Hitachi Class 395

Railway Strategies Live 2010

23 June, 2010

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 2 July, 2010

Introduction to Hitachi Ltd

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- **Large Global Company, 2010 revenues ~ € 80 billion**
- **Railway systems is part of Social Infrastructure & Industrial Systems – revenues ~ € 11 billion**
- **First electric locomotive produced in 1924**
- **Long standing supplier to Japan Railways**
- **International growth plans for railway products**

Over the next 3 years, Hitachi will invest ~ €9 billion on its social innovation businesses

Hitachi's European rail objectives

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- **Demonstrate compatibility of Japanese products with UK infrastructure**
- **Win a UK rolling stock project**
- **Deliver on time and deliver world class levels of reliability and quality**
- **Use successful demonstration of product quality, reliability and performance in the UK as a springboard to enter European markets**

Hitachi's Approach

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- Ensure everything works from day one
- Deliver projects on time & budget
- Reliability has to be designed in
- Work co-operatively with the stakeholders

Equipment - Hitachi V-Train 1

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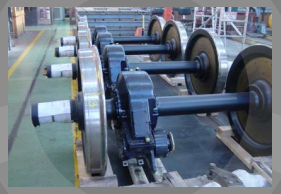
- New Axles and gear boxes
- New Brake Resistors
- New HT cable
- New Transformer
- New Traction Gear
- New Traction Motors
- New Auxiliary Supply







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Hitachi V-Train 1 Objectives

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- Validate and confirm equipment performance under UK conditions
- Demonstrate Hitachi competence to acceptance authorities
- Early understanding of equipment failure/interference pattern/internal supervision.
- Early warning on design issues needing resolution for smooth acceptance of the production vehicles.

Class 395 background

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- First rolling stock project for Hitachi in the UK
- First high speed domestic service
- First train designed to high speed TSI
- Will be used to carry spectators to the 2012 London Olympics

Target Journey Times

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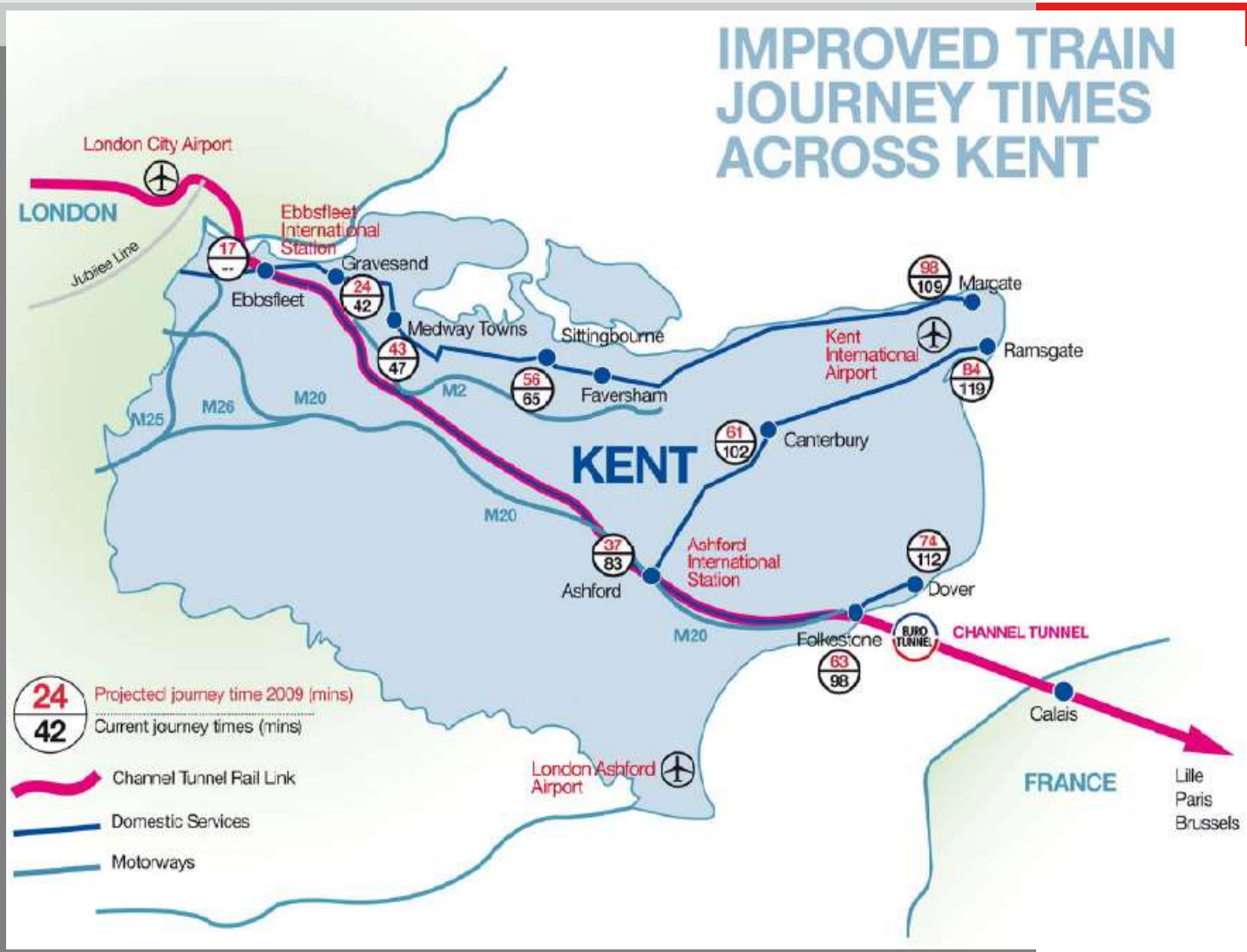

