

A Retrospective on the Mexican Toll Road Program (1989–94)

Jeff Ruster

Mexico's private toll road program more than doubled the national toll road network—from 4,500 kilometers in 1989 to 9,900 kilometers in 1994. Fifty-three concessions were awarded for the approximately 5,500 kilometers of roads, and by the first quarter of 1995 forty-four were in full or partial operation, representing 5,120 kilometers. The investment of approximately US\$13 billion in the program over the period 1989–94 was sourced from local commercial bank debt, concessionaire equity, and federal and state government grants and equity contributions (figure 1).¹

However, gross miscalculation of investment costs and operating income led to an unsustainable set of operating conditions for these limited recourse financings. The financial equilibrium of the sector was further undermined

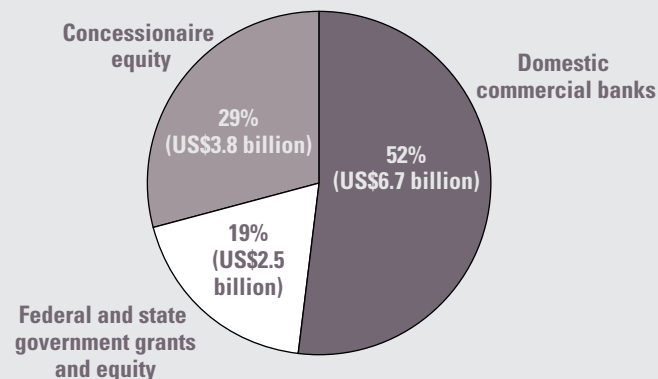
by the Mexican currency crisis of December 1994. The combination of macroeconomic and project-level factors brought new project development to a virtual standstill, despite government estimates that another 6,500 kilometers of roads are needed by 2000. Restructuring of both project debt and equity investments has been the main focus of recent efforts.²

The financial and economic repercussions have been widespread. Local commercial banks were saddled with nonperforming toll road loans estimated at US\$4.5 billion to US\$5.5 billion. Concessionaires and their affiliates were faced with writing off significant portions of their investments. Moreover, the government has been unable to unclog the road construction program and has been under severe pressure to inject scarce financial resources to rescue investors. Users, in the meantime, were left with some of the most expensive road tolls in the world.

In retrospect, some industry observers have characterized the toll road program as a rushed and poorly designed effort to develop the infrastructure the country needed to compete effectively in an era of free trade. Others have simply labeled it a mechanism to lift the construction industry out of the economic depression of the 1980s. Whatever the diagnosis for the poor performance of the sector, from a private investment perspective the impact was to shut off capital flows to the sector and to add to the Mexican banking system's nonperforming loan portfolio.

This Note presents a diagnostic of key policy, regulatory, and institutional gaps that undermined the financial equilibrium of the sector. A checklist of recurrent problems illustrates

FIGURE 1 SOURCES OF FUNDING FOR THE TOLL ROAD CONCESSIONS



Source: Author's compilation.



BOX 1 THE TOLL ROAD CONCESSIONS

Legal framework. Under the program, the Secretary of Communications and Transport granted concessions to special-purpose entities, which in almost all cases were either directly owned by or were affiliates of one or more local construction companies. The concession agreements were issued under the federal law of General Means of Communication, which governs, among other things, roads that connect two or more Mexican states and bridges along any such road. Under this legal framework, concessions could not exceed fifteen years, though this was later extended to thirty years, and a free, parallel alternative to each highway was required.³

Concession party responsibilities. The concessionaire was responsible for financing, building, operating, and maintaining the toll road subject to government regulation for a specified period of time in exchange for the right to receive toll revenues generated by the project. The role of the Secretary of Communications and Transport centered on project definition, including highway path, location of interchanges and toll booths, and number of lanes; establishment of design and construction standards; design and implementation of tendering procedures; and supervision of the concessionaire.

Concession design. The concession specified the duration of the agreement, the work to be undertaken, operational and maintenance standards, government supervision, required maintenance reserve funds, concessionaire reporting requirements, certain fees payable to the government, and the tolls to be charged. On termination of the concession, the right to operate the highway and to collect toll revenues reverted to the government. The government was to remain the owner of the project throughout the term of the concession.

