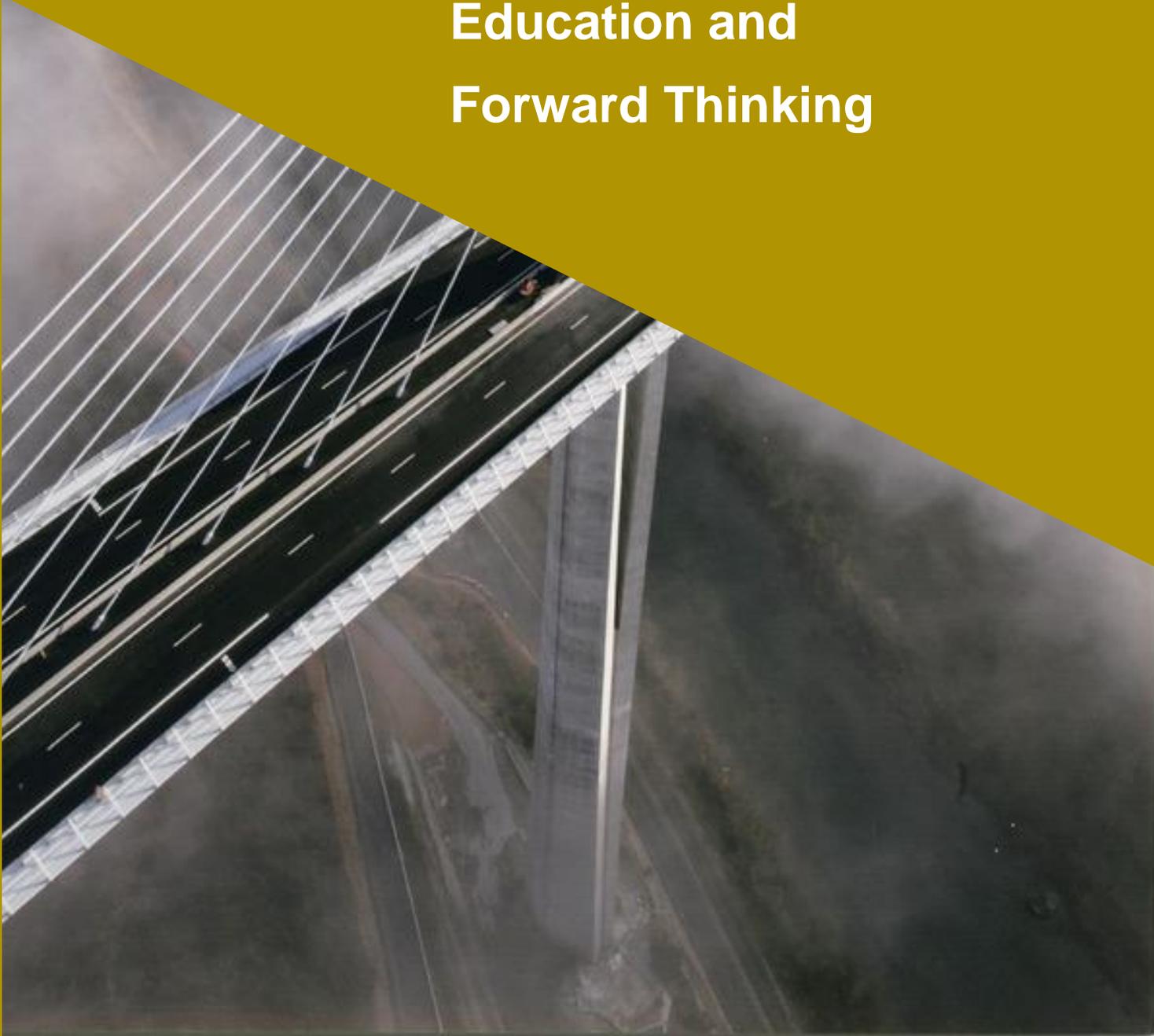


Project Mandate

Education and
Forward Thinking



Contents

What are you trying to do?	2
How is it done today, and what are the limits of current practice?	2
What's new in your approach and why do you think it will be successful?	2
Who cares? If you're successful what difference will it make?	2
What are the risks and the payoffs?	3
How much will it cost?	3
How long will it take?	3
What are the preliminary and final exams to check for success?	4

What are you trying to do?

