

**MEXICO**  
INFRASTRUCTURE &  
SUSTAINABILITY REVIEW

HIGHLIGHTS  
2018



## STEPS TO A SUSTAINABLE AND INCLUSIVE CONSTRUCTION SECTOR

**GUSTAVO ARBALLO**

President of the Mexican Chamber of the Construction Industry (CMIC)

**Q: What is CMIC's 2017-2018 forecast for the construction industry, especially with the elections around the corner?**

A: CMIC expects 2018 to be as difficult as 2017. The real estate industry, especially the construction of medium and high-end residential buildings, mixed-use developments, shopping centers and tourism infrastructure, will likely play a leading role for the remainder of 2017 and in 2018. The Center for Economic Studies of the Construction Sector (CEESCO) estimates growth for 2017 from a contraction of -1 percent to a 0.5 percent expansion due to fundamental factors such as the 23 percent cut in the public investment budget compared with 2016, as well as increases in interest rates. A reduction of 40,000 jobs is expected in the event of a contraction or the creation of up to 20,000 jobs if there is growth.

From January to July 2017, the construction industry contracted 0.6 percent compared with the same period in 2016. It is likely that, for the remainder of the year, factors that inhibit investment and growth will include reduced public and private investment and the rise in the official interest rate to twice its 2015 level, which will make infrastructure projects more expensive. The result of the NAFTA renegotiation could also have an impact by restraining vital exports, in turn negatively impacting investment in industrial and commercial construction and services.

**Private investment has been the driving force behind the growth of the construction industry since it represents 75 percent of the total investment in the sector**

In 2018, the construction industry is expected to grow between 0.3 percent and 1 percent. Residential construction geared toward the middle and upper classes, as well as a robust tourism sector, commercial and service infrastructure will be the industry drivers in 2018. Risk factors include an even greater reduction in oil prices or oil production,

continued inflationary pressures and an additional cut in 2018 expenditures for public investment in infrastructure.

**Q: What are the construction sector's concerns regarding the New Housing Law in Mexico City and the federal Human Settlements Act?**

A: CMIC's greatest concern within this context is the urban resilience required to adapt to redensification and transformation that entails generating vertical housing for inhabitants. We support both changes to the laws and urge prompt implementation. There has been an exodus of city dwellers due to the lack of housing for workers with incomes equivalent to less than 10 times the minimum wage who are eligible for INFONAVIT and FOVISSSTE, but we hope the new laws will address this and expedite access to housing for this demographic. Another result has been a rise in speculative practices and constant increases in the prices of urban land and houses due to the low supply of popular housing, with values ranging from MX\$900,000 to MX\$.5 million per dwelling. Additionally, with a lack of activity in popular housing, the construction industry working in this sector has become stagnant, resulting in job losses. In an effort to assist the current Mexico City government, CMIC's members have identified plots of land that are eligible for use under the new housing law to encourage and facilitate the construction of housing for workers entitled to homes in urban areas. We want to promote the construction of 10,000 living spaces, which is only a fraction of what the inhabitants of this city require.

On the subject of the General Law on Human Settlements, we are interested in information about the adjustments that the local authorities will make to their regulations as well as to their urban development plans, and how this will impact the construction industry. We also wish to see clear commitments and actions that promote real changes in the human settlements of our country, toward competitive, connected, coordinated and equitable models.

**Q: What would make the construction sector more attractive to both investors and contractors?**

A: In the January-May 2017 period, credit granted by commercial and development banks to the construction

industry fell 6.5 percent in real terms compared to the same period a year before. The total amount of credit provided to the industry in May 2017 was MX\$489.8 billion, MX\$3.9 billion less than in May 2016. This result is due to two factors that have reduced credit availability to construction companies. The first is the reduction in public works that has narrowed the opportunities to obtain a contract. Without a contract, there is no guarantee with which credit can be obtained. The second is the gradual increase in interest rates, which lifts the cost of credit and reduces available financing. On June 22, 2017, Banxico decided to increase the overnight interbank interest rate by 25 basis points for a third time to 7 percent. With this increase, the benchmark interest rate doubled compared to 2015 levels. Rising interest rates increase the cost of financing, inhibit investment and increase the cost of debt.

In recent years, private investment has been the driving force behind the growth of the construction industry since it represents 75 percent of the total investment in the sector. The reduction of public resources for the development of infrastructure opens up a range of opportunities for the private investor to participate in complementary infrastructure projects like roads, ports, airports, railways, telecommunications and water projects to maximize economic and social benefit.

But steps are being taken to address these issues. In Mexico, we now have the PPP law, which establishes a stronger legal framework for mixed participation, and allows for greater investment in infrastructure. In this way, the law has bolstered investor interest in the sector. It also provides greater legal certainty to the creation of projects that involve the joint participation of the public and private sectors. Within the law, there is the novel USP scheme that allows an investor the possibility of proposing a PPP project to the government. The main areas of opportunity in Mexico for PPPs seem to be hospitals, petrochemical and natural gas, water supply, sanitation, power generation, telecommunications, penitentiaries, schools, roads, railways, ports, transportation and housing.

**Q: Which sectors represent the most important PPP projects for construction companies and what are companies looking for to encourage participation?**

A: All sectors are of great importance for the construction industry, whether in hydraulic infrastructure, transport, hospitality, education, energy, penitentiaries, railways or ports. In this sense, CMIC recognizes the effort being made by the Ministry of Finance to promote PPP projects in such complex times to achieve competitiveness, economic growth and job creation. But to overcome the problems caused by federal budget cuts, the government needs to ensure that the processes of tendering, awarding and contracting PPP projects are carried out competitively, efficiently and under



Mazatlan-Durango Highway, Grupo Hermes

principles of transparency and accountability. We must also generate a more collaborative relationship between the public and private sectors, with the purpose of involving the private sector in the design, financing, construction, operation and maintenance of new infrastructure works, as well as the expansion and modernization of existing infrastructure.

**Q: Looking forward, what are the sector's top goals and how is CMIC working to ensure that it thrives?**

A: Among the sector's main goals is the implementation of a public infrastructure policy that allows proper planning, contracting, execution, operation and maintenance of infrastructure projects under conditions of economic viability and financial sustainability and with adherence to environmental impact. Therefore, the private sector and CMIC's member organizations are working through consultation forums to make a public policy proposal oriented toward competitiveness and productivity, taking into account everything across the development cycle of the infrastructure. This includes project conception, planning and operation and maintenance, which help to improve efficiency and quality of infrastructure. In addition, we have set out to identify the strategic projects that the country needs, from a regional perspective, to create a National Sustainable Infrastructure Program by the year 2030.

*CMIC represents the interests of construction companies, offering services to promote a highly competitive industry at the forefront of innovation that incorporates social responsibility and technological innovation*



# UNCLOGGING MEXICO'S MOBILITY ARTERIES

To combat the congestion and environmental effects of motorized transportation, the Mexican capital is setting an example for not only the country but also other cities around the world by implementing innovative public policies in mobility. In July 2017, Mayor Miguel Ángel Mancera dropped regulatory requirements for parking spaces in the construction of new developments and pushed to incorporate new uses for existing lots. The announcement

was a stride toward integrated urban planning as mandated parking causes a shortage of living spaces, drives up the costs of housing and promotes the use of automobiles in cities. The city was also the first in Latin America to use a bike-sharing program in 2010. Mexico may still have a long way to go in terms of mobility but concerned citizens and authorities are working to reverse the effects of car-oriented legislation to develop healthier cities.

### MEXICO'S BIKE REVOLUTION

Bicycles are gaining popularity as a form of transportation. Over the last three years, the 30 most-populated cities in Mexico invested on average 0.3 percent of federal funds designated to mobility for bicycle use

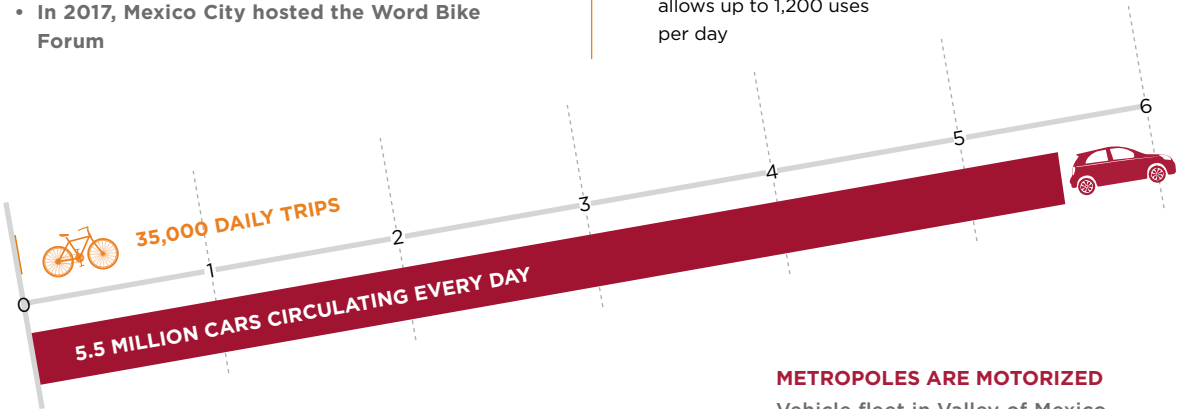
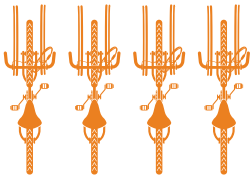
#### Extended Paths

There are 737km of bicycle infrastructure in Mexico.

- **Mexico City** encompasses **170.11km** (bike lanes, bus-bike lanes and complete street schemes)
- **15km bicycle paths** added in **2016** on main avenues (Revolución, Patriotismo and Buenavista)
- In **2017**, **Mexico City** hosted the **World Bike Forum**

#### Parking Facilities for Bikes

Two massive bicycle parking facilities located at Modal Transfer Centers Pantitlán and La Raza (first of their kind in the city). Automatic accessibility system allows up to 1,200 uses per day



**MX\$3.5 billion**  
received by Mexico City in 2015 from the Mexico-Chile Cooperation Fund Commission to keep promoting the use of bicycles.



#### METROPOLES ARE MOTORIZED

Vehicle fleet in Valley of Mexico Metropolitan Area more than doubled in one decade; ZMVM includes the capital and 18 State of Mexico municipalities

**30 million**  
vehicles registered in 2015



27,171,560  
automobiles

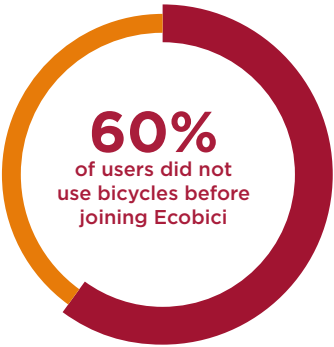


2,608,659  
motorcycles

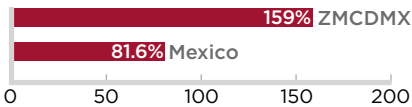
#### Bike-Sharing System

Early in 2010, Ecobici became one of the biggest bike-sharing programs in the world

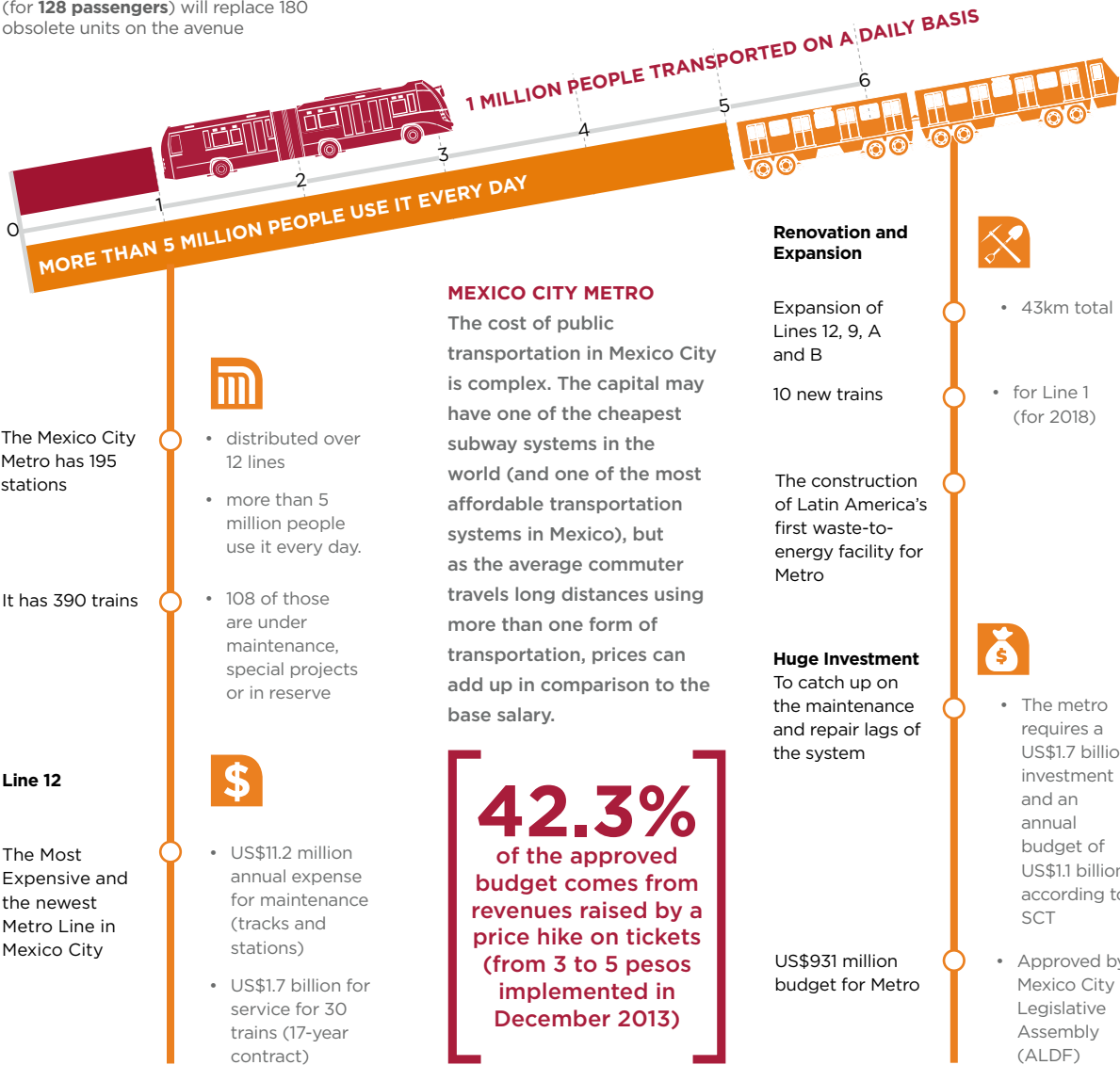
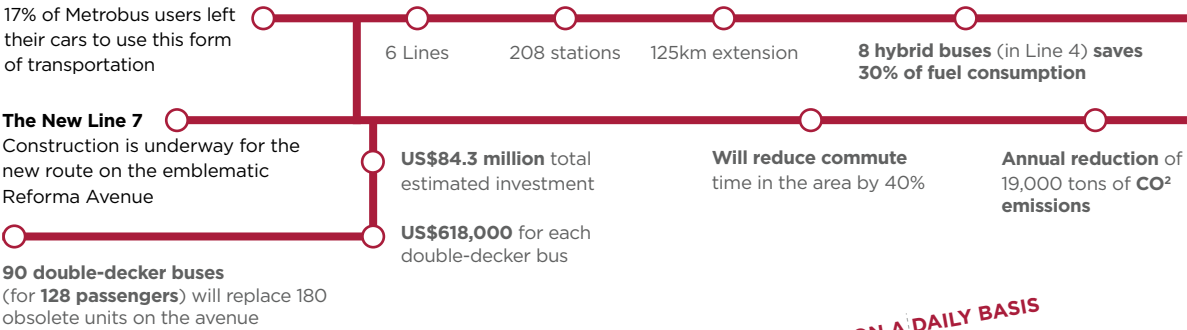
- **452 stations** and **6,500 bicycles**
- **36 million** trips provided in **six years**
- **2,652 tons of CO<sup>2</sup> reduction** (until 2016)



