

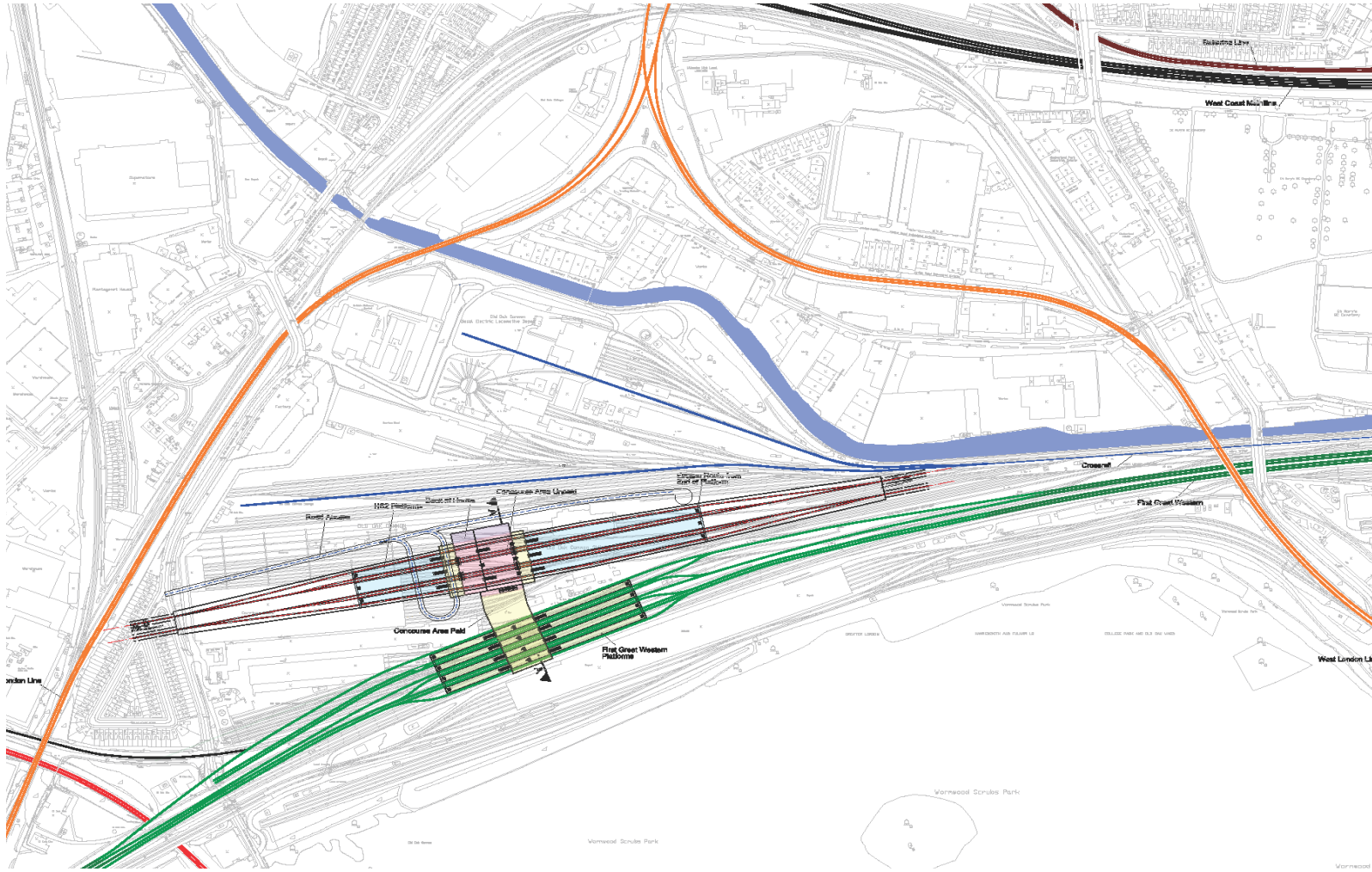
# London Euston



# Old Oak Common

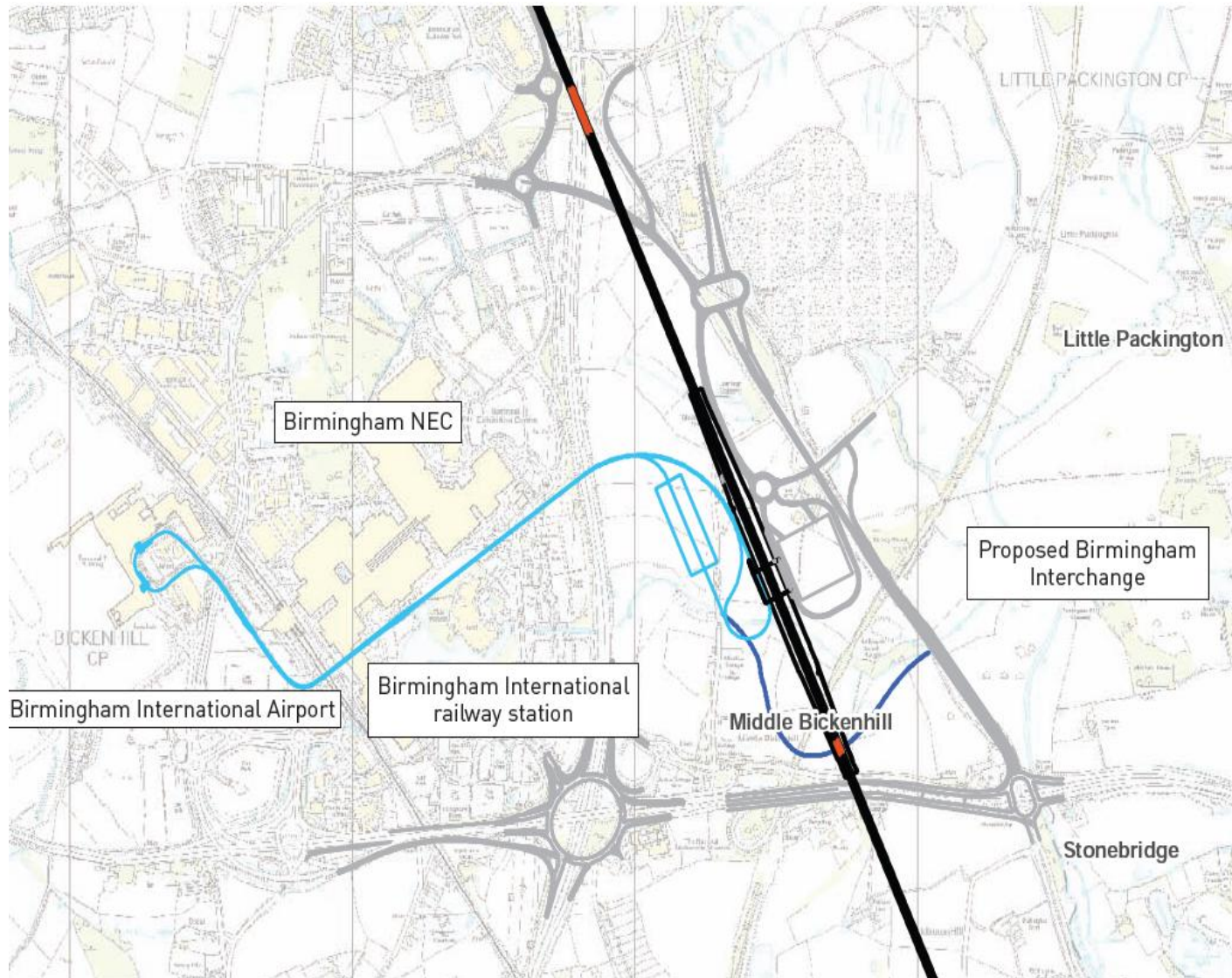


