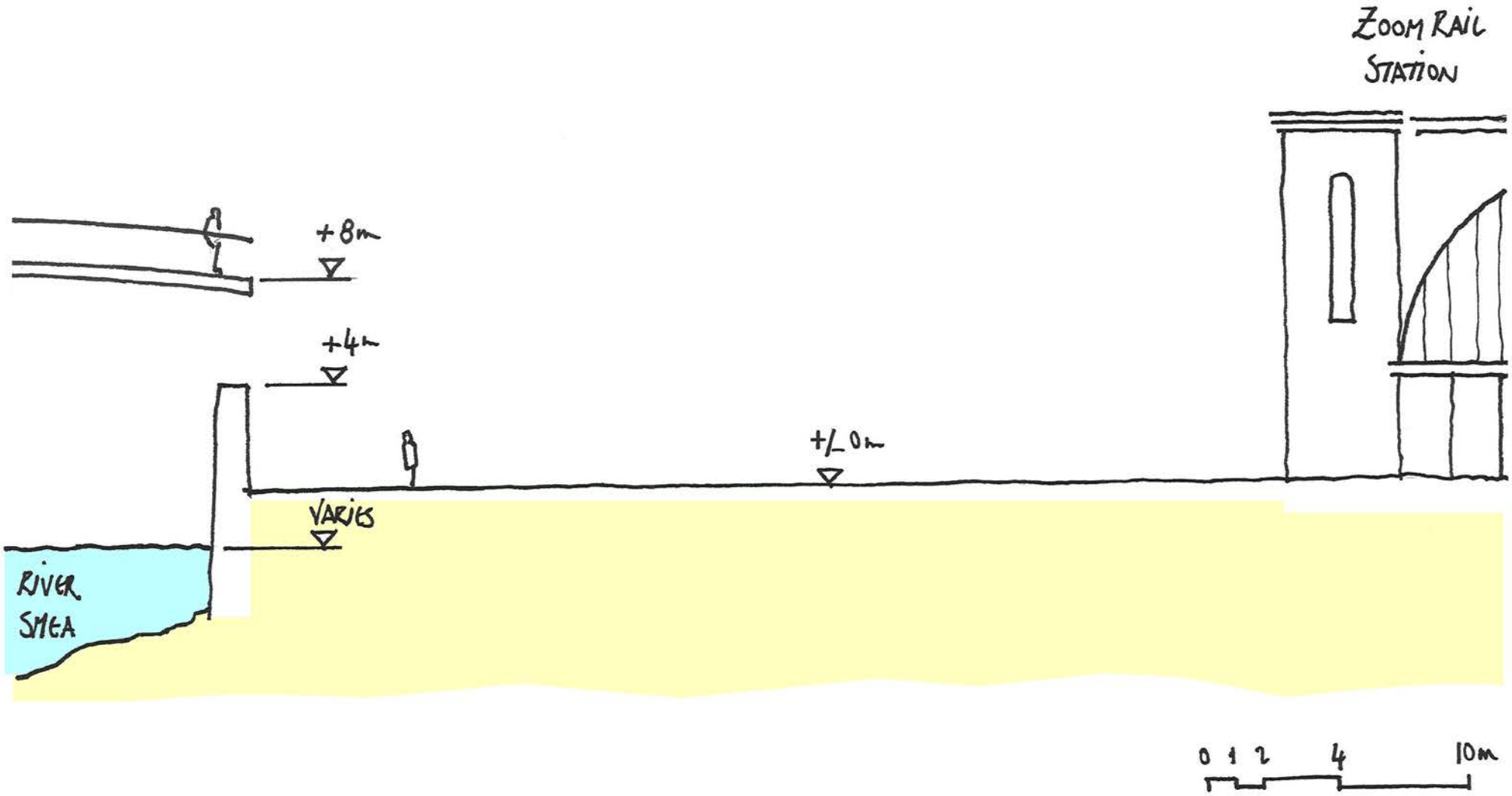
River Smea cross-section



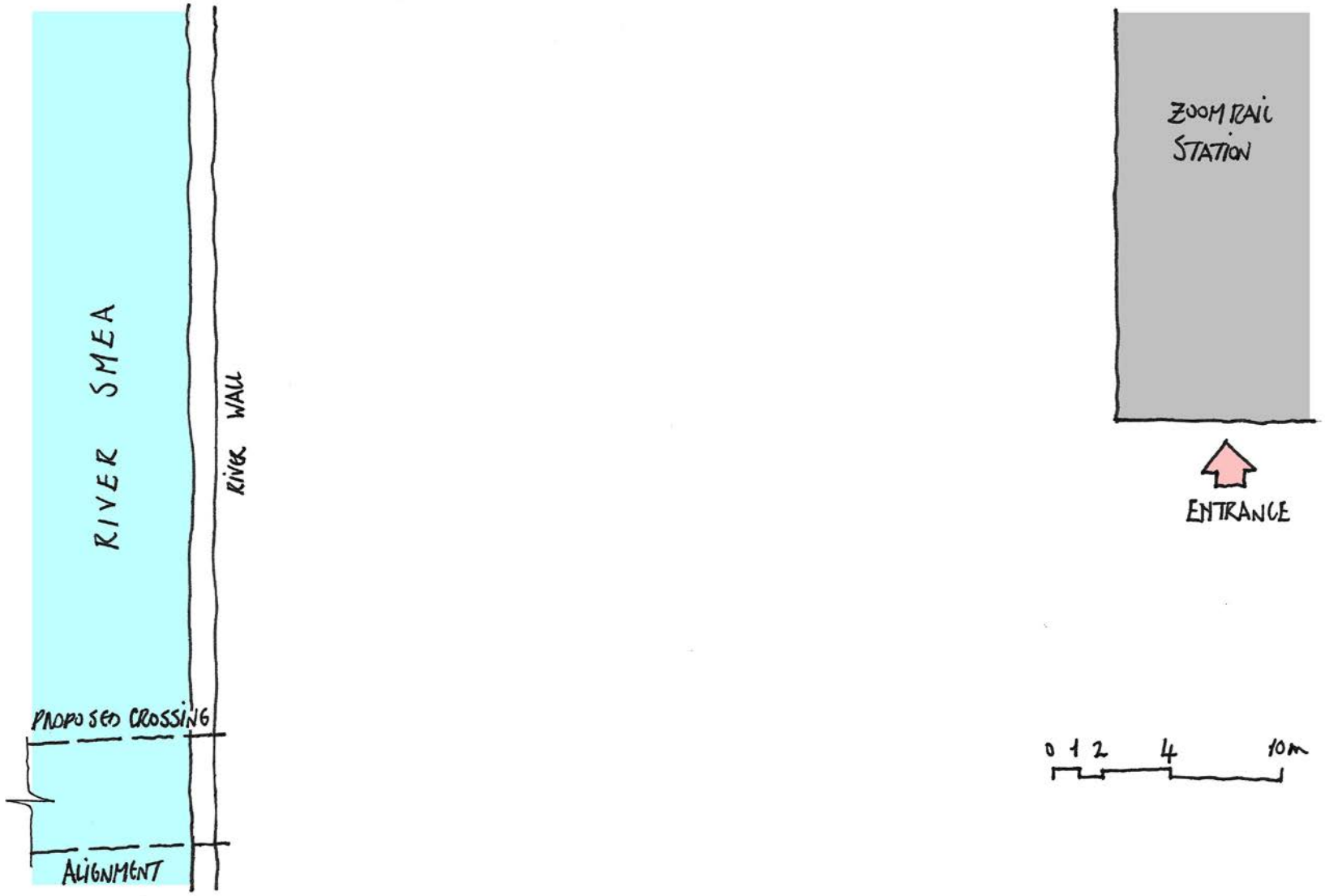
River Smea plan



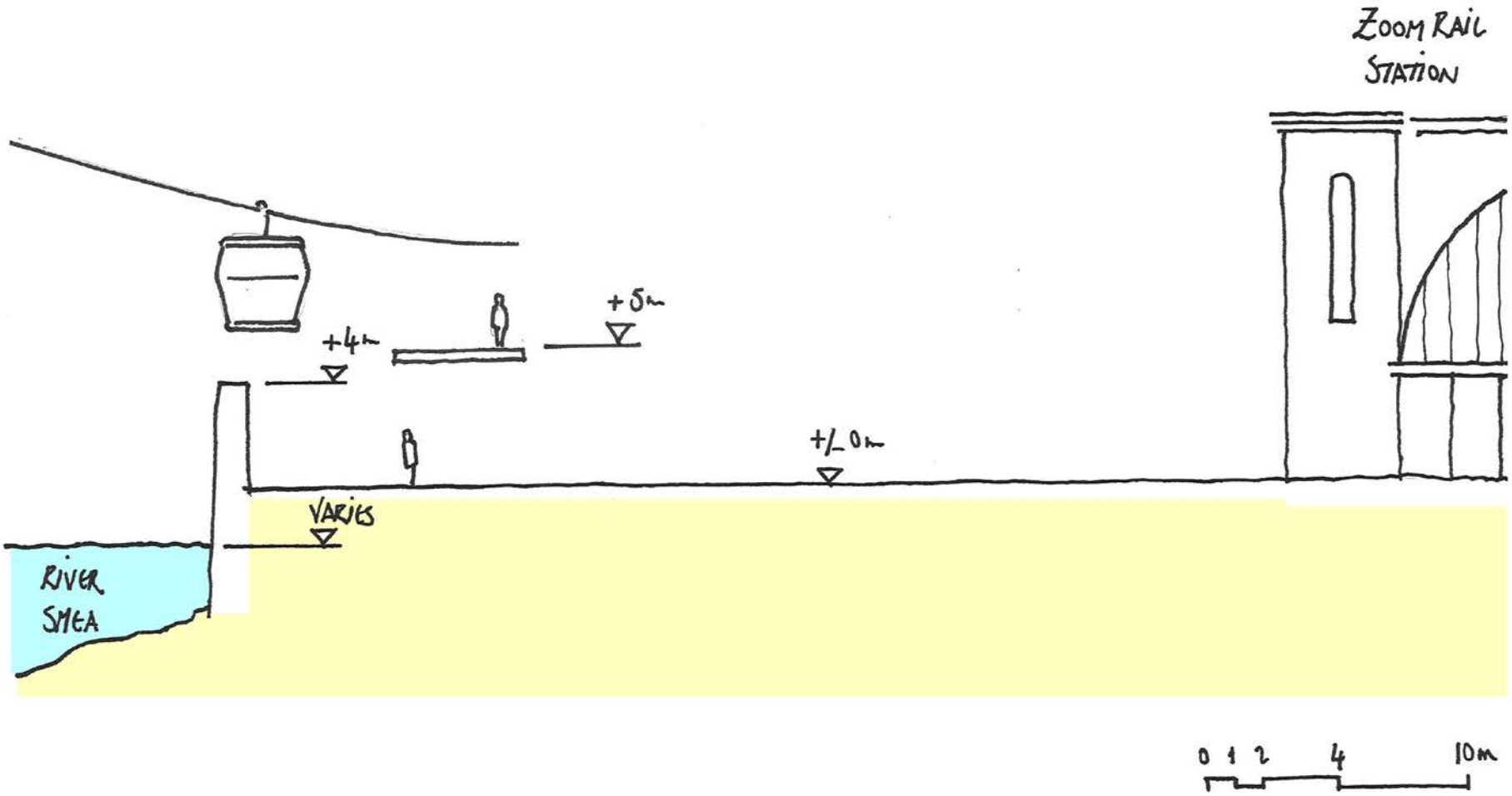
Bridge – Bank cross-section



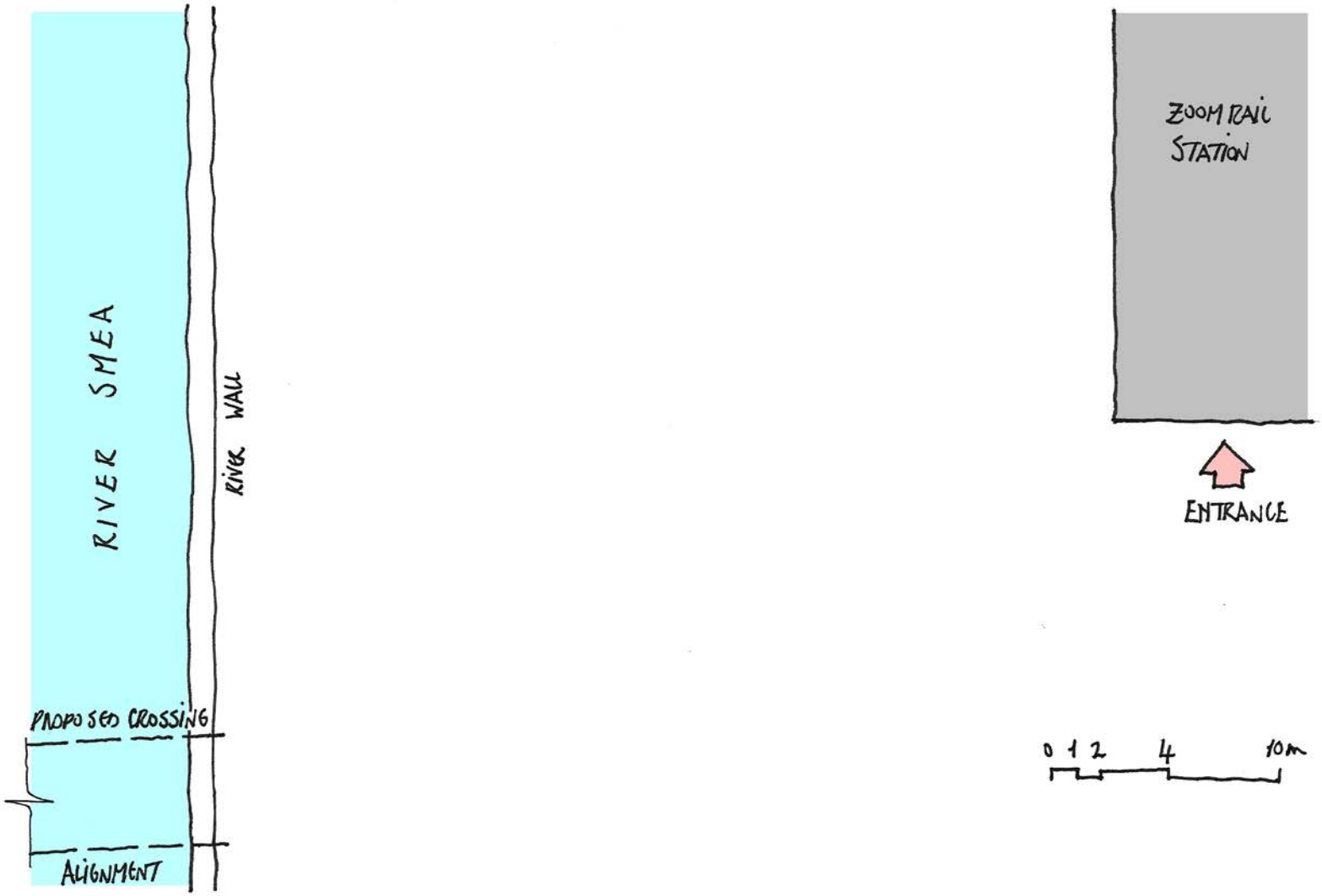
Bridge – Bank plan



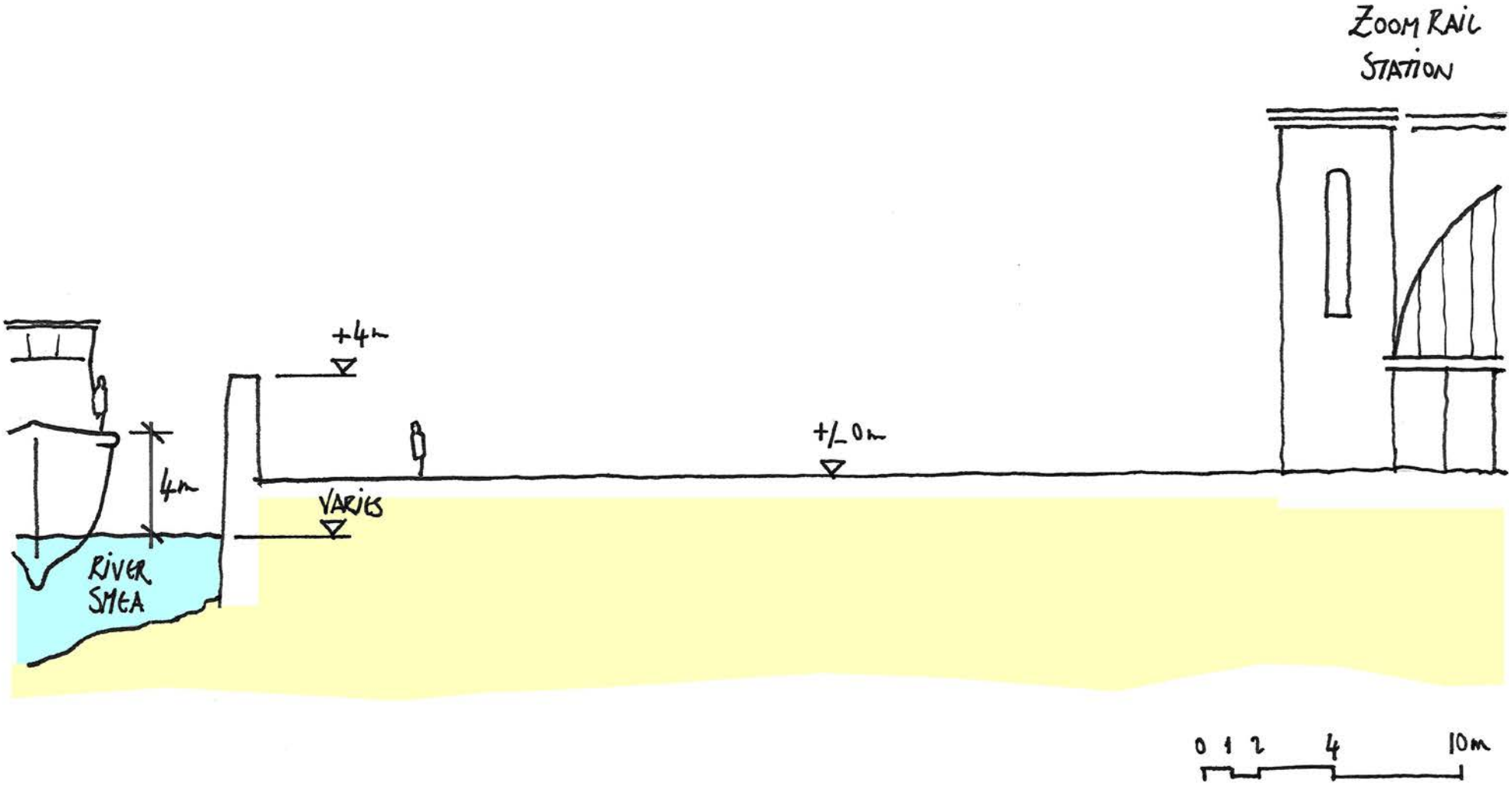
Cable car – Bank cross-section



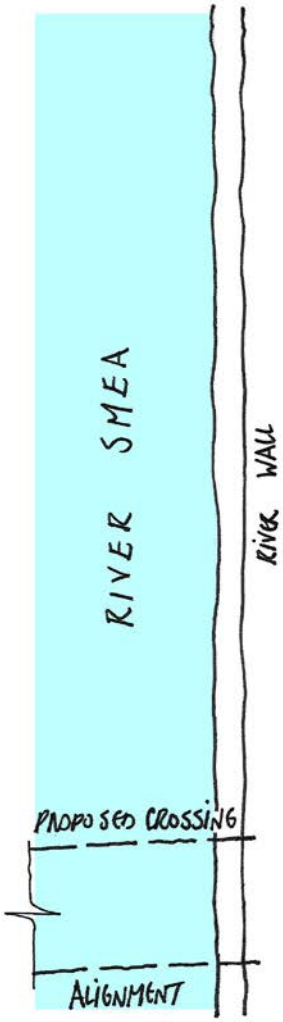
Cable car – bank plan

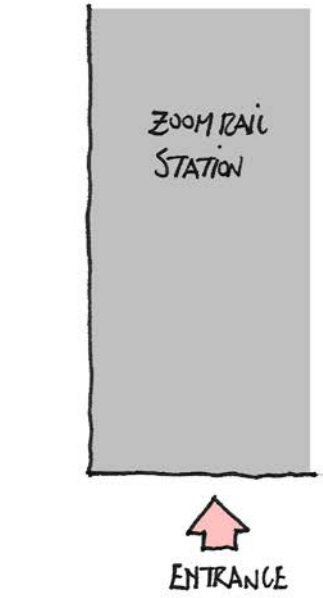


Ferry – Bank cross-section



Ferry – Bank plan





Workshop 04