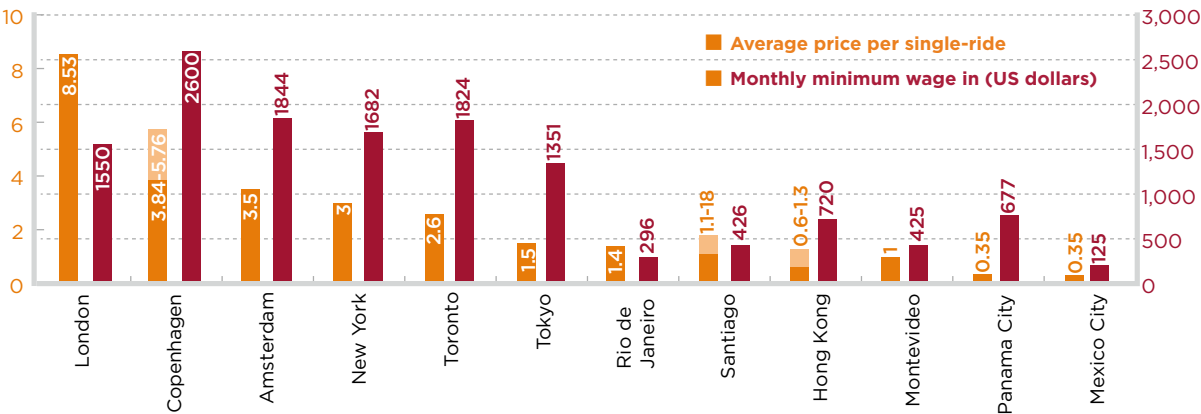
#### Vehicle Increase (2005-2015)







AVERAGE PRICE SINGLE-RIDE METRO TICKET 2017 COMPARED TO MONTHLY MINIMUM WAGE SALARIES





# STRATEGIC ALLIANCES AT THE FOREFRONT OF INFRASTRUCTURE

**EDUARDO ANDRADE**  
Director of Sacyr México

**Q: How is Sacyr supporting Mexico's infrastructure development?**

A: Sacyr's operations in Mexico are still incipient but we are starting to grow and profit from the country's significant market. Mexico requires first-world infrastructure, which is something I believe all the administrations of the past 20 years understood. That is why the plans are very ambitious. Sacyr is committed to helping Mexico achieve its goals. To be more precise, we have several projects under construction. These include four hospitals, involving an investment of MX\$3.5 billion, a freeway that will cost about MX\$1.3 billion and the elevated and underground trains in Guadalajara, worth about MX\$8 billion. We have also completed several transmission lines with a value of MX\$500 million.

**Sacyr has several projects under construction, including four hospitals, with an investment of MX\$3.5 billion**

**Q: What alliances have you fostered to create consortiums?**

A: We are creating alliances with Mexican companies, a goal that complies with GACM's requirements. They are helping us to be more competitive and to understand the country's construction market. In an association, we seek an emphasis on work-related safety, the quality of the work, efficiency and commitment and we ask that the company partner with us on an attractive price proposal. Our goal is to combine our international experience with the local knowledge of our potential partners.

**Q: How will your decision to participate in PPPs impact Sacyr's strategy in Mexico?**

A: The legal framework for PPPs in Mexico is well-defined but still new, so many realizations are being made in the process regarding infrastructure financing, design and expectations. Also, many of the proposals lack a cohesive thread. Nevertheless, we believe this scheme is the future of infrastructure development in the country. We

have won tenders for a freeway and a hospital, and our goal is to continue growing. PPPs require previous experience of two to three years. We presented an unsolicited business proposal for a project in Bahia de Banderas more than a year ago. We did not win the tender but this case exemplifies our vision for the Mexican market and how we have been working on this idea for several years.

Our goal is to be leaders in infrastructure development in Mexico, so we plan to take advantage of the related reforms, such as the Energy Reform. Also, the legal certainty that the country offers fosters a better investment environment. Sacyr is a major global player, which I believe is important when participating in PPPs.

**Q: What were the main challenges when competing for NAICM's tenders?**

A: There is a high level of competition for the tenders, but what I find remarkable is the quality of the companies that are bidding. For the airport tenders, the system works through prices and points awarded for the qualitative part of the proposal to ensure the winning company represents the highest value. The winning bid must include a competitive price, the guarantee that the cost is worth the excellent quality delivered and compliance with a deadline. I believe this scheme is very useful, as it promises Mexicans will have an airport built by knowledgeable firms that were fully prepared to face such a challenging project.

Regarding how we obtained the concessions, we had to be more creative than our competitors. We provided a more efficient use of time and presented modern designs that incorporated the use of the newest materials and technologies. In my opinion, the challenge is to dream big while comparing our infrastructure with other countries in the region, such as Chile, that have accelerated their development processes. We understand that Mexico requires infrastructure development to be efficiently intercommunicated. Sacyr is committed to advancing this goal.

**Q: How do you plan to implement a greenfield-projects approach in Mexico?**



A: Sacyr looks for concessions that can create jobs in the construction field, so we look for greenfield projects because these allow us to have control from the beginning of the development. There is uncertainty surrounding brownfield projects and uncertainty hinders our capacity to be completely accountable. When we build greenfield, Sacyr is present from the inception of the project, so we can answer any questions about the quality of its execution and the decisions made to complete it. Also, the fact that we are vertically integrated allows us to be present in the design, financial, execution, operations and maintenance of projects.

**Q: When do you expect to finish Guadalajara's light train?**

A: We will finish on time and according to plan, as we use a raise bore drill that helps us to make fast progress. President Peña Nieto visited the construction site and asked us whether we would meet the deadline and we were able to respond with confidence. The project is on track as we have regained the time lost at the beginning of the construction stage. It is a very interesting development and it is an honor to be able to participate in a project of such a magnitude in a country like Mexico.

**Q: What role does Sacyr want to play in Mexico in the long-term?**

A: We want to be market leaders in the development of infrastructure for basic and energy services. We are a company that possesses strong leadership in several countries and we intend to translate this to the Mexican context. I believe the market, given its growing needs and its high-quality competition, is perfect for the application of this strategy.

**Q: What are your expectations for the next administration's infrastructure program?**

A: We expect aggressiveness and ambition. I believe all candidates understand the difference between the infrastructure we have today and what we aspire to have in the future. I expect an ambitious administration that accelerates the infrastructure development in the country. I would also like to express my gratitude to Mexico and its institutions for welcoming Sacyr and for providing a high-quality and industrially safe environment. The private sector should continue to invest in Mexico's infrastructure to increase the quality of life of the country's citizens.

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*Sacyr is a multinational infrastructure and services company. Its emphasis on innovation and international expansion have made it a world leader in the building and management of infrastructure, industrial projects, and services in 29 countries*





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# BUILDING AND MAINTAINING ROADS TO EFFICIENCY

**BENITO NEME**

Director General of CAPUFE



**Q: What is the difference between the road network CAPUFE operates and networks franchised to third parties?**

A: The network CAPUFE operates entails 44 highways totaling 4,198km of road or 15,146.35km when adding all the lanes, amounting to 44 percent of the National Toll Roads Network. This network also includes 18 national and 14 international bridges, representing 65 percent of the National Toll Bridges Network. CAPUFE is the largest operator of toll roads in Mexico and one of the largest worldwide. This governmental body has almost 60 years of experience in operating and maintaining toll road infrastructure in Mexico and was a pioneer in the implementation of electronic toll service technologies. CAPUFE offers over 15 services as an added value to its toll road network. These include emergency ramps, user insurance, medical assistance and telecom technologies, including the 074 hotline, through which various toll road services like traffic assistance and information are provided. CAPUFE's Integral Emergency Attention System handles accidents and medical emergencies. CAPUFE's vehicle park includes 298 emergency response units including ambulances, towing trucks, dynamic traffic-signaling units and rescue units, all operated by specialized staff and ready to provide efficient assistance anywhere along CAPUFE's road network.

**Q: How do CAPUFE, SCT and other public agencies interact to develop new highways and renewal projects?**

A: CAPUFE is in charge of renewing, expanding and modernizing the existing road infrastructure it operates. However, building new roads is the responsibility of SCT. In the case of concessions awarded to CAPUFE, this decentralized body defines and proposes maintenance and modernization projects for highways and bridges to SCT. SCT then procures the necessary funds from the Ministry of Finance using the Federal Expenditure Budget every fiscal year. For those highway and bridge projects that integrate the network of the National Infrastructure Fund (FONADIN), the process is different. CAPUFE defines and presents Banobras a proposal underlining the funds required to execute the projects. Banobras submits these proposals for authorization before the Technical Committee of FONADIN. This committee is composed of representatives from the

Ministry of Finance, SCT, the Ministry of Public Service (SFP) and Banobras itself. It is the latter that provides CAPUFE with the authorized resources.

**Q: How does CAPUFE plan to invest in technological developments for toll booths and electronic invoicing?**

A: Since the beginning of the current administration CAPUFE has undertaken a wide modernization program in its toll road network. This program aims to widely publicize useful information to support safe, smooth user transit on CAPUFE's roads, to handle incidents and to provide help and emergency services in a timely and efficient manner. This program entails the installation of variable-message electronic signs, monitoring and local control centers connected to the National Control Center and Users Assistance Central. Between 2012 and 2016, all toll equipment and systems within the Mexico City-Cuernavaca-Acapulco highway corridor and the Chamapa-Lecheria highway were renewed. Users can now pay the tolls electronically or with cash, which has significantly reduced crossing times at toll stations. In 2017, the technological modernization of the Mexico City-Queretaro-Irapuato highway corridor started. This corridor is vital for industry and tourism because of the number of vehicles transporting cargo and passengers through this road system.

**Q: How much do you expect tolls to rise in the coming years?**

A: CAPUFE's tolls were dropping in relation to inflation between 2012-2016 because the tolls had not been raised since 2012. FONADIN ordered CAPUFE to raise its tolls 8.7 percent in November 2016 to reduce this lag. These new tolls enable CAPUFE to allocate funds to cover the costs of operation, user services and road maintenance. CAPUFE uses 56 percent of its budget to perform major or minor maintenance on its toll road network. In 2017 CAPUFE's conservation and modernization program amounted to MX\$7.3 billion.

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*CAPUFE is a public dependency in charge of operating, maintaining and improving roads that are part of its network, either directly or through concessions to private investors. It also participates in projects to develop new roads and bridges*



# GREATER DECENTRALIZATION NEEDED FOR ADEQUATE WATER INFRASTRUCTURE

**RAMÓN AGUIRRE**

Director of the Mexico City Water Management System (SACMEX)

**Q: What is SACMEX's project timeline for the water plan for the future of Mexico City?**

A: Water management for Mexico City is divided into three main issues. First, there is much to do to solve the problem and the key actions to be implemented require a certain level of infrastructure. For example, we estimate that 70 percent of the city's pipelines need to be replaced, which equals 15,000km, and this takes time to achieve. Second, the cost to develop this level of infrastructure is significant. Third, Mexico City cannot be treated as an isolated system. The capital's plans must be integrated with those of the State of Mexico. The required investment is approximately MX\$256.03 billion, implying a huge total investment. But we can adjust the timeline to ensure that it is attainable. Our current plan foresees an annual investment of MX\$6 billion over 40 years.

**Sacmex estimates that 70 percent of the city's pipelines need to be replaced, which equals 15,000km**

We need to strategically solve the problem of leaks, given that about 40 percent of water is being lost. The most urgent leaks must be prioritized and eventually, the pipeline network must be replaced completely, as the pipes are 57 years old, on average. Next, we need to focus on the sewer system, which is deteriorating. We need to foster water reuse at all levels and maximize rainwater collection to better manage resources and avoid flooding. Likewise, we must improve our supply sources and we are considering deep wells as a short-term solution. We also need to build metropolitan treatment plants to reuse water in agricultural areas so they do not put a strain on the aquifers, which are being overexploited.

*The Mexico City Water Management System (SACMEX) started operations in 2003 with the merging of the General Direction for Hydraulic Constructing and Operation and Mexico City's Water Commission. It operates under the the Environment Department*

**Q: What strategies are you implementing to reduce water consumption?**

A: We need people to change their consumption habits if we are to reduce water usage by 30 percent. To facilitate this, we are implementing two strategies: we have launched marketing campaigns on traditional and online media sources and we are implementing differential tariffs and sanctions for high consumption.