# Old Oak Common Interchange

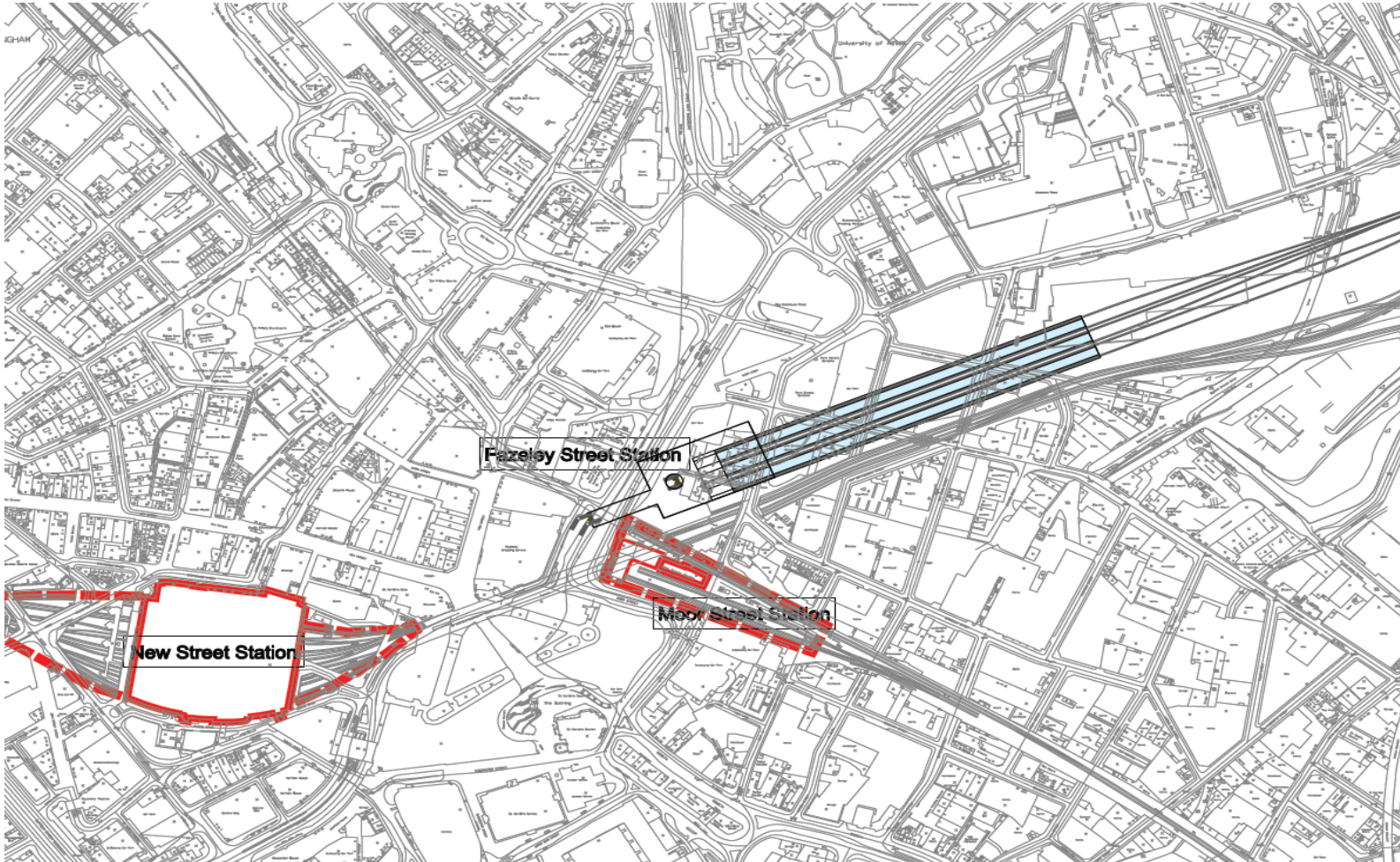




