Bridgwater Tidal Barrier Scheme

Reducing flood risk in Bridgwater together

Sedgemoor IN SOMERSET

Environment Agency

Welcome to this consultation about a Tidal Barrier for Bridgwater

We want to bring you up to date with the current situation, share with you our progress since the last event held in March and find out what your thoughts are on the different options we are proposing

At the last exhibition we asked you to share any thoughts and concerns you have about the scheme.

Below are the top 5 points raised in your feedback:

- **What will a barrier look like? And would it affect the appearance of the river in the town?**

  Board 2 shows images of possible types of barrier. Any barrier won't alter the appearance of the river through the town.

- **Which solution provides the highest protection from flooding?**

  Each solution would provide a similar high standard of protection against flooding, by combining a tidal barrier with improved tidal flood banks downstream.

- **Would construction of the barrier alter future development of the town?**

  Yes. Improved flood protection for the town is important for business confidence to retain and attract investment and growth into the area. Sedgemoor District Council and the Environment Agency aim to ensure that both existing properties and new development in Bridgwater will be protected from high tide levels in the future. A tidal barrier is a key part of this plan.

- **Will a barrier affect nature and the environment?**

  There are relatively few environmental issues associated with a tidal surge barrier as the barrier gates would only be closed relatively infrequently, when required to protect against flooding. A tidal barrier would have less impact on the natural environment than other potential flood defence solutions.

- **Will the tidal barrier be combined with a road?**

  To incorporate a road would mean that the design and construction would be more complex, it would take longer and make the delivery of the barrier less certain. A cost saving by merging the two aspirations cannot be guaranteed.

  So we are not planning to add a road crossing to the tidal barrier. However, we have not ruled out altering the barrier project if the funding and permissions required for other aspirations are provided in time.

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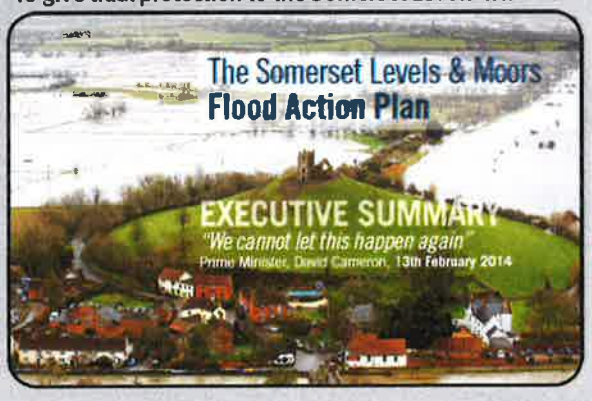
Why build a Tidal Barrier for Bridgwater?

Old defences in the town may not be adequate in the long term...

To give tidal protection to the Somerset Levels & Moors



To allow new development in the town

11 different types of gate have been considered and **the best two types** for the Bridgwater Barrier are:

Rising sector gate

A rising sector gate is a curved gate which normally sits in a recess in the base of the structure. The gate is driven via the circular panels at either end.

When required the gate is rotated from its recess into the closed position. The gate can also be rotated out of the water for maintenance. In its open position the gate allows boats to navigate through the structure.

The Thames Barrier is a good example in the UK.

Thames Barrier Operation sequence

Vertical lift gate

Vertical lift gates have been used extensively around the world for tidal surge barriers. They involve the raising and lowering of a vertically mounted gate between two large towers which contain the lifting equipment. The gate can be designed to lay horizontally in the raised position which can reduce visual impact. The gate can be raised high enough to allow boats to navigate through the structure.

The Hull Barrier is a good example in the UK.

Hull Barrier

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Scheme Plan

The scheme will consist of:

- A tidal surge barrier across the river channel. This will be a very large concrete structure in the bed and banks of the channel with a steel gate(s) across the channel.
- Improvements to flood defences downstream of the barrier. This will include raising and reinforcing existing flood banks and walls alongside the River Parrett and may also include new defences at Chilton Trinity and Combwich. We will develop plans to improve defences in conjunction with the barrier.

The 5 barrier sites under consideration are shown on the plan to the right along with the flood defences to be improved. (Only the improvements to flood defences downstream of a particular barrier site would be required).

Potential Sites 1 and 3 were ruled out at an early stage.

The **Advantages** and **Disadvantages** of each of the 5 barrier sites are outlined on **Boards 4 to 8**.

