



Department
for Transport

Rolling Stock Perspective

Fourth edition

Moving Britain Ahead



October 2018



Department
for Transport

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Ministerial Foreword



The train market in the UK continues to be a vibrant one and passengers are benefiting from investment in new trains across the country. We are seeing train manufacturers like CAF and Stadler joining Hitachi, Bombardier and Siemens in opening new facilities in the UK to build or maintain trains. Investors have been keen to put their money into the future of the industry with new trains for Northern, TransPennine and Anglia soon to enter into service as well as on the Gt Western and East Coast intercity routes.

Private companies are showing how they can marry opportunity and innovation to repurpose existing stock like the Viva Rail trains, Angel's HyDrive or Porterbrook's tri-mode vehicles, and develop new ultra-light trains for metro services like the ones being designed by WMG in Dudley which is supported by both Network Rail and Eversholt Rail.

We need to see much closer working between train operators and Network Rail and a much greater alignment of goals so that it is in both party's interests to succeed in delivering the rail network the country needs. As more digital systems are introduced to the railway (like automatic power changeover for bi-mode trains) it is increasingly important that the industry takes a track-and-train whole system approach to design to ensure that the trains and the track-mounted equipment work together when introduced.

A handwritten signature in black ink that reads "Jo Johnson".

Jo Johnson MP,

Minister of State at the Department for Transport and Minister for London

Rolling Stock Perspective

1. Introduction

This is the fourth issue of our Rolling Stock Perspective, in which we signal to train manufacturers, owners and operators the types of improvements and innovation we want to see in the railway industry. In this issue we will revisit many of the themes covered previously as well as discussing new challenges the industry must face.

Since the last issue there have been over 600 new carriages ordered for the West Midlands, Essex Thameside, Crossrail and Welsh services. Many of these trains will be manufactured by Bombardier, who have secured the majority of these orders for their Derby factory and CAF who are building two fleets of its Civity trains and opening a new factory in Newport in autumn 2018. In addition, a new rolling stock funder has entered the market, all of which demonstrates that there continues to be healthy competition between train owners and manufacturers to build and fund the procurement of new trains for UK passengers.



Northern's new Class 195 diesel train

We are pleased to see that some innovative ideas are starting to become reality with Alstom working with Eversholt on the conversion of class 321 units to bi-modes using hydrogen fuel cells, Viva rail breathing new life into its class 230 trains with a hybrid power pack option, Angel trains working with Chiltern to introduce hybrid class 165 HyDrive trains in 2019, and Transport Design International making good progress on building their Very Light Rail (VLR) manufacturing and test facility in Dudley.

These light weight, refreshed and re-purposed vehicles, offered to the market at competitive rates, could strengthen the case for the reopening of disused lines. As the demand for housing and business premises that are well connected to the mainline increases, the reopening of these old alignments would reinvigorate local services. We would welcome proposals, via our Rail Network Enhancements Pipeline, for schemes that include the use of affordable rolling stock for these routes and we expect train manufacturers, franchise holders and ROSCOs to engage with operators and local authorities alike to examine the opportunities and the case for these.

We are pleased to see that Rolls-Royce have agreed the delivery of MTU Hybrid PowerPacks that will convert Porterbrook's Class 170 Turbostar DMUs from diesel-only to Hybrid operation. This Hybrid technology will enable a reduction in exhaust gasses around stations and urban areas. Porterbrook have also entered into a partnership with the Birmingham Centre for Railway Research and Education ('BCRRE') to create HydroFlex – the UK's first hydrogen powered train. Porterbrook will provide a 'Class 319' electric unit to BCRRE for conversion by their technical and research experts into a hydrogen powered train, allowing both organisations to demonstrate how this fuel-of-the-future might be deployed across the UK's rail network.

There is good news for UK-based vehicle equipment designers. The 'Infinity Train' will offer suppliers, especially SMEs, the unique ability to demonstrate new products and technology in a real passenger train environment. Based at Long Marsden and formed from one of Porterbrook's currently off-lease class 319 units the Infinity Train will also allow British based companies to showcase their technology to customers from both the UK and overseas, supporting the Rail Supply Group's ambitious plans to grow UK rail exports.

In this issue we will be revisiting our key objectives for rolling stock i.e. improving journeys for passengers; digitising the railway to reduce costs and increase capacity; getting most out of the assets we have; improving train connectivity and information for passengers; and reducing the impact that the railway industry has on the environment.

2. Decarbonisation

In February 2018 the Rail Minister Jo Johnson set out his vision to decarbonise the rail industry and set out an aspiration for the removal of all diesel-only trains from the network by 2040. Rail Delivery Group appointed Malcolm Brown to lead an industry taskforce to address this challenge for traction, property and infrastructure. The taskforce's remit is to show how the UK can become the world's leading low-carbon railway by 2040 and have an industry that is a world leader in developing and delivering low carbon rail transport solutions for all.

The taskforce's initial report will set out the range and feasibility of lower carbon options. It will build on wide consultation within the industry and research into developments in rail in other countries and how other transport modes are developing decarbonisation solutions. The taskforce will follow up on its initial findings in 2019 with a final report incorporating an economic appraisal and route map to deliver its recommendations.

There has been significant research and development on decarbonisation, especially in recent years as the UK's statutory climate change commitments have come to influence public transport policy. The taskforce's challenge was not to drive innovation. Rather, it was to find ways to catalyse existing innovation and find practical ways to bring lower carbon options to a point where they can be implemented without compromising rail's obligations to provide a timely, reliable and comfortable service to passengers and a reliable, cost-competitive service to freight shippers.

A key issue for the taskforce is to find other traction options that are able to provide lower carbon outcomes at a reasonable cost.

The taskforce will be exploring all options critically to ensure that the right long-term choices are made. This involves setting clear outcomes, specifying what the industry can do and proposing actions to ensure that the right policy and investment climate is established to enable the recommendations to be delivered.

3. Alternatives to Diesel Fuel

Rail remains the most environmentally friendly form of transport in terms of carbon emissions per passenger mile. Nevertheless, we want to see train manufacturers, owners and operators working together to develop trains capable of storing power on board from the electrified network where it exists and using this stored energy when operating away from the electrified parts of the network. Where diesel engines are used as part of the solution we want those engines to be the cleanest (in terms of engine exhaust) possible.

Recent advances in energy storage technologies like batteries and hydrogen are at, or approaching the stage, where they will be suitable for some types of journey which do not have such high energy and power demands, such as rural branch line and suburban commuter services. It is expected that this technology will develop quickly in the coming years.

Whilst new trains are being introduced onto Gt Western, East Coast and Anglia services many other diesel-only passenger trains in service today were built before the 2014 European regulations on train exhaust emissions were introduced. A challenge for owners of these trains is to find cost effective ways of improving their exhaust emissions if they are going to be seen as credible options for franchisees in delivering their environmental strategies.



Class 180 train approaching Reading station

A recent Network Rail report highlighted that there are specific parts of the network that suffer more than others with pollution build up due to their city centre location, the amount of train engine idling done at those stations and their physical layout. We want to see measures put in place to reduce this pollution at its source, like using auto engine stop-start software, electric launch systems and station shore supplies during long dwell periods.

We expect train owners and manufacturers to further develop cost effective proposals to convert their existing or future diesel trains to bi-mode or use an alternative energy source to diesel. Using current technologies, it should be possible for bi-mode and alternative fuel trains to be capable of operating without diesel engine emissions from the moment they approach platforms until they are clear of the station environment, thereby improving the level of air quality for waiting passengers and those working in the immediate area.

We have placed requirements in our most recent franchises to develop, test and deploy new and emerging technologies during the franchise. These new technologies could include hydrogen fuel cells, batteries, supercapacitors or other energy storage systems. Such deployments must include the supporting infrastructure, supply chain and maintenance arrangements necessary to ensure a reliable train service.

4. Disabled Passenger Benefits

Inclusive Transport Strategy: achieving equal access for disabled people.

Earlier this year the Department set out the Government's plans to make our transport system more inclusive across all sectors (road, rail, sea and air) and to make travel easier for disabled people. While it is focused on the inclusion of disabled people, many of the improvements will also benefit other travellers.

1st January 2020 is the deadline for ensuring that all trains meet the accessibility standards. The standards set requirements for handholds, signage, wheelchair spaces etc. which rail vehicles must meet in order to enable those with reduced mobility to use trains more easily. A lot of good work has already been done with the number of trains that meet these RVAR and PRM-TSI requirements higher now than it has ever been. This is partly due to the large number of newly-built trains being introduced to the network but also due to wholesale train fleet refurbishments enabled by the franchising process.

There is still a small percentage of trains that do not meet the RVAR or PRM-TSI standards. We expect train owners and operators to target these vehicles for upgrade in the coming months.

Much can still be done to make travelling around the rail network easier for those with disabilities or for those with reduced mobility. Whilst work to improve the passenger environment has delivered a measurable uplift in accessibility, the challenge of bridging the gap between the train and the platform remains. Rolling stock with retractable steps, filling the gap between the train and the platform, are due to be introduced on Greater Anglia services in 2019 making it easier for those with wheelchairs, prams or heavy luggage to use services with a greater degree of independence. We want to see innovative approaches used on trains and stations to remove the remaining physical barriers to travel.



