STANDARD &POOR'S

INFRASTRUCTURE FINANCE

A Credit Review Of Mexico's Toll Road Sector: Stable And Strong

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Despite a high-profile period of credit distress in the Mexican toll road sector during the mid-1990s, Standard & Poor's Ratings Services currently rates 10 toll road credits in Mexico, which except for one have been very stable, and ratings on which are at the highest categories under the Mexican rating scale. Four of them are at the top of the global scale (AAA), due to full wraps from monoliners (see table 1). This reflects an uplift in sector credit quality during the past 10 years, which, although retaining some potential areas of concern to international lenders and bond-holders, remains significant.

Table 1

Rated Mexican Toll Roads

Toll road	Amount of debt (Mil. $)	Rating	Outlook	Maturity year	AADT 2005
Autopista Tijuana Mexicali S.A. de C.V.	62	mxBBB+	Stable	2012	8,443
Autopista México-Toluca	N.A.	N.A.	N.A.	N.A.	29,434
Senior debt*	395	mxAAA	Stable	2028	N.A.
Subordinated debt	138	mxA+	Stable	2030	N.A.
Autopista Monterrey-Cadereyta*	212	mxAAA	Stable	2029	12,306
Autopistas ArmeríA-Manzanillo y Ecatepec-Pirámides*°	182	mxAAA	Stable	2015	21,427
Autopistas del Estado de Chihuahua°	235	mxAA+	Stable	2012	33,193
Autopista Veracruz - Cardel	66	mxAA+	Stable	2014	15,843
Carreteras de Cuota Puebla	49	mxAAA	Stable	2019	12,616
Carretera Viaducto La Venta - Punta Diamante	20	mxAA	Stable	2019	7,730
Libramiento de Matehuala*	52	mxAAA	Stable	2032	5,369
Libramiento Plan del Rio	N.A.	N.A.	N.A.	N.A.	7,793
Senior debt	30	mxAAA	Stable	2020	N.A.
Subordinated debt	17	mxBBB	Stable	2030	N.A.

*Also rated AAA. °Pool of toll roads. N.A.-Not available.

Here, we summarize the history of Mexican toll roads, identify key areas in which credit improvements have been made, review current activity in the asset class, and look forward from a credit perspective at the next stage in the development of what is one of the world's largest and most active toll road sectors.

Lessons From History

The period 1989-1994 witnessed a concerted effort by the Mexican government, through its Secretariat of Communications and Transportation (SCT), to improve, upgrade, and extend the strategic highway network by way of an ambitious concession program. During this period, 52 limited-recourse toll road concessions were awarded, covering more than 5,000 km of highway. The required investment of around $13 billion was financed through the domestic banking sector (50%); considerable concessionaire equity (30%), funded through expensive, limited-tenor, floating rate commercial loans and/or "sweat equity" (an arrangement whereby a construction company builds a facility on behalf of a concessionaire, to be later compensated through the reward of an equity state in the concession); and a remaining mix of public-sector grants/equity contributions (20%).

The spectacular financial failure of this program is legend, to the extent that it is used in academic texts and on finance courses as an important example of what can go wrong with large-scale, national infrastructure concession initiatives. The reasons behind the financial distress, and lessons learned, are summarized later; however, the subsequent workout (known as "the rescue") took one of the following two forms:

- Revert-to-government. 40% of the program–i.e. 20 concessions covering 22 highways–was taken over by the federal government, and the outstanding bank loans of around $5 billion were assumed by a new government entity, Fideicomiso de Apoyo al Rescate de Autopistas Concesionadas (FARAC) through the National Development Bank, Banco Nacional de Obras y Servicios Publicos (BANOBRAS). No compensation was provided to equity holders, and estimates suggest they lost around $3 billion. Once under government control, toll tariffs on

these highways were significantly reduced (by 40% for trucks) to promote asset usage and revenue generation.

- Term extension. The remaining 32 concessions, which stayed under private-sector control, had their terms extended (on average by 20 years) to give lenders and investors the opportunity to recover their original investment over longer time horizons. A good example of this extension is Mexico-Toluca highway. Since its award, the Mexico-Toluca highway concession has been amended on a number of occasions to allow for extensions to its term. The Mexican government granted the concession in 1989 to Promotora de Administracion Carretera S.A., a TribasA-owned special-purpose vehicle. The concession covered the construction and subsequent operation of the toll road for a very limited term of two years, four months. In 1991 this term was extended by 11 years (reflecting a more realistic revenue/cost relationship), only to be extended again in 2002 (to 2013, as compensation for additional construction works) and in 2006 (to 2031, as compensation for a negotiated tariff reduction).

The reasons behind the financial collapse of a number of Mexico's "first-wave" highway concessions are often over-simplified in the literature. In common with many causes of financial distress, the negative impact of a number of factors combined to escalate a credit problem into a crisis for private sector participants:

- Concession award criteria. Highway concessions were awarded to the bidder offering the shortest concession period, with a maximum legally permitted term of 15 years. Back then, the government's main concern was to "recover" the enhanced asset in the shortest period of time possible, and thereby avoid public pressure for privatizing the country's properties. In response, the average term proposed by bidders was around 10 years–although some were significantly shorter (measured in months rather than years). The subsequent cost-recovery requirement to repay debt and make payments to equity providers (mainly the participating construction companies) in these short periods placed intense pressure on tariffs to the extent that, for users, Mexican toll roads became among the most expensive in the world. For example, toll rates were 16-62 U.S. cents/km, compared with 2-9 cents/km in the United States. In response, traffic diversion away from the toll roads (particularly trucks) led to usage, and hence revenue receipts, well below expectations. More than half of the toll roads reached less than 50% of the forecast volumes (see comments on traffic forecasting below) and in some cases, outturn revenues were only 15%-25% of base-case projections.
- Concession award process. The rules and procedures surrounding the fast-track (somewhat rushed) award of some of the early Mexican toll road concessions were criticized for lacking clarity and transparency. The size of the ambitious program itself tested participants' administrative and technical capabilities. Prequalification rules were not particularly onerous and restricted competition to within the stretched domestic construction sector. Allegations of corruption and impropriety surrounded the process.
- Tariff setting and escalation. The flexibility with which concessionaires could adjust tariffs was constrained to a semiannual increase tied to CPI. Government approval was required for any additional tariff adjustments. This restricted the ability of toll road operators to use price to manage demand risk and maximize project revenues. This feature, coupled with short-term concession periods, as explained above, induced participants to establish initial tariffs at illogically high levels.
- Traffic and revenue forecasting. The projections of asset use and revenue generation–underpinning the bidders' business-case evaluations–were frequently the output from relatively unsophisticated traffic models incorporating unrealistic macro- and microeconomic assumptions.

Some of these models were tariff-insensitive to the extent that they failed to capture any relationship between the point-of-use price and the resulting level of demand. As our research results reported below highlight, on average, usage fell below expectations by around 30%. Cash available for debt servicing came under added pressure as routine operations and maintenance, and periodic major maintenance costs proved to be higher than anticipated.