# Birmingham Airport Interchange



# New Birmingham Station



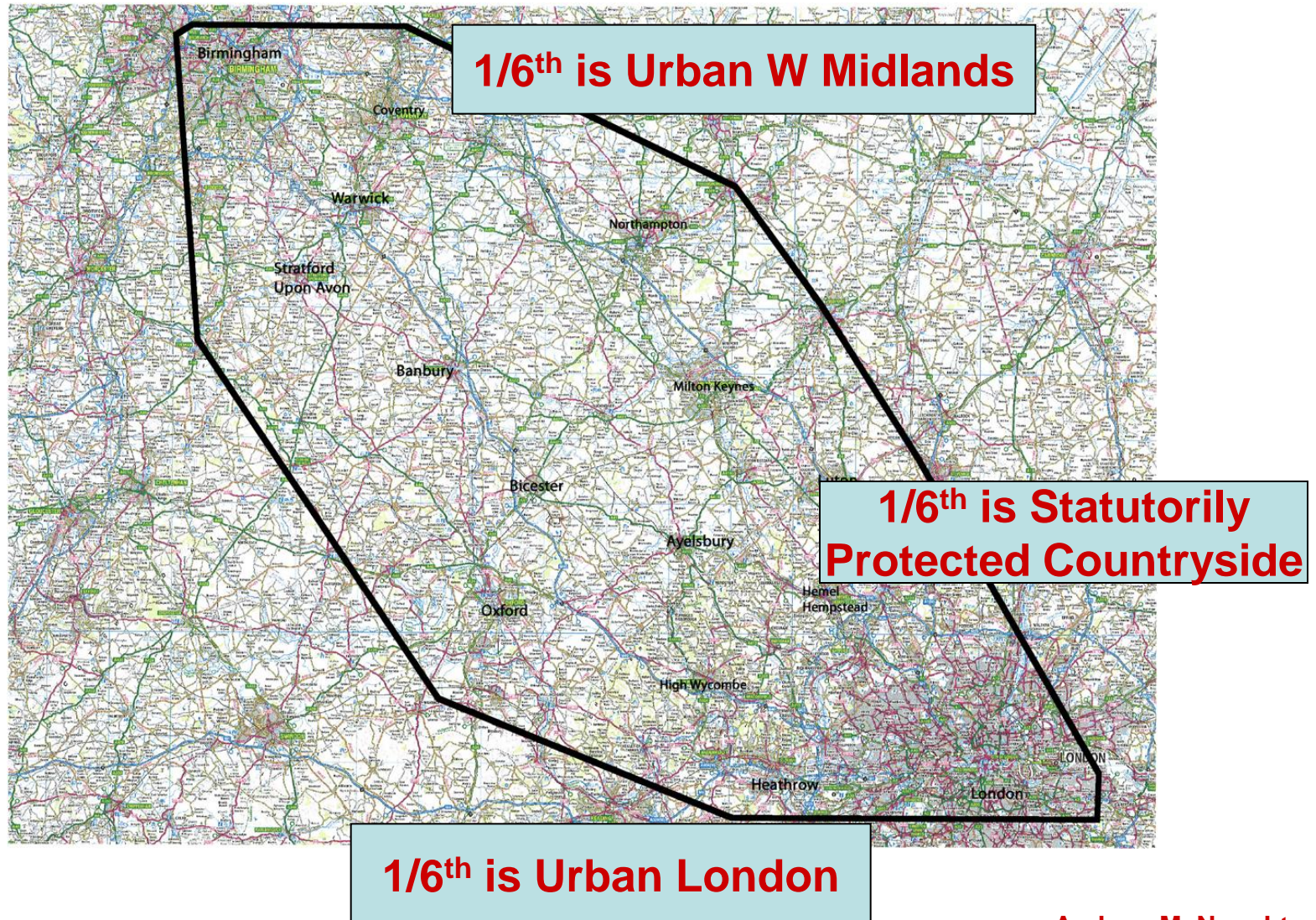


