The East Midlands Control Centre – An Ecofriendly Building

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Scheme Project Manager

15th October 2009

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AGENDA

- **Background to EMSR Programme**
- **EMCC fit with the programme**
- **What is the EMCC?**
  - **Detail of building**
    - **Why Bateman Street, Derby ?**
    - **How long did it take to build ?**
    - **Why does it look like it does?**
    - **How does the building work?**

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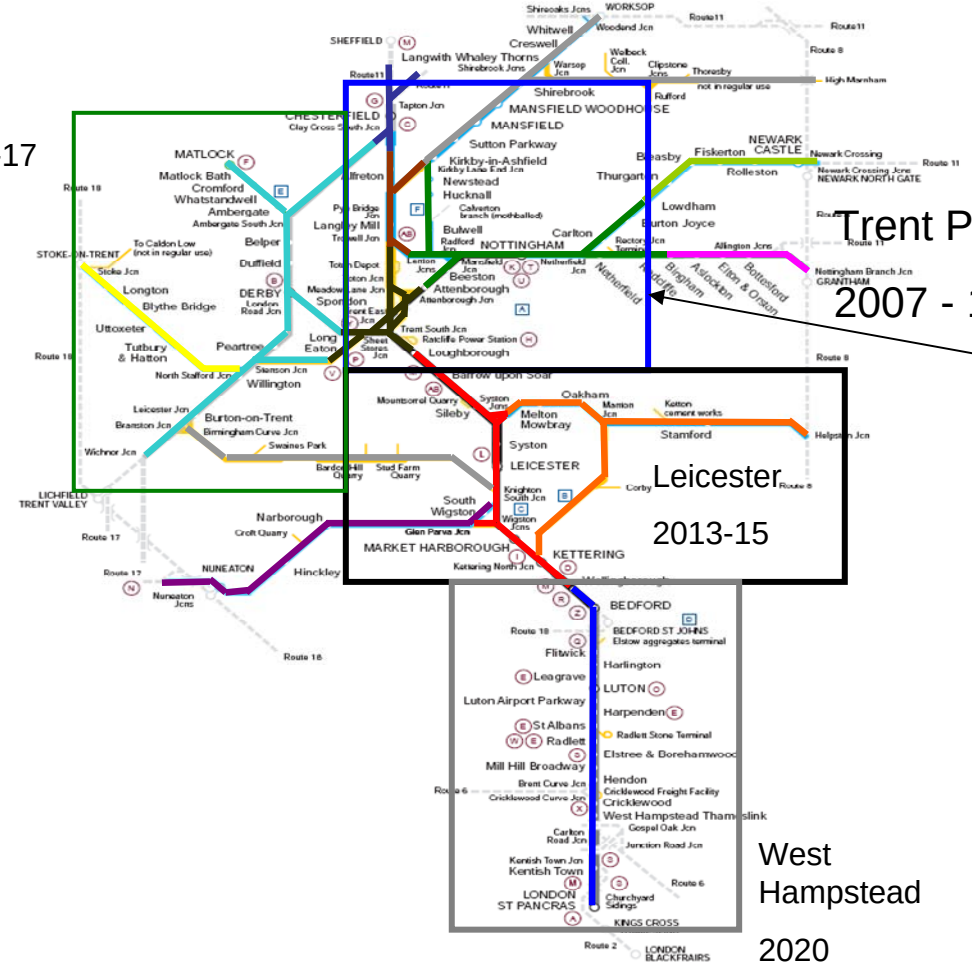
EMSR Programme

