

# CROSSRAIL

**DESIGNED TO TRANSFORM RAIL TRANSPORT ACROSS LONDON, CROSSRAIL IS HEADING TOWARDS THE HOME STRAIGHT DESPITE THE CHALLENGES OF THE LAST 12 MONTHS.**

**T**he multi-billion pound Crossrail is one of Europe's largest projects currently under construction and will provide a 10% increase in rail capacity in central London. The new line, known as the Elizabeth line, will be a high frequency, high capacity service linking 41 stations over 100 kilometres from Reading and Heathrow in the west, through central

London, to Shenfield and Abbey Wood in the east. It will give 1.5 million additional people access to central London within 45 minutes, reduce journey times and create new journey opportunities.

The project required 42 kilometres of new tunnels, 10 new stations, over 50 kilometres of new track, integration of three signalling systems and upgrades across existing

infrastructure. The new stations, public space and associated developments will add to the fabric of the landscape, act as a catalyst for regeneration and influence the way people experience the city and its suburbs.

The new Elizabeth line trains have been built at Bombardier Transportation's UK site, helping to deliver a further 760 UK jobs and 80 apprenticeships in Derby. »



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Constructed using strong, but lightweight materials such as aluminium for the body shell, the trains have been designed to be light, yet well equipped for performance and customer comfort with features such as intelligent lighting and temperature control systems.

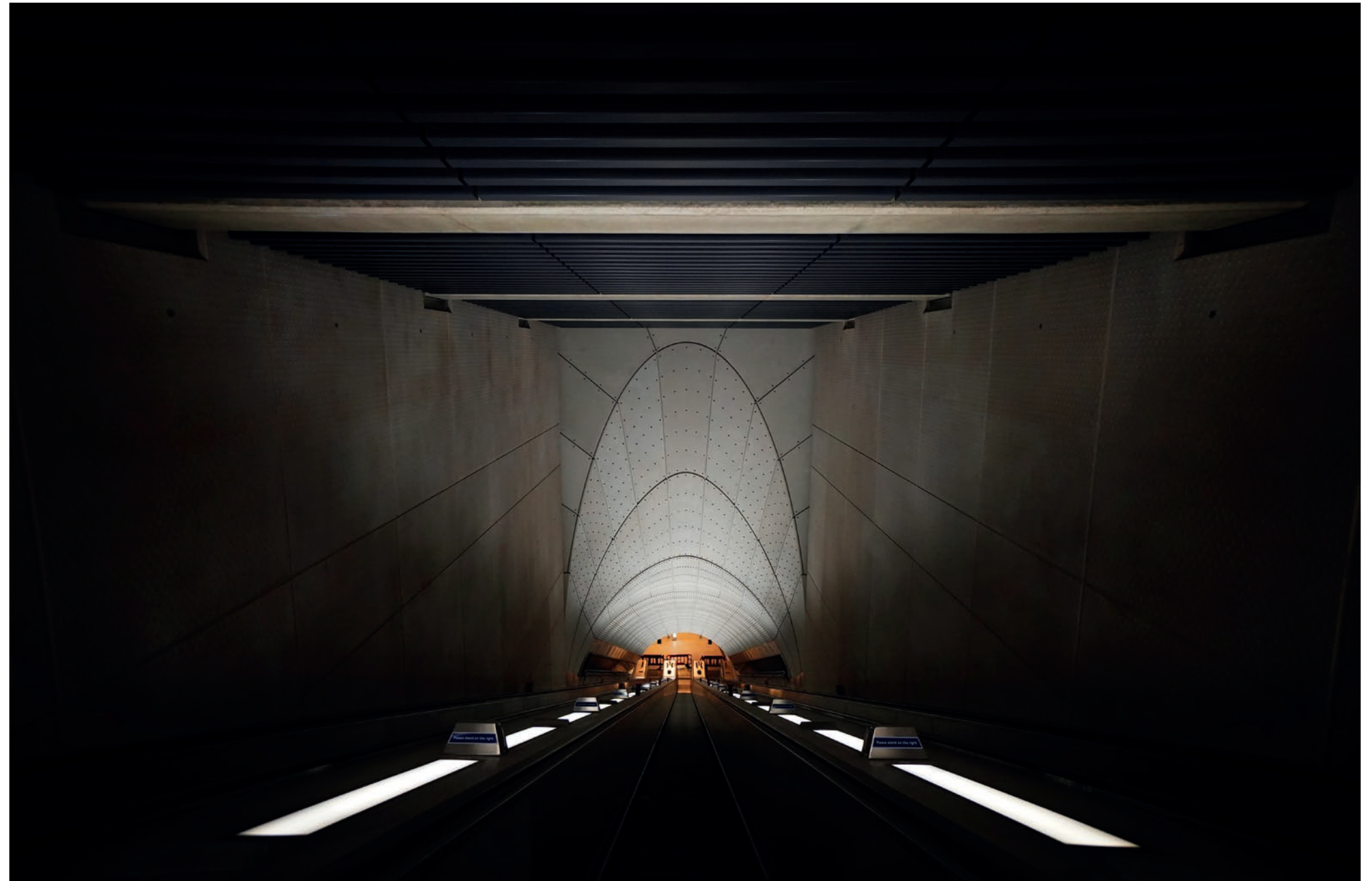
The trains regenerate electricity back into the power supply when braking to use up to 30 per cent less energy, as well as delivering faster journey times than the old trains.

