The authors of this chapter are civil engineers who have lived and worked on many continents and have had particular experience of civil engineering megaprojects. By counting “project countries,” meaning countries where they have had some involvement on projects without being fully resident, it is fair to say that they have had some experience of the way things work in well over 30 different countries. The views and opinions expressed in this chapter are therefore those absorbed from personal familiarity based on a combined professional working experience of some 60 years. As such, they may be considered subjective, but nevertheless the writers feel that the sharing of these views can only be helpful to those considering embarking on a megaproject outside of the United States.

What Cannot Be Exported Overseas

The first thing to understand is that the experience from one location cannot necessarily be directly translated and used in a new location. There are many issues to consider that may or may not be unique to a particular country. The main issues can be categorized under the following headings:

- Political issues
- Cultural issues
- Labor custom and practice
- Finance processes
- Procurement processes
- Legal issues (which include custom and practice on styles of contract as well as what the authors call “enabling legislation”)

Political Issues

Political issues cover the style and system of government at both national and lower levels and how these different levels interact and work in practice. Other chapters in this volume have explained that a full democracy may perhaps create the most difficult...
climate for getting things done. A good comparison here of the typical extremes might be the United States versus Singapore. In the United States we find there are not only state and federal governments to be dealt with but also city and county rules and regulations. The political path to project completion is a maze of obstacles from conception of the idea onward. Any single project may have politicians at up to six layers of elected bureaucracy to deal with and from differing political parties, each with his or her own interests. This is not a recipe for rapid and objective decision-making. Conversely in Singapore, working with a single level of government means that things can get done and get done quickly and there will not be layers of government with conflicting requirements. The contrast in time from inception to construction of large projects in, for example, New York and Singapore can be explained in very large measure by the differing political environments.

Above all, one of the political essentials with respect to accommodating megaprojects is the degree of transparency within the system. This means, *inter alia*, having rules for procurement by the governments and their bureaucracies that are clearly understandable and publicly available. Absence of transparent mechanisms can lead to corruption, which is discussed further in the closing section of this chapter. Environments that promote a protectionist policy by introducing hurdles to prevent non-local participation are clearly directly responsible for cost increases to projects. The intent of favoring local industry is undoubtedly well-intentioned in terms of providing wealth and jobs, but once schemes reach megaproject proportions all bets of this type are off. Megaprojects by their very nature—and remembering they are usually a “one-off”—cannot be entirely serviced by local firms and local skills, and thus importing expertise and technology is a prerequisite. Trying to restrict out-of-town, out-of-state, or out-of-country competitors only encourages a closing of ranks, which often results in cartels forming to carve up the work and a failure to adopt the most appropriate technology. The sad result is that the public pays too much for the end facility and that facility may not be as good as it could have been.

The same is true for specifications and supply rules that prevent foreign products from being incorporated. The “Buy America” legislation is an example of a political policy which can prevent the American public from enjoying the benefits of overseas development in certain technical areas of expertise, and it can also result in the public paying more than necessary for the end product.

**Cultural Issues**

Cultural issues comprise a very deep subject. They embrace the psyche of a nation or people, and in some societies there are different cultural groups with different feelings and aspirations that need to be accommodated in the planning of the project. One of
the most elemental issues is the extent to which a people or nation can accept the benefits of the many against the disbenefits of the few, which in turn impinges on issues such as individual rights and the importance they are given in the big picture. For example, in the United States the right to own property is a fundamental precept with links back to Colonial and Revolutionary days. This makes the implementation of the “eminent domain” principle far more difficult than in most other countries. Further, the history of the abuse of eminent domain has made public opinion support the individual’s rights even more strongly. The other extreme of this issue might be found in a country like Italy, which permits project-enabling legislation to allow the compulsory acquisition of real estate to fit the project schedule — the difference in the Italian model being that if a property owner feels he has been unfairly compensated, his claim is dealt with after the acquisition. Some countries have reached compromise methods between these two extremes. For example, the Hong Kong Special Administrative Region has a history of the government or a quasi-government project promoter negotiating compensation payments with building owners, resulting in payments that many have considered to be above market rate. Thus, by making property owners more than happy, the projects proceeded on time or ahead of schedule and consequently were completed within the overall budget.