**Q: What is the private sector's role in reducing the budget gap to enable compliance with the Water Management Plan for Mexico City?**

A: I see a great ally in the private sector to provide services, paid with results. PPP schemes are advantageous in that the reward is derived from benefits of a specific project. For example, rather than paying for a water-treatment plant, SACMEX essentially pays for drinkable water, as our interest is not in the plant but in the quality of the water. But by law, water treatment, distribution, drainage and supply services cannot be privatized. Although water management should be a public endeavor, I believe that it is better to involve the private sector to ensure the proper control of certain services. The problem is that it is simply unconstitutional.

**Q: What do you believe would be the ideal relationship between the public and private sectors for water management?**

A: Ideally, we would have service provision contracts paid according to results. The problem with the private sector is that the company controls which projects it wants to participate and can withdraw from a project if it no longer finds it lucrative. Conversely, the public-sector finances projects because it is required to and not only because it is cost-effective.

**Q: What strategies are you implementing to guarantee that the 40-year agenda will transcend administration changes?**

A: The Legislative Assembly is about to create a new binding law to draft and fully execute a strategic plan to manage the issue in the long term. Part of this law requires the city government to allocate an annual budget for water.





Atotonilco wastewater treatment plant, CONAGUA

**Q: To what extent do you believe that local governments should have more autonomy in terms of budgeting for water management?**

A: Mexico's management model is not adequate, as the dependencies in charge of water constantly change due to political decisions, and their representatives are not appointed on merit. The system is politicized, instead of working according to a technical plan. We need to change our current model and prioritize technical decision-making.

**Q: What can be done to make authorities prioritize water management in the country?**

A: I have perceived a certain level of neglect from the federal government in the cutting of our budget. We need to make the authorities realize their duty to correct this error, given the consequences it carries by limiting our sphere of action. The issue is highly dependent on the involved players, especially those in charge of the budget, as this is not a matter of goodwill but of financial capabilities.

**Q: What is SACMEX doing to prepare in case of meteorological or other natural phenomena that may endanger water systems?**

A: The only and best way we can prepare is to take action to ensure that our infrastructure will work efficiently. That is, to ensure that our storm program, which deals with rainfall issues and coordinates the actions of the Department of Public Safety, the Fire Department,

Civil Protection, Water System Management, the Urban Management Agency, the Social Development Department and Health Department, is successful in reducing the risk of flooding by managing water properly.

**Q: What is your position regarding the real estate boom in Mexico City and the amount of water that each project will require?**

A: We are demanding developers make up for the water they will use. It is clear that a lot of water is being lost due to pipeline leaks, so we want each developer to implement key actions for structure rehabilitation to compensate for the consumption the project will involve. Ultimately, they will not completely solve the problem but this solution will help us mitigate it.

**Q: What are SACMEX's top projects for 2018-2019?**

A: Our budget was reduced, so for 2018 we will be focused on small projects that address the current crisis in the most reasonable and efficient way possible. We do not have or plan to start a large and emblematic project. Rather, we will continue with the rehabilitation of the existing infrastructure, among other small new initiatives. Regarding 2019, the upcoming administration will decide the projects it wants to focus on. There are many interesting potential projects, especially related to water network rehabilitation, water-treatment plants and deep wells, which I consider very important. I would probably invest in any of those.



## SINGLE-COMPANY MANAGEMENT BOOSTS PROJECT EFFICIENCY

**ROBERTO CALVET**

Director General of AECOM

**Q: How is AECOM innovating in project management and how are its clients benefiting from this?**

A: Clients require a single contact that understands the project's needs and that can single-handedly address those needs. It is risky to have several companies develop processes and introduce distinct technologies without coordination. AECOM's Integrated Delivery Strategy (IDS) allows us to manage a project with a unified guarantee and a client-supplier strategy. We can manage every stage of a project, from conception to operation throughout the project's life. This includes planning, design, engineering, construction and operation.

**Q: What are the challenges of implementing this strategy in Mexico, where several companies are usually involved in the management of large projects?**

A: Clients need to understand the advantages in terms of technology, efficiency and quality of having a single company manage the entire process. Implementing AECOM's IDS does not imply that other companies will not take part in the project, but that a single management methodology is established and that suppliers from various sectors are more efficiently integrated into each step of a project's development.

**Q: What factors are the most troubling for foreign companies that want to develop infrastructure projects in Mexico?**

A: Planning, sustainability, innovation and ethics. First, infrastructure projects in Mexico are not properly planned. All the necessary conditions and factors are not addressed in the best possible way. Second, project sustainability must go beyond addressing how environmentally friendly projects are. The economic, political and social elements of sustainability must also be considered. Social impact studies must be as important as environmental impact

or financial feasibility because neighboring communities are always severely affected by infrastructure projects. The third factor is innovation. Mexican companies do not invest enough in their innovation departments, especially in implementing information technologies like BIM or Lean construction. Mexico continues to plan and execute projects as it has done for 40 years. Finally, ethics and transparency weigh on the ability of foreign and national companies to jointly work on large infrastructure projects in Mexico.

**Q: What can be done by the government to address these challenges?**

A: The National Council on Infrastructure (CNI) is an initiative developed by CMIC. Its purpose is to provide a roundtable opportunity for the private and public sectors to discuss the planning of complex projects. It was designed to guarantee that the government is not the only one to conceive and define the priorities for an infrastructure project by having the private sector – represented by chambers of commerce and associations – present its ideas. The government could take advantage of similar roundtables by listening to scholars and businessmen to address projects with more than political priorities and budget in mind.

Similar councils or committees where private companies, government dependencies and academic institutions can take part would be ideal. If they existed, large infrastructure projects would have to be revised by a committee integrated by members of all three groups and each aspect of the project would be thoroughly analyzed. The participation of the government through a public organism is important so that the social and political aspects of infrastructure projects are not ignored by the private sector. This is critical because public infrastructure projects are oriented toward creating a social benefit. This interaction between sectors has provided satisfactory results in other countries. In the UK, for instance, the private sector has come up with innovative concepts within public tenders – the compulsory use of BIM is a good example. Today, tender packages are delivered in a BIM format instead of a blueprint format.

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*AECOM designs, builds, finances and operates infrastructure assets in more than 150 countries. In 2016 its revenues totaled US\$17.4 billion, it was ranked first in Engineering News Record's "Top 500 Design Firms" for the eighth straight year*

# NAICM WINNER TARGETING OTHER EMBLEMATIC PROJECTS

**HÉCTOR OVALLE**

President of COCONAL



**Q: How does COCONAL differentiate itself among construction firms in Mexico?**

A: Hard work, quality and commitment. I believe this industry requires companies to provide a remarkable added value, not only by doing things well but by delivering a useful product that adds value. Our goal is to execute our projects with the best quality and with a strong social component that will benefit the market. Our levels of competition at an internal and external level are high but I believe that many of our competitors have neglected efficiency and struggle with corrupt, wasteful practices and poor quality. Conversely, we stand out by always remaining transparent and providing a quality service, as our main focus is in creating suitable infrastructure, not only in making money.

The construction industry in Mexico is experiencing a crisis rooted in the disappearance of big Mexican companies and enhanced by the generalized belief that construction is an endeavor that can be managed by any professional, even those who are not qualified as civil engineers. Mexico lacks compliance with the professional law, both in the private and public sectors. To build infrastructure, experts with the required technical skills are required to solve the problems that may arise. Our company stands out due to its adequate channeling of human resources, as all our employees are qualified and specialized in the discipline in which they work. For example, we hire our engineers right after they finish their undergraduate degrees and provide incentives for them to obtain their diplomas. Likewise, we invest in their education and training by sending them to local or foreign courses so we also foster a great loyalty within them.

Additionally, we stand out for having a comprehensive plan in key areas. First is our strategy for the adequate management of human resources. Secondly, our environmental strategy includes about 15 environmental engineers and biologists who focus on waste management, recycling, environmental best practices, permit follow up and legal adherence. Likewise, we encourage our employees to celebrate World Environment Day and we participate in reforestation by planting 40,000 trees per year, among other actions. We also have a high regard for

safety and ensure we provide the optimum equipment for personal protection and the safety of our staff.

**Q: What is the importance of the material banks and how did you secure them?**

A: First, it is necessary to carry out a general inspection with geologists in the field. Once we have located the quarries, we negotiate with their owners. We are managing 30 tezontle quarries with volcanic foam and 25 rock quarries. Each one has a specific process for exploitation. For example, for the rock, we use explosives, while tezontle is extracted with tractors.

## The Toluca-Valle De Bravo highway concession was designed, completely developed and funded by COCONAL, representing a MX\$1.3 billion investment

**Q: Apart from NAICM, what other emblematic projects is COCONAL targeting at the moment?**

A: At an international level, we are bidding for a highway in Guatemala and another in Costa Rica. Our market is in Central and South America, as we have found that the US has very different market conditions that are rarely friendly to Mexican firms. At a national level, we are concluding the last, 15km stage of the Toluca-Valle De Bravo highway concession. This project is very important, as it was designed and completely developed by our company, representing a MX\$1.3 billion investment, which was provided 100 percent by COCONAL. We expect to inaugurate it by Oct. 17, 2017.

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*COCONAL develops infrastructure projects with a focus on timeliness and cost-effectiveness. Its services include constructing, concessions, infrastructure operation and rehabilitation and transport of related machinery*





# ROOM FOR THE PRIVATE SECTOR IN WATER INFRASTRUCTURE

**NICOLÁS MORRIS**

Regional Director for Mexico, Peru and Colombia of Ayesa

**Q: What are the main issues Ayesa has identified within Mexico's water infrastructure?**

A: To solve the country's pressing water problems, especially in large cities such as Mexico City, we must look at the issue from a different perspective. There are different strategies that will have to be implemented to meet future demand. Extracting water from the city's aquifers is no longer an option. The water that is extracted is of poor quality and extremely difficult to purify due to the amount of minerals it contains. We must limit the quantities of water that we extract and instead look for alternatives. The Cutzamala System is the country's largest water infrastructure project and acts as the ZMCM's water tap. It distributes, stores and purifies much of the area's water supply. We are involved in the expansion of Line 3 of the system, which includes more than 7.7km of pipes. Apart from bringing water from other locations, we must address the efficiency of the existing water infrastructure. Of the water that is pumped through Mexico City's water system, less than 50 percent actually makes it to the faucet because of leaks and system malfunctions. Another project in which we are participating is Atotonilco Waste Water Treatment Plant, that when completed, will be the largest water-treatment plant in the Americas and will treat 60 percent of Mexico City's wastewater. This is a huge step and authorities are aware that water-treatment infrastructure is a priority.

**Q: What role does Ayesa play in the construction projects such as Atotonilco and Zapotillo?**

A: Ayesa has different roles in these projects. We have supervised the construction of Mexico's most important water projects, such as the Aqueduct II in Queretaro, the third line of the Cutzamala System and the WWTP in Atotonilco. The role of a supervisor involves technical and constructive expertise, being the eyes of the client and verifying that everything is being done according to what was established in the contract.

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***AYESA** implements computer systems to manage public finances, health and education, among others. It designs infrastructure, provides aircraft manufacturing engineering, works in oil and gas, chemistry, biotechnology and mining*

The other role played by Ayesa is all the engineering behind the projects. Ayesa elaborates executive projects that consider the whole lifecycle of the project, from the feasibility studies to commissioning, operation and maintenance. In this role, Ayesa has participated in Zapotillo, Purgatorio and Santa María Dams, a wide portfolio of water-treatment plants, water supply and sewage systems and irrigation systems.

**Q: How can the private sector play a larger role in bridging the water infrastructure gap?**

A: Private companies can manage certain parts of the water cycle. Privatization is a delicate word in Mexico and personally I do not know why we are afraid of it. I believe that it is necessary to have the private sector become more involved, perhaps not in the complete privatization of a city's water system but certain parts of the process. For instance, the collection of fees for water services or water treatment could be privatized. Atotonilco will function under a PPP scheme wherein the Mexican government contributes a large sum of money and this is complemented by the private sector, which constructs and finances the project. The private sector will receive a return on its investment through the fees charged for the use of the water-treatment plant. We must combine public resources with private partners to get the most of the limited resources the country has. Nevertheless, it is crucial that the private sector and investors feel comfortable participating under a PPP framework in Mexico.

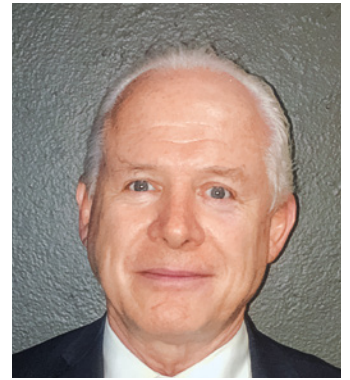
**Q: Given the high subsidies on water services, how can water infrastructure projects become more attractive to investors and engineering companies?**

A: Water projects with a standalone private investor are not viable. Much investment is needed to close the water gap in Mexico. Along with public and private investment, we need a cultural change and citizens must pay the real cost of water. For Atotonilco to be developed, it needed heavy public investment. As we move forward and require more private investment, we need to give investors the security that they will see adequate returns. The goal of the private sector is to make money. If the right price is not paid for water, utilities companies will not be able to operate the system and this will promote the misuse of water in general.

# OVERCOMING CHALLENGES WITH THE INTERURBAN TRAIN

**JULIO AMODIO**

Director General of CAABSA Infraestructura



**Q: What strategy has led to the success of CAABSA Infraestructura in the Mexican market?**

A: CAABSA has been building Mexico's infrastructure for more than 38 years. Today, we are constructing Mexico's largest and most important projects thanks to the experience we have gathered over the years. To grow and participate in many projects, we first had to secure financial support for the company. CAABSA created the real estate arm Desarrollos Grupo CAABSA to support the company financially, in the event that there are few public works in the market or an infrastructure project is delayed.

**Q: What have been the main challenges during the construction of the Mexico-Toluca Interurban Train?**

A: The main challenges we have encountered in the development of this project are the change of route for the train and the lack of liberation of the rights of way (ROW) for the project. By not having the ROW before the project begins, it delays the entire construction and can drastically increase prices. The ROW for the interurban train had not been liberated before the project began and that is why even though construction was supposed to begin in January 2015, it began in December 2015. There were many social problems, especially near Vasco de Quiroga and the town of Santa Fe, forcing the path to be changed.

**Q: Why is ROW one of the main problems for the successful construction of Mexican infrastructure projects?**

A: The Public Works Law establishes that the dependency has the obligation of liberating the ROW for all infrastructure projects. The number one rule for construction is that the developer must be the owner of the land. The interurban train project will cover more than 50km, passing through hundreds of land owners and *ejidos*, which makes negotiations for ROW even more difficult. The government does not expropriate the land because that would lead to a legal trial that could take even longer.