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Class 395 Milestones

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- Contract signed in June 2005
- Southeastern selected in Jan 2006
- Depot completed in July 2007
- First Unit arrived in August 2007
- Preview service started in June 2009
- Full service started in December 2009

Base Train for Class 395

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Low Risk Solution

	HIGH SPEED OPERATION WITH COMMUTER	SAME
Max Speed	NEW LINE 240km/h	NEW LINE 225km/h
	EXISTING LINE 130km/h	EXISTING LINE 160km/h
Configuration	6 CAR UNIT, 20m VEHICLE	SAME
Door Position	1/3, 2/3	SAME
Seats/Unit	335	354
	AIRTIGHT CARBODY, DOOR, VENTILATIONS	SAME
Annual Mileage	250, 000 miles	100, 000 miles

Unit Formation

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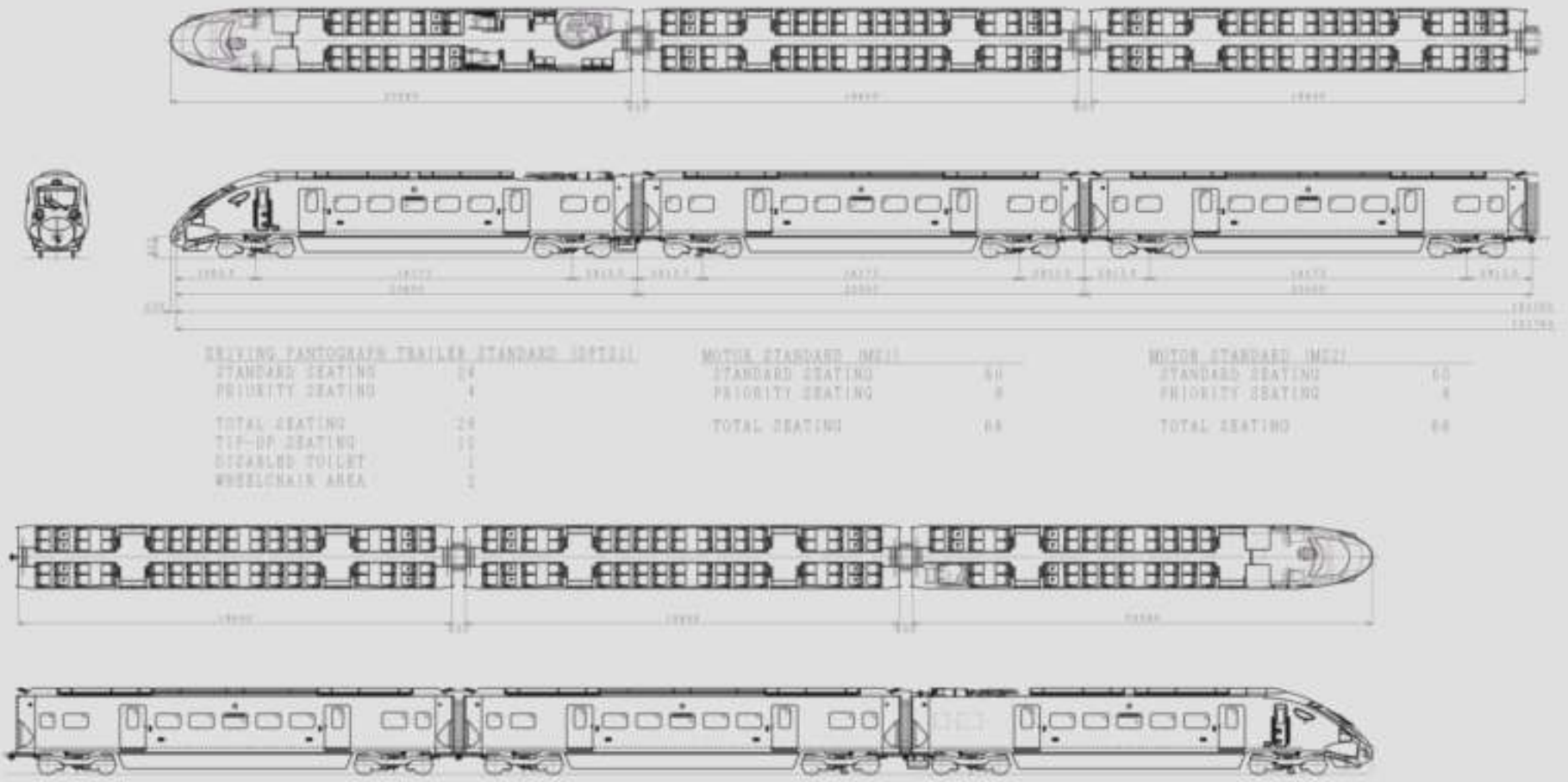

