

Article

Infrastructure in the UK, investment and net stocks: May 2023

Update of existing estimates of investment and net stocks of infrastructure in the UK economy.

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Correction

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We have identified and corrected errors relating to 'market sector investment'. All constant price data (in both 2019 and 2020 prices) and associated growth rates have been corrected in this bulletin and corresponding tables.

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1 . Main points

- Total market sector investment in infrastructure in 2021 was £10.9bn in 2019 constant prices, down 9.7% from 2020.
- Market sector net stocks of infrastructure were estimated at £337.0bn in 2021 in 2019 constant prices, down 0.3% from 2020.
- Total general government investment in infrastructure rose by 15.2% in 2021 relative to 2020, to £23.8bn in current prices.

2 . Market sector

Infrastructure plays a crucial role in the economy and is widely considered an important determinant of productivity and therefore economic growth. It can also enable access to opportunities and improve quality of life. To this end, this article provides experimental estimates of market sector net stocks and investment in infrastructure over the period 1997 -- 2021. For consistency, this article follows methods, assumptions and definitions used in [previous work](#) by the ONS on infrastructure. Given the lack of a formal definition for infrastructure in the System of National Accounts 2008 or the European System of Accounts 2010, we follow a data-driven, functional definition.

Investment

Market sector investment in infrastructure in 2021 was £10.9bn, a 9.7% decline compared to 2020, dropping by £1.2bn (in 2019 constant prices). This drop represents the net effect of four sectors decreasing their investment and three sectors increasing their investment.

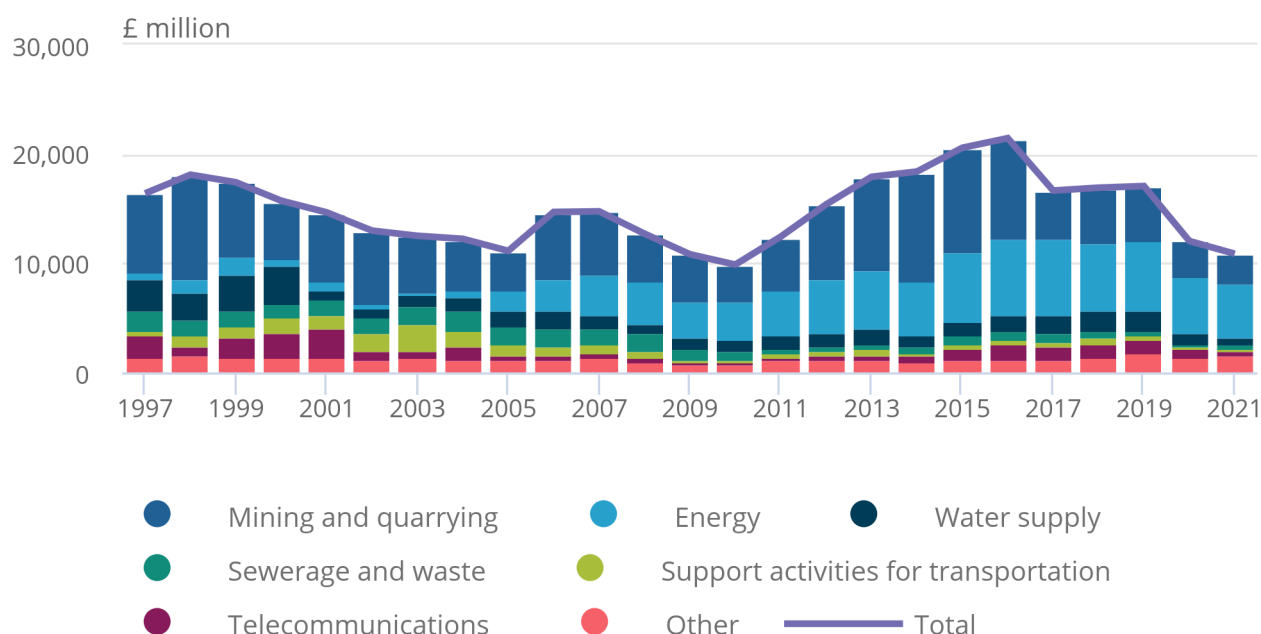
In 2019 constant prices, the sectors with lower investment in 2021, compared with 2020, were mining and quarrying (down by £641.0m, a 19.8% reduction), water supply (down £480.2m, a 44.1% reduction), telecommunications (down by £159.4m, a 25.6% reduction) and support activities for transport (down by £9.7m, a 2.9% reduction). The sectors with higher investment in 2021, when compared with 2020, were sewerage and waste (up by £106.3m, a 55.5% increase), energy (up by £13.1m, a 0.3% increase), and 'other' sectors (up by £8.4m, a 0.5% increase).