- Bid submissions. Bid submission deadlines were tight, leaving limited investigative or general preparatory time. Bids were not required to be accompanied by detailed financial or operational information. As a result, the ability to review financial model resilience to stress or sensitivity tests was limited. Thus, when the toll roads started to face financial difficulties, especially after the Mexican crisis of 94, little thought had been given as to how the concessionaires could respond.
- Bidder focus. Bidding parties were mainly Mexican construction companies, focused on the upfront construction works and less concerned with the long-term support for and financial feasibility of the concessions, which, because of Federal involvement, many regarded as having implicit government guarantees.
- Concessionaire experience. The limited set of domestic construction companies bidding for the concessions was not well versed in the planning, operation, maintenance, and, in particular, administration and financial management of toll roads.
- Construction cost overruns. A number of concessionaires faced challenges due to inadequate preparatory design work, incomplete tendering information, limited independent engineering oversight, and late changes being made to the proposed construction works program by the federal government, leading to cost overruns and schedule delays. Average cost overruns of 30% have been reported, with at least one project suffering a 200% increase. For example, Cuernavac A-Acapulco toll road, according to the World Bank, has a delay of 30 months and experienced a cost overrun of 200%. Additionally, concessions were awarded before all permits, approvals, and the right-of-way were secured, introducing further delays and exposing concessionaires to community pressures for route realignment–placing further upward pressure on costs.
- Inadequate financial structures. The financial structures were built under weak assumptions, i.e., expectations that the relation between the U.S. dollar and the Mexican peso would not be altered. These assumptions proved to be tremendously wrong as evidenced by the Mexican peso crisis: The Mexican government devalued the peso in December 1994. By the end of December, the peso had fallen by 66%, GDP fell by 6.2%, and the rate of inflation on a 12-months basis climbed to 52% in December 2005. Short-term interest rates reached a level of 71.5% in April 1995. The economic history of Mexico was marked by the severe recession that started in the fall of 1994. The recession deepened even further following the 15% devaluation of the national currency. This increased the debt of a couple of Mexican concessionaires (Mexico-Toluca and Champoton-Campeche) that financed using dollar-debt, but also exposed the lack of liquidity built on the structures of Mexican peso debt projects.

We are not, however, looking back at history but, rather, considering the credit quality of the Mexican toll road sector today and in the future. Nevertheless, it is important to identify the reasons behind the failure of the early toll road concessions to illustrate how and why subsequent developments have made important contributions to the credit strengthening of the toll road sector in Mexico today.

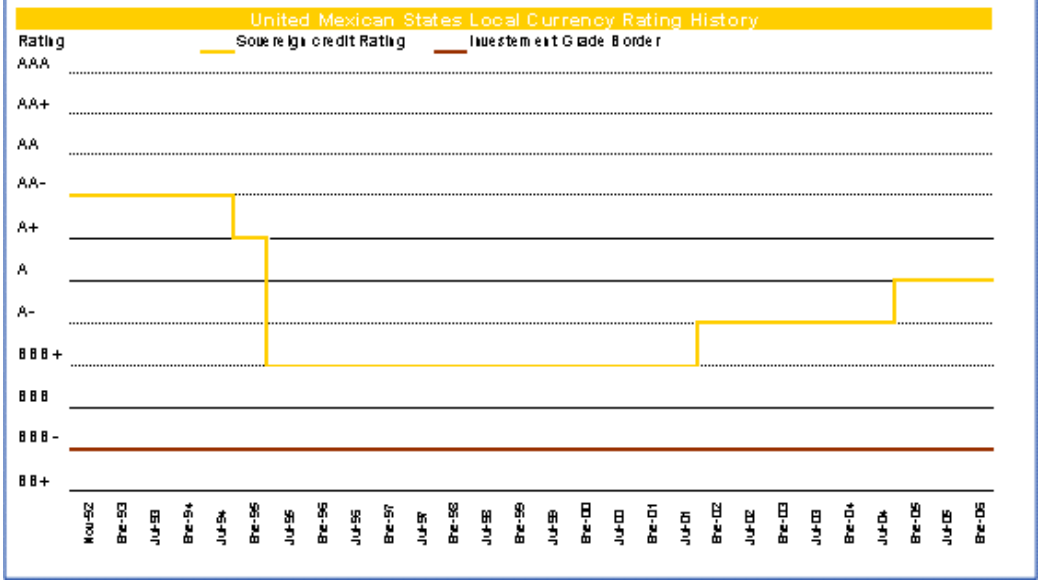
Subsequent Developments

Even though a number of mistakes were made with the first-wave toll road concessions, infrastructure was built and the payment culture in Mexico was established. Moreover, the Mexican government initiated the following series of reforms to address shortcomings in the program:

- Concession award criteria. The government has moved away from the practice of awarding concessions based on the minimum term. Today, concessions are awarded to bidders that meet technical, economic, and legal conditions, while requiring the minimum public subsidy. The SCT will prepare an Executive Project that would be reviewed by the participants during the bid, who may propose changes to improve it.
- Concession award process. The time available to acquire bidding documents has been extended and the SCT has provided more details to the concessionaires. The transparency of the process has improved.
- Tariff setting and escalation. The SCT allows the establishments of an Average Maximum Toll (AMT), which can be set by the concessionaire for each type of vehicle according to the Toll Regulation Basis given by the SCT for each case. Nevertheless, the tariff established for each type of vehicle does not have to exceed the AMT. In this case, the concessionaire could increase the tariff depending on the mix of the toll road's users to comply with the AMT. Nevertheless, if the mix of users calculated by the concessionaire is different, then the tariff will have to be set again. Consequently, the concessionaire will have to modify the tariff every four months to establish the specific toll for each type of vehicle.
- Traffic and revenue forecasting. One of the most significant reforms made by the Mexican government has been to insist on higher-quality and more in-depth traffic and revenue studies to accompany toll road concession bids. This happened in concert with a general improvement in local traffic consultants' technical capabilities and a trend for bidders to use internationally recognized consulting firms. Importantly, SCT recently commissioned two leading international practitioners in the field to compile a traffic studies guidance manual outlining best principles and good practice for local consultants. Although uncertainty always accompanies projections of future consumer behavior (and credit analysts should test the underlying assumptions and stress the modeling results), adherence to SCT's guidance should result in bidders having a better understanding of the demand characteristics of new toll roads–including drivers' price-response–that can be carried forward into their financial models.
- Bid submissions. The bidding documents are designed according to the Law of Roads in which concessions are granted through a public bid, and they are given to the bidder that not only provided a technical and financial proposal that fulfils the necessary requirements from the applicable basis, but also to the one that needs the smallest amount of public funds. The SCT will require and provide more detail to the bidders.
- Bidder focus. Bidders today are typically joint ventures between local and international construction companies, financing institutions, and specialist toll road operators with an appetite for long-term project participation. For example, in the case of the Libramiento Norte project awarded in December 2005, 22 entities requested the bidding documents. Bidders included Acciona, FCC Construcción, OHL, Itinere Infrastructuras (from Spain), Norberto Odebrecht (from Brazil) with Autoroutes du Sud de la France, the Omega Corporation, ICA, and InbursA-IDEAL (from Mexico).

- Concessionaire experience. Currently, the companies have the knowledge and experience in planning, operating, maintaining, and, in particular, administration and financial managing of toll roads.
- Construction cost overruns. Construction contracts are still secured on a fixed-price, lump-sum, turnkey basis; however, these contracts now make specific provisions to reimburse additional capital expenditure if the scope-of-works is subsequently extended by SCT. Rights-of-way are now secured in full before any concession is let. The construction of the road will be the exclusive responsibility of the concessionary and there will be three different supervisors: One named by the SCT, one designated by the Technical Committee of the Trust, and one designated by the concessionary. So, now there is a close supervision of the construction process to give certainty to the concessionaire that it is fulfilling the applicable construction norms and specifications.
- Currency stability. Greater macroeconomic stability in Mexico combined with low inflation (3.3% in December 2005), a flexible exchange rate, and deepening financial markets has left the local economy better placed to absorb or adjust to negative shocks. Stronger integration with the U.S. economy–demonstrated by the positive correlation between economic growth in Mexico and the U.S.–has made a key contribution to that stability (see chart 1). Under our expectation, Mexico will maintain macroeconomic stability throughout the political transition in 2006. The new administration that takes office in late 2006 is expected to remain committed to moderate budget deficits that are consistent with continued economic stability.
- Improved financial structures. Sponsors and bankers now recognize the importance of adequate financial structures that could stand financial stress sensitivities, coupled with the development of the local domestic market.

