

# MORE BY RIVER

## KS3 MATHS / GEOGRAPHY

### Specification

Carnwath Road Riverside is an important construction site for building the Thames Tideway Tunnel. Situated on the riverside in the London Borough of Hammersmith and Fulham, it is surrounded by a bustling metropolitan area of industry, shops, housing and leisure facilities. Whilst use of barges will reduce road use from the site by 90%, careful logistics planning is needed to ensure that travel to and from the site is safe, sustainable and has minimal negative impact on the local community.

### In this lesson, you will learn:

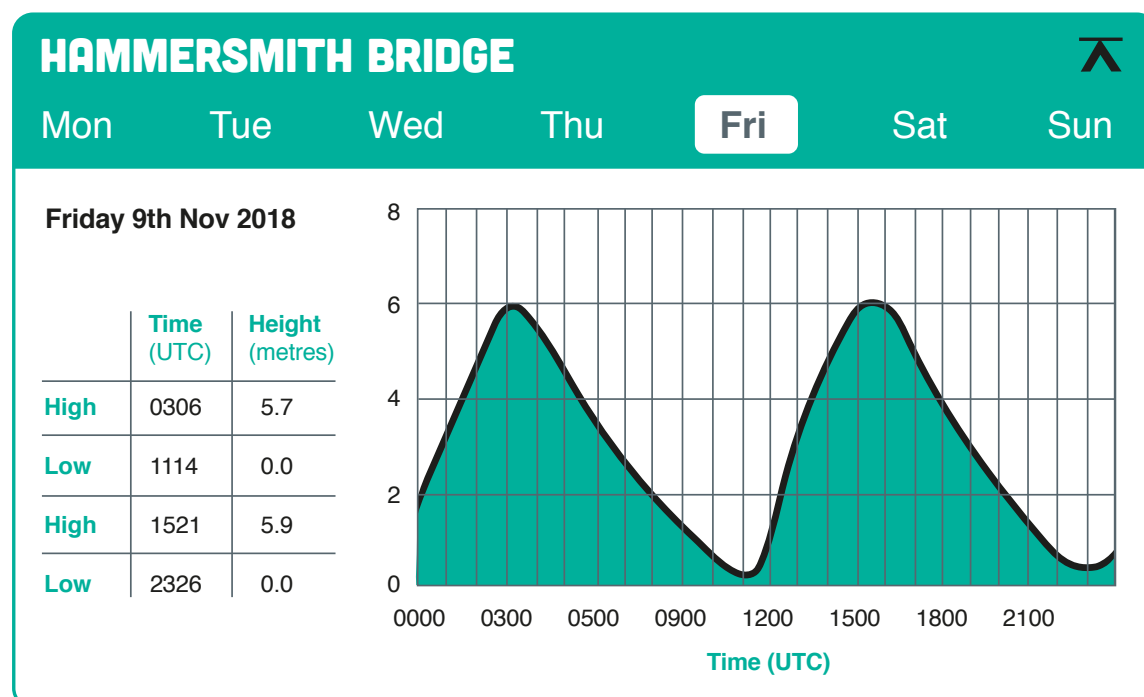
- To design a logistics plan for the Thames Tideway Tunnel.
- To understand the role of the tidal River Thames in transporting goods and materials.
- To analyse the work of present professionals and the impact of construction projects on individuals, society and the environment.

Use your teacher's guidance to complete the challenges below. You may also need to use your wider research skills.

### Starter: The Tidal Thames

Excavating the 25km long Thames Tideway Tunnel will produce huge amounts of spoil. 90% of this will be transported by barge, using the River Thames to transport the excavated earth out of London to be reused, loaded from drive sites such as Carnwath Road Riverside. This process is reliant on the tidal River Thames falling tide to help move the barges downstream.