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Site ② Scheme Description

- **Barrier width & height:** 82m x 10.5m
- **Gate types:** Rising sector (2 gates) or Vertical lift (3 gates)
- **Length of improved downstream defences:** Approximately 6km

Advantages

- **Protects Bridgwater with the shortest length of improved downstream flood defences.**
- Can minimise flood risk to north Bridgwater, protecting existing development and maximising opportunities for future growth.
- **Provides the most space to store river flows upstream when the barrier is closed.**
- Could reduce tide locking of the Kings Sedgemoor Drain (KSD) outfall when the barrier is closed, so long as flows in both the Parrett and the KSD are not too high.
- **Furthest site, 850m, from residential property.**
- No space constraints to construction of the barrier or a temporary bypass channel.
- **Good access for construction to north bank off A38.**

Site 2 Barrier Location Plan

Disadvantages

- **Highest maintenance costs due to large size of barrier.**
- Would prevent navigation to Dunball Wharf when the barrier is closed and would make navigation much more difficult when the barrier is open.
- **Biggest overall impact on natural environmental.**
- The barrier could appear out of place in an open, flat, rural landscape.
- **Potential for impacts on bird population - the site is closest to the special conservation areas of Bridgwater Bay.**
- The river bed moves around at this site so there is a risk of problems at the barrier due to erosion and silt deposition.
- **Greatest risk of increasing siltation downstream which would affect navigation and the special conservation areas downstream.**
- Poor access for construction to south bank through Chilton Trinity.

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Site ④ Scheme Description

- **Barrier width & height:** 74m x 9.5m
- **Gate types:** Rising sector (2 gates) or Vertical lift (3 gates)
- **Length of improved downstream defences:** Approximately 8km

Advantages

- **Protects Bridgwater with a shorter length of improved downstream flood defences than sites further upstream.**
- Can minimise flood risk to north Bridgwater, protecting existing development and maximising opportunities for future growth.
- **Large space to store river flows upstream when the barrier is closed.**
- No impact on navigation to Dunball Wharf.
- **500m from the nearest residential property.**
- No space constraints to construction of the barrier or a temporary bypass channel.
- **Good access for construction to east bank off A38.**

Site 4 Barrier Location Plan

Disadvantages

- **High maintenance costs due to large size of barrier.**
- The barrier could appear out of place in an open, flat, rural landscape, although east bank could be developed in the future.
- **The river channel bed moves around at this site so there is a risk of problems at the barrier due to erosion and silt deposition.**
- Risk of increasing siltation downstream which could affect navigation and the special conservation areas downstream.
- **Poor access for construction to west bank through Chilton Trinity.**

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Site ⑤ Scheme Description

- **Barrier width & height:** 46m x 9.5m
- **Gate types:** Rising sector (1 gate) or Vertical lift (1 gate)
- **Length of improved downstream defences:** Approximately 11km

Advantages

- **Protects Bridgwater with a shorter length of improved downstream flood defences than Sites 6 and 7.**
- Adequate space to store river flows upstream when the barrier is closed.
- **No impact on navigation to Dunball Wharf.**
- No pier in the middle of the river channel, therefore easier to navigate through the barrier than Sites 2 and 4.
- **Not out of character with local landscape that is already dominated by commercial buildings.**
- Farther from the special conservation areas of Bridgwater Bay than Sites 2 and 4.
- **No pier in the middle of the river channel, therefore less impact on sediment movement in the river than Sites 2 and 4.**
- Could utilise existing roads through Express Park for access.

Site 5

Site 5 Barrier Location Plan

Disadvantages

- **Longer length of downstream defence improvements required than Sites 2 and 4.**
- Less storage space in river channel upstream than for downstream sites
- **175m from nearest residential property and very close to commercial property at Express Park.**
- Space for construction very constrained on east bank, temporary bypass channel required on west bank.
- **Access for construction to west bank is difficult through Chilton Trinity, new access road would be required.**

Chilton Trinity from Barrier site

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Site ⑥ Scheme Description

- **Barrier width & height:** 38m x 9.5m
- **Gate types:** Rising sector (1 gate) or Vertical lift (1 gate)
- **Length of improved downstream defences:** Approximately 12km

Advantages

- **Protects Bridgwater with a shorter length of improved downstream flood defences compared to Site 7.**
- No impact on navigation to Dunball Wharf.
- **No pier in the middle of the river channel, therefore easier to navigate through the barrier than Sites 2 and 4.**
- Not out of character with local landscape that is already dominated by commercial buildings.
- **Farther from the special conservation areas of Bridgwater Bay than Sites 2, 4 and 5.**
- No pier in the middle of the river channel, therefore less impact on sediment movement in the river than Sites 2 and 4.
- **Could utilise existing access through Express Park.**

Site 6 Barrier Location Plan

Disadvantages

- **Longer length of downstream defence improvements required than Sites 2, 4 and 5.**
- May not be enough space to store high river flows upstream when the barrier is closed.
- **Increased water levels downstream of the closed barrier could impact on Chilton Trinity Sewage Treatment Works.**
- 275m from nearest residential property and very close to commercial property at Express Park.
- **Space for construction very constrained on north bank, temporary bypass channel required on south bank.**
- A new access road would be required to get to the south bank for construction.
- **Potential disturbance of former tip site on south bank**