Figure 1: Market sector investment in infrastructure in 2021 declined significantly compared with 2020, by £1.2bn

Market sector investment of infrastructure, UK, 1997 to 2021, £m (2019 constant prices)

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Market sector investment of infrastructure, UK, 1997 to 2021, £m (2019 constant prices)



Source: Office for National Statistics

Notes:

1. Energy (division 35, UK Standard Industrial Classification); mining and quarrying (divisions 5 to 9); water supply (division 36); sewerage and waste (divisions 37 to 39); warehousing and support activities for transportation (division 52); telecommunications (division 61); other (remaining divisions).

Although investment in the sewerage and waste sector in 2021 saw the largest percentage increase from 2020, of 55.5%, the 2020 level of investment by market sector companies in sewerage and waste infrastructure was the lowest since 1997 when the time-series began. As such, the percentage change does not reflect a significant increase in investment relatively to the norm; for example, the 2021 level of investment in sewerage and waste infrastructure was considerably lower than the mean across the period 1997-2021.

Net Stocks

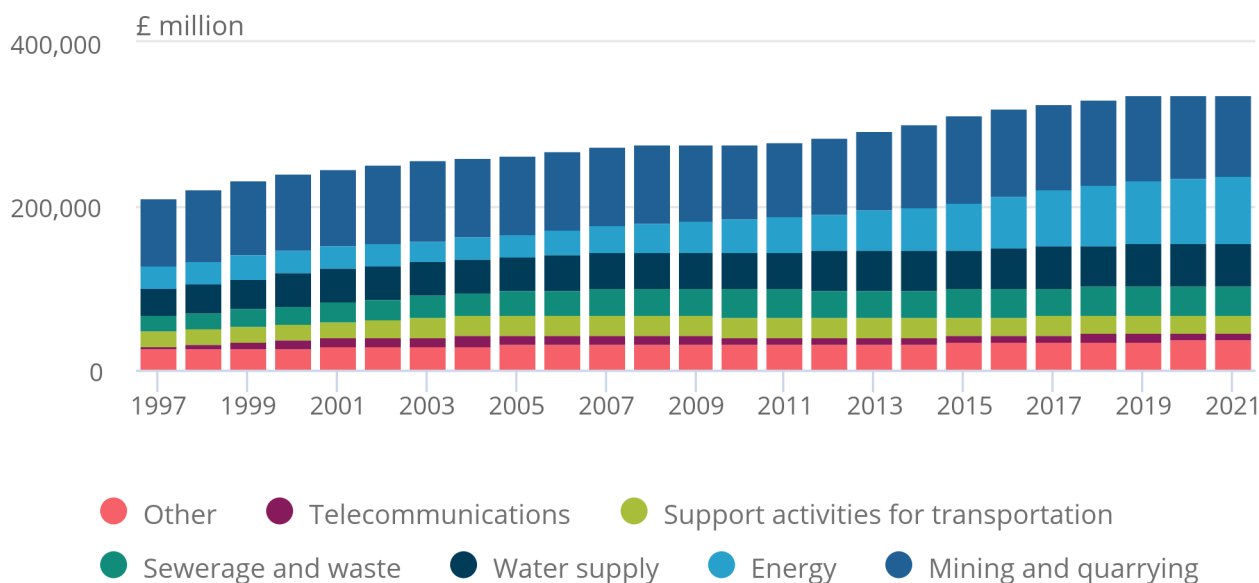
The net stocks of infrastructure in the market sector in 2021 have decreased for all sectors, except for energy and other, when considered in 2019 constant prices. The 2021 total net stock of market sector infrastructure was £337.0bn, 0.3% lower than 2020.