Wheelchair passenger on GWR service



GTR Accessibility Communication Guide

People who use train services independently but who may be partially sighted, deaf or suffer from dyslexia or have learning disabilities or dementia may struggle to get the information they need about those services. Many of those passengers rely on information screens, signage and audible announcements on trains to navigate around the network. We expect all train manufacturers, owners and operators to ensure that all the existing aids on their trains are in good condition and operating reliably.

Govia Thameslink Railway (GTR) has introduced Accessibility Communication Guides. These simple cards enable passengers to communicate with train and station staff simply by pointing to images that represent the information or assistance they need.

The ability to remotely locate assistance when it is needed is a valuable passenger benefit. We want to see train manufacturers and our franchisees introducing systems on trains that can help people with hidden disabilities find their way around the trains and communicate with staff.

Equally passengers who require accessible toilet facilities during their journey need to be certain that they will find them in working order. We want manufacturers and maintainers to use technology to monitor and maintain these systems to keep them in service whenever the train is in use.

5. The Passenger's Environment

Maintaining a good travelling environment for passengers is a key outcome the Department seeks to achieve through its rolling stock design and franchising requirements. We expect our franchisees to have in place processes and procedures to deal with trains stood in any weather (hot or cold) so that a comfortable environment is maintained for passengers. Train designers should consider the continued operation of lighting, air-conditioning, toilets etc. when power to the train is lost.

The Department expects its franchisees to ensure that their trains are suitable for the kinds of journeys their customers are making. Guidance is given in section 8 on the attributes different train types should have. Such attributes include vehicle loading indicators and active occupancy detection systems. Train operators are encouraged to utilise the information from such systems to provide real-time carriage occupancy information to passengers on-board and to provide summary information to passengers in advance of travel, allowing them to make more informed decisions about their journey.



Interior of Northern's new electric train

Passengers rightly expect wireless services on trains to keep pace with the facilities and information provided by other transport modes and in other public spaces. Train operators should not overlook the benefits to themselves of being able to keep passengers informed, especially during disruption, providing advice and information to passengers to relieve overcrowding at affected stations.

We expect our franchisees to buy fast and reliable Wi-Fi and mobile connectivity systems when procuring new or refurbishing existing trains. Trains should have a fast communications network and space reserved for future high bandwidth multi-media equipment capable of at least one (1) gigabit per second speeds and that can be increased in readiness for future 5G technology.

Train owners, operators and Network Rail must expect and plan for new technology to keep us at the forefront of the digital revolution. The industry must prepare for the introduction of a new cab radio system that will replace existing railway systems from 2025.



6. Parcels on Passenger Trains

The use of spare space on rolling stock is already being capitalised on by WeGo Couriers, who utilise non-passenger space on passenger trains to transport a wide range of consignments on East Midlands Trains. Eurostar's EuroDespatch service also makes use of spare space on its trains to transport goods and large items of luggage between London, Paris and Brussels.

Converted passenger rolling stock has been used by Colas Rail and TNT to successfully trial the carriage of express parcels and perishable products for distribution in central London. The goods were then transferred into a fleet of TNT electric and low-emission vehicles to produce an end-to-end service that was reliable, faster than by road and resulted in reduced emissions.



Courier parcel service on East Midlands Trains

The Department has provided £3.5m in funding via the Innovate UK First of a Kind competition to demonstrate “tomorrow’s trains today” from which £350k funding was given to 42 Technology Ltd to demonstrate the feasibility and value of an adaptable carriage. Their design featured seats that would automatically fold and slide along the sides of the vehicle, thus allowing the carriage of goods during under-utilised off-peak periods.

Our 2016 Rail Freight Strategy identified the potential to carry goods on passenger trains where there is spare capacity. The strategy considered the carrying of parcels directly between city centres on off-peak passenger services facilitated by adaptable rolling stock able to carry freight into cities.

A study undertaken by Arup on behalf of the Department identified that there is potential to develop the ‘goods on passenger trains’ model beyond the small-scale examples currently in operation. The market would be created by companies wanting to transport time-sensitive, high-value goods on the rail network to speed up their deliveries and reduce their carbon footprint. Such goods would be accommodated in specific areas of the train, segregated from passengers, be of a size that would be easy to load or unload within the dwell time and without the need for special handling equipment.

New trains with flexible areas for passengers or freight provide an opportunity for the carriage of goods with little impact on off-peak passenger services. Multi-purpose carriages provide an opportunity to offer additional revenue earning services and to make fuller use of the assets.

The Department expects to see train manufacturers, owners and operators taking full advantage of opportunities to use the assets the rail industry has to full effect.

7. Rail Digital Services

Transport Secretary Chris Grayling and then-Network Rail Chief Executive Mark Carne jointly launched Network Rail's Digital Railway Strategy on 10th May 2018 and committed to ensuring all new trains and track signalling are digital or digital-ready from 2019. This means procuring new trains with modern in-cab signalling either fully or partially installed when built, reducing costs and the time needed to realise the benefits once the route has been updated.

Technologies that today are delivering benefits to passengers include automatic door selection at short platforms, automatic power changeover for bi-mode trains, the European Train Control System (ETCS), Driver Advisory Systems and Traffic Management Systems (TMS). These systems improve safety and allow us to optimise the use of the rail network.

With closer alignment of train operators, owners and Network Rail, we expect to see the industry work collaboratively, taking a whole system approach to support these initiatives. Systems such as a national defect and fault reporting system for ETCS and train stock and crew management systems must be interoperable with other systems (such as TMS) if we are going to fully realise the benefits available to the railway through digital technologies.

The testing of Thameslink services through the heart of London using ETCS and Automatic Train Operation has shown that with modern systems and ways of working much can be achieved for the benefit of passengers. The larger-scale deployment of similar systems could come a step closer if the trial of a hybrid system at the ERTMS National Integration Facility (ENIF) is successful. This trial is allowing level 3 ETCS fitted trains, which are able to run closer together, to operate between level 2 ETCS and non-ETCS fitted trains for the first time.

This would create more capacity, allow more frequent train services and provide a way of realising the benefits of ETCS whilst the nation's train fleet and signalling systems are being updated. To that end, we will continue to invest the £450m National Productivity Investment Fund (NPIF) allocation in digital technologies for the railway and progress the First-in-Class programme, retrofitting existing passenger and freight vehicles with ETCS.

8. Rolling Stock Aspirations by Service Group

The aspirations for rolling stock on the coming pages are necessarily broad and do not take precedence over requirements set out in individual 'Invitations to Tender.' They provide a high level overview, which train operators should work towards. These aspirations are intentionally cast as output based and we expect train operators to take innovative approaches and use their experience to meet or exceed them.

We have divided services into five broad groups. It is important to note that trains can be used flexibly during off-peak periods. Britain has a busy railway, particularly during the morning and evening rush hours, and a train used on a metropolitan service in the morning may be used on inter-urban or rural services outside of the peak. It is also important to note that passengers' perceptions of the type of service they are travelling on vary dependant on the time spent on the train and their reason for travelling.

It is essential for vehicles to have flexible interiors if train operators are to respond to increasing demands from passengers at manageable cost. In the long term this will ensure that rolling stock can be deployed on various routes with differing needs and ultimately allow train operators to prepare quickly and easily for occasions when passenger numbers put pressure on capacity e.g. high season holiday or festival traffic. Thought should also be given to providing flexible interiors suitable for large packages, luggage or bicycles.

Metropolitan

The metropolitan service group typically serves high-density traffic flows to meet a high volume of passenger demand during the peak hours, with passengers generally making relatively short journeys on services with frequent stops. Passenger expectations may focus on certain aspects of comfort and there is a recognition that operators must balance the need to transport high volumes of passengers against the expectation of a seat. These trains may also provide services to outer-suburban stations.

Rural/Regional

This service group will generally serve more rural communities at a lower frequency than the other service groups and have lower ridership but it performs a vital service for travellers, the local community and tourists as well as the regional economy.

Inter-Urban

Passenger expectations of the Inter-urban service group are similar to the InterCity group on services that are primarily express with limited stops but may be of a shorter duration. It transports leisure and commuter passengers between towns and cities. These trains may also provide services to outer-suburban stations.

InterCity

The InterCity service group is one of predominantly long distance services where passenger expectations are generally high given the nature of the market, length of journey and the transport modes against which operators compete.

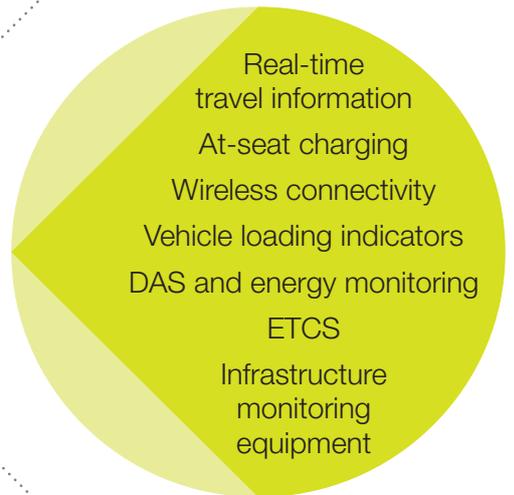
High-Speed InterCity

These vehicles are envisaged as providing ultra-high speed (up to 360kph ~225mph) services between major cities in Britain. Passengers will have high expectations for the facilities on board and for modern state-of-the-art interiors that meet the needs of business, commuting and leisure travellers.

