# Lower Thames Crossing footbridge sets new standard for low-carbon infrastructure



The £10bn Lower Thames Crossing (LTC) project, poised to become the longest road tunnel in the UK, has taken a pioneering step beyond its main infrastructure works by championing innovative low-carbon design through a national footbridge competition. Situated over the A127, this footbridge aims not only to reconnect severed pathways between Moor Lane and Folkes Lane but also to set a new benchmark in sustainable structural engineering within the UK’s highways network.

LTC, designed to alleviate chronic congestion at the Dartford Crossing—where traffic volume has long exceeded the original design capacity—has been explicitly framed as the "greenest road" in the nation. The main route features 4.2km twin road tunnels beneath the Thames Estuary and integrates ambitious environmental goals, including legally binding carbon footprint limits embedded within its Development Consent Order. Stretching the boundaries of conventional construction practices, the scheme incorporates low-carbon materials and alternative fuels, such as hydrogen, while promising six times more green space than the footprint of the road itself, alongside a million trees, new woodlands, and extensive pedestrian and cycling paths.

Against this backdrop, the footbridge competition was launched to explore fresh architectural and engineering concepts that would embody the project's sustainability ethos. The contest, unusual for such infrastructure projects, sought designs that went beyond standard solutions to push the industry towards scalable, low-carbon innovations. Out of over 30 anonymous entries—ranging from domestic to international contributions—five were shortlisted, each demonstrating creative use of low-carbon materials like timber, locally sourced stone, and recycled steel, alongside modular construction techniques.

The eventual winner, Horsycle, conceived by Arup and Seán Harrington Architects, presents a strikingly innovative design that entirely eschews concrete, traditionally a high-carbon material in bridge construction. Instead, it employs two glulam (glued laminated) timber beams spanning 70 meters over a central steel pier, seamlessly integrating timber’s natural aesthetics with modern engineering rigour. The bridge's modular deck is mounted above the beams, protected by cantilevers that echo historic timber bridge designs— a "back to the future" approach highlighted by Harrington—offering weather resilience and ease of assembly. Reinforced earth ramps at either end, built using material excavated from the LTC works, further reduce structural complexity and embodied carbon, contributing to near "carbon-free" construction.

This timber-centric, modular design not only meets environmental objectives but also answers community aspirations for an elegant, memorable structure that naturally complements the surrounding green landscape, including the Thames Chase Forest Centre and the nearby Hole Farm Community Woodland. This footbridge will restore pedestrian and cycling connectivity severed by the A127’s initial construction in 1924, encouraging sustainable, active travel within and beyond local communities.

National Highways underscores the potential for Horsycle to become a prototype for future footbridges across the UK's road network, signalling a shift toward wider adoption of low-carbon infrastructure. The competition’s broader success is reflected in other shortlisted designs which embraced themes such as “urban mining” through steel reuse, low embodied carbon stone bridges, and prefabricated timber solutions, showcasing a vibrant, evolving dialogue around sustainability in public works.

The LTC project's commitment to embedding sustainability rigorously into procurement and construction practices offers a valuable model for infrastructure delivery. With timelines targeting construction start as early as 2026 and road opening in the early 2030s, the footbridge stands as an early, tangible exemplar of the LTC’s green ambitions. Its progression will likely spur further adoption of environmentally conscious bridge design, helping reshape how the UK develops its roads and associated infrastructure for a low-carbon future.

