



Developing High Speed Rail for Britain

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Introduction

Why Britain is developing HSR (c £50bn)

How we are doing it

What we have learned



Britain is Growing

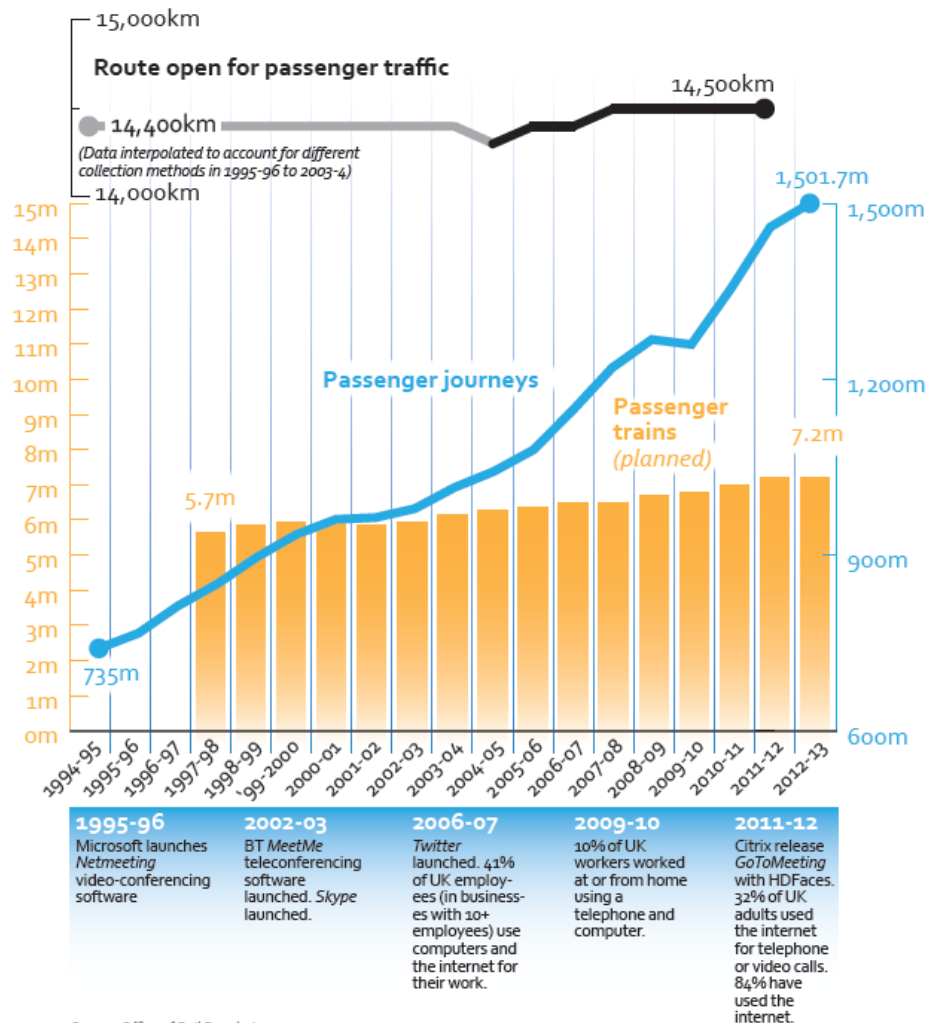
Population of England

- 2008 52m
- 2033 60m
- 2050 70m

Living in City Regions

- Today 41m
- 2050 61m

Rail Demand - Doubled in 20 Years



Source: Office of Rail Regulation

We Have Upgraded Classic Rail

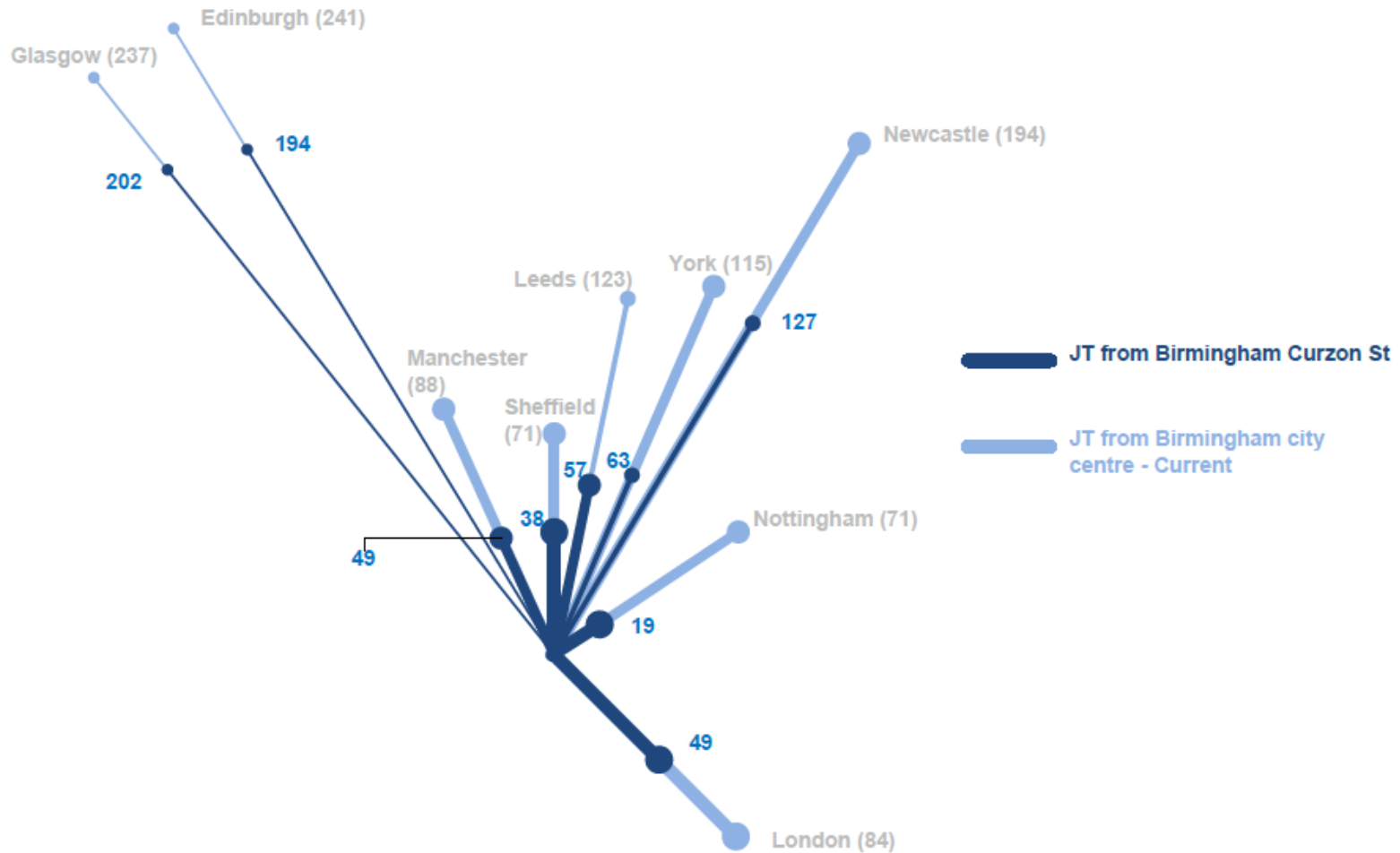


January 2013: Initial Network Announced



- London to
 - West Midlands 1-24 to 0-49
 - Manchester 2-08 to 1-08
 - Leeds 2-12 to 1-22
- Birmingham to
 - Manchester 1-34 to 0-41
 - Leeds 2-05 to 0-57

Changing Connectivity (e.g. Birmingham)



Underpinning Growth

- Rebuild and rebalance UK economy
- Wider benefits from released capacity
- Supports the creation of up to 400,000 jobs
- Cities working as one economic powerhouse
- **HS1** (in SE England) has seen regeneration worth twice the initial capital cost since opening in 2003



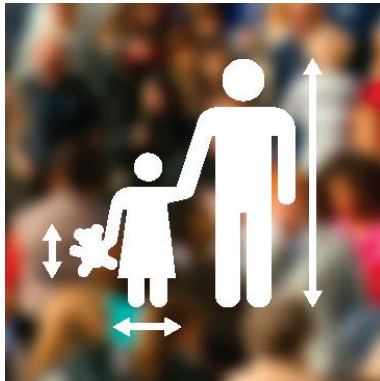
HS2 Guiding Principles

1. HSR high capacity need to be matched by strong demand
2. City to city journeys, not shorter distance trips
3. Maximise capacity – mixed services reduce capacity
4. Initial network should serve cities further north by through running
5. As the network grows more dedicated services to maximise capacity and reliability
6. Well integrated with other transport networks to carry benefits through to whole door-to-door journeys

“A new passenger transport backbone, not a replica of the existing railway” – Lord Adonis

“Imagine an advanced high-speed rail network that connects more people quickly reliably and more pleasurably than ever before in the UK.”