Accessible



Ambience



Technology

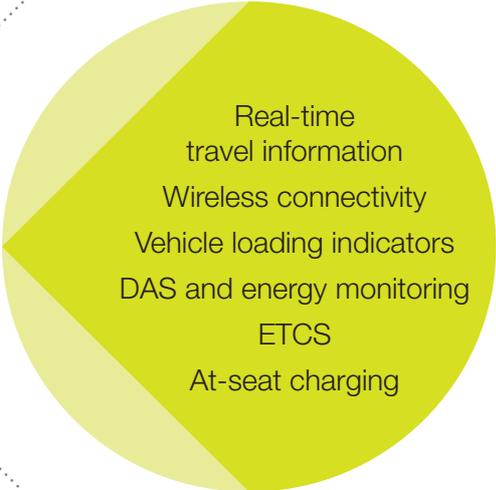


Accommodation

Accessible



Ambience



Technology

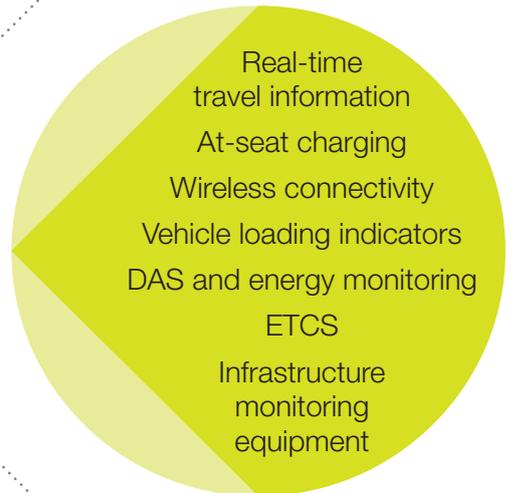


Accommodation

Accessible



Ambience



Technology



Accommodation

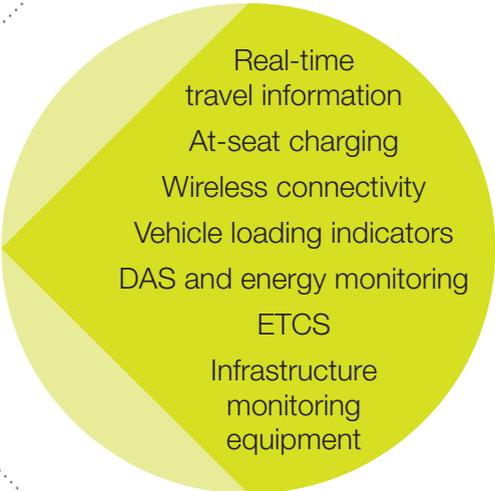
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InterCity



Ambience



Technology

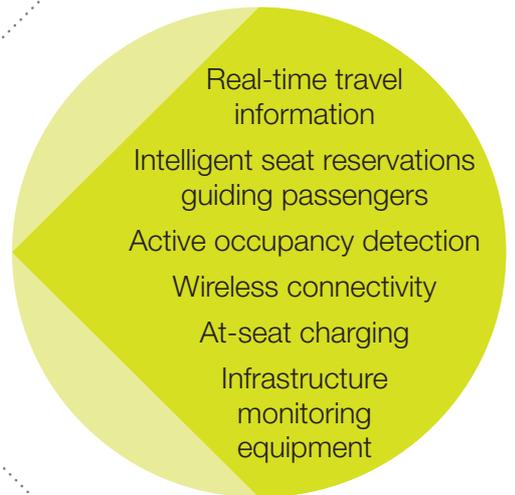


Accommodation

Accessible



Ambience



Technology



Accommodation

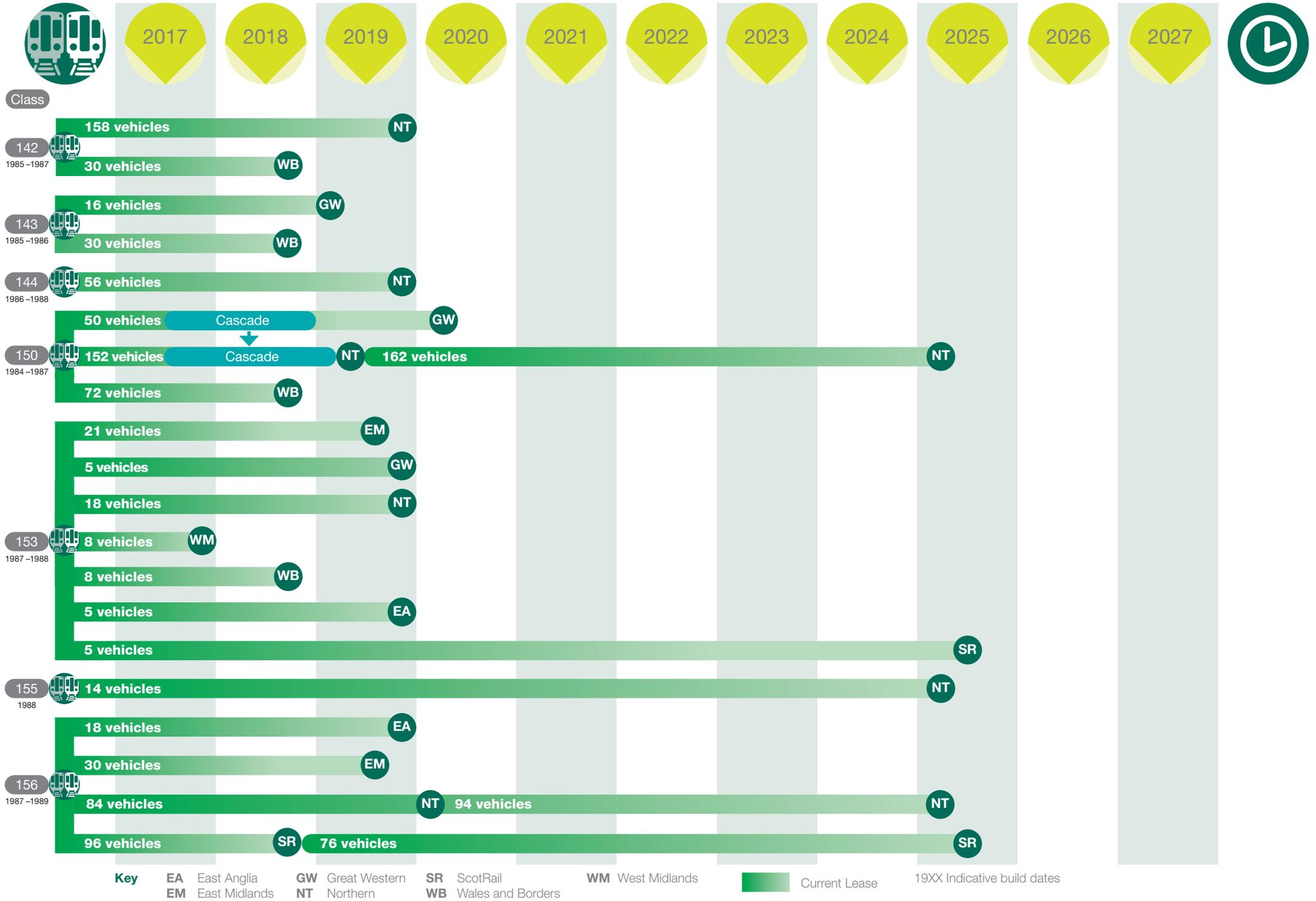
9. British Rolling Stock Fleet – Class by Class Overview

The following charts provide an overview of rolling stock in Britain, showing on which franchises or concessions they are currently operated, the date they are leased to as well as an indication of the year in which they were built. It is important to note that the quality of the vehicle is important, not its age. Good, high quality refurbishment can deliver a passenger experience comparable with new rolling stock.