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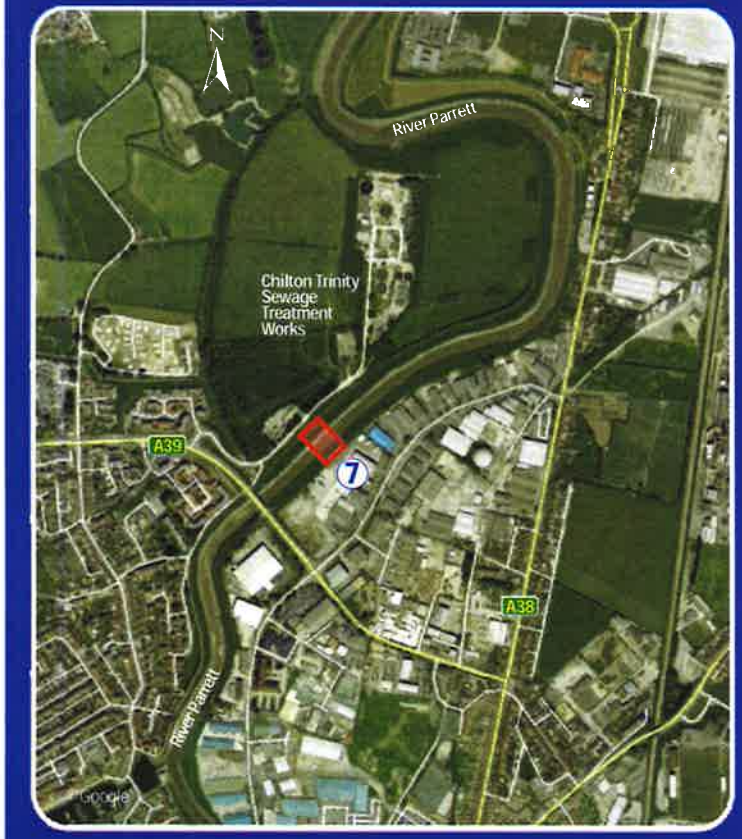
Site ⑦ Scheme Description

- **Barrier width & height:** 27m x 9.5m
- **Gate types:** Rising sector (1 gate) or Vertical lift (1 gate)
- **Length of improved downstream defences:** Approximately 14km

Advantages

- **No impact on navigation to Dunball Wharf.**
- No pier in the middle of the river channel, therefore easier to navigate through the barrier than Sites 2 and 4.
- **Not out of character with local landscape that is already dominated by commercial buildings.**
- Site with the least overall impact on the natural environment.
- **Easiest site for access for construction and operation on west bank.**



Site 7 Barrier Location Plan

Disadvantages

- **Longest length of downstream flood defence improvements required.**
- Inadequate space to store high river flows upstream when the barrier is closed.
- **Greatest overall impact on Bridgwater during construction phase: increased noise, disturbance and traffic.**
- Within 100m of residential property and very close to commercial property.
- **Space for construction is very constrained, a temporary bypass channel required on west bank.**
- Access for construction of barrier and flood defences on the east bank is very difficult.
- **Flood defence raising on the east bank would be very difficult.**

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Site 4

- **Can minimise flood risk to existing and future development in north Bridgwater**
- Construction impacts to residential and commercial property would be minor.
- **No space constraints for construction.**
- Large upstream storage volume in the river channel.

The estimated costs* of a tidal barrier and associated banks for **Site 4** are:

- **Site 4 £65M – £80M**

* Total project cost estimate includes: design development, legal, land, construction and contingencies

There are still some issues to be addressed and these will be considered in detail at the next stage.

These include:

- **The type of gate, rising sector or vertical lift.**
- The extent and alignment of the improved downstream defences.
- **The impact on silt movement in the River Parrett.**
- Mitigation for environmental impacts that cannot be avoided.
- **Construction methodology and access.**

Barrier Location Plan

Site 5

- **Works effectively for flood risk management**
- It has an acceptable level of environmental impact.
- **Would not be out of character with the adjacent built environment.**
- Minimal impact on navigation.

The estimated costs* of a tidal barrier and associated banks for **Site 5** are:

- **Site 5 £45M – £60M**

What do you think?

Please ask our staff any questions that you have about the scheme and then provide your comments via the feedback forms provided.

If you would like to send in your comments later please email your response to bridgwater.barrier@environment-agency.gov.uk

We will collate all feedback from this consultation and make a decision about the preferred barrier site in October 2016. We will produce a summary of the consultation which will be available from the late autumn. This will be available to view on Sedgemoor District Council and the Somerset Rivers Authority websites

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Project Programme and Funding

Programme

The construction of the tidal surge barrier in the River Parrett will be a major civil engineering project. The project will need approval from a Secretary of State under a Transport and Works Act Order (TWAO). This is a complex legal process that will take some time.

The key project milestones are:

- Selection of the preferred barrier location late 2016
- Development of the barrier and flood defences to outline design stage by Spring 2017
- Consultation on the preferred option Spring 2017
- Submission of the business case for approval Summer 2017
- Submission of the TWAO June 2018
- Approval of the TWAO and final funding approval 2020
- Scheme detailed design 2021–2022
- Scheme construction 2022–2024

Funding

Funding for the project is being provided by:

- The Environment Agency
- Sedgemoor District Council
- Heart of the South West Local Enterprise Partnership

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local enterprise partnership

Supported by:

- Somerset Rivers Authority

Somerset Rivers Authority

Parrett Estuary

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