Other important elements are project statutory approval processes and the requirements for consultation. The ability of the public to question and protest plans is long enshrined in many democracies, although the extent of this consultation and the speed of the process vary significantly. For example, the United Kingdom’s Public Inquiry system for major projects is similar in many ways to a court procedure, with an Inspector (the “Judge”) presiding over an inquiry closely resembling a court of law and with proponents and opponents lined up on either side with their respective lawyers. The process can be extremely lengthy in hearing all the “evidence” for and against the proposed project before the Inspector reaches a decision. In fact, although this gives the public (and particularly opponents to the scheme) a fair opportunity to be heard, it is widely acknowledged that the process has become too lengthy, time consuming, and costly.

The public’s attitude to development, change, environmental impact, and big business are all fundamental to how a project will be perceived. The acceptance of projects and the ability of the public to protest in an influential way can have a significant impact on the speed and success of any large project. A culture of protest, rather than simply accepting the imposition of change, can frequently influence the outcome. In many Western nations there has grown a strong environmental lobby that opposes megaprojects, which are seen as having negative environmental impacts or as promoting the interests of “Big Business.” Making rational and objective decisions on the project benefits and the handling of environmental impacts can often become mired in irrational debate.
Labor Custom and Practice

Although labor custom and practice may be considered a subset of “cultural issues,” it deserves a special heading because of its overwhelming importance. Megaprojects require mega-labor forces. This includes not only the various levels of construction workers, from unskilled labor to highly skilled craftsmen, but also the layers of professional staff necessary for design and implementation. For most territories the days of labor abuse, thank goodness, are long gone. It is important that the training and, if necessary, importation of labor and professional staff to be planned. Successful projects in the modern world rely on a well-trained and happy labor force. Putting arrangements in place that give this result requires an understanding of the local practice and customs as well as knowledge of available skills. This applies whether “union shops” are operated or not, though a history and a custom of a labor force capable and willing to multitask, rather than needing individual workers for individual tasks (demarcation), has a significant impact on the type and size of workforce required.

Many arrangements for certain trades or skills have evolved over history. A good example of this evolution, because of the linear nature of tunneling, is that of tunnel miners. Tunnel miners need skills involving both brawn and brain. The key issue is that tunnel projects can proceed no faster than the face mining. This would seem to give the miners a position of complete power in terms of wage negotiations, and hence tunnel workers are indeed usually well paid. The traditional structure that has developed in almost all countries of the world (but notably not in all of the United States) is for miners to work on a target-bonus system. In such a system, it is imperative to set the progress targets fairly so that the base wage rate (paid when targets are not met) provides a sufficient living income and that bonuses (paid when daily or weekly targets are met or exceeded) provide extra money which the individuals perceive is well worthwhile for them to make. The gang has to work as a team to earn the bonuses, which means the “leading miner” has to control, supervise, and discipline his own gang to make sure everyone gets the bonus benefits; slackers will soon get dropped from his team. By setting targets and bonuses correctly, it is usually possible to optimize progress to match the capabilities of the available plant and equipment. Fixing a problem that is delaying production becomes everyone’s problem. Contrast this to a fixed-wage agreement where there is no incentive for a miner to achieve a higher output level. In fact, the reverse is true: the longer the project lasts, the longer the miner will be employed at that same location. In this example, a fixed-wage agreement becomes a disincentive to progress.