The information contained within this section is indicative and has been prepared using Franchise Agreements and other material as available to the Secretary of State at the date of this document. Note that information on some Welsh and West Midlands services was not available at the time of publication. As such neither the Secretary of State nor his officials, appointed agents or advisers makes any representation or warranty (express or implied) as to the accuracy or completeness of the information. It does not include Open Access Operators. Sub-leasing arrangements have been simplified in some instances. The Department's Rolling Stock Team welcome any ideas for future publications, comments or corrections and can be contacted at:

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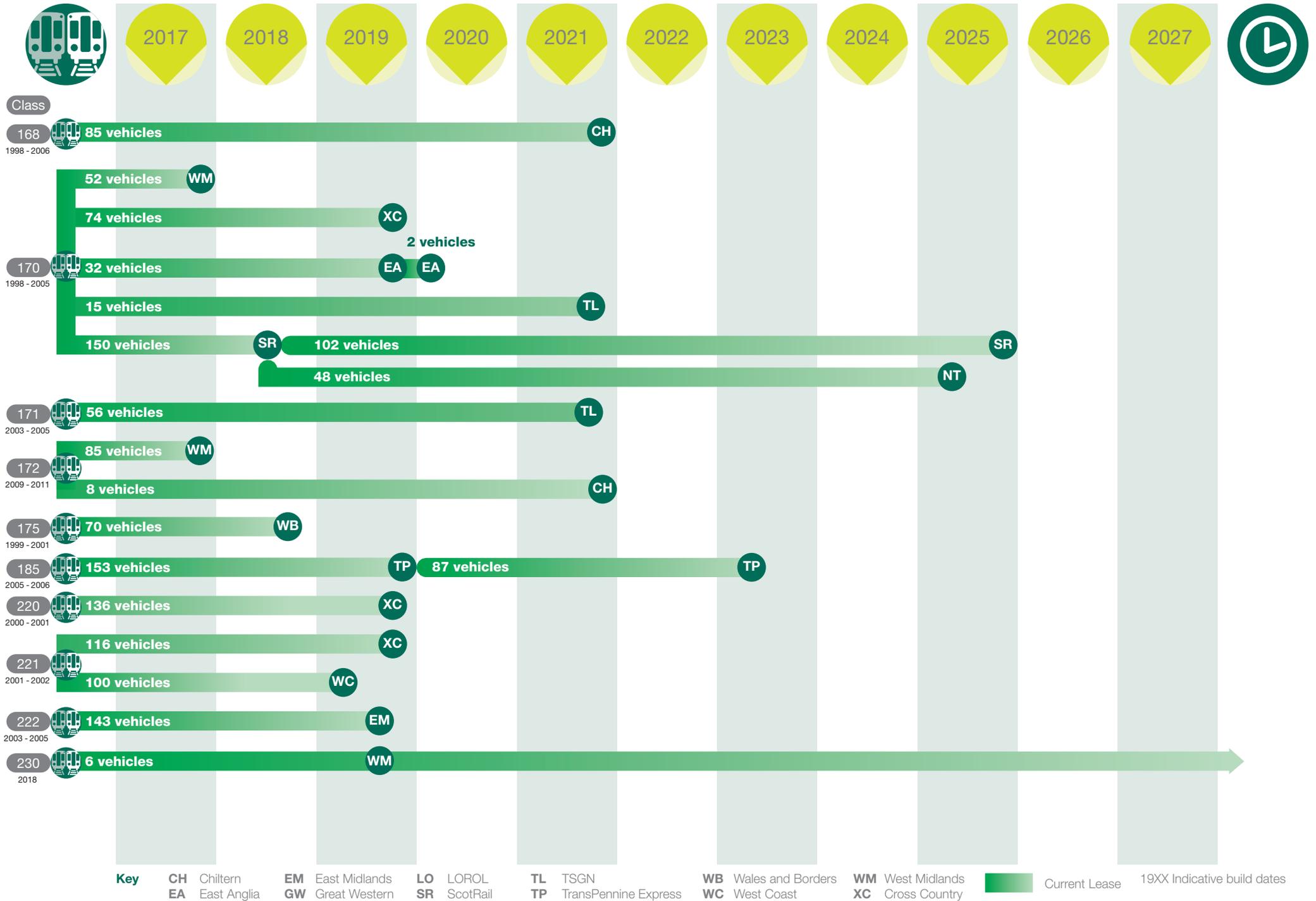
DMU Rolling Stock (Pre-1996 Orders)



DMU Rolling Stock (Pre-1996 Orders)



DMU Rolling Stock (Post-1996 orders)

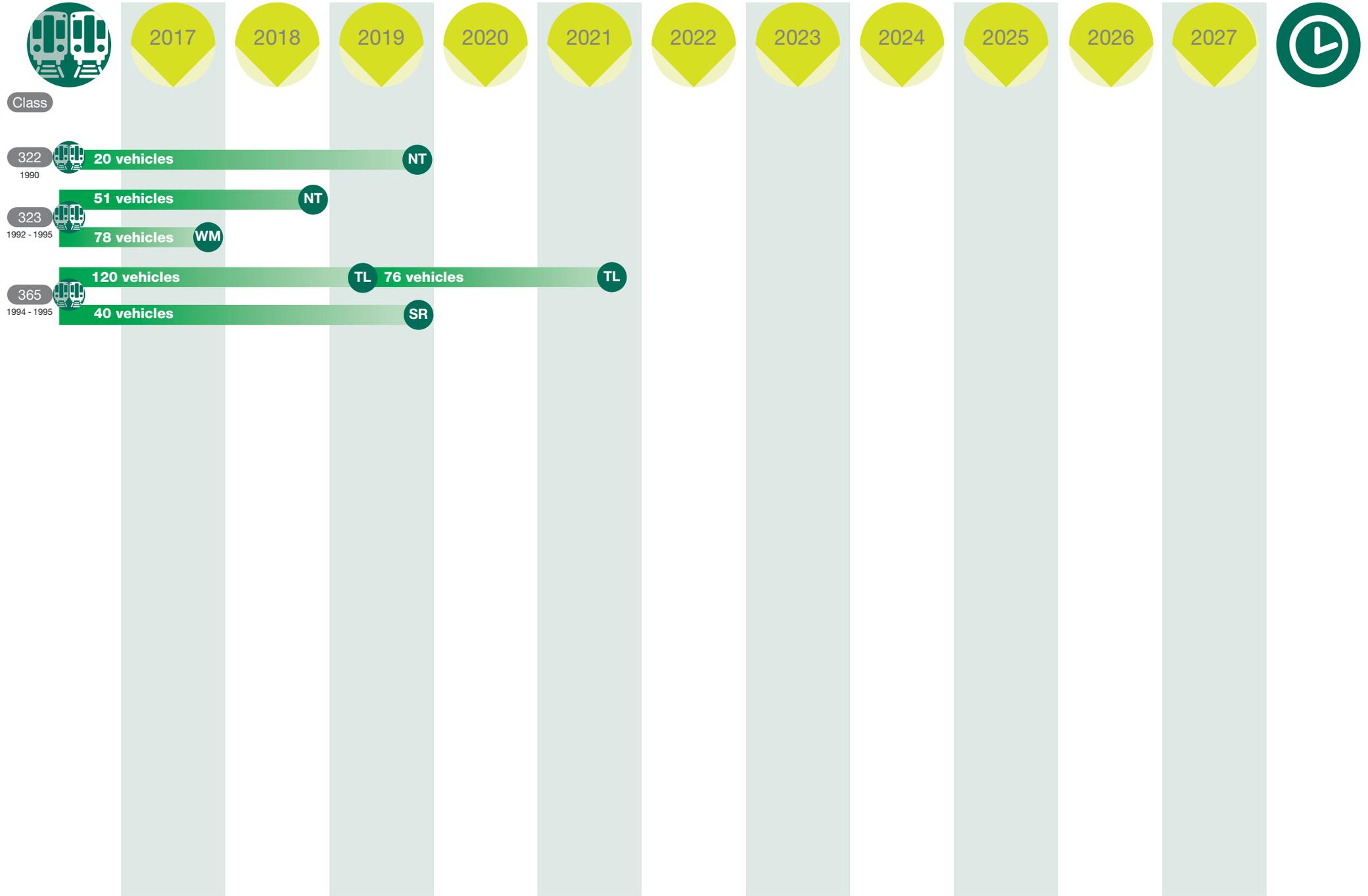


AC EMU Rolling Stock (Pre-1996 Orders)