**Q: What are the main characteristics a consortium should have when bidding for a construction project?**

A: For the interurban train, we formed a consortium with Cargo, Gonzalez Soto, Pret and Omega. The most important

aspect to consider when forming a consortium is that the companies involved create synergies and complement each other with their unique specialties. For instance, Cargo has the equipment and experience to mount the large pieces of the structures. Pret and Gonzalez Soto specialize in prefabricates and has the experience creating the special columns and locks and concrete structures. As for Omega and CAABSA, both are experienced in constructing complex projects such as this one. We are the company in charge of coordinating the entire consortium.

**Q: In your opinion, what are the main challenges construction companies face while participating in public works projects?**

A: The root of all infrastructure projects stem from the urgency at which the public sector wants to construct them. Because the public sector is sometimes in a hurry to start building a project, the proper studies, preconstruction analysis and planning stages are not properly carried out. There are many differences between participating in a private-sector project and a public-sector project. Public works are based on unit prices that allow more flexibility when managing the budget. This often extends construction times and creates cost volatility. In the private sector, projects are more likely to be completed on time and budget, although they have their own complications. Typically, private works have a defined budget and they have to stay within that budget, leaving little room for contingencies. Planning is a skill the Mexican market has yet to master even though it is the foundation for any public or private project. For 2017-2018, we expect to be more active constructing projects for the private sector than the public sector, given the proximity to presidential elections and budget cuts. At the moment, we are still completing various public projects, such as the Mexico-Toluca Interurban Train, CETRAM Iztapalapa and the new Papalote Museum.

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*CAABSA Infraestructura is a Mexican civil engineering firm that belongs to the CAABSA Group. It is dedicated to the construction, consulting, supervision and administration of all types of construction projects*



# EXPANDING SOUTH TO MEET UNDERSERVED DEMAND

**GONZALO ROBINA**

Co-CEO of Fibra Uno (FUNO) and President of the Mexican Fibras Association (AMEFIBRA)

**Q: What challenges have Fibras faced in 2017 and what has been done to overcome them?**

A: This has been a challenging year, mainly due to three macroeconomic factors: the increase in interest rates, the elevated US dollar-Mexican peso exchange rate and higher inflation. Also, international investors withdrawing from emerging markets due to perceived speculation produced a surplus of Fibra certificates, which lowered their price.

The restored confidence in emerging markets is an opportunity, given the existing liquidity in international markets. Portfolio managers are returning to emerging markets. Fibras are appealing in this scenario because we are trading under the net value of our assets. For example, if a company buys shares of FUNO at the moment, it basically purchases real estate assets at a 25 percent discount.

Regulations bind Fibras to invest at least **70% of their assets in real estate for rent, and 30% in other financial instruments**

**Q: What is your view of the regulatory changes recently made to Fibras in Mexico?**

A: There have been several positive changes, characterized by the goodwill of the governing institutions, that have facilitated improvement. We have developed a recurring issuer program, which involves authorization for a certain volume of certificates, without them having to be processed at once, but gradually as a total allowance, providing greater market flexibility.

Whether or not Fibras will be able to invest in projects with returns obtained from sources other than leasing has been an extensively discussed issue. At the moment, regulations bind Fibras to invest at least 70 percent of their assets in real estate for rent, and 30 percent in other financial

instruments. So far, the regulation remains as it is but some points have been clarified and made more flexible.

**Q: How are Fibras changing in Mexico, compared to similar financial mechanisms abroad?**

A: US instruments date from the early 1970s, and like in Mexico, were originally diversified in several sectors. The US instruments are specialized at the moment, which I believe sets the trend for Mexico, as we have Fibras, such as Terrafina and Prologis, which are specifically designed for one industry. In the long term, instead of one large, diversified Fibra, I think we will have different small ones for specific sectors. FUNO has not done this so far because we believe that our business is more profitable using the current strategy but as soon as we find specialization more advantageous, we will move toward it. The size of our company allows us to divide into smaller Fibras that can thrive independently.

**Q: What is the importance of the investment made by Afores in Fibras?**

A: Most Fibras have been anchored to an Afore, which for us represents the patrimonial investment of Mexican citizens. Afores, in return, find Fibras as a very useful vehicle to ensure their assets are invested in a very solid sector, with high capital returns, especially given that they often have the resources but lack a solid long-term investment opportunity.

**Q: What do Fibras need to do to remain a competitive investment option for Afores given an open international market?**

A: Since their creation, Fibras have been regulated by two articles of the ISR Law. One says that their main goal is to promote real estate investment in Mexico. It does not forbid investment abroad, but the incentive is to develop the national industry. Afores can buy shares of any company but Fibras are mostly committed to Mexico, regardless of whether or not it is possible to invest internationally. FUNO is committed to promoting the development of the industry in Mexico, and our capital will stay in the country.





**Q: What are your expectations for the Mitikah project?**

A: Real estate projects have been focused mainly in Polanco and Santa Fe, and the southern part of the city has been largely neglected. To address a real need, we are practically building a city, which will be FUNO's and the Helios CKD's legacy. Mitikah has developed and applied an integrated process involving the community, the authorities and the neighbors. We take care to add value to the community, which is an approach that has taken a lot of time and resources, but that we are glad to have implemented.

The first few years were devoted to permits, licenses and infrastructure matters, among other factors. Today, we are building about 4,000m<sup>2</sup> to 5,000m<sup>2</sup> of structure weekly, and we also have made great progress in the foundations. The first office building is already constructed up to the 10th level. Regarding the retail component, we have pre-leased 50 percent of the area. For the residential tower, even though it is expected to be delivered in full by 2020, the sales have shown that it is already a huge success, which I believe is due to Mitikah being a unique and high-quality project. We are entering an excellent market in a mature area with a good socioeconomic balance.

**Q: What are your expectations for Fibras in 2018, especially regarding the possibility of Fibras investing in sectors other than infrastructure?**

A: Regarding other opportunities across different sectors, FUNO has a strong foothold in university projects. We lease to the university operator, with the ultimate goal of fostering educational development. We also have the Puerta de Hierro Hospital in Guadalajara, which is externally operated by the renter. To my knowledge, there are no plans yet to create a Fibra specifically for hospitals, but it is unquestionably a sector in which Fibras are growing rapidly.

I think 2018 will be a complicated year. There is a lot of global tension rooted in international conflicts. Also, the elections in Mexico will increase speculation. But Fibra investments are planned for the long term, about 20 to 50 years, so the possible volatility of the next year is something we are prepared for. Often, in these uncertain scenarios, the best opportunities arise. We must be prepared and maintain a certain liquidity to take advantage of them. In Fibra Uno we are convinced that Mexico is a very attractive place to continue investing. We will continue focused on generating the maximum amount of value over time and building a world class real estate company with the best property portfolio in Mexico.

*Fibra Uno (FUNO) is the first and largest Fibra in Mexico. FUNO focuses on generating sustainable value for investors through the operation, acquisition, sale, and development of real estate for commercial use*



## PUSHING THE BOUNDARIES OF MEXICO CITY'S MIXED-USE DEVELOPMENTS

**JAVIER SORDO MADALENO DE HARO**

Architecture Director of Grupo Sordo Madaleno

**Q: What types of projects does GSM want to develop in the Mexican real-estate market and what challenges does it face?**

A: As time passes, GSM is concentrating its efforts more and more on mixed-use developments. It is clear that standalone projects, whether commercial or office developments, are not working well in the market anymore. Consumers are looking for the experience created when all these components are brought together, which are what makes a project successful today. GSM combines housing, tourism, commercial, corporate and cultural developments into one and that is where we see the biggest opportunity in the market.

Finding the perfect location is definitely one of the most difficult elements when constructing in urban settings. There are few AAA lots available but once the land is acquired the next step is getting all the permits, land use and licenses in order. This is a tedious and intricate process that involves many government agencies and can take up to two years but you must do it right.

**Q: How is GSM integrating the Artz mall development into a residential area as complex as Pedregal?**

A: Artz is a project that because of its nature became a controversial topic, not for what it represents but because of where it is located and because sometimes people are not well-informed about a project. One of the biggest challenges we faced was integrating it into the mobility system of the Periferico highway. We are investing more than MX\$200 million (US\$11 million) in public infrastructure around the commercial development, including installing U-turns, bypasses and tunnels.

We want to create projects that truly boost the quality of life of their surrounding areas. We always invest large amounts of money in additional infrastructure that improves mobility and flow of traffic in the area. Apart from road infrastructure, we also invest in the improvement and construction of the area's entire water infrastructure system. Artz Pedregal will bring to life the southern area of Mexico City that had been forgotten for many years in terms of new commercial and mixed-use real-estate developments. I think it is important that both the developers and communities ensure communication is

transparent. For Artz, we decided to allocate 50 percent of the profitable space, which totaled more than 20,000m<sup>2</sup>, to green areas for the community. We have invested a great amount of money to develop supporting and public infrastructure around our projects to increase quality of life.

**Q: What differentiates Artz from other commercial developments in the south of Mexico City?**

A: Artz Pedregal is a mixed-use project that will be like no other in Mexico. We are integrating luxury boutiques such as Louis Vuitton, Gucci and other luxury brands that could previously only be found in Palacio de Hierro. There will also be a cultural element integrated into the mall and four corporate towers. We believe that this will be the future of malls. All these new elements that we are integrating will surprise the market and it will be a pioneer in architecture, tenant mix and urbanization. We believe it will surpass the success Antara enjoyed when it was first developed in 2006.

**Q: How will Reforma Colón transform Mexico City's downtown area?**

A: Reforma Colón is our largest and most complex project at the moment but it will have a tremendous impact on the urban development of the city. This project will regenerate downtown Mexico City, paving the way for similar projects not only in Mexico but in all of Latin America. For the past three years, we have been working hard to fuse together 27 properties totaling more than 45,000m<sup>2</sup>, which is a close-to-impossible task in Mexico's saturated city center. We have the opportunity to truly transform this part of Mexico City and bring it back to life. Concentrating cities in their center is more efficient in terms of investment and infrastructure, while creating microcities within the city makes for much more efficient use of space.

**Q: How is GSM able to fund multiple large projects that demand heavy investment?**

A: At GSM we are independent developers but at Sordo Madaleno Arquitectos (SMA) we also work as third-party architects with other developers, such as Fibra Danhos and Fibra Uno, on projects such as Parque Toreo and Midtown Jalisco. Most of the projects that form part of GSM's portfolio





Reforma Colón, Mexico City, Grupo Sordo Madaleno

are privately funded. We have our own private fund with some participation from international funds, but we prefer to have control of most of the properties. We have had the opportunity to create a Fibra but our business model is based on private equity. In 2016, GSM developed nine different projects, requiring larger amounts of capital. We are looking into the possibility of perhaps issuing a different financial instrument.

**Q: Which cities have caught GSM's eye for new developments in 2017-2018?**

A: We have worked in many cities across the country. A city we believe has great potential is Leon, Guanajuato and we are about to start constructing a mixed project (commercial and corporate) there. It is a city that has significant growth and has an attractive macroeconomic environment. Guadalajara is also a good market but has become slightly saturated in terms of commercial development. In 2017, we are designing five office towers as a third party. Although the market has an absorption rate of 30,000-40,000m<sup>2</sup>, more than 100,000m<sup>2</sup> are currently under construction. Guadalajara is likely to start experiencing the challenge that Mexico City is dealing with regarding a surplus of offices.

To ensure the wellbeing of the communities, we set in motion a System of Action by Cooperation, which demonstrates the responsibility that we have as developers. This system is funded 100 percent by GSM and its purpose is to provide proper urban planning for the project's surrounding areas, such as the Juarez neighborhood. This will promote the development of more efficient transport, bike lanes and social infrastructure because all the money that we donate will be injected back into these 400ha. Reforma Colón represents a very large investment in road infrastructure planning and improvement to ensure that there are no mobility problems through Insurgentes and Reforma. This project

will raise the value of the surrounding 400ha drastically and there will be updates in land use and even housing. I dare say that in maybe 10 years, Mexico City's center will be a completely different place.

**Q: What are the main factors that will continue to push the development of commercial real estate in Mexico?**

A: Location will always be one of the top factors in any real-estate development. There are many developers that are taking the initiative to create projects outside of cities due to the lack of land availability. The inertia driving the sector can at times cause developers to make the wrong decision in order to simply place their money in a project. They go to areas that are sparsely populated when we should instead be patient and wait for opportunities that are worthwhile.

E-commerce is a threat but I would not say that traditional commerce will disappear. We just have to evolve with it. Amazon is growing drastically but it is now also opening its own physical stores. Companies have to adapt to changing trends and to the habits of the new generations, which is why our shopping centers are now streets and cultural centers. We do not want people to feel like they are entering a contained and traditional shopping mall when they enter Reforma Colón or Artz. Another project that we will be developing is the Estado Azul in Napoles, which will become the Artz of Insurgentes Sur. In the future, the demands for outlets will grow even more. We are working with Simon Property Group of the US to create fashion outlets with the experience that consumers want. We have ongoing projects in Guadalajara, the south of Mexico City, Cancun and Queretaro.

*Grupo Sordo Madaleno is a leading real estate development company and architectural firm that specializes in luxury commercial centers and mixed-use projects. Its newest projects include Reforma Colón and Artz Pedregal*





# LEVERAGING THE EXPERTISE OF AN INTERNATIONAL PARTNER

**JIMMY ARAKANJI**

Co-Founder and Co-CEO of Thor Urbana

**Q: What is your analysis of the real estate industry and how do you evaluate optimism in the sector?**

A: We continue to be very optimistic and bullish about the potential of real estate in Mexico in general. Obviously, certain sectors are more appealing to us than others and we see more growth potential in certain segments. But in general, we think the industry is going through an interesting time. This has been developing since the opening of the capital markets in Mexico seven or eight years ago when the first Fibra was created and the CKDs were launched. At this point, the real estate industry in Mexico underwent a complete transformation, from being a very family-dominated industry to being a much more professional and institutional market.