Making the model

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Narrative

Students are to make a model of their crossing.

The aim is to be as visually accurate as possible. The materials will have a cost per unit that will end up giving a realistic cost to their design.

How this workshop fits into the project

This model will refer to the crossing they designed in the previous workshop. They will also use it in the community consultation at the end to demonstrate how they met their brief.

Curriculum links

Design Technology – Select from and use specialist tools, equipment and machinery precisely. Test, evaluate and refine ideas and products against a specification, taking into account the views of intended users and other interested parties.

Workshop objectives

Make a model to scale using chosen materials.

Employability skills

Team working; negotiation; and initiative.

Deliverer's tips

This workshop has been purposely left open to match the skills of your students, the specialities of your college, and the resources you have available.

You could:

- Focus on the aesthetics of the model
- Focus on the strength of the model and perform a strength test on it at the end of the project
- Extend the workshop into a STEM club
- Design the model using CAD
- Use the iPad app Make A Scape to build a computer model and test its strength. http://thinkup.org/innovation/makeascape

Resources

Suggested materials:

- Timber (suggested 9x9 mm)
- Rigid plastic tubes (suggested 10 mm diameter)
- Straws
- String
- Corrugated cardboard

Starter – 5 mins

Show students the starter slide containing the previous workshop titles and objectives. Students should match the title with the objective. The ones remaining will be this workshop and objective.

Introduction – 10 mins

Explain to students that in this workshop they will be creating a model of their crossing in Smeaton. The main aim of the model is to make it visually accurate. The materials they can use will have a price attached per unit length. They will need to record how much material can be sold back at the end.

Creating their model – 45+ mins

- Timber (suggested 9x9 mm) £15,000 per cm
- Rigid plastic tubes (suggested 10 mm diameter) is £10,000 per cm
- Straws (£1000 per cm)
- String (£500 per cm)
- Corrugated cardboard (£500 cm^2)
- You might like to suggest students set up two tables 128.5 cm apart to represent the river Smea

Workshop Roundup – 5 mins

Ask students to think of a material they have used today and give an advantage and a disadvantage to making a model from that material.