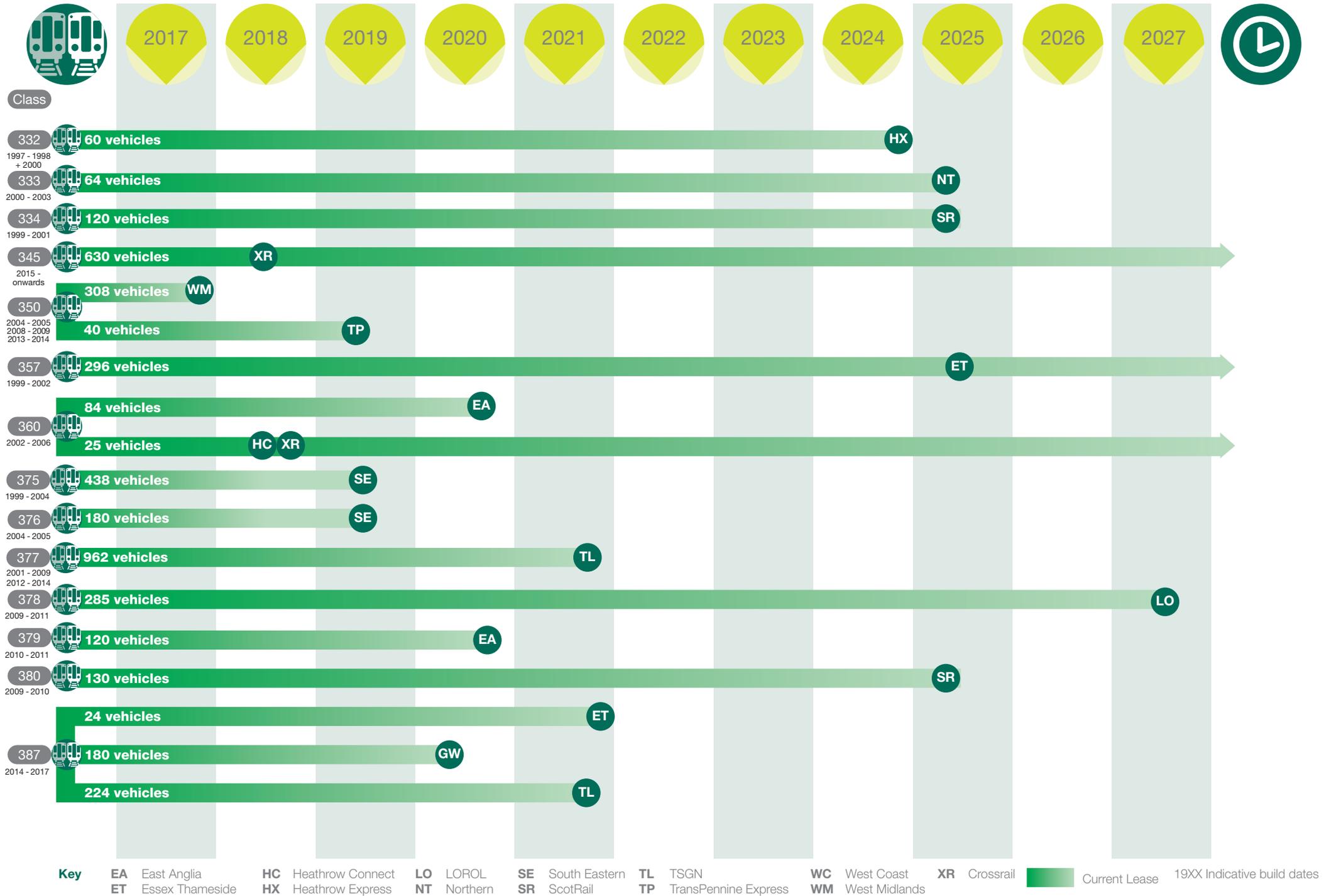
AC EMU Rolling Stock (Pre-1996 Orders)

28



Key WM West Midlands NT Northern TSGN
 GW Great Western SR Scot Rail
 TL TSGN
 Current Lease
 19XX Indicative build dates

AC EMU Rolling Stock (Post-1996 orders)