- **29 x 6 Car units 174 cars**
- **25Kv and 750v DC Power capability**
- **140MPH on 25Kv 100MPH on 750v DC**
- **4 x IGBT Traction packs 16 x 210Kw Motors**
- **Service Acceleration 0.7 m/s^2**
- **Track Gauge 1435mm**
- **Car Length 20m between coupler faces**
- **Passenger capacity 354 Seats, 508 standing**

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Aluminium Body Structure

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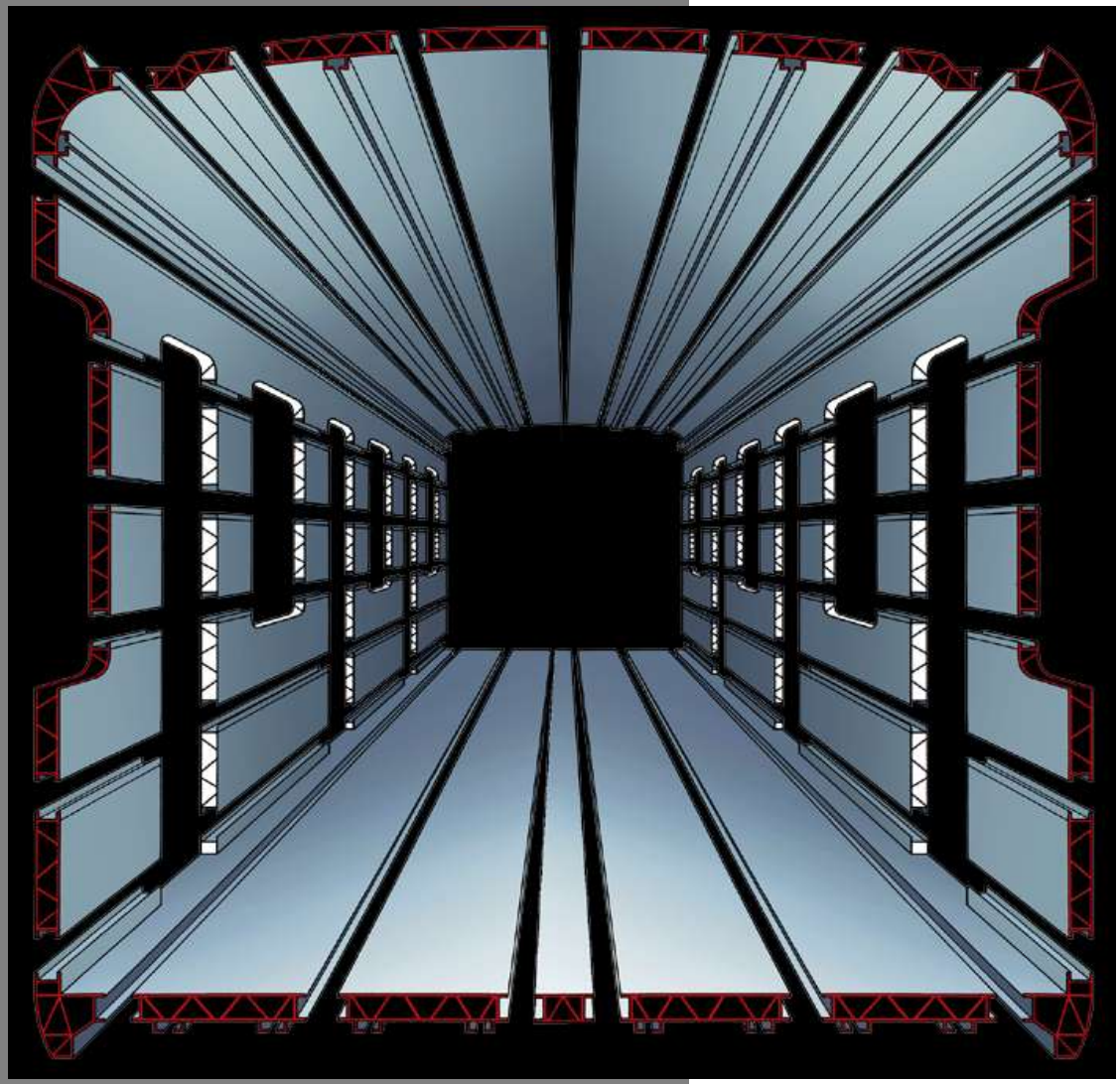
Aluminum Double Skin Structure

