ITRC mistral

multi-scale infrastructure systems analytics

Analysis Highlights - Transport

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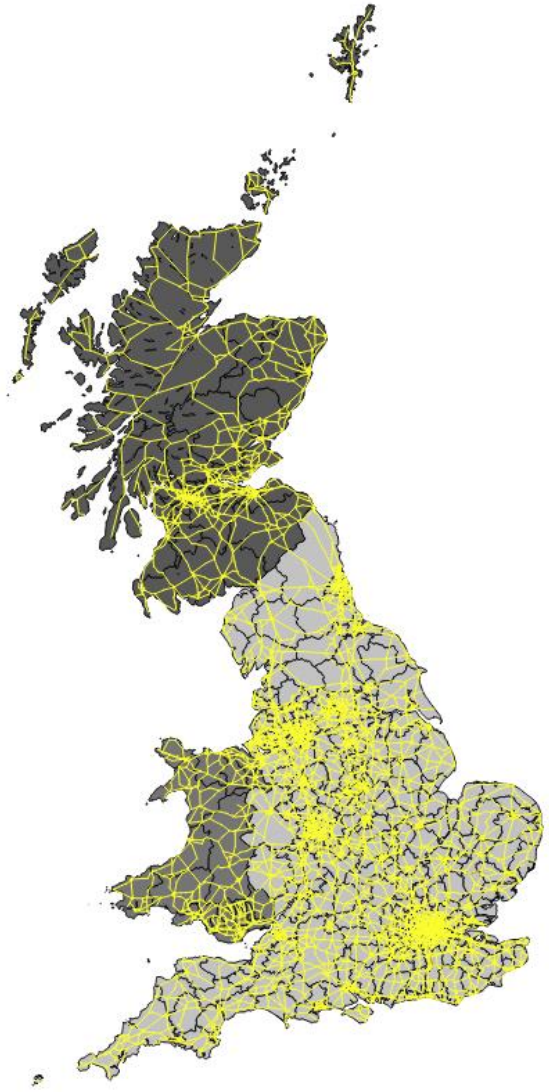
NISMOD Transport v2

Road demand and capacity:

- Major road network for Great Britain (A roads and motorways).
- 380 LADs / 7700 TEMPro zones.
- OD matrix estimation (AADF count data).
- Calibration with vehicle kilometres, trip length distribution, total number of car trips.
- Offline route set generation.

Railway station demand

Airport demand and capacity



NISMOD Road Model Outputs / KPIs

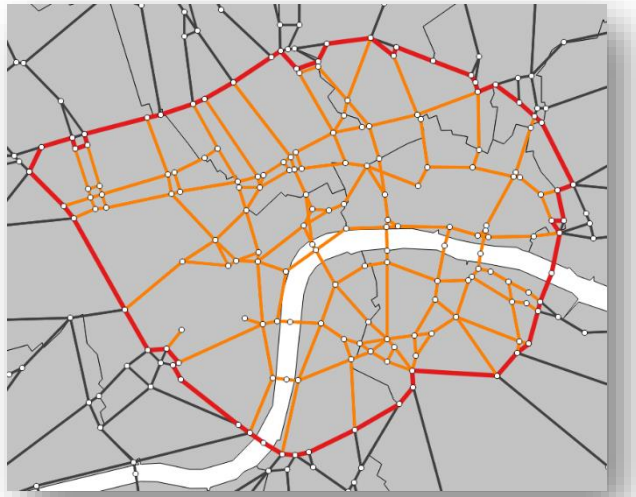
- Link-based
  - Travel time
  - Speed
  - Vehicle flow
  - Capacity utilisation
- Zone-based
  - Vehicle kilometres
- Inter-zonal
  - Travel time
  - Travel cost
- National
  - Energy consumption
  - CO2 emissions

