

Public-Private Partnerships

The International Experience

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PROJECT CONCEPTION TO PROJECT DELIVERY: WHAT IS DIFFERENT OVERSEAS, AND WHY

Henry Michel

In the next decade, trillions of dollars will be spent worldwide on public infrastructure projects, including transportation, public service and utilities, and environmental restoration. For the governments and the developers who plan and build these projects, the challenges are formidable: to provide the greatest benefits to the people while saving time and money and controlling and minimizing all manner of risk.

It is critical that those megaprojects use the most advanced technologies; meet political, environmental, socioeconomic, and cultural demands; and stand the test of time. This requires strategic advice, planning, and analysis early in the life of the project to avoid costly mistakes and to set the stage for long-range success. Today I would like to discuss the following prerequisites in some detail: an understanding of the big picture, the step-by-step analysis that supports early planning efforts, and the analytics of the actual planning process. Then I would like to close my remarks with some lessons learned and actual case studies.

An understanding of the big picture is essential to successful project development and funding. Unfortunately, this preplanning stage is where many projects suffer from insufficient care and attention. Understanding the big picture requires at least three things. First, it requires a determination to understand

all of the project sponsor's stated and hidden goals and to reconcile possible conflicts among them. Second, one needs to have a thorough understanding of all project components. These include the basics—like planning, engineering, procurement, and construction—and a few more esoteric areas, including technology, environment, socioeconomic and cultural impacts, and, of course, the politics of the situation. Financing is certainly important. It is also important to understand delivery systems and management of the process and the facility. Third, one needs to be aware of which options are immediately available and those that demand a bit more creativity. Equally important, most infrastructure projects need to be workable parts of larger systems. It is within this broader perspective that the best choices can be made.

Obviously, each project is unique. In general, however, the project planning team can apply the following step-by-step approach to the analytic process. First, one identifies the economic, political, and social goals and addresses potential inconsistencies. Next, one assembles a team and develops viable alternative strategies to achieve these goals. And third, one arranges site visits, performs necessary research, and analyzes information on past financing of similar projects, technological alternatives, likely schedules and costs, environmental issues, political ramifications, socioeconomic impacts, possible improvements to the project elements, possible alternative revenue sources, and creative financing alternatives. The approach may not strike anyone as particularly creative or innovative, but this is only the basic data-gathering and preanalysis phase.

After this effort, actual planning takes place. This process is the key to reducing or mitigating the risks that are inherent in any project, but especially in the international arena. Despite its importance, this evaluation seldom is performed at the earliest stage of the project development process, when it is most needed. Another important point is that the early analysis should be undertaken by totally neutral and unbiased experts who have no interest in participating in any further elements of the project.

The analysis should consider the project from both project-specific and context-specific perspectives. Project-specific areas comprise technological, financial, contractual, and operational issues. Context-specific areas include political, socioeconomic, environmental, and cultural considerations. Proposed projects can then be rated and ranked on a risk basis such that the identified and potential risks can be mitigated, managed, and controlled by making modifications or even major changes to the intended project configuration before anything is cast in stone. This analysis can make the difference between a project's ultimate success or failure. Its results can translate into lower costs, faster construction, use of the latest technologies, and the ability to attract venture capital. The analytic results can also identify the need to cancel a project before valuable resources are expended, so you can readily see where the absence of any possible conflict of interest makes that option easier to recommend. The final steps for the analyst are then to draft alternatives, review them, prepare recommendations, and assist in developing implementation strategies.