Derby

2015 -17



Leicester

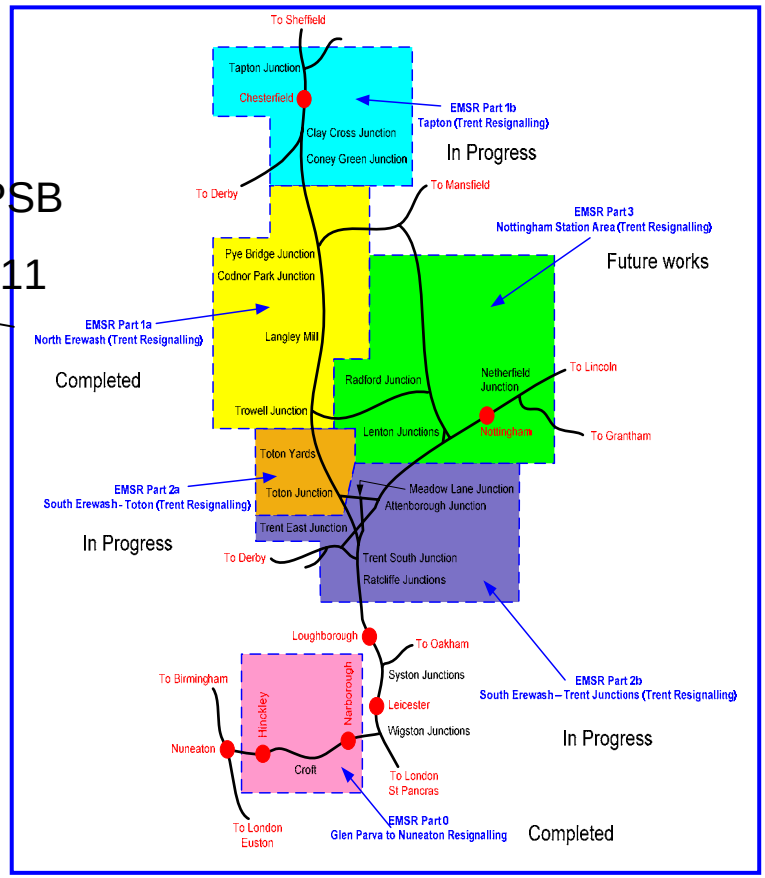
2013-15

West Hampstead

2020

Trent PSB

2007 - 11



Glen Parva Nuneaton
North Erewash
Tapton
South Erewash
Nottingham Station Area
Leicester
Derby Recontrol

West Hampstead
Willington to Stoke
Sheffield
Bingham to Allington
Lowdham to Newark
Syston to Peterborough

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EMSR Programme

- **Enabling Works**
  - Trent & Derby Telephone Concentrator Renewal (FTN/GSM-R Synergy)
  - **Part 0 – Glen Parva to Nuneaton Resignalling – Successfully Commissioned July 2006**
- **The Main Works**
  - **Part 1a – North Erewash (Trowell to Coney Green excl.) – Successfully Commissioned - August 2007**
  - **Part 1b – Tapton (Coney Green to Tapton incl.) – Successfully Commissioned - September 2008**
  - **Part 2a – South Erewash (Toton Area) – Oct 2009**
  - **Part 2b – South Erewash (Trent Triangle Area) – Christmas 2009**
  - **Part 3 – Nottingham Station Area – 2012**
  - **Part 4 – East Midlands Control Centre (EMCC) – Open for business!**
  - Part 5 – Leicester Recontrol & Resignalling – beyond 2013
  - Part 6 – Derby Recontrol & Resignalling – beyond 2015
  - Part 7 – West Hampstead Recontrol & Resignalling – beyond 2015
  - Part 8 – Willington to Stoke Resignalling – (to be included with Derby)
  - Part 9 – Sheffield Resignalling – beyond 2015 (Control Location TBA)
  - Part 10 – Nottingham to Grantham Resignalling
  - Part 11 – Nottingham to Newark Resignalling
  - Part 12 – Syston to Peterborough / Kettering to Manton – (to be included with Leicester)
  - Part 13 – Leicester to Burton – to be included with Leicester)