High Speed Trains



2017

2018

2019

2020

2021

2022

2023

2024

2025

2026

2027



Class

390 574 vehicles

2001 - 2005
+ 2010 - 2012

WC

395 174 vehicles

2006 - 2009

SE

800 369 vehicles

2014 -
onwards

GW

Key

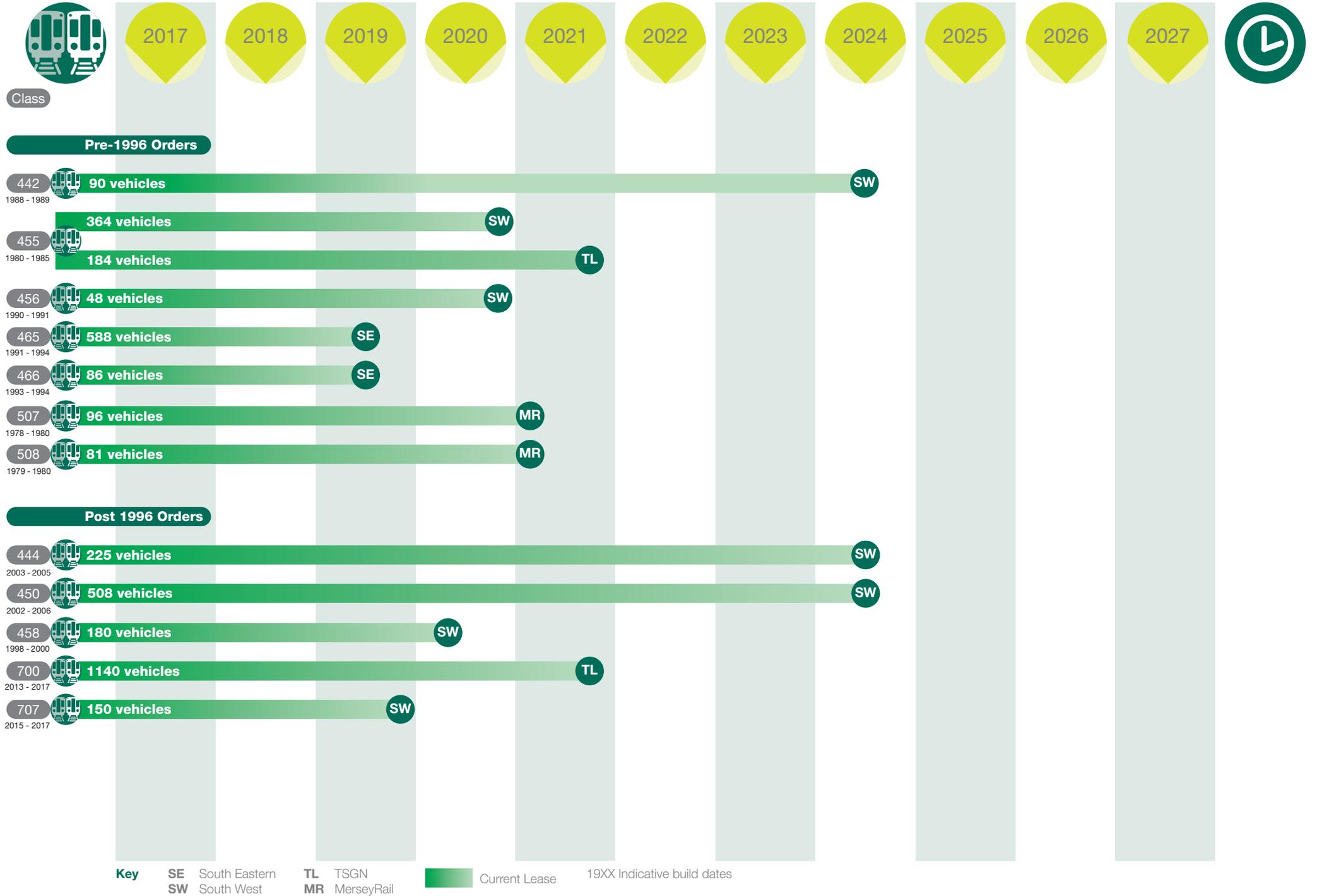
GW Great Western
SE South Eastern

WC West Coast

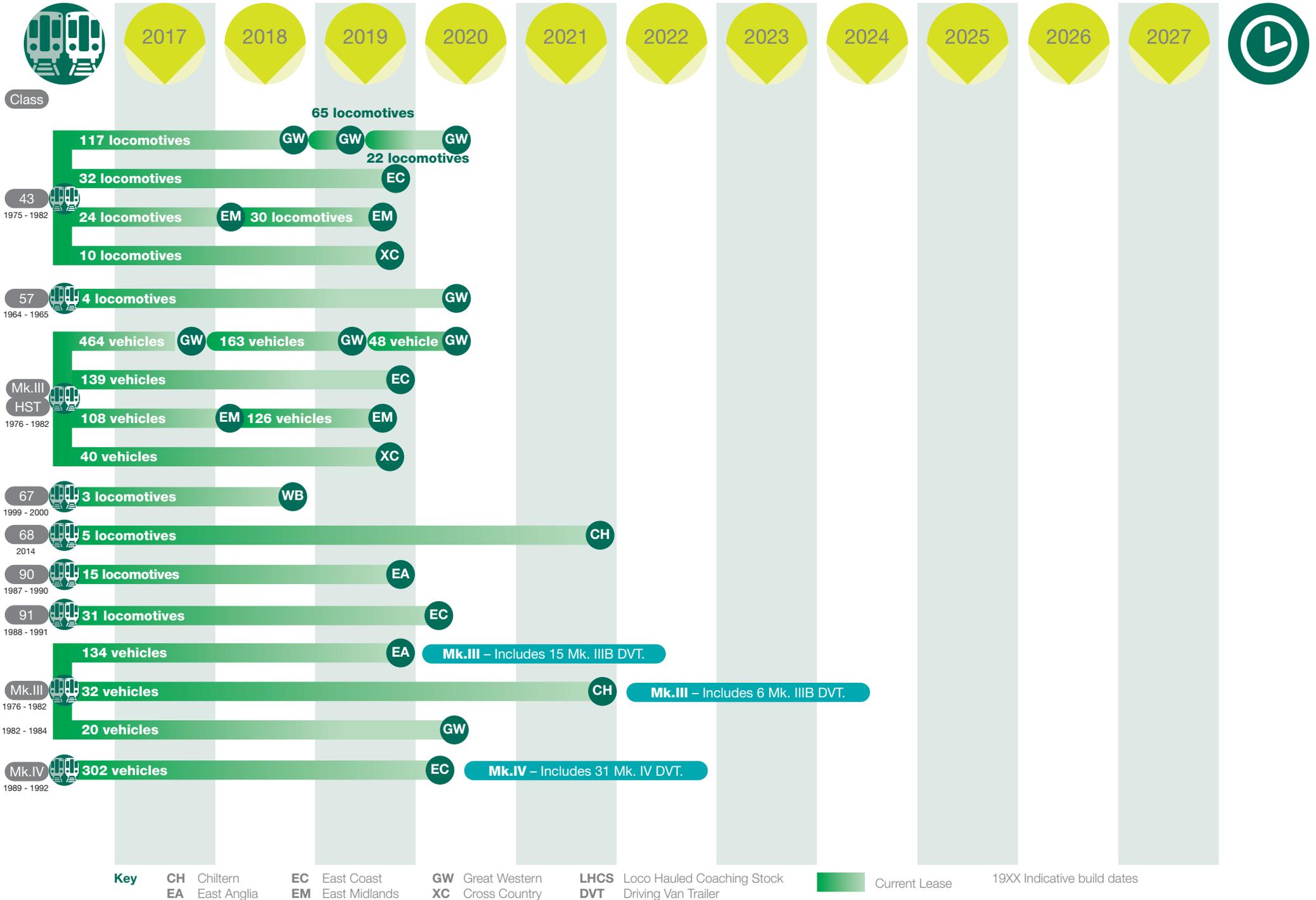
Current Lease

19XX Indicative build dates

DC EMU Rolling Stock



LHCS & HST



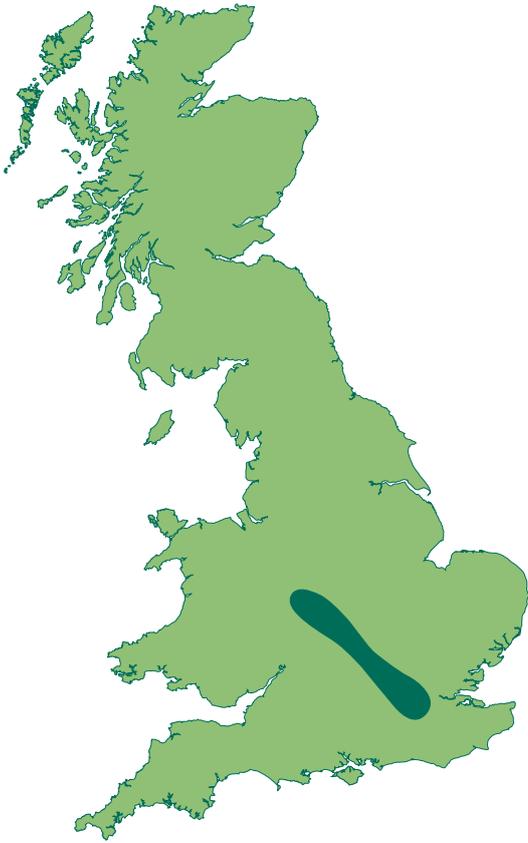
10. Department for Transport – Franchised Operators View

The following charts provide an overview of rolling stock that is currently on each of the franchises let by the Department with an indication of the make-up of their fleets and the years in which they were built.

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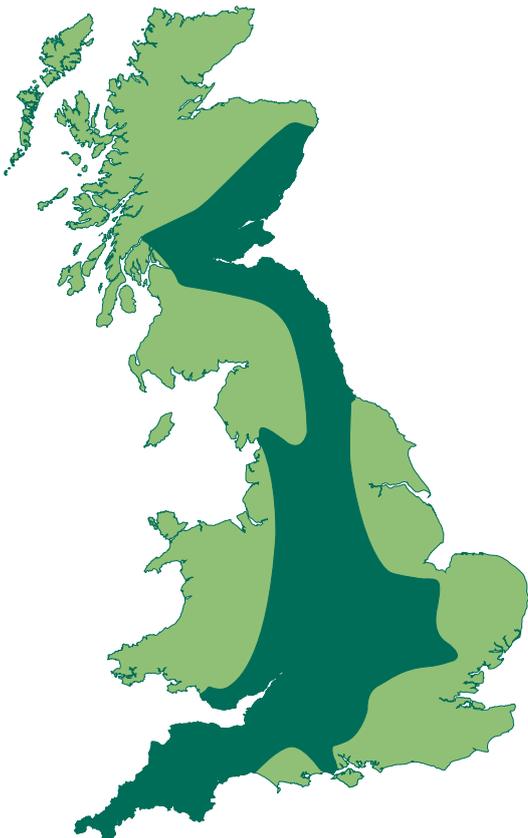
Chiltern



Diesel
Fleet

<i>Class</i>	<i>Quantity</i>	<i>Built</i>
Class 68	6 Locomotives	2014
Mk. III (inc. DVT)	32 Vehicles	1975–1988
Class 165	89 Vehicles	1991–1993
Class 168	85 Vehicles	1998–2006
Class 172/1	8 Vehicles	2011

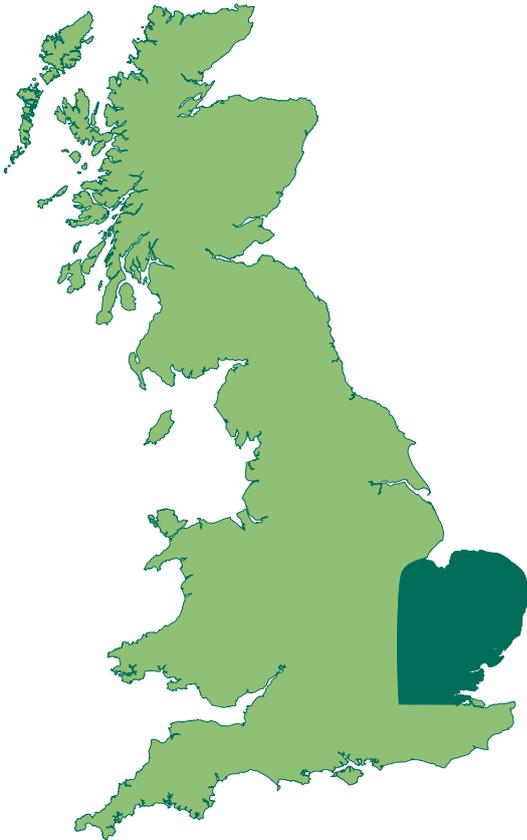
Cross Country



Diesel
Fleet

<i>Class</i>	<i>Quantity</i>	<i>Built</i>
Class 43	10 Locomotives	1976–1982
Mk. III	40 Vehicles	1975–1981
Class 170	74 Vehicles	1998–2002
Class 220	136 Vehicles	2000–2001
Class 221	116 Vehicles	2001–2002

East Anglia



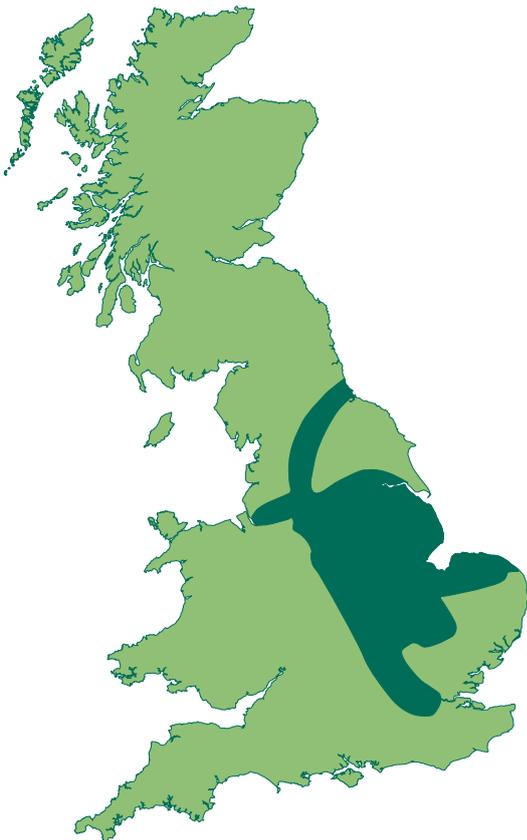
Diesel
Fleet

Class	Quantity	Built
Class 153	5 Vehicles	1987–1988
Class 156	18 Vehicles	1988
Class 170	32 Vehicles	1999–2002

Electric
Fleet

Class	Quantity	Built
Class 90	15 Locomotives	1987–1990
Mk. III (inc. DVT)	133 Vehicles	1975–1988
Class 317	232 Vehicles	1980–1987
Class 321	420 Vehicles	1988–1990
Class 360	84 Vehicles	2002–2003
Class 379	120 Vehicles	2010–2011

East Midlands



Diesel
Fleet

Class	Quantity	Built
Class 43	28 Locomotives	1976–1982
Mk. III	108 Vehicles	1975–1988
Class 153	21 Vehicles	1987–1988
Class 156	30 Vehicles	1987–1989
Class 158	52 Vehicles	1990–1992
Class 222	143 Vehicles	2003–2005