It is important to understand the various trades, skills, and professions that will be required for a project, as well as their history and the local labor law context. To this must be added an understanding of the current market for those trades, skills, and professions and whatever mechanisms for training a new labor pool or importing the skills...
that are available and could be made to work in the particular locality. When training is deemed necessary, the source of the new recruit trainees must also be identified. For example, there might be a local smelting plant scheduled to close or perhaps one closing in a nearby town. Maybe the local sea is “fished out” and fishermen are desperate to find alternative sources of income. In all cases, it is necessary to think about available accommodation where an influx of people is required. For remote locations, this may mean building a “construction town” that provides family facilities. The whole of this process takes detailed planning, and promoters usually understand well that resourcing the people for a project is basic. It is important for project promoters to get their governments to understand this also, and they usually do. For example, labor and immigration departments may need to have regulations changed by legislation to facilitate an influx of foreign workers.

Lastly, the understanding of labor custom and practice goes hand in hand with project estimating. International price benchmarking is frequently recommended for megaprojects. However, it is usually the case that the labor element within a project is large. If the manning levels used internationally do not translate to the specific country, then the benchmark estimates will need to be modified. For example, as a result of existing union agreements covering the eastern seaboard area of the United States, underground construction employs approximately four times the number of personnel as in similar jobs in Asia, Australia, or Europe. Obviously, therefore, an international benchmark price for a tunnel from those continents cannot be used as a comparison for underground work in New York. The authors are proponents (particularly in countries with a strong trades union establishment) of negotiating project wage agreements with unions and trade organizations. Setting in advance the wage level mechanisms and, if possible, such things as strike-prevention measures will give a far more reliable project cost estimate. If undertaken professionally by all those involved, a project wage agreement can eliminate practices that may have become outdated or inapplicable for a megaproject.

Finance Processes, Procurement Processes, and Legal issues

These three categories are dealt with at length in other chapters of this volume and so will not be discussed in detail here. The important issue in all cases is always to “think local” and not to try to impose a model used in another country when that model does not fit the local circumstances. Some countries have unique ways of doing things while others use approaches that are common, or at least similar, to a group of countries sharing a related culture. The history of “common country groups” often goes back to the days of a colonizing power and its legacy of legal, commercial, and linguistic frameworks. For example, French-speaking countries will often share ways that are based on Napoleonic
standards, and Spanish-speaking countries will likewise share their own commonalities, which well pre-date modern day Spain. Of course, the situation gets more complicated when a megaproject crosses country borders, which is often the case. This sometimes requires new sets of rules to be created specifically for the project, rules that need to be compatible or acceptable within the existing frameworks of the different countries. Labor and immigration law issues frequently require governments to pass new legislation. For everything mentioned in this chapter, local knowledge and understanding are essential, and this means having local people within the project implementation team in senior positions.

The ability to acquire the real estate and property necessary for a project to proceed is clearly of fundamental importance, and differing legal frameworks and property rights can make this a key project risk. As stated previously, in democracies that highly value the rights of the individual property holder over the needs of the wider community, simply obtaining the property necessary for the project can become a long and involved process.

Obtaining statutory approvals and being able to remove any obstructions, such as utilities, is fundamental to maintaining the progress of any project; but for megaprojects, the risks can be enormous when parties with no intrinsic interest in the project are involved. In countries where utilities are state owned or heavily regulated, the facilitating work may be relatively straightforward. This is particularly the case where the government or the utility owner is the project sponsor. In countries where the utilities are owned by private companies, the ability to have these companies engage in the project may be severely limited. A particularly stubborn or slow-moving utility company can seriously delay a project or may even hold an owner to ransom.

What Must Be Exported Overseas

Conversely, there are some universal rules that not only cross boundaries but are required fundamentals in all locations. The two most important are:

- “Time is money.”
- “Quality endures long after price is forgotten.”