Engineering is changing as new challenges are arising for engineers particularly in the urban environment and smart cities. Therefore, it is necessary to consider what new skills and techniques will be required to move forward and provide engineers with the requisite skills and resources. This requires to determine what education is required for engineers to develop skills beyond traditional engineering.

Urban engineering requires additional skills to shape the physical setting for life in cities.

How is it done today, and what are the limits of current practice?

There are currently over 7 billion people living on this planet, with about half living in cities. By 2050 we expect this to have risen to 70%. This urban living creates new challenges and we need skilled engineers with the ability to deal with these new challenges. Current training is targeted at traditional practice placed within core engineering subjects, but urban engineering requires new, additional techniques and skills. We need to be able to think ahead and plan for the future. In order to do this, we need engineers who can think beyond traditional boundaries and who embrace collaborative work outside the traditional silos, considering not only the built form but also the hidden infrastructure.

What's new in your approach and why do you think it will be successful?

This new approach looks to add to normal civil engineering skills and add extra skills for urban engineering addressing how we interact with the world, our environment, and society. To achieve success the approach will also consider the whole concept and address the needs of those that design and implement proposals along with the aspirations of the end users. The key is to upskill engineers, and other professions involved in urban engineering, to think outside traditional silos and embrace the new challenges lying ahead as a result of environmental and anthropogenic changes.

Who cares? If you're successful what difference will it make?

With more and more people living in cities it is essential for city dwellers that their needs are addressed at an early stage being mindful of future changes to ensure that they do not become issues. Engineers need to be able to deal with modern challenges within cities, which are more complex than traditional engineering challenges and embrace a range of different disciplines which go beyond engineering itself. Additional training will allow engineers to address these issues

with an understanding of *how* to address the challenges of urban living covering traditional municipal engineering skills such as housing, delivery of resources, waste, sustainability, and sustainable development of infrastructure below and above the ground surface.

Training will need to be implemented not only for engineers at the beginning of their career but also for those who have been chartered for some time as well as those in other disciplines such as urban designers.

What are the risks and the payoffs?

The process involves two stages: First, an identification of missing skills is needed and then secondly a means of training engineers in these skills needs to be developed. There are few risks in the first identification stage. The biggest risk is that having identified a skills gap it is not followed up. There may also be a risk not to compromise a traditional engineering education, which is also vital to provide the necessary underlying knowledge and allow engineers to be receptive to the new skills.

The payoffs are that civil engineers will learn new skills and techniques as well as identifying new resources which bring huge benefits to those who live in the urban environment.

How much will it cost?

Costs will be minimal in the identification stage where skills gaps are identified. This will be an exercise which will be undertaken by the Municipal Engineering Panel (MEP) within the ICE. The MEP, through its broad knowledge of municipal engineering, is uniquely qualified within the ICE to carry out this task.

How long will it take?

The Municipal Engineering Panel would expect to complete this identification stage within a year. The means of training civil engineers in the required skills will be more complex and various training methods will also need to be identified within this timescale. However, the implementation of these new training methods will take longer and require to be delivered through a number of different approaches. It is likely that this will take another 1 to 2 years to implement. In the longer term it might also be necessary to implement some of the proposed training within Higher Education institutions, which can be driven through the Joint Board of Moderator's accreditation processes, but will take time to implement across all institutions due to the accreditation cycles.

What are the preliminary and final exams to check for success?

It is likely that the training methods implemented will use a mix of formal and informal techniques. The formal training will involve final examinations to prove competence and the informal training will involve a level of self checking as the process continues to demonstrate that the lessons have been learnt.

Our vision

Civil engineers at the heart of society, delivering sustainable development through knowledge, skills and professional expertise.

Core purpose

- To develop and qualify professionals engaged in civil engineering
- To exchange knowledge and best practice for the creation of a sustainable and built environment
- To promote our contribution to society worldwide

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