Chart 1



The points above illustrate key ways in which the Mexican toll road concession program and its administration have been improved–all of which enhance credit quality and provide a transparent concession award process and institutional environment, better matched to international norms, in which lenders can evaluate credit risk. Later, we build on the above to describe the concession program today. First, however, we turn our attention to two key areas of risk that have a critical

impact on the credit quality of today's toll roads in Mexico: the assessment of traffic risk and an evaluation of the legal framework governing local highway concessions.

Traffic Risk In Mexico

Key determinants of background traffic growth

Mexico is a large country both in terms of geography and population. Covering around 2 million square km (roughly 3x the size of Texas), it is the 14th-largest country in the world by surface area, nearly 4x the size of France (Europe's largest country-excluding Russia) and comparable in physical size to the whole of Indonesia.

With a population exceeding 100 million people (July 2006 estimate), Mexico is the 11th most populous nation in the world. If current trends continue, with an above-average annual growth rate of 1.16% per year, Mexico will increase in population to 150 million by 2035, and the population will double from current levels during the next 60 years. It is important to note that Mexican population growth lies above the world average, currently estimated at 1.14% per annum compared to the U.S. growth of 25% lower at 0.91% per annum.

In terms of economic performance, however, Mexico currently ranks considerably lower in the world's league tables. GDP/capita estimates of $9,000 (comparable to Russia or Malaysia) place it 85th out of 231 countries reported. This is one-quarter of GDP/capita in the U.S. and one-third of that in the U.K. Nevertheless, the absolute size of the economy (measured in terms of annual GDP) recently exceeded around $800 billon–second only in Latin America to Brazil–and this magnitude, and its potential for growth, has led to Mexico being identified as one of the world's seven largest emerging market economies (with China, India, Brazil, Indonesia, Turkey, and Russia).

Turning from macro- to microeconomic data, a number of international studies have explored and contrasted the relationship between income (GDP/capita) and car-ownership (or "motorization rate") in different countries. A clear trend is evident, characterized by a positive relationship between personal income and car-ownership, and, for developing/transitioning countries, an income "threshold point," above which car ownership increases dramatically. Different studies suggest slightly different values for this threshold, but these values tend to lie in the $7,500–$10,000 range. Mexico's current GDP/capita lies at the upper end of this range, suggesting that car ownership in the country is set to increase rapidly in coming years. Chart 2 presents the findings from one of these international studies. Although the study was published in 2000, we believe that the trend illustrated remains broadly relevant today.

Chart 2

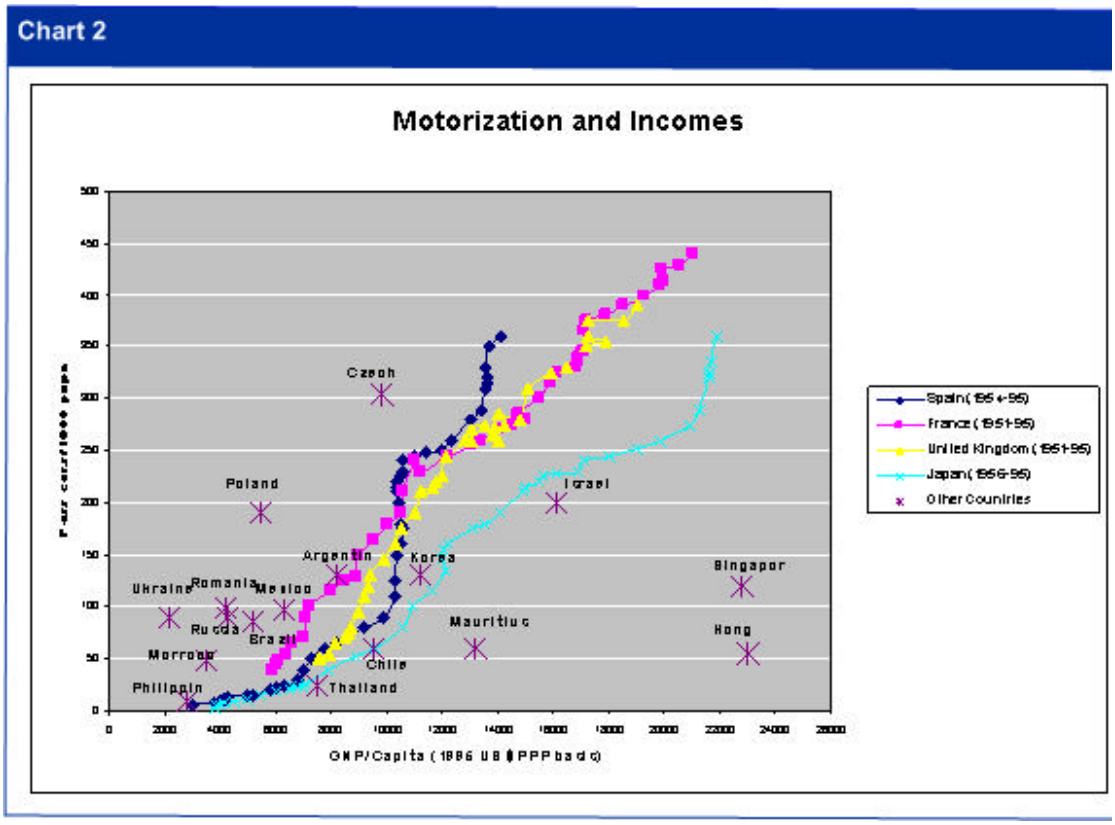


Chart 2 is derived from a World Bank study. The solid lines track motorization rates (i.e. the rate of car ownership) from four developed countries since the 1950s. The positive correlation between income and car ownership is evident. The individual points on the chart reflect different countries at their different stages of economic development. Mexico is placed in the lower, left-hand corner of the chart–very close to the trend lines–suggesting that it has reached (or perhaps has just exceeded) a point at which income levels can support widespread motorization.

The transport mix in Mexico is dominated by roa d transportation. Roads account for an estimated 98% of passenger movements, and 70% of freight movements. The lack of new developed tracks in the rail sector severely limits rail competition (there are 17,000 km of rail track compared to 330,000 km of highway). Road transportation dominates despite the fact that less than one-third of highways are currently paved (and only 6% of paved roads are high capacity, i.e. expressways). In terms of national highway development, road density is still very low in Mexico. Density, measured in terms of mile-of-road-per-mile^2, is recorded as 0.09 (compared with 0.40 in the U.S. and numbers closer to 1.00 in Western Europe).