PEOPLE



PLACE

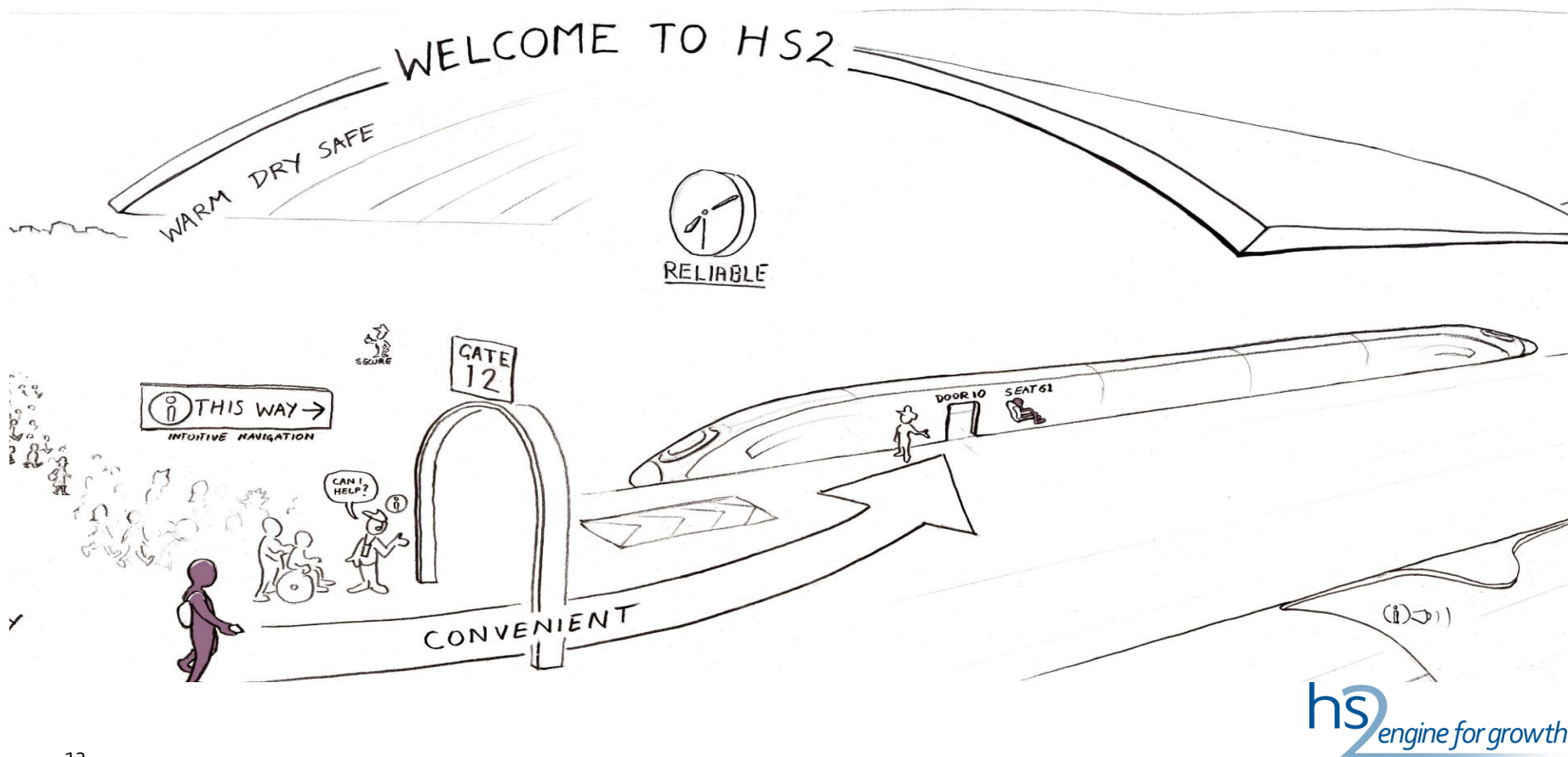


TIME



Stations are critical

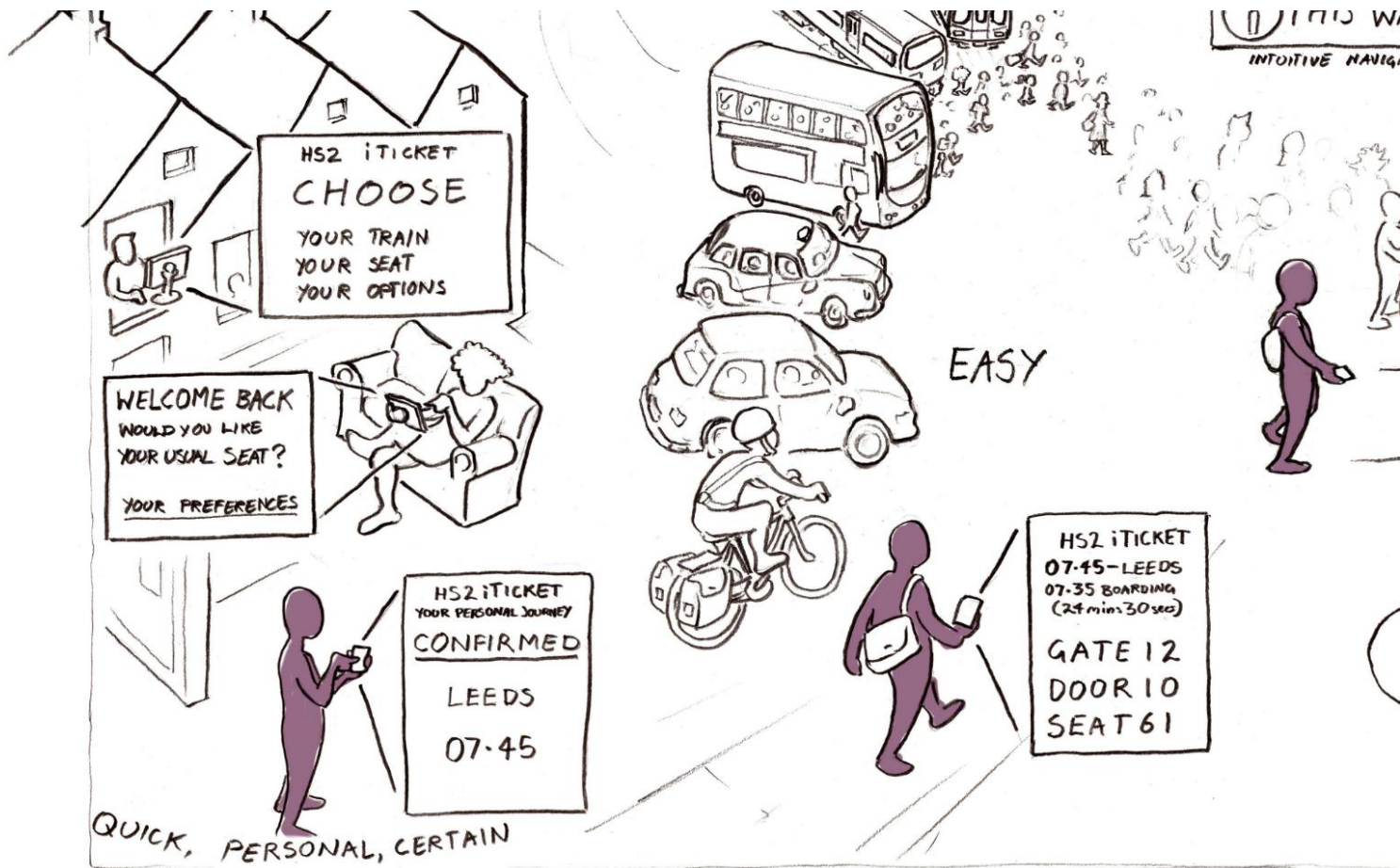
- Every discipline will play its part