- Frame less Structure
- Smoother Surface Finish
- Best fit for modular design



Friction Stir Welding Technology

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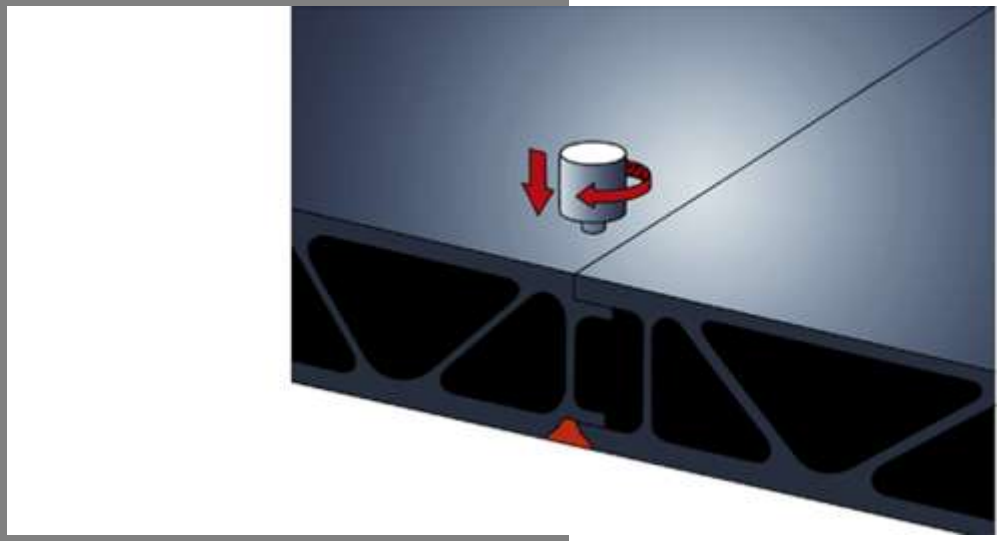
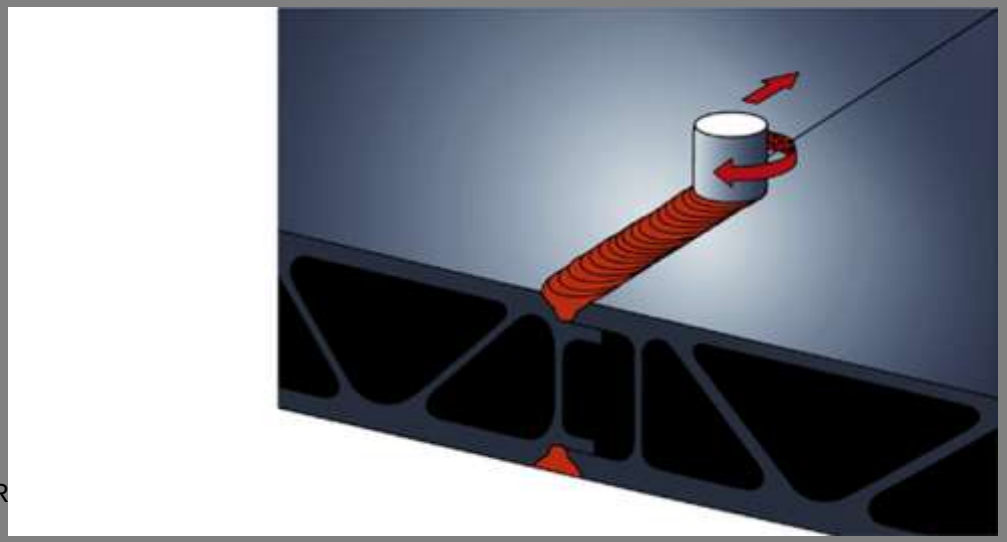
- Minimal Distortion
- Higher Strength






FSW – Friction Stir Welding delivers light weight with higher quality finish

Hitachi Rail Sites

- London
  European HQ
  Project management
  UK Maintenance HQ
  European sourcing

- Kasado Japan
  Rolling stock and
  Key mechanical component
  Design, manufacture and test