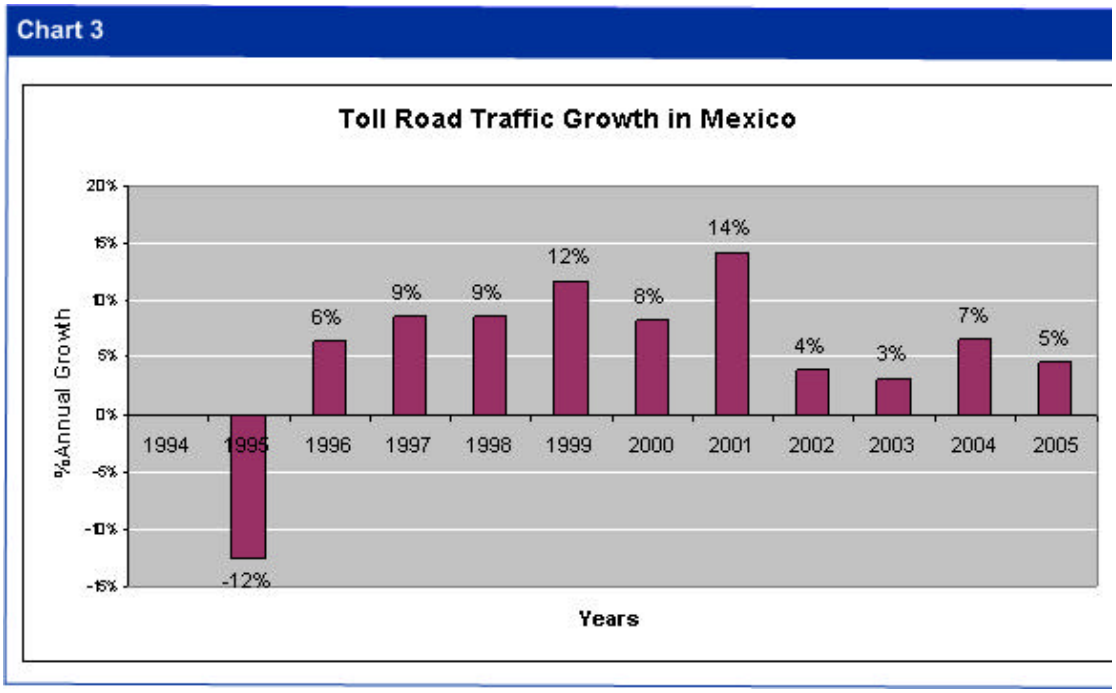
Taken together, the facts presented above lead us to conclude that, if the Mexican economy realizes its full potential, the outlook for future "background" traffic growth across the country is strong, mainly due to the following:

- The physical size of the country, the fact that highway density is generally low and that high-capacity road provision is limited;
- The current dominance of road transportation for the movement of people and goods–a dominance set to continue in the future;
- The large (and fast-growing) population, many of whom have car ownership aspirations (starting from a low car ownership base); and
- The longer-term potential for economic growth (traffic growth tends to show a positive correlation with economic or GDP growth).

Toll road traffic growth trends in Mexico

We collated toll road traffic statistics from all the federal concessions (115 in total: 73 highways and 42 bridges) from 1994 to 2005. This enabled an analysis of average annual traffic growth to be conducted. The results are presented in chart 3.

Chart 3



The 1995 figure represents growth from 1994 to 1995 (and the rest of the figures follow a similar format). The growth is negative in 1995 largely because of the impact of the economic recession in Mexico (mentioned earlier). Nevertheless, traffic growth for the past 10 years has been positive, with an average growth of 8%.

This traffic growth is strong, but the year-to-year variation is considerable (-12 to +14.0%), emphasizing that actual trends seldom follow the smooth, continuously positive growth suggested by many traffic models. Importantly, transaction structures with investment-grade aspirations need to demonstrate sufficient liquidity reserves to be able to accommodate year-on-year departures from longer-term growth trends.

Traffic growth and economic growth

Many countries demonstrate a positive correlation between macroeconomic growth (GDP growth) and traffic growth, although the strength of this positive relationship differs from country to country. In chart 4, we plot average annual toll road traffic growth and Mexican GDP growth for the same horizon.

Chart 4

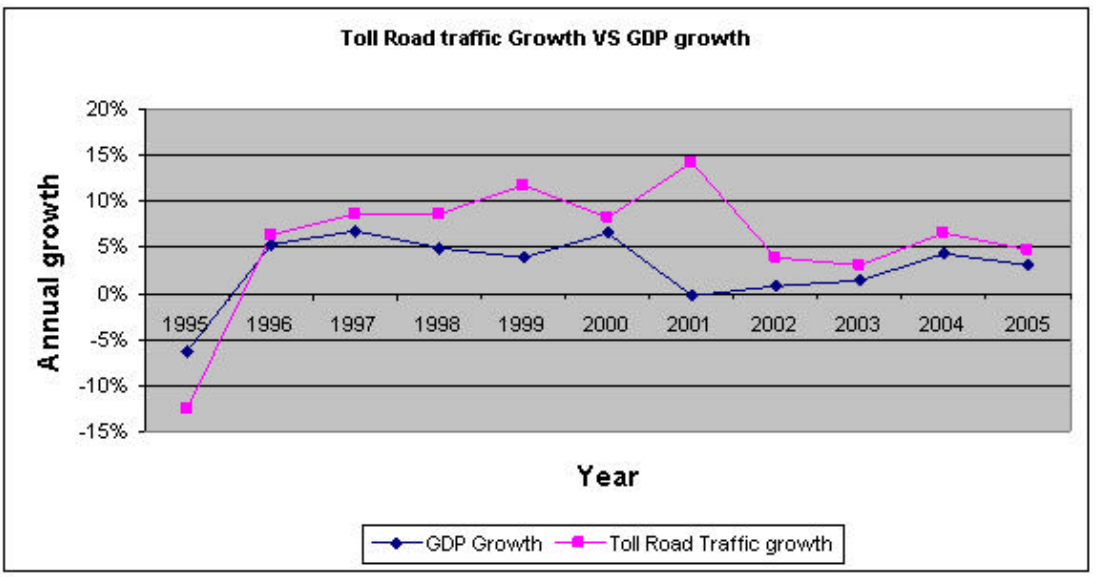


Chart 4 suggests that there is a positive relationship between GDP and toll road traffic growth in Mexico, but this relationship is clearly not perfect. Running a simple linear regression of GDP growth against traffic growth reveals an R-squared of 0.70. Thus, around two-thirds of the variability in the traffic growth da ta set is explained by GDP. While significant, the implication is, of course, that factors other than macroeconomic growth trends explain the remaining third of the variability in the data. In summary, GDP growth appears to be a general, yet imperfect, gui de to traffic growth, and additional contributory variables/factors should be explored, understood, and communicated as part of the traffic forecasting process.

Table 2 illustrates that although, in general, traffic growth in Mexico has showed a continued positive trend during the past 10 years, there were several toll assets that suffered declines.

Each asset behaves according to regional patterns rather than national, which is logical in large countries like Mexico. Interestingly, toll roads tend to behave with less volatility than do toll bridges. The growth reflected on the national network reflects that 42% of the toll roads have had incremental traffic year over year during the past 10 years. On the other hand, 58% of toll roads at least presented one year of decline in traffic. Nevertheless, 48% of these recovered at least 100% on the immediate year. There were several different reasons for this behavior-among others, overextended periods of work on the road and sharp tariff increases. Toll road users respond to other factors than time saving, as evidenced by the 25 toll roads that did not recover in the following year. In those cases, even though time savings remained constant, it took two years to recover in five cases, and more than two years in 15 cases (the recovery period for the other five remains uncertain since the decline occurred in 2005).

Table 2

Quantity Of Toll Assets With Growth/Declines

	No. of assets with		No. of years with	
	No decline in traffic	**Decline in traffic**	**Traffic decline**	**>100% recovery****
Roads	31	42	48	23
Bridges	3	39	119	32
Total*	34	81	167	55

*Data includes 115 toll assets during the past 10 years (1996-2005). **At least 100% recovered traffic in the immediate year after a decline.

Toll bridges behave in a more erratic way since only 7% of them never suffered traffic declines and very few only suffered one year of decline with an immediate full recovery (three, or 7%). Furthermore, from the total of toll bridges where traffic declined, 80% of them had more than one year of traffic losses and, contrary to toll roads, a significant number of toll bridges have showed consecutive years of traffic losses, which in some cases went as long as five years. The above mentioned numbers are affected by the international bridges, which are mainly influenced by U.S. economic activity and the construction of new bridges: Tomates and Laredo III. The magnitude of such declines and recoveries is also important.