A 21st Century Railway: The Passenger Experience

High capacity: up to 18 trains per hour, up to 1100 seats per train

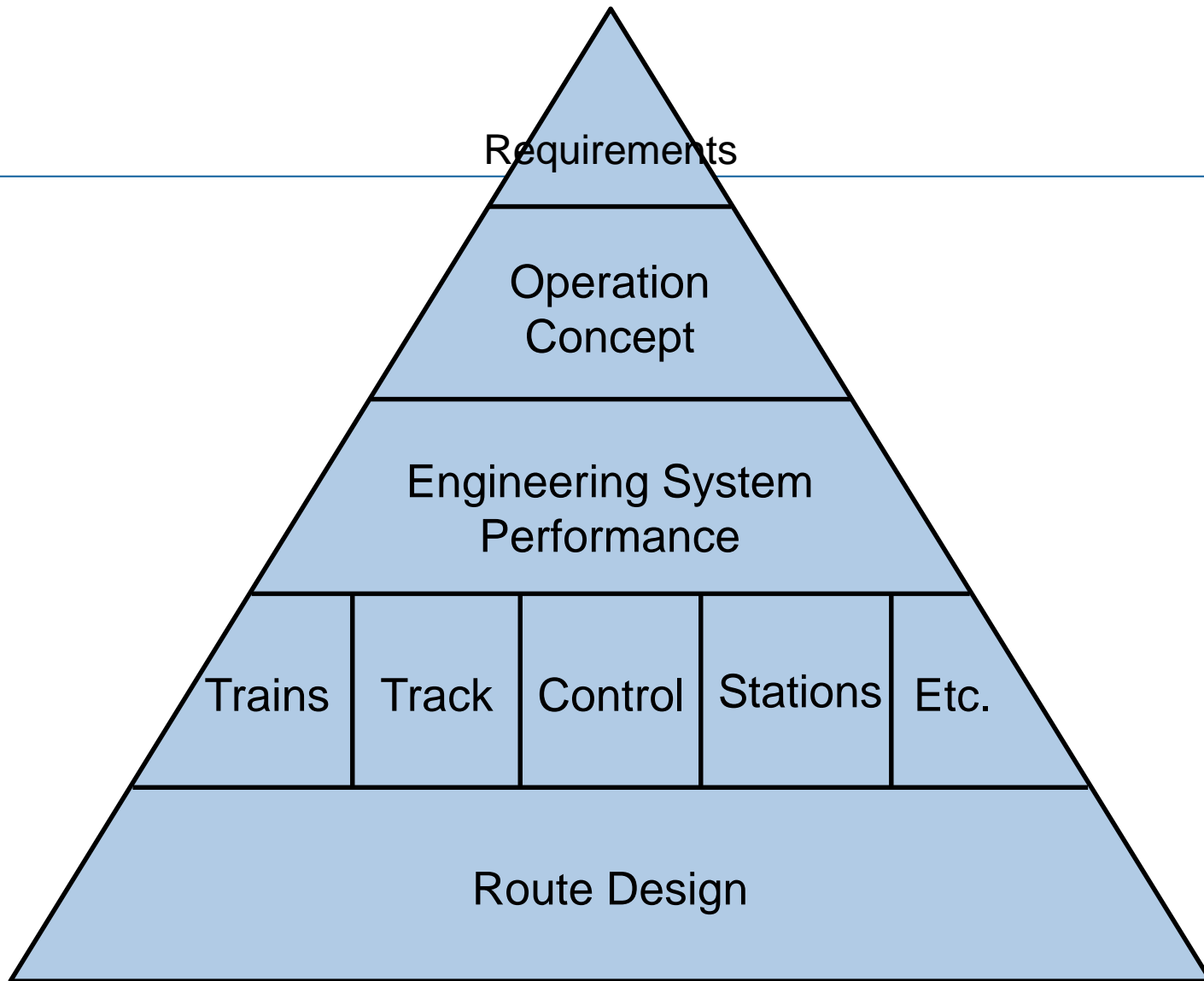