- Mito Japan
  Electrical systems, TMS
  and Traction design,
  Manufacture and test

Kasado works

Mito works

Hitachi Class 395

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- Owned by Eversholt Rail, and operated by Southeastern
- Delivered on budget, and 6 months ahead of schedule
- Each Class 395 has TVM, KVB, TPWS signalling
- The train had to obtain 3 safety certifications
- Each 395 had to complete 4,000 miles fault-free running prior to acceptance by the operator

Approximately 40% of components sourced from EU suppliers

Deliveries

Class 395 Mock-up

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Class 395 mock-up

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Class 395 – Cab Components

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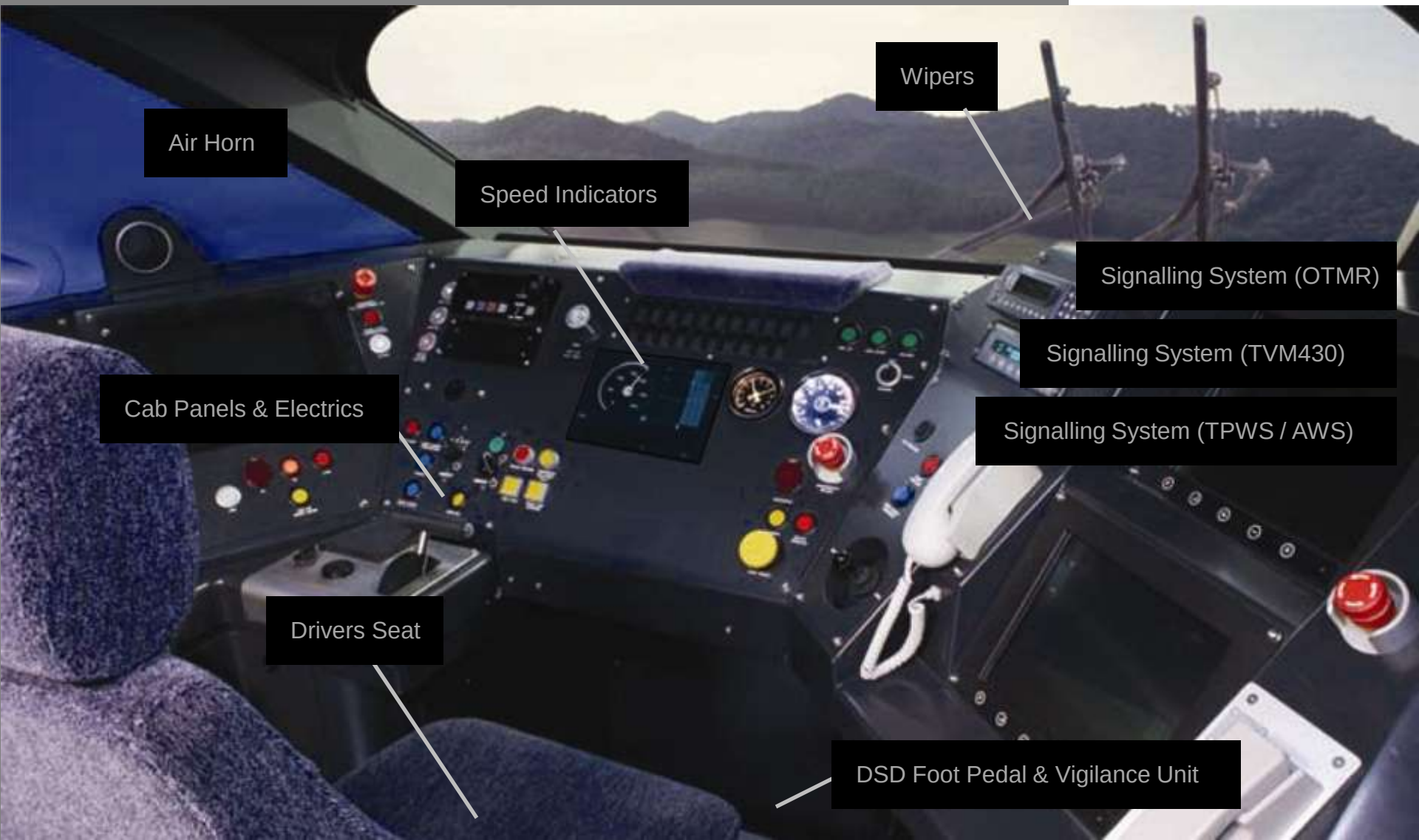