For the first time, people were able to understand exits when it comes to real estate and they were able to access real estate assets through Fibras on the BMV, not necessarily owning building blocks but owning shares in real estate companies. This resulted in a great deal of liquidity, certainty and transparency in the market. This happened alongside the creation of the CKDs, which allowed Afores to invest in real estate for the first time. At this point, there were hundreds of billions of pesos in pension funds that were not being invested appropriately and were not producing returns. The creation of these instruments created the foundation for a new cycle of real estate development. We have seen in recent years a great deal of capital coming from abroad and looking to capitalize on Mexico's real estate opportunities. This has translated into a more world-class and up-to-date inventory of real estate, from shopping malls to mixed use and residential developments.

**Q: In which sectors do you see most opportunities within real estate in Mexico right now?**

A: Different sectors are at a different point in their cycle right now. We continue to be big believers in the retail sector and its growth potential going forward. More and more international

brands continue to enter the country every year looking to capitalize on Mexico's growing middle class, favorable demographics and expanding consumer credit. In terms of office space, there is much more supply than demand, with many vacancies in the prime office sectors, and rents have not achieved significant growth. This sector concerns us. We have been reluctant to invest in office space because we think the speed at which space is being leased is not aligned with the speed of development. We do not see any opportunities for developing office space in Mexico City, Monterrey or Guadalajara because those cities are oversupplied. Residential is a very interesting sector with many subsectors, such as multifamily. This sector is dynamic right now, driven by the desire of Millennials to change their lifestyles. They want to be closer to work and to the city centers and amenities. Residential for rent is an interesting niche that we are looking at right now and residential for sale also appeals to us. The demand for residential in Mexico is still far from being met. There are different socio-economic price points, but the general demand will not be met for the next 10 years so there is a lot of potential. Residential real estate in Mexico is underdeveloped and most of the current stock is obsolete so we continue to see development potential going forward.

**Q: What do you require to reach your goals and continue growing as a company?**

A: Thor Urbana is a company that is really looking to push the boundaries and break paradigms. Our goal is not to become a Mexican real estate company but to become a global player delivering a world-class project. We have a joint venture with Thor Equities, which is one of the leading real estate investors in the retail sector in the US and Europe. We are trying to leverage its expertise, global exposure and proximity to the most developed markets around the world to gain insights into new trends, new and revolutionary concepts and fresh ideas. There is a lot of information sharing that is helping set us apart from the competition. A new concept called The Lab was launched last year. It is in the development stage at the moment, but through this, we will be tracking local and up and coming entrepreneurs and designers who have great ideas and want to try conceptual business models.

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*Thor Urbana is a Mexican real estate development firm with a management team that collectively has over 120 years of experience in the development of A+ real estate in Mexico, the US, Latin America and Europe*

# PARTNERS, RISK MITIGATION KEYS TO 2020 VISION

**JORGE ÁVALOS**

CEO of Fibra Mty



**Q: What is Fibra Mty's investment profile and what is its strategy to maintain an accelerated growth rate through 2018?**

A: Our profile for investments will not change in the next year. We want to maintain our portfolio with a mix of 50 percent industrial and the other half in office developments. In terms of geographic diversification, we want to concentrate 50 percent of our assets in Monterrey and the remainder throughout the rest of the country. Today our investments are distributed throughout nine cities and seven states. Our 2020 Vision includes reaching more than MX\$20 billion in assets by 2020 and also defines the risks that we will incur depending on each tenant family. We do not participate with more than 15 percent in each subsector like automotive, technology, logistics or aviation. This helps mitigate the cyclical risks of each subsector and geographical area.

**Q: How will a larger participation of Afores in Fibras impact the sector?**

A: The participation of Afores will continue to boost Mexican Fibras and a larger participation of Afores will benefit the CONSAR. So far, Afores have more than MX\$27 billion to invest in these types of assets. Vehicles that are already in the market and have participation from Afores will look to find new investors to diversify their investor base. We see Fibras moving into a structure of internalization, such as Fibra Inn. In 2017, we saw the first case where an externally managed Fibra took the decision to internalize itself, which is what Fibra Mty did when it first entered the market two years ago. Fibras are looking to create vehicles where their interest is aligned with those of investors and to maintain transparent corporate structures.

**Q: What are the main challenges Fibras will face in 2018 and how is Fibra Mty mitigating those risks?**

A: One of the main challenges is managing the volatility of exchange rates, especially with dollar-denominated profits. One can have a surplus due to the revaluation of profits and large deficits from the subvaluation of profits. We have already seen this happen in 2017. In 1Q17 we had a large revaluation of profits and in 2Q17 it was the opposite where we went from a surplus of MX\$22 to MX\$17 per dollar. The predictability of

flows will be a challenge for Fibras in the next year. A challenge for us will be to not focus on growth in terms of size. Instead, we must focus on having satisfied tenants, efficient assets and to predictable earnings. This will translate to guaranteed contract renewals for us, even if a competitor has lower prices.

The Fibras that have a track record and have been in the market longer are more worried about investing in technology. In 2016, it took Fibra Mty a year to develop its enterprise resource planning (ERP) model. We were the first to integrate S4 Hana ERP, which is a vertical made specifically for real estate. It allows us to have a more efficient reporting system and management of business intelligence. For example, in 2016, it took us two weeks to draft our financial earnings report for the BMV and in 2017 with this new system, it took us only two hours.

**Q: What new partnerships does Fibra Mty want to develop to strengthen its position in the market?**

A: We are always on the lookout for new partners and investors to participate in the Fibra. We have four development partners that participate with certificates in the Fibra, one of which is our principal partner, Desarrollos Delta. We also have developed a partnership with Grupo Valoran, which developed WTC Industrial Park. We want to create partnerships with developers that we know build quality developments so that we can create long-lasting relationships.

2018 will be a complicated year due to the volatility created by the NAFTA negotiations, and while this goes unresolved we could see some hesitation from national and international investors. Next year, presidential elections will also pose some difficulties. But I am very positive that Fibras will grow and the modifications that have been made to the regulatory framework through AMEFI will help boost the sector's efficiency and results.

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*Fibra Mty has been in the market for two years and specializes in industrial and office assets in Monterrey. As of August 2017, it had a value of US\$355 million, 42 properties and a GLA of 494,240m<sup>2</sup>*



# DEVELOPER POSITIONING FOR AFORE INVESTMENT

**EDUARDO OROZCO**  
Managing Director Latin America of Greystar

**Q: As a multifamily property developer and manager, what market characteristics do you look for when deciding where to develop?**

A: The ideal characteristics we look for are comparable around the world: we focus on large cities with rapid employment growth, a young population and a demographic shift. Many cities are growing quickly and the infrastructure is falling behind, which creates a great number of challenges from an urban standpoint. This results in challenges to quality of life. We are interested in at least 12 major cities in Mexico that are highly concentrated in the services industry, which tends to attract the younger demographic and millennials.

At the same time, we see a complex infrastructure situation. Take for example Santa Fe, where almost 200,000 people work every day but there are less than 15,000 residential units. Between 100,000-150,000 people come and go to Santa Fe through two points of access. This opens an opportunity for our market to provide really high-quality residential developments with many amenities and a high level of services for a demographic with a real housing need and a lifestyle problem.



There is a requirement for **40-60% more houses** because people are living alone or with roommates

In a pattern similar to the US in the last five years, we are seeing a new preference in Mexico for renting rather than owning. There is a much greater drive toward lifestyle and the 24-hour city wherein people want to be closer to work and have more convenience. The population is more mobile and less willing to commit, there are more single-person households, people delaying marriage and parenting and similar trends. As a result, for the same population, now there is a requirement for 40-60 percent more houses because people are living alone or with roommates rather than in large family units.

**Q: What are the challenges in Mexico City's regulatory framework for developers?**

A: For the first time, the new Federal Housing Law includes rental properties as part of its scope. Previously, the focus of public policy was on the volume of people who could be placed in housing rather than on the quality of that housing. There are large regions on the outskirts of Mexico City that resemble ghost cities because it makes no sense for anyone to live there given the working demographics and geography.

One of the most encouraging signs as developers and operators is SHF's strong program for providing financing for multifamily developments. Commercial banks are still trying to understand the product in Mexico, whereas it is well-established in countries like the US. Every institutional investor has massive exposure to multifamily development, which are the second-biggest asset class owned by REITs after retail developments. From a local government perspective, there have been several changes introduced by Mexico City's new Constitution. We are concerned about the repercussions from the constitutional changes that make Mexico City a state rather than a special district. Traditionally, we have witnessed that decentralization is not very conducive to transparency or accountability. As an institutional investor that has been present in Mexico for five years, we are committed to the market and we want to participate as much as possible in the dialogue.

**Q: Why did Greystar choose a CKD over other financing instruments like CerPis?**

A: As an experienced asset manager, we are raising and deploying funds from various global investors, including insurance companies, pension funds, sovereigns, endowments, institutions and family offices. When we first came to Mexico, we started by investing a dedicated account from a Canadian pension fund and we were successful in deploying that capital into some landmark projects in Guadalajara and the Mexico City areas of Periferico Sur and Bosque de las Lomas.

When looking at the asset class, it makes sense to have the returns denominated in the same currency as the investment. The rents in Mexico are and always will be in pesos because





Américas Country, Guadalajara, Greystar

people are paid in this currency. When we grow in a new country, we always try to find a balance of new investors, and these tends to be local investors because they have a presence and know the market. For us, strategic partners like Afores are the right move in the Mexican market.

We chose CKDs over other types of instruments because we knew Afores had never had access to these asset classes because they had never been formally developed in Mexico. We thought a CKD would bring in different kinds of investors so they could familiarize themselves with the asset classes and understand how we carry out our business as investor manager, developer, and operator of core buildings. We also believe that CKDs are relatively simple instruments for both investors and managers. Our plan going forward is that once we are successful in deploying the capital from the CKD we want to pursue other opportunities related to these instruments so we have a long-term commitment to the market.

**Q: How do you mitigate risks associated with a potential housing market slowdown?**

A: In Mexico, our business plan is to build 10,000 units in the next five years. Right now, we are in the process of building 1,500 units and we want to speed that up considerably. To achieve this, one of the most important questions is funding. We believe the Afores have the opportunity through our CKD to gain access to an asset class they do not have to date. Traditionally, the risk spectrum of the multifamily product has been significantly lower than that of other asset classes in the real estate world because housing is a basic need that is less prone to the macroeconomic environment.

From a market perspective, the last expense people will cut out when the economy slows is rent, since a living space is a basic need. When examining occupancy rates of our portfolio of 350,000 units during the crisis in 2008-2009, office and

residential were operating at a 96 percent rate. In the depths of the crisis, our occupancy rates fell to 93 percent, while office portfolios dropped to around 80 percent due to the different risk profiles.

**Q: What are the main challenges you encounter in attracting investors?**

A: We have had a lot of interest but the queries are more about the asset class rather than about us as a manager. There is a preconception associated with renting that links it to instability, to the extent that in 80 percent of our meetings we are asked about this. The difference comes in the sheer size and scale in which we are working because many of these ideas are related to informal apartment owners who have all of their patrimony invested in the apartment and do not have the resources to screen those renting the property or respond when the tenant is not paying.

When operating 500 apartments, each individual unit is a tiny part of the overall cash flow, meaning that if one tenant is unable to pay or throws up legal issues, it will not affect our return. One of the most important things we do is to screen those who will rent in our building and to do so, we examine several different factors. We gauge the risk profile and, based on the outcome, we personalize the level of requirements, including security deposit, insurance policy, co-signee or letter of recommendation from the employer. In addition, since we control the operation of the asset with technology and a team in the building, we have protocols to address all the potential operational challenges that come up. This is the real value add of an experienced and institutional operator.

*Greystar provides world-class services in the multifamily real estate business. Its innovative business model integrates the management, development and investment disciplines of the multifamily industry on international, regional and local levels*

# HOW MEXICO'S HOUSING SECTOR IS CREATING ISLANDS

**Verticalization is the buzzword of the year among residential developers. But if the 2014 National Housing Plan created by SEDATU and CONAVI was meant to bring people back into the cities and contain urban sprawls, why are people continuing to move to travel an average of two hours to reach their job?**

Mexico's 10 largest cities are Mexico City, Ecatepec de Morelos, Guadalajara, Puebla, Ciudad Juarez, Tijuana, Leon, Zapopan, Monterrey and Ciudad Nezahualcoyotl. Eight of these cities are the motors that drive Mexico's economy and are home to the country's most important industries. Two are the result of exponential growth, lack of space and rising home prices. Ciudad Nezahualcoyotl and Ecatepec de Morelos have a combined population of more 2.8 million people and form part of the Valley of Mexico Metropolitan Area (ZMVM).

The urban sprawl surrounding Mexico City has grown so much that it has eaten up various states and municipalities around it. The ZMVM includes 60 additional municipalities from the State of Hidalgo and the State of Mexico, which together have more than 20 million citizens. Of these, only approximately 9 million live in the actual city and the remaining 11 million live in the 60 other municipalities, such as Ecatepec and Nezahualcoyotl. According to INEGI's 2010 housing and population survey, of every 100 Mexicans, 52 moved from Mexico City into the State of Mexico and in INEGI's Intercensal Survey in 2015, more than 545,284 migrated out Mexico City.

## MONEY TALKS

According to INEGI's National Occupation and Job Survey, more than 24 million workers earn less than MX\$5,000 a month. Mexico's minimum wage continues to be just MX\$80.04 a day with exhausting working hours that are among the highest in the world. With that in mind, Mexico City (MX\$1.53 million) Queretaro (MX\$1.45 million) and Morelos (MX\$1.21 million) are the three states with the most expensive average when it comes to housing prices. When compared to the national average as of 2Q17 of MX\$744,943, according to Federal Mortgage Society (SHF), the concept of bedroom cities begins to make more sense.

Mexico City's most attractive delegations are Alvaro Obregon, Cuajimalpa, Miguel Hidalgo, Benito Juarez and Cuauhtemoc, at an average price between MX\$22,000-40,000 per m<sup>2</sup>, an 86 percent increase from 2012-2017. By using CONDUSEF's credit simulator, for a nonaffiliate of Infonavit, the lowest monthly payment for a mortgage loan would be MX\$8,630.85 from Santander for a house of a value of MX\$1.02 million. To qualify for the loan, the applicant

needs a minimum income of MX\$20,135.18 a month and after 15 years the total amount paid will be MX\$1.9 million.

For an Infonavit affiliate, the monthly payment would fall to MX\$6,363.02 a month and a monthly income of MX\$14,654.31 would be required to qualify for a loan for a MX\$750,000 house. With a MX\$1.02 million mortgage loan, a person could purchase a home of 46.3m<sup>2</sup> or a 25m<sup>2</sup> apartment in the central delegations in the city. This does not take into account the luxurious apartments in Miyana in Polanco or in Santa Fe, where apartments start at MX\$8 million for a two-bedroom unit.