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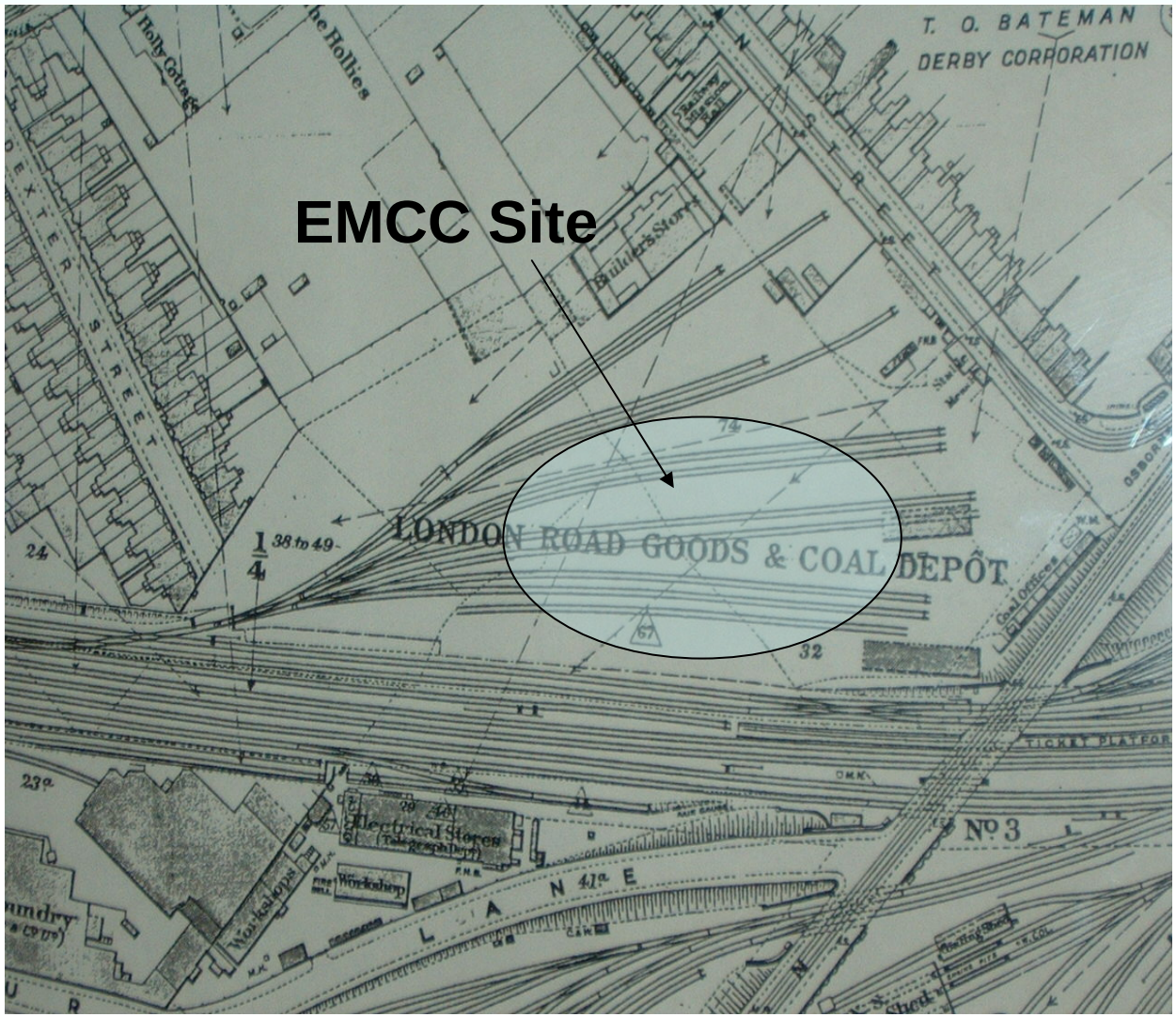
Why Bateman Street, Derby?



1921 survey

- Economic Reasons
  - Network Rail land
  - Low purchase cost
- good central location
- Next to railway!

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Why Bateman Street ?

C. 2001

- The site had been an oil depot with rail sidings alongside (still present)
- Depot not used for many years
- Site was under lease to EWS

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Cutting the sod

- Discussions about an EMCC site had been ongoing for several years
- Worksite opened in Oct 06
- Official opening March 08

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Original Site June 2006

June 2007

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EMCC Complete

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The EMCC

- It is the prototype for the next generation of signalling control centres.
- The modular design has allowed Network Rail to provide a quality facility at efficient cost.
- All signalling, communications and associated infrastructure controlling the rail network between St Pancras and Sheffield will be housed in the building.
- The building also accommodates the Network Rail/Train Operating Companies Integrated Control Centre.