Large, clear areas around the doors allow quicker and easier boarding and alighting. A mixture of metro-style and bay seating will be available through the train, providing choice and comfort for customers. The trains will be driver-operated with on-train customer information systems delivering real-time travel information, allowing customers to plan their onward journeys whilst onboard.

The interior design and colour palette

has been carefully selected to provide an accessible and welcoming environment. The design includes darker floors and natural finish materials that will wear in, and not wear out, ensuring they retain their high-quality feel for years to come. The light coloured ceilings also maximise the feeling of height and openness inside the new trains. The material and colour choices also align with Elizabeth line stations for a consistent customer experience.

Accessibility is a major aspect of Crossrail, and all of the All of the 31 stations on the Elizabeth line western and eastern sections will be step-free to platform level. The new central Elizabeth line stations will provide level boarding on all trains, however due to the different types of trains that already run along the eastern and western section stations, including freight trains, level boarding could not be provided for the new Elizabeth line trains. »







“From the start of Trial Running it will take a period of time to test the Elizabeth line before it can open for passenger service. This includes a final phase known as Trial Operations which involves more than 150 operational scenarios being tested.



To alleviate this, TfL has station staff on hand whenever trains are running to deploy boarding ramps between the platform and train. Passengers who need assistance will benefit from the same 'turn up and go' service currently provided by Transport for London (TfL) on the Tube and London Overground, with the assurance that all stations will be staffed from first to the last train.

Work started on Crossrail in May 2009 and the plan is to bring the Elizabeth line into passenger service as soon as practically possible in the first half of 2022.

**■ Testing Landmark**  
Crossrail reached a crucial landmark in December 2020 when it started System Integration Dynamic Testing (SIDT). This is the enabling phase for Trial Running, which sees the number of test trains in the new tunnels increase from the current four to eight.

During the SIDT period, testing is carried out on complex systems where they will be testing scenarios as close to operational conditions as possible. Signalling and control of the railway will all take place from the new control centre at Romford. Drivers will be operating a maximum of eight trains, simulating a timetabled service across the Elizabeth line central section.

Crossrail expects to commence Trial Running as soon as possible at the earliest opportunity in 2021. From the start of Trial Running it will take a period of time to test the Elizabeth line before it can open for passenger service. This includes a final phase known as Trial Operations which involves more than 150 operational scenarios being tested.

**■ New Stations**  
Ten new stations are being built for the Elizabeth line in central London and southeast London. In underground spaces, from station platforms to the top of the escalators, the architectural forms and materials will be recognisably consistent to give passengers a sense of familiarity right across the route.

As passengers move upwards, into the ticket halls and surrounding streetscape, each new station will have its own, distinct character that reflects the environment and heritage of the local area. The stations have been designed to create accessible, safe and comfortable spaces that people can move through easily and efficiently. The remainder of the Elizabeth line route includes 31 existing stations. Each of these outer London stations are being upgraded with some undergoing major design transformations. »



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“The project included the development of a unique set of BREEAM criteria for underground stations enabling assessment of environmental performance. Crossrail will be the first underground railway in the world to be rated under the scheme and will set a benchmark for future transportation projects.