A classic example of a conflict of interest can be found in the construction of the English Channel tunnel. It was, as you know, one of the largest engineering projects ever built and certainly one of the costliest. It was under study for hundreds of years and had been a pet project of Sir Winston Churchill in the early 1930s. In 1981, two British/French consortia were formed. One was the Trans-Manche Link, or TML, owned by five British and five French contractors, established to build the project. The other, the Channel Tunnel Group together with France Manche, or CTG/FM, was to be the owner/operator. Because of an extremely short time frame in which to present a proposal, the owner/operator had to depend on the builder for assistance in preparing the proposal, although it would also have to negotiate a construction contract with the same group. The short time frame and multiple players also meant that the banks would have to consider loans to a company in which they were to be shareholders and that the contractors would end up signing contracts with an entity that they controlled. Twelve years later, Euro-

tunnel, the shareholder company that succeeded CTG/FM as the owner/operator, took possession of the tunnel, and 4 years later it stopped paying interest on its \$8 billion debt. To learn more about this case, I refer you to a wonderful book: *The Chunnel*, by Drew Fetherston.

Examples closer to home abound. Two examples stand out in my home state of New York; each was profiled in the May-June 2000 issue of *American Heritage Magazine*. Both cases illustrate how politicians' concerns with reelection rather than profits lead to some decisions that are clearly based not on economics but on political advantage. One example concerns the World Trade Center Towers and the other the Erie Railroad. Let me focus on the latter. Now curiously, the Erie Railroad was the result of one of the best economic decisions ever made by the state of New York, the decision to build the Erie Canal. But to secure the support of legislators not benefiting from the canal, the governor had to promise them an avenue of their own, once the canal was finished, to be built with substantial aid from the state. When the charter was finally approved by the legislature in 1832, it virtually guaranteed an economic basket case. It established an independent corporation to build a railroad that would, upon completion, be the longest railroad in the world to run almost literally between nowhere and nowhere. What's more, the legislature required that the Erie have the unusual gauge of 6 feet and not connect with any out-of-state railroad. It ultimately cost a fortune in taxpayer dollars to bring the Erie up to modern standards—a good lesson in how not to run a railroad.

As a final example I would like to point to a project that is indeed benefiting from a proper prenatal analysis. We find this project in the Kingdom of Saudi Arabia, and the analysis resulted in a total reformatting of the approach to convert a problem into an opportunity. The original scope had called for a build-operate-transfer transportation program that included the financing of a national rail network. The project did not make sense economically until the analytic process incorporated the information that the northern part of the kingdom contained some of the greatest phosphate deposits in the world, which were, however, largely inaccessible. So how to solve the transportation access problem? Enlarge the concession area and increase the duration of the concession in return for the mining concessionaire's assistance in the financing of the rail system. This is a perfect example of transportation infrastructure projects needing to be workable parts of larger systems and how good analysis can make that happen.

PUBLIC-PRIVATE PARTNERSHIPS IN THE U.K. ROADS SECTOR

Philip Alexander

My firm has been advising the U.K. Highways Agency since 1994 on the creation and implementation of public-private partnerships. This is a new form of contract for the United Kingdom, and we are now beginning to extend it to maintenance and management of the highway network. I believe there is probably an option to use this approach in the United States as well.

The development of public-private partnerships in the United Kingdom dates back to the Private Finance Initiative (PFI) in 1993. The PFI started out with a transfer of estuarial crossings to the private sector, including the transfer of existing infrastructure across the Thames and Severn Rivers. Existing bridges or tunnels were concessioned off to the private sector in return for the private sector creating another asset alongside the existing one to create more capacity. The Channel Tunnel largely predates the PFI. In operational terms, it is a wonderful success. In financial terms, it has been very unsuccessful.

The PFI's focus on estuarial crossings ultimately led to use of the public-private model for road infrastructure as well. For example, the Birmingham Northern Relief Road will be the only real toll road in the United Kingdom—a facility where people actually pay cash. The concession was awarded in 1991, and the facility is scheduled to open in 2004—with the delay thanks to much resistance to new road building in the United Kingdom from so-called environmental protesters.

The United Kingdom has now used the PFI to fund prisons, hospitals, and education. The final element of the PFI that I should mention is the nation's trunk road network, which is funded through shadow tolls. Shadow tolls involve a government payment to a private operator largely on the basis of traffic volumes, so there is no real user-pays element here.