Figure 2: Total market sector net stocks of infrastructure in 2021 were 0.3% lower than 2020

Constant prices (2019=base), UK, 1997 to 2021, £ million

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Constant prices (2019=base), UK, 1997 to 2021, £ million



Source: Office for National Statistics

Notes:

1. Energy (division 35, UK Standard Industrial Classification); mining and quarrying (divisions 5 to 9); water supply (division 36); sewerage and waste (divisions 37 to 39); warehousing and support activities for transportation (division 52); telecommunications (division 61); other (remaining divisions).

The largest stock of infrastructure was in the mining and quarrying sector, decreasing 3.2% to £98.3bn in 2021, closely followed by energy and water, which were £83.2bn and £52.4bn respectively (in 2019 constant prices).

Growth rates of net stocks of water infrastructure have remained positive until 2020, reaching a high of 2.7% in 2006. However, in 2021 there was a 0.5% decline in net stocks of water infrastructure, the first year where there was a decline in investment with respect to the previous year. In 2019 prices, the growth rate in net stocks of sewerage and waste infrastructure was positive from 2003 to 2018, albeit with a declining trend, becoming negative from 2019. The support activities for transport sector declined 2.0%, in 2021, following a downward trajectory since 2003, with a negative rate since 2009. Net stocks of telecommunications infrastructure also saw a decrease, of 3.6% in 2021.

3 . Government spending on infrastructure

In this section we discuss infrastructure investment by the [general government](#) (GG), made up of totals for [local government](#) (LG) and [central government](#) (CG), from 2006 to 2021 for the UK.

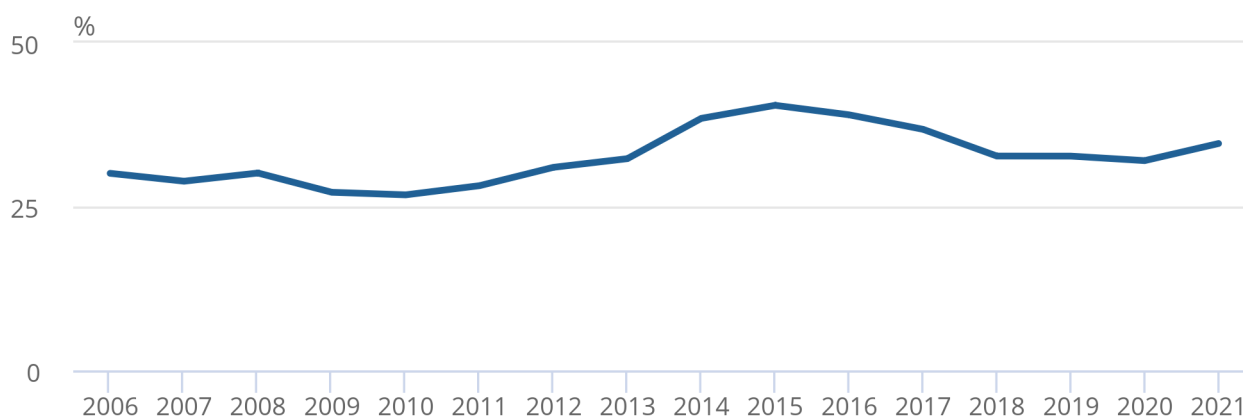
In 2021, total GG spending on infrastructure was £23.8bn, with £17.3bn of spending coming from CG, and the remaining £6.5bn spent by LG. This is a 15.2% increase on 2020's total investment by GG in infrastructure. The majority of this spending, £20.7bn, was on transport, including roads, airports, harbours, and railways, with 72.8% of spending coming from CG, representing a 16.7% increase from the 2020 CG investment in transport. CG investment in other types of infrastructure was also noticeably higher than in 2020, increasing by 19.1%.

Figure 3: Infrastructure share of general government investment increased in 2021 by 2.6 percentage points

Percentage, current prices, UK, 2006 to 2021

Figure 3: Infrastructure share of general government investment increased in 2021 by 2.6 percentage points

Percentage, current prices, UK, 2006 to 2021



Source: Office for National Statistics

Infrastructure investment as a share of GG investment grew to 34.6% in 2021 from 32.0% in 2020, recovering from a slight decline between 2018-2020, where it was at most 32.7%. However, this figure is lower than the share of investment in infrastructure in the post-financial crisis period of 2014-2017, where it averaged 38.7% per year. On the other hand, government infrastructure investment as a share of GDP (currently 1.0%), is the highest since 2006, when records began.