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Regeneration and Negative Impacts reduced

- The project involved the regeneration of a brown field site contaminated with asbestos and hydrocarbons.
- All existing materials on site were recycled and contaminated materials managed for safe disposal.
- All construction materials employed are easily recyclable.
- Only water based paints were used.
- All timber was obtained from managed renewable resource and, where possible, from the UK.

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Operational Integrity

- The building's operationally critical activities – which will control over 350 miles of operational railway – have influenced the design of the building fabric and services.
- The building's steel frame and cladding provide a high level of blast resistance in case of terrorist attack.
- The building's services provide three levels of back-up to provide resilience in the power supplies and distribution to ensure continued operation.

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Operational Integrity

- Whilst it is required to achieve a high level of operational integrity under the most extreme conditions, Network Rail had a clear intent to demonstrate it's commitment to the environment.
- The design of the building produced solutions and applied technologies that enabled the EMCC to achieve a BREEAM rating of "Very Good".

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These Solutions Included -

- **System Resilience** – Network Rail to provide a virtually failsafe signalling system. The three levels of back-up are –
  - **Standby Generator**
  - **Uninterruptable Power Supplies**
  - **Secondary Standby Generator facility**
- **The Solar Exposure** of each elevation of the building was considered resulting in a reduction of the glazed areas, the use of tinted glazing and vertical brise soliel to the West elevation to minimise the solar gain and reduce the cooling requirements.
- **Solar Panels** on the roof supplement 80% of the total domestic hot water.

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These Solutions Included -

- **Lighting** provides individual or grouped luminaire dimming to reduce the energy used. Day light inter linked controls are used so that artificial illumination is reduced to suit the natural daylight available. Lighting systems to non-critical, low occupancy and low usage areas are complete with presence detection switching to reduce energy consumption.
- **The Main HVAC Equipment** is operated and installed with ‘soft starting’ switchgear to reduce the high starting currents and peak demands.

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These Solutions Included -

- **Rainwater Harvesting** system has been employed to reduce water consumption by 1million litres of water per year.
- **Airtight Construction** betters the air leakage providing good practice for naturally ventilated offices.
- **Heat Recovery** is provided by means of a plate heat exchanger. The Air handling units sited on the roof recover waste heat back into forced ventilation system.

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And what wasn't.....

- **Sustainable Urban Drainage**
  - To reduce the outfall to the public sewer. This couldn't be done because the ground conditions weren't suitable – when a hole was filled with water it didn't soak away!!
- **Green Roof**
  - The weight of the roof would have been significantly greater than a traditional roof and as such the entire steel frame and foundations would have needed to be more substantial and therefore more expensive.
- **Photovoltaic Panels**
  - Clean electricity generation on site that would reduce burden on electricity provider and reduce electricity bills.
- **Ground Source Heat Pumps**
  - Using the heat in the ground to heat the building. This was rejected because of the concerns over contamination.

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Open for Business

- Integrated Control Centre (ICC) opens March 08

- Signallers moved in August 2008 (1A & 1B desk)