The new Labor government transformed the PFI into its Public-Private Partnership program (PPP) in 1997 and extended it to local authority services, courts, and defense infrastructure and equipment. We now have the private sector actually leasing out tanks and aircraft to the government. The London Underground is now in the process of semiprivatization, and privatized trunk road maintenance and new road construction are ongoing. One major initiative is a national strategic traffic control system that will cover the whole trunk road

network in England. The system will cope with incidents and traffic congestion from a single control center that transmits to variable message signs in about 1,200 locations around the country. The U.K. Highways Agency has just recently selected the preferred bidder, who is supported by Halcrow for real-time traffic simulation and communications.

To get a PPP or design, build, finance, and operate (DBFO) contract off the ground, you must consider a number of factors. Government attitude at all levels has to be right; you would be surprised at the number of different competing factions present in the public sector. Of course, some view the PPP approach as one where the private sector is taking over their jobs—which, in many cases, is exactly what happens.

Although there are a number of difficulties, you can overcome them. In some cases a legislative change is needed. Other times, if you can demonstrate persuasive value-for-money benefits, you can win over a lot of governmental hearts and minds. Also, you need to ensure the availability of public-sector funding for a long period of time—generally 30 years. This is because the private concessionaire must be assured that the public partner will still have the money to satisfy its end of the bargain after 30 years. Finally, there has to be a champion within the public sector to push something like this through.

Since 1994, the U.K. Highways Agency has awarded nine DBFO contracts. They cover nearly 250 km of new roads (mostly dual carriageway and motorways) and more than 900 km of existing trunk roads. The important thing to remember is that all of these remain as public roads; they do not become the property of the private sector.

Each contract includes core requirements that are totally nonnegotiable, not only for the first 3 years, say, or construction, but also for the 27 subsequent years of operations. For example, all projects must go through the United Kingdom's public inquiry process and comply with all statutory orders, environmental statements, and safety requirements. There are also so-called illustrative requirements, which are negotiable. The government provides certain specifications, design standards, and geometric alignments that lie within existing right-of-way.

The DBFO payment mechanism is fairly unusual. It is a payment by government to the operator of the road via a shadow toll. With a shadow toll, instead of the user paying the toll, the government pays the operator on a per-vehicle basis. Bidders for a DBFO contract may bid up to four different bands of toll value, depending on the class of vehicle and the numbers of vehicles, but the top

band must always include a zero toll. The reason is that if you have a zero toll above a certain traffic level, it caps the downside risk for government and caps the upside opportunity for the private sector. This ensures that the government knows what its absolute maximum price will be over this 30 years. We now recognize that the new emphasis on reducing traffic congestion demands a slightly different spin on the shadow toll concept. So the United Kingdom is now developing a newer payment mechanism based on lane availability rather than traffic levels. This is especially applicable to congested urban routes because concessionaires face no traffic risk in these areas and thus may have no incentive to keep the road up to standard. Under the lane availability mechanism, the public sector deducts payments for delays and actually charges the concessionaire for lane nonavailability if a significant defect—like a very big pothole—creates an inconvenience or impediment to a free flow of traffic.

There are remedies if a DBFO company does not comply with the contract. We issue penalty points, which, if they accumulate, become warning notices and lead to suspension of payments. If things really go awry, the public sector can impose additional monitoring, take control, and charge the DBFO company for its services. The bankers obviously take a very keen interest in the award of any penalty points because they can see their investment at risk. So they also tend to monitor the performance of DBFO contracts.

DBFOs are all about the allocation of risk. Within the PFI/PPP context in the United Kingdom, significant risks transfer to the private sector, including construction risk, traffic risk, latent defect risk on the existing infrastructure, and the risk inherent in handing back a facility after 30 years that still has a certain residual life left in it. The government retains some risk as well, including risk for planning delays, cases where the client changes its mind, and certain changes in law that could affect the enforceability of DBFO contracts. There are also some shared risks, including risks associated with protestor action—on one recent project, the cost of dealing with protestor action was more than £10 million (about \$15 million).