### 📌 Reference Map:

* Paragraph 1 – [[1]](https://www.newcivilengineer.com/in-depth/lower-thames-crossing-footbridge-design-competition-fostered-new-ways-of-thinking-about-low-carbon-infrastructure-18-06-2025/), [[4]](https://www.traffictechnologytoday.com/news/infrastructure/winner-of-lower-thames-crossing-low-carbon-footbridge-contest-revealed.html)
* Paragraph 2 – [[1]](https://www.newcivilengineer.com/in-depth/lower-thames-crossing-footbridge-design-competition-fostered-new-ways-of-thinking-about-low-carbon-infrastructure-18-06-2025/), [[4]](https://www.traffictechnologytoday.com/news/infrastructure/winner-of-lower-thames-crossing-low-carbon-footbridge-contest-revealed.html), [[2]](https://www.arup.com/news/arup-and-sean-harrington-architects-win-national-design-competition-for-a-low-carbon-footbridge-on-lower-thames-crossing/)
* Paragraph 3 – [[1]](https://www.newcivilengineer.com/in-depth/lower-thames-crossing-footbridge-design-competition-fostered-new-ways-of-thinking-about-low-carbon-infrastructure-18-06-2025/), [[2]](https://www.arup.com/news/arup-and-sean-harrington-architects-win-national-design-competition-for-a-low-carbon-footbridge-on-lower-thames-crossing/), [[4]](https://www.traffictechnologytoday.com/news/infrastructure/winner-of-lower-thames-crossing-low-carbon-footbridge-contest-revealed.html), [[5]](https://www.riai.ie/whats-on/news/sean-harrington-architects-shortlisted-for-lower-thames-crossing-low-carbon-footbridge-competition)
* Paragraph 4 – [[1]](https://www.newcivilengineer.com/in-depth/lower-thames-crossing-footbridge-design-competition-fostered-new-ways-of-thinking-about-low-carbon-infrastructure-18-06-2025/), [[4]](https://www.traffictechnologytoday.com/news/infrastructure/winner-of-lower-thames-crossing-low-carbon-footbridge-contest-revealed.html), [[5]](https://www.riai.ie/whats-on/news/sean-harrington-architects-shortlisted-for-lower-thames-crossing-low-carbon-footbridge-competition)
* Paragraph 5 – [[1]](https://www.newcivilengineer.com/in-depth/lower-thames-crossing-footbridge-design-competition-fostered-new-ways-of-thinking-about-low-carbon-infrastructure-18-06-2025/), [[4]](https://www.traffictechnologytoday.com/news/infrastructure/winner-of-lower-thames-crossing-low-carbon-footbridge-contest-revealed.html), [[2]](https://www.arup.com/news/arup-and-sean-harrington-architects-win-national-design-competition-for-a-low-carbon-footbridge-on-lower-thames-crossing/), [[5]](https://www.riai.ie/whats-on/news/sean-harrington-architects-shortlisted-for-lower-thames-crossing-low-carbon-footbridge-competition)
* Paragraph 6 – [[1]](https://www.newcivilengineer.com/in-depth/lower-thames-crossing-footbridge-design-competition-fostered-new-ways-of-thinking-about-low-carbon-infrastructure-18-06-2025/), [[3]](https://nationalhighways.co.uk/our-roads/lower-thames-crossing/news-and-media/footbridge-of-the-future/), [[6]](https://www.dmag.com/projects/ecospan-bridge/), [[7]](https://www.constructionenquirer.com/2024/12/06/timber-designs-shortlisted-for-highways-footbridge-of-the-future/)
* Paragraph 7 – [[1]](https://www.newcivilengineer.com/in-depth/lower-thames-crossing-footbridge-design-competition-fostered-new-ways-of-thinking-about-low-carbon-infrastructure-18-06-2025/), [[2]](https://www.arup.com/news/arup-and-sean-harrington-architects-win-national-design-competition-for-a-low-carbon-footbridge-on-lower-thames-crossing/), [[4]](https://www.traffictechnologytoday.com/news/infrastructure/winner-of-lower-thames-crossing-low-carbon-footbridge-contest-revealed.html)

