

# ITF and CEDR joint Initiative: A database of road infrastructure delivery cost

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## Why would an end unit cost database for road infrastructure be useful?

### The short answer

It would help improve the procurement methodology of major road infrastructure projects and save procuring authorities massive amounts of money.

### A slightly longer answer

A database of end unit costs could provide the following three substantial benefits:

- Benchmarking
- Cost savings
- Accountability

*First and foremost, the database would serve as a benchmarking tool for a series of applications:*

- Is the lowest bid for a proposed project suspicious as being abnormally low, compared to the cost of similar projects in the database?

A bid is deemed abnormally low, when the price offered for the project does not allow full cost recovery for the contractor<sup>1</sup>. Consequently, the procuring authority may find itself under considerable pressure through the contractors' cost claims and may face contractor failure during project execution. The potential consequences are increased transaction cost for both parties to the contract, higher project execution cost, and delays in project delivery.

- How similar or different (e.g. higher or lower) is the (normalised) cost per km of a motorway (e.g. 2x2 lanes) in one country compared to other countries?

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<sup>1</sup> This problem is also known as ALT - Abnormally Low Tenders

If the cost of road infrastructure delivery in one country is substantially lower than in other countries, then potentially infrastructure quality or longevity might be an issue. If it is substantially higher there might be room for considerable savings.

- What is the source of the cost differentials between similar projects?

It is implicitly known that building a 2x2 lane motorway in the Netherlands does not cost the same as in the UK, Italy, Australia or the USA. Through including descriptive project data that allows comparing projects with similar attributes, the database would provide the opportunity to identify or eliminate broad direct causes (e.g. terrain configuration). Depending on the descriptive data captured in the database, it may be possible to explain more reasons that lead to such an observed variation in end costs. For example, in terms of procurement and contract design, such a database would be able to assess how different contracting arrangements perform (e.g. design-bid-build vs design & build) in terms of end cost not only on-time/on budget performance. Despite numerous decades of project delivery, a lot of empirical questions about procurement design are still unanswered, because such a database does not exist.

*Second, through the above various possibilities for benchmarking, cost-saving opportunities may arise for various procuring authorities.* By understanding in more detail the drivers of end unit cost differentials, procuring authorities can gradually modify their procurement processes and engage in contract designs that have demonstrably performed better. They would also be able to identify which are the most critical parameters in a road project that appear to influence end unit cost variability and aim to control them in a well-informed manner.

*Finally, procuring authorities will be able to defend their decisions with respect to road project delivery based on well-established empirical information.* This will increase accountability and protect both the tax-payers (or users) from inefficient and thus excessively expensive project delivery, as well as public officials whose decisions would be subject to public or organisational scrutiny with respect to their outcomes.

### **A departure from existing data collection efforts**

It should be noted that the proposed database would require information whose collection constitutes a departure from existing practices. For example, many procuring authorities in many countries populate, maintain and manage unit price databases.

- Is a unit price database sufficient to achieve the same objectives?

No. In most contract types unit-prices do not fully reflect the contractors' revenue expectations. Depending on the contract type, variation claims may considerably affect the end price of road construction. In addition, there is a multitude of other factors that will drive cost (terrain, complexity/interfaces with third party systems, etc.) beyond the cost of basic inputs.

## What kind of information would be in the database?

The database would be populated with data on final cost of delivery of road infrastructure projects. Each project would include descriptions of project characteristics (greenfield/brownfield; urban/non-urban; terrain difficulty; share of tunnel, elevated construction, etc.) that would allow comparison of cost per relative unit (e.g. cost per km). The databased should also aim to capture the type of procurement underlying the delivery of the project (e.g. public vs PPP, single phase vs two-phase, ItT, ItN, etc.) as well as the type(s) of contract(s) signed with the relevant contractors (e.g. types of works involved, fixed-price vs cost-plus, etc.).

The key challenge is striking a balance between being pragmatic and being complete. The “pragmatic” dimension implies that data requests to data owners should be reasonable and easy to deliver (i.e. streamlined) or they will not report anything. The “complete” dimension implies that sufficient descriptive data will need to be captured that will allow useful comparisons at least to some extent.

Notwithstanding the above trade-off with respect to completeness, the remaining four general principles of data collection need to be adhered to, i.e. measurability<sup>2</sup>, reliability<sup>3</sup>, accuracy<sup>4</sup> and robustness<sup>5</sup>, while good care needs to be put in place so that the collected end cost unit data reflect “as built” and not “as designed” project characteristics.

## Next steps

Where the balance between “pragmatic” and “complete” should be struck would be determined by an ITF-CEDR expert group.

The expert group would develop the data collection concept starting with greenfield projects first as that may be conceptually easier. Once that is achieved the group would also define the data collection

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<sup>2</sup> i.e. well-defined, specific, quantifiable, and available data

<sup>3</sup> i.e. consistent, stable, and up-to-date data

<sup>4</sup> i.e. measuring what they should, without errors

<sup>5</sup> i.e. robust in scope, reflecting variability



concept for brownfield projects. These project types may be available in greater numbers than greenfield projects but are also more complex to treat.

If interested to find out more or to participate please contact:

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