Table 3

Magnitude Of Traffic Losses

(%)	Average decline	Average recovery*	Median decline	Median recovery*
Roads	9.29	14	5.5	14
Bridges	7.71	14.09	5	9
Total	8.17	14.05	5	12

*At least 100% recovered traffic in the immediate year after a decline.

As shown in table 3, on average, the total toll assets have showed periods (years) where traffic has declined 8.17%. This figure is in direct contrast with the overall traffic growth presented in the previous chart. The reason is simple; the chart growth represents the annual growth in traffic of the Mexican federal toll network, while table 3 considers individual years of each toll road as an event. This clearly indicates and sustains the fact that toll road behavior is linked to several factors and only a portion of it could be linked to GDP growth, as previously indicated.

Table 3 should be read in conjunction with table 2. For example, the 9.29% of toll road declines refers to all the years on all the toll roads, while the 14% recovery only refers to those toll roads that recovered the lost traffic in the following year. What is interesting is that in those cases, the recovery was, on average, higher than the previous year's decline. Notwithstanding the positive magnitude of the recovery in those cases, the key element of table 3 is the volatility that traffic presented when analyzing years as individual events. Even when looking at the median, volatility between -5 and 12 is high. This historical behavior only reflects the importance of having robust financial structures. It also clearly indicates that linear forecasting will carry a significant risk of error.

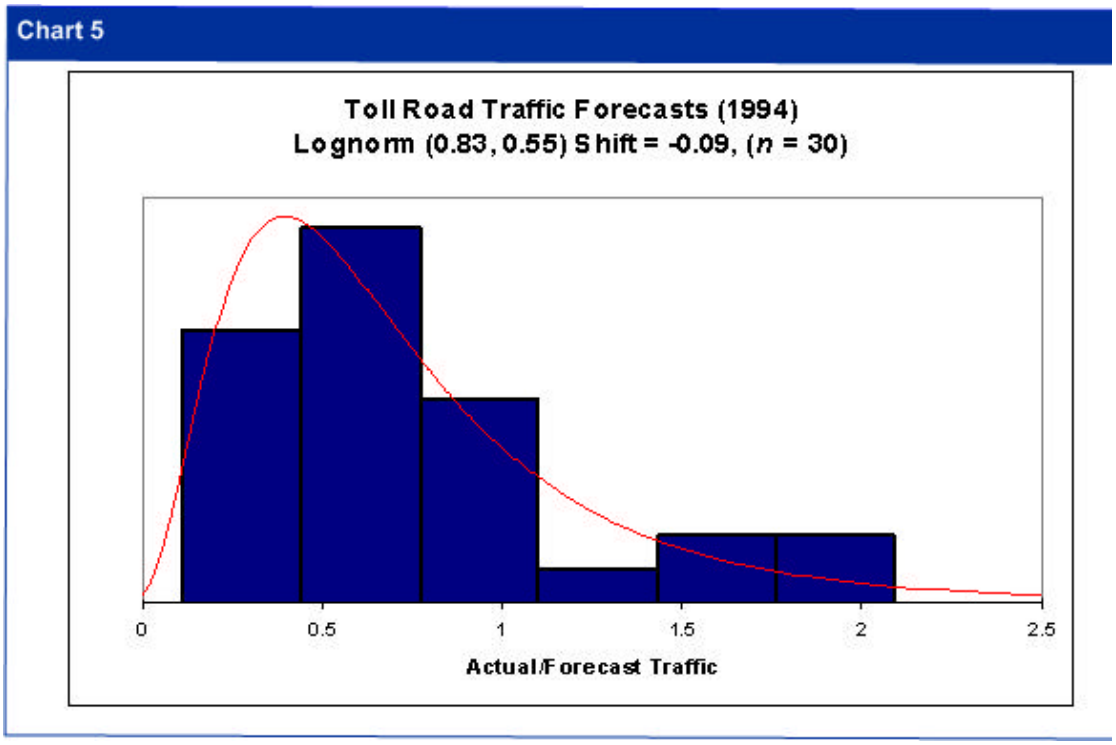
Traffic forecasts

Since 2002, we have published a series of research reports looking critically at traffic forecasts for international toll facilities and comparing projections with actual usage. Our research has identified a consistent tendency for over-forecasting (optimism-bias), and considerable inaccuracy (error).

Forecast accuracy is presented as a ratio of actual-to-forecast traffic. Thus, an accurate forecast returns a value of 1.0. Toll roads that performed above expectations produce ratios above 1.0, whereas projections that turned out to be too optimistic result in ratios below 1.0.

Chart 5 presents the forecasting accuracy analysis from Mexican toll road traffic projections made in 1994. The distribution follows a lognormal distribution characterized by its positive skew (i.e. extended tail to the right). This tail captures a small number of roads that outperformed their respective projections by some margin (in some cases traffic was more than twice the forecasted level). Nevertheless, the distribution shows that the majority of ratios lie below unity (overforecasting). In fact, traffic forecasts turned out to be too high in more than 75% of cases.

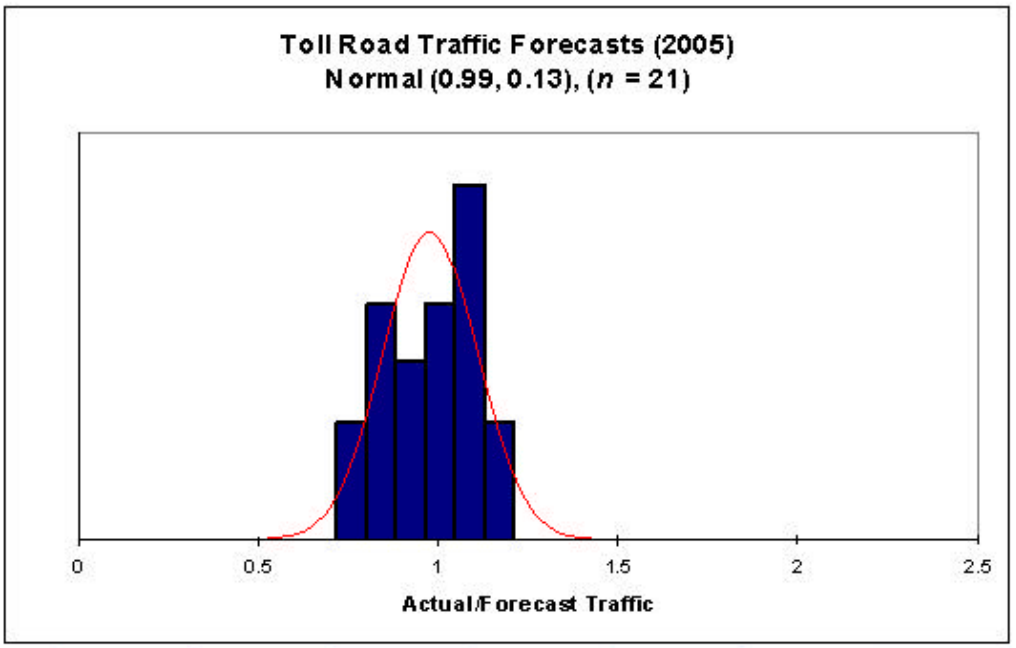
Chart 5



The average error from the 1994 data set is 26% (actual traffic turned out to be 74% of the forecast), but it is the spread of the distribution that causes the most concern–from actual traffic that was only 11% of that projected to traffic volumes that exceeded their respective forecasts by 100%. The body of the distribution is clustered around 75%. This magnitude of forecasting inaccuracy makes it difficult for investors to assess the true strength of the business proposition underpinning toll road transactions.

