



Infrastructure UK

Investigation into the cost of Civil Engineering Infrastructure

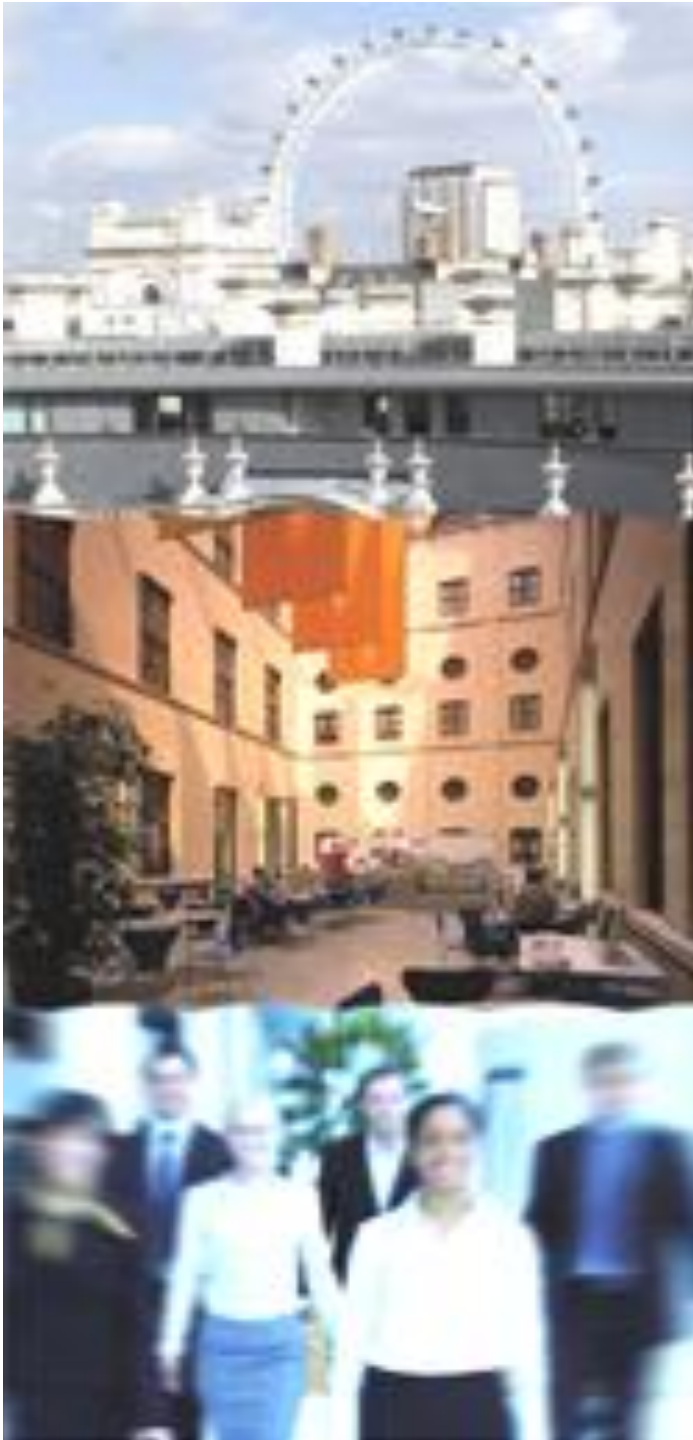
Cost Benchmarking
Data Collection Forms 2A and 2B
[Final version]

[> Instructions](#)

[> Project summary inputs](#)

[> Cost benchmark inputs](#)

[> Non-addressable attribute inputs](#)



Overview

Overview

This cost template forms part of the investigation by IUK into the direct and indirect factors influencing the cost of major infrastructure projects. Specifically, this work is part of the detailed review of individual projects across a number of sectors and geographies. This aims to allow for a bottom-up analysis of major cost components. As such the depth and quality of information provided in these interviews will form a key component of the overall study.