Multiple entrances and ticket halls, more space below ground and straightforward access to the rest of the transport network will ensure that Elizabeth line stations feel spacious, are easy to navigate and can cater for future growth in passenger numbers. The platforms have been built to accommodate the new 200 metre long train as well as longer rolling stock in the future.

Many of the stations are nearing completion, with Farringdon Elizabeth line station that latest to be handed over to Transport for London (TfL) in March 2021. This is the second of the new Elizabeth line stations to be handed over to TfL and the first to London Underground as infrastructure manager. Custom House was the first Elizabeth line station to be handed over to TfL last year.

Situated within the heart of London Crossrail, Farringdon Station is an intrinsic piece in the Crossrail scheme. As part of the redevelopment, Farringdon has been made considerably more accessible by the Thameslink Programme. A total of five new lifts have been installed, which means the station now has step-free access to every platform for the first time. A new glass and steel footbridge has also been installed that, combined with the new lifts and staircases, improves interchange at the station between National Rail and London Underground services for all passengers.



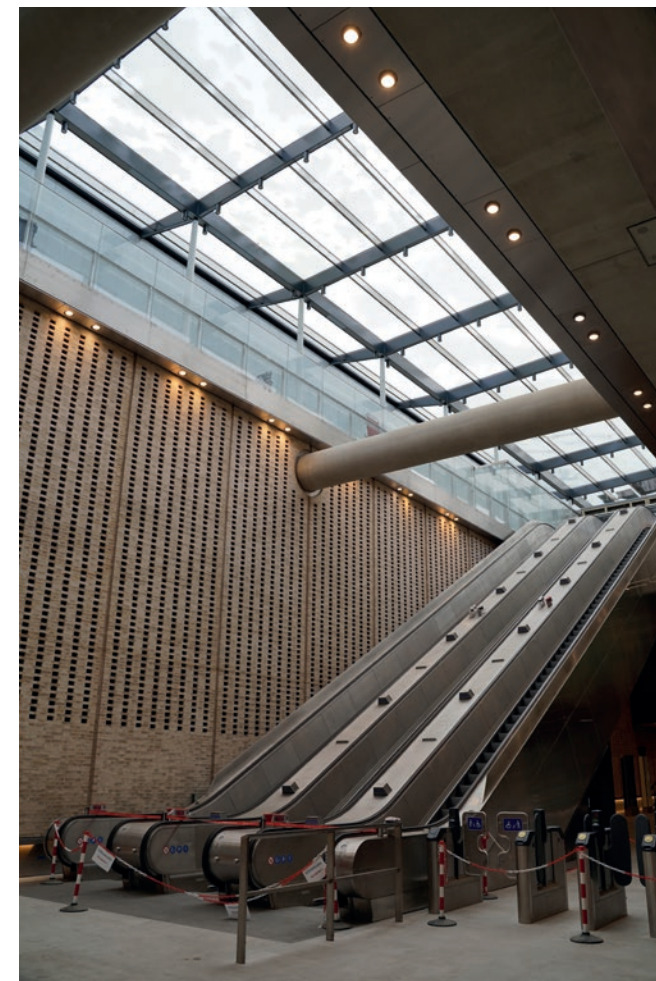
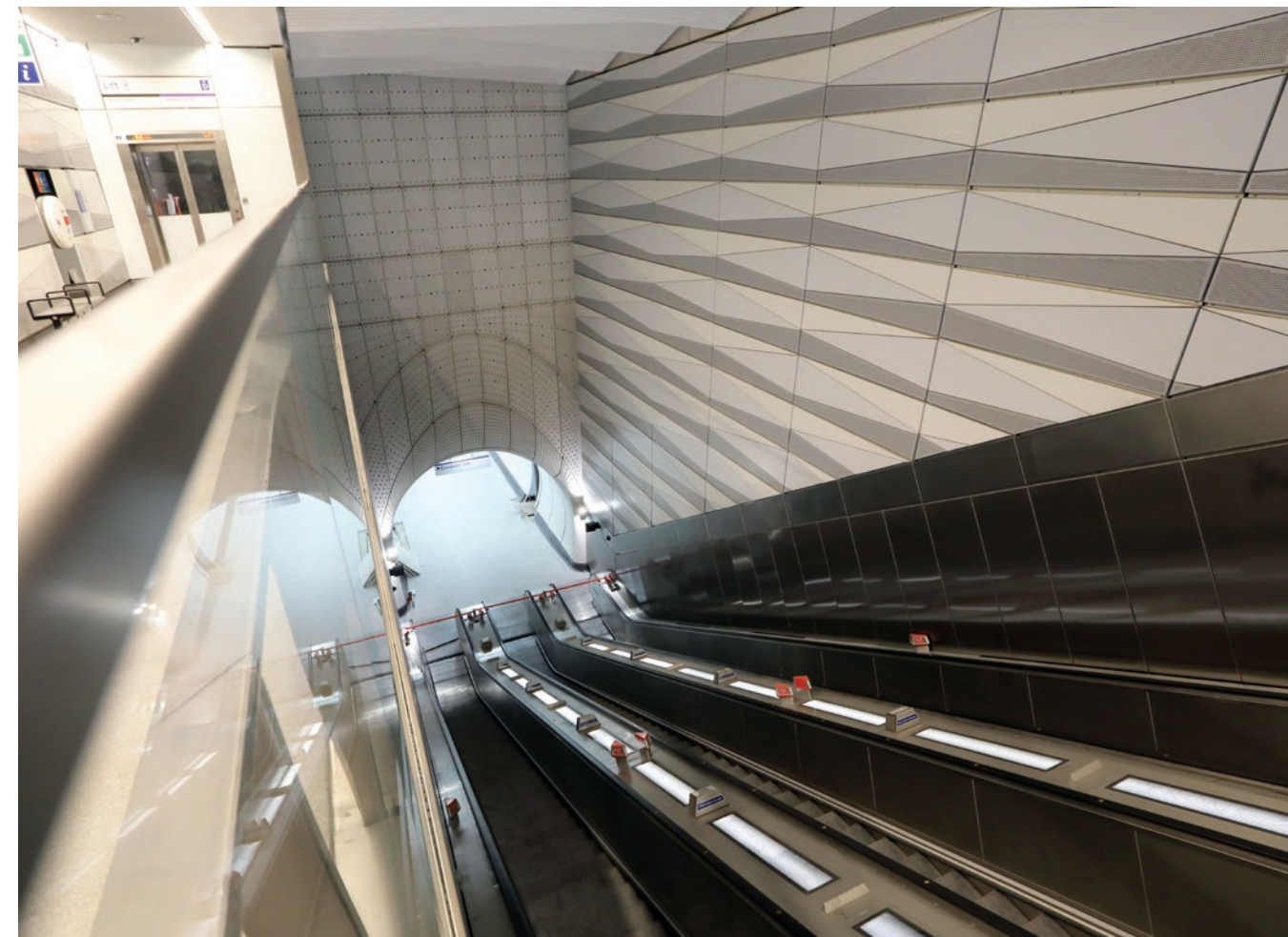
A new concourse linking to this new footbridge has also been built on Turnmill Street, increasing the options available for accessing the station.