Tariff and adjustment mechanism. Each concession set forth a schedule of tolls by category of vehicle. Tolls were allowed to increase semiannually in accordance with the consumer price index (CPI) or whenever the CPI increased by 5 percent or more since the previous adjustment. All other toll adjustments beyond the levels set forth in the concession required the government's written approval.

Guarantees. Each concession also contained guarantees of traffic volumes by category of vehicle. Most concessions provided that if the actual traffic volumes on the highway fell short of those specified in the concession, the concessionaire would be entitled to request an extension of the term of the concession to permit recovery of its investment.

how the failure to address these issues manifested itself in the course of implementation.

Major issues and sector performance

Although the program attracted significant private investment, well-publicized problems negatively affected sector performance. These revolved around the following issues:

- **Inadequate tendering process and concession design.** The prequalification standard was not rigorous enough (for example, bidders were not required to submit a detailed financing plan). Also, the project award criteria limited the pool of potential candidates (and thus potential competition for the market) to a handful of local construction companies that were more interested in the construction work than in the long-term financial viability of the projects. (See box 1 for an outline of the concessions.)
- **Inadequate financial discipline in government-owned commercial banks.** This led to large amounts of nonrecourse financing with little or no due diligence undertaking. It was not uncommon for lenders to waive important conditions precedent to initial and subsequent funding (insurance and bonding requirements, securing permits and rights of way, satisfactory review of traffic studies, geotechnical and environmental studies, and the like). As the story goes, such behavior was guided by an implicit understanding that even if the projects proved commercially nonviable, ultimate recourse was indeed to the government.
- **Underdeveloped local financial markets.** Legal and regulatory limitations combined with poor macroeconomic fundamentals inhibited the capacity of local markets to provide long-term fixed rate financing. Peso-denominated debt featured very short maturities rarely extending beyond five years, with interest rates often 1,000 to 1,500 basis points above those paid by the government. This situation was exacerbated by the currency crisis of December 1994, when all-in interest rates rose to more than 100 percent a year for most projects, which were already strapped to meet their debt service obligations.

- **Underdeveloped institutional capability.** The above three issues were aggravated by the fact that the program's scope simply exceeded the technical and administrative capacity of the local construction industry, the liquidity of domestic financial markets, the project finance experience of most financial intermediaries involved, and the institutional capabilities of regulatory officials. Consequently, the control mechanisms needed to develop the roads within such a short time were never adequately addressed.

A summary follows of how these four problems manifested themselves in project implementation—in the regulatory and institutional framework for the concessions, the operative period, and the financial and legal arrangements of the projects.

The regulatory and institutional framework

Problems relating to the regulatory and institutional framework for the concessions included vague project selection criteria stemming in large part from the lack of an intermodal strategy and inadequate planning criteria at the federal and state level, inadequate prequalification and award criteria, uncertain tariff adjustment procedures, and lack of an independent regulatory authority to supervise the contractual arrangements. The major recurring issues included the following:

- This greenfield program sought to establish five main road corridors, three of which were to run between the main industrial centers in Mexico and the principal border crossings into the United States.⁴ Nonetheless, some high-priority segments were never concessioned, while others that were constructed lacked contiguous sections that would integrate them into the network. This piecemeal pattern of contracting reduced the near-term attractiveness of the toll roads to long-distance traffic, particularly to truckers, who pay the highest tolls.
- Somewhat related is the lack of an intermodal development strategy. Thus, project development in the various transport sectors often occurred without due coordination. Consequently, investors were unable to determine whether a project fit well into the long-term development plans of a region, especially given concurrent plans to privatize the rail, port, and airport sectors.
- Understaffing and limited institutional capabilities within the Secretariat of Communications and Transport often led to problems in obtaining permits or approvals for change orders on a timely basis and to inadequate enforcement of the concession requirements regarding construction and maintenance quality control standards.
- In addition to the problems relating to bid selection criteria, there was no efficient pre-selection process to screen out potential bidders that lacked the capacity to assume the essential risks of construction design and management, completion of large projects, and commercial management of toll road operations. While operating a toll road is fairly simple (mostly consisting of collecting tolls from passing vehicles), managing a toll road program is much more complex. It includes estimating demand in the face of competition from toll-free roads or other forms of transport, adjusting tolls to optimize revenues, planning maintenance to minimize long-term costs, and managing short- and long-term financial commitments. Ideally, the bidding consortia should be able to demonstrate that these skills are available to them. The lack of a good screening process led, for example, to the selection of medium-size concessionaires that financed their equity contributions through commercial loans. When projects began to suffer financial difficulties, these concessionaires were often unable to meet their equity infusion requirements. Others did not have the necessary technical capabilities, including specialized machinery, skilled labor, and adequate quality control procedures. Even some of the larger companies were stretched too thin, given the speed at which different concessions were awarded to the same firm.
- Formal mechanisms were never established for soliciting or channeling inquiries or requests from private sector participants before,