Instructions for completing the template (worksheet "Cost Inputs")

Only the deep pink cells () on worksheet "Cost Inputs" are to be completed, and all cell references in these instructions refer to this worksheet. Where appropriate, drop down tables have been added to these cells to restrict answers to specific responses. All other cells have been locked to avoid confusion.

The individual projects identified for the detailed review will receive this template prior to the interview for familiarisation and as much data gathering where possible. The intention of the interview will then be to complete as much of the template as possible and identify the sources for any outstanding data points. While it is desirable to complete the template in one meeting, the study team recognise that there may be a need to contact other stakeholders in order to complete/confirm data points and a record of these subsequent meetings should be noted in the "Qualifications & notes" text box (K17).

Completing the template: Part A

The project summary identifies the overall characteristics of the project being interviewed. The key points to note in this section are:

- Primary Category (cell G11) - this represents the overarching unit of measurement for the project and drives the output in cell G21;
- Total Cost (cell G17) - this should be in millions and currencies should be consistent throughout the template;
- Quantity (cell G23) - this defines the primary output of the infrastructure (e.g. MWe declared net capacity for a power station);
- Base Date (cell I5) - all costs inputted need to relate to the same base date to allow for indexation of costs between projects; and
- Project Stage (cells I19, I21 and I23) - costs provided should reflect the current maturity of the project being interviewed. As this will be measured differently between sectors, respondents have the opportunity to select between different measurement scales (i.e. RIBA, GRIP or OGC). For reference, a

comparison of the differences between these sectors is given on the worksheet "Annex A - Stage Comparator". Respondents are asked to select the appropriate stage for ONE of these categories, or provide an explanation in the notes (cell K17) as to the level of maturity the project has reached for the cost dataset provided;

Completing the template: Part B

- Costs for the project should be entered in column G between rows 30 and 104;
- All costs for each project need to be mutually exclusive (i.e. the sum of them all must add to the project total);
- Costs entered should be inclusive of overheads, profit and tax for the contractor.
- Where the breakdown for a section is known (e.g. section 1 - Feasibility Stage (pre-construction), cells G30:G41), then please provide the breakdown. In the event that only a global figure is known for the section, then please provide this global subtotal under the "Other" heading (cell G41);
- Unit of measure (column H) - For some of these "sub-costs" the unit of measure will be the same as the Principle Unit of Measure identified in Part A. For others, the survey is looking to identify other units of measure (e.g. cell H33 - "Earthworks"). For this latter group, the specific quantity needs to be entered in the quantity cell in column I, so taking the "Earthworks" example, the m³ of earthworks moved needs to be given in cell I33;
- For the "Other" categories (e.g. row 41), it is expected that the unit of measure used in the relevant cell (I41 in this example) will be the same as the PUM unless there is a specific reason to use a different measure of quantity;
- Finally, any explanatory notes on these costs should be included in Part A of the template in cell K17, and should make specific reference to the cost item to which they refer.

Completing the template: Part C

- Only the section relating to the Primary Category identified in Part A (cell G11) should be completed in Part C. For example, selecting Aviation in cell G11 only requires the completion of rows 113:120 in Part C;
- In part C, the units are identified in column H (or specified in the case of "other"), and the actual quantities should be entered in column G. Supporting explanatory notes can be added in column I where it is felt to be appropriate.

Contacts:

If you have any questions regarding this template, please contact your relevant study person in the first instance, who will be the person who provided you with this template in the first instance.