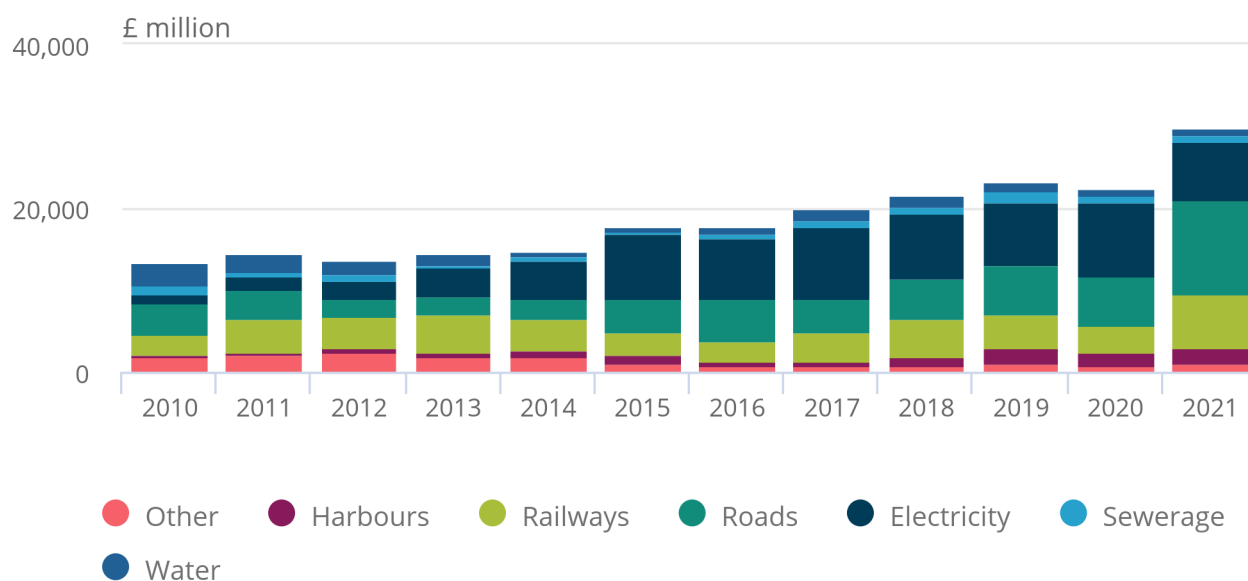
4 . Infrastructure construction

Figure 4: New work infrastructure construction in total increased in the year to 2021 by £7.3 billion, with a large increase in new work road infrastructure of £5.6 billion

Current prices, GB, 2010 to 2021, £ million

Figure 4: New work infrastructure construction in total increased in the year to 2021 by £7.3 billion, with a large increase in new work road infrastructure of £5.6 billion

Current prices, GB, 2010 to 2021, £ million



Source: Office for National Statistics

Notes:

1. "Other" includes gas, communications, air and transport.

In this section we present data from [Output in the construction industry](#), published earlier this year by the ONS, to provide a more general context for a better understanding of infrastructure investment. In 2021, new work infrastructure construction had a total value of £29.9bn, a 32.8% increase compared to 2020 (in current prices). Much of this increase was due to roads and railways, which together made up 61.1% of all new work, and saw respective spending increases of 93.4% and 88.7% in 2021. The harbours and 'other' categories also saw higher expenditure on new work in 2021 than 2020, up 6.3% and 61.4% respectively, although they were a much smaller percentage of total infrastructure new work (5.8% and 4.0% respectively).

There was significantly reduced construction activity in electricity infrastructure in 2021 than in 2020, specifically 19.8% lower. However, electricity remained the second largest subsector, making up 23.7% of the total.

The public sector accounted for 54.7% of all new infrastructure construction in 2021, an increase from 51.7% of all new infrastructure construction in 2020.

Regional Breakdown

In this section we provide a regional breakdown of new work infrastructure construction in Great Britain from 2010 to 2021, based on modelled estimates. All data are in current prices and drawn from [Output in the construction industry: sub-national and sub-sector](#), published earlier this year by the ONS.