Mark Wild, Crossrail Chief Executive, said: “I am delighted that Farringdon station has been handed over to London Underground, this is a huge milestone for Crossrail. I am proud of everyone who has worked so hard to get this magnificent

new railway station over the line and we look forward to more stations reaching this stage in the coming months.”

Paddington Elizabeth line and Tottenham Court Road Elizabeth Line Station are both now in their final commissioning phases.

Lighting controls specialist Delmatic supplied the networked control and management of lighting to Crossrail. »



### Specialists in high quality decorative paints and protective coatings

Cousins Group Ltd have been a family run business since its establishment in 1975. Since then, Cousins have become synonymous with delivering work of the highest quality to many of the most high-profile projects in London and the South East.

With a wealth of knowledge and experience within the transport industry, Cousins have worked on a number of projects ranging from railway stations to airports, with values from £25,000 up to £10,000,000.

Our track record of working on major transport infrastructure projects such as Liverpool Street, Custom House Station and

Gatwick & Heathrow Airports, along with our extensive third-party accreditations provide sufficient demonstration of our ability to work successfully on projects and maintain the highest standards.

Our teams are trained by the manufacturers of many specialist finishes such as:

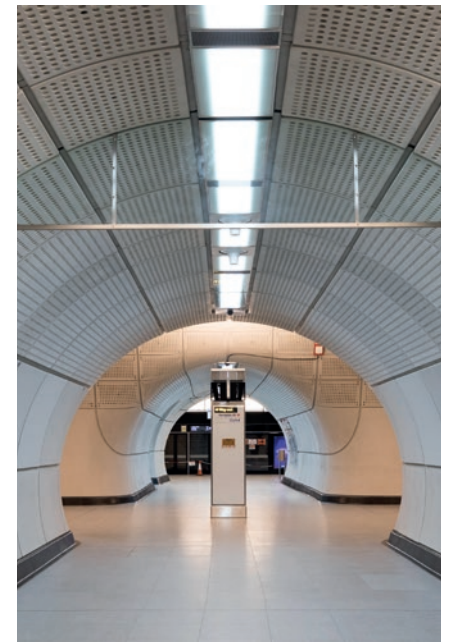
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Delmatic's state-of-the-art systems provide smart, secure and energy-efficient management and monitoring of normal and emergency lighting across the seven Elizabeth line stations, including the network of shafts, portals and depots.

The systems support Crossrail's goal to deliver energy-efficient, sustainable solutions for London's transport network. The systems enhance energy-efficiency through presence detectors and multi-sensors which adjust lighting levels to changing conditions of occupancy and daylight detection, while real-time management and monitoring of the lighting network delivers operational efficiencies and supports station security and safety of passengers.

Delmatic's systems integrate with central batteries for comprehensive emergency light monitoring, and independently track the performance of every lamp across

the network, alerting failures in real time. Innovative software algorithms monitor the illumination impact of individual lamp failures and automatically increase the output of remaining lighting to compensate for the outages.

The project included the development of a unique set of BREEAM criteria for underground stations enabling assessment of environmental performance. Crossrail will be the first underground railway in the world to be rated under the scheme and will set a benchmark for future transportation projects.

■ **Covid-19**  
Crossrail sites are observing strict social distancing protocols and the numbers of people at each location is limited at all times.

Crossrail have increased efforts to complete the outstanding construction

and assurance activities for Trial Running to make up some of the lost time caused as a consequence of COVID-19. This was supported by a 6-week construction blockade which came to an end on 17 September, an 11-day blockade in November, and a further blockade over the festive period. The construction blockades have been very successful with a high level of productivity achieved and a major programme of works delivered across the central section route way by the supply chain. ■

To keep up to date with the latest developments, please visit [www.crossrail.co.uk](http://www.crossrail.co.uk)



# DELMATIC

DELMATIC ARE LEADING INTERNATIONAL SUPPLIERS OF ADVANCED LIGHTING MANAGEMENT SYSTEMS. DELMATIC HAVE SUPPLIED SYSTEMS TO THE WORLD'S LARGEST AND MOST PRESTIGIOUS BUILDINGS AND TRANSPORTATION PROJECTS, INCLUDING LONDON'S CROSSRAIL, DUBAI METRO, DOHA METRO, AND THE HARAMAIN HIGH SPEED RAILWAY IN SAUDI ARABIA.

*Delmatic provides clients, consultants and designers with unmatched depth and calibre of technical knowledge, as well as unique experience in applying advanced lighting management systems to the world's largest transportation projects.*

**D**elmatic systems reimagine and redefine lighting control, providing absolute flexibility and versatility, achieving optimum energy and operational efficiency, integrating emergency light and battery testing and monitoring, applying biodynamic tuneable-white profiles for enhanced comfort and wellbeing, and sharing valuable real-time intelligence with other connected systems.

Delmatic's systems seamlessly mesh wired, wireless and mixed-mode devices across physical or cloud networks, continuously monitoring, analysing and optimising lighting and connected building services performance. Delmatic's cutting-edge sensors and controllers combine with powerful visuals, dashboards, user interfaces and apps, while expert application of open-protocol Lon, BACnet, DALI-2, IP, and MQTT technologies delivers unparalleled insights and intelligence.

Delmatic pioneered electronic lighting control in 1959 and supplied the world's first smart lighting control system. The most advanced technology, reliability of the highest order and an unparalleled depth of experience made Delmatic the supplier of choice for the UK's largest single public infrastructure development.

