

Performance indicators

Correction: 3 June 2015: The labels for 'Gas performance indices' in Table 1.E have been corrected under the headings 'Asset or capacity utilisation', 'Service quality and reliability' and 'Asset condition'. This is to amend a production error in the original version. These corrections do not affect any data or other contents within the document.

1.1 This document presents performance indicators (PIs), in terms of performance and cost indices for each infrastructure sector. It presents information on how to interpret the indices; how they are calculated; an explanation of the data sources used; tables containing the indices; and a list of sources.

1.2 The PIs were first set out in the National Infrastructure Plan 2011, and subsequently updated in the National Infrastructure Plan 2012 and 2013. This annex to the National Infrastructure Plan 2014 further updates those indices with the latest data available from across each infrastructure sector.

Interpreting the indices

1.3 The base year for the majority of these indices is 2005, with the index set at 100 for that year in each infrastructure sector. In instances where data was not available for 2005, the index was set at 100 in the first year for which data was available. The values for other years within the same series represent the proportional change in the underlying measure relative to the base year. For example, a value of 125 in 2007, where the index in 2005 was 100, would indicate that the underlying measure has increased by 25% since 2005.

1.4 An index that is rising reflects an increase in the underlying measure, while one that is falling reflects a decrease in the underlying measure, irrespective of whether that movement is a positive or negative development; this is a change from previous editions.¹ A clear description of the measure underlying each index has been provided to allow the user to interpret each index. Similarly, unlike previous editions, no averaging has been done across indices. These changes have been made to ensure greater transparency, following feedback from industry stakeholders.

How the index numbers were calculated

1.5 The index numbers for the performance indices were calculated using a range of inputs; a full list of sources is available at the end of this document. Where applicable, these inputs reflect dimensions including:

- capacity, access and availability
- asset or capacity utilisation
- service quality and reliability
- asset condition
- carbon emissions
- safety
- efficiency

¹ In previous editions, an increase in an index compared to 2005 was intended to demonstrate a positive development (for example a decrease in cost or increase in performance) whilst a decrease in an index was intended to demonstrate a negative development.

1.6 To calculate an index the value of the underlying measure in any given year is divided by the value of the underlying measure in the base year and multiplied by 100. For example, assuming a base year of 2005, a value of 4,000 units in 2005 would result in an index value of 100 (calculated as $(4,000 / 4,000) \times 100 = 100$), and a value of 5,000 units in 2007 would result in an index value of 125 (calculated as $(5,000 / 4,000) \times 100 = 125$).

1.7 Where data was given for a financial year, the data was entered for the calendar year in which the start of the financial year fell. For example, data given for the financial year 2011-12 was entered as 2011. This is a further amendment from previous editions, where data was entered in the calendar year within which the end of the financial year fell.

1.8 All financial figures have been converted into real (2013) prices using the Retail Price Index.

Data sources

1.9 The data used to construct the PIs presented in this document have been collected from a range of primarily public sources; including government publications and regulatory reports by private sector infrastructure providers. A full list of sources can be found at the end of this document.

1.10 Since these PIs were first published in the National Infrastructure Plan (NIP) 2011, there have been a number of changes in the data available for use. Where possible, the same data sources used in previous versions have been used. In some cases however, these data sources are no longer available and it has been necessary to use an alternative source and revise data where possible. These changes are indicated in the notes accompanying the relevant table.

1.11 In exceptional cases, indices have been dropped where they are no longer deemed to be an appropriate indicator of performance. Where this has occurred, an explanation is given in the accompanying notes for the relevant table.

1.12 Following feedback from industry stakeholders, the PIs for the ports sector have been excluded this year. IUK is looking to compile a more comprehensive set of indicators for this sector which it will seek to publish in the next version of the NIP.

Performance indicators

Major roads

Since 2005, the increase in motorway provision has allowed for a degree of stability in the capacity utilisation of the country's road network, average delays and average road speeds. Total investment (capital and current) in real terms as a proportion of vehicle-kilometres has been on a steady decline since 2005. Nonetheless, the condition of the network has improved considerably over the period, while carbon emissions and fatalities, relative to road usage, have declined.