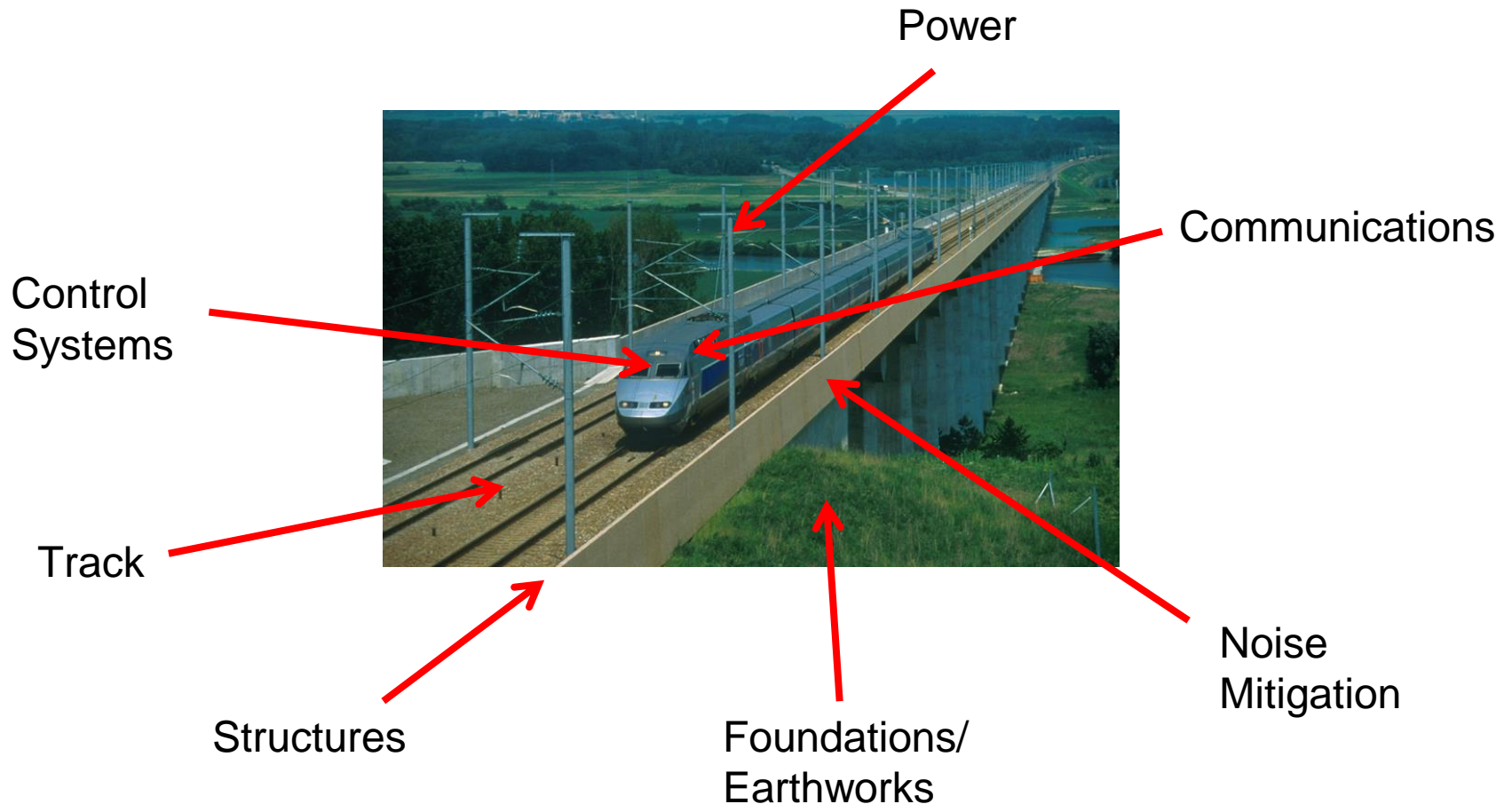
Designed around Human Capability

- Constructor
- Operator
- Maintainer
- User

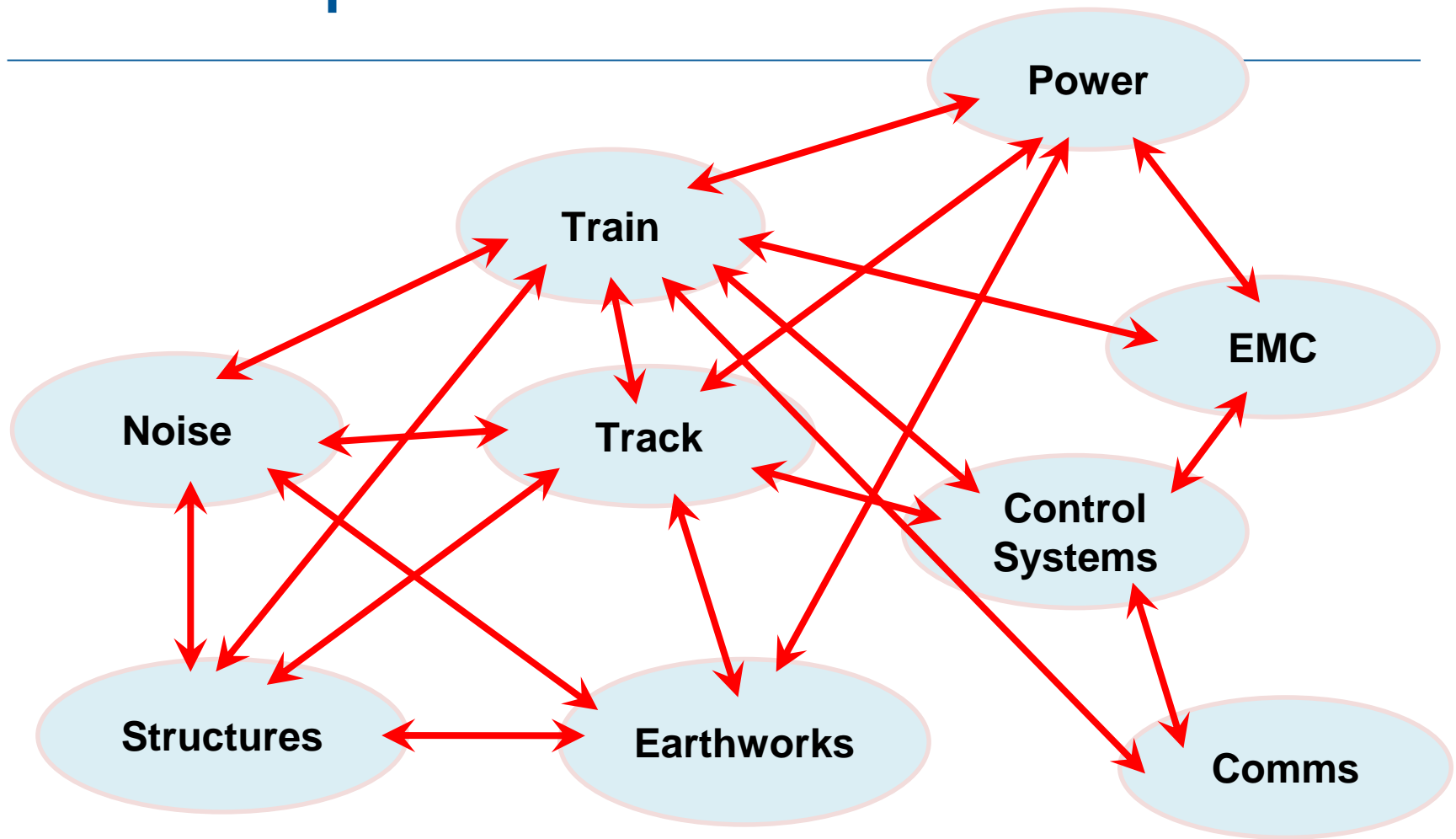




A Complex Technical System