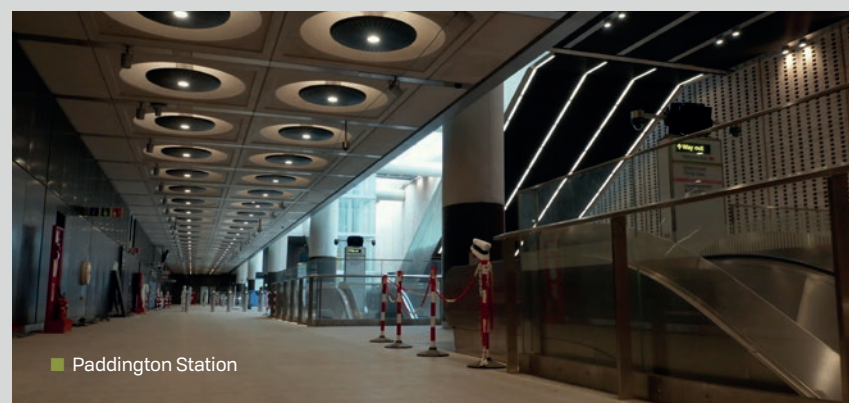
Delmatic systems provide intelligent, secure and energy efficient management and monitoring of normal and emergency lighting throughout Crossrail's seven central London stations – Paddington, Bond Street, Tottenham Court Road, Farringdon, Liverpool Street, Custom House and Whitechapel – as well as across the network of shafts, portals and depots. The state-of-the-art systems minimise energy consumption and support Crossrail's goal to deliver