Table 1.A: Major roads

Major roads performance indices	Underlying metric	Indices									
		2005	2006	2007	2008	2009	2010	2011	2012	2013	
Capacity, access and availability											
Motorway density (UK population)	km per million inhabitants	100	100	99	99	99	98	98	98	97	
Motorway density (UK land area)	km per thousand km ²	100	101	101	101	102	102	102	103	103	
Motorway density (Licensed Vehicles)	km per million licensed vehicles	100	101	99	98	99	99	99	99	98	
Asset or capacity utilisation											
Average capacity utilisation of motorways	Traffic to maximum capacity (veh-km)	100	101	102	102	100	99	100	100	101	
Service quality and reliability											
Average vehicle delay on the slowest 10% of journeys on the Strategic Road Network	Minutes delay per mile	100	106	110	98	94	96	n/a	n/a	n/a	
Percentage of journeys on Highways Agency roads that are 'on time'	Journeys completed within a 'reference' time-frame	n/a	n/a	n/a	n/a	n/a	100	103	97	99	

Major roads performance indices	Underlying metric	Indices								
		2005	2006	2007	2008	2009	2010	2011	2012	2013
Congestion on locally managed 'A' roads	Average speeds during the weekday morning peak	n/a	n/a	100	101	102	101	103	102	100
Asset condition										
Motorway and all-purpose trunk roads (HA managed) – roads requiring investigation	Proportion of the network where the investigation threshold for at least one condition aspect has been exceeded	100	91	79	79	73	59	59	52	38
Carbon emissions										
Carbon emission by road vehicles	Tonnes of CO ² equivalent per veh-km (all roads)	100	100	101	96	94	94	93	93	n/a
Safety										
Fatalities on all roads	Fatalities per billion vehicle-km	100	99	91	79	70	59	61	56	55
Efficiency										
Investment and maintenance on major roads	Public sector road expenditure (capital and current) (real 2013) per veh-km	100	95	91	89	89	87	82	79	77

Notes:

Asset condition: Break in data series – improved methodology for assessing road condition was introduced in 2009 by Department for Transport

Average vehicle delays (minutes delay per mile): Break in series in 2008. Series discontinued in 2010.

Percentage of journeys on Highways Agency roads that are 'on time': New series commencing in 2010

Data used to construct the 'Average Vehicle Delays' PI used in previous years has been discontinued (presented above until 2010). An additional two alternative measures ('Percentage of journeys on Highways Agency roads that are 'on time'' and 'Congestion on locally managed 'A' roads') are being presented in this version of the NIP.

Passenger rail

Passenger utilisation of railways and train frequency have increased over the period analysed, as has crowding. Since 2005, the number of railway casualties in relation to passenger-kilometres has fallen, punctuality has improved and the number of failures relative to utilisation has declined. The real cost of rail passenger services (passenger fares and government subsidy) per passenger-kilometre has fallen by 18% over the period.

Table 1.B: Passenger rail

Passenger rail performance indices	Underlying metric	Indices								
		2005	2006	2007	2008	2009	2010	2011	2012	2013
Capacity, access and availability										
Train frequency	Timetabled train-km relative to route-km available	100	101	102	104	109	111	113	114	115
Asset or capacity utilisation										
Passengers in excess of capacity (PIXC)	Standard class passengers in excess of the capacity on their train service on London and South East train operators' services across both peaks	100	117	103	103	76	103	110	103	107
Service quality and reliability										
Public Performance Measure	Proportion of trains arriving on time	100	102	104	105	106	105	106	105	104
Asset condition										
Infrastructure failures	Failures relative to train-km	100	102	93	89	75	67	64	62	65
Safety										
Casualties	Total fatalities, total major injuries, minor injuries, shock/trauma and suicides relative to passenger-km	100	91	83	80	76	74	73	69	67

Passenger rail performance indices	Underlying metric	Indices								
		2005	2006	2007	2008	2009	2010	2011	2012	2013
Efficiency										
Cost of rail passenger services	Government support and passenger revenue (2013 prices) relative to passenger-km	100	113	98	94	90	82	80	82	82

Notes:

Route length (used in 'Train frequency' PI): Break in series in 2007

Passenger-kms (used in 'Casualties' PI): Break in series in 2007 and 2009

Time-tabled train kms (used in 'Train frequency' PI): Break in series in 2007

PPM: Break in series in 2007

Train-kms (used in 'Train frequency' PI): Break in series in 2007

Infrastructure failures: Break in series in 2008

The assessment presented in this document is not meant to supersede or interfere with the Office of Rail Regulation's role as the safety and economic regulator for Britain's railways nor is it meant to provide any additional targets for the sector.