PART A: PROJECT SUMMARY INPUTS

Project information

Client Name

Project Name

Client Type

Primary Category (Sector)

Secondary Category (Sub-sector)

Time & location

Base year for indexation

Country

Principal Region (UK only)

Measurement

Total Cost (millions)

Currency

Principal Unit of Measure (PUM)
(Result of selection in cell G11)

Quantity (units to be defined)

Principal Unit Cost (PUC = Total Cost/PUM)

Other

Nature of the works

Current RIBA Stage (if applicable)

Current GRIP Stage (if applicable)

Current OGC Stage (if applicable)

Project Overview (a general description of the project and identification of the promoter and key stakeholders:

Qualifications & notes (incl. comments on data quality and completeness, identification of follow-up contacts and a chronology of meeting with the different parties that has been conducted in order to build up the cost picture):

PART B: COST DATA INPUTS

Reference	Stages and elements	Cost	Unit of Measure	Quantity	Unit Cost	Explanatory notes
1	Feasibility Stage (pre-construction)	-				Definition: Up to and including submission of an outline planning application
1A	Concept design					Client's preliminary design costs (e.g. RIBA A or GRIP 1) including engineering and architectural services.
1B	Environmental Assessment					Includes costs relating to Environmental Impact Assessments (EIAs).
1C	Business Case Preparation					
1D	Supporting Studies					Include the cost of studies supporting the feasibility stage (e.g. Market Testing exercises).
1E	Exhibitions, public consultation & stakeholder management					
1F	Estimating and Review Costs					
1G	Project Management (Client)					Cost of client's internal project management functions.
1H	Project Management and other external advisor costs					External advisory expenditure including project/programme management, financial advisors, insurance advisors, etc.
1I	Legal Costs					External legal advisor expenditure.
1J	Project insurances					Insurances provided by the client
1K	Governance					Cost of meeting client's approvals processes, board administrative functions and any gate stage costs.
1L	Other					Other factors or the total for the section if breakdown not known. Use the PUM unless there is a specific alternative.
2	Planning & Design (Development Phase /Pre construction)	-				Definition: Up to and including agreement of main works contract price
2A	Preliminary Design					
2B	Exhibitions, public consultation & stakeholder management					
2C	Approvals, consultation and statutory obligations					This should include costs associated with parliamentary process.
2D	Environmental Statement					
2E	Project Management (Client)					Cost of client's internal project management functions including procurement and tender processes.
2F	Project Management and other external advisor costs					External advisory expenditure including project/programme management, financial advisors, insurance advisors, etc.
2G	Legal Costs					External legal advisor expenditure.
2H	Surveys / Investigations					
2I	Estimating and Review Costs					
2J	Governance					Cost of meeting client's approvals processes, board administrative functions and any gate stage costs.

PART B: COST DATA INPUTS						
2K	Third Party Costs					
2L	Business Case Preparation					
2M	Other					Other factors or total if breakdown not known
3	Construction Phase (asset classes)	-				Contract mobilisation to end of defects liability period/financial closure
3A	Client construction stage costs	-				
3A10	Project Management (Client)					Cost of client's internal contract management functions.
3A20	Design costs (Client)					Includes all professional design costs.
3A30	Client project/programme management and other advisory costs					Other external advisory expenditure (N.B. this now includes legal costs).
3A40	Other					
3B	Civil Engineering (Constructor's Cost Elements)	-				
3B10	Earthworks		£/m3			Earth moving, cuttings and embankments, treatment and disposal
3B20	Substructure		£/m2 plan area			Below ground, retaining, dividing and containing structures
3B30	Pavements		£/m2			Roads, runways, hard landscaping
3B40	Structures		£/m2 plan area			Bridges, viaducts, over structures, barriers, towers and masts,
3B50	Track		£/km			Sub-grade, ballast, track system, S&C
3B60	Tunnels		£/km			Bored tunnels, excavated tunnels, cut and cover tunnels, immersed tube tunnels, shafts and cross passages
3B70	Other					Other factors or the total for the section if breakdown not known. Use the PUM unless there is a specific alternative.
3C	Equipment & installations (Constructor's Cost Elements)	-				
3C10	Power Supply		£/MWe (DNC)			HV/MV substations, transformers, cabling, switchgear & equipment
3C20	Major plant & process		£/MWe (DNC)			Process and production plant, power generation (e.g. Turbine, generator)
3C30	Balance of Plant		£/MWh			Control and monitoring systems, secondary plant
3C40	Utility infrastructure & network connections		£/km			Transmission and distribution networks for water, gas and electrical supply
3C50	Specialist systems		£/km			Signalling, metering?
3C60	Telecomms & control		£/km			Telephony, radio, CCTV, telemetry, SCADA
3C70	Other					Other factors or the total for the section if breakdown not known. Use the PUM unless there is a specific alternative.

