

PROJECT MALLARD

James Park Associates has combined forces with Acumen Design Associates to give GNER passengers an interior capable of inspiring a new golden age of rail travel, writes **David Southworth**



A new ceiling was designed that permitted brighter and more uniform lighting

GNER's fleet of Mk IV IC225 vehicles were first introduced into service in the late 1980s and at the time represented a pinnacle of achievement for the former British Rail's (BR) Inter-City operation.

Capable of 140mph, these trains were the greyhound of the BR fleet and, intended for use on the West Coast main line, were designed as tilting trains, despite the required tilting bogies never being fitted. They were ultimately allocated to East Coast operation between London and Edinburgh, working with a smaller fleet of HST trains that served the non-electrified sections beyond Edinburgh.

By 2001, however, the fleet was in need of a major overhaul, especially with Virgin Trains' introduction of new stock for the West Coast and Cross Country fleets. With this in mind, Project Mallard was conceived – a design that would revitalise the Mk IV fleet, modernising and improving it to the point where it would not only compete with, but would surpass the competition in terms of reliability and comfort.

Potent and emotive

The Mallard was one of the most potent and emotive symbols of the 'golden age' of

railway travel, representing style, speed and engineering excellence. Designed by the LNER's chief mechanical engineer, Sir Nigel Gresley, it holds the steam locomotive speed record of 126mph, set on 3 July 1938. Project Mallard was so called to inspire and project the essence of that golden era with a 21st century twist, delivering an award-winning, customer-focused and commercially sound design for the refitted GNER Mk IV IC225 fleet.

Thus began Project Mallard, which in itself was unique – a qualitative brief that called on benchmarks not only within the railway industry but also in the automotive, aviation and hotel industries. To support the high aspirations detailed in the project, not one but two leading design companies were called upon to propose concepts. In addition, the train owners, HSBC Rail, and GNER recruited a design manager from British Airways to oversee and manage the project on their behalf.

For the two design companies involved – James Park Associates (JPA) and Design Acumen (DA) – this was a singular challenge as they were both keen competitors in the aviation sector. A joint team was therefore established in a neutral location in

London. The interior design contract was led by JPA with DA (now Acumen Design Associates) providing creative and management support on a shared basis.

JPA had prior experience with rail vehicle refurbishment and was aware of the challenges that lay ahead regarding the constraints in producing a new interior for an existing vehicle, one that would comply with current legislation. Knowing this, the team set out to answer the brief, considering the rake of vehicles in each train as an entire space rather than an entire set. A complete business analysis was performed which investigated issues such as ticketing and ticket sales, passenger seat reservations, luggage management, catering concepts, and passenger flow and platform design.

GNER made clear that its priorities lay in the enhancement of passenger comfort and convenience, through seating design and improvement of the sanitary facilities.

Virtual reality

Initial concepts were produced, supported by an animated walk-through and scale models, which included a full width kitchen at the Driving Van Trailer (DVT) end of the rake, making use of its

under-utilised space for food storage and preparation. A mid-train buffet/bistro was included, as well as a shop at the locomotive (coach A) end of the train. This augmented the dining experience, but also provided a high-class café in the centre of the train for standard-class passengers.

Based on market research, GNER also wanted smoking provision to be retained, but reduced. While the layout produced in initial concepts was space efficient, the route for passengers to the restaurant and shop presented difficulties in that they would have to pass through the smoking areas. Dedicated booths with appropriate extraction were therefore designed into each class. Family areas were incorporated into standard class and credenzas were provided in first class, from where passengers could obtain complementary coffees, newspapers, etc.

The layout also considered the possibility of reducing the number of exits (Eurostar has only one set of exits per carriage) to increase the space available to passengers. Trials were carried out to examine the effect on station dwell times and passenger egress times and the effects were shown to be minimal.

“New seats were designed for additional comfort throughout the train and electronic reservation systems were proposed to ease the task of allocating reservations”

When the Mk IV fleet was originally introduced, the provision for universal access was not as advanced as is currently the case. Wishing to comply with all current regulations as far as possible, GNER and HSBC Rail added universal toilets and the capacity for carrying wheelchair users was increased. In addition, it was decided to extend the 10% pitch of the seats to accommodate priority passengers who required the additional space.

New seats were designed for additional comfort throughout the train and electronic reservation systems were proposed to ease the task of allocating reservations – and in rapidly releasing these reservations where it was clear that passengers had not taken up their reservation. At-seat power was proposed to answer the ever-increasing usage of laptops and mobile telephones, as well as connectivity to the Internet for laptop users and PC services through smart ticketing and IT.