during, or after the bidding process. Thus, the relationship that developed between the public and private sectors often lacked transparency and was at times adversarial.

Project cost structure

Cost overruns and delays frequently arose because of information deficiencies, problems with securing rights of way, lack of effective turnkey construction arrangements, unanticipated design changes, local community resistance, and permitting issues. As a result, the average cost per kilometer of new highway rose to about US\$2.6 million to US\$2.8 million, compared with the original estimated cost of US\$1.7 million. This figure does not reveal the full extent of the overruns associated with the “hard costs” of construction, that is, the costs associated with required equipment, material, and labor, and as opposed to “soft costs” (interest payments during construction, cost escalation due to inflation, advisory services, and the like). The dramatic drop during 1990–94 in both inflation and interest rates offset in part the real increases in hard costs.

Reasons for the cost overruns included the following:

- Projects often broke ground with only very preliminary engineering and design work. In the case of the 267 kilometer Cuernavaca-Acapulco toll road, for example, this led to cost overruns of 200 percent and time delays of thirty months.
- Construction often began without first securing the right of way. This failure was often exacerbated by mounting resistance from local farmers and community groups, environmentalists, and historical conservationists, and resulted in delays and even rerouting of some projects. As problems occurred, machinery and material sat idle while mobilization and interest costs mounted.
- One of the most frequently recurring problems related to supervision and unilaterally mandated change orders by the Secretary of Communications and Transport. In a project in which four pedestrian bridges were ex-

pected, the final number reached almost sixty as a result of government-mandated change orders, often required to appease local interest groups.

- Many projects were financed under very loose cost-plus construction arrangements or none at all. This, combined with the fact that lenders only rarely hired an independent engineer to assist them with their due diligence investigation before financial closing or with supervision of the contractors’ efforts, created a void in terms of monitoring quality control programs, permitting issues, and the progress of construction budgets, critical path activities, and the like.
- In some projects, construction came to a virtual standstill because of poorly defined procedures and bureaucratic delays regarding the issuance of permits for purchase and use of chemicals or dangerous substances. In one project, time delays resulting from problems in securing permits for dynamite directly resulted in cost increases of nearly 30 percent.

Project revenue structure

Cash flow generated by the sector has been far below base-case expectations as a result of traffic shortfalls and higher-than-expected operations and maintenance expenditures. The December 1994 currency crisis led to a sharp decline in disposable income and thus road usage, along with a drop in economic activity that resulted in a marked decrease in commercial activity and freight transportation. As a result, of the thirty-two projects for which operating data were available in March 1995, less than five could meet their base-case revenue projections. On average, actual project revenues were 30 percent below original projections.

Important factors leading to this situation included the following:

- Shortcomings in the traffic studies reflected a general lack of expertise by the concessionaires, the lenders, and their consultants in developing adequate methodologies (box 2). On only five of the thirty-two toll roads for which traffic data are available has the

average daily traffic been above base-case expectations (table 1).