# Birmingham Current Land Use



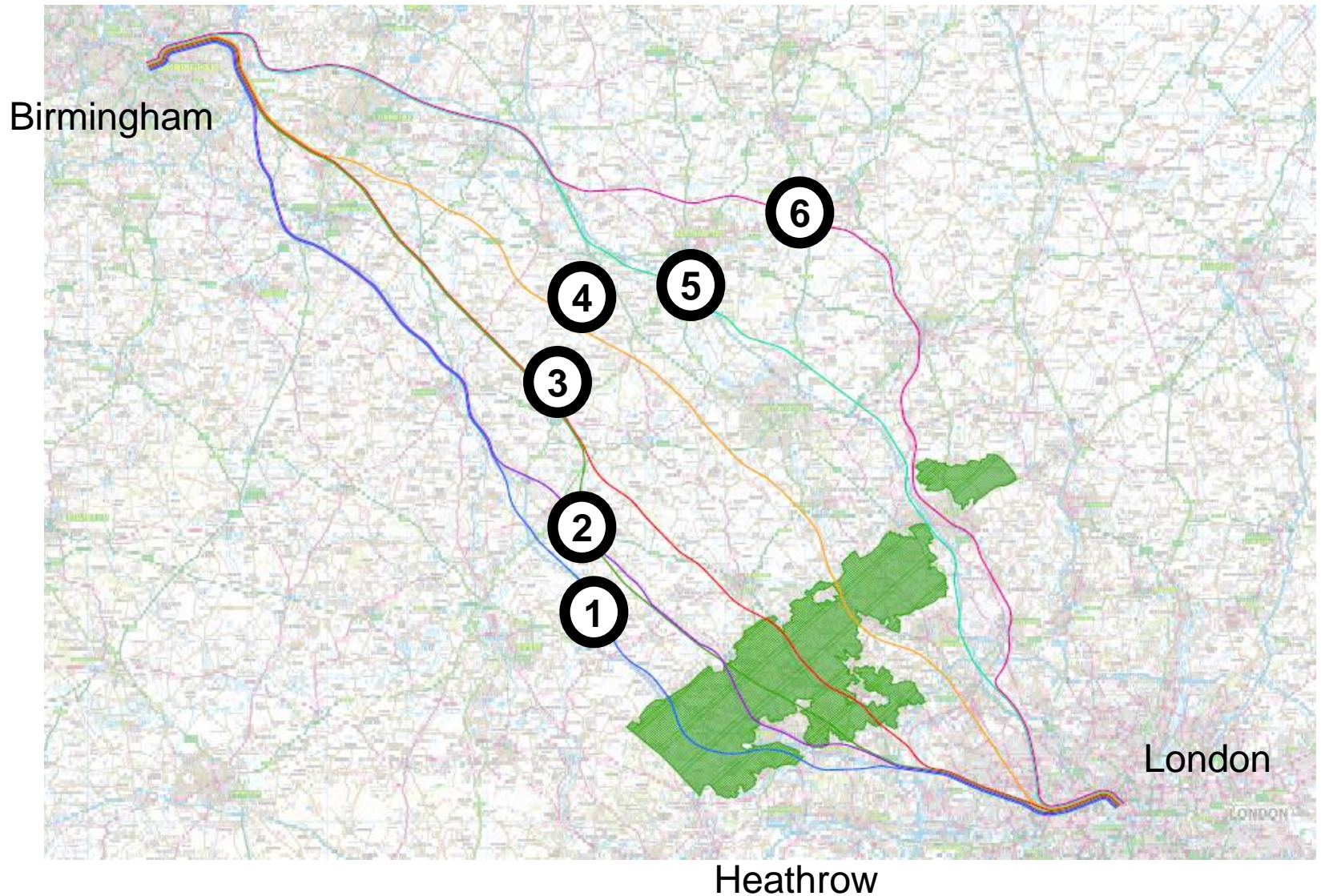


# Route Challenges – Urban and