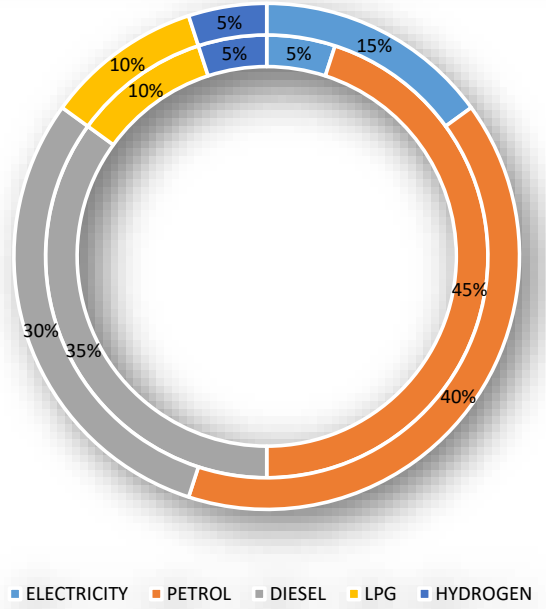
- Disaggregation
  - Time of day
    - e.g. 8AM - 9AM
  - Road category
    - A-road, motorway
    - urban, rural
  - Vehicle type
    - car, van, rigid, artic
    - AV
  - Engine type
    - ICE: petrol, diesel, LPG, H2, CNG
    - HEV: petrol, diesel
    - PHEV: petrol, diesel
    - FCEV_H2, BEV

NISMOD Transport: Applications

Capable of assessing a range of future scenarios and policy interventions:

- Infrastructure construction and expansion
- Changes to taxation/charging regimes
- Changes to vehicle fuel mix
- Changes to vehicle performance
- Travel behaviour change





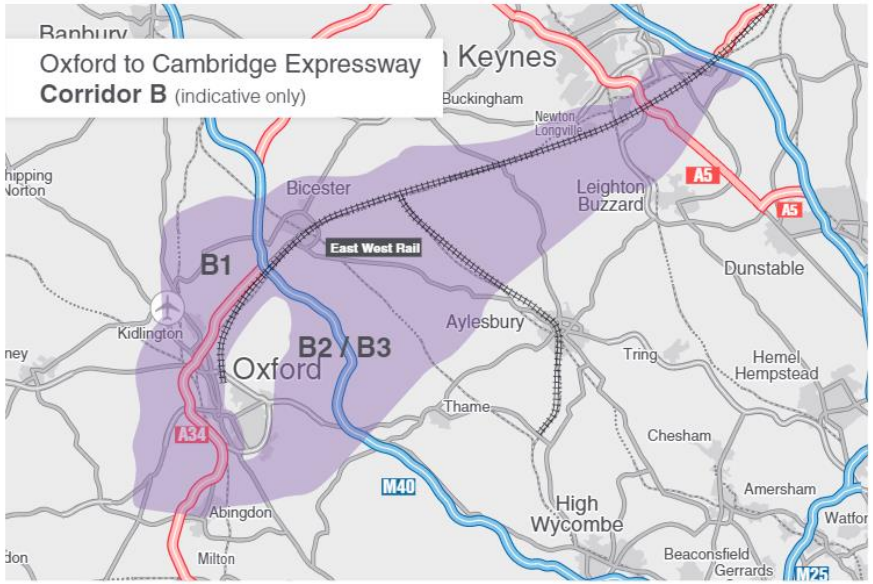
NISMOD Transport and the Arc

Assessment of:

- Expressway Route B1 Oxford-Milton Keynes
- Road enhancements Bedford-Cambridge
- New stations on East West Rail

…under three dwellings scenarios…

…with a transition towards more ‘sustainable’ vehicle fuels.



Transport Analysis Selected Results

New roads and Arc connectivity

- New road may have limited impact on travel time between Milton Keynes and Oxford.
- New road could significantly reduce travel time between Oxford and Cambridge.

Increasing congestion and travel times

- High population growth scenarios will result in increased congestion levels throughout the road network.
- Planned road expansions and developments insufficient to prevent travel time increases in the long run.

Vehicle electrification and carbon footprint

- Vehicle electrification could lead to a sharp decrease in direct carbon emissions by 2050, even under high population growth scenarios.
- Prominent market shares of BEVs and PHEVs will substantially increase the electricity demand of the transport sector.