The greatest spend on new work infrastructure construction was in London, £6.9bn in 2021. Scotland, the second largest region, had a total of £4.5bn. The West Midlands, London, and Yorkshire and the Humber, saw the highest percent increases in 2021, with growth rates of 120.7%, 108.2% and 81.3% respectively. The Northwest and the East Midlands were the only regions where infrastructure new work was less in 2021 than 2020.

The highest level of repair and maintenance construction was in the South East, at £1.6bn, followed by Yorkshire and the Humber, at £1.5bn, in current prices.

5 . Infrastructure data

[Output in the construction industry](#)

Dataset | Released 12 May 2023

Monthly construction output for Great Britain at current price and chained volume measures, seasonally adjusted by public and private sector.

[Output in the construction industry: sub-national and sub-sector](#)

Dataset | Released 12 May 2023

Quarterly non-seasonally adjusted type of work and regional data at current prices, Great Britain.

[Central government annual expenditure: ESA Table 11](#)

Dataset | Released 21 February 2023

Annual UK government expenditure for central government only, broken down by function using the classification of functions of government.

[Local government annual expenditure: ESA Table 11](#)

Dataset | Released 21 February 2023

Annual UK government expenditure for local government only, broken down by function using the classification of functions of government.

[General government annual expenditure: ESA Table 11](#)

Dataset | Released 21 February 2023

Annual UK government expenditure for general government only, broken down by function using the classification of functions of government.

[Capital stocks and fixed capital consumption](#)

Dataset | Released 23 January 2023

Annual estimates of gross and net capital stocks and consumption of fixed capital in the UK, in current prices and chained volume measures

[Business investment by industry and asset](#)

Dataset | Released 12 August 2022

Detailed breakdown of business investment by industry and asset, in current prices and chained volume measures, non-seasonally adjusted and seasonally adjusted, UK.

6 . Glossary

Infrastructure assets

Infrastructure assets are considered fixed capital assets which have an economic life of at least one year, and the asset stock is determined by the investments made in the current and previous periods. Given the characteristics of many types of infrastructure assets, they tend to have very long economic lives, requiring lengthy time series of investment flows to track the value of the asset stock. The existing stock of infrastructure assets will depreciate, as assets are affected by wear and tear from use, and obsolescence as they become outdated. As such, it is necessary to record both the repair and maintenance expenditure on infrastructure and the investment in the construction of new stock.

Central government

[Central government](#) (CG) consists of all administrative departments of the state and other central agencies whose responsibilities cover the whole economic territory of a country, except for the administration of social security funds.

Local government

[Local government](#) (LG) consists of all types of public administration whose responsibility covers only a local part of the economic territory, apart from local agencies of social security funds.

General government

In the European System of National and Regional Accounts (ESA2010), paragraph 2.111, the [general government](#) (GG) sector (S.13) is defined as consisting "of institutional units which are non-market producers whose output is intended for individual and collective consumption and are financed by compulsory payments made by units belonging to other sectors, and institutional units principally engaged in the redistribution of national income and wealth."

Net stocks

The net stock is the gross capital stock (defined as the value of all fixed assets still in use at a point in time), less the consumption of fixed capital accrued up to that point. Net stock takes into account the depreciation of assets over time as a result of physical deterioration, foreseeable obsolescence or normal accidental damage.

Market sector

The market sector is defined as the whole economy, excluding government and the [non-profit institutions serving households \(NPISH\) sectors](#). It consists of seven sectors, in line with our [Developing new statistics of infrastructure: August 2018 article](#).

These sectors are:

- energy (division 35, UK Standard Industrial Classification)
- mining and quarrying (divisions 5 to 9)
- water supply (division 36)
- sewerage and waste (divisions 37 to 39)
- warehousing and support activities for transportation (division 52)
- telecommunications (division 61)
- "other", representing the remaining divisions

Non-profit institutions serving households (NPISH)

Non-profit institutions serving households ([NPISH](#)) are institutions that:

- provide goods and services, either free or below the market prices
- mainly derive their income from grants and donations
- are not controlled by government

7 . Data sources and quality

Data sources

- investment (gross fixed capital formation) and capital stocks - definition by asset (other structures) and industries
- government - definition by "Classification Of the Functions Of Government" (COFOG)
- construction - definition by "type of work"; the sub-national and sub-sector construction output estimates are no longer badged as National Statistics (as of March 2019)

Strengths

The first strength of this article is that calculation methodology and data categorisation are the same as in the previous article, following the same functional definitions. The benefit of this is that the present article and accompanying dataset are consistent with previous work, consequently allowing these experimental data to be used to inform policy. This is in line with international developments on the measurement of infrastructure investment.