Chart 6 shows Mexican toll road traffic forecasting accuracy from 2005. For comparison purposes, the scale of the axes remains as before. This is a very different looking chart. It follows a symmetrical (normal) distribution–meaning that, instead of the systematic tendency toward forecast optimism, the ratios of actual-to-forecast traffic are more evenly distributed around 1.0 (mean of 0.99). Although no optimism-bias is detected, however, the error range (spread) remains considerable, from actual traffic 28% below that projected to asset overperformance of 21%.

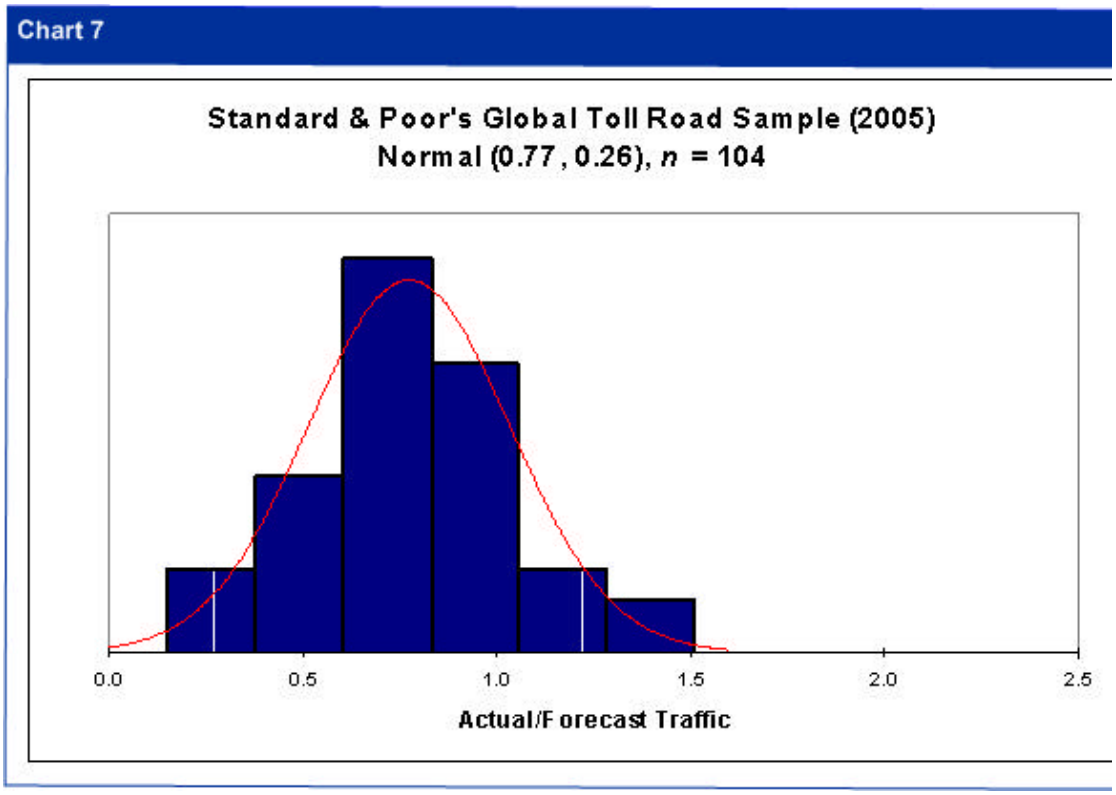
Chart 6



The initial conclusion from the two charts is that traffic forecasting accuracy has improved in Mexico during the past 10 years. Systematic optimism-bias appears to have been removed, and the error range has been reduced. Nevertheless, great care needs to be taken with this conclusion. The 2005 forecasts represent (now) mature assets in their operating phase. It is not uncommon for toll roads that have been operating for some time to have their subsequent years' projections rebased according to actual operating performance (a luxury that can not be extended to greenfield toll roads). In fact, the conclusion to be drawn is that the traffic forecasting performance for toll roads retains uncertainty to the extent that even one-year-ahead projections for mature, operating facilities can be accompanied by error ranges of 10%-20%.

Chart 7 presents the full results from our international study of toll road traffic-forecasting accuracy. Improvements in local forecasting capabilities (mentioned earlier) brought Mexican practice into line with international norms. Thus, the errors associated with the early Mexican traffic forecasts are likely to reduce, although, depending on the concession award criteria used, a tendency toward optimism bias may remain. We commonly detect optimism bias in situations where bidders are incentivized to provide high traffic forecasts, such as a procuring authority awarding toll road concessions to bidders requiring the minimum level of state support.

Chart 7



Early Mexican toll road traffic forecasts were plagued by problems associated with limited local technical capabilities and over simplistic modeling platforms. The result was considerable optimism bias and enormous errors (see Early Forecasts in table 4). For reasons alluded to earlier, forecasting practice has subsequently improved, although the very nature of predicting future driver behavior will always retain uncertain and carry potential for error. The forecasting manual prepared on behalf of SCT is an important development and has the potential to contribute to further improvements in local forecasting practice–if its guidelines are followed. This would bring Mexico closer to internationally recognized state-of-the-practice, reducing–although not eliminating–the potential for error (see Later Forecasts). The fact that traffic forecasts are always surrounded by some measure of uncertainty is highlighted by the fact that even one-year-ahead forecasts for operating assets have a material potential error range associated with them.

Table 4

Traffic Forecasting

(%)	Optimism bias	Error
Greenfield toll facilities		
Early forecasts	25%	± 75%
Later forecasts*	0%-25%	± 20%-30%
Operating toll facilities	Near-Zero	± 10%-20%

*Based on Standard & Poor's international surveys of traffic forecasting performance.

The Legal Framework For Mexican Road Concessions

(Note: With the special contribution of Gaxiola, Moraila y Asociados firm.)

The concession framework: overview

The legal framework for federal toll road projects in the Mexican market is reasonably well developed and is generally supportive. The Mexican Constitution specifically enables the federal government to grant concessions for the provision of public services–including toll roads.

The particular law governing toll road concessions dates back to 1993 (Ley de Caminos, Puentes y Autotransporte Federal), although several dispositions contained in other legal regulations are complementarily applicable, i.e. The Political Constitution of the United Mexican States, The Law of General Communication Courses, The Commerce Code, The Federal Civil Code, The Federal Civil Procedures Code, The General Law of National Assets, The Federal Law of Administrative Procedure, The Basic Law of the Federal Public Administration, The General Law of Ecological and Environmental Protection, The General Law of Waste Prevention and Integral Management, The Federal Law of Economical Competition, and Secondary dispositions.

The procurement process

According to the Federal Law of Roads, Bridges, and Autotransport, the SCT will award the concessions for the construction, exploitation, conservation, and maintenance of federal toll roads for specified periods of time through a public bid, which is divided in two stages. In the first stage, the technical aspects of the project are evaluated, and only the proposals that meet these technical requirements are admitted into the second stage, in which the economical issues are considered. The concessionaires could be Federal States, Municipalities, Mexican private persons, companies organized under Mexican Laws, or foreign investors through Mexican companies created to obtain and exploit road concessions. The concessionaire will not be able to transfer the concessions or the rights that derive from it in favor of third parties without the authorization of the SCT, although transfer of control could be done after three years of operation. Concession terms are limited to a maximum of 30 years (for preconstruction road projects) or 20 years (for operating assets). The term could be extendable up to the same time period granted originally, under certain conditions.

On the financial bid proposal, the bidders should take into consideration potential financial support from the government. The government could contribute with public resources through a trust know as Fideicomiso de Inversion en Infraestructura (FINFRA), created in a governmental bank (BANOBRAS) in the following two different concepts:

- Initial contribution, which consists of the amount that, according to the adjudicated bidder's proposal, FINFRA must contribute during the construction period to provide the project with financial viability; and
- Subordinate Contribution Commitment (Compromiso de Aportación SubordinadA-CAS). The government will also contribute a subordinated amount during the operation stage if the concessionaire requires it during the bidding process.