Explain to students that in the next workshop they will be preparing a presentation for use in the community consultation in the final workshop.

Workshop 05
Creating a presentation

hs2 engine for growth

Transport for London

think up

Narrative

Students will learn about how to give a great pitch. They will then organise, prepare and practise a group presentation ready for the community consultation in the next workshop.

How this workshop fits into the project

Students will need to remind themselves about their job roles, the brief, and the stakeholder views from previous workshops. They must have this ready for the final workshop where they will hold a community consultation. When not presenting, students will make up the audience of the community consultation and they will make notes on each presentation from the point of view of the local stakeholders.

Curriculum links

English - Working effectively in groups of different sizes and taking on required roles, including leading and managing discussions, involving others productively, reviewing and summarising, and contributing to meeting goals/ deadlines.

Workshop objectives

Summarise design decisions to present to others.

Employability skills

Summarising; brainstorming; team working; and meeting deadlines.

Teacher's tips

It is important to give students structure in this workshop as it is easy for them to spend the whole time playing on PowerPoint. That is why we have suggested a structure that encourages thinking about presentations in general before going into creating their presentation.

Resources

- Sugar paper

Starter – A great pitch – 20 mins

Hand out the sugar paper and pens. Ask the teams to each come up with three examples of a great pitch. For example; ads, a deal on The Apprentice, Dragons' Den, a strong brand.

Elicit examples of great pitches.

Ask the teams to brainstorm what made those pitches so great.

Discuss as a class and try to come up with five rules of pitches.

Introduction – 10 mins

Explain to the class that in the next workshop they will be conducting a community consultation.

Ask the teams to discuss 'What is community consultation?'

A community consultation is an opportunity for stakeholders to have their say on proposed designs.

It is also for the project team to learn from local people about local issues and history, the things you can't learn from a map or survey.

Getting the message right – 20 mins

Explain that each student will have to describe and defend the decisions they took in the design of this project, specifically relevant to their job roles. They should remember that the audience will be role-playing the stakeholders from the first workshop, so they should aim to satisfy those stakeholders as well as the brief as best they can. They should attempt to show that they have followed through with majority-held views but that compromises have been made for minority views.

Explain that each group should review their brief and decide what the main points of their presentation should be.

Creating the presentation – 30 mins +

Explain that each group will now create a five or six-minute presentation where each member will talk for one minute. They should consider the visuals that will help get their message across. They can have a maximum of 5 PowerPoint slides.

Workshop Roundup – 5 mins

Ask students to name one piece of good practice when giving a presentation.

Explain to students that in the final workshop they will be presenting their proposal for the crossing in Smeaton. They should have ready all the work that they have done. During the presentation the students will be taking notes from the perspective of the stakeholders they role-played in the first workshop.

Workshop 06
Talking to the community

hs2 engine for growth

Transport for London

think up

Narrative

Students will deliver their presentations to the rest of the class. The rest of the class will be role-playing as stakeholders and they will vote on which team best meets all of the requirements.

How this workshop fits into the project

In their presentations the students will have to defend their designs in front of other students who will be role-playing as stakeholders.

The stakeholders that students are role-playing are the stakeholders they each researched during Workshop 01.

The designs the students are presenting will be those they developed during Workshop 04.

Curriculum links

English - Making formal presentations and participating in debate.

Science - Recognising the importance of peer review of results and of communication of results to a range of audiences.

Workshop objectives

- Understand the different stakeholders and their perspectives in an infrastructure project
- Be able to present new crossing project and explain reasons behind them

Employability skills

Communication; summarising; and valuing diversity

Teacher's tips

Make sure that all students have written down three things that their stakeholder would be concerned or hopeful about the new crossing.

It is a good idea to have the posters from the first workshop available.

Extension

The school or students could invite a stakeholder representative or employee of a transport, building or engineering company to attend and provide feedback.