■ Tottenham Court Road Station



■ Paddington Station

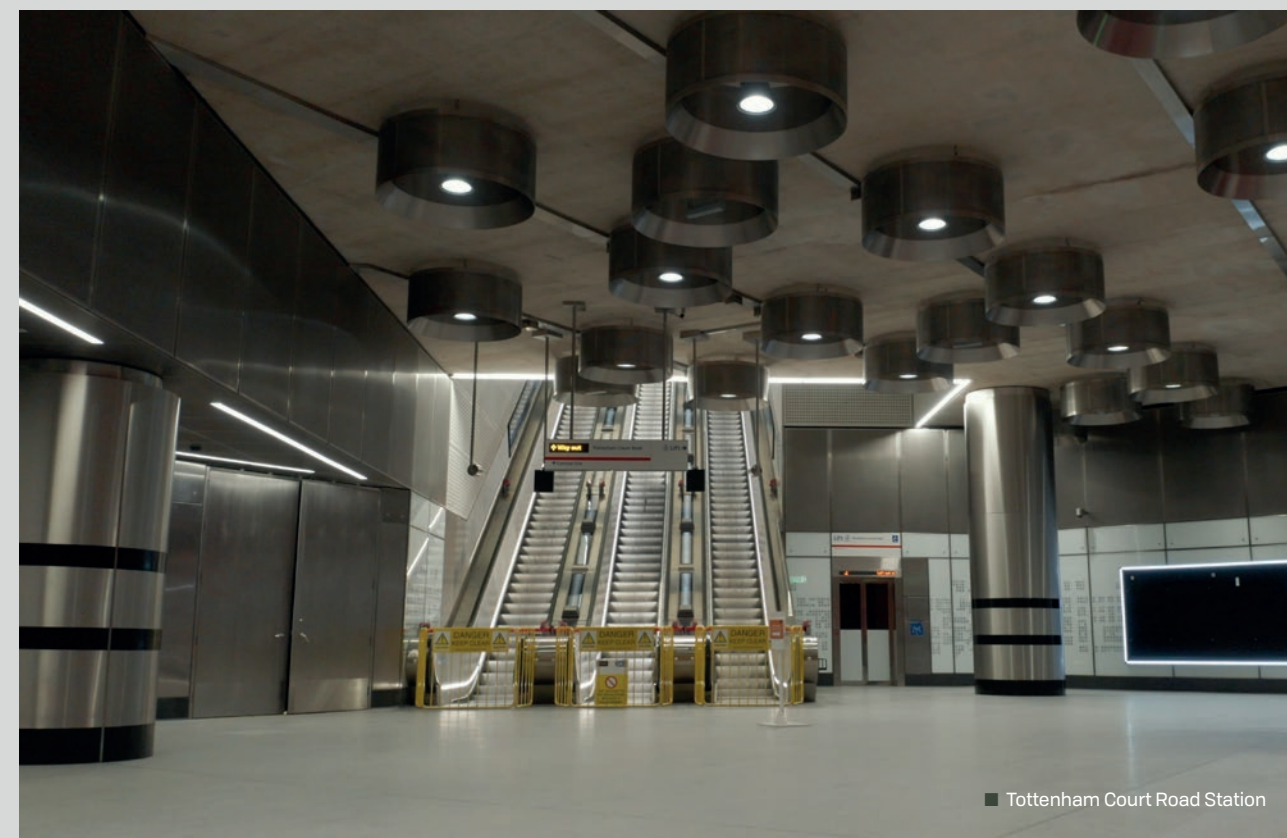


■ Paddington Station

energy-efficient, sustainable solutions for London's transport network. The systems enhance sustainability through energy-efficient digital dimming, presence/absence detection, and photocell control in daylight areas, coupled with operational efficiencies gained through real-time management and monitoring of the lighting network. The systems log the number of hours each lamp has been in operation and generates relamping plans which avoid the premature replacement of luminaires

(with the associated environmental and disposal issues) by ensuring that lamps are retired at the optimum point.

The systems also play a crucial role in supporting station security and safety, by integrating with the central battery to provide comprehensive emergency light monitoring and testing, as well as tracking the performance of every lamp across the network and highlighting failures in real time. Delmatic's advanced software algorithms automatically increase the output of remaining lighting



■ Tottenham Court Road Station

to compensate for lamp failures. Different colour temperatures of lighting are used to promote intuitive wayfinding and transit movement through the stations. Passengers are encouraged to instinctively move towards the warmer tones of lighting on the station platforms, after exiting escalators or corridors which are lit in a cooler blue colour.

Delmatic's innovative lighting management systems installed at Crossrail, received Highly Commended in the category of 'Best Large Project'

at the 2020 DALI Lighting Awards. DALI, which stands for Digital Addressable Lighting Interface, is a dedicated protocol for digital lighting control that enables the easy installation of robust, scalable and flexible lighting networks. The DALI Lighting Awards showcase the very best application of DALI lighting management solutions around the world, and the accolade is testament to Delmatic's commitment to design and supply cutting-edge systems of the highest quality.

Delmatic's track record in providing

advanced lighting controls for major international transportation projects was instrumental in their selection for Saudi Arabia's Haramain High Speed Rail network. The 460km high speed rail line links the cities of Mecca and Medinah via Jeddah and King Abdullah Economic City. Delmatic systems provide powerful scene-setting control and monitoring within the huge destination stations – ranging from 275,000 sq m to 460,000 sq m – as well as control of decorative concourse and façade lighting. »