Study the Tide Chart below for Carnwath Road Riverside, and then answer the following questions:



**Questions:**

- How many tides are there in 24 hours?
- What is the maximum height of the water at Carnwath Road Riverside?
- How long does it take to get to from high tide to low tide?
- How long does it take to get to from low tide to high tide?

**Challenge: Carnwath Road Riverside Logistics Plan**

Each Tideway Drive Site has a detailed Logistics Plan, which is used to coordinate the movement of goods, people and materials, taking into account all transport connections to the site, including road, river and public transport.

Each plan includes detailed information about the local area and the needs of the local community, and includes solutions to ensure that all travel and transport is safe, sustainable and has a minimal impact on the local area.

**Project Brief**

Taking on the role of a Tideway Logistics team, you will work as a group to create a detailed logistics plan for Carnwath Road Riverside Drive Site.

- Each member of the team will have a specific role, and be coordinated by the Logistics Manager.
- You will present your plan as a planning document to inform local stakeholders of the logistics plan for the site.

**Team Roles**

Each member of your team will be responsible for a separate brief, as outlined below:

**BRIEF: Logistics Manager**

Your job is to coordinate your team and ensure that they meet their individual briefs for the Logistics Plan. You should:

- Ensure that your teams plans take into account the needs of all stakeholders and are meeting their briefs.
- Coordinate the creation of the planning document.
- Introduce and conclude the planning document.
- Identify opportunities to minimise disruption and build a relationship with the local community.

**BRIEF: Staff Travel Planner**

Your job is to research the local area and to decide on a transport plan for the 165 workers and staff travelling to and from Carnwath Road Riverside. You should:

- Decide on the most suitable transport routes for workers commuting to and from Carnwath Road Riverside, considering convenience, sustainability, minimal impact on the local area and the needs of local stakeholders.
- Devise a scheme to encourage workers to travel sustainably to and from work.
- Identify stakeholders and make plans to meet their needs.

**BRIEF: Construction Route Planner**

Your job is to research the local area and to decide on the most suitable route for construction vehicles A, B and C marked on the Locality Map. You should make decisions based on the needs of your stakeholders as well as the most sustainable route for each vehicle. You should:

- Decide the most suitable route to Carnwath Road Riverside for vehicles A, B and C, and be able to justify your choices.
- Decide which times of day are most suitable and least suitable for construction movements to and from site.
- Identify stakeholders and to make plans to meet their needs.

**BRIEF: River Transport Officer**

Your job is to research and manage the barge operations at the Carnwath Road Riverside. You do not have to decide what time the barges will arrive and depart (as this will change depending on tides) but you should:

- Decide how many barges can be loaded per day.
- Research when are the busiest times on the river, when Barge loading should be avoided.
- Identify stakeholders and to make plans to meet their needs.

**Research Materials**

In order to help your team to make decisions, a selection of research materials has been provided. This includes:

- Statements from local stakeholders.
- A land use map of the area around Carnwath Road Riverside, also detailing local transport connections.
- A memo from the Chief Civil Engineer and Environmental Advisor at Carnwath Road Riverside.
- A Tide Chart for Carnwath Road Riverside.

*You should also include your own research.*

**Planning Document Tips**

- Remember that the planning document is for local stakeholders. You should explain how you are planning to meet their needs.
- Be creative – logistics is all about problem solving. Don't be afraid to think outside the box to meet your brief.
- Be sustainable – sustainability is a key priority of logistics planning – make sure that you explain how you plan to ensure that you have a minimal effect on the environment,
- Use a professional tone – remember that you are representing Tideway!

## Research Materials 1: Meet the Stakeholders

I live close to Carnwath Road Riverside, and use the nearby leisure centre. My main concerns are congestion and road noise. I travel to work, and there is already congestion and a lack of parking spaces, especially at peak times. Road noise also effects my evening relaxation and sleep.

**Mariska - Local Resident**

Our students travel to school on foot and by bicycle, and it is important for their safety that we do not experience an increase in large vehicles near to our school at times when students are travelling. Air quality and noise is also a concern for us, the latter especially during exam time.