Another factor keeping people away from cities is a change in demographics. "There are almost 50,000 people living in Mexico City who are getting married and 10,000 divorcing each year," says José Shabot, Executive President of housing developer Quiero Casa. "They need housing and when they cannot find affordable and decent housing, they move to the outskirts, making the existing mobility problems a bigger challenge."

It is no wonder people are migrating to the State of Mexico. Ecatepec de Morelos has an average price of MX\$7,413 per m<sup>2</sup>, which means a 60m<sup>2</sup> apartment would cost only MX\$444,780. While the cheapest apartment according to Quiero Casa in Mexico City has a price tag of MX\$600,000, and the size and safety of the apartment is almost always compromised. Ecatepec de Morelos and Ciudad Nezahualcoyotl also happen to be some of the most dangerous areas not only in the ZMVM but also in the entire country.

## OTHER CITIES MUST BE CHEAPER

For five years in a row, Nuevo Leon continues to be the state with the greatest level of housing development in the country, according to Realty World Mexico. Nuevo Leon developed more than 69,535 homes in 2016, followed by Jalisco with 55,945 and Quintana Roo with 32,440 homes. Prices in Monterrey have also increased along with production. In the first quarter of 2017, the price of housing has increased 5.18 percent in comparison to 1Q16, with an average price of MX\$744,943, according to SHF. Monterrey was the city with the highest increase, with 5.83 percent in comparison to 4.50 percent in Mexico City and 4.34 percent in Guadalajara.

Just like in Mexico City, Monterrey's urban sprawl has caused municipalities to mix and now the most populated areas in Nuevo Leon – Guadalupe, Apodaca, Santa Catarina, General Zauzua and General Escobedo and Juarez – have turned into the Metropolitan Zone of Monterrey. The phenomenon repeats, with high housing prices and the need to commute for more than two hours to reach places of work.

San Pedro Garza Garcia is the one of the most expensive cities in Mexico, with a price per square meter of MX\$38,312.95. To live at a decent distance from their jobs, people would need to pay approximately MX\$2.3 million for a 60m<sup>2</sup> apartment. "Many people that work in San Pedro Garza Garcia live in other housing developments with an average price tag of MX\$2-4 million," says Marco Garza, Founding Partner at GM Capital. "Typically, they cannot afford the high-priced homes, education and costs of living in the neighborhood where they work." People want to live closer to where they work and play, driving the construction of housing back into urban areas.

Developers in Monterrey also believe that mixed-use developments could be the cure to the city's problem. As of 4Q16, there were 24 mixed-use developments, seven under construction, and it is projected that there will be nine new projects in 2017. But with such exorbitant prices and the average income of Nuevo Leon being MX\$7,962 a month in 1Q17, it is out of reach for most families. "The San Pedro Garza Garcia market is a little saturated and Monterrey has other submarkets that are gaining traction," says Carlos Rousseau, Senior Partner and Co-Founder of Orange Investments. "The more rural areas of Monterrey are beginning to see further commercial developments, mixed-use projects and shopping malls being built. I think in the future, we will start to see a big movement toward Monterrey's downtown."

**IS MIXED-USE REALLY THE CURE?**

Mexico's cities are only beginning to build upward. Verticalization is slowly taking over the housing sector, but of the 2,586,438 households in INEGI's 2016 National Housing Survey, only 818,661 (31 percent) live in an apartment complex, and 1,725,214 (66.7 percent) live in an independent house in Mexico City. The number of people living in an apartment increased 1.8 percent and the number of people living in an independent house decreased 1.3 percent from 2014-2016.

Residential developers in Mexico believe it is a slow but sure transition. "By 2025, millennials will represent approximately 75 percent of the country's workforce," says Marcelo Rodriguez, Director General of Grupo Proyecta. "Currently, there are more than 30 million millennials living in Mexico between the ages of 21 and 34 who will be looking to either rent or buy housing in the coming years." New generations want to live closer to their everyday activities,



but the current housing and mortgage prices do not match the salaries of recent graduates.

The 2014-2018 National Housing Policy wants to bring people back into the cities, but are the right mechanisms in place to ensure that the cities are inclusive? Mixed-use developments are on the right track, but they are not affordable for the majority of the population. "The problem with sprawls appears when it does not come from a natural process, but from a commercial condition artificially created by the government or developers, mainly due to economic efficiency motives and speculation, even when there is no need for it," says Gabriel Ballesteros, Partner at Ballesteros Mureddu. "If the expansion of the city does not come from a growing process that respects the contiguity of the city, then it creates new spaces whose value will grow within the speculation process."

Mexico City's new Housing Law is a ray of hope for creating decent and inclusive living conditions within the city. It will allow the use of government land to make more housing developments and has new codes that will grant developers new conditions and incentives. For instance, if developers are building for Infonavit or Fovissste, they will be allowed to build more stories, further verticalizing the city. "Combining these new policies will make land cheaper and in turn will create lower prices for the end consumer," says Shabot. "This will help provide apartments to not only middle class, but also to people who are below middle class. Our homes are within the range of MX\$600,000-2.5 million and our average price is MX\$1.5 million. But if land becomes cheaper, then we would be able to lower the price at least by MX\$100,000 in some of our segments."





# CHANGE IN AFORE RULES TO BOOST INFRASTRUCTURE INVESTMENT

**JUAN MANUEL VALLE**  
Director General of Afore XXI Banorte

**Q: How attractive are infrastructure and real estate for Afores, especially with the emergence of new investment vehicles?**

A: Infrastructure projects are the perfect match for pension funds. It is natural that *Afores* want to participate more in these types of projects. Afore XXI Banorte has put together one of the strongest investment teams in the country that focuses on alternative investments with sound corporate governance and processes. We have been putting together a benchmark portfolio that reflects our strengths.

A: We are active investors in all the projects in which we are involved. It usually takes six months from the first proposal to the time we authorize the investment. Our investment team analyzes each project and once it has a strong case, it is then presented to an internal committee. Several lawyers and I participate in this internal committee, which is where we submit the project as an internal discussion to prepare for presentation to the Investment Committee. In 2016, we approved one of every three projects that we received.

Afore XXI Banorte has committed **more than MX\$60 billion for investment in CKDs, of which MX\$17 billion are invested in infrastructure**

As of August 2017, we have committed more than MX\$60 billion for investment in CKDs, of which approximately MX\$17 billion are invested in infrastructure (28 percent) and MX\$16.3 in real estate (27 percent). Afore XXI Banorte has been involved in various successful real estate projects and is investing in new projects in Mexico. Among these is a major project that could change the footprint of downtown Mexico City and this could be announced soon and could modify our investment figures.

Managers have been more prompt to invest in real estate than infrastructure in general, possibly because real estate projects are completed much more quickly. In infrastructure, there are projects with a longer “J” curve, where we have yet to see results, whereas in real estate, we are already receiving flows. As an example, we are a significant investor in the *Red Compartida* project, which will provide Mexico with over 90 percent of coverage in mobile and data service at speeds of 700MHz throughout Mexico.

**Q: How does Afore XXI Banorte approve an investment in an infrastructure project?**

**Q: How does the Afore prefer to participate when it comes to large infrastructure projects?**

A: For large projects, we work with the strongest players in the international markets such as Caisse de dépôt et placement du Québec (CDPQ), BlackRock and Riverstone. A good example is the Zama well that recently struck significant oil in shallow waters off the coast of Tabasco and is the first successful exploratory well found in the fields auctioned in the bidding rounds. Afore XXI Banorte owns almost 5 percent of that project through two different vehicles issued by Riverstone and BlackRock. We are indirectly investing in this project because both companies approached us to invest in their CKDs.

In the largest CKD that we have, Infraestructura Mexico, we had originally planned to invest independently. But we partnered with CDPQ and the idea of this CKD was that for any investment that CDPQ found interesting, we would invest at the same level, ensuring that neither would have the majority share. The company that would be operating the project would have to have 51 percent of the entire investment. This provides the incentive to have good administrators and operators for the project, as well as institutional investors that are there for the long term. We have been working with funds that have been in the market longer than we have and we receive feedback from them to adopt best practices. Our teams also go abroad and receive training from these large international pension funds. We believe that our approach to creating partnerships with other funds and international players helps improve the success of our investments.



**Q: How could Afores help bridge the financial gap in the infrastructure industry and attract investment from international funds?**

A: There are many funds interested in investing in sectors such as toll roads, ports, housing, commercial, energy or renewables, but they do not feel comfortable doing it on their own. We want to make them feel comfortable partnering with us. When they see that Mexico's largest pension fund is involved they tend to feel better about investing. Now that the regulation will change and Afores will be allowed to invest 100 percent of a CKD and no longer be limited to 35 percent, our experience tells us that it is better to co-invest with international funds. The previous regulatory framework limited the ownership of a vehicle by an Afore to a maximum percentage, so the general partners had to collaborate with at least three Afores to raise a successful CKD. Although we will now be able to invest 100 percent, we will not do so and instead invest with dedicated international funds such as Temasek, CDPQ and PSP, among others. For future projects, we want to partner with large funds as co-investors.

**Q: How will these changes to the regulatory framework affect the country's ability to invest in projects?**

A: This will be a positive change. For the largest Afores and projects, the way things are set up today limits the capacity for doing things quickly. If four Afores sit at a table with investors to finalize a proposal, everybody wants something different. The current regulatory framework limits the flexibility of investors and large projects require great amounts of funding. The changes will make it easier for fund managers to raise money. Some managers have told us that there is so much interest that they could raise the resources abroad. The best opportunities for us are in Mexico but investing in the BMV is complicated for us because we are too large.

**Q: To what extent are Afores ready to boost investment and what needs to be done to make them feel comfortable using this new financial instrument?**

A: We analyzed the pros and cons of CerPIs against CKDs. In a CerPI, we do not have the option to decide where it will be invested. If we were to invest in that vehicle, it would be much easier with managers who have proven their capacity. For instance, we would consider partnering in a highway CerPI with a company that has been successful through a CKD in acquiring and managing highways. If RLH Properties for instance had issued a CerPI with the experience that it has, we would have invested because of the company's experience. We are already own a 35 percent participation in RLH Properties through various projects.

**Q: What opportunities do you see in Afores investing in Special Purpose Acquisition Companies (SPAC)?**

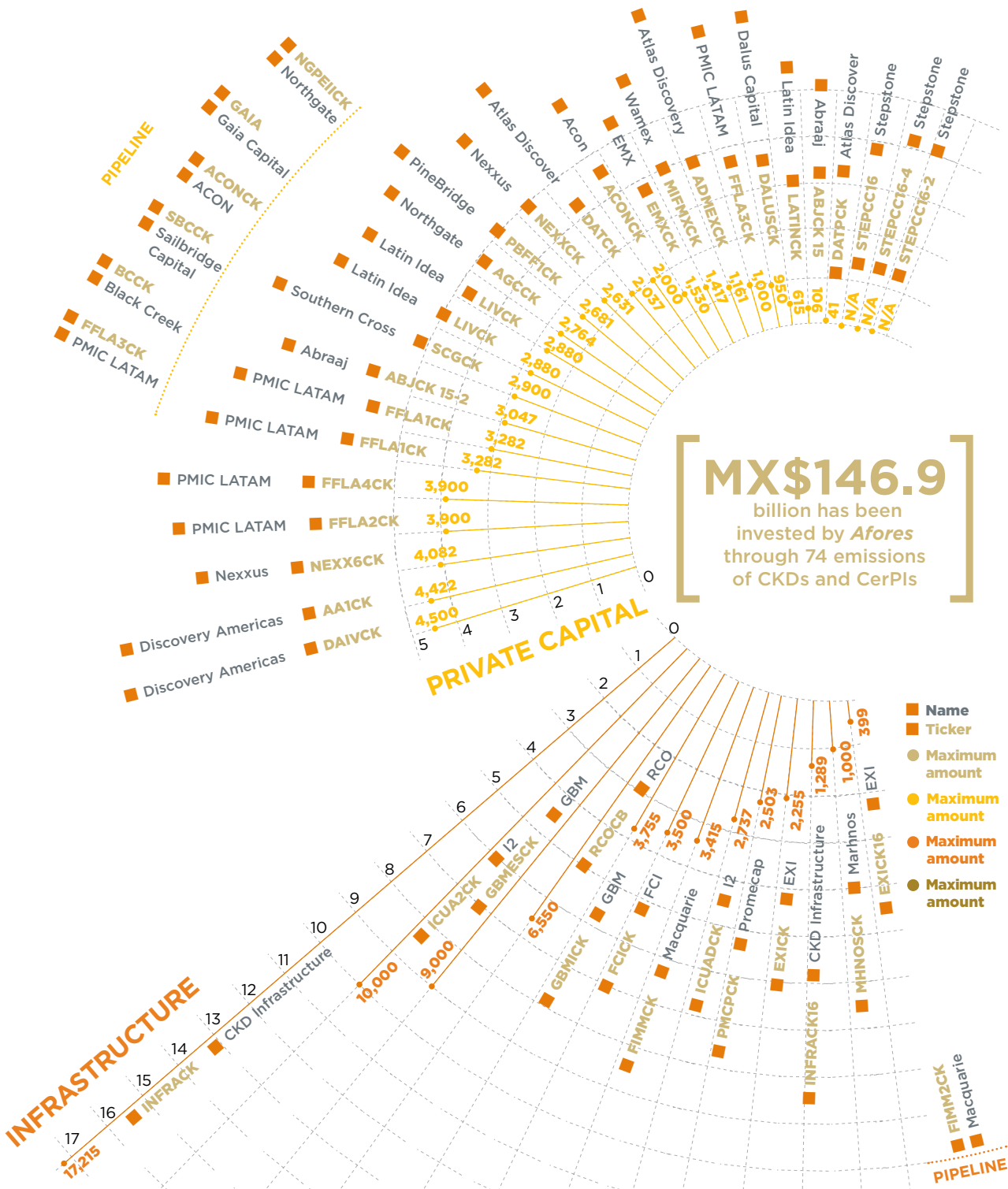
A: For new instruments such as the CerPI or SPAC, it all depends on who is behind the projects. Riverstone and the former YPF management team are behind the first SPAC, and they are great managers with strong track records. The energy sector has large oil companies, but there are also small ones. There is an opportunity to consolidate a company that may never play with their larger counterparts, but provide economies of scale. In terms of SPAC, managers have to bring the project to us, similar to a CKD but on an international scale. If we decide to invest in a project and the process is finalized, our managers will remove the SPAC and enlist the company. If we decide not to invest, we receive our original commitment. The operational costs are all assumed by the sponsors. Afores are relatively new in Mexico, having been in the market for only 20 years. For many years Afores were only allowed to trade bonds but since the regulatory framework changed, they have been the driving force of these new instruments.

