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The 2014  
**GLOBAL  
INFRASTRUCTURE  
INITIATIVE**

RETHINKING INFRASTRUCTURE

McKinsey & Company

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Post conference report

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# introduction

\$57 trillion is needed in global infrastructure investment between 2013 and 2030, simply to keep up with the world's GDP growth. This is more than the total estimated value of today's infrastructure.

Underinvestment in infrastructure can cripple lives. Worldwide, 1.3 billion people have no access to electricity, 2.5 billion do not have adequate sanitation, and a further 2.5 billion rely on the traditional use of biomass for cooking.

But in the face of this need for new infrastructure, infrastructure productivity is not increasing — in fact, there has been zero gain in construction sector labor productivity over the past 20 years in Japan, Germany, and the US.

This is the infrastructure challenge that the world faces: to increase investment, meet global needs, and transform productivity. The McKinsey Global Infrastructure Initiative brings together the world's most important leaders and thinkers in the sector to rethink infrastructure and to challenge and inspire us to meet the needs of a growing, urbanizing global population.

Meeting for three days in Rio de Janeiro, we aimed to:

- Establish a vehicle to drive much-needed change in the industry
- Build a community of committed leaders dedicated to lead this change
- Start the conversation on how we could “rethink” the way we plan, finance, build, and operate infrastructure around the world
- Combine quick, tactical ideas to unlock improvements, with higher order, longer term themes.

The debate over the three days proved that as the problems are widespread, there are ideas, innovations, and opportunities in every sector and geography. There are new approaches to be tried and proven practices that should be spread further.

Discussion focused on the four “pillars” of the conference — plan, finance, build, and operate — and some of the key ideas are summarized in this report. At the end of the conference, we brought our ideas together into 25 actions, highlighting the quicker, most-mentioned and most implementable suggestions from the debate. As the discussion was conducted under “Chatham House” rules, speakers have generally not been identified, unless specific permission has been received.

We would like to thank our partners, the Abraaj Group, our affiliate Albright Stonebridge Group and our institutional supporters the Government of the State of Rio de Janeiro, the City of Rio de Janeiro, and the Brazilian Development Bank without whom this event wouldn't have been possible.

*“We all agreed on the thing we need to improve: government, government, government”*



*“I'd like to revolutionize how my organization operates projects, but the cultural and bureaucratic obstacles are immense — the way projects are operated hasn't changed for decades”*

*Major General John W. Peabody,  
Deputy Commanding General for Civil  
and Emergency Operations, US Army  
Corps of Engineers*



# the 25 actions

## plan:

- Iterate the master plan every 1-2 years, terminating ineffective ideas and linking the plan to financing options
- Spend 3-5 percent of budget on up-front studies and complete as much design as possible before procurement launches
- Evaluate projects rigorously on life cycle cost, not lowest cost
- Conduct design-to-cost works (even for Hurricane Katrina reconstruction)
- Invest early in building really competent governance as a client
- Establish a Know Your Client (KYC) process for engineers and designers to minimize scope changes
- Invest in citizen engagement — particularly up front. Remember though that communities do not want a water treatment plant — they want water!

## finance:

- Seek multilateral bank or government money for up-front planning
- Better communicate investors' needs to earn a margin above their cost of capital
- Develop local currency-financed PPPs and/or government-negotiated stapled financing solutions
- Move to standardized insurance packages to reduce costs
- Develop alternative revenue streams for PPPs (such as selling air rights as stock)
- Better identify the range of risks and explain how these are shared.

## build:

- Create communities to share leading practices between countries and asset classes
- Attempt construction innovations in pilots first, and then scale
- Infrastructure companies must win the talent war: attracting the best people and different types of talent by showing they are fast moving and cutting edge
- Know that future-proofing a city can be as cheap as a weather forecast and a siren
- Improve collaboration between designers, owners, and contractors, and have common KPIs and incentives for all contractors.

## operate:

- Use other people to review your project and bring in ideas
- Use data and technology to optimize asset utilization: move from concrete to silicon
- Price is the most powerful way to manage demand, but users need help to accept that pricing will benefit the wider economy
- Sharing data with customers can help them avoid peak usage periods and improve flow
- Invest and grow talent
- Rebrand “maintenance” as “asset preservation” to win support
- The ROI on ancillary revenue is high: take a whole customer perspective, and think broadly of all their potential purchases that day.

# plan

Infrastructure investments are costly, complex, have long time horizons — and are likely to fail without proper planning.

Through the debate at GII, we heard of projects that only came to life for political reasons, went on for years or even decades, and were at varying stages of development with limited progress toward completion. Some overran the budget, sometimes by more than 200 percent, or faced fierce stakeholder opposition. In a large number of cases, the root of the problem was insufficient planning.



The Honorable Anthony Foxx  
Secretary of Transportation US  
Department of Transportation

We also heard how early planning could lead to the success of a project. Five themes were identified as critical for success:

- **Selecting** projects with a long-term strategic vision, iterating a master plan, and killing bad projects early
- **Preparing** projects, and investing early in rigorous project planning and design
- **Building** the team with an accountable governance structure, competent sponsors, aligned incentives, and appropriate risk taking
- **Regulating** infrastructure with clarity, credibility, and efficiency
- **Engaging** stakeholders early, building grassroots community support.

## Selecting projects: creating a long-term strategic vision, iterating a master plan, and killing bad projects early

Political cycles affect the planning of many attendees' projects. Lee McIntire, Executive Chairman, CH2M Hill Companies, said, "politicians like bridges and airports, which they can publicly inaugurate, but not infrastructure they cannot see."

And election cycles bias decisions: the first government involved with a major investment faces stakeholder opposition during planning; the next takes the blame for costs and budget overruns; while the third is rewarded in the inauguration ceremony.

High-performing countries think 25-50 years ahead and plan for the resources they will need along the journey.

In Australia, plans are being constructed at arm's length from government, but linked closely to finance vehicles and in a way that wins the confidence of stakeholders.

## "Our permitting process resembles a relay race across 13 agencies"

In Panama, the administration is required to put an economic development plan forward to the national assembly and appoint the board overseeing the critical canal infrastructure, which is then an independent entity for a period of nine years.

These plans should be adaptable to the needs of the infrastructure user, with feedback channels for conveying those needs — while continuing to follow the overall economic vision and guide private-sector investments. For one major city development, the master plan was reworked four times within eight years.

## *“Bad private projects never start; bad public projects never end”*

Master plans are also vehicles to push socially and economically worthwhile projects forward and help kill off politically motivated or ill-conceived projects of insufficient benefit. Terminating bad projects early is one of the most important elements of planning, as many projects fail before construction begins, but after money has been spent on development. Or, as Roberto Senna, Managing Director and Partner, RS Partners Empreendimentos e Consultoria Ltd., put it, “bad private projects never start; bad public projects never end.”

One presenter even suggested that the construction industry decline projects that were insufficiently prepared.

Particularly in emerging economies, financing this level of preparation seems to be a challenge even if the payback during execution is big. But development banks have now recognized this and are increasingly providing project preparation support. Some countries have established revolving funds where winning bidders replenish the fund after the tendering phase.



Carol Ratti  
Director  
Sensible City Laboratory  
MIT



Carol Browner  
Senior Counselor  
Albright Stonebridge Group



John Rice  
Vice Chairman  
General Electric Co.

### **Preparing projects: investing in rigorous project preparation and design**

Even for lump-sum turnkey projects, some sponsors tender and award construction contracts when the design is only 10 percent complete.

In one large project, Lee McIntire, Executive Chairman, CH2M Hill Companies, said, they “ended up with 42,000 change requests.”

Insufficient feasibility studies precede costly overruns and it was said that some promoters deliberately present low cost estimates, and then overrun the budget as the project proceeds.

A rule of thumb was proposed: at least 3-5 percent of the total project budget should be spent on preparation.

### **Building the team: accountable, competent, and aligned**

The main differentiator between success and failure of large projects, according to research cited in the debate, is the quality and experience of the project manager. “Many politicians do not have this skill set, yet find themselves responsible for major projects when in government,” said Samir Brikho, Chief Executive, AMEC PLC.

Even if the right teams are in place, incentives are often misaligned or risks inappropriately allocated. “Large infrastructure projects are highly complex to structure and require a broad team of specialists; rarely does anyone take the aggregate view. Everyone tries to push risk to other parties even when they are the best owners to handle it,” said Frank Beckers, Senior External Advisor, McKinsey & Company, founder and Managing Director, Symbolus Infrastructure Consultancy.



More risks, according to some present, should be taken by the owners, who can promote innovation and lower life cycle costs along the way. Incentives for teams on the owner and supplier side should be aligned — not only via penalties, but also by sharing the upside of innovations and cost savings.

To build competence, it was said that “companies and investors increasingly need to train people and supply chains locally beyond getting the job done,” or set up special delivery entities, such as for the London Olympics, where the Olympic Delivery Authority hired competent professionals from around the world.

### Regulating infrastructure: bringing clarity, credibility, and efficiency

Investors demand clarity, stability, and credibility when it comes to investments with 25- to 30-year payback periods. Several cases were discussed where bids only came from state-owned companies, or no bids were received at all, due to concerns about what exactly was covered in the scope of a concession.

Investors spoke of their preference for legislation over administrative rulings. They also look at track records and stability of the political environment. “Activist regulators, with particularly strict rules and supervision, can be positive for investors as they may serve as an insurance policy against stakeholder opposition,” said Carol Browner, Senior Counselor, Albright Stonebridge Group.

Regulatory efficiency was regarded as being equally important as clarity. “Our permitting process resembles a relay race across 13 agencies, which we need to turn into a concurrent process,” said the head of a government agency.

Governments need to organize swift delivery of infrastructure programs.

*“At least 3-5 per cent of the total project budget should be spent on preparation”*

In Panama, the metro was delivered on time and within budget, as the CEO could knock on the door of the President to remove obstacles while working.

In Mexico, President Peña established a “COO” with responsibility across land, infrastructure, and housing to move the investment agenda forward.

### Stakeholder engagement: building grassroots community support

Communities that face the negative effects of infrastructure projects or feel ill served can stop or delay projects, even if projects are in the best interests of the country.

Investors and planners were advised to take local communities seriously. They should assign equally good teams for dealing with communities as for operations. Luis Alberto Moreno, President of the Inter-American Development Bank observed, “I often say to CEOs ‘you pay great money to the people dealing with operations. You should pay the same amount to the people dealing with communities.’”

“Communities need to see the benefits and feel they are getting a decent price,” said one investor. “Infrastructure is a public service that people cannot opt out of. Investors must provide a high-quality service to prevent the public, politicians, and regulators from turning against them,” he added.

In the words of David Middleton, Chief Executive, Transport Scotland: “communicate, communicate, communicate, and sometimes battle in the face of challenges.”

### More information

See articles in *Rethinking Infrastructure: Voices from the Global Infrastructure Initiative*:

- “Making the consumer case