The concession will be granted to the bidder that not only provided a technical and financial proposal that fulfills the necessary requirements from the applicable basis, but also to the one that will need the smallest amount of public funds, considering the amount of the initial contribution plus the net present value of the CAS, the latter calculated under the discount rate assigned by the SCT in the bid basis. If a tie is determined by the SCT, the concession is given to the participant that offered the lesser cost for construction, and if the tie remains, it is given in favor of whom ever offers the highest risk capital contribution.

An example of this procurement process is provided in the following Case Study.

Case study: MoreliA-Salamanca toll road (bid process)

The concession for the MoreliA-Salamanca toll road includes two road tranches: "Road Stretch 1" of 51.2 km that must be constructed by the concessionaire, and "Road Stretch 2" of 31.8 km that must be constructed by SCT, which would be handed the concession for its operation, exploitation, and maintenance.

The concession estimates a term of 30 years and would be granted by public bid, which allows the participation of individuals and companies, national and international. Originally, the bid program was planned to last seven months (from June 2004 to January 2005), but during the procurement process, several delays arrived, so the bid was not granted until June 3, 2005, five months after the original term.

In the Bid General, it was established that the concession would be granted to the bidder that, besides meeting technical, financial, economic, and legal requirements, needed the minimum public subsidy, taking into account the sum of initial contribution and CAS net current value, calculating an annual discount rate of 10%.

There were proposals from several companies and consortiums, like: the consortium integrated by Obrascon Huarte Lain S.A. (OHL) and Compañía Contratista Nacional S.A. de C.V., Grupo Mexicano de Desarrollo S.A., Promotora Inbursa S.A. de C.V., Omega Corp. S.A. de C.V., and Consorcio de La Peninsular integrated by La Peninsular Compañia Constructora S.A. de C.V., Consorcio de Obras y Dragados Maritimos S.A. de C.V., Operadora y Administracion Tecnica S.A. de C.V., Pavimentos de la Laguna S.A. de C.V., and Grupo Profrezac S.A. de C.V.

A tie was determined, since OMEGA and Consorcio de La Peninsular didn't ask for Initial Contribution or CAS. Therefore, according to the tie agreements the concession was granted to the company that offered the lower cost of construction: Consorcio La Peninsular.

The road tranche is currently under construction, and, as of today, it has been entirely financed by risk capital.

Construction /financing process

In addition to mentioned laws, once financing is involved, it will be regulated by Ley de Instituciones de Crédito, Ley del Mercado de Valores y Ley de Títulos y Operaciones de Crédito, and its corresponding rules and dispositions.

Generally, the concessionaire will create a trust (Administration Trust) to conduct the construction process. In Mexico, the figure of a Trust is legally considered bankruptcy remote, if properly set up. Ideally, debt holders act as beneficiaries of such trusts and have controlled the regulatory board, known as the technical committee. The concessionaire will be solely responsible of the construction of the road; however, three additional supervisors will be designated for the supervision of the works: one designated by the SCT, one by the Technical committee, and one by the concessionaire.

The concessionaire will have the option to securitize the flows derived from the project, and have the option of refinancing through future securitizations if the financial cost conditions improve and if the SCT authorizes it. So far in Mexico, securitization of toll roads has been for post-construction projects. In most cases, the concessionaire has created a new trust (Issuance Trust) to administrate the resources generated from the operation of the toll road. The debt issued by the trust could be guaranteed to give additional protection to the bondholders (see Libramiento de Matehuala case study). On termination of the concession, the rights to operate the toll road and to collect revenues revert to the government.

Case study: Matehuala Bypass (financial structure)

On March 31, 2003, the SCT, on behalf of the Federal government, granted a 30-year concession title to Desarrolladora de Concesiones Omega S.A. de C.V. (DECOMSA) for the construction, operation, exploitation, management, and maintenance of the Matehuala bypass. The concession title included an upgrade and 8.4 km expansion of the Matehuala City Boulevard (free alternative).

In September of the same year, Omega signed a Simple Credit Opening Contract with BANOBRAS to perform the bypass construction for up to Mexican pesos (MxP) 85 million, which was dedicated to partially cover the construction of the road, including, among other concepts, the cost of works with its corresponding upgrades, right of way, studies, permits, taxes, and controlling equipment (the Credito Banobras). In November 2004, the road initiated its operations.

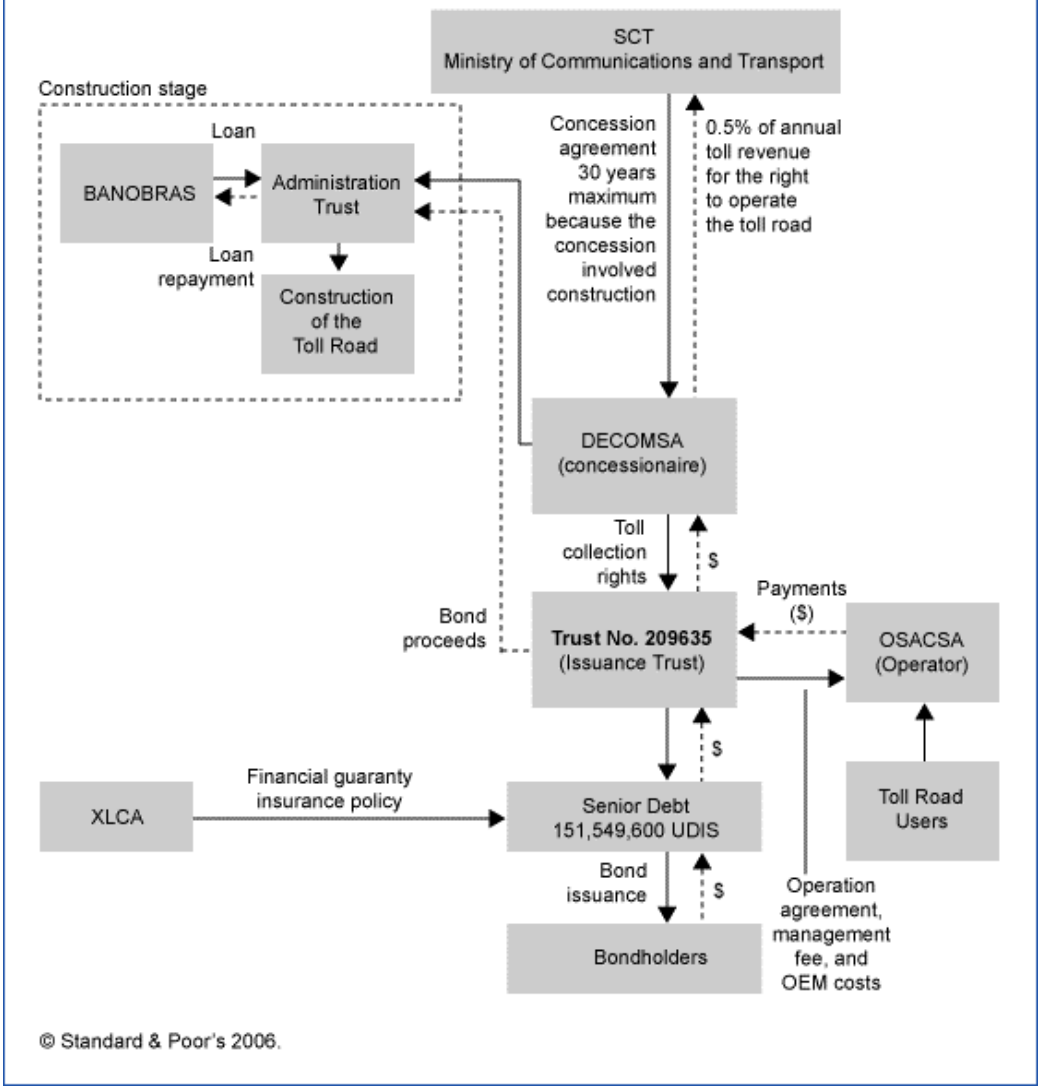
A year later, the concessionaire issued notes for an amount equivalent to 151,549,600 UDIS, that is, around MxP550 million, which was used to settle the debt with BANOBRAS, and to pay the expenditure generated by the issuance, the funding constitution that brings liquidity to the trust and others in terms of the same trust.