PART B: COST DATA INPUTS						
3D	Stations & Termini (Constructor's Cost Elements)	-				
3D10	Platforms & roof structures		£/m2 platform area			Platform structures including canopies, access bridges and vertical circulation
3D20	Buildings: Public areas		£/m2 GFA			Above and below ground station/terminal buildings, passenger facilities and public areas
3D30	Buildings: Non-public areas		£/m2 GFA			Above and below ground station/terminal buildings, equipment rooms, support facilities and back of house areas
3D40	Other					Other factors or the total for the section if breakdown not known. Use the PUM unless there is a specific alternative.
3E	Buildings (Constructor's Cost Elements)	-				
3E10	Buildings operational		£/m2 GFA			Depots, workshops and maintenance facilities
3E20	Buildings administrative		£/m2 GFA			Offices, operational and commercial property
3E30	Other					Other factors or the total for the section if breakdown not known. Use the PUM unless there is a specific alternative.
3F	Cross topics (Constructor's Cost Elements)	-				
3F10	Enabling works		£/m2 site area			Please complete only if enabling works are let as a separate contract and specify scope of contract in Part A comments box
3F20	Staffing					Contractors project staff (including admin, but excluding all operatives)
3F30	Preliminaries					Contractors site overhead elements (including offices, compounds, security staff, set-up & dismantle)
3F40	Design costs					Contractors design costs
3F50	Public realm		£/m2			Soft and hard landscaping, access, rights of way and connectivity
3F60	Environmental mitigation factors & Section 106/278 costs					Temporary and permanent measures, environmental bunds, noise barriers, planting, watercourse protection,
3F70	Contractors Performance Costs					Bonds, Warranties, Insurances, Guaranties
3F80	Project Critical Plant & Equipment		£/item			E.g. TBM's
3F90	Statutory utilities diversions		£/item			Water, gas, electrical, telecomms etc
3F100	Land acquisition & compensation payments					Land purchase, CPO's, Section 106 & 278 costs
3F110	Contractors financing costs					Contractor management of project cycle payments
3F120	Other					Other factors or the total for the section if breakdown not known. Use the PUM unless there is a specific alternative.
4	Commissioning	-				
4A	Testing and assurance					Factory Acceptance Testing, Technical Assurance, inspection on and off site up to operational handover

PART B: COST DATA INPUTS						
4B	Third party & statutory approvals					Legal and technical fees associated with approvals by 3rd parties and statutory approvals as a result of the project
4C	Delivery into service					Operational mobilisation and ramp up including training, cost of handover & DLP
4D	Other					Other factors or the total for the section if breakdown not known. Use the PUM unless there is a specific alternative.
5	TOTALS	-				