**Caroline - Headteacher, Sands End Academy**

My busy builders supply depot could be negatively impacted if staff at the Carnwath Road Riverside Site use the local parking spaces, as these are needed by my customers. An increase in long vehicles could also delay deliveries to and from my wood-yard, especially in the morning between 9am and 10am.

**Jim – Director, Carnwath Building Supplies**

London roads are already busy, and lives could be at stake if emergency vehicles such as ambulances become stuck in traffic. Any new developments must make sure that they do not cause additional congestion, especially near to hospitals and medical centres.

**Abiola – Paramedic, Royal Marsden Hospital**

Our famous Thames Boat tour has passed by the site of Carnwath Road Riverside for the last twenty years, and whilst we welcome more use of the River, it is important that our tours remain safe and enjoyable for passengers and crew. We would like the Carnwath Road Drive Site barges to avoid peak times on the River, as this part of the River Thames can get very busy.

**Jake – Skipper, Thames Gannet Boat Tours**

## Research Materials 1: Meet the Stakeholders

Many local people rely on local buses to commute to work, as well as to access local services such as libraries, schools and hospitals. Narrow London streets provide little room for two wide vehicles to pass, meaning that more trucks on the road at peak times could cause considerable traffic problems and delays to bus services.

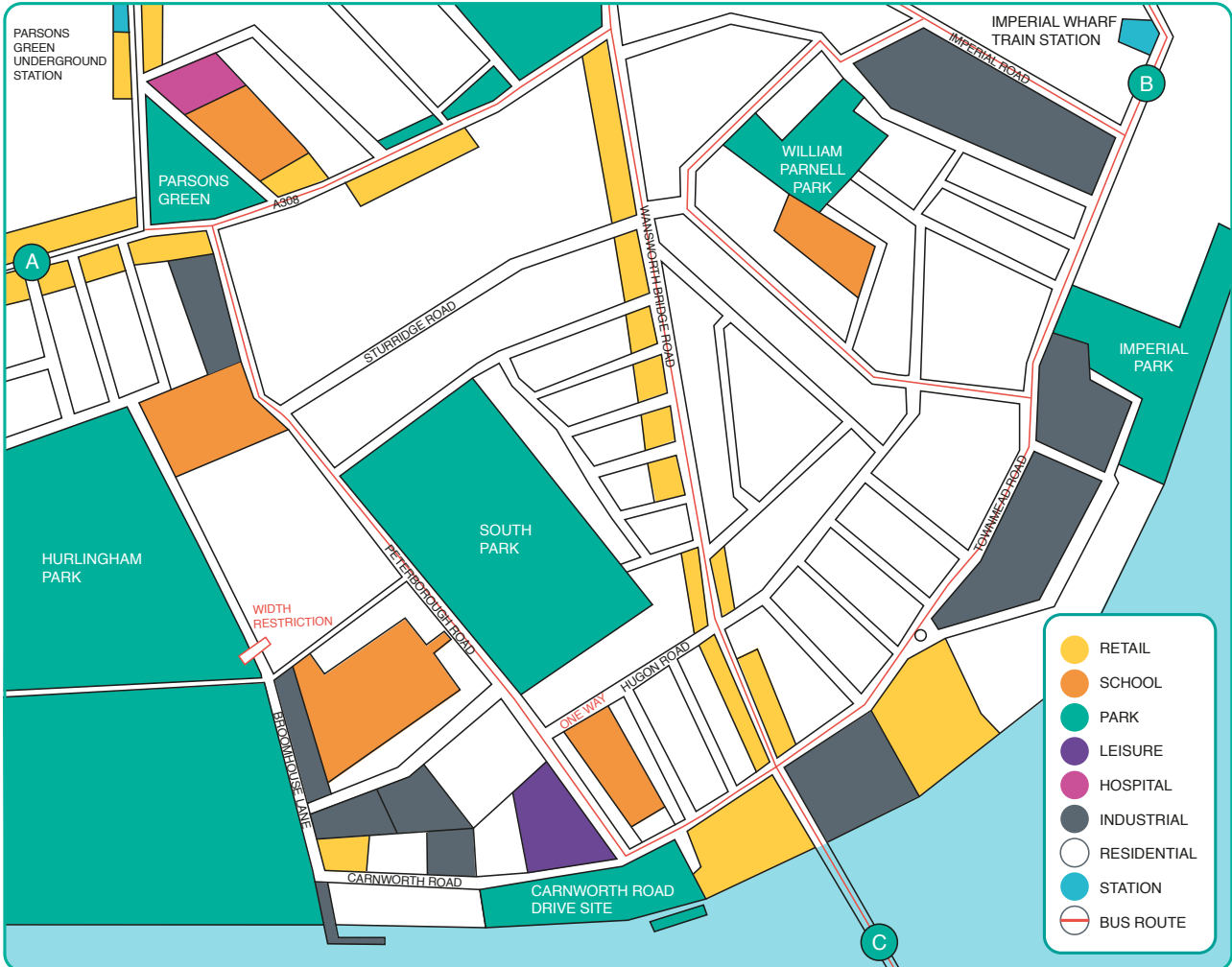
**Werner – Bus Driver**

Getting the Travel Plan right for this area is vital to the success of this site, as well as the livelihoods and living standards of local people. Minimising road usage by transporting more by river will reduce the environmental impact of the site, but you must also consider how your workers and staff will be commuting. Consider advising staff on local public transport routes, and incentivising sustainable travel such as cycling to those workers who live locally.

**Farwaz – Local Authority Sustainable Travel Officer**

### Research Materials 2: Land Use Map

Use this map to plan your construction routes. Consider the land use along each route and how stakeholders may be affected.



See Landusemap.bmp