Last but not least, a new ceiling was designed that permitted brighter and more uniform lighting, while also making significant improvements to the diffusion of conditioned air throughout the passenger space.

Reality bites

After the initial concepts had been presented, it was necessary for reality to bite in terms of physical and budgetary constraints. Having established a world-class design, the process then became one of engineering a high-quality solution for practical operation within an agreed budget. The catering solution was deemed too expensive to implement, so an innovative concept was found that rotated the existing catering car, allowing a café bar to be constructed that faces standard class, while the first-class restaurant could be served from the far end.

This also meant that the fleet could be standardised. In its original format, there were standard rakes, with 2.5 first-class carriages and 3.5 Pullman carriages – (the half

being the 20 seats in the restaurant car). In the new configuration, all rakes have three first-class carriages – a solution favoured by GNER.

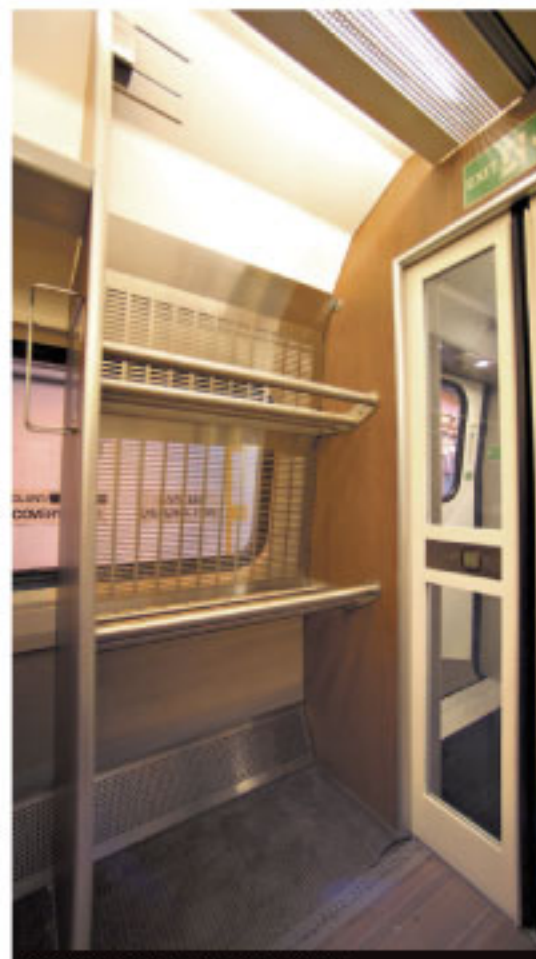
During the detailed design stage, much effort was focused on ensuring the safety of the interior. In ways that are mostly subtle and/or concealed, the new vehicle interiors significantly augment the safety of passengers in the event of a derailment. HSBC Rail and GNER have both invested heavily in passenger safety. HSBC Rail, for example, has a ‘roll-over rig’ in which a vehicle can be gradually rolled over to examine how the interior might be better designed to assist escape. The JPA/DA team were subjected to this so that the final design could take account of these issues and improve egress wherever possible.

The final stages of design were visualised through mock-ups. The first of these was a wood and foam version constructed at one of GNER’s depots, used to develop the kitchen in co-operation with a number of GNER chefs. The acceptability of the passenger environment was also gauged by the reactions of various visitors.

The final ‘glass-case’ mock-up was constructed by Bombardier. The manufacturer was also charged with the refurbishment work of the fleet, on both the interior and the underframe, the object of which was to improve the functionality and reliability of onboard equipment, such as air conditioning.

Ultimately, the first of the newly rebuilt carriages was launched by Her Majesty Queen Elizabeth II on 9 October 2003 – a poignant moment as it was also Her Majesty who had launched the original fleet for BR nearly 20 years previously.

There are now six rakes in service and preliminary customer research carried out by GNER has proved extremely favourable, with 73% of those surveyed deeming the new Mk IV IC225 “as good as or better than other brand new rolling stock introduced on the UK rail network”. END



Increased luggage area



Provision for smokers in each class



Chefs helped with the kitchen layout



The café bar provides a bright and pleasant environment

“The layout also considered the possibility of reducing the number of exits so that the space available to passengers was increased considerably”



New seats were designed for additional comfort



GNER's Mk IV IC225