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■ Paddington Station

During the day, decorative yet efficient lighting scenes sequence according to solar scheduling, daylight detection and occupation. After dark, dynamic scenarios simulate stars in a night sky while precision rotation and focusing of projectors onto spherical chandeliers cascade diamonds of light onto the station concourses and platforms. The complete systems are managed and monitored across the IP network using Delmatic's animated graphical software.

Delmatic systems also provide energy-efficient control of lighting across the forty-seven stations on the driverless Dubai Metro network as well as throughout the thirty-seven stations

of the Doha Metro network. Delmatic's lighting control and monitoring is combined with SCADA and open protocol Modbus communication across the stations' IT network, and integrates with the stations' building management system to share key data and optimise operational efficiency. The unique 'vaulted spaces' architecture within the Doha Metro stations directs daylight deep into the interior, and the Delmatic systems dynamically adjust lighting to replicate the effects of daylight in subterranean areas. Integrated light lines double as wayfinding elements and the systems initiate configurable day, evening, and

night lighting accents and scenes as well as support and security functions.

Delmatic provides clients, consultants and designers with unmatched depth and calibre of technical knowledge, as well as unique experience in applying advanced lighting management systems to the world's largest transportation projects. Delmatic have offices in London, Abu Dhabi, Dubai, Qatar and Riyadh, and partners in key markets across the globe. ■

To find out more please visit:  
[www.delmatic.com](http://www.delmatic.com)

**delmatic**

the lighting management company

## advanced lighting controls for international rail projects

Delmatic are leading suppliers of advanced, wired, wireless and IOT lighting management solutions.

Our open networked systems are at the cutting-edge of technology, full of innovative ideas to save energy, share monitored data to optimise efficiency and sustainability, simplify installation, reduce costs and enhance passenger experience.



Crossrail, London



Haramain High Speed Railway, Saudi Arabia



Dubai Metro, United Arab Emirates



Doha Metro, Qatar