PART C: NORMALISING INPUTS

Reference	Sector Specific Attributes	Quantity	Units	Comments	Explanatory Notes
6	Aviation				
6A	Percentage of airside works (as opposed to landside works)		%		Reflects the additional costs related to the development of airside infrastructure.
6B	Regional point-to-point or hub airport		Toggle		If both apply then select the hub toggle.
6C	Number of transport connections		Range 1-3		Minimum of one (i.e. private vehicles on road), one for coach connections and one for any rail connection (i.e. a maximum of three).
6D	Operational hours		% of 24 hours		
6E	Static capacity (peak hour capacity)		# of passengers/hr		
6F	Service Standard		High/Medium/Low		Looking to explain cost differences in the business model of the facility. Low = Low specification fit-out, no lounge or CIP (Commercially Important Passenger) facilities. Medium = Point to point model with medium specification fit-out and provision for lounge and CIP facilities. High = International hub model with high quality fit-out, extensive lounge and CIP facilities.
6G	<i>insert other</i>				
6H	<i>insert other</i>				
7	Energy - CCGT				
7A	Units at the station		Integer		Number of generation units on the site.
7B	Greenfield or Brownfield site		Toggle		
7C	Distance to grid connection		Distance (km)		The aim is to calculate and average distance from the facility to connect to the relevant transmission infrastructure.
7D	Environmental constraints & mitigation				Comment on specific environmental constraints that have had significant impact on project costs.
7E	<i>insert other</i>				
7F	<i>insert other</i>				
8	Energy - Wind				
8A	Number of turbines		Integer		
8B	Mean water depth		Depth (m)		
8C	Foundation type (concrete caisson, or steel)		Toggle		
8D	Distance to grid connection		Distance (km)		The aim is to calculate and average distance from the facility to connect to the relevant transmission infrastructure.
8E	Environmental constraints & mitigation				Comment on specific environmental constraints that have had significant impact on project costs.
8F	<i>insert other</i>				
8G	<i>insert other</i>				

PART C: NORMALISING INPUTS

9 High Speed Rail					
9A	Length of route built new		Distance (km)		This should be less than the quantity of the PUM given in part A.
9B	Length of route in the urban environment		Distance (km)		This should be less than the quantity of the PUM given in part A.
9C	One or two tracks		Range 1-2		
9D	Length of bridges		Distance (km)		
9E	Length of other elevated structures		Distance (km)		
9F	Description of surface terrain		Toggle		This allows a reflection on the additional costs associated with building on soft ground conditions.
9G	Length of tunnels (single bore)		Distance (km)		
9H	Length of tunnels (twin bore)		Distance (km)		For the avoidance of doubt, a 10 km twin bore tunnel should be recorded as 20km in this input.
9I	Net face area of tunnel (single bore)		Area (m ²)		
9J	Net face area of tunnel (twin bore)		Area (m ²)		Record the net face area of one bore.
9K	Number of cross passages		Integer		
9L	Number of ventilation shafts		Integer		
9M	Description of tunnelling terrain		Toggle		This allows a reflection on the additional costs associated with tunnelling through rock.
9N	Number of new stations		Integer		
9O	Number of new depots		Integer		
9P	Specification – maximum design speed		Speed (km/h)		
9Q	Specification – maximum gradient		Gradient (%)		
9R	Interfaces with existing systems and stations interchanges		# of interfaces		Taking the example of a metro line extension, the number of interfaces should include each connection with existing metro lines, interfaces with high speed rail stations, etc.
9S	Designed for freight		Yes/No		
9T	<i>insert other</i>				
9U	<i>insert other</i>				
10 Light Rail					
10A	Length of route built new		Distance (km)		
10B	Length of route in the urban environment		Distance (km)		
10C	One or two tracks		Range 1-2		
10D	Length of bridges		Distance (km)		

PART C: NORMALISING INPUTS					
10E	Length of elevated structures		Distance (km)		
10F	Description of surface terrain		Toggle		This allows a reflection on the additional costs associated with building on soft ground conditions.
10G	Length of tunnels		Distance (km)		Please state type of tunnel (e.g. Cut and cover, bored).
10H	Net face area of tunnels		Area (m ²)		
10I	Number of cross passages		Integer		
10J	Number of ventilation shafts		Integer		
10K	Description of tunnelling terrain		Toggle		This allows a reflection on the additional costs associated with tunnelling through rock.
10L	Number of new stations		Integer		
10M	Number of new depots		Integer		
10N	Interfaces with existing systems and stations interchanges		# of interfaces		
10O	<i>insert other</i>				Comment on any additional significant cost items for the project, such as signalling interfaces with road control systems, power distribution alternatives to overhead lines, environmental considerations, etc.
10P	<i>insert other</i>				
11	Metro Rail				
11A	Length of route built new		Distance (km)		This should be less than the quantity of the PUM given in part A.
11B	Length of route in the urban environment		Distance (km)		This should be less than the quantity of the PUM given in part A.
11C	One or two tracks		Range 1-2		
11D	Length of bridges		Distance (km)		
11E	Length of elevated structures		Distance (km)		
11F	Description of surface terrain		Toggle		This allows a reflection on the additional costs associated with building on soft ground conditions.
11G	Length of tunnels (single bore)		Distance (km)		
11H	Length of tunnels (twin bore)		Distance (km)		For the avoidance of doubt, a 10 km twin bore tunnel should be recorded as 20km in this input.
11I	Net face area of tunnel (single bore)		Area (m ²)		
11J	Net face area of tunnel (twin bore)		Area (m ²)		Record the net face area of one bore.
11K	Number of cross passages		Integer		
11L	Number of ventilation shafts		Integer		
11M	Description of tunnelling terrain		Toggle		This allows a reflection on the additional costs associated with tunnelling through rock.
11N	Number of new surface stations		Integer		