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## Bibliography

1. <https://www.newcivilengineer.com/in-depth/lower-thames-crossing-footbridge-design-competition-fostered-new-ways-of-thinking-about-low-carbon-infrastructure-18-06-2025/> - Please view link - unable to able to access data
2. <https://www.arup.com/news/arup-and-sean-harrington-architects-win-national-design-competition-for-a-low-carbon-footbridge-on-lower-thames-crossing/> - Arup and Seán Harrington Architects have won the Lower Thames Crossing's national low-carbon footbridge competition. Their design eliminates all concrete from the bridge and approach ramps, integrating planting to support biodiversity and reconnect fragmented habitats. Located at the northern end of the Lower Thames Crossing over the A127, the footbridge will restore a severed walking and cycling route between Moor Lane and Folkes Lane, providing access to local green spaces, including Thames Chase Forest Centre, Folkes Lane Wood, and the new 100-hectare Hole Farm Community Woodland. This initiative aligns with the project's vision to create the UK's greenest road, featuring six times more green space than the road itself, one million trees, a community woodland, two new public parks, and 40 miles of new and improved pathways for walkers, cyclists, and horse riders. Construction could begin as early as 2026, with the new road expected to open in the early 2030s.
3. <https://nationalhighways.co.uk/our-roads/lower-thames-crossing/news-and-media/footbridge-of-the-future/> - National Highways has unveiled the five shortlisted designs for its low-carbon footbridge contest, aiming to find innovative, sustainable designs for a crossing over the A127, a key strategic road connecting Southend and London. The winning design could set a new standard for footbridges across the UK. The five shortlisted entries are: Arup and Seán Harrington Associates; COWI and Moxon; Davies Maguire Ltd; Useful Studio Architects and Expedition Engineering; and Webb Yates Engineers. The competition is part of the Lower Thames Crossing project, which aims to be the UK's greenest road, featuring six times more green space than the road itself, one million trees, a community woodland, two new public parks, and 40 miles of new and improved pathways for walkers, cyclists, and horse riders. The winning design is due to be announced in late Spring 2025.
4. <https://www.traffictechnologytoday.com/news/infrastructure/winner-of-lower-thames-crossing-low-carbon-footbridge-contest-revealed.html> - National Highways has announced the winner of the Lower Thames Crossing low-carbon footbridge contest, with the winning design from Arup and Seán Harrington Architects setting a new benchmark for sustainable design that could be replicated across roads UK-wide. The design eliminates all concrete from the bridge and approach ramps, integrating planting into the design to promote habitat connectivity. The Lower Thames Crossing is a new road and tunnel under the River Thames that will connect the A2 and M2 in Kent to the A13 in Essex and M25 in the London Borough of Havering. It aims to drive economic growth by tackling congestion at the Dartford Crossing and creating a new connection between the ports of the southeast, the Midlands, and the North. The footbridge will provide a crossing over the A127, at the northern end of the Lower Thames Crossing route, and restore the connection between Moor Lane and Folkes Lane, which was severed when the A127 was opened in 1924. It will also offer the local community an uninterrupted route between local green spaces such as Thames Chase Forest Centre, Folkes Lane Wood, and Hole Farm Community Woodland, the new 100-hectare woodland being created in partnership between the Lower Thames Crossing and Forestry England. The competition is part of the project’s plans to be the greenest road ever built in the UK. As a pathfinder project exploring carbon-neutral construction, the project will reduce its own carbon footprint and drive change throughout the UK construction industry by scaling up the use of low-carbon materials and methods. It will create six times more green space than the road, and includes one million trees, a community woodland, two new public parks, and 40 miles of new and improved pathways for walkers, cyclists, and horse riders. The Lower Thames Crossing received planning permission in March 2025 and is now working with the government on funding options. Construction could start as early as 2026, with the new road expected to open in the early 2030s.
5. <https://www.riai.ie/whats-on/news/sean-harrington-architects-shortlisted-for-lower-thames-crossing-low-carbon-footbridge-competition> - Seán Harrington Architects, in collaboration with Arup London, has been shortlisted in the Lower Thames Crossing low-carbon footbridge competition. Their innovative design features a two-span bridge with twin haunched glulam girders, a steel central pier, and reinforced earth embankments, showcasing sustainable materials and construction methods. Launched in July, the contest is seeking innovative, sustainable designs for a crossing over the A127, a key strategic road connecting Southend and London, and located close to the northern end of the Lower Thames Crossing. The winning design could also form the new footbridge standard and be replicated across roads country-wide. Over 30 entrants were received and assessed anonymously, and judged on their proposed use of low-carbon materials and construction methods, and evidence of good design principles to allow ease of access and a pleasant crossing experience. The winning design is due to be announced in late Spring 2025.
6. <https://www.dmag.com/projects/ecospan-bridge/> - Davies Maguire's EcoSpan Bridge was a finalist in the National Highways Low-Carbon Bridge Design Competition. The design combines traditional materials with emerging technological innovations to produce a creative and sensitive design. The purpose of the competition was to propose a new suitable low-carbon footbridge, located at the north end of the proposed route for the Lower Thames Crossing (LTC) scheme. Davies Maguire’s design was announced as a runner-up, making it to the top 5 out of over 60 entries. Working closely with the design team, they developed a multi-span bridge that incorporated low embodied carbon techniques, while successfully integrating with the surrounding natural environment. The main emphasis of the bridge design was to showcase the benefits of adopting timber as an alternative construction material.
7. <https://www.constructionenquirer.com/2024/12/06/timber-designs-shortlisted-for-highways-footbridge-of-the-future/> - The winner of the low-carbon footbridge design race will be tested on a crossing over the A127, a key strategic road connecting Southend and London, close to the northern end of the Lower Thames Crossing. National Highways said the winning design could also form the new footbridge standard and be replicated across Britain’s roads. Shaun Pidcock, Programme Director, Lower Thames Crossing said: “The Lower Thames Crossing is green by design, so it was pleasing that we received so many high-quality entries for a low-carbon footbridge of the future, the perfect complement to the scheme. The five shortlisted entries all plan to utilise new low-carbon materials, and I look forward to seeing how the designs develop and the eventual winner being selected.” The winning design is due to be announced in late Spring 2025. Shortlisted bridge designs include: Arup and Sean Harrington Associates; COWI and Moxon; Davies Maguire; Useful Studio Architects and Expedition Engineering; Webb Yates Engineers.