Rural



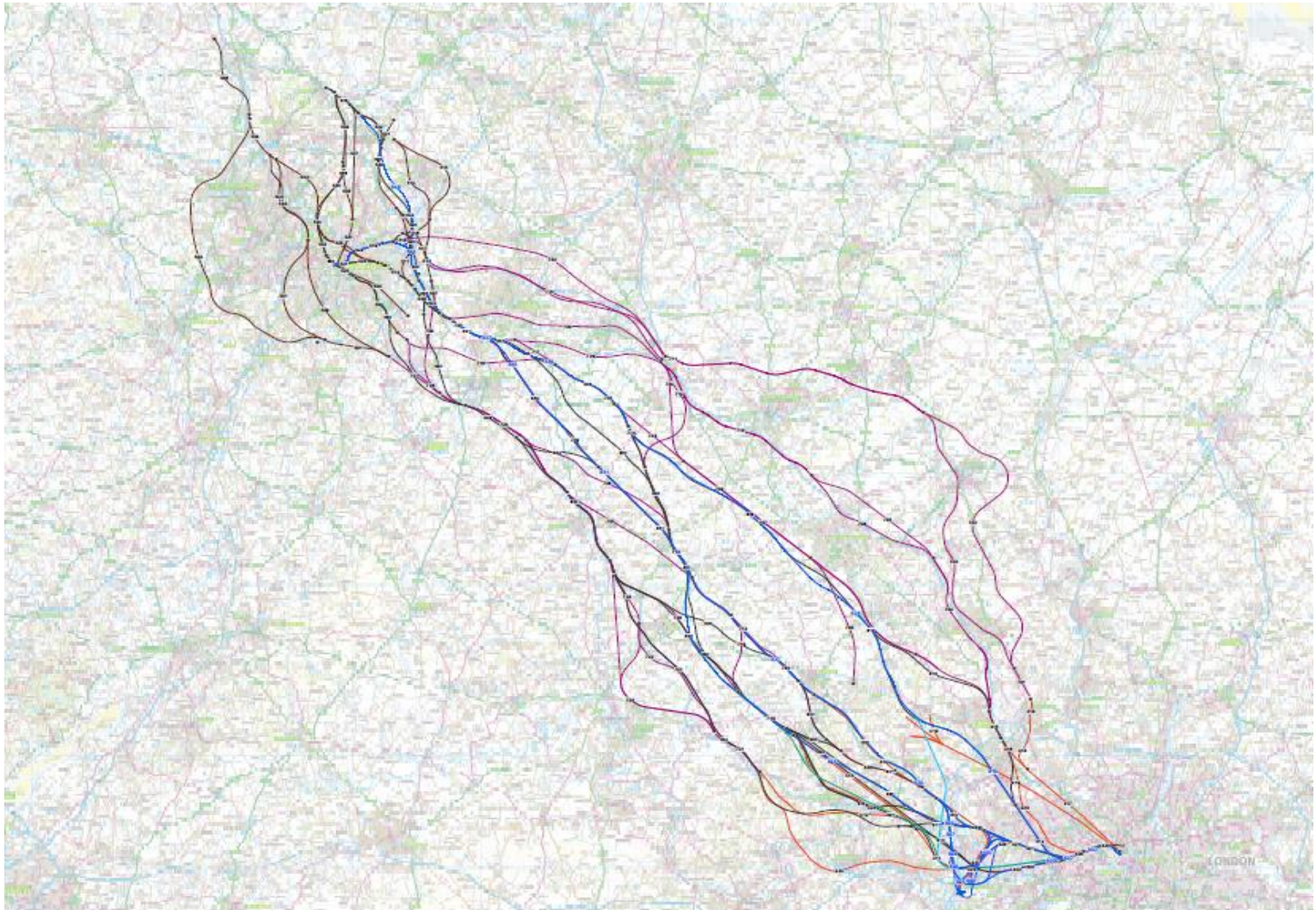


# Initial Corridor Thoughts





# Route Development