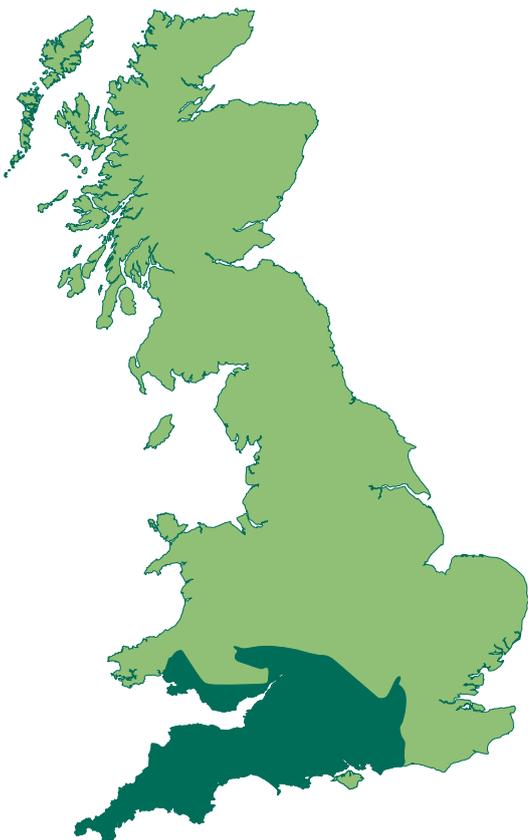
Essex Thameside



Electric
Fleet

Class	Quantity	Built
Class 357	296 Vehicles	1999–2002
Class 387	24 Vehicles	2014–2016

Great Western



Diesel
Fleet

Class	Quantity	Built
Class 43	117 Locomotives	1975–1982
Mk. III	464 Vehicles	1976–1982
Class 57	4 Locomotives	1964–1965*
Mk. III Sleeper	20 Vehicles	1982–1984
Class 143	16 Vehicles	1985–1986
Class 150	50 Vehicles	1984–1987
Class 153	14 Vehicles	1987–1988
Class 158	43 Vehicles	1990–1991
Class 165	88 Vehicles	1992–1993
Class 166	63 Vehicles	1993
Class 387	180 Vehicles	2016–2017

* Built as class 47 locomotives, rebuilt as Class 57 in 2004.

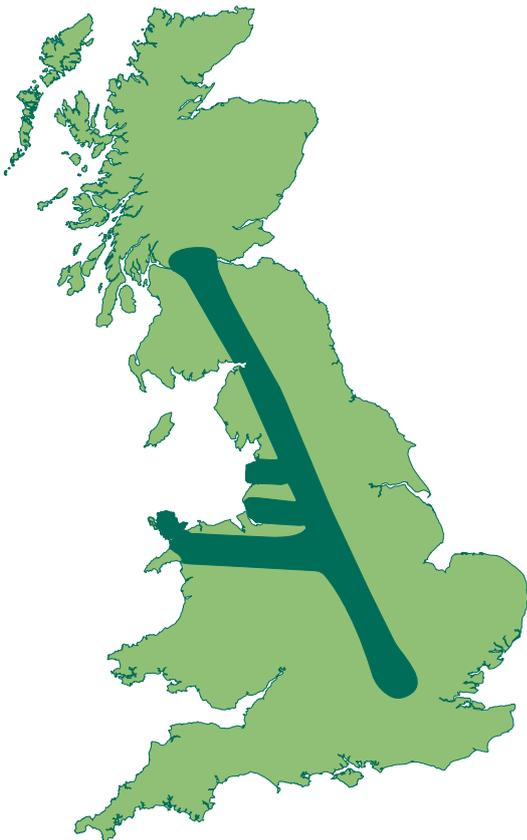
InterCity East Coast



Diesel Fleet			
	<i>Class</i>	<i>Quantity</i>	<i>Built</i>
	Class 43	32 Locomotives	1975–1982
	Mk. III	139 Vehicles	1976–1985

Electric Fleet			
	<i>Class</i>	<i>Quantity</i>	<i>Built</i>
	Class 91	31 Locomotives	1988–1991
	Mk. IV (inc. DVT)	302 Vehicles	1989–1992

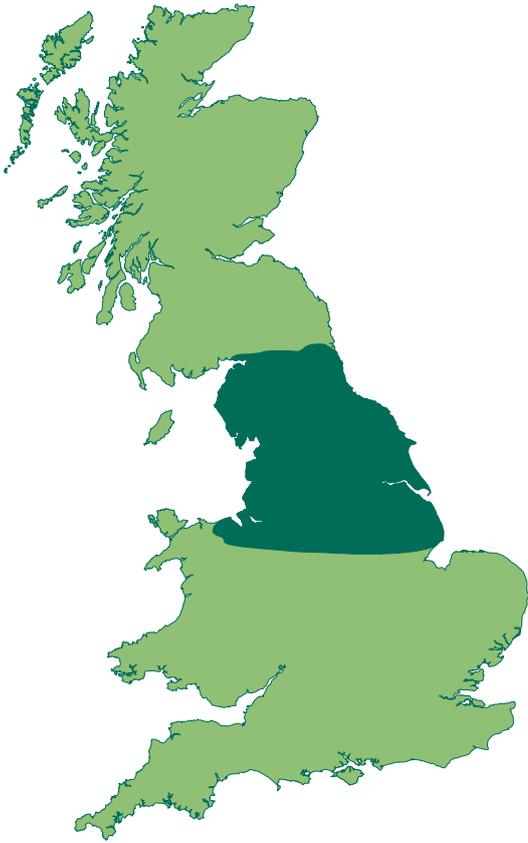
InterCity West Coast



Diesel Fleet			
	<i>Class</i>	<i>Quantity</i>	<i>Built</i>
	Class 221	100 Vehicles	2001–2002

Electric Fleet			
	<i>Class</i>	<i>Quantity</i>	<i>Built</i>
	Class 390	574 Vehicles	2001–2012

Northern



Diesel Fleet

Class	Quantity	Built
Class 142	158 Vehicles	1985–1987
Class 144	56 Vehicles	1986–1988
Class 150	152 Vehicles	1985–1987
Class 153	18 Vehicles	1987–1988
Class 155	14 Vehicles	1988
Class 156	84 Vehicles	1988–1989
Class 158	102 Vehicles	1990–1992
Class 170	12 Vehicles	2004–2005

Electric Fleet

Class	Quantity	Built
Class 319	132 Vehicles	1988–1991
Class 321	12 Vehicles	1991
Class 322	20 Vehicles	1990
Class 323	51 Vehicles	1994–1995
Class 333	64 Vehicles	2000 & 2003

South Eastern



DC/DV Electric Fleet

Class	Quantity	Built
Class 375	438 Vehicles	1999–2005
Class 376	180 Vehicles	2004–2005
Class 395	174 Vehicles	2006–2009
Class 465	588 Vehicles	1991–1994
Class 466	86 Vehicles	1993–1994
Class 377*	100 Vehicles	2003–2009

* Sub-hire from TSGN franchisee

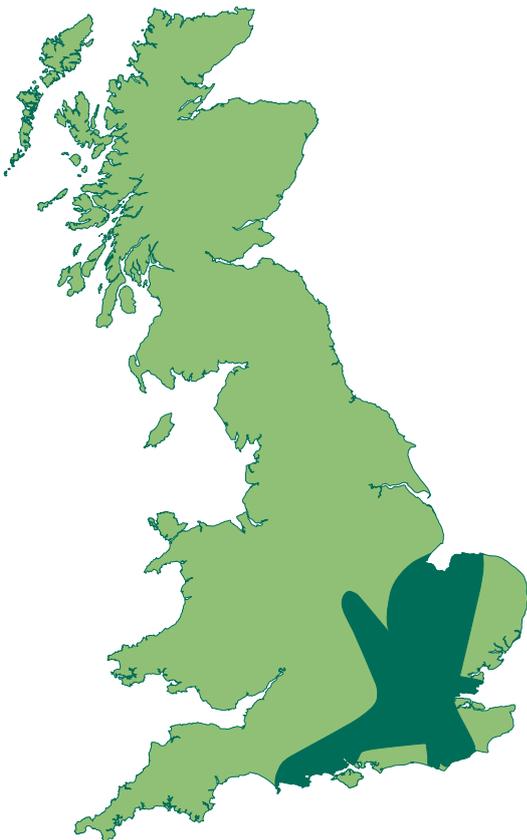
South Western



Diesel Fleet	Class	Quantity	Built
	Class 158	20 Vehicles	1990 – 1991
	Class 159	90 Vehicles	1991 – 1993

DC Electric Fleet	Class	Quantity	Built
	Class 444	225 Vehicles	2003 – 2005
	Class 450	508 Vehicles	2002 – 2006
	Class 455	364 Vehicles	1980 – 1985
	Class 456	48 Vehicles	1990 – 1991
	Class 458/5	180 Vehicles	1998 – 2000
	Class 483	12 Vehicles	1938
	Class 707	150 Vehicles	2015 – 2017
	Class 442	90 Vehicles	1988