- In some projects, trucks were expected to account for 20 to 45 percent of users. In reality, trucks were less than 5 percent of the traffic on many roads, leading to a weighted average tariff much lower than originally expected. In some cases, the existence of a black market for toll tickets contributed to this outcome.
- Despite obvious time and cost advantages of the new roads, many potential users were simply unwilling to pay the toll. Aside from the extremely high tariffs, this unwillingness was also due to the fact that the concessionaires did little to market the time and cost savings of the roads (for example, through monthly passes, volume discounts, and direct negotiations with high-volume users such as trucking or passenger bus companies).
- In all but a few concession agreements, the concessionaire could adjust the tariffs only with prior approval by the Secretary of Communications and Transport (even for downward adjustments). This greatly reduced the flexibility of the concessionaire in efforts to maximize cash flow.
- Minimal attention was paid to the development of such auxiliary services as gas stations, rest stops, hospitals, tow truck services, and restaurants. (For most projects, concessionaires were granted the right to operate these services for two years beyond the concession term.) A toll bridge expected to handle 5,000 trucks a day moving through a U.S. border crossing captured only 200 users a day. This shortfall was in large part due to inadequate attention to access roads and to installation of customs clearing facilities.
- The government faced great resistance from the trucking industry in implementing and enforcing technical measurement and axle-weight standards. Truckers for the most part continued to use the toll-free option, especially in light of the very high tolls.
- Operations and maintenance budgets often were not heavily scrutinized by the concessionaire or its lenders, and in many cases extraordinary maintenance costs were grossly

BOX 2 TRAFFIC STUDIES

Traffic study methodologies often suffered from the following:

- **Lack of analysis of specific traffic characteristics, including time and seasonal variations by type of vehicle, trip origins and destinations, and purpose and frequency of trips.**
- **Failure in projections to identify key economic parameters that would affect road usage, such as population, employment, per capita auto ownership, per capita and disposable income, and performance of key industrial indicators.**
- **Unrealistic growth rate assumptions for extended periods that, if realized, would have exceeded the capacity of the road.**
- **Failure to include an end-user learning curve or differences in tariff elasticity between end users.**
- **Overreliance on increased demand due to the opening of interconnecting roads, the construction of which was often delayed or never undertaken.**
- **Underestimation of the congestion relief that the opening of the new toll road would bring for the toll-free option, and thus overestimation of the actual time savings of the new road.**
- **Insufficient attention to general conditions of alternative and feeder routes and the identification of factors influencing the traffic-carrying capacity of key sections.**
- **Inadequate and at times not readily accessible data from the Secretary of Communications and Transport for traffic studies.**
- **Though investors sometimes employed their own independent consultants, actual fieldwork was limited to one to two weeks of traffic surveys. This was often the result of insufficient time allotted to bidders and financiers between the date of release of the bid documents and the deadline for delivery of bids.**

underestimated. Though provisions for major maintenance reserve funds were included in most concession agreements, enforcement of these provisions by the Secretary of Communications and Transport and creditors was often lacking, especially as concessionaires began to experience financial difficulties.

- Inadequate toll collection operations and systems, poorly designed fiduciary structures, and the inexperience of the trustees and commercial banks responsible for supervising the flow of project funds led to less than strict controls over collection and proper application of road revenues.

Project financial structure

Lack of liquidity in the local financial markets, use of short-term, high-cost, floating rate debt, currency risk (both devaluation and convertibility) faced by international investors, and the high cost and limited availability of surety and insurance coverage severely hampered sector performance.

- Concessionaires' financial contributions were in the form of "sweat equity" provided through the retention of work from construction affiliates. These contributions originally amounted to 25 to 30 percent of investment costs, but as lenders demanded higher equity cushions and debt service coverage ratios, the contributions increased to about 50 percent of project costs. This led to inflated construction budgets (and hence toll levels), with some projects effectively financed with 100 percent or more leverage. Estimates of the average gross margins in the road building program range from 35 percent to 50 percent of total costs. Like the distortions arising from the bid selection criteria, these excessive margins in no small part were the result of a lack of competition among the limited number of project bidders.