**Research Materials 3:  
More by Memo**
**RE: LOGISTICS PLAN**
**TO: Logistics Team**
**FROM: Glenda Ferndale, Project Director, West Tunnel Section**

Dear Team

As Project Director for the West Tunnel Section and Carnwath Road Riverside, I would like to formally welcome you to the team. As you will soon be writing the Carnwath Road Riverside logistics plan, here are some updates on recent developments that may influence your plans.

- 90% of Excavated material and 90% of tunnel lining segments will be transported by barge. This will dramatically reduce road use. We expect to require two barge trips per day, resulting in four barge movements.
- We have recently taken delivery of a concrete crusher, to reduce concrete waste from demolition. Over the course of July, it reduced HGV movements by 50, and will further reduce movements by 260-300 over its deployment.
- 45 trips will need to be coordinated for other vehicles, resulting in 90 movements, including aggregate lorries, ready mix concrete lorries and pre-cast concrete tunnel segment lorries.

As you are aware, any delays to deliveries or removal of aggregate will result in delays in tunnelling, so it is vitally important that your logistics plan minimises the potential for delays. Let me know if there is any further information that you require from me or my team.

 Best wishes,  
Glenda

**RE: LOGISTICS PLAN**
**TO: Logistics Team**
**FROM: Tariq Hadad, Environmental Advisor**

Dear Team

This is just a short email to introduce myself and to pass on a couple of relevant notes for your logistics plan and team.

- As with all drive sites, Carnwath Road will seek to maximise the use of barges to transport machinery, spoil and tunnel ring segments. In one year, the eight barges will keep 20,000 lorries off the road.
- Minimising road movements is a key priority. Aim to keep all movements to the shortest possible to minimise the carbon footprint of each journey, as well as noise, vibration and air pollution.
- We are currently looking for volunteers to help with a gardening project at South Park. If any of your team could join, it would be of great benefit to the local community and help with community engagement.

Please get in touch if there is anything that I can assist with.