What are the benefits of the PFI process? It is supposed to give us innovation from the private sector and deliver a better value-for-money. I think technical innovation was actually fairly limited for the first eight contracts. There was much more financial innovation, including the use of privately financed bonds, which is very rare in the United Kingdom. As for value-for-money, we found that these contracts deliver something like a 12 to 17 percent improvement on the public-sector procurement cost. This finding derives from our running a public-sector comparator test. It is a bit complicated but I would be happy to discuss it later.

And what have we learned? First, it does take a long time to get one of these contracts in place: generally about 5 months for the bid and 6 months for the negotiations. Also, the process is expensive; bidders can spend £2 million or £3 million, or \$5 million to \$6 million. The government incurs cost as well because it has to pay advisors like ourselves. Next, we are changing the payment mechanism to better reflect new government transport policy. The new approach aims to transfer a broader spectrum of responsibilities and will yield more revenue to the concessionaires for things like implementing safety enhancements—so long as they perform. In sum, the results really are no worse than those of conventional procurement, and in many cases they are quite a bit better.

As for the future, two more DBFO projects are being considered by the national government. Many local highway authorities are considering them as well, but these governments tend to be quite strapped for cash. Future procurements for highway maintenance will undoubtedly consider the PPP approach. Also, future payment mechanisms will be geared more toward rewarding performance rather than increased traffic volumes, and we are currently developing maintenance performance specifications that can be linked to the payment mechanism.

In terms of furthering technical innovation, one barrier is that in the United Kingdom, government tends to take the project through the planning process, leaving DBFO concessionaires with very little opportunity to innovate. Restructuring the planning process to encourage innovation will be the major challenge for us in the next generation of DBFO contracts.

FINANCING ROAD AND RAIL PROJECTS— AN INTERNATIONAL PERSPECTIVE

Jim McMeckan

Looking to some recent international experience, the rationale for private-sector investment and management in the road and rail sectors, I believe, is persuasive. The advantages include shorter delivery time for new projects, reduced construction and operating costs, a transfer of risk away from the public sector, preservation of scarce public capital, and lower financing costs thanks to innovative structuring decisions. However, I emphasize that to achieve these benefits, the structure of the concession must be commercially sound. I think we can all recall projects or concessions that have not achieved those objectives;

most often the underlying reason is that the structure was not commercially sound at the outset.

Privately funded toll roads are on the rise in Australia, and I want to talk briefly about one case study that involves the Melbourne City Link project. It connects three freeways that were built in the 1960s and 1970s, and the cost of the project was about U.S. \$1 billion. This facility is now partially opened and will carry about 175,000 vehicles per day. It is fully electronically tolled at 100 km/h—no toll booths. The government funded the acquisition of the right-of-way. Construction was privately funded with a range of equity, senior debt, and junior debt instruments. The project is listed as an equity investment on the Australian stock exchange, and it is currently trading at a premium of 320 percent from when it was listed at preconstruction in 1996. An operating joint venture will maintain the facility throughout a 34-year concession period.

Similar techniques are becoming more common internationally, and I will just give a few examples where Macquarie is involved. A U.S. \$200 million tunnel in Rostock, Germany, is the first private toll road in Germany. The Midland Expressway, otherwise known as the Birmingham Northern Relief Road, at about U.S. \$900 million, is probably the largest public construction project going on in the United Kingdom at this time. And there is the South African highway that will extend from Johannesburg to Maputo.