PART C: NORMALISING INPUTS					
11O	Number of new sub-surface stations		Integer		
11P	Number of new deep stations		Integer		
11Q	Number of new depots		Integer		
11R	Technology - driverless operation		Yes/No		
11S	Technology - bi-directional operation		Yes/No		
11T	Interfaces with existing systems and stations interchanges		# of interfaces		
11U	<i>insert other</i>				
11V	<i>insert other</i>				
12	Road				
12A	New build or lane addition		Toggle		
12B	Number of lanes (including the hard shoulder)		Integer		
12C	Length of route in the urban environment		Distance (km)		This should be less than the quantity of the PUM given in part A.
12D	Length of elevated sections		Distance (km)		This should be less than the quantity of the PUM given in part A.
12E	Structures, flyovers & viaducts		# of items		
12F	Description of surface terrain		Toggle		Straightforward = shallow/good ground conditions. Complex = deeper/poor ground conditions, special treatments, etc.
12G	Length of tunnels		Distance (km)		Tunnel length taken from the Principal Unit of Measure in part A.
12H	Net face area of tunnels		Area (m ²)		
12I	Number of cross passages		Integer		
12J	Number of ventilation shafts		Integer		
12K	Description of tunnelling terrain		Toggle		This allows a reflection on the additional costs associated with tunnelling through rock.
12L	Junctions/interfaces with other transport		# of interfaces		
12M	<i>insert other</i>				
12N	<i>insert other</i>				
13	Utilities				
13A	Location; urban non urban		Toggle		
13B	Site size		ha		
13C	Operational hours	35.00%	% of 24 hours		
13D	<i>insert other</i>				

PART C: NORMALISING INPUTS					
13E	<i>insert other</i>				
13F	<i>insert other</i>				
13G	<i>insert other</i>				
13H	<i>insert other</i>				
13I	<i>insert other</i>				
14	Waste				
14A	Technology choice		Toggle		If other, please specify the technology choice.
14B	Location; urban non urban		Toggle		
14C	Site size		ha		
14D	Percentage of input material recycled in the plant	5.00%	%		In this context, recycling is not expected to include ash residues from incineration.
14E	Operational hours	35.00%	% of 24 hours		
14F	<i>insert other</i>				
14G	<i>insert other</i>				
15	Water - Tunnelling Projects				
15A	Length of tunnels		Distance (km)		Tunnel length taken from the response to 3B80 in part B.
15B	Net face area of tunnels		Area (m ²)		
15C	Number of shafts		Integer		
15D	Average tunnel depth		Depth (m)		
15E	Number of pumping stations		Integer		
15F	Number of treatment works		Integer		
15G	Interfaces with existing systems		# of interfaces		
15H	Description of tunnelling terrain		Toggle		This allows a reflection on the additional costs associated with tunnelling through rock.
15I	<i>insert other</i>				
15J	<i>insert other</i>				
15K	<i>insert other</i>				
15L	<i>insert other</i>				
15M	<i>insert other</i>				

ANNEX A - STAGE COMPARATOR

RIBA vs. GRIP vs. OGC vs. TfL