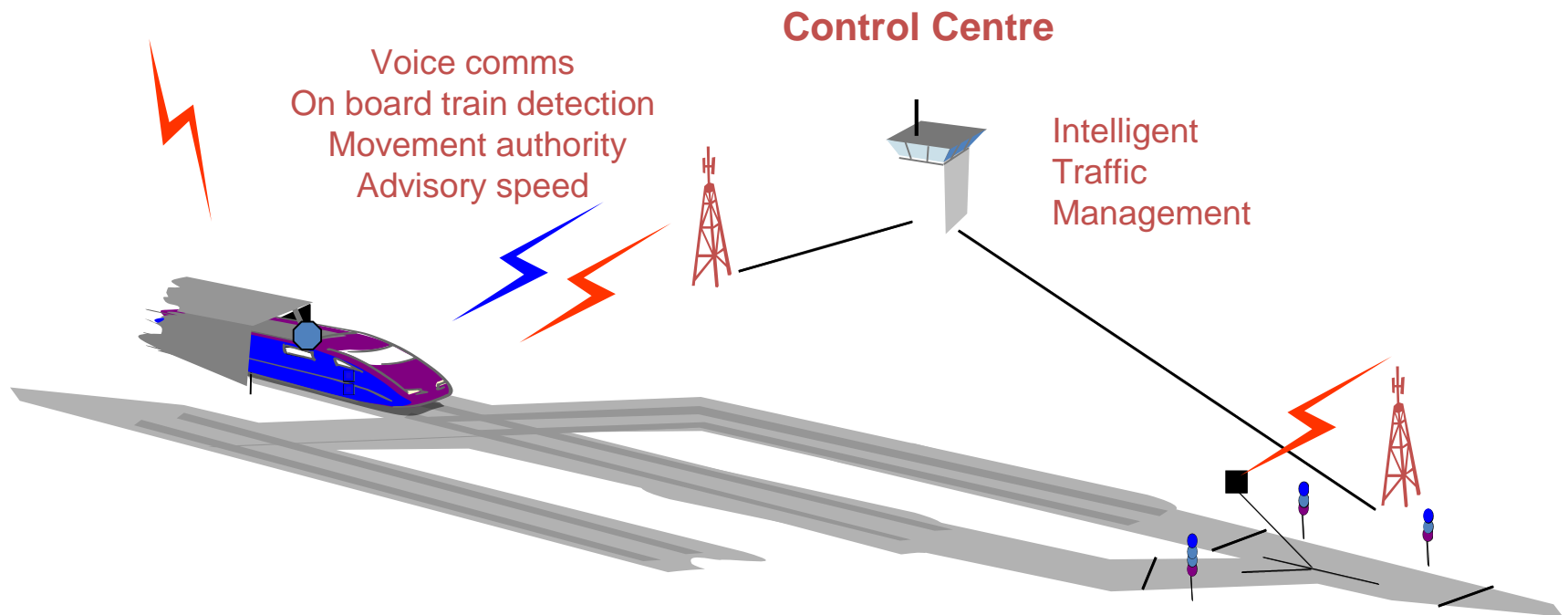
With Multiple Interactions



zoom Trains (Capable of Running in Pairs)



Transmission Based Control (ETCS Level 2)



