

# Transport for South East Economic Connectivity Review

## Methodology note

13 April 2018

### Objectives

The modelling exercise aims to estimate the impacts of growth uplifts in sectors of interest in the Transport for South East (TfSE) area. It was designed to capture:

- Direct impacts in the target industries
- Indirect impacts in the supply chain as a result of the target industries purchasing inputs from the rest of the economy
- Induced impacts in population-dependent sectors as a result of people employed in the target industries and their supply chain spending their income on local services.

### Growth sector definitions

The following sectors, defined in terms of the Standard Industrial Classifications (SIC) 2007, were identified as growth priorities in the TfSE area to be modelled in the two scenarios.

**Table 1: Growth sectors for modelling**

Scenario	Sector	SIC code
Scenario 3	Data & IT	62: Computer programming, consultancy and related activities 63: Information service activities
	Engineering & architecture	42: Civil Engineering 71: Architectural and engineering activities; technical testing and analysis
	Marine & maritime	50: Water transport 30.1: Shipbuilding 33.15: Repair of ships
	Finance & insurance	64: Financial service activities, except insurance and pension funding 65: Insurance, reinsurance and pension funding, except compulsory social security 66: Activities auxiliary to financial services and insurance activities
	Transport & logistics	49: Land transport and transport via pipelines 50: Water transport 51: Air transport 52: Warehousing and support activities for transportation 53: Postal and courier activities

Scenario	Sector	SIC code
Scenario 4	Data & IT	As above
	Engineering & architecture	As above
	Marine & Maritime	As above
	Tourism	55: Accommodation 56: Food and beverage service activities 93: Sports activities and amusement and recreation activities
	Advanced manufacturing	20: Manufacture of chemicals and chemical products 21: Manufacture of basic pharmaceutical products and pharmaceutical preparations 26: Manufacture of computer, electronic and optical products 27: Manufacture of electrical equipment 28: Manufacture of machinery and equipment n.e.c. 29: Manufacture of motor vehicles, trailers and semi-trailers 30: Manufacture of other transport equipment 33: Repair and installation of machinery and equipment
	Low carbon environmental	24.46: Processing of Nuclear Fuel 28: Manufacture of Machinery 29: Motor Vehicles 35: Electricity, gas, steam and air conditioning supply 36: Water collection, treatment and supply 37: Sewerage 38: Waste collection, treatment and disposal activities; materials recovery 39: Waste Remediation 74.901: Environmental Consulting
	Biosciences	21: Manufacture of basic pharmaceutical products and pharmaceutical preparations 26.6: Manufacture of irradiation, electromedical and electrotherapeutic equipment 32.5: Manufacture of medical and dental instruments and supplies 72.11: Research and experimental development on biotechnology
	Creative industries	58: Publishing activities 59: Motion picture, video and television programme production, sound recording and music publishing activities 60: Programming and broadcasting activities 61: Telecommunications 74.1: Specialised design activities 90: Creative, arts and entertainment activities 91: Libraries, archives, museums and other cultural activities

Source: Cambridge Econometrics and SDG.

### **Baseline projections**

The baseline projections were converted from CE's 45 industries to growth sectors. This was done by estimating the proportion of an industry (which is defined by one or more 2-digit SIC codes) that each component of a growth sector accounts for, based on data from the Business Register and Employment Survey (BRES) over 2009-16. These proportions were applied to both employment and GVA, assuming that all sub-sectors within an industry had

the same productivity level as the industry as a whole. The components were then aggregated to give total employment and GVA baseline projections for each growth sectors.

Baseline projections were also created for an additional sector to represent the rest of the economy in each TfSE sub-area that is not part of any growth sector. The size of this sector is different in the two scenarios depending on the growth sectors that are modelled.

