

VIRTUAL ROUND TABLE

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INFRASTRUCTURE 2016



MEET THE EXPERTS



Ricardo Barretto Ferreira da Silva - BKBG
 T: +55 11 9 6339 3349
 E: barretto@bkgb.com.br
 W: www.bkgb.com.br

P **ractice areas**
 Technology, media and telecommunications
 Intellectual property

Contracts
 Tax and business restructuring
 Corporate law, mergers and acquisitions (M&A)
 Banking and finance
 Agribusiness

Education

Graduate course in Tax Law, University of North Dakota (1975)
 Graduate course, Institute of World Affairs, Connecticut (1973)
 Bachelor of Laws, University of São Paulo (1972)



Alison Manzer - Cassels Brock & Blackwell LLP
 T: +1 416 869 5469
 E: amazer@casselsbrock.com
 W: www.casselsbrock.com

Alison Manzer is a partner in the Financial Services Group at Cassels Brock & Blackwell LLP. Her practice includes a broad range of practice specialties in finance and regulation of financial services. Alison chairs the Project Finance and Development Committee of the ABA Business Law Section, is a Fellow of the American College of Commercial Finance Lawyers and American Bar Foundation and president of The Association of Commercial Finance Attorneys. She is an adjunct professor Osgoode Hall Law School, LLM, International Finance. Alison has an LLM and MBA and is currently completing her M.Sc./ DBA at Henley Business School. Alison has been recognized as a leading lawyer by several of the peer ranking publications such as Lexpert, Chambers, IFLR and Best Lawyers. She is a Practical Law Advisor and the author of several legal books and articles.



Xiaolian Zhang - King & Wood Mallesons
 T: +86 10 58785004
 E: zhangxiaolian@cn.kwm.com
 W: www.kwm.com

Xiaolian Zhang is a partner with King & Wood Mallesons. Joined the firm in 1994, Ms. Zhang is specialized in infrastructure projects, foreign direct investment in China, mergers & acquisitions and cross-border transactions. Ms. Zhang advises investors in infrastructure projects in China including metro, toll roads and bridges, railways, water, waste water treatment, hydro-electricity, and waste disposal and recycling. She advises on all phases of projects from structure planning, due diligence, tendering procedures, consortium, transaction documents, until establishment of project company and deal closing.



Teresa Empis Falcao - Vieira de Almeida & Associados
 T: +351 21 311 3478/ 422
 E: tef@vda.pt
 W: www.vda.pt

Previously a senior lawyer at Allen & Overy society LLP Lawyers (London), integrating the Project Group, from September 1999 to November 2008. He participated in several banking and project financing, in Portugal and in other jurisdictions with a focus on the sectors of infrastructure, transport and energy. He joined Vieira de Almeida & Associados, RL, from December 2008 to July 2011. in that capacity, he worked actively or led the financing of several projects in the sectors of infrastructure and energy.

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Joshua Nickerson - Skadden, Arps, Slate, Meagher & Flom LLP
 T: +1 202 371 7268
 E: joshua.nickerson@skadden.com
 W: www.skadden.com

Joshua B. Nickerson represents clients in the acquisition, development and financing of energy, infrastructure and sports-related assets. He has extensive experience negotiating the full range of contracts for these transactions, including concession agreements, stock and asset purchase and sale agreements, credit agreements, construction contracts, power purchase agreements, operations and maintenance agreements, and other related agreements. Mr. Nickerson represents clients across a broad range of assets and services in the energy sector, including solar, wind, waste-to-energy, natural gas, combined heat and power, coal, nuclear, refinery services and power marketing. He also represents clients in public-private partnership transactions involving toll roads, airports and other assets.



Neal Sklar - Peckar & Abramson
 T: +1 305 358 2600 x 5248
 E: nsklar@pecklaw.com
 W: www.pecklaw.com

Neal Sklar is a senior partner in Peckar & Abramson's Miami office. His primary area of practice is focused on the representation of general contractors, construction managers and infrastructure contractors in a variety of construction related matters both domestically and abroad. These matters include providing counsel on state and federal government projects as well as Public Private Partnerships (P3s) involving transportation, commercial, heavy and social infrastructure, energy and multifamily residential projects. A substantial portion of Mr. Sklar's practice involves providing on-site counsel and day-to-day guidance to clients on small, midsize and some of the nation's largest construction and infrastructure projects as well as many international projects. He has also authored several articles on current developments in construction law and is a frequent lecturer at seminars on Public Private Partnerships and other construction-related topics. Mr. Sklar is also a co-founder of The P3 Institute, which brings together local government officials and the private sector to discuss potential P3 projects across all asset classes.



Infrastructure 2016

In our Infrastructure 2016 Roundtable we spoke with six experts from around the world. We discover the best examples of completed or pending infrastructure, the latest developments and trends relating to PPP projects in China, and what one of our respondents considers as “the next big thing in urban transportation in the United States”. Featured countries are: the United States, Canada, Mexico, Brazil and China.

1. Have there been any recent regulatory changes or interesting developments?

Barretto: It should be initially noted that the most relevant investments in Brazilian infrastructure have occurred during the late nineties upon privatization of the telecommunications sector and of important mining companies. It has been a most successful drive taken by the Brazilian Government. However, during the past decade the Government took a different approach, including in relation to the restrictions imposed on the acquisition of rural land by foreigners, which sent a clear and negative message to the foreign investing community. A shift in this approach is urgently needed to start to attract investment from abroad.

In the past years, Brazil’s demand for infrastructure investment has increased significantly. Since 2007 the Brazilian government has been trying to implement the Growth Acceleration Program (PAC) regarding a sustainable development through the launching of logistics, energy, social and urban infrastructure projects. These projects

have been preceded by simplified bidding processes with the purpose of reducing bureaucracy and attracting the private sector. In addition, the Brazilian government launched in 2012 the Logistics Investment Program (PIL), a concession program which aims to build up and modernize the country’s infrastructure through the integration of roads, railways, ports and airports in articulation with supply chains. Since then, the Brazilian government has been periodically launching auctions to grant concessions to the private sector and attract foreign investors.

It is important to highlight that investments in broadband infrastructure are increasing year by year due to the global trend of digital convergence. In the past three years, the telecommunications regulatory agency Anatel has carried out several auctions for spectrum bands use and satellite launching and exploitation, with the purpose to increase private investments in 3G and 4G technology. More recently, Anatel launched a public consultation aiming at discussing a new regulatory framework for telecommunications, which may favour digital convergence.

Manzer: Canada has recently experienced a change of government at the federal level as well as several of the provinces of Canada. A predominant theme of the election promises made by the Liberal Party of Canada (now the Government of Canada with a controlling majority), was a stimulus program for the Canadian economy using significant infrastructure investment. This investment would be made in infrastructure projects of specific public interest, many to be identified by the individual provinces. While provinces have identified some variations, significant infrastructure investment is expected to be made in public transit, green projects and social infrastructure (including affordable housing). The infrastructure spending program will be for refurbishment and expansion of existing projects, as well as construction of new and expanded infrastructure projects particularly in public transit.

Zhang: Taking into consideration the importance of infrastructure investment to the overall economic growth and the introduction of social capital to the infrastructure sector, the Chinese government is making efforts to

improve the fair competition environment in China, perfect the pricing and financial subsidy system, and strengthen financial, tax and land policy support. In particular, for PPP projects, in order to encourage social capital to participate in PPP projects, the government is going to simplify project approval procedures, establish government guidance funds and provide support in the form of tax preferential treatments, financial subsidies, subsidised loans, and so on. Due to the lack of diversified investment channels in China, the infrastructure sector may become a ‘safe harbour’ for private investors. Private investors are interested in PPP projects. However, it is also noted that due to the absence of a mature PPP legal system, and the concern over the government’s ability and credit to perform PPP agreements, although the government has launched many PPP projects in the market, most participants are state-owned enterprises.

Sklar: In December 2015 President Barack Obama signed into law the Fixing America’s Surface Transportation (FAST) Act which is a funding and au-

thorization bill to govern United States federal surface transportation spending. The FAST Act encourages the use of public-private partnerships (P3s) as the preferred method to execute much needed transportation and infrastructure projects. Although this is a start, more efforts will be required by Congress to push states and counties in this direction.

As provided by the U.S. Transportation & Infrastructure Committee, the bill reforms and strengthens transportation programs, refocuses on national priorities, provides long-term certainty and more flexibility for states and local governments, streamlines project approval processes, and maintains a strong commitment to safety. This is the first law enacted in over 10 years that provides long-term funding certainty for surface transportation, where state and local governments can move critical projects forward, including new highways and transit lines, with the confidence they will have a federal partner over the long term.

Nickerson: Yes, at U.S. federal level, there was significant 2015 year-end legislative activity that should help boost investment in domestic infrastructure. In December, Congress passed the “FAST Act,” the first long-term trans-

portation bill since 2005. Among other things, the Act allocates funds for several important credit programs for the next five years. Chief among them is the TIFIA program, which currently provides financing to almost every public-private partnership (PPP) transaction and other major infrastructure project in the U.S. today. But there is also a lot of funding provided rail and transit programs and I expect we will see one little used program, the Railroad Rehabilitation and Improvement Fund, take on a much higher profile.

Also in December, and as part of the Consolidated Appropriations Act for 2016, Congress extended the investment tax credit and production tax credit and related bonus depreciation rules, which are critical economic drivers for solar and wind investment in the U.S. and the basis for the tax equity industry. The investment tax credit for solar projects, previously scheduled to step down from 30% to 10% for projects placed in service after 31 December 2016, will now stay at the 30% level for projects where construction begins on or before 31 December 2019, so long as the project is placed in service before 1 January 2024. The production tax credit, mostly used by wind projects, received a shorter extension at the full rate, currently 2.3

cents/kilowatt hour, to 31 December 2016. So wind projects that begin construction this year will receive the full rate for the first 10 years of commercial service.

2. Are there any compliance issues or potential pitfalls that firms need to be cautious about?

Barretto: Infrastructure investments in Brazil are usually carried out under public contracts; preceded by a bidding process or through the so called Public-Private Partnership (PPP). It is important to highlight the need to comply with the Brazilian Anticorruption legislation (*Law Number 12,846/2013 Decree Number 8,420/2015*), which provides for the administrative liability of legal entities for acts committed against the national or foreign public administration. By way of compliance measures to be taken by companies, the regulatory norm sets forth the adoption of an integrity program, which must demonstrate commitment by the upper echelon, implementation of ethics and conduct codes, employees’ and third parties’ periodic training, conducting audits and monitoring programs, the existence of a communication channel for guidance and denunciation, and an investigation policy with the inclusion of corrective actions

and outsourcing policies, among other measures. Additionally, should effectiveness of the program be demonstrated, this will be an important extenuatory factor for imposition of the civil and criminal fines and penalties provided by the aforementioned legislation.

Zhang: for an infrastructure project, in addition to the pitfalls/risks which are generally recognized (such as project completion risk, risk of change in law, early termination risk, force majeure risk, financing risk, operation and maintenance/replacement risk, etc.), the firms need to be specifically cautious about the following major pitfalls/risks:

Security risk

Considering the spread of terrorism in many areas of the world, security risk is becoming a more important issue to evaluate for certain infrastructure projects. Security issues may result in the government imposing higher requirements on security facilities of the projects and request project companies to cooperate in other security measures. These will affect the capital expenditure, operating costs and expected revenue of the project.

Risk of breach of government

The ability and willingness of government to respect and fulfil its obligations under PPP agreements is always critical to the success of an infrastructure project in China.

Project construction investment being exceeded

In addition to other factors which may result in project construction investment being exceeded, it is worth noted that the price of major construction materials and interest rate at the moment is relatively low in China. The project investment budget may be exceeded if construction materials and interest rate increase significantly. This will affect the project return and need to be addressed properly.

Completion of project construction on schedule

For transportation projects in China, because the relocation of existing buildings/residents from the construction site is becoming more time consuming and difficult than before (as a result of the increased protection given to ownership of private property), the completion of project construction on schedule is difficult to achieve for some projects. This may result in consequences and issues such as completed sections of project may have to be operated first for years before the en-

tire project is completed, accounting issues, replacement issue of trains and major facilities, etc.

Sklar: Despite overall cost benefits, the standard P3 procurement process can often be remarkably expensive and time consuming, such that social infrastructure projects (often much smaller than the transportation and utility infrastructure projects) are viewed by some as too small to warrant the P3 due diligence and transaction costs. This is largely due to the fact that bidders have no guarantee of either capturing the project or recovering the bid and preparation costs, which can be substantial. Moreover, the owner must delay both the design and the commencement of the work until the conclusion of what can sometimes be a lengthy procurement process.

However, a Preliminary Development Agreement (PDA) is a dynamic procurement option that could help streamline the selection process, minimize cost to both the owner and bidders, and maintain competition. A PDA is a procurement method in which a competitively-selected bidder takes the initial risk of developing a project, and, in exchange, receives the first right-of-refusal on a negotiated basis once the project is deemed feasible. Project teams, both

solicited and unsolicited, propose a true partnership with the owner by determining, on an open-book basis, the cost and technical features of project delivery for a certain government asset.

This arrangement is beneficial during the early stages of a P3 project when the scope and costs have not been completely defined. Private bidders will often propose an array of innovative development plans, and the owner, while retaining termination rights, selects the most feasible plan. The private entity is then reimbursed for its bid and preparation costs.

We utilize PDAs to benefit the private sector as an excellent way to introduce an unsolicited proposal to a government entity without having to incur significant costs. Moreover, PDAs are looked upon favourably by governmental agencies in that PDAs employ conditions and establish measures that help incentivize the private sector to develop projects and ensure sufficient transparency and competition.

Nickerson: Infrastructure investing in the U.S. is subject to a range of regulatory issues. For non-U.S. investors participating in U.S. based infrastructure transactions, compliance with U.S. anti-money laundering and anti-

bribery regulations can be especially time consuming in terms of disclosure and crafting representations and warranties and covenants that are not too restrictive or burdensome from a compliance perspective.

Another issue that all investors in U.S. PPPs face is that they frequently involve some level of Federal credit support, which can definitely make a project's debt service profile and gearing more attractive. But the bitter with the better is that a number of cumbersome federal statutes apply, including NEPA (National Environmental Protection Act) for environmental permitting and the Davis-Bacon Act, which regulates wages paid to workers. There is some hope on the horizon, though. One objective of the FAST Act is to find a way to streamline the NEPA permitting process. A new agency within the U.S. Department, called the Infrastructure Finance Bureau, was established under the FAST Act to focus on this and to coordinate the different federal funding programs.

3. What markets are currently providing the best opportunities?

Barretto: Among the most attractive opportunities/sectors are the following:

- Information Technology, technological research and development of technological innovation;
- Renewable energy, covering generation, co-generation, transmission and distribution of electricity; and production and processing of natural gas in any physical state;
- Transportation, road pavement; waterways; organized ports and port facilities for private use, commuter trains and railways, including engines and wagons, and airport systems and flight protection systems to be installed in public airfields;
- Basic sanitation, covering drinking water supply, and sewers and sanitation;
- Irrigation; and
- Pipelines.

Manzer: The federal government of Canada's focus, supported by the provincial governments, is on infrastructure projects in public transit, green projects particularly renewable energy and social infrastructure (including affordable housing). This focus will dictate the markets which will provide the most opportunity. A combination of the government's flow of funds, along with projects that meet the criteria of known conditions and technology, frequently coupled with utility style regulation, provides a more readily finance-

able project in the Canadian markets. The Canadian financing sources, particularly the term lending sectors of insurance and pension, have a strong interest in infrastructure with stable revenue.

Zhang: As said above, China is launching many PPP projects. Those projects that have stable revenue and cash flows that can support investment capital and returns are popular to investors – for example, rail transit, highways, water, wastewater treatment – in particular those located in more developed areas in China where the government has a good credit record and stronger financial capacity. According to the National Development and Reform Commission (NDRC), railways, roads and other infrastructure are the 'short slab' for China, and need investment. NDRC has recently approved roads and railway projects in various places. The integrated road grids plan for Beijing, Tianjin and Hebei includes construction of more than 20 inter-city railways, which provides attractive investment opportunities. New energy projects will continue to get government support. In addition, due to the deteriorating environment in China, environment related projects are highly supported by the government. Wastewater treatment, solid

waste disposal, soil decontamination and rehabilitation, river control, and sponge city projects are included in the government's investment plan and will offer many investment opportunities. With the progress of urbanisation and hospital system reform in China, social infrastructure, such as education and hospitals, have received more attention than before and brought investment opportunities.

Sklar: Water Infrastructure in the United States is an area poised for tremendous growth. As recently stated by United Water, no commodity is more precious, but the infrastructure to support water delivery and recovery is in serious need of repair – \$263 billion according to one EPA estimate. Federal funding can help, but it is not a complete solution. An alliance between the public and private sectors is one of the most efficient and cost-effective options of providing safe water reliably in the face of aging infrastructure, growing demand and the increasing complexity of water management. Nearly 73 million Americans receive water services from a privately owned water utility or a municipal utility operating under a public-private partnership.

By some estimates, more than \$1 trillion in upgrades are needed to the vast

system of mostly underground pipes. In FY 2016, the EPA announced that it was requesting \$2.3 billion for the Clean Water and Drinking Water State Revolving Funds, continuing the funding levels provided in FY 2015. The agency's FY 16 budget includes \$50 million in technical assistance, training, and other efforts to help communities and states to plan and finance drinking water and wastewater infrastructure improvements.

Nickerson: In the U.S. infrastructure markets, renewable energy continues to provide strong opportunities and hopefully 2016 will see yieldcos mature and show less volatility for investors. The extension of the investment tax credit and production tax credit, accelerated depreciation benefits, renewable portfolio standards (in effect, state renewable energy quotas), and falling equipment and installation costs make up for continuously soft demand for electric power.

A related opportunity is battery storage. As renewables make up a larger percentage of the electric generation stack, there are growing concerns about grid stability, because renewable energy is intermittent and dependent on the wind blowing or the sun shining. There is a lot of focus now on develop-

ing and deploying utility scale batteries to act as load banks. The idea is to charge the batteries when renewable energy is produced and then draw on the batteries when renewable assets are not generating.

In transportation, I expect major investment in rail and transit infrastructure in the coming years. For example, New York Governor Cuomo recently announced his plan for a \$20 billion project to build new rail tunnels under the Hudson River and into Penn Station in Manhattan. Several states are pursuing high speed rail, including California, where Governor Brown is promoting an HSR project connecting Los Angeles to San Francisco. Lastly, private sector rail operators are re-entering the market for intercity passenger rail, which has been essentially a government service since the early 1970s. Currently there is one project, Florida East Coast Railway's All Aboard Florida, that is near financial close. The FAST Act includes financial support for private sector investment in passenger rail projects.

Falcao: The European market is providing good opportunities for infrastructure investment, not only because of its long history of private investment in infrastructure, but also as a result of

a stable and supportive regulatory and political setting with the governments in many European countries privatising or selling their infrastructure assets.

This means that there are investment opportunities in brownfield investments, which remain as the most appealing due to their proven track records, but actually also in the construction of new "greenfield" projects.

Moreover, the European Commission announced its investment plan for Europe in 2014 – the so-called "Juncker Plan" – which no doubt could assist in creating significant opportunities for investors, notably in those sectors on which the plan is initially focused, such as broadband and energy networks, as well as transport infrastructure in industrial centres; education, research and innovation; and renewable energy and energy efficiency.

4. Which countries are currently ripe for investment?

Manzer: The ageing infrastructure in the developed countries, up until recent years somewhat overlooked, is creating new opportunities in politically, economically stable countries. Throughout Europe, North America and South America the infrastructure

which was developed in the 1960s and 1970s is rapidly ageing, deteriorating and becoming inadequate given population shifts and changes. This provides investment opportunities in a number of sectors. Renewable energy provides opportunities throughout developed nations, with a focus on hydroelectric in Canada, geothermal in the United States and nuclear in the United Kingdom and Europe. Social projects, specifically affordable housing in many parts of North America, represent opportunities for commercially based returns with public revenue support. Public transit provides a utility like return on investment and transit expansion is required in many developed countries and their major municipal centres.

Zhang: In addition to the many PPP projects in China, in March 2005, China unveiled principles, framework, cooperation priorities and mechanisms of the One Belt and One Road Initiative. The Initiative aims to revive ancient trade routes between China and the West with the creation of the land-based Silk Road Economic Belt and oceanic 21st Century Maritime Silk Road. Under the Initiative, China and relevant countries along the route will provide more investment opportunities in many sectors, especially infrastruc-

tures. Moreover, the China-led Asian Infrastructure Investment Bank (AIIB) was established on December 2015. AIIB will provide significant financial support primarily for the development of infrastructure in its member countries, especially China.

Sklar: The Mexican government has increasingly turned to P3s to build infrastructure, but critics have said the country's system operates under a cloak of opacity and is plagued by the discretionary use of funds. Mexico has earmarked approximately \$300 billion dollars for P3s over the next three years. The Law on P3s, in effect since 2012 and amended in 2014, regulates long-term contractual arrangements by the public sector for the provision of services that use infrastructure partially or totally provided by the private sector. The law requires that the contracts be put out to tender, and gives the state the power to declare the works of public utility and to expropriate land, while setting a minimum timeframe of 40 years for the contracts.

Mexican authorities have reported that:

- The 2014-2018 national infrastructure plan includes 743 projects in areas such as energy, telecommunications, transportation, housing, urban devel-

opment, health and tourism.

- The energy sector will represent a significant portion of the investment over the next five years as Mexico opens the state-run oil and electricity sectors to private investment and increased competition. Telecommunications and transportation projects which include highways, railways, ports, and broadband networks, are expected to surpass \$100 billion.
- Finance Minister Luis Videgaray has publicly communicated that 60% of the investment will come from federal and state budgets and the rest will come from the private sector. He has also estimated the infrastructure plan will add between 1.8 and 2 percentage points to Mexico's growth rates by 2018.

Nickerson: The U.S. remains a very attractive location for infrastructure investment. There is massive need for new infrastructure and rehabilitation of existing infrastructure and there are opportunities at almost every point along the investment spectrum.

From a non-U.S. investor's perspective, recent tax law changes will make investing in the U.S. more attractive. Congress amended the Foreign Investment in Real Property Tax Act of 1980 (FIRPTA), which taxes sales of U.S.

real estate by non-U.S. investors. The amendments exempt non-U.S. pension funds from the tax and increase the percentage holding a non-U.S. investor may hold in a REIT on a FIRPTA-exempt basis from 5% to 10%.

Converting the high demand for capital into completed projects can sometimes be challenging because infrastructure assets tend to be highly regulated, with lots of stakeholder participation in the planning and permitting stages and again in secondary market transactions after commercial operation begins. Transaction costs can also be an issue for project sponsors pursuing opportunities in different states, as each state has its own regulatory structure and transaction documents are not necessarily uniform across transactions. In this respect, Canada receives much praise, as they have a strong network of provincial offices that manage and promote infrastructure procurements and use very standardized documentation.

5. How can investors better assess the projects they choose to invest in?

Barretto: Investors may visit the [Federal Government website](#) and the similar websites available at some State Government levels, through which

they may check the variety of existing projects and related financial and tax incentives. In addition, investors may consider retaining specialized consulting firms operating in Brazil, besides a law firm and an auditing firm to guide them through the applicable regulatory laws.

Manzer: The assessment of infrastructure projects, whether in Canada, or elsewhere, should go "back to basics" in the current economic environment. Simple questions (i.e., can it be built, if it is built will it work and will the assured revenue stream carry the investment costs and anticipated returns) should remain central to assessment. The infrastructure needs being identified are in traditional sectors, using proven and traditional technology with new types of revenue identification, collection and support. These projects can be assessed against a simple assured revenue and cost to develop and commercialize a model, given the reasonable assurance of investment return. The assessment process can be accomplished using traditional project finance and development techniques.

Zhang: Carrying out due diligence on infrastructure projects is undoubtedly very important for the assessment by investors of the projects. Due dili-

gence typically will cover aspects including technical, business, legal, environmental, financial and tax, labour, and so on. For greenfield projects, due diligence allows investors to understand the regulatory regime and policy direction, and the legal status and conditions of the project, so as to enable investors to better understand the proposed terms and conditions of the project, choose the appropriate deal structure and make informed investment decisions. For existing projects, due diligence helps to assess the legal and operational status of the project, identify legal obligation liabilities and risks, make financial forecasts for revenue and operation costs, and determine the need to upgrade and replace facilities and technology. In particular, China is imposing ever stricter requirements on environment, labour and safe production. Therefore, investors have to carry out due diligence on these areas in order to determine compliance status, liabilities, risks and costs, and expenses. The findings of the due diligence will be reflected in the transaction documents in the end.

Falcao: The "optimism bias" in project assessments by governments and investors in general has often led to ineffective risk transfers and implicit liabilities such as guarantees which may

result in excessively large contingent liabilities and, consequently, in governments or investors, as the case may be, making large unexpected payments. In our experience, costs and delays are systematically underestimated, and benefits (including traffic or demand) often overestimated when assessing a project.

Due diligence is, therefore, absolutely crucial in order to ensure that investors spend their resources on carefully selected projects with adequate rates of return, rather than being allocated to projects that deliver benefits far lower than those estimated.

6. Can you talk us through the process of gaining regulatory approval for a new project? Does this assist or hinder the ability to streamline delivery?

Barretto: As a general rule, infrastructure investments in Brazil are submitted to the jurisdiction of regulatory agencies. Thus, the regulatory approval of new projects is usually granted under a concession or similar type of contract, always preceded by a bidding process. The bidding process involves the following steps:

- drafting of the technical, economic, and environmental feasibility analysis;

- Approval by the appropriate authorities (Ministry and regulatory agency);
- organization of public consultations and hearings;
- submission of studies and documents to Brazil's Superior Court of Audit (TCU), at the federal level;
- publication of the bid notice.

The bidding process requires presentation of documentation evidencing legal and technical qualification for the project, as well as economic-financial capacity and tax compliance. In addition, infrastructure projects usually require environmental licenses. The Brazilian environmental authority (IBAMA) requires three distinct licenses, the so called Previous License, Installation License, and Operation License. Depending on the dimension of the environmental impact, IBAMA also requires the Environmental Impact Statement and Environmental Impact Report (EIA/RIMA) and public hearings involving local environmental authorities, legal representatives of communities affected, and sanitation authorities.

Manzer: Regulatory approvals in Canada will vary significantly depending upon the location, whether on private land, provincially or federally owned

land, or land subject to First Nations rights; the nature of the project and particularly its impact on matters such as environment; the nature and extent of land use and related permits for access, construction and use; and industry specific regulation generally involving matters of public interest such as health and safety.

The identification of the required regulatory approvals, while fragmented, is generally well known in Canada and the regulatory processes are designed to respond to appropriately completed applications, with supporting reviews and reports, and generally on a timely basis. The use of appropriately qualified consultants, and of supporting studies and reports – including engineering, environmental and insurance among others – will assist in facilitating the regulatory process for the infrastructure project.

Zhang: Launching a new PPP project, the government has various preparation procedures to complete first, primarily including: identification of projects, value for money assessment, financial capacity assessment, and preparation and approval of implementation plan. After all the above preparation procedures are completed, the government shall go through

government procurement procedure to choose the social investors according to China tendering and bidding law.

In addition to the above procedures for a new PPP project, a new infrastructure project normally needs to obtain the following regulatory approvals: project approval, environmental approval, land use planning approval, land approval and land use right granting, construction commencement approval, completion acceptance etc. More regulatory approvals may be required depending on the circumstances.

The above procedures could be time consuming for a new project and may hinder the ability to streamline delivery. As a result thereof and also due to the fact that Chinese government often imposes a tight construction schedule of a new infrastructure project, it is not rare that government will designate entities to commence project works at the same time the above procedures are being conducted. Such project works conducted by designated entities before the regulatory procedures are completed will add complication to the project and need to be addressed in the PPP agreements in the end.

Nickerson: It's interesting to watch how regulatory approval processes

evolve. For example, Virginia, which is probably the most sophisticated state when it comes to understanding how to evaluate and structure P3s, recently modified its approval process in the wake of the U.S. 460 PPP project, which was awarded before the environmental approval process had been completed. When problems on that front arose, the state was already committed under a concession agreement with a consortium of Ferrovial Agroman S.A. and American Infrastructure. The state ultimately terminated the contract, but there was criticism that the concession hadn't been properly vetted before being awarded. In response, the Virginia legislature amended the state's PPP statute to establish a Transportation P3 Advisory Committee, with representatives from the assembly, senate, and various state transportation boards and departments to determine whether a project should proceed as a PPP or not (before the procurement process begins) and to set parameters for what the concession needs to achieve. Importantly, once the advisory committee makes its recommendation, there is no legislative interference with the concession. People say that U.S. PPP's are subject to relatively high political risk. As each state gains experience with implementing PPP's and finds the right balance of government-

tal oversight and flexibility to capture the benefits of private sector delivery of infrastructure, project design and implementation should become more streamlined and predictable.

Falcao: In Portugal, it is generally the line Ministries (energy, infrastructure, transports, health, etc.) who are responsible for the launching, licensing and major regulation of the projects, either directly or through their governmental departments.

The approval of the Ministry of Finance may also be required when the project involves public investment or, more generally, where the PPP legal framework applies. Reference should be made to UTAP (Unidade Técnica de Acompanhamento de Projetos, an administrative entity under the supervision of the Ministry of Finance recently created for the follow-up of PPP projects.

Environmental impact assessments are generally required for infrastructure projects. The PPP law establishes that PPP procurement procedures shall only be launched after approval of the relevant environmental impact declaration.

Although the process seems rather

complex, we think it helps designing bankable projects, distributing risks appropriately, and assessing technical and financial viability of projects.

7. To what extent could the development of existing infrastructure help reduce infrastructure costs?

Manzer: Development of existing infrastructure, whether revitalizing or expanding, can be significantly less onerous as to the required regulatory approvals. If the initial regulatory approvals included a suitable scope of review, particularly as to matters such as environmental, permitting and engineering impact, then existing regulatory approvals and permits may allow the project to proceed without further renewal, replacement or revision of the regulatory approvals. The regulatory approval process should, in any event, be considerably lessened by using the existing approvals, the conditions and concepts of those approvals and in obtaining the necessary consents, authorities and permits for the planned changes to the existing infrastructure project.

Falcao: Given the difficulty in expanding existing infrastructure or financing new infrastructure, developing and maximizing the efficiency of existing

infrastructure could definitely help reducing infrastructure costs.

There is room to enhance the use of existing infrastructure and such improvements are mostly related with technological developments, such as new power technologies, driverless cars and smart infrastructure in the form of digital technologies. Regulatory frameworks may help or hinder the optimisation of existing infrastructure capacity and will need to be flexible to allow innovative use of existing infrastructure. Existing infrastructure may need to be repurposed for other uses as well.

Maintaining the service level of the existing infrastructure is also an essential factor of better use. In this context, concession contracts or PPPs can assist in meeting the expected performance of infrastructure.

8. Can you outline the infrastructure challenges posed by global sustainability?

Manzer: Sustainability goals which are now recognized on a global basis will affect the approval, public acceptance and access to financing for infrastructure projects. Global sustainability addresses a balancing of cost for access and use, lifecycle of the related infra-

structure and the need for access on both a commercial and public basis. Sustainability goals and concepts recognized in Canada will affect most infrastructure projects because they will drive a need to demonstrate general contribution to the publicly identified goals for development because of aging infrastructure, population shift, population increase including through immigration along with environmental goals and challenges. Issues will be most significant for projects which create adverse impacts to the environment, deliver costs which are not supportable in the economy or do not address identified public structure needs. Infrastructure will be assisted by sustainability where there is delivery against environmental goals.

Zhang: Global sustainability is an important concept generally recognized by most countries across the world. In China, government issued in 1994 the White Paper on China's Population, Resources, Environment and Development in 21st Century, introducing the sustainability strategy into the long term plan of economic and social development for the first time. The main content of this strategy covers four aspects: (i) development shall be complete covering various sectors such social, science and technology, culture,

environment etc.; (ii) the economic and social development shall not exceed the capacity of resources and environment; (iii) fairness of relationship between people, i.e. the development of people today shall not prejudice the development opportunity of people in the future, and the development of part of people shall not prejudice the benefits of other part of people; and (iv) the harmony between human beings and nature. As far as infrastructure sector is concerned, the sustainability of infrastructure projects has become an important topic and challenge, especially city infrastructures, such as water, transportation, energy, and waste management. In addition, the sustainable development of resources-oriented cities in China is a big challenge too when such cities are facing the exhaustion of resources.

Nickerson: Our energy and transportation infrastructure is so carbon intensive. How do you replace the existing installed capacity fast enough to meaningfully address the problem? Renewable energy is one path, but it's a tiny percentage of total electric production, and it creates major challenges of its own, because renewables mostly produce energy on an intermittent basis, which challenges the stability of transmission grid. One development that

could make a significant difference is importing hydroelectric power from Canada. But the transmission system isn't in place yet to take advantage of those resources.

Natural gas is frequently referred to as a "transitional" energy source, one that is less-carbon intensive than coal, but capable of supporting the massive baseload capacity needed by the U.S. economy. But when electric demand finally begins to grow again, there will need to be a substantial amount of new pipeline capacity needed to expand the delivery of natural gas to the locations where gas-fired generation will be built.

The challenge from a transportation perspective is just as great. Electric vehicles are clean at the tailpipe, but the electricity is produced by carbon emitting power plants. Until a transformative technology like fuel cells can essentially eliminate emissions from vehicle operations, it may be other technologies, like driverless vehicles, that will hold the prospect of reducing congestion and vehicle operating times. Looking beyond the automotive industry, well designed transit systems can help reduce vehicle utilization. But it is very hard to assume that if you build the asset, the people will come.

Falcao: One of the greatest challenges posed by global sustainability is to protect infrastructure assets from physical and cyber-attacks. That challenge has been magnified not only by the escalation of geopolitical unrest and the increased sophistication of the cyber-attackers, but also by the growing interconnectivity of the systems which leads to an exponential increase in impact of any single attack, very evident in cross-border infrastructure projects.

The range of tools and compliance activities that may be necessary to protect critical infrastructure will require investments in security and inherent costs and no doubt difficult choices to the decision-making authorities between security (which will largely be invisible) and investment into expansion capacity of infrastructure.

9. Which projects, already built or in the pipeline, constitute the best examples of completed or pending infrastructure?

Barretto: Some examples of recent infrastructure projects involve the sectors of logistics, energy and basic sanitation, as follows:

- Concessions and expansion of six international airports in the cities of Natal, Campinas, Brasília, Guarulhos,

Rio de Janeiro, and Belo Horizonte;

- Concessions of Highway BR-163, located in Mato Grosso State, an import agribusiness pole;
- Hydroelectric Plant of Belo Monte, located at the Xingu River, Amazonas State;
- Hydroelectric Plant of São Luiz de Tapajós, located at the Tapajós River (North region);
- 718 Km of Norte-Sul Railway, located between Amazonas and Tocantins States (North region);
- Smart Grid Project implemented by the energy distributor company Light in the amount of R\$750 million;
- PPP of basic sanitation in the Recife Metropolitan Region (Pernambuco State) intended to guarantee 90% of dwelling houses with basic sanitation.

Manzer: The development of the Lower Churchill Hydro Electric Project – commenced in 2014 and expected to reach commissioning in 2018 – represents an example of a significant renewable energy project of regional and national significance to Canada. The project was conceived and developed to provide power independence for the Province of Newfoundland and significant power additions for the Province of Nova Scotia, with export capabilities. The project was a combined regional project of two provinces, and will result

in the Province of Newfoundland, on completion, being 100% green renewable energy and the Province of Nova Scotia having a significantly reduced reliance on coal power production. The project was uniquely structured using a federal government credit wrap structure, the author was involved in the development of the structure acting for Canada in this role. The significance of the project is its size, regional impact, and unique financing structure which allowed the use of the high Canada credit rating to reduce costs and make a financially viable mega-power project for a smaller population region.

Zhang: Beijing Metro Line 4 project (completed) is a very good example of a successful PPP project in China (it is also the first PPP project in the real sense in China). This metro line is 28.2km long and its route goes through traditional commercial area, popular tourist resorts, and Beijing railway station (west). It is called the golden route of Beijing. The social investors of this project are Hong Kong MTR Corporation and Beijing Capital Group Co., Ltd. The social investors set up a joint venture company (the project company) with a State-owned company designated by government, Beijing Infrastructure Investment Co., Ltd. The project company was responsible for

30% of the project investment (mainly the part of electrical and mechanical equipment) and Beijing government was responsible for 70% of the project investment (mainly the civil construction works). The project company was granted a 30-year concession right to operate this metro line. This metro line has turned out to be one of the busiest metro lines in Beijing. Beijing government and the project company have worked out a good mechanism to share risks and benefits of the project and the project has achieved great success in saving government expenditure, improving operation efficiency and quality of public services, and providing reasonable return for social investors.

Sklar: The state of Florida has become a hot bed for Infrastructure projects. Now that Florida has expanded its P3 legislation to allow local government to use P3's to construct infrastructure projects, numerous projects are being proposed by several county and state agencies using a P3 procurement method in addition to traditional methods.

At a recent P3 Institute event, Miami-Dade County Mayor Carlos A. Gimenez issued a memorandum listing 51 projects where there may be a viable interest for private industry to respond

to a potential P3 solicitation. Among the projects put forward by county officials as either in the works or potentially well-suited for P3 treatment are a new Royal Caribbean cruise terminal recently granted preliminary approval by the County Commission; expansion plans for Miami International Airport; the Baylink rail connection between downtown Miami and Miami Beach; and new civil and criminal courthouses and jail facilities throughout South Florida.

Additionally, the South Florida Water Management District has identified P3 projects as strengthening their efforts to meet the water needs of the environment as well as the state's economy. As part of their strategic plan for 2012-2017, key multi-year projects include bank stabilization along the Hillsboro Canal, maintenance of the East Coast Protective Levee and structure refurbishments throughout the Kissimmee Basin.

Miami-Dade Transit is the largest transit agency in Florida and has several transportation projects proposed for entering into P3 agreements including the Beach Corridor Transit Connection project, passenger rail service along State Road 836 and transit-oriented development projects.

These are all examples of infrastructure projects taking place in many jurisdictions across the United States.

Nickerson: I think the most impressive recent accomplishment in the U.S. PPP market is the Pennsylvania Bridge Rapid Replacement Project, an approximately \$900 million concession awarded to a consortium led by Plenary Group and Walsh to repair or replace approximately 4,000 structurally deficient bridges across the state. The unique aspect of the deal isn't the assets, most of the bridges involved are very small, but rather the bundling of small projects to achieve economies of scale and the accelerate delivery. Rehabilitation and replacement will take place over a three year and the concessionaire will provide major maintenance and repair over a 25 year period, which functions like a warranty, as the replaced bridges should not require much repair work during that time if initial replacement was done properly. The primary challenge for this project – and the true measure its success or failure – is how well or how poorly the granting authority, Pennsylvania's department of transportation, monitors compliance with the concession agreement's matrix of key compliance indicators.

Another bellwether infrastructure project is the Next Generation Kentucky Information Highway, a 3,209 mile "middle mile" fibre optic cable PPP between Macquarie and the Commonwealth of Kentucky that reached financial close in 2015. The concession has a 30-year term and the compensation structure involves a milestone payment after the first phase of the project is built, followed by monthly availability payments during the term.

10. Are there any exciting technological developments on the horizon?

Barretto: In the beginning of 2016, *Law 13,243* – the so-considered legal framework of science, technology and innovation development – was enacted by the Brazilian President. The Law aims at promoting a series of actions to encourage research and the scientific and technological development, as well as to reduce bureaucracy regarding investments in the relevant sectors. One of the advances of the Law is the possibility of exemption of bidding process for hiring innovative services or products provided by micro, small and medium-sized companies. Institutions of science, technology and innovation development can be hired by simplified process. In addition, such Law amends *Law 8,666/93* (Brazilian

Bidding Act) in order to establish new hypotheses of exemption from bidding process for hiring the supply of goods and services intended to research and development activities. With the new legal framework one expects an increase in the number of technology poles (four at present) and new players interested in investing in innovation.

Manzer: While there are a number of technological developments which will impact infrastructure over the next years, including advances in building materials particularly for climate control by improving insulating qualities and superior building materials for roads and bridges including rebar and surfacing, the most significant developments are likely those of battery and robotics technology. The development of commercially viable large scale batteries, now expected to be a short term reality, allowing storage of power during peak production will significantly change the face of power generation and electric grid delivery systems. Robotic technology is changing the face of various industries, including infrastructure, by improving efficiency in both development and operations.

Sklar: The transportation construction industry is moving towards cloud collaboration platforms. These platforms

connect owners, contractors and their project teams in the construction, infrastructure, and energy sectors, providing project-wide visibility and control between the many different organizations collaborating across their projects.

Recently, the Colorado Department of Transportation (CDOT) and the High Performance Transportation Enterprise (HPTE) have agreed to use cloud collaboration platforms to manage information and processes for multiple CDOT highway infrastructure projects, including the US 36 Express Lanes, I-25 North, I-70 East, and C-470. All of these projects fall under the HPTE's mandate to pursue more efficient ways of financing infrastructure projects, such as public-private partnerships (P3), design-build contracting and other methods of alternative delivery. Proponents of this information sharing technology state that large government projects stand to benefit significantly from these platforms in several respects including the ability to streamline processes and procedures through facilitating real time communications among all project participants. Additionally, these systems help organize and maintain accurate project records.

Falcao: Indeed there are. Although in-

infrastructure has remained largely unaffected by the technological revolution (other than the telecoms sector), that will clearly no longer be the case over the coming years.

Technological innovation is now due to play an important role in improving efficiency, productivity, safety, security and environmental outcomes in transport and, therefore, contributing to global sustainability.

Remarkably, much of the demand for technological advancement will be led by the consumers. That is the case of new power technologies, notably solar technologies, driverless cars and smart infrastructure in the form of digital technologies, such as automatic management systems which will enable reducing fuel consumption and travel times and, overall, a better use of the infrastructure.

Another exciting technological development in infrastructure construction is the use of Cable Propelled Transit (CPT) systems a/k/a Urban Gondolas in the United States. Already in use in many cities around the world, CPT systems are being examined to assist in alleviating congestion domestically. Long considered as a means of transportation to get up and down a moun-

tain at a popular ski resort, Gondolas are now integral parts of public transit systems in major metropolitan areas around the globe including Singapore, La Paz Bolivia, Caracas Venezuela, Rio de Janeiro Brazil, Medellin Colombia and several parts of Europe and Asia.

The benefits of CPT systems make them attractive for use in American markets. From a financial perspective, CPT systems are a more cost effective option than traditional transit systems with a cost of \$12 million per mile as opposed to \$100 million per mile when compared to light rail systems. Where real estate is at a premium, CPT systems are quite attractive when considering the need to tear out lanes used by cars and purchasing land by eminent domain which would be needed by light rail systems. Since Urban Gondolas don't stop at train stations, large real estate costs are eliminated. Gondolas run constantly and only slow down to walking speed enough for passengers to get on or off. If you miss one, you just wait 30 seconds to get on the next one. CPT systems are also much easier to design and install with less moving parts dramatically speeding up the design, construction and installation of these transit systems when compared to other transportation systems such as light rail. As a result, we see CPTs/

Urban Gondolas as the next big thing in urban transportation in the United States.

11. Do you see any particular challenges or opportunities with the introduction of new internet infrastructure needs – fibre optic vs. copper wire?

Barretto: The opportunities in internet infrastructure are increasing year by year. Under Decree 7,175/2010, the Brazilian Government has been implementing the National Broadband Plan (PNBL) with purposes to expand broadband internet access across the country using the fibre optic infrastructure. As an improvement to the PNBL, the Federal government announced in 2015 the *Banda Larga para Todos* (Broadband for All) Program, which aims at implementing fibre optic cables in 90% of the Brazilian cities by means of subsidies granted to the private sector in reverse auctions. In addition, the Ministry of Defense is in charge of implementing the *Amazônia Conectada* (Amazonia Connected) Program to install 7.8 km of fibre optic cables through Amazonian rivers and offer opportunities for a series of data network services to the country side of the State of Amazon, like the internet, telemedicine, university at distance, interconnection between health, pub-

lic security, traffic and tourism.

Mention should be made of the *Cidades Digitais* (Digital Cities) Program, which aims at increasing modernization of local management through construction of fibre optic cable linking public entities, development of e-government applications, and implementation of free wi-fi zones in public spaces of large circulation, such as squares, parks and roads.

Nickerson: Fibre optic cable build out is clearly a major opportunity. I mentioned the Next Generation Kentucky Information Highway before, which is the one project that has reached financial close. A number of other states and counties, including Connecticut, Oregon and Los Angeles County, have either entered into concession agreements or are currently negotiating them. And recently, an RFP was issued by a quasi-governmental entity called the First Responder Network Authority (or FirstNet), for a PPP to provide a nationwide broadband network for use by local, state, regional and federal "first responder" and other public safety personnel.

The central challenge for fibre optic roll out is the same as for all utilities: how to install the "last mile" of

broadband fibre from the larger, state wide network to individual homes and businesses in the most cost-effective and timely manner. Going forward, fibre optic cable capacity needs to be integrated into State, county and local plans for road, sewer and gas line projects, which create the opportunity to lay down new cable. It might be worthwhile to look at the Pennsylvania Rapid Bridge Replacement Project that I mentioned earlier as a structural template for a “last mile” fibre optic cable PPP.

12. In an ideal world what would you like to see implemented or changed?

Barretto: In an ideal world, the Brazilian transportation would be diversified and the federal government should prioritize investments in railways and waterways so as to support the permanent growth of exports. At present, 52% of transportation is concentrated in roads, but only 18% in trains and 32% in watercourses, pipelines and air. Such inefficiency represents 10.6% of the Brazilian GDP. At the same time,

transportation by road is the most expensive for industry and agribusiness sectors, considering the high prices of oil and tariffs.

The concentrated investment in land transportation also affects urban mobility. Currently, 85% of Brazilian population lives in urban areas. Since 2011, the federal government has been offering resources to state and local governments to support urban mobility solutions through concessions or PPPs, but only 20% has so far been used. The largest Brazilian cities have serious problems with traffic due to the predominance of individual vehicles and the lack of an efficient, safe, good quality collective transportation system. Thus, in an ideal world, state and local governments should discourage the use of private transportation by improving investments and attracting the private sector to manage alternative transportation, such as light rail transit (LRT).

Nickerson: Public sector borrowers have a major advantage over private

sector borrowers in infrastructure investment, especially in the transportation sector. In an ideal world, there would be a level playing field for all investors. The advantage public borrowers have is that interest on bonds they issue (“municipal bonds”) is tax free to investors, whereas interest on private sector bonds and bank loans is taxable. This disparity is mitigated somewhat by private activity bonds (PABs), which are issued by government entities but the proceeds of which are lent to private sector entities for investment in infrastructure projects. PABs were issued for both the Pennsylvania Bridge project and the Kentucky fibre optic cable project that I previously mentioned. But there is a \$17 billion limit on the total amount of PABs that can be issued and to date nearly \$11 billion have been issued or allocated. Also, PABs are not first come first served. Each state receives a rateable allocation of PABs capacity based on population size. So, there may be a mismatch between the location for the best candidate projects and the locations where there is the greatest ca-

capacity to issue PABs. Many hoped that the FAST Act would increase the limit on PABs, but that did not happen.

The tax exemption on municipal bonds is so entrenched and valuable to public sector issuers and industry built around municipal bond offerings that it’s hard to imagine that going away. But it truly puts private sector participants, and by extension PPP solutions, at a huge competitive disadvantage. Lifting the limit on PABs is a short term solution, but there needs to be a more durable long term solution.

The U.S. electric generation system is by and large privately held, either by regulated investor owned utilities or by independent power producers who are exempt from many levels of federal and state regulation. Could toll roads and other transportation infrastructure follow a similar path? Public sector monitoring and regulation would remain. But the business of building, operating, maintaining and rehabilitating the assets would be in private hands.

The image displays six law firm logos arranged in a 3x2 grid. The top row features the logo for Vieira de Almeida & Associados, which includes a circular emblem with the letters 'VA' and the text 'VIEIRA DE ALMEIDA & Associados Sociedade de Advogados, R.L.' below it. To its right is the Skadden logo, consisting of the word 'Skadden' in white serif font on a red rectangular background, with 'Skadden, Arps, Slate, Meagher & Flom LLP & Affiliates' in smaller black text underneath. The middle row shows the Peckar & Abramson, P.C. logo, with 'PA' in large blue letters and '&' in a smaller font, followed by the full name 'Peckar & Abramson, P.C.' in blue. To its right is the King & Wood Mallesons logo, featuring 'KING & WOOD' in black with the 'O's in red and blue, 'MALLESONS' in black, and the Chinese characters '金杜律师事务所' below. The bottom row contains the Casells Brock Lawyers logo, with a stylized blue 'CB' emblem above the text 'CASSELLS BROCK LAWYERS' in blue. To its right is the BKBG logo, with the letters 'BKBG' in a large, bold, green sans-serif font.