Automatic Train Operation



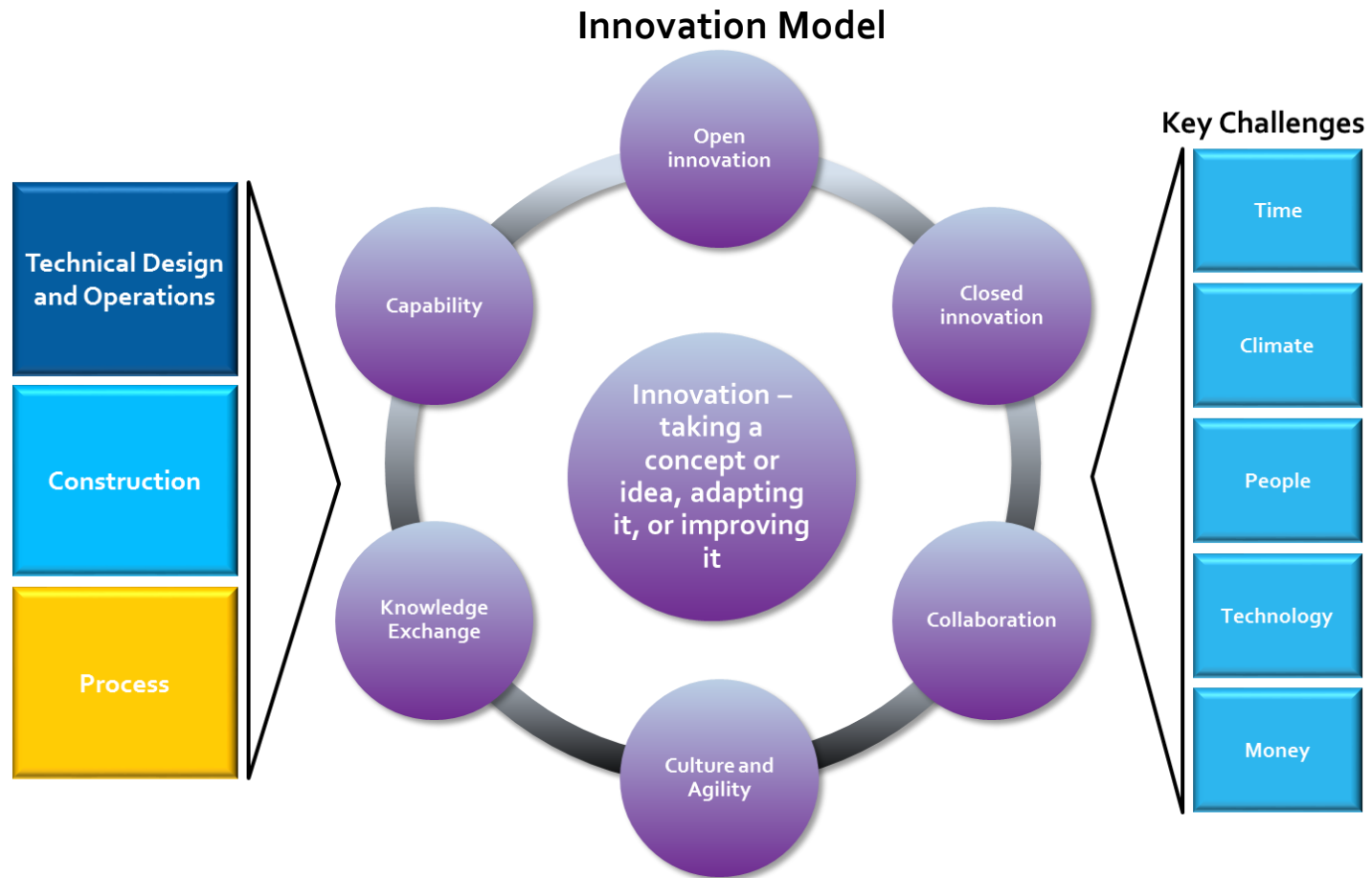
Observed trends in UK climate

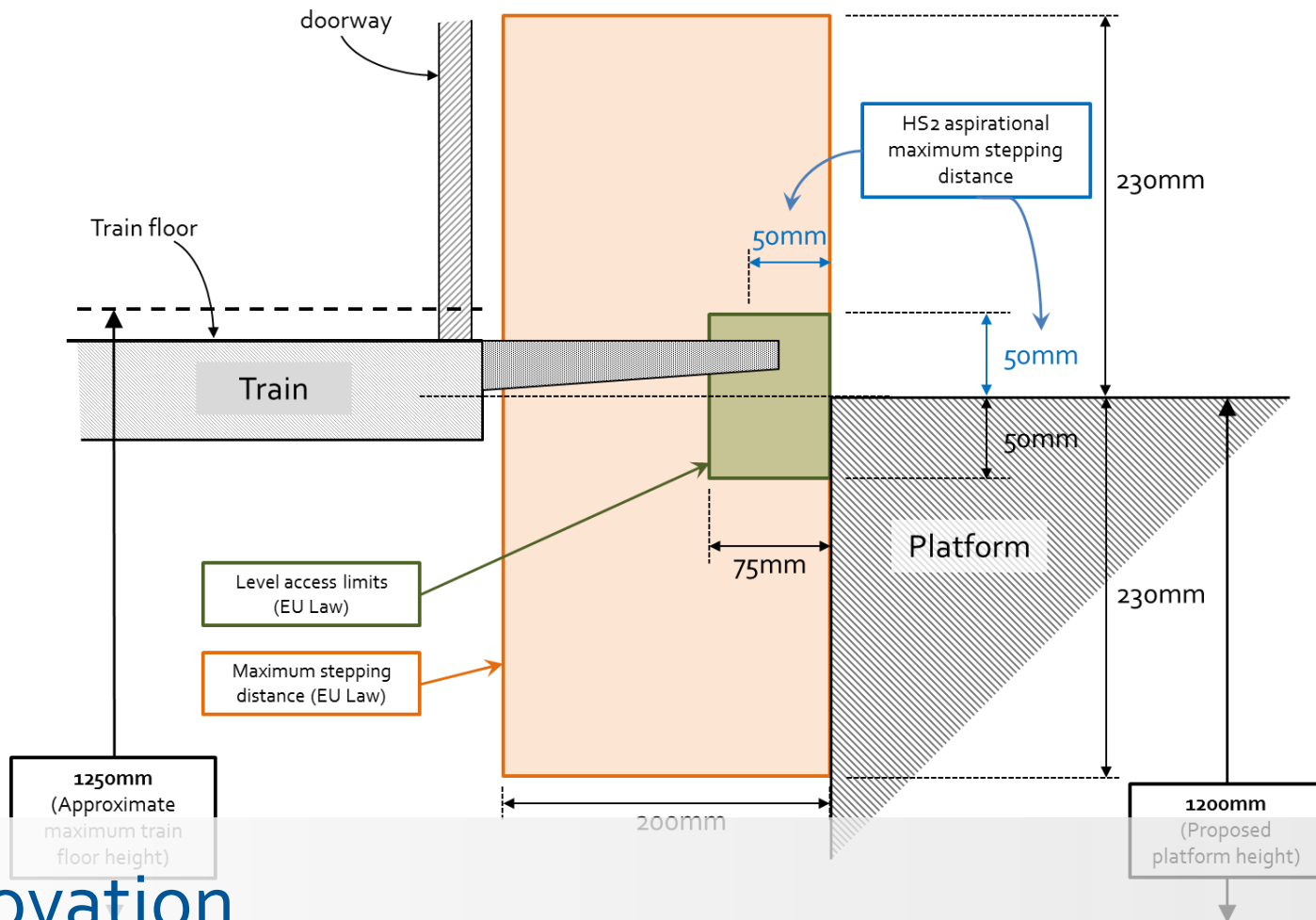
“Central England Temperature has increased by about 1°C since the 1970s”