Thameslink, Southern & Great Northern

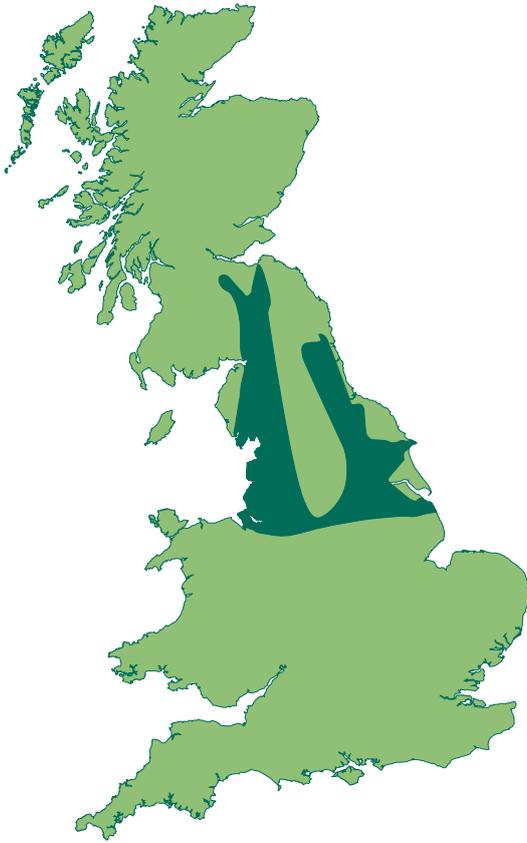


Diesel Fleet	Class	Quantity	Built
	Class 171	56 Vehicles*	2003 – 2005

Electric Fleet	Class	Quantity	Built
	Class 313	189 Vehicles	1976 – 1979
	Class 365	120 Vehicles	1994 – 1995
	Class 377	862 Vehicles [▲]	2001 – 2014
	Class 387	224 Vehicles	2014 – 2016
	Class 455	184 Vehicles	1982 – 1984
	Class 700	1140 Vehicles	2013 – 2017

* 15 Class 170 vehicles on sublease to the Scotrail franchise operator
 ▲ Excludes 100 vehicles on sublease South Eastern franchise operator

TransPennine Express



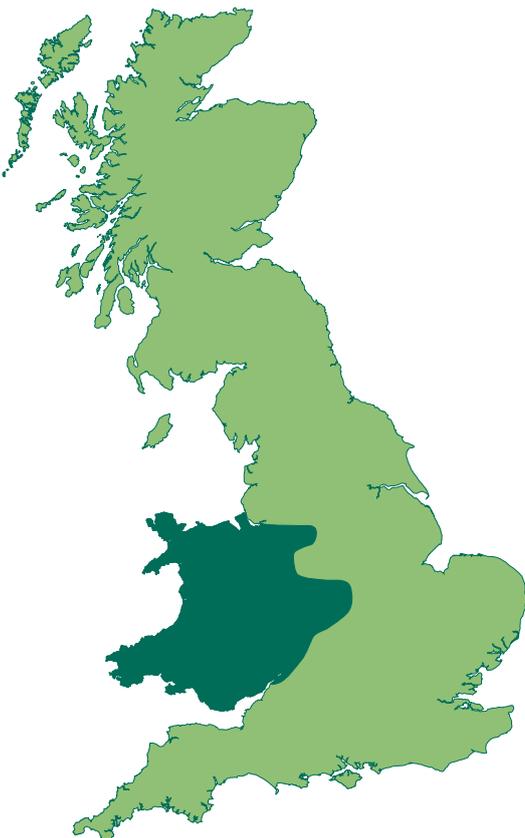
Diesel Fleet

<i>Class</i>	<i>Quantity</i>	<i>Built</i>
Class 185	153 Vehicles	2005–2006

Electric Fleet

<i>Class</i>	<i>Quantity</i>	<i>Built</i>
Class 350	40 Vehicles	2013–2014

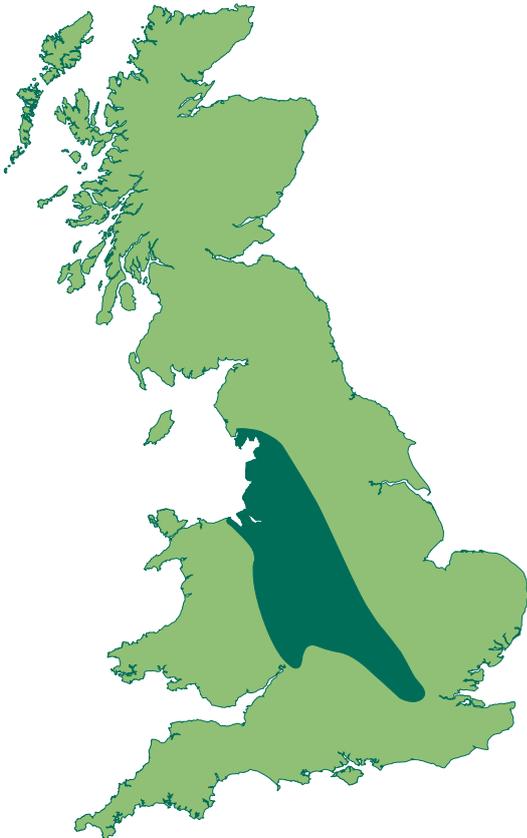
Wales & Borders



Diesel Fleet

<i>Class</i>	<i>Quantity</i>	<i>Built</i>
Class 67	3 Locomotives	1999–2000
Mk. II (inc. DVT)	15 Vehicles	1975–1987
Class 142	30 Vehicles	1985–1987
Class 143	30 Vehicles	1985–1987
Class 150	72 Vehicles	1986–1988
Class 153	8 Vehicles	1987–1988
Class 158	48 Vehicles	1989–1992
Class 175	70 Vehicles	1999–2001

West Midlands



Diesel Fleet

Class	Quantity	Built
Class 139	2 Vehicles	2009
Class 150	6 Vehicles	1984–1987
Class 153	8 Vehicles	1987–1988
Class 170	85 Vehicles	2000
Class 172	85 Vehicles	2010–2011
Class 230	6 Vehicles	2018*

Electric Fleet

Class	Quantity	Built
Class 319	36 Vehicles	1988–1991
Class 323	78 Vehicles	1992–1993
Class 350	308 Vehicles	2004–2005

* Introduced into mainline service.

11. Key Rolling Stock Publications

There are a number of key publications for rolling stock which we have listed here for reference.

[Rolling Stock Strategy Steering Group](#)

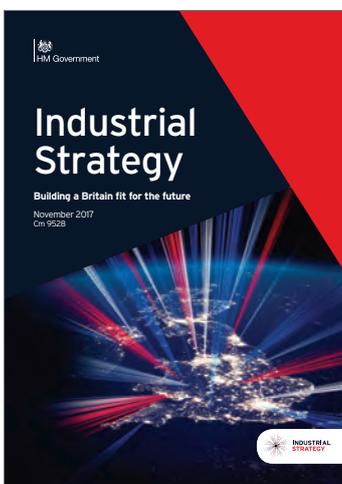


[Rail Sector Skills Delivery Plan](#)

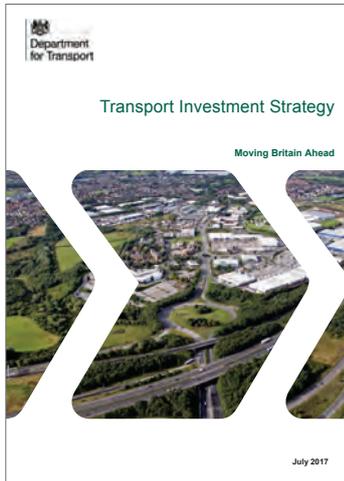


[Unlocking Rail Investment – building confidence, reducing costs](#)

[Industrial Strategy White Paper](#)



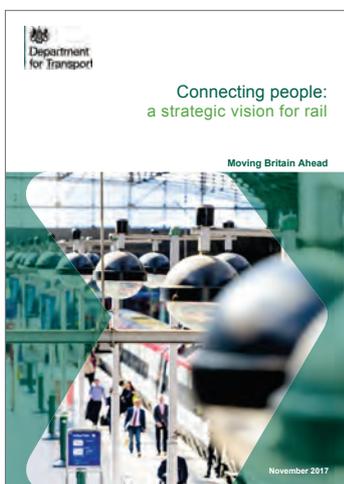
Transport Investment Strategy



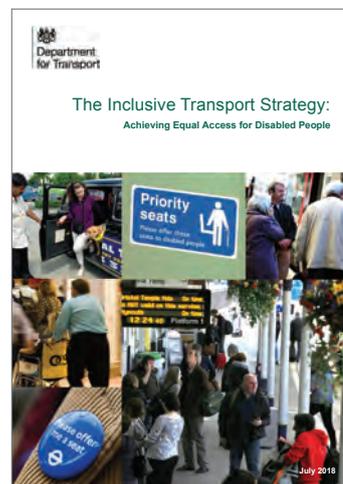
Joint Rail Data Action Plan – addressing barriers to make better use of rail data



Connecting People – a strategic vision for rail



The Inclusive Transport Strategy: achieving equal access for disabled people



[Rail Network Enhancements Pipeline: A New Approach for Rail Enhancements](#)