Tariq

The following tide charts measure the high and low tides of the River Thames over a five-day period. You should consider:

- How many tides there are in a twenty-four hour period.
- How the tides change over time.
- How the timings of low and high tides will affect the regular movement of barges.

## HAMMERSMITH BRIDGE

Mon

Tue

Wed

Thu

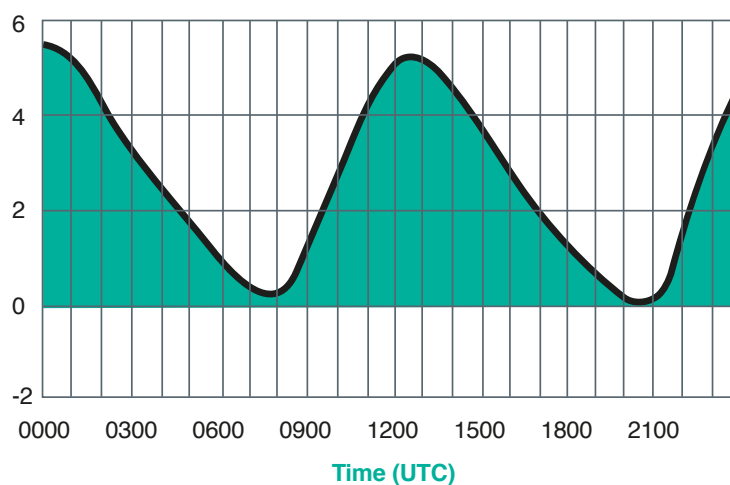
Fri

Sat

Sun

Monday 5th Nov 2018

	Time (UTC)	Height (metres)
Low	0801	0.2
High	1229	5.3
Low	2040	-0.0



## HAMMERSMITH BRIDGE

Mon

Tue

Wed

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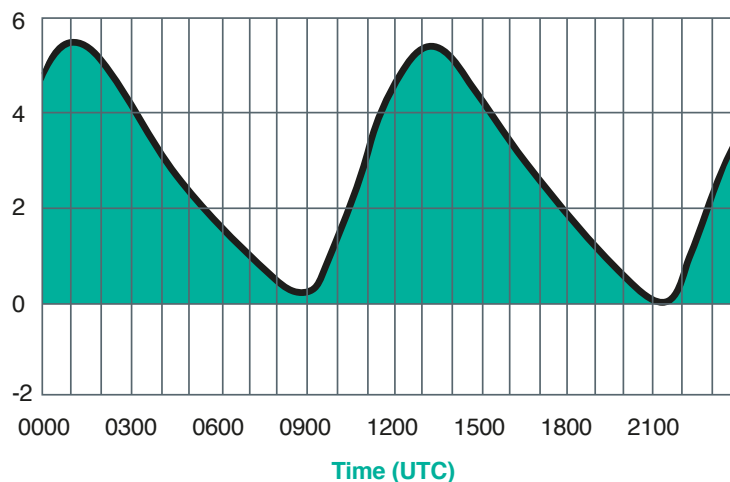
Fri

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Sun

Tuesday 6th Nov 2018

	Time (UTC)	Height (metres)
High	0057	5.6
Low	0900	0.1
High	1321	5.5
Low	2132	-0.1