- The concession agreements contained an adjustment clause to shorten the concession term if traffic exceeded guaranteed levels. Because of the lack of any upside potential, this clause led to significant disincentives to apply true risk capital.
- The only source of local debt financing was the commercial banking sector. But the tenors for such debt often extended only through the construction period, with the expectation that once the project was in operation, cash flows would be securitized through local or international debt offerings. However, as roads incurred cost overruns and the debt servicing ability of the projects proved far less than had been expected, these construction lenders soon were forced to restructure and extend the terms of their bridge financing. In addition, the loans were characterized by high floating interest rates, often 1,000 basis points higher than the local market reference rate. This combination of high interest rates and short maturities resulted in prohibitively high tariffs.
- As many projects became increasingly unable to meet their debt service obligations, lenders' appetite for new toll road investments declined. Consequently, many banks that had underwritten huge amounts for projects were later unable to syndicate or refinance the loans, and liquidity quickly dried up in the market. Once word spread about the actual financial situation of many projects, other, untapped sources of funding (such as international institutional investors) quickly turned their attention to other investment opportunities, both within and outside the country. Likewise, in the few international offerings, market liquidity and resulting pricing were adversely affected by the presence of currency risk, in the form of both exchange rate depreciation and convertibility or transferability concerns.⁵
- Local commercial banks were lacking in credit analysis, loan documentation, internal controls, and risk and liquidity management. Thus, the skills needed for limited recourse financing—to analyze project credit, security arrangements, and operative agreements—

TABLE 1 DAILY TRAFFIC HAS NOT MET EXPECTATIONS

Average daily traffic as a percentage of guaranteed traffic	Number of roads
Above 100	5
75–100	2
50–74	8
25–49	8
6–24	9

Note: As of December 1994.

Source: Author's compilation.

simply were not adequate for the complexity of the projects and the huge demand for credit.

- Performance, advance payment, and hidden defects bonds, as well as insurance for property damage, third-party liability, force majeure, and delayed opening, were high cost and very scarce. Where coverage was secured, significant problems arose in collection. These problems resulted as much from lenders' inexperience in negotiating the terms of such policies as from cumbersome and vague collection procedures.

Legal considerations

Legal aspects of the projects that weakened financial discipline included issues associated with lender security and enforcement rights, dispute resolution mechanisms, tax treatment, and procedures for securing government capital contributions. Key problems included the following:

- Legal disputes in Mexico arising between a private party and the government were to be resolved within the constraints of the Mexican court system and were not subject to international arbitration. Being subject to the local court system represented a significant risk to international investors because of their lack of familiarity with the legal system.
- State governments were expected to provide grants or cash equity or to dedicate toll revenues from existing roads for certain projects as part of the construction financing, as contingent obligations to cover cost overruns, or to cover costs related to securing the right of way. But there were often delays or actual defaults in the fulfillment of these financial obligations, in part because the contributions were to be sourced from annual budget appropriations, a process subject to tremendous uncertainty and discretion. As a result, state governments were often left without any means for meeting their obligations. Other problems arose because of the lack of a clear registration process for public debt, which left lenders with no clear understanding of where they stood relative to other state creditors.

- Lenders were not allowed a collateral assignment of the concession agreement. Consequently, they could neither secure revenue generated by the project nor exercise borrower substitution rights in the event of a default. This greatly diminished their bargaining power at the negotiating table with both the borrower and the government.
- Some concessionaires were not single-purpose entities. In these cases, it was impossible for lenders to isolate specific cash flows by project, and borrowers with multiple concessions were able to apply the cash flow from some projects to support the financial needs of related but separately financed ventures.
- Under many trust agreements, local banks allowed the concessionaire the final word in technical decisions on such matters as change orders, change of material subcontractors, and toll collection procedures. This led to major problems relating to construction and operating costs as well as quality control.
- Certain tax aspects affected the financial viability of the projects. Changes to the tax code were required regarding the 2 percent tax on assets, application and calculation of depreciation and tax credits, and payment of value added taxes. But these modifications were made only after nearly twenty-five projects had been concessioned, and in many cases they required annual approval and thus subjected financiers to nonrenewal risk.

Policy conclusions

Policies to address such issues will vary depending on sector objectives, the current status of the legal and regulatory framework, and the technical and financial capability of the public and private sector participants. Of the many lessons to be learned from the Mexican program, however, perhaps the most important for governments developing a sector program based on private investment is the necessity of devising systems of regulation and support that provide the encouragement and room for maneuver that the private sector needs, while minimizing the government's exposure to the host of commercial and financial

risks surrounding projects. The sector strategy must include sound and explicit incentives to select worthwhile projects. Prices should be set to ensure the viability of privatized enterprises without protecting private parties from bankruptcy. Prices should also be allowed to reflect actual demand—in this respect, the need to develop congestion pricing is of fundamental importance. The regulatory framework should check the abuse of market power and ensure adequate services. Besides protecting investors, an appropriate regulatory and market structure protects the government and eventually taxpayers from bearing ultimate responsibility for the financial performance of privatized enterprises.