Interior Components /1

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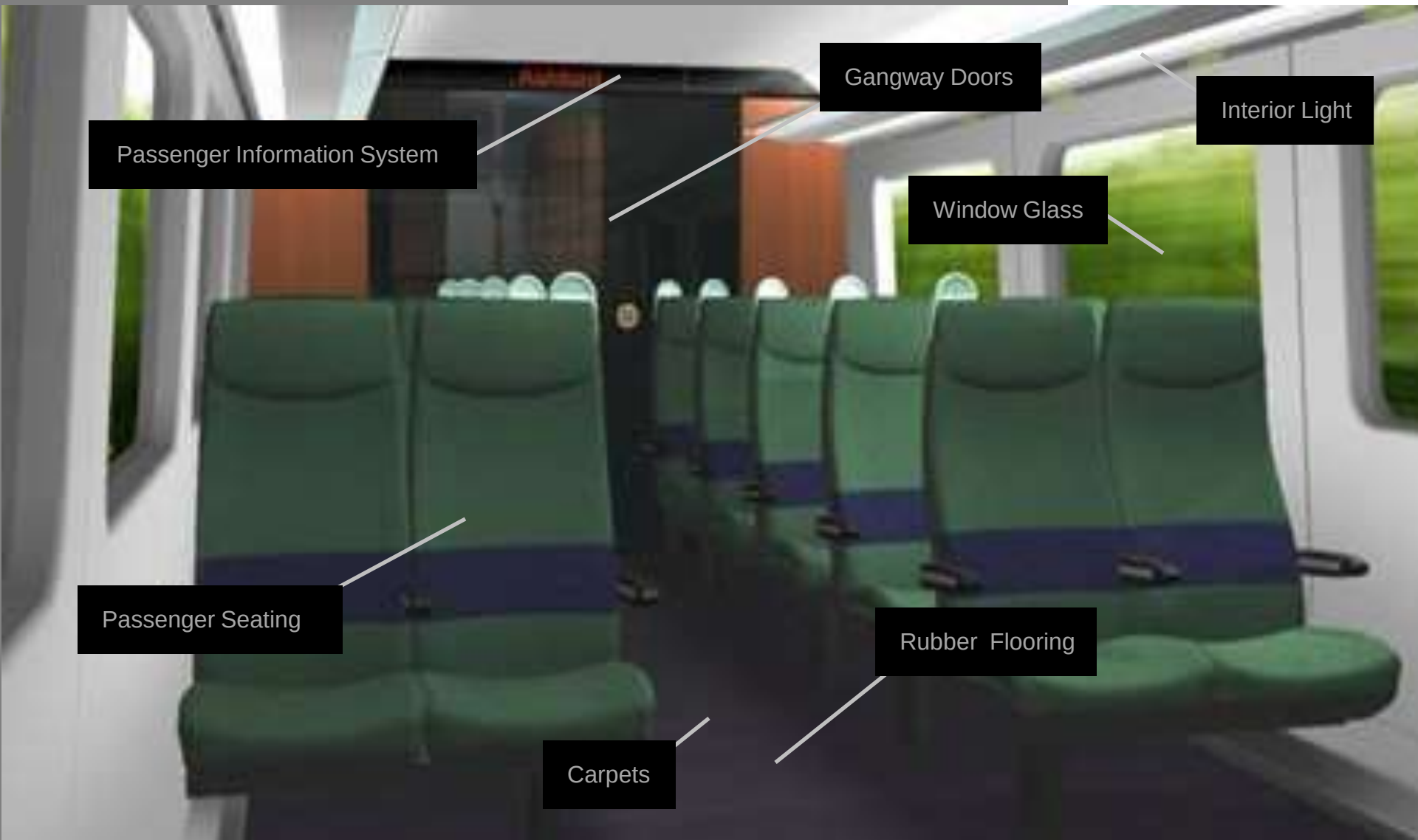

Interior Components /2

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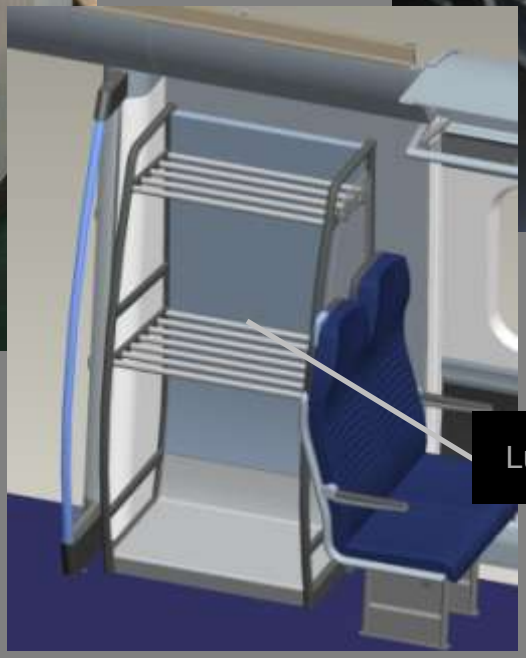
Toilet Module