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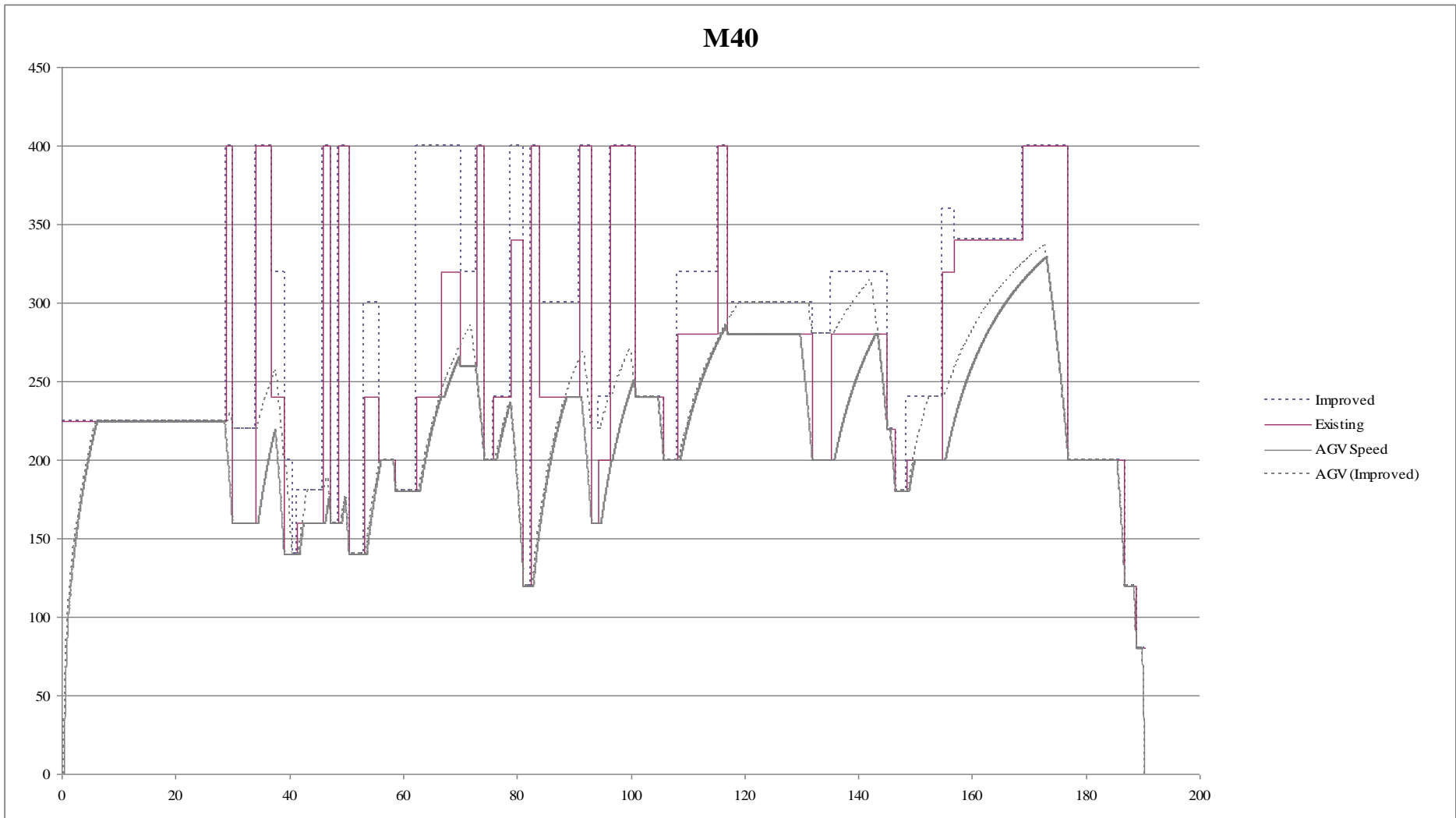