The second strength of this article is that data time series is extended by one more year, crucially, the year of the pandemic, which will allow policy makers and industry experts to observe the impact the pandemic had on infrastructure investment, both by the private and the public sector. The extension of the time series includes revisions of the values of previous years, representing the most accurate data available. Leases have now been included into the central government investment time series (whereas they were previously excluded) and can explain the large changes we see in some categories. Similarly, data for local government infrastructure investment have been revised due to availability of updated figures for Scotland and some changes in the accounting of transport.

Constant price estimates are available for market sector investment with base year 2019 and 2020. The section 2 above illustrates data only in base year 2019 prices for easier comparison with the rest of the analysis, but the accompanying data tables have both versions.

Limitations

Measuring infrastructure comes with numerous challenges. The main conceptual issue is the lack of a universally accepted definition of infrastructure. Neither the System of National Accounts (2008) nor the European System of National and Regional Accounts (ESA2010) contain a definition. Consequently, we focus predominantly on making use of the data available for what is considered core economic infrastructure: transport, energy, water and waste handling assets, telecommunications, mining and quarrying, and 'other' (which includes all assets not in these categories). Housing and social infrastructure (such as education or health) is therefore not included, although there may be scope to extend our definition in future editions.

Scarcity of available data is another challenge. Sourcing data for the private sector is especially difficult due to commercial sensitivity. An issue with government data is the lag between the latest data available and the current period, preventing us from bringing the data any further than 2021.

Related to data scarcity, the complexities around identifying economic ownership of infrastructure assets prevent us from producing regional estimates. So far is that the modelling used to determine economic ownership of the infrastructure asset (in the absence of available data at the level required) does not always yield realistic estimates.

A further challenge is identifying suitable price indices to produce the constant prices data time series for government investment and for infrastructure construction findings. This was a particular issue in the current publication, as it includes a year of market disruption due to the Covid-19 pandemic (2020/2021). Constant price data in 2020 prices for net stocks is currently unavailable due to missing deflator data. Constant prices for net stocks and investment are derived by the Office for National Statistics (ONS) according to the methodology outlined in the [chain-linking methods used within the UK National Accounts](#).

A final limitation is the lack of mechanisms that monitor performance of infrastructure (for better asset life estimates).

Note that all calculations in this bulletin are based on underlying, unrounded data.

8 . Future Developments

We intend to continue improving the conceptual approach, implementing technical improvements, and producing new case studies on pressing topics linked to infrastructure.

Producing international comparisons of infrastructure investment and net stocks is another ambition, and we are actively contributing to the development of an internationally agreed definition.

There is currently a renewed focus on climate adaptive infrastructure, for instance, infrastructure which minimises harm done to the environment or is designed with the inevitable consequences of climate change or global warming in mind. Although some aspects of adaptive infrastructure, such as investment in low emission busses, could be measured using the same methods we have used in this publication, others, such as land improvements and building adjustment to reduce the carbon footprint of infrastructure, would require new techniques to estimate. Given the radical transformations ongoing in many of the key infrastructure sectors we are concerned with, there is a pressing need to develop methods to estimate investment in climate adaptive infrastructure. As a first step, we are looking at flood defences in our accompanying article, [Investment in flood defences, UK: May 2023](#).

9 . Related links

[Infrastructure in the UK, investment and net stocks: May 2022](#)

Article | Released 5 May 2022

Update of existing estimates of investment and net stocks of infrastructure in the UK economy.

[Developing new statistics of infrastructure: August 2018](#)

Article | Released 21 August 2018

The second in a series of articles on infrastructure statistics, updating measures of infrastructure investment and introducing measures of infrastructure stocks.

[Developing new measures of infrastructure investment: July 2017](#)

Article | Released 5 July 2017

The first in a series of articles on infrastructure statistics, focusing on definitional and data challenges in measuring infrastructure investment.

10 . Cite this article

Office for National Statistics (ONS), released 17 May 2023, ONS website, article, [Infrastructure in the UK, investment and net stocks: May 2023](#)