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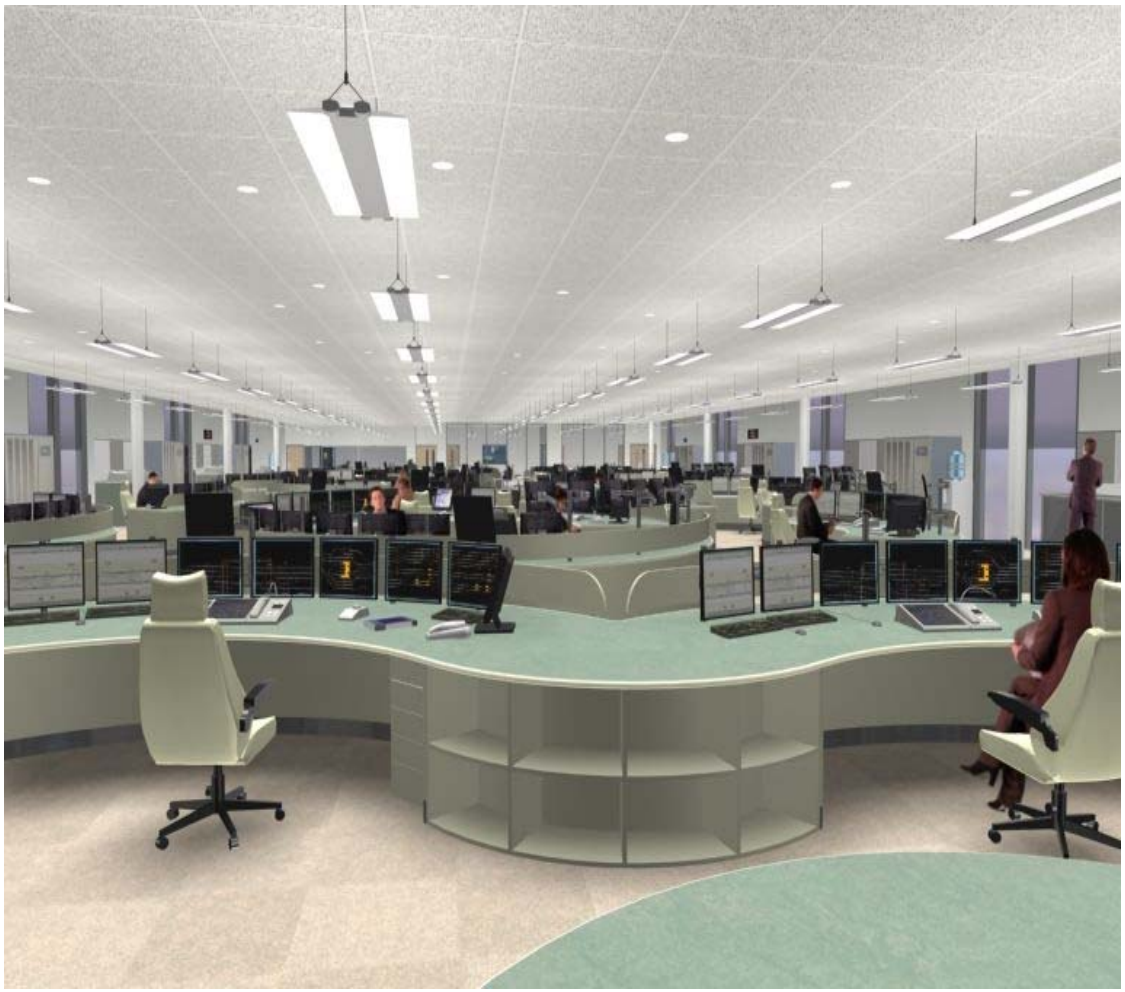
1st Floor signallers



- 20 signallers desks
- 350 route miles
- 240 staff in total
- Specific work on ergonomics and layout of desks to create optimum working environment

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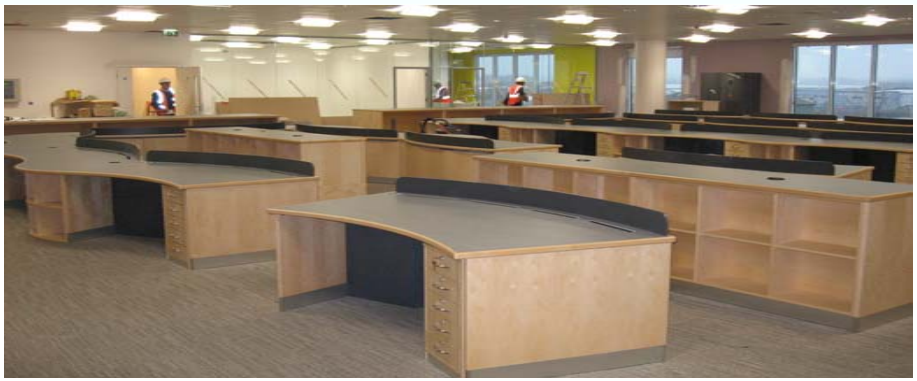
2nd floor - ICC



- ICC for the first time at Derby
- Joined by Area Manager's team

- NR & EMT controllers working in the same room offers significant customer benefits
- Improves safety communication