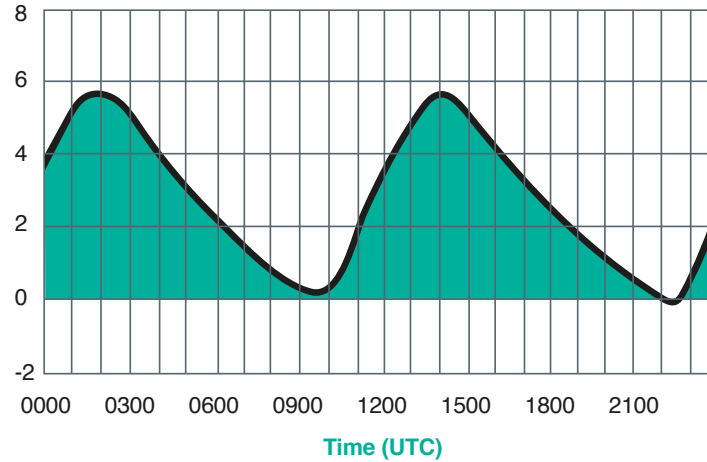
## HAMMERSMITH BRIDGE



Mon Tue **Wed** Thu Fri Sat Sun

Wednesday 7th Nov 2018

	Time (UTC)	Height (metres)
High	0147	5.7
Low	0950	0.1
High	1404	5.7
Low	2215	-0.1



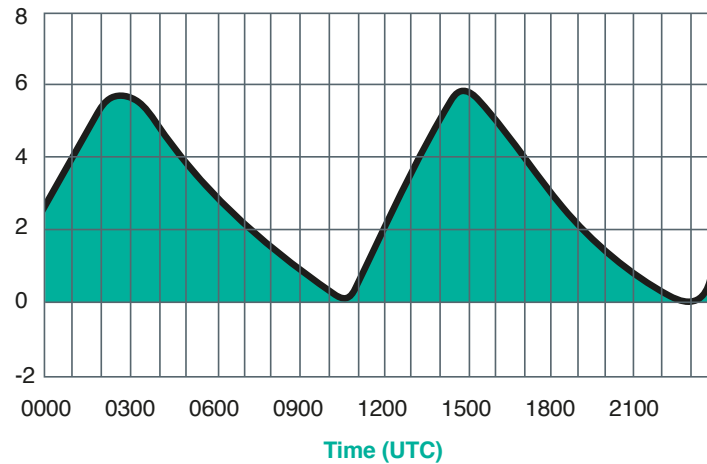
## HAMMERSMITH BRIDGE



Mon Tue Wed **Thu** Fri Sat Sun

Thursday 8th Nov 2018

	Time (UTC)	Height (metres)
High	0229	5.7
Low	1035	0.0
High	1444	5.8
Low	2253	-0.0



**HAMMERSMITH BRIDGE**


Mon

Tue

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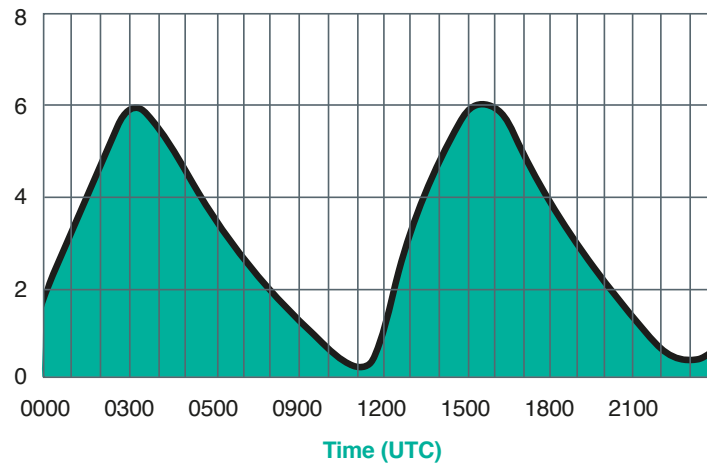
**Fri**

Sat

Sun

**Friday 9th Nov 2018**

	Time (UTC)	Height (metres)
High	0306	5.7
Low	1114	0.0
High	1521	5.9
Low	2326	0.0


**Extension: Presentation**

Having written up your plan, you will now present it to local stakeholders at a local planning meeting. You should include:

- Presentations from each team member explaining their part of the plan.
- An introduction and Q&A from the Logistics Manager.
- A slideshow to accompany the presentation.

Remember that you are presenting to stakeholders, and that you should be explaining how your plan meets their needs. Be professional in tone – don't forget that you are representing Tideway!