### *Modelling methodology*

The modelling work for each scenario is set out as follows:

- 1 Direct uplifts in growth sectors in those LEPs that had specifically targeted that growth sector in their SEP
  - Alternative employment growth rates over and above the baseline were applied to relevant growth sectors to generate the direct employment uplifts in each TfSE sub-area.
  - Productivity levels in the baseline for each growth sector in each sub-area were applied to direct employment to create direct GVA.
- 2 Indirect uplifts in the growth sectors' supply chain through intermediate consumption
  - Sectors with overlaps were combined to avoid double counting the supply chain impacts.
  - Multipliers were calculated for each group of growth sectors, using data from the UK's 2014 Input-Output Table for the ratio of intermediate purchases from within and from outside of each group. They represent the percentage increase in GVA in the supply chain that results from a 1% increase in GVA in a group of growth sectors.
  - The multipliers were applied to the direct GVA uplifts to estimate the associated indirect GVA uplifts in the rest of the economy, which were then divided by the average productivity levels in the baseline to produce indirect employment.
- 3 Additional population growth is required to fill the additional jobs in each area
  - The employment rates (employment divided by working-age population) for each TfSE sub-area in the baseline were applied to the sum of the employment uplifts (from both the growth sectors and their supply chain) to estimate the working-age population requirements.
  - These were then translated to total population requirements using the working-age population's share of total population in each TfSE sub-area in the baseline.
- 4 Population growth generates additional demand for local services
  - The relationship between population growth and employment growth was captured by an empirically derived elasticity of 0.13, which means a 1% increase in the population leads to a 0.13% increase in total employment. This was translated into an elasticity for population-dependent sectors only, using the ratio of employment to total population in each area.
  - The population-induced employment was converted into GVA using the average productivity level of population-dependent sectors for each TfSE sub-area in the baseline.
  - Population-dependent sectors were defined as follows, in terms of CE's 45 industries:
    - Retail trade
    - Food and beverage services
    - Public administration and defence
    - Education
    - Health
    - Recreational services
- 5 The indirect and induced uplifts were added to the baseline projections for the rest of the economy and total employment was calculated as the sum of all groups of growth sectors and the rest of the economy.

## Assumptions

Alternative 35-year (2016-2050) employment growth rates for the two high-growth scenarios were generated for targeted LEPs by comparing the current local employment projections with a range of historical precedents for each growth sector in the rest of Great Britain, based on 1981-2016 employment data from CE's local area databank. The procedure was as follows:

- For each growth sector, local authorities from around the UK were selected that had employment levels greater than a set minimum criterion of 1% of total UK employment<sup>1</sup>.
- The three qualifying local authorities with the highest 35-year employment growth rates were then selected, and the mean of these growth rates was then stored as the *rate of historic precedence* for that growth sector.
- For each upper-tier local authority within a sector-targeted LEP, their future growth rate was adjusted upwards from the baseline employment growth rate to the mean of the baseline employment growth rate and the rate of historic precedence.

Table 2 presents the historical precedents used to inform the assumptions, including the relevant TfSE LEP areas and growth sectors.

**Table 2: Historical precedents used to inform modelling assumptions**

Growth sector	TfSE LEP	Historical precedent	Growth rate (2016-50, % pa)
Data & IT	Thames Valley Berkshire, Enterprise M3, Solent, Coast to Capital, South East	West Sussex, Cambridgeshire, Surrey	5.5
Engineering & architecture	Solent, Coast to Capital	South Gloucestershire, Aberdeenshire, Milton Keynes	3.8
Marine & maritime	Solent, South East	Poole, Flintshire, Plymouth	3.0
Finance & insurance	Coast to Capital, South East	South Gloucestershire, Milton Keynes, Swindon	5.0
Transport & logistics	Thames Valley Berkshire, Solent, South East	Warwickshire, Staffordshire, Milton Keynes	5.0
Tourism	Enterprise M3, Solent, Coast to Capital, South East	West Lothian, Flintshire, Wokingham	3.4
Advanced manufacturing	Enterprise M3, Solent, South East	Flintshire, Cambridgeshire, Plymouth	1.0
Low carbon environmental	Enterprise M3, Solent, South East	Bridgend, Perthshire, Wrexham	4.0
Biosciences	Thames Valley Berkshire, Enterprise M3, Solent, Coast to Capital, South East	Highland, Halton, Worcestershire	5.0
Creative industries	Thames Valley Berkshire, Solent, Coast to Capital, South East	Milton Keynes, Halton, South Gloucestershire	5.7

Source: Cambridge Econometrics.

<sup>1</sup> The purpose of this criteria was to avoid selecting spurious growth rates generated by very low numbers of employees.