“Sea level around the UK has risen by about 1mm/yr in the 20th century; the rate of rise in the 1990s and 2000s has been higher than this.

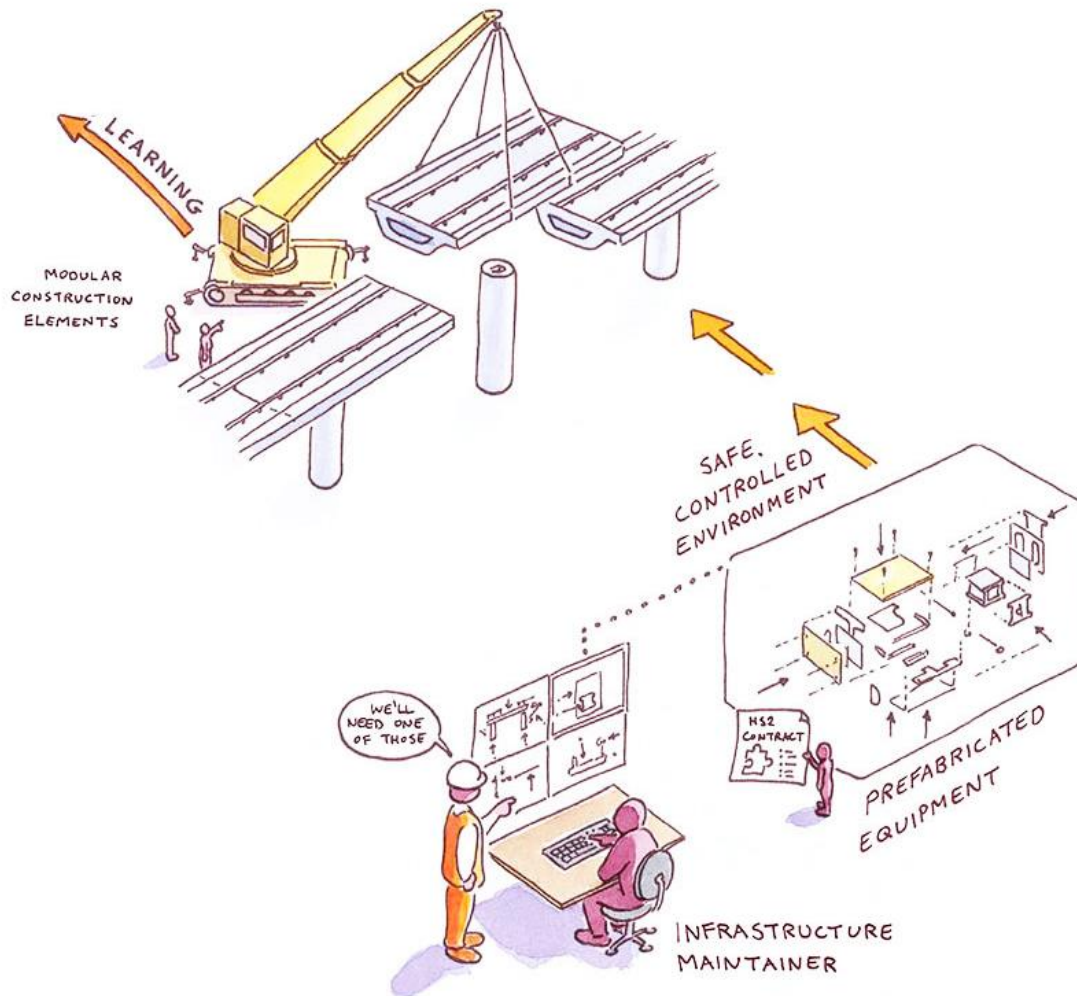
UK Climate Projections (UKCP09)