Resources

Assessment sheets

- 6.1 Smeaton Housing Coalition (print one for each group member)
- 6.2 Ecologists' Alliance (print one for each group member)
- 6.3 Smeaton City Council (print one for each group member)
- 6.4 Confederation of Businesses (print one for each group member)
- 6.5 Smeaton Tourism Board (print one for each group member)

Starter

Ask students to think back to the first workshop and the stakeholder they role-played. On a scrap piece of paper they should write down three things that their stakeholder was concerned or hopeful about for the new crossing. They should then read these to someone who doesn't know which stakeholder group they were in. The other person should try to guess their stakeholder group before they finish reading.

Introduction – 5 mins

Explain to students that today they will be conducting the long-awaited community consultation. They will either be presenting or making notes on the other presentations.

Stakeholder concerns or hopes – 10 mins

Explain that in a moment you will hand out an assessment sheet. They need to remember which stakeholder group they were in during the first workshop. Write down three things the stakeholder was concerned or hopeful about for the crossing. If they are unsure they can read the posters from Workshop 01.

Hand out the assessment sheets to the appropriate students. Put the posters on the table for students to reference.

Check each student has three concerns or hopes from the point of view of the stakeholder.

Community consultation presentations – 45 mins

Each team gives a five minute presentation followed by two minutes of questions from students role-playing stakeholders.

Final discussion – 20 mins

Each stakeholder group discusses which project they liked the most and why. They vote as a stakeholder group for their favourite crossing proposal.

The different stakeholders announce their winning teams with a few quick reasons.

The class discusses the preferred solution. You should ask students to make reference to concessions made between majority-held views and minority-held views.

Teacher debriefs students by explaining that although they are leaving the project here, in a real project this would be the beginning of a second phase of design. Zoom Rail in collaboration with Transport for Smeaton would take the preferred crossing design and adjust it to the comments made during the community consultation. They may then even have a second round of community consultation. And then, finally, the process of building can begin!

Ask students to think of a key concept from this project. Before leaving they have to share their key concept with the rest of the class.

Smeaton Housing Coalition	Team 1	Team 2	Team 3	Team 4	Team 5
Think back to the first workshop when you role-played a member of the Smeaton Housing Coalition. During today's presentations you will be playing that role again. Write down three concerns or hopes you would have about the new crossing. 1. .... 2. .... 3. .... Make notes on how well each group scores against the list.					

Ecologists' Alliance	Team 1	Team 2	Team 3	Team 4	Team 5
Think back to the first workshop when you role-played a member of the Ecologists' Alliance. During today's presentations you will be playing that role again. Write down three concerns or hopes you would have about the new crossing. 1. .... 2. .... 3. .... Make notes on how well each group scores against the list.					

Smeaton City Council	Team 1	Team 2	Team 3	Team 4	Team 5
Think back to the first workshop when you role-played a member of the local council. During today's presentations you will be playing that role again. Write down three concerns or hopes you would have about the new crossing. 1. .... 2. .... 3. .... Make notes on how well each group scores against the list.					

Confederation of Businesses	Team 1	Team 2	Team 3	Team 4	Team 5
Think back to the first workshop when you role-played a member of the Confederation of Businesses. During today's presentations you will be playing that role again. Write down three concerns or hopes you would have about the new crossing. 1. .... 2. .... 3. .... Make notes on how well each group scores against the list.					

Smeaton Tourism Board	Team 1	Team 2	Team 3	Team 4	Team 5
Think back to the first workshop when you role-played a member of the tourist board. During today's presentations you will be playing that role again. Write down three concerns or hopes you would have about the new crossing. 1. .... 2. .... 3. .... Make notes on how well each group scores against the list.					

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Finding out more

This resource was developed by Think Up with the support of HS2 Ltd and Transport for London.

Find out more about HS2 Ltd's education programme at: www.plotr.co.uk/hs2forteachers

Find out more about TfL's support for schools and young people at: www.tfl.gov.uk/info-for/schools-and-young-people/

Contact Think Up at info@thinkup.org

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