# Follow Existing Transport Corridors?





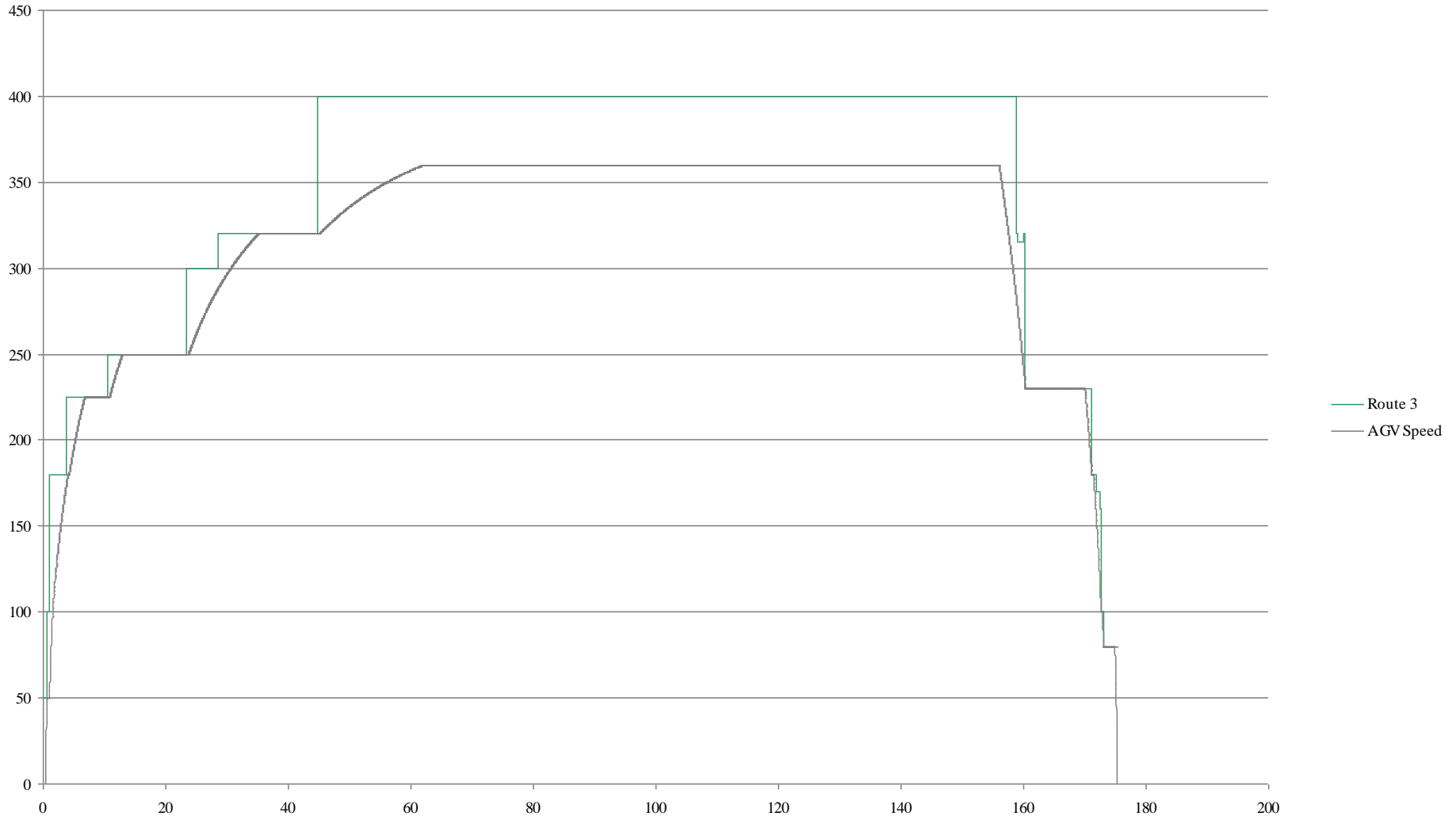
# Route 1 Speed Potential





# Route 3 Speed Potential

HS2













# Feared Impact



# Minimum Radius Curvature

- 200kph - 1800m
- 400kph - 7200m





# Gradients

Classic Main Line:

- 0.5 to 1.0%

HS1 Design:

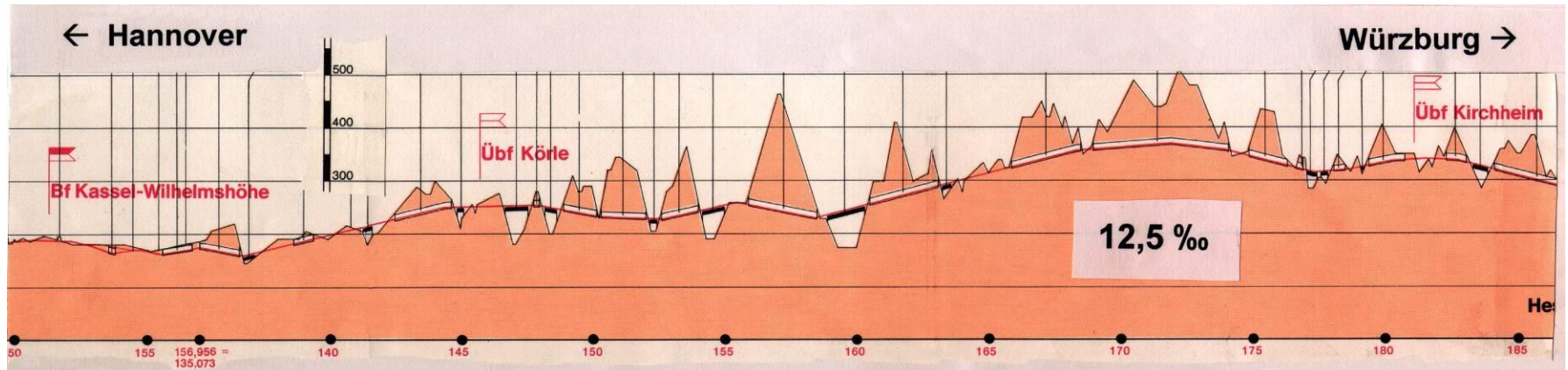
- 2.5%

Max HS line:

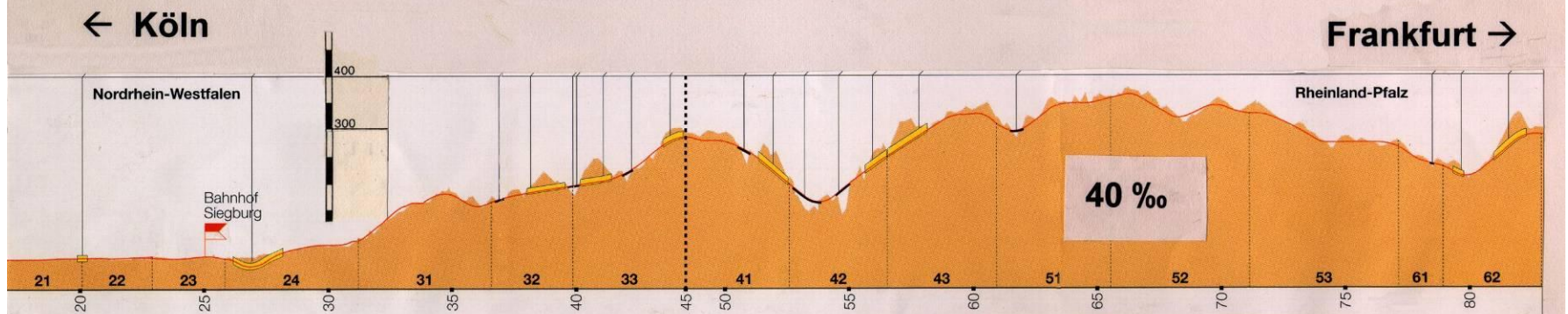
- 3.5%



# Gradients - Consequences



NBS Hannover - Würzburg (1991): High Speed + Freight Trains



NBS Köln - Rhein/Main (2001): High Speed 300 km/h



# Tunnels

- Aerodynamics and pressure effects
- Cost
- Construction disruption
- Construction Carbon



# Sensitive Design





# Future Network

- The HS2 Ltd “Inverse A”...



# 1<sup>st</sup> Stage Network



- London to
  - West Midlands 1-24 to 0-49
  - Manchester 2-08 to 1-40
  - Glasgow 4-20 to 4-00
- Birmingham to
  - Paris 4-30 to 3-00



# 2<sup>nd</sup> Stage Network



- London to
  - West Midlands 1-24 to 0-49
  - Manchester 2-08 to 1-13
  - Leeds 2-15 to 1-20
  - Scotland 4-20 to 3-30
- Birmingham to
  - Manchester 1-34 to 0-40
  - Leeds 2-05 to 1-05
- Heathrow to
  - Manchester 1-15
  - Paris 2-40



# HS2 Timescales

- 2011                  Public Consultation
- 2012                  Decision to Develop
- 2013                  Start Act of Parliament
- 2017                  Start Physical Work
- 2025                  Open to Birmingham
- 2033                  The “Y” Complete





**This is the work of generations**

Prof Andrew McNaughton