HS2 Innovation





Innovation



Design for Off-site Manufacture

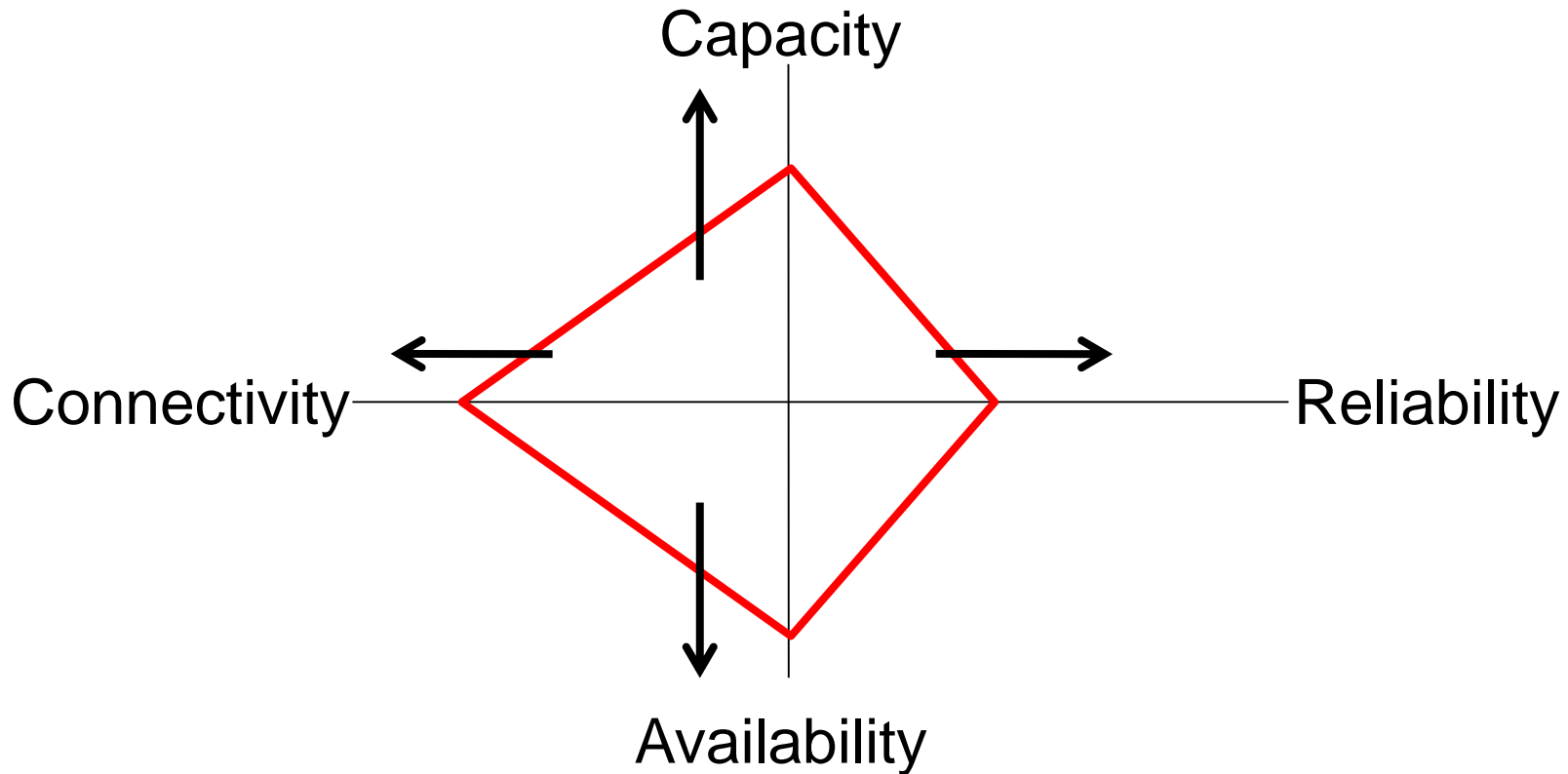




International Technical Standards



Maximising Capacity, Connectivity, Availability and Reliability



What our passenger panel is telling us

- Inclusive
- Personalised
- Easy, intuitive and low stress
- “We want a wow factor”

What our future passengers say they want aligns with what we need to deliver for our Requirements

Our Journey

- 2009 Government announcement of study
 - HS2 Ltd created to undertake work and advise government
- 2010 Announcement of strategy, a first route
- 2011 Public consultation on strategy and first route
- 2012 Government decision to proceed
 - HS2 Ltd expanded to be developer
- 2014 Government Bill (“planning process”) commenced
- 2016/7 Expected Act of Parliament
- 2017 Start Construction
 - HS2 Ltd to be constructor
- 2026 Operation of Phase 1
 - HS2 Ltd to be infrastructure manager
- 2033 Operation of Phase 2



Judged By Future Generations