What are some of the lessons shown from these private tollway projects? First, we have seen that a commercially sound business plan is essential. Second, education of the financial markets is a gradual process; a surprising number are relatively unfamiliar with these types of investments. We see a great appetite for this kind of investment across a range of institutional capital sources, but it will take time to do the necessary education. Third, a competitive tendering process for these concessions can achieve better-than-expected outcomes. In many jurisdictions the competitive process has been very fierce, and the benefit of that ultimately comes through to the customer. Fourth, thoughtful financial structuring can significantly enhance financial returns. Many of the assets we have been talking about here are relatively low risk, and establishing the right repayment structures and so forth can achieve cost-effective financial arrangements. Fifth, a comprehensive communication program with customers and the wider community is vital; you cannot just come into a community with a major project and expect it to fly through. Finally, an experienced developer is essential. A lot of people would like to get these projects going, but a lot have also learned the hard way that many projects never make it through to financial close.

I would like to spend some time now on the public transport sector. My remarks will focus on a new

public-private partnership program in Australia's state of Victoria. I have been involved in this effort for the last 3 years. Many assume that public transport is a loss-making business: how could you ever see the private sector being interested in that? Well, here is how we have seen it happen.

Victoria is in the southeast corner of Australia. It is our second-most populous state, with 4.6 million people. The capital is Melbourne, with 3.3 million people. The state's credit rating is now triple-A, after a drop to single-A in the early 1990s due to a very large debt program. We are one of very few jurisdictions that have been able to regain a triple-A rating from Moody's.

Here is some background on the public transport sector. Victoria's metropolitan train network includes 12 lines covering 360-odd route-km; it carries about 300,000 passengers per day. The rural passenger network covers 1100 km and has a relatively small ridership of 25,000 per day. There's also a metropolitan tramway system of 240 km, which probably makes it the third- or fourth-largest tramway system in the world. Melbourne was one of the few cities that did not throw out its tramway system in the 1950s and 1960s, and today it carries about 300,000 passengers per day. The rural freight operation is rather extensive, but not of particularly high volume: about 7.5 million tonnes annually. A metropolitan bus operation is the final leg of the system; it carries about 300,000 passengers per day. So, in the Melbourne metropolitan area, there are about 1 million people using public transport each day. Still, as in the United States, the automobile is the dominant mode of choice. Public transport accounts for about 7 percent of trips across the whole of the Melbourne metropolitan area. It is very much focused on the central area, where the mode share for public transport is around 45 percent.

The whole operation, before 1998, was completely owned and operated by the Public Transport Corporation of Victoria, which was a government instrumentality. In 1998, the state undertook the Rail Reform Program. This program seeks to stimulate demand, which in turn is expected to lead to higher revenues and lower costs, and thus an operating surplus, which would then lead to the ability to provide more attractive services and a better deal for the public: in all, a virtuous circle, if you will. We will see over the next 15 years whether this virtuous circle comes into existence; as of today, we are 1 year into the program.

The Railroad Reform Program had quite a complex, nonexclusive set of objectives: to improve the quality of services for the customer, increase ridership, lower the long-term cost to taxpayers, maintain safety, and transfer significant risk to the private sector. This last one is very important and centers on an allocation that targets risk to those best able to handle it.

In July 1998, the state's monolithic rail operation was broken into six businesses: two metropolitan train businesses, two metropolitan tramway businesses, and two rural train businesses (one passenger and one freight). On behalf of the taxpayers, the government sold all rolling stock and leased the infrastructure to the private concessionaire. At the same time, the government purchased some services back in the form of a subsidy payment that accounted for the fact that there are many small customers who purchase rail services on a trip-by-trip basis. So the government, on behalf of the community, basically serves as one very large customer purchasing these transport services.

These partnerships are performance based. The concessions were awarded on a competitive basis in terms between 10 and 15 years. From a private-sector perspective, when losses occur, the best way to make money is to stop doing what you are doing. But obviously this is unacceptable from a public policy point of view, so the contracts specify minimum service levels. The contracts also deal with fares, which are a very sensitive political issue. In this regime, we hold the fares to the rate of inflation, although there is a shadow fare (akin to a shadow toll) paid for ridership growth, with the government prepared to pay 50 cents on the dollar for each additional rider that comes onto the system. This creates a direct financial incentive for the concessionaire to grow the ridership. Similarly, the contract specifies extensive bonus and penalty payment regimes (as much as 15 percent of monthly revenue) for on-time service. Again, the state was interested in achieving better service for the customer, not just in paying out big lumps of money.