Viewpoint is an open forum intended to encourage dissemination of and debate on ideas, innovations, and best practices for expanding the private sector. The views published are those of the authors and should not be attributed to the World Bank or any of its affiliated organizations. Nor do any of the conclusions represent official policy of the World Bank or of its Executive Directors or the countries they represent.

To order additional copies please call 202-458-1111 or contact Suzanne Smith, editor, Room F6P-188, The World Bank, 1818 H Street, NW, Washington, D.C. 20433, or Internet address ssmith7@worldbank.org. The series is also available on-line (www.worldbank.org/html/fpd/notes/notelist.html).

♻️ Printed on recycled paper.

tive schedule requires payment (with a 1 percent added premium for investors) in eighteen years if project revenues are impaired, whether because of insufficient traffic flows, currency fluctuations, or similar risks. The deal was priced at about 500 basis points over U.S. Treasuries at the time of closing.

- The Mexico City–Cuernavaca toll road, owned and operated by Capufe. The placement of exchange rate–linked bonds in August 1994 was originally planned as a US\$625 million, twenty-year final maturity transaction. But because of investor concerns about currency risk and long-term interest rate volatility, the issue was cut back to a seven-year, US\$265 million 144A placement (though also featuring a dual amortization schedule with an expected payout in five and a half years and a targeted average life of three and a third years). The issue received a local currency–based “A” rating from Standard & Poor’s. The deal was initially placed at about 350 basis points over U.S. Treasuries.

A fourth financing of about US\$300 million for the Tepic–Guadalajara toll road was canceled at the last minute because of the onset of the December 1994 currency crisis.

Jeff Ruster (jruster@worldbank.org), Private Sector Development Department

- ¹ Federal funding also included contributions by Petroleos Mexicanos (Pemex) and by Caminos y Puente Federales de Ingreso y Servicio Conexo (Capufe), the federal highways and bridge operator, for more than 1,100 kilometers (km) of public toll roads.
- ² The World Bank’s Operations Evaluation Department reports that by early 1997 nearly forty projects, accounting for US\$11.5 billion of debt and equity investments, had submitted requests to the government for financial restructuring. In August, the government of Mexico announced a restructuring package of around 80 billion new pesos for 23 road projects—comprised of an assumption of 60 billion new pesos of project debt and a cash injection of 19 billion new pesos. As part of the package, the government also plans to reduce the tolls for cars and trucks by 15 and 35 percent respectively.
- ³ The governments of several Mexican states also granted concessions under local law to build and operate highways; these have generally been modeled on those granted by the Secretary of Communications and Transport under federal law.
- ⁴ The five major axis links are Nogales–Culiacán–Tepic–Guadalajara–Toluca–Mexico City (721 km); Nuevo Laredo–Reynosa–Monterrey–San Luis Potosí–Querétaro–Mexico City (480 km); Ciudad Juárez–Mexico City–Puebla–Oaxaca (340 km); Mexico City–Veracruz–Sayula–Ocozacoautla–Arriaga–Puerto Madero (428 km); and Tuxpan–Pachuca–Mexico City (222 km).
- ⁵ Three projects already in operation were nevertheless able to re-finance by tapping the international capital markets prior to the December 1994 currency crisis. This was due in large part to expectations that Mexico would receive an investment-grade rating. These three projects are as follows:
 - The ten-year, US\$207 million placement for the Toluca toll road in June 1992. The deal initially was not well received despite repricing of about 700 basis points over U.S. Treasuries. Investor concerns centered on tight debt service coverage ratios of 1.25 to 1, combined with the existence of currency risk, a particularly sensitive issue at the time because the peso was estimated to be about 20 percent overvalued.
 - The US\$110 million placement for the Ecatepec–Pirámides and Manzanillo–Armeria toll roads, which were jointly securitized. The proposed financing and security structure was perceived as much simpler than that in the Toluca placement, and it provided for a dual amortization process. The target amortization is based on a twelve-year final maturity. The alterna-