*Afore XXI Banorte is the largest pension fund manager in Mexico and the fourth-largest in Latin America. It manages more than MX\$660 billion in 16 different Siefors, representing 23 percent of the market*

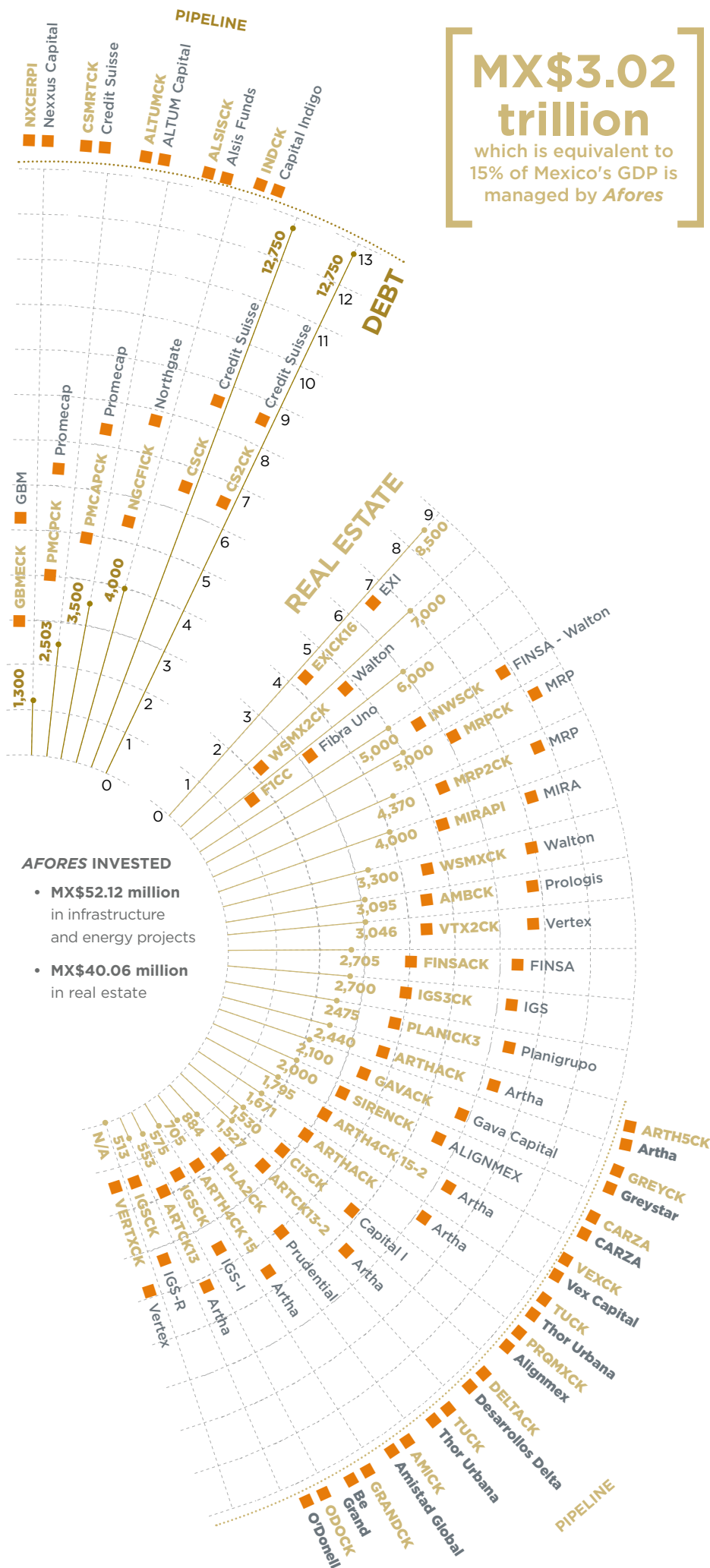
# PENSION FUNDS TO THE RESCUE

As the Federal budget for infrastructure development shrinks, the sector is looking to the BMV to obtain money for its projects. Structured vehicles such as CKDs and CerPIs are gaining popularity among developers and funds that can now access funds from *Afores*, to bridge the country's infrastructure gap, whether in public infrastructure or real estate. Throughout the years, regulatory framework for *Afores* has allowed them to invest more and more in the infrastructure industry, and

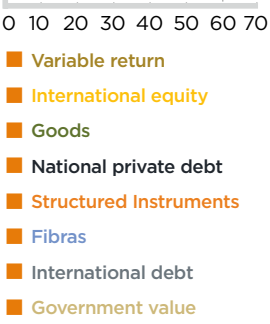
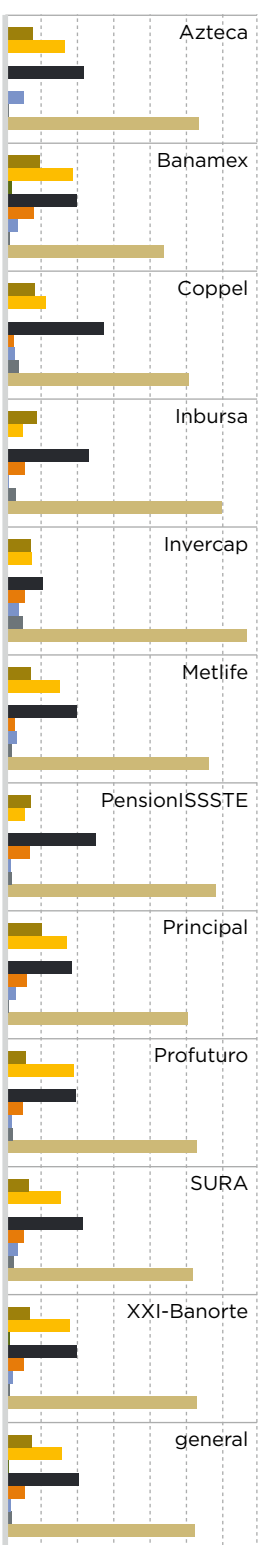
with new instruments such as Fibras and Fibra Es, they will become more active in years to come. In September 2017, CONSAR announced that the limit *Afores* can invest in a Fibra or CKD in a single issuance will be increased from 35 percent to 100 percent, which will provide *Afores* with more flexibility to invest in bigger projects in the future. But with more flexibility to invest, which subsectors within the infrastructure industry are most attractive to *Afores*?







WHICH AFORE INVESTS IN STRUCTURED INSTRUMENTS THE MOST?



Sources: CONSAR, BMV, 414 Capital Inc



## NEW AIRPORT PROGRESSING ACCORDING TO PLAN

**FEDERICO PATIÑO**

Director General of GACM

**Q: What progress has been made on NAICM's development?**

A: The project was announced in September 2014 by President Peña Nieto. Since then, GACM has hired the best team worldwide. We have the world's best consultants, Parsons as our Project Manager, the best architect in the world, Norman Foster in partnership with FR-EE Fernando Romero, Dutch engineering firm NACO and Arup, which is responsible for the master plan. In that regard, 2014 and 2015 were years dedicated to planning and carrying out the required tests. Several studies were carried out even before this point. An airport is a project that involves complex logistical development and demands a high level of sophistication.

We then focused on the design, always keeping various questions in mind: What sort of airport do we want, a regional or an international hub? What was the desired capacity and the expected growth? This was necessary to plan the size of the project according to passenger and airline growth trends. The project was designed to meet the country's needs, so that it could serve as the gateway from Mexico to the world. Starting in 2016, the construction began with preliminary projects for site preparation, such as the 33km perimeter fence, access roads, construction of the on-site offices, the removal of debris, the temporary sewage and ground leveling. All those projects are now completed. In the same year, we tendered around 65 percent of the project's value, awarding runways 2 and 3, the foundation piles and the electrical substation, among others.

In 2017, we started the construction of the terminal foundations, the control tower and runways 2, 3 and 6. The runways are being built simultaneously, starting with 2, 3 and 6 in the first phase and 1, 4 and 5 in the second. This year we started to see the project take shape in a tangible way. We have 7,000 trucks moving material every day and 40,000 people working on the project. By next year, we expect to have generated 160,000 direct and indirect jobs.

**Q: What challenges has GACM faced in the initial construction phase and in the creation of the masterplan for tenders and construction?**

A: During 2015, we focused on the design and planning of the project. Part of this was the design of the master plan. It involved the active participation of all the parties involved in the project, and balancing their needs. We held over 230 meetings with regulatory and international agencies, national and international airlines, government agencies and service providers, to hear their needs and concerns and take them into account in the design of the master plan.

The biggest challenge for me is to prove that Mexico can carry out projects of this magnitude in a transparent and honest way. GACM endeavors to become a reference for projects of this scale. Also, we want to complete the project on time and within budget, especially given its level of complexity. This project involves a series of contingencies and uncertainties, and we constantly encounter surprises that we must solve. The possibility of making a mistake with decisions is always present, so we try to have the best counseling possible. It is also paramount to have a sense of urgency because often we do not have much time to react to certain situations.

**Q: What strategies are being implemented by the different companies involved to optimize processes and the areas where cost overruns are arising?**

A: Only 6 percent of the megaprojects constructed around the world are finished on time and within budget. We are one of the first projects in Mexico and the first of its kind to use BIM (Building Information Modeling). This methodology helps us use intelligent, connected workflows to help improve predictability and productivity. We also work closely with the project manager, contractors and supervision entities to develop management strategies.

NAICM is also a self-financing project. Recently, we issued green bonds for up to US\$4 billion, which gives us a total financing of US\$6 billion. The financing scheme is backed by the current airport's excess cash flows and eventually by the new airport. Fortunately, the financing scheme is based on the TUA that is charged to most passengers, and is charged in dollars. This protects the private financing from the peso's devaluation and volatility in the markets.



NAICM Perimeter

**Q: What are the expectations for NAICM for the end of 2017 and into 2018?**

A: 2017 was the year for big tenders and the beginning of construction. By the end of 2017, we will have already tendered around 85 percent of the project's value with our most important projects awarded. These include the passenger terminal building, the air traffic control tower, runways 2, 3 and 6, the electrical substation and the ground transportation center, among others. The next two years will see the development's consolidation as we will really be constructing these projects simultaneously. We will see harmony among the people, ground and machinery. These years will be the most construction-intensive so NAICM can finish the project by 2020.

GACM is the owner of AICM and the concessionaire of NAICM. Once we inaugurate NAICM we will have to close AICM, which is 770ha. After constructing NAICM, GACM will be its operator. In the meantime, we are carrying out the required tests, in collaboration with the Mexico City government, to determine what we will do with AICM's land.

**Q: What do you believe is the best future use for the AICM territory?**

A: I believe this land comprises a territorial reserve that is unavailable elsewhere in the State of Mexico; it is twice as big as Central Park. We cannot make a mistake, as we owe it to future generations to put the area to best use. In my personal opinion, we must consider the best practices of other countries when closing an airport and opening a new one. I find this a marvelous opportunity to build a smart and modern city that is environmentally friendly and that is directed to the potential middle class and to younger people.

I would avoid the excessive use of cars and instead have a great number of bicycle paths. I would also like to see a lot of technology and many universities to build a city of knowledge, as well as a place in which people can live where they work and in which they will find everything they need. This would be a happy city that can regain the style of the typical Mexican neighborhood, similar to La Condesa or La Roma. With the AICM land, we have the ideal place to achieve this goal, but we must come up with something completely out of the box, involving lateral thinking instead of duplication and making more of the same. We have a great opportunity here to build a masterpiece like we expect NAICM will be, but also an extraordinarily cultural space for our citizens.

**Q: How are GACM and SCT ensuring the continuity of NAICM's development beyond the presidential elections in 2018?**

A: Funding is guaranteed by the placement of green bonds for US\$6 billion. The contracts for the tenders are signed and construction is underway and advancing very quickly. We have contractual obligations with the bondholders and the contractors working on the construction of the new airport. Canceling the project would be a waste of money and it would imply the loss of thousands of jobs, sending the wrong message to the capital markets about Mexico's obligations.

*GACM is the group that oversees the operation of AICM and the construction of NAICM. It is a government dependency and is charged with ensuring tenders for the new airport are carried out with speed and transparency*



# DESIGNING MEXICO'S GATEWAY TO THE WORLD

**FERNANDO ROMERO**  
Founder of FR-EE

**Q: What is FR-EE's key differentiator from other successful architectural firms?**

A: We firmly believe that architecture is an opportunity to mark a specific historical moment and boost the development of a given context. Every context has information that can be translated to improve the economic development of a certain area, and that also is as an opportunity to portray the development of the technology of a civilization. We incorporate that knowledge into our designs, which is our main differentiator.

**Q: What role do architects play in defining the future of Mexico's infrastructure?**

A: About 99 percent of infrastructure has been designed by engineers, who solve quantitative problems based on numbers. I think that architecture is an amazing opportunity to go beyond the quantitative aspects of problems and find the symbolic potential of every project. This means that infrastructure is a great chance to portray the identity of a country. We do not want to merely solve numeric problems. As architects, we are interested in answering fundamental problems from a perspective that will enrich people's quality of life, while boosting social and economic development.

**NAICM comprises more than 1 million m<sup>2</sup> of total construction, including a ground transportation center and the control tower**

**Q: How do you think architecture has changed in Mexico during the last couple of years?**

A: We come from a very strong modern movement. Modernity carries the post-war conscience of constructing buildings with the capacity to be easily reproduced. Post-modern architects have been educated through the suffering of several economic crises, and I think the experiences of the 1940s and 1950s have given us a strong

heritage in Mexico. Through this, we were able to connect with a context that combined the global with the local.

Mexico is one of the richest countries in terms of natural resources, and one of the most visited countries in the world. I firmly believe it has all the elements, including the cultural heritage, to create amazing architecture. But we have not placed a higher value on the context and that must be our main goal, especially in this interconnected globalized world with a melting pot of cultural identity. We must also ask ourselves how we can use the existing technologies to enrich this culture by connecting and understanding its information.