Time Is Money

This old adage would seem to be a statement of the ever-so-obvious. Yet on megaprojects the authors have found that time and again this simple rule gets overlooked in the fog of huge organizations and project teams. Earlier chapters make reference to the infamy of megaproject time and budget overruns. We believe that the budget overruns are almost always the outcome of the time overruns.
An issue that frequently gets lost in both the analysis and the outturn sums is that “the project” is not simply the construction phase or construction contracts. “The project” is something that starts with a dream, moves to an idea, and then usually progresses to a feasibility study. Even after that point, “the project” is still a very long way from the building stage. Options have to be priced, conceptual designs developed, detailed designs worked up, and contract documents drafted long before procurement processes can be started. This whole incubation stage costs money. The longer it takes, the more it costs. The longer it takes, the higher will be the bids when contracts eventually reach the street. This is the outcome of the way world economies work on a continuing inflationary basis. So all delays, even before any contracts are let, result in the owner (and that usually means, ultimately the public) paying more dollars. Every time a decision is delayed, at every stage and for whatever reason, the price goes up. Every time a previous decision is rescinded and changes are made, the price goes up. The key to delivering a megaproject within budget (and there actually are examples of this happening) can be summed up in one word: speed.

As the project moves through its various stages, the cost of every week of delay rises on an exponential curve. The delays late in construction, or worse, after construction (such as in the commissioning stage of a railway), are hugely expensive. Usually in the final reckoning, true cost increases are neither calculated nor revealed: the true cost increase, of course, would include the unavailability of the facility for public use, which means the additional costs incurred, for example, in people’s travel times or for using alternative facilities.

The trick is to spend a good deal of money wisely in the early days. This should include things such as real estate acquisition and utility diversions. Putting off getting the land for work sites or buying the buildings that need clearing does not save money. In the final reckoning, delaying the acquisition costs more money than the real estate costs alone, because delayed acquisitions usually result in delay to the construction work itself, and the costs of construction delays are dear. This is difficult to explain to budget holders when there is no overall budgetary link, and this is also why a single organization should be made responsible for realizing the project. Unfortunately, because of the processes required for large infrastructure spending in the United States (budgets coming from different purses, an ROD, or record of decision, being needed before the real spending starts), the recommended seamless approach is not usually possible here. However, it has been achieved in other countries. As an illustration, it may be useful to compare two similar large projects with which the authors are familiar (see Table 1, next page).

The primary reason that the Hong Kong Island Line metro project was able to be built at this speed was that the entire planning cycle took cognizance of the “time is money” maxim by adopting the following principles:
1. The government had enacted enabling legislation (called “the Railways Ordinance”) years in advance. This legislation empowered the Mass Transit Railway Corporation (MTRC) to acquire whatever land was necessary for the project and fairly compensate owners. In most cases owners were more than happy with the compensation received.

2. The government enacted compressed-air working legislation years in advance after it was established by consultants that compressed-air mining would be the principal method required for tunnel construction.

3. The areas required for the project (mostly for the off-line stations) were identified at the concept stage before detailed design was started. This allowed the acquisition process to be started early so that all properties were acquired before construction contracts were put out for bids.

4. Previous lines had been constructed using cut-and-cover station boxes in the

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Table 1. A comparison of factors that affect subway construction in New York and Hong Kong.