In addition, the concessionaire reached an agreement with Operacion y Conservacion de Autopistas Concesionadas S.A. de C.V. to operate and manage the bypass.

The financial structure considers as an alternative income source a debt service fund having 12 months of resources from the issuance, and will keep 7.65% of the outstanding debt or 12 months of payments of the debt service. Also, the notes have been granted by XL Capital Assurance Inc. by means of the issue of the financial guarantee insurance policy, which guarantees the principal and interest scheduled payments that, according to trust, the trustee must pay to its bondholders according to the terms established in said policy.

On the other hand, the concessionaire will not receive any distribution after debt service, as it is expected that any flow surplus would be designated to prepay the debt, as long as the debt coverage rate is greater than 1.15x. The prepayment mechanism avoids debt concentration and builds in growing payments in the last years.

Matehuala Bypass Financial Structure



Mexican Toll Roads Today

The federal government, at the beginning of each governmental term, establishes priorities with respect to highway infrastructure and transportation in a document called the National Development Plan. Under the current plan, the SCT has developed the following two legal-financial models that make possible the execution of road infrastructure projects combined with public and private participation:

- The New Concession Model. Traditional federal toll road concessions with the concessionaire relying on user fees for cost-recovery.
- The PPS Model. This model will provide long-term public services, focused on upgrading federal toll-free roads under public-private association scheme (PPS), primarily in the health, education, and transport sectors. The PPS-type arrangements, with the concessionaire relying on government payments, are based partly on asset availability and partly on asset use (shadow tolls).

We expect the new federal administration in Mexico to continue expansion of the toll road network and to increase the construction of public roads through resources that could be obtained

by concessions "packages" of roads currently in operation. These could include roads with strong traffic like the road that connects Mexico City with Guadalajara.

The new concession model

The Matehuala Bypass (AAA/Stable/—) was the first concession to be awarded under the new concession program. This 30-year concession was awarded to DECOMSA on May 9, 2003, for the construction, maintenance, and operation of 14.2 km of highway (see case study).

Since then, four other toll road concessions have been granted, covering nearly 703 km with a total investment of $1.107 million. Highways currently in the New Concession Program are summarized in tables 5 and 6.

Table 5

Current Projects Under The New Concession Model

Project	Length (kms)	Value (Mil. $)	Concesionaire	Status
Matehuala bypass	14	35	Omega	In operation
Mexicali bypass	41	62	Omega	In operation
Amozoc - Perote	103	169	Facopsa**	In construction
Tepic – Villa Unión	152	283	Inbursa	In construction
Morelia – Salamanca	83	132	Peninsular	In construction
Mexico City bypass*	223	575	Inbursa	In construction
Tecpan bypass	4	15	Omega	In construction
Total	620.2	1,270		

*Also known as Libramiento Norte de la Ciudad de México. **Fabricación y Construcción de Pavimentos S.A. Source: SCT.

Table 6

Future Projects Under The New Concession Model

Project	Length (kms)	Value (Mil. $)	Status (as of August 2006)
Monterrey-Saltillo and Poniente de Saltillo Bypass	92	225	In procurement
San Luis Río Colorado International Bridge	0.4	7	In procurement
Reynosa/Anzaldúas International Bridge	10	59	In procurement
Arriaga – Ocozocoautla	93	205	In preparation
Perote-Banderilla and Xalapa Bypass	58	229	In preparation
Compostela-Puerto Vallarta	103.5	308	In preparation
La Piedad Bypass	18	67	In preparation
Irapuato Bypass	29.5	52	In preparation
Chihuahua Bypass	41	65	In preparation
Bojórquez Bridge	0.9	23	In preparation
Total	446.3	1,241	

Source: SCT

Public-private partnerships (PPS model)

Under the initial stages of the PPS initiative, the SCT already granted two highway projects: Irapuato–La Piedad highway in the State of Guanajuato and Queratero-Irapuato. This new scheme could become a valuable alternative to address population needs in terms of high-quality public services, and to tackle the weaknesses in the traditional public investment and private concession models. In our opinion, the most significant value added by this new structure is not only efficient risk allocation, but also intangible benefits obtained by the public sector (see "New Public-Private

Partnership Scheme Will Support Infrastructure Development in Mexico," published Oct. 11, 2005, on RatingsDirect, the real-time Web-based source for Standard & Poor's credit ratings, research, and risk analysis). In the future, the SCT will select projects that will have had identified several road construction or upgrading projects, listed in table 7.

Table 7

Current Projects Under The PPS Model

Project	Length (kms)	Value (Mil. $)*	Concesionaire	Status (as of August 2006)
Irapuato – La piedad	75	161	CONIPSA**	In construction
Querétaro-Irapuato	93	314	FARAC	In operation
Total	168	475		

*Includes resources for the 20-year maintenance. **Concesionaria Irapuato la Piedad S.A. de C.V. Source: SCT.

Table 8

Proposals Under The PPS Model

Project	Length (kms)	Value (Mil. $)*	Status (as of August 2006)
Río Verde - Ciudad Valles	112	479*	In procurement
Nuevo Necaxa – Tihuatlán	84.7	809*	In procurement
Tapachula – Talismán	45.1	108*	In procurement
Nueva Italia - Apatzingán	30	69	In preparation
Zacatecas-Saltillo	213	109	In preparation
Total	484.8	1,574	

*Includes resources for the 20 year maintenance. Source: SCT.

Summary And Conclusions

In conclusion, there is compelling evidence to suggest that, rather than remaining saddled with legacy issues, the federal toll road concession program in Mexico today has benefited significantly from the (somewhat painful) lessons of the past. Analysis of the credit quality of individual projects should, of course, continue to be conducted in a rigorous manner, focusing on issues pertinent to specific cases. Nevertheless, the fact that we already have a majority of our recent Mexican toll road ratings at investment grade (with others expected in the future) demonstrates that well-structured road-concession transactions that offer appropriate levels of lender and bondholder protection retain high credit quality characteristics.

In general, traffic growth in Mexico has showed a continued positive trend during the past 10 years. Nevertheless, historical evidence reflects that traffic growth is not linear and that significant declines occurred, although in some cases significant recoveries followed. In Mexico, there is a positive relationship between GDP and toll road traffic growth; however, the relationship is clearly not perfect since the variability could be explained by factors other than macroeconomic growth trends. Therefore, GDP growth appears to be a general guide to traffic growth, and that additional factors should be explored, understood, and communicated as part of the traffic-forecasting process.

The development of reliable revenue projections has always been a critical credit issue. Future revenues are no longer the simple product of the number of vehicles and tolls; rather, forecasting will become more complicated and more sophisticated to determine the value of roadway utilization. An investment-grade toll road transaction is not necessarily one that performs robustly

against the most likely future-year scenarios. It is the one that performs robustly against a number of future-year scenarios.

In terms of traffic forecast, we see a significant improvement during the past 10 years, but irrespective of how good the forecast becomes, there will always be a degree of uncertainty. For this reason, investors should test the assumptions behind forecasts to ensure that projects can withstand performance that remains below expectations–especially on a year-on-year basis, since the volatility will remain high even on mature assets.

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