**Q: What do you think about architects creating alliances with other clusters to work on NAICM?**

A: I think collaborations have long been present in architectural history. For example, the Centre Pompidou in Paris was built through collaboration and became an icon. To me, it was a blessing to be able to collaborate with Norman Foster, probably the most admired architect in the world today, who has a remarkable knowledge regarding the design of airports. It was extraordinary to see our ideas converge in developing NAICM's masterplan. Norman was very open and sensitive to our vision of the project. Also, his capacity to build the argument and stress the ideas was paramount when selling our design. The competition was exceptionally strong, but we are convinced we developed the most coherent and beautiful solution, which is why we were awarded the project.

**Q: What are the main challenges you encountered while designing NAICM?**

A: NAICM is a complex project given the number of flows that will happen within its structure: of people, goods, luggage, systems, employees, agencies and so on. Its scale is extraordinary, as it comprises more than 1 million m<sup>2</sup> of total construction, including a ground transportation center and the control tower. In terms of technical aspects, to build it on soil that was once a lake and thus has a huge compression capacity makes the project as complicated as building on the ocean. The technical aspects can be solved





Render of the Completed NAICM Airport

with technology. We scanned the area and realized that the underground soil is changing in depth, so we needed to come up with a structure that could float. We followed the principle of compensation, which enabled us to plan floating foundations for the airport. This is important because the terminal has to work harmoniously within the masterplan and the runways need to move with the compression capacity of the soil.

I believe the NAICM project is the best investment for the future development of the economy and tourism of the country. FR-EE saw the competition as an opportunity to design a building that solved numeric problems but to also design the gate of Mexico, which has the potential of connecting our history with modern architecture to project to the rest of the world. We seek to use architectural design to create the first experience many will have in the country.

**Q: What strategies have been implemented to guarantee the safety of the airport in case of an earthquake or another natural phenomenon?**

A: The structure is designed to last 1,400 years and to resist earthquakes. Given that it is horizontally designed, I believe it is seismic immune. The challenge is more geared toward other issues, like the dimension of the structure versus how comfortable it is for a passenger to walk its distance; the international standards for other risk situations, like fires and other incidents. NAICM is the biggest airport in the Americas, and after Istanbul's, the biggest one in the world in terms of square meters. Given its location in a highly

seismic area, it is important to incorporate earthquake-resistant technologies into the structure.

**Q: What are the most important aspects of creating a truly sustainable masterplan for cities in Mexico?**

A: I think the world is changing very quickly. In the next few decades, we will be confronted with realities that today appear as science fiction. Our cities come from medieval schemes that have evolved through migration and yet remain somehow disconnected from the current reality. If we are at a time when civilization is exploring how to live on Mars, the question is how can we try to use the same intelligence and resources to think about the cities of the future. An important segment of the population will reside in urban areas in the near future, so I am particularly fascinated by how these metropolises can be planned with new notions that incorporate the fast-changing features of the world, new technologies and new communication systems. Cities of the future will have to question how we live today. We need to start inventing notions of new urbanism, to develop a post-modern utopian model and innovate to create sustainable growth for our planet, through cities that have a coherent relationship with the environment.

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*FR-EE is a global architecture and industrial design firm founded by Fernando Romero. Its commitment to translating historic, social and environmental contexts into contemporary urban destinations has generated impact in cities and communities*



# INFRASTRUCTURE CANNOT REST SOLELY ON PPP SCHEME

**DIANA MUÑOZCANO**

Chief Investment Officer of Grupo Indi

**Q: What impact have public tenders and schemes like PPPs had on infrastructure development?**

A: Infrastructure is a sector with slow mobility that requires patience and preparation. I believe that its processes have consistently improved, as PPPs have allowed a professionalization that goes beyond engineering, to a more stable financial flow that facilitates comprehensive strategic planning for the long term. Regarding the tenders, we are still trying different models to adapt to different times and contexts. There is no ideal scheme.

We need more infrastructure but not all of it can be built through PPPs, as the private sector assumes most of the risk. We try to work through unsolicited proposals (USP), which we think is an interesting way of collaborating with the public sector, even though this tool requires a high level of investment that may hinder its application. It would be very interesting to see more USPs at the state level, as local construction firms often have a more in-depth knowledge of their market needs.

**Grupo Indi's main projects in Mexico include a mega container terminal in Michoacan and the second floor of Periferico in Mexico City**

**Q: What strategies does Grupo Indi implement to minimize project risk?**

A: I believe that a key component of our success is that we have ventured into projects as investors and not only limited our participation to construction. We are also exploring diversification by venturing into real estate. We also have tourism as a second option when the infrastructure industry

decelerates. It is a sector that we know well, being the first we entered as investors, and we will continue to foster the industry given its constant growth. Also, the maritime industry promises to gain strength.

**Q: What have been Grupo Indi's most challenging projects in 2017?**

A: Our most challenging project is NAICM. Also, the Circuito Interior is an interesting and complex project as it is a PPP for the first underground road in the country, built under Mexico City. It was essential that we planned the logistics well for the construction stage to ensure the least possible disruption of the daily dynamics of the area. For this project, we collaborated with La Peninsular and IDINSA. We believe that partners multiply the value that we can add to our projects, so we are willing to associate with firms that can complement our knowledge, expertise and with which we can build a relationship based on trust.

**Q: How do you view your experience working at NAICM?**

A: In this project we have found three main challenges given the number of players involved. First, the interoperability of all the tenders must be harmonized, as there are many local and international players involved. Second, the technical challenges are vast, given the unique and complicated soil conditions that required specific materials and engineering. Texcoco's ground has been challenging. Third, we were responsible for taking the project to trial phase, which took us longer than expected but allowed us to test the viability of the project. We have managed to optimize our time-efficiency and make up for the delays. Our goal is to continue our participation in NAICM and I believe we can contribute most to the foundations.

**Q: What imprint do you want to leave on the Mexican infrastructure industry?**

A: We want to be among the top construction firms in the country and to remain present and relevant for a long time. Also, we aim to foster development through quality projects, both as investors and constructors. We have been dabbling in energy-waste management for a year. It is a slow process but we are excited to participate more in clean-energy initiatives.

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*Grupo Indi has 40 years' experience in the market, developing projects for the public and private sectors. It is divided into four business units: building, infrastructure, services and Welndi*

# MEXICO TO LEAD IN SUSTAINABILITY AND INFRASTRUCTURE

**ALICIA SILVA**

Founder and Director General of Revitaliza Consultores



Mexico may not be the first country that comes to mind when listing the greenest countries on the planet or even in Latin America. But it could become a sustainability champion because of the exponential increase in the number of certified green buildings the country has seen in recent years. Revitaliza Consultores wants to continue contributing to this trend by helping clients obtain LEED and other certifications. "In 2011, there were only 11 LEED-certified buildings in Mexico and now there are more than 700, which is a considerable improvement," says Alicia Silva, Founder and Director General of the green consulting firm.

There are several factors that promote the adoption of sustainable practices in Mexico. According to Dodge Data & Analytics' World Green Building Trends 2016 Report (WGBT16), the positive impact that green policies have on business is the most important. Silva points to the country's several international commitments to sustainability, with COP21 and COP22 being the most recent and important, as a foundation for the adoption of sustainable practices in construction and other sectors. To meet these commitments, Silva proposes that the country raise the bar on standards. "Mexico and Latin America in general are ready to compete in markets with higher sustainability standards," she says. To this end, Revitaliza Consultores offers a series of consulting services on sustainability and energy efficiency to help its clients achieve certifications that include LEED, LEED for Homes, EDGE and WELL.

The company is working on several key projects, such as the commissioning of NAICM and airports in Cancun and Colombia, the certification of several IMSS hospitals in Sonora and the Bajío region and a cooperation with tequila company José Cuervo toward a Sustainable Sites certification related to onsite infrastructure management. Silva says Revitaliza's certification efforts on the José Cuervo project were complemented by the Parksmart certification the project received, which is related to how parking is handled. As part of its recertification portfolio, the company is applying the Arc data management platform in Torre Mayor, which helps the building achieve a higher LEED score. Mexico leads the world in terms of expected commercial green activity, according to

WGBT16. But there are challenges that must be faced in the infrastructure and real estate industry. Among them, Revitaliza Consultores underlines transparency and specialized training. "There are several projects that are implementing stringent measures to avoid corruption, including NAICM," says Silva. "In this project, the tendering and Request for Proposals (RFP) processes were completely straightforward." On training and education, Revitaliza Consultores has noticed a lack of education and skills among some employees. To overcome this, the company imports appropriate personnel that can train Mexican workers to develop the skills that are necessary for commercial green activities. Silva says doing so enables these capabilities to stay in the country and to improve domestic competitiveness.

Silva explains that tourism was one of the sectors initially reluctant to adopt LEED certifications because of regulatory restrictions, but developers are starting to implement sustainability programs in their projects. A proposal for 150 hotels in the portfolio of a major hotel chain in Mexico was recently submitted to Revitaliza Consultores. For Silva, this demonstrates that the industry is addressing sustainability not as an add-on but as a centerpiece of business. "A great paradigm change had to take place, it was a case of learning from the experience of others before investing," she says. "The LEED certification has already been available for over 10 years and we are seeing increasing numbers of Mexican companies that are ready for it, and that the number of certified buildings has grown exponentially."

There are new sustainability certifications, such as Net Zero Energy Building (NZEB) and Living Building Challenge (LBC), yet Silva believes their adoption is unlikely in the immediate term. "Those new standards are so ambitious that LEED now seems almost easy to obtain," she says. Both NZEB and Living Building are sustainability certifications created by the International Living Future Institute. NZEB focuses on buildings obtaining energy from renewable sources installed on-site and LBC focuses on every aspect of sustainability, ranging from net-zero energy and water to health, aesthetics and equity. The main problem with these certifications is not the absence of technology but the slower ROI.

# MEXICO

## INFRASTRUCTURE & SUSTAINABILITY REVIEW

# 2019

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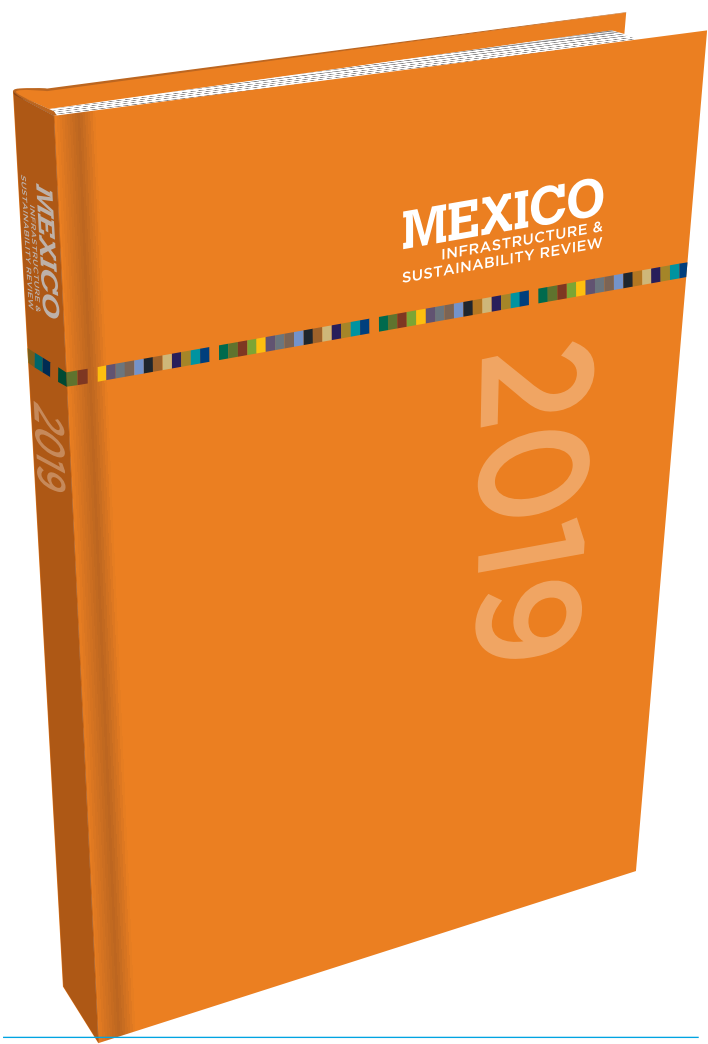
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I VIEW THE TOP

## BIM TO INCREASE ACCURACY IN NEW AIRPORT

**GUILLERMO ORTIZ**  
PRESIDENT OF THE REPUBLIC OF COLOMBIA

**HOW THE NEW AIRPORT IN BOGOTÁ IS BEING DESIGNED**

As a leader in the construction industry, the Republic of Colombia has achieved a series of milestones, one of which is the new Bogotá Airport. This project is a landmark for the country, as it represents the first time that a large-scale infrastructure project has been designed using Building Information Modeling (BIM). The use of BIM allows for a more accurate and efficient design process, reducing the risk of errors and delays. It also enables the construction of a more sustainable and resilient airport, one that is better equipped to handle the challenges of the future.

The new Bogotá Airport is a testament to the country's commitment to modernization and progress. It is a project that has been designed with the highest standards of quality and safety, ensuring that it will be a lasting legacy for the people of Colombia. The use of BIM is a key factor in this success, as it has enabled the design team to create a more accurate and efficient design, one that is better equipped to handle the challenges of the future.

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**Guillermo Ortiz** is the President of the Republic of Colombia. He has been in office since 2010 and has led the country through a period of significant economic growth and social progress. He is a strong advocate for the use of technology in the construction industry and has played a key role in the development of the new Bogotá Airport.

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## A LOOK AT THE MIXED-USE TOLUCA REDEVELOPMENT PLAN

The proposed development in Toluca, Mexico, is a landmark project that will transform the city's urban landscape. It is a mixed-use development that will include a mix of residential, commercial, and recreational spaces. The project is designed to be a sustainable and resilient community, one that is better equipped to handle the challenges of the future. It will be a testament to the city's commitment to modernization and progress, and it will be a lasting legacy for the people of Toluca.

The proposed development in Toluca, Mexico, is a landmark project that will transform the city's urban landscape. It is a mixed-use development that will include a mix of residential, commercial, and recreational spaces. The project is designed to be a sustainable and resilient community, one that is better equipped to handle the challenges of the future. It will be a testament to the city's commitment to modernization and progress, and it will be a lasting legacy for the people of Toluca.

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