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<tr>
<th>PROJECT 1 — Second Avenue Subway, New York City, USA</th>
<th>PROJECT 2 — Hong Kong Island Line, Hong Kong SAR</th>
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<td>This subway (metro, or underground urban railway) project has been divided into phases to suit funding requirements. The whole project is over 8 miles (13 km) long and will have 16 stations and the publicized estimated cost was about $16 billion. The project has been split into four phases and the construction contract mentioned here is in the first phase. The first phase is therefore only about 2 miles (3.2 km) long with only 4 new stations and connection to an existing station. The authors have been working on this project for over six years and the first construction contract for Phase 1 (tunnel boring) was let in March 2007. At the time of writing (2009, that is, two years after contract award) tunneling has not yet started.</td>
<td>This similar metro project was also about 8 miles long having 12 stations. The design consultancy was let in December 1980 with design work starting in January 1981. The first trains were carrying passengers in May 1985, that is, less than four and a half years after the detailed design was awarded. The project was completed within the budget. Both projects are in complex and dense cities, but this project was far more technically challenging with more congested (narrower) streets and difficult granular soil below the water table. This required open-faced shields (pressure tunnel boring machines were still in their infancy) for compressed-air mining in up to 3.5 bars pressure. Extensive chemical ground treatment was also required.</td>
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main roads. This had caused immense disruption, and the public had been outraged by the inconvenience caused. The entire concept was changed for this new railway so as to minimize taking space in the streets and largely to do away with cut-and-cover construction in the road. This was achieved by siting stations “off-line” (that is, to one or other side of the running tunnels) in city blocks. The areas needed were created by demolishing acquired buildings. Deep basements were built on the demolished sites and these became the station concourses, linked to the platform tunnels by hand-mined passenger adits. Each concourse basement was topped by a thick, heavily reinforced transfer slab that was capable of supporting practically any design of high-rise building. The MTRC subsequently built tower blocks atop these slabs, and the revenue generated from this real estate financed the entire railway.

5. Obviously, some street shafts were required for launching the tunneling shields, and the locations for these, as well as the boundaries for each individual contract, were finalized at the concept stage. This allowed the street shafts to be designed in the first few months, and let and built as advanced contracts while the remainder of the designs was being completed.

6. Utility diversions were also negotiated in advance and let and completed in those first few months.

7. The design consultants had extensive local experience and were able to specify in detail the method to be used for ground treatment areas. This had to be carried out from the surface to start and complete the compressed-air soft-ground tunnel drives, to protect fragile buildings, to construct sumps and cross-passages, and so on. Deviations from the specified approaches were not allowed.

8. Similarly, ground treatment to be carried out underground for junctioning compressed-air work was specified in detail (sodium silicate and bentonite-cement grouting combinations), and deviations from what was shown on the drawings were not permitted.

9. Trucking of spoils was allowed only at night so as not to interrupt the regular traffic on the already highly congested streets. This meant daytime stockpiling (tunneling projects are nearly always worked on a continuous 24-hour basis for safety reasons). Where necessary, work sites were decked to make multilevel space available in the restricted ground areas acquired.

10. The savvy contractors mitigated complaints and objections by liberal use of cash and by promptly fixing any damage caused to private property. For example, on one station where the top of a mountain had to be demolished with explosives, many building windows were broken as a result of the thousands of blast rounds fired. By replacing all damaged windows with superior quality double-glazed units on the same day that a breakage occurred, and even paying disgruntled residents
additional money “for their trouble” where it appeared appropriate, there were no work interruptions and no legal actions started.

No matter where a project is in the world, the enemy is always time. Lost time can hardly ever be recovered. When acceleration processes do recover some time, it always comes at a premium cost. The primary reasons that megaproject outturn costs become so high are that insufficient attention to detail is spent in the planning and concept stages and owners do not stick with the decisions made in those stages. For example, it is always too late to leave property acquisitions and utility diversions to the detailed design stage. Every “repackaging” iteration at the design stage (which is a frequent occurrence in large projects) causes delay and increases costs. Contract packaging and the contract boundaries need to be finalized at the concept stage and fully adhered to in the following stages. Packaging changes interfere with concept principles and cause a cascade of future problems.

Quality Endures Long After Price Is Forgotten

Most megaprojects are about constructing facilities for the public benefit that have to last a very long time. No one driving over a 200-year-old bridge that was originally designed for horse traffic will be dismayed to learn that the bridge’s reconstruction to accommodate modern traffic went over budget. Yet this budgetary control is what we tend to concentrate our efforts on in modern times. Even more important to remember is the lifetime cost of maintaining the facility. Skimping on small elements to save capital budget can result in maintenance spending that swamps the savings. This old maxim remains valid today and has to be taken in conjunction with the “time is money” adage. This is particularly true for moving and wearing parts of machinery, for finishes in public areas, and for most electrical and mechanical elements, which usually have to endure for longer than the originally specified design life. On many big projects there will be research undertaken and committee meetings held to decide on something basic, such as what paint or finishes should be applied to walls in public areas, and the ranking often revolves around the capital cost. Imagine having a tooth filled at the dentist: the patient expects the filling to last a very long time and does not ask the dentist, “Do you have anything cheaper?” The situations are exactly comparable. Even when the rankings are done correctly and the lifetime maintenance is factored in, an absurd decision can still be made because the owner’s representative only has direct control of the capital budget. The paradox is that the process of making these decisions consumes time — and remember that the time-and-money curve has an exponential form. So choosing plain steel washers over stainless steel, for example, may actually cost more (even if that decision time takes only one day) than selecting stainless at the
outset. In reality, decision times for components and products usually take a lot longer than a day. Thus, for expensive elements, such as escalators in a rail station, there is little point in wasting thousands of man-hours deciding what to specify. The product with the highest specification is probably the cheapest overall, and making that decision quickly can give the discount in time savings that actually pays for the superior product. Designers and project promoters have a duty to future generations and this duty should not be taken lightly.

**Corruption**

The closing section of this chapter briefly addresses a worldwide issue that is the cause of much wasted funding from governments, lending banks, and ultimately the general public. Corruption is something that consistently seems to creep into megaprojects and becomes one of the major reasons for budget explosions. Once corruption is allowed to occur it becomes insidious and begets corruption at further levels. Inevitably, if the corruption starts at the highest level, such as in countries where a ruler or minister or politician requests a “facility fee” for awarding a contract, it cascades down to the lowest level and some form of bribery or kickback pervades all activities. There is no substitute for maintaining a high ethical standard, and excuses such as “That’s the way business is done here” do not need to be tolerated. The authors’ view is that it is better to walk away and let someone else play that game: there is sufficient work available in the world for those who wish to live with principles of decency and fairness.

There is a wealth of literature relating to corruption on public projects. One of the best summaries with respect to the high-level issue of the procurement process itself is the Norwegian report “Corruption in Public Procurement; Causes, Consequences and Cures,” by Tina Sørjede (Bergen, Nor.: Chr. Michelsen Institute, 2002). This report distinguishes between political or high-level corruption and administrative or bureaucratic corruption. It points out that in countries with a fully corrupt system the contract is awarded to the best briber, not the company best experienced or equipped to do the work. It further makes reference to the Organisation for Economic Co-operation and Development’s year 2000 recommendations (No Longer Business As Usual: Fighting Bribery and Corruption, Paris: OECD, 2000). Here, OECD recommends what it calls a “white list” approach. Companies self-certifying that they comply with all antibribery laws can get their names put on an approval list. In the event that any audit or other inspection reveals their certifying statements are false, their contracts become automatically terminated and their names struck off the list. Sørjede goes on to make certain recommendations for strategies to combat procurement corruption. Below in paraphrased (and sometimes amplified) form is a numbered list of what we view as the top ten recommendations from the OECD report.
1. An independent procurement unit with professional, knowledgeable, and adequately paid officials should be established.
2. Rotation of officials responsible for procurement should be considered.
3. Access to information is of primary importance in the bidding process.
4. Procurement rules must be clear and simple.
5. Performance or quality ratings must form a part of the assessment process.
6. Separating bid assessments into technical and financial evaluations using different panels of people is strongly recommended. Thus a “two-envelope” system is preferred.
7. A high number of bidders is no assurance of a competitive result and does not ensure a clean process, especially where local, state, or national market protection rules are applied. International bids need to be facilitated and encouraged for megaprojects. This may mean modifying a traditional procurement process so it becomes tailored to accommodate international bidders.
8. The period allowed to submit bids must be reasonable and adequate for bidders to undertake the work and should not be skewed by public holidays. Where multiple contracts are to be let, or coexistent projects have overlapping schedules, procurement agencies and/or their subgroups need to cooperate to ensure that bid intervals do not overlap.
9. There must be strict adherence to the time limits set for submittals and also for assessments, decisions, and awards.
10. Rules and routines for communication during the bidding process need to be set and enforced.

However, the direct form of corruption in procurement is not the only type of corruption that is seen on large projects. Some forms of corruption are more subtle and less easy to walk away from because they are culturally ingrained and need not directly involve the foreign backer, contractor, or individual worker. For example, there are many places where the “conflict of interest” principle does not seem to apply. In such locations one might find that the same academic is working as a consultant to a government, a contractor, and a designer on the same project. When working in these circumstances, it may not be necessary for the U.S. company or individuals to discard their own ethical standards. In such situations, having a required person on the payroll need not compromise making the right decisions. Nevertheless, this practice and the use of compulsory “agents” and middlemen needs to be handled very carefully to ensure it does not develop into something worse.

Other forms of corruption are even less obvious. For example, one country has a method of bidding contracts where the bidder has to put a discount percentage against a number of standard government unit price rates. In a tunnel job, the bid calculation
is based on the bid quantities, but it is recognized that quantities will change, especially for initial steel supports such as arch ribs and rockbolts. However, payment is made on an admeasurement basis. The highest discounter wins the contract but then has to design the initial support for which he has safety responsibility. Normally the contractor subrogates this responsibility to a design consultant. The design consultant gets paid as a percentage of construction payments. Thus, why should the designer produce an economic design? He is incentivized to overdesign, eliminate risk, and maximize fee. This might result in double the tonnage of steel being used. The contractor does not object, as he gets paid by the ton and so is able to increase his own profit. Thus the public gets duped out of millions of dollars.

Somewhat more malicious is the falsification of quality, testing procedures, or inspections and verifications. Stories abound of steel rebar being removed after inspection to be refixed in the next concrete pour. Another popular legend exists of a place where concrete test cubes could be bought at a market stall as substitutes for the real samples that go to the testing laboratory. In a similar vein is the diluting of concrete mixes or the falsification of batch labels on delivered materials. Unfortunately, the increasing trend of “self-certification” allows these practices to be perpetrated, and random sample quality checks can never substitute for full-time independent inspectors. In general terms, the less sophisticated the country, the more stringent the testing process needs to be, and the old style of contract, where the engineer from the design firm actually administers the construction contract with his own team of staff, still works best.

Closer to home, corruption takes many more twists. Vested interests, pork-barrel politics, and plain vanity from politicians who wish to add their name to a bridge or road before they die result in much wastage of public funds. Unfortunately the complexity of approvals and funding for public infrastructure makes the audit trail difficult to follow and makes controls hard to enforce. In such cases the benefit of the many gets brushed aside for the benefit of the few — the few being those who walk the corridors of power.

**Conclusions**

All countries have their own way of doing things and it is wrong to believe that outside experience may easily be adopted to “improve” the in-country methods. For this reason it is necessary to be very wary of “international benchmarking,” especially when this is of a financial nature. While it may be true that lessons learned elsewhere could improve designs, procurements, and construction contracts, the existing cultural, political, and legislative frameworks may not allow necessary modifications to existing practices that would allow such changes. That is not to say that governments should not look to methods used elsewhere in order to consider making political and legislative changes where clearly these might lead to a better enabling structure for a megaproject.
Indeed, the authors encourage such an approach, but only those in positions of authority or power are able to make such changes — and even they will have some limitations.

On the other hand, there are some golden rules that apply everywhere when it comes to giving the public value for money. The most important of these is that “time is money.” Any approaches that are able to shorten the whole life cycle of a project from feasibility to commissioning will result in lower cost. A “time is money” point of view needs to be instilled in both governments and owner agencies in order to benefit the public purse. Agency staff need to be trained to understand the cost of indecision and backtracking on previous decisions. There are examples in the world of big projects that do not exceed original budgets, and usually these exist where the culture of “sticking with the plan” is inherent within the owner or client organization.