Luggage Stacks

Bay Tables

Fire Protection

Exterior Components

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Brakes

Gangway

Coupler

Wheel & Axle

Gear Box

Roof Unit (VCB)

Cab HVAC

Pantograph

External Light

Class 395 - Major European Suppliers

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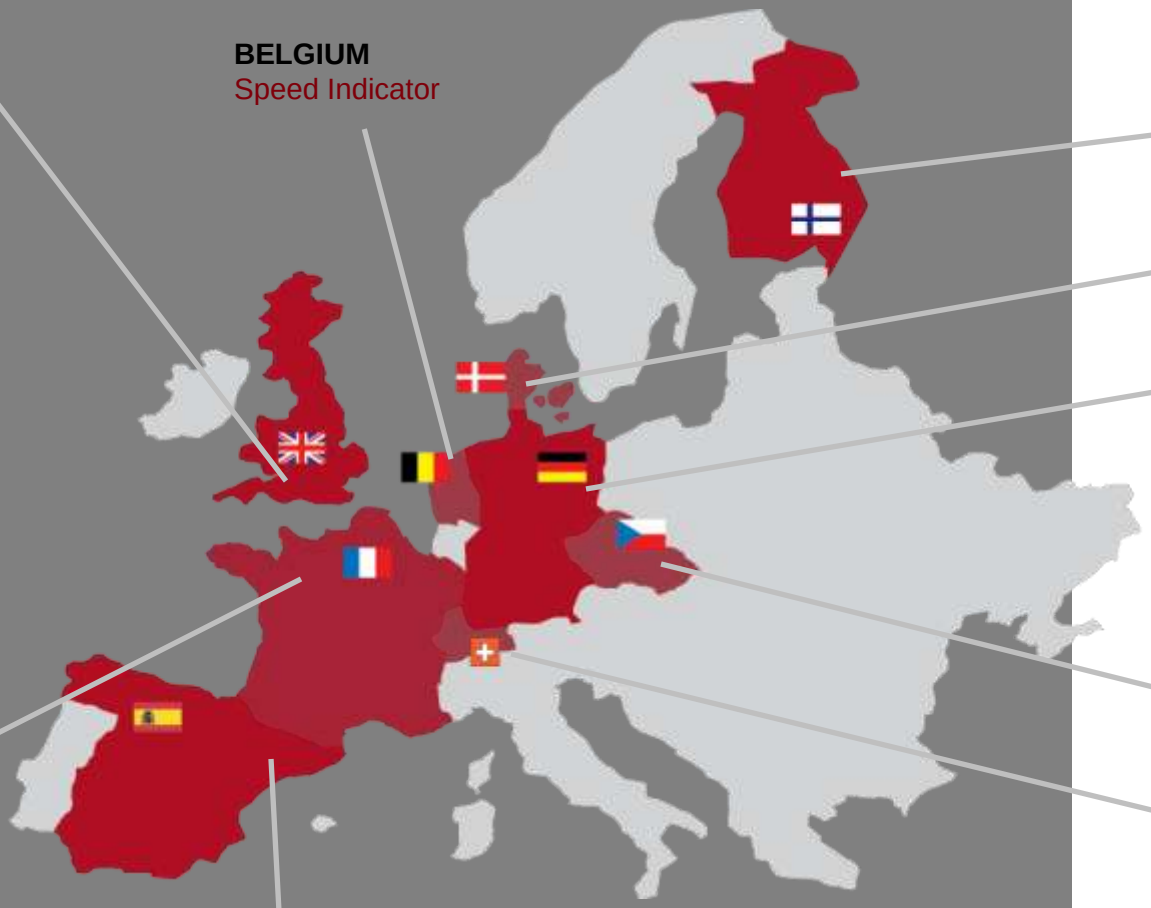

GREAT BRITAIN
Wheel sets
Gangway
TPWS/ AWS
Rubber Flooring
Cab Panels
Cab Electrics
HVAC
Pneumatic Fitting
Air Horn
Brake Hose
Fire Protection
Internal lights
External lights
Door Sounders
DSD Foot pedal
Rail ramps
Advert frames
Catering locks
SRS

BELGIUM
Speed Indicator

FRANCE
Signal System
Pantograph
CCTV
Wiper
VCB
Bay Tables

SPAIN
Toilet

FINLAND
Gangway Door

DENMARK
PIS

GERMANY
Couplers
Seats
Damper
Glass
Carpet
Flexible Conduits
Luggage Stacks

CZECH REPUBLIC
Reduction Gear

SWITZERLAND
Cable

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CTRL – Logistics European Supply

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EUROPEAN PURCHASE

MORE THAN 70 SUPPLIERS

DELIVERY CONTROL

CONSOLIDATON PORTS:

SOUTHAMPTON

HAMBURG

ROTTERDAM

DELIVERY OF TRAIN ON TIME TO THE UK

Hitachi Ashford Depot

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- Home of Class 395
- State of the art Shinkansen style maintenance facility
- Hitachi employs over 110 staff at depot
- Key staff worked on the production line in Japan
- All staff are trained to a high level
- Component exchange factory
- Time based maintenance
- Kaizen techniques used throughout
- Automatic inspection equipment
- Central information database
- Hitachi control the entire site
- Capable of supporting other fleets

Ashford Depot Progress Pictures

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Ashford Official openning

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Class 395 Press Coverage

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Class 395 Inauguration

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Class 395 – Progress report

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- Best out-of-the-box UK EMU performance to date
- On target to achieve first year reliability performance
- Since Dec, LSER passenger number have increased by 5,000 in the morning – 4,000 are on High Speed
- High Speed passengers make up approximately 10% of LSER's passengers – in line with expectations
- Some stations have seen massive increases in High Speed usage – At Canterbury West, 75% of all trips are now made on High Speed
- High Speed Customer satisfaction rating is 95% - second only to WSMR

Class 395 Reliability

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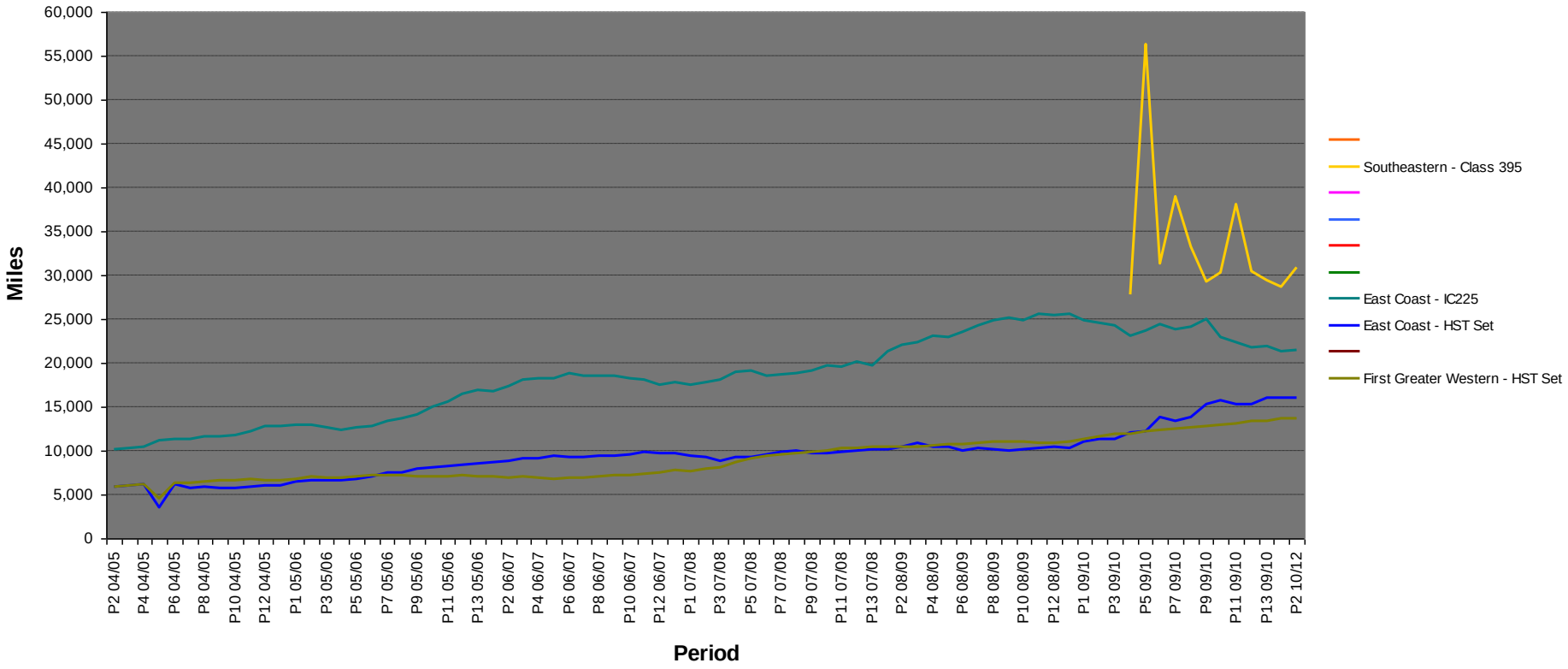
MAA (Moving Annual Average)



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Near term objectives

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- Continued participation in future UK rail projects
- Engaging actively with the European rail industry
- Increase EU content

We look forward to working with you