Airports

Traffic at UK airports, both in terms of passenger throughput and air traffic movements, is recovering following the economic downturn and the disruptions caused by the volcanic ash incident. Delays, measured in minutes, have meanwhile declined considerably – by just under 25% between 2005 and 2013.

Table 1.C: Airports

Airports performance indices	Underlying metric	Indices								
		2005	2006	2007	2008	2009	2010	2011	2012	2013
Capacity, access and availability										
Passenger throughput	Terminal passengers	100	104	107	105	97	95	99	100	103
Traffic	Air Transport Movements	100	102	105	103	94	89	92	91	92
Service quality and reliability										
Average delay	Minutes	100	111	113	107	78	111	73	76	76
International destinations served by UK airports	Number	100	105	109	108	104	103	105	105	104
International destinations served by London airports	Number	100	100	102	100	94	92	92	93	93
Long-haul destinations served by London airports	Number	100	106	113	109	103	100	105	103	103
Number of international passenger flight departures – all UK airports	Number	100	103	106	105	96	92	96	95	97
Number of international passenger flight departures – London airports	Number	100	103	107	106	100	95	100	99	100

Notes:

The Pls 'Capacity (ATM) per capita' and 'Capacity (Terminal Passengers) per capita', presented in previous years, have been removed from this version of the NIP due to the lack of availability of a full series for these measures.

Performance indicators 'Terminal Passengers' and 'Air Transport Movements' have been introduced in NIP 2014.

The assessment presented in this chapter is not meant to supersede or interfere with the Civil Aviation Authority's role as the UK's specialist aviation regulator nor is it meant to provide any additional targets for the sector.

Electricity

Generating capacity, both per head of the population and per unit of economic output, have increased over most of the period reviewed, having declined over the last year as the economy begins to recover. Peak load as a percentage of generating capacity has declined, while data available on de-rated margins indicates considerable fluctuations in this measure. The quality and reliability of the system has been strong, as unplanned interruptions and minutes lost are both on the decline, with very strong availability and reliability of supply of the transmission system. Transmission and distribution losses have fluctuated over the period since 2005, while the carbon intensity of electricity generation has generally followed a declining trend.

Table 1.D: Electricity

Electricity performance indices	Underlying metric	Indices								
		2005	2006	2007	2008	2009	2010	2011	2012	2013
Capacity, access and availability										
Generating capacity (per capita)	MW per 1000 inhabitants	100	101	101	98	102	109	106	105	97
Generating capacity (per economic unit of output)	MW per \$trl GDP	100	99	97	95	105	111	108	107	99
Asset or capacity utilisation										
Peak load as a percentage of generating capacity	Maximum demand relative to UK Major Power Producers' capacity	100	94	97	97	93	87	84	84	84
De-rated margins	Average excess of available generation capacity over peak demand	100	n/a	n/a	n/a	n/a	276	n/a	200	n/a
Service quality and reliability										
Unplanned interruptions	Unplanned interruptions relative to number of customers	100	118	103	98	96	93	87	82	n/a
Unplanned minutes lost per customer	Supply minutes lost per customer	100	145	118	109	118	101	98	88	n/a

Electricity performance indices	Underlying metric	Indices								
		2005	2006	2007	2008	2009	2010	2011	2012	2013
Transmission system availability	Proportion of 'circuit-hour' availability	100	100	100	99	100	99	99	100	99
Reliability of supply of the transmission system	Energy supplied relative to what would have been supplied by transmission system	100	100	100	100	100	100	100	100	100
Asset condition										
Transmission and distribution losses	Losses relative to total electricity supplied	100	99	103	102	109	103	111	113	106
Carbon emissions										
Carbon intensity of electricity generation	Thousand tonnes of CO ² equivalent relative to TWh produced	100	106	104	102	94	96	91	99	91

Notes:

This year a new measure is being presented, namely de-rated capacity margin. Data for the latter was only available for the 3 years presented.

The assessment presented in this document is not meant to supersede or interfere with Ofgem's role as regulator of the gas and electricity sector nor is it meant to provide any additional targets for the sector.

Gas

Gas import capacity has increased by more than eight-fold since 2005, while both average and peak import capacity utilisation have declined. UK gas supply cover, the ratio of peak supply to peak demand, has increased over the period. While leakage has crept upwards over the last few years transmission reliability has remained constant (at 100%).

Table 1.E: Gas

Gas performance indices	Underlying metric	Indices								
		2005	2006	2007	2008	2009	2010	2011	2012	2013
Capacity, access and availability										
Gas import capacity	Gas import capacity to total consumption	100	158	335	459	430	596	796	801	875
Gas storage capacity	Gas storage capacity to total consumption	100	109	106	108	108	114	129	138	149
Asset or capacity utilisation*										
Average import capacity utilisation	Imports to import capacity	100	108	61	50	66	56	42	44	38
Peak import capacity utilisation	Peak imports to peak import capacity	100	63	49	71	58	55	81	67	68
UK gas supply cover	Peak supply to peak demand	100	109	110	108	118	120	114	121	126
Service quality and reliability*										
UK gas transmission system reliability	Gas delivered by the gas transmission system as a proportion of gas demanded	100	100	100	100	100	100	100	100	100
Asset condition*										
Gas distribution leakage – old measure	Gas distribution leakage assessment to gas input in the distribution network	100	101	101	100	101	101	101	101	n/a
Gas distribution leakage – new measure	Gas distribution leakage assessment to gas input in the distribution network	n/a	n/a	n/a	n/a	100	88	103	104	105

Notes (for table 1.E):

UK gas distribution leakage assessment – old measure: Break in series in 2009

A new measure, UK gas transmission system reliability, has been introduced in NIP 2014

Gas distribution leakage measure used in previous years has now been discontinued. A new measure is in force. Both have been presented in this document.

The PI 'GB gas supply interruptions' used in previous years has been removed due to lack of complete and consistent publicly available data

The assessment presented in this document is not meant to supersede or interfere with Ofgem's role as regulator of the gas and electricity sector nor is it meant to provide any additional targets for the sector.

* The labels for 'Gas performance indices' in Table 1.E have been corrected under the headings 'Asset or capacity utilisation', 'Service quality and reliability' and 'Asset condition' in June 2015. This is to amend a production error in the original version. These corrections do not affect any data or other contents within the document.

Communications

Both average and fastest broadband speeds have increased significantly over the period reviewed, while the cost of purchasing broadband has declined, as has that of residential and mobile calls. Subscriptions to both mobile phone and broadband connections, as well as broadband penetration rate for households and businesses, have all increased significantly. Likewise, an increase in the number of secure servers and communication paths has been observed since 2005.

Table 1.F: Communications

Communications performance indices	Underlying metric	Indices								
		2005	2006	2007	2008	2009	2010	2011	2012	2013
Capacity, access and availability										
Communications paths	Number of paths relative to population	100	106	111	114	117	118	119	n/a	n/a
Mobile subscriptions	Subscriptions relative to population	100	106	111	114	119	119	119	123	n/a
Broadband penetration rate – households	Internet access market (households) captured by high speed or broadband internet	100	100	129	140	155	162	169	173	171
Broadband penetration rate – businesses	Internet access market (businesses) captured by high speed or broadband internet	100	118	119	133	135	134	143	n/a	n/a
Broadband subscriptions	Subscriptions relative to population	100	132	157	173	181	195	200	206	216
Secure servers	Subscriptions relative to population	100	118	156	187	220	288	327	344	n/a
Service quality and reliability										
Average broadband connection speeds	speed	n/a	n/a	100	112	124	137	169	203	271
Fastest broadband connection speeds	speed	100	372	559	745	931	838	745	931	1,117

Communications performance indices	Underlying metric	Indices								
		2005	2006	2007	2008	2009	2010	2011	2012	2013
Cost of residential calls	Spend (£) per month (2013 prices)	100	96	89	83	80	78	73	72	70
Cost of mobile calls	Spend (£) per month (2013 prices)	100	85	71	59	48	42	38	37	34
Broadband cost	Spend (£) per month (2013 prices)	100	82	71	62	57	51	49	48	47

Notes:

Fastest connection speed offered by incumbent: Data for 2007, 2008, 2010 and 2012 are interpolations

For the purposes of increased transparency, the PI 'Observed average broadband connection speeds', presented in previous years, has been replaced by its two component PIs namely 'Average broadband connection speeds' and 'Fastest broadband connection speeds'.

For the purposes of increased transparency, the PI 'Cost of telephone and broadband services', presented in previous years, has been replaced by its three component PIs namely 'Cost of residential calls', 'Cost of mobile calls' and 'Broadband cost'.

The assessment presented in this document is not meant to supersede or interfere with Ofcom's role as regulator and competition authority for the UK communications industries nor is it meant to provide any additional targets for the sector.

Waste

In line with commitments to reduce the amount of waste sent to landfill, the amount of landfill capacity has decreased since 2005 (by 25%), while incineration capacity and usage have increased, as has household recycling. The cost per tonne of waste management has decreased in real terms.

Table 1.G: Waste

Waste performance indices	Underlying metric	Indices								
		2005	2006	2007	2008	2009	2010	2011	2012	2013
Capacity, access and availability										
Landfill capacity	Cubic metres relative to population	100	101	99	93	87	85	81	75	75
Incineration capacity	Tonnes relative to population	100	129	128	128	134	134	150	149	158
Asset or capacity utilisation										
Landfill life left – non-hazardous waste (commercial sites)	Years of life left at current usage	100	106	107	118	134	130	129	132	133
Incineration capacity usage	Incineration throughput relative to capacity	n/a	100	106	104	106	114	113	121	120
Service quality and reliability										
Household recycling rate	Recycled waste relative to total waste collected	100	116	129	141	149	155	161	162	163
Efficiency										
Cost of disposing of municipal waste	Cost (real 2013) of local authority waste management (excluding landfill tax) per tonne disposed	n/a	n/a	n/a	100	100	89	83	74	n/a

Notes:

Data relating to the cost of waste disposal has been updated to ensure that the cost figures relate more closely to the data relating to the tonnage of waste disposed.

Flood risk management

The condition of flood risk management assets has remained broadly stable over the relevant period for which the index was available. Total spend by Defra in real terms on flood and coastal erosion per additional household protected has fluctuated over the period, increasing over recent years.

Table 1.H: Flood risk management

Major roads performance indices	Underlying metric	Indices								
		2005	2006	2007	2008	2009	2010	2011	2012	2013
Asset condition										
Flood Risk Management asset condition – old measure	Assets at or above target condition in high consequence systems	100	85	100	107	n/a	n/a	n/a	n/a	n/a
Flood Risk Management asset condition – new measure	Assets at or above target condition in high consequence systems	n/a	n/a	n/a	100	101	102	103	102	98
Efficiency										
Defra spending on flood and coastal erosion risk management	Total spend (2013 prices) relative to additional households protected	100	180	153	141	87	77	108	80	119

Notes:

The PI 'Households better protected as a percentage of total number of households in England', presented in previous years, has not been included in NIP 2014 due to the lack of availability of a full time series for this measure.

The PI 'FDGiA Expenditure per additional household protected' presented in previous years has been reviewed and replaced with the PI 'Defra spending on flood and coastal erosion risk management' to better reflect Defra spending in this area.

List of sources

General data

Land area

Gross Domestic Product

RPI

Population

Roads

Road length

Management information provided by Highways Agency

Motor vehicle traffic

Vehicle statistics Table VEH0104

Road traffic statistics Table TRA0103

Road traffic statistics Table TRA4102

Road conditions

Road network size and condition Tables RDC0201 & RDC0210

Environment

Transport energy and environment Table ENV0201 (2005 to 2011)

Management information provided by Department for Transport (2012)

Fatalities

Fatalities on all roads Table RAS30003

Public sector road expenditure

Public Expenditure Statistical Analyses 2010 Table 5.2 (2005-06 to 2008-09)

Public Expenditure Statistical Analyses 2014 Table 5.2 (2009-10 to 2013-14)

Congestion

Percentage of journeys on Highways Agency roads that are 'on time', Table CGN0104

Congestion on locally managed 'A' roads (average speeds during the weekday morning peak), Table CGN0205

Rail

Routes open for traffic

Office of Rail Regulation (2013-14)

Passenger traffic

Rail statistics Table RAI0101

Office of Rail Regulation (2013-14)

Rail statistics Table RAI0103

Passengers in excess of capacity Table RAI0210

Public Performance Measure (PPM)

Cost of railways

Office of Rail Regulation data portal Table 12.8

Office of Rail Regulation Table 1.6

Asset failures

Network Rail, Table 1.26 (2005-06 to 2007-08)

Office of Rail Regulation data portal (2008-09 to 2013-14)

Rail casualties

Table RAI0501 (2004-05 to 2012-13)

Rail Safety and Standards Board Page 31 (2013-14)

Airports

Traffic (terminal passengers & ATM's) Table AVI0102 a & b

DfT average delay (Management information provided by Department for Transport)

Connectivity (Management information provided by Department for Transport)

Electricity

Power generation

Total transmission entry capacity, DUKES Table 5.6

Plant Capacity, DUKES¹ Table 5.7

Maximum Loads Table 5.9

Total net supply Table 5.1

Unplanned interruptions per 100 customers & unplanned minutes lost per customer

Transmission system availability National Grid plc Annual Reports and Accounts (2005 to 2012)

Reliability of supply of the transmission system National Grid plc Annual Reports and Accounts (2005 to 2012)

Total transmission and distribution losses

Digest of UK Energy Statistics (DUKES) Archive (2005 to 2006)

Department for Energy and Climate Change (2007 to 2010)

Digest of UK Energy Statistics (DUKES) Electricity (2011 to 2013)

Carbon emissions from electricity generation Table 1

² <http://webarchive.nationalarchives.gov.uk/20130109092117/http://decc.gov.uk/assets/decc/statistics/publications/dukes/dukes07.pdf>

Gas

Existing UK gas import facilities capacity (pipelines and LNG), National Grid, Gas Ten Year Statement 2013 p 138

Existing UK gas storage capacity, National Grid, Gas Ten Year Statement 2013 p 140

Annual UK gas supplies & IUK Exports Chapter 3

UK peak demand Table G5

UK peak supply capacity, National Grid, Gas Ten Year Statement 2013 p 45

UK import capacity utilisation, National Grid, Gas Ten Year Statement 2013 Table A2.4A

UK gas transmission system network reliability

UK gas distribution leakage assessment Table 4.3

De-rated Margins (Winter Outlook Report 2013/14)

Communications

Total communication access paths Table 4.3

Mobile Broadband subscriptions

OECD communications outlook 2013 Table 4.7

Ofcom Infrastructure Report 2013 Figure 47

Household broadband penetration rate Figure 5.55

Business broadband penetration rate

Broadband subscriptions

Organisation for Economic Cooperation and Development Statistics (2005 to 2012)

Organisation for Economic Cooperation and Development broadband portal (2013)

Secure Servers Table 5.13

Average modem sync speeds

Ofcom Infrastructure Report 2012

Ofcom Infrastructure Report 2013

Fastest connection speed offered by incumbent Page 4

Mobile calls cost Figure 5.72

Residential calls cost Figure 5.62

Broadband costs Figure 5.66

Waste

Landfill capacity, Landfill input, Incineration capacity, Incineration throughput (England & Wales)

Household recycling rate (England)

LA waste collected (Management information provided by Defra)

Cost of disposing of municipal waste (Management information provided by Defra)

Flood defence

Households with improved protection (Management information provided by Defra)

FRM asset condition

[Environment Agency annual report and accounts 2006/07](#)

[Environment Agency annual report and accounts 2007/08](#)

[Environment Agency annual report and accounts 2008/09](#)

[Environment Agency annual report and accounts 2009/10](#)

[Environment Agency annual report and accounts 2010/11](#)

[Environment Agency annual report and accounts 2011/12](#)

[Environment Agency annual report and accounts 2012-13](#)

[Environment Agency annual report and accounts 2013/14](#)

[Defra spending on flood and coastal erosion risk management \(revenue and capital\)](#)