As for other features of the contract, service quality and customer service are crucial and are monitored every 3 months. One of the reasons we have two tram operations and two train operations is to enable "competition by embarrassment," under which the performance of the respective concessionaires is publicly displayed in the media and on the platforms at the end of every quarter.

Loading levels are monitored on a regular basis, and infrastructure condition is also monitored on a regular basis. This is complex, considering that concessions span 10 to 15 years, whereas infrastructure assets last for 60, 70, or 80 years and beyond. The front-end concessionaire has a great temptation to let the next guy pick up the problem. It is quite a challenge to perform adequate monitoring without being excessively intrusive, so we had to do a lot of thinking in that area.

What we achieved out of this was a substantial reduction in aggregate subsidies coupled with a significant shift toward performance payments. In 2000, the government will provide 80 to 90 percent of payments as a fixed lump sum. But by the end of this decade, the

split between fixed subsidies and variable performance payments will be approximately 50/50. I think that from a public policy perspective, that payment regime is much more satisfactory than the regime we had before.

But it is not just about cost. There is a greater frequency of service delivering more convenient service, and, over time, we expect to see about 10 percent more service operated on a daily basis. We also expect significant improvements to the rolling stock and infrastructure. Increasing service reliability is also important. Again, by contract, passenger minutes of delay are to decline by 40 percent by the end of this decade. If concessionaires are able to beat that, they can potentially earn further performance payments.

As for the ultimate outcome, we expect an overall 30 percent reduction in cost per passenger kilometer. This will take us from last year's 12 cents per passenger-kilometer to 8 cents per passenger-kilometer in 10 years' time. The other critical point here is the shift toward having 80 percent of payments based on performance.

We have learned the following lessons. First, improved services really can be achieved at a lower cost. Second, an incentive and penalty regime is crucial to motivating operator performance. Third, operator control of both above-rail and below-rail activities is highly desirable because it helps preclude the interminable disputes that can otherwise arise whenever a train is late. Next, strong political commitment is necessary, particularly in the public transport area. Labor issues can present a big challenge. However, at this point, we have found that employees are very happy, for although we have a smaller number of employees in the system, wages are going up. And finally, a comprehensive communications program with customers and the community is absolutely essential if this type of arrangement is to be successfully implemented.

PRIVATE AND PUBLIC ROLES: INSTITUTIONAL CONSIDERATIONS IN PROJECT DELIVERY

Robert Garin

Today I will focus on three particular aspects of public-private delivery of toll road projects: institutional, environmental, and financial.

On the matter of institutional issues, we first recognize the need for a legislative framework and strong political support for any public-private partnership initiative. We have just heard from Philip Alexander on the U.K. experience, which offers an innovative model

for financing the construction and maintenance of infrastructure through shadow tolls. We have seen limited legislative authority for similar partnerships in Northern Europe, Wales, Sweden, and, more recently, Portugal. Electronic tolling is now being considered in Germany on the Autobahn system. I should also note that new concessions have been developed in the past few years in Eastern Europe with various grades of success. In the United States, several states have passed supporting legislation, but only two private projects so far have seen actual implementation. One is the State Route 91 project in Orange County, California, and the other is the Dulles Greenway in Virginia. There are many cases of public-sector expansions of existing turnpike systems and a few cases of new toll roads developed by public authorities (such as the E-470 in Denver and the TCA projects in Orange County), but these are not what I would call public-private partnerships in the true sense of the word.

The European experiences, as well as the few in the United States, illustrate some typical elements of successful legislation. The first is recognition that free alternative routes must be available to the public. Second, government usually wants to regulate either the level of profit or the toll rates themselves, though the best control may well be market regulation. Risk allocation is also important; compensation must be available for major risks. And despite the availability of competing routes, unexpected sources of competition must be limited, at least during the initial phase of operations.

A second consideration related to institutional concerns is the right of eminent domain for land acquisition for public interest purposes. The private sector can play a role in expediting acquisition of right-of-way through providing survey and mapping services as well as appraisals, but ultimately, some governmental entity must have the power, or delegate the power, of eminent domain. Donation of land by property developers can also be a major positive factor in a project financing. In the case of State Route 125 in San Diego, which my firm is involved in, almost two-thirds of the necessary land is being donated by developers who will benefit from the project thanks to higher property values and increased residential and industrial development opportunities.

Let me now turn to my next major point, which is the environment. Risk associated with the environmental clearance process is typically borne by the public sector for several reasons. One is that projects, even when developed through a public-private partnership, are usually selected by the public sector. This is true in the United States and in other countries as well. Another reason for the public sector to assume risk related to the environmental permitting process is that the project's purpose and rationale must support the public interest. From the private-sector point of view, as was mentioned

by former speakers, the main focus is having a commercially viable project. The third reason is that the environmental process needs to start very early. It can be a lengthy and convoluted process and is preferably well under way before the award of the concession.

The final point I would like to make on the environmental aspects of the project delivery process is specific to the United States. As many of you know, an effort is under way to streamline a process that now involves many federal and state agencies. Before project sponsors can obtain the final approval from FHWA—known as the record of decision—the U.S. Fish and Wildlife Service has to issue a nonjeopardy biological opinion on the impacts of the project. The National Maritime Fisheries Service has to render an opinion; the U.S. Army Corps of Engineers has its own permitting process as well. Finally, of course, the Environmental Protection Agency has an oversight role for everything else. This does not even deal with state-level permits and approvals.

As for financing, I would like to stress the need for a public role in supporting revenues or providing guarantees on the revenues that ensure that the debt obligations of the project will be met in the early years of operation. This support role has been achieved in several ways. For example, developers of new private toll roads in France in the 1970s were provided with a guarantee on 30 percent of the project debt. To obtain this guarantee, the developers had to meet a requirement that 10 percent of the financing come from private equity.

A similar program has been adopted in the United States, as you are all aware, through the TIFIA provisions included in TEA-21. And in Canada, the Ontario Transportation Authority, a governmental body, assumed responsibility for issuing the bonds for the 407 project. They were later refinanced fully through the private sector after the initial operations showed a very healthy development of tolls and of traffic and revenue.

In Eastern Europe, similar support from the public sector facilitates access to financing from the European Bank for Reconstruction and Development. Other forms of support include direct government loans, such as in Malaysia.

Finally, another way that the public sector can support, rather than supplant, the private role in financing transportation infrastructure is through funding connecting facilities. This was critical to the SR-125 project in San Diego; the 3.2 km (2 mi) at the north end of our 18-km (11-mi) project are financed by local sales tax funds and federal funds. Without this connecting segment, our project would not have been able to earn enough revenue to support the private financing.

I want to mention electronic toll collection because, having seen toll operations and opposition to tolls in

so many different environments, I believe that open-road electronic toll collection can shift perceptions. Electronic toll collection has been implemented in places as diverse as Toronto's 407, the Melbourne City Link in Australia, and of course SR-91 in California. As for SR-125, we expect to use both electronic and cash toll collection initially, but we believe that within a few years the toll operations will be 100 percent electronic.

To conclude, I believe that the United States has not yet taken full advantage of private-sector efficiencies in

developing toll roads. It is disappointing that only two private toll roads, and maybe a third one very soon, have been implemented in such a large country. To the credit of U.S. DOT, I think that new federal legislation, and especially the TIFIA element, will be the most useful instrument in the past 10 years in promoting private participation in road development. The next step would be to allow the private sector to have access to the tax-exempt market, which offers the lowest available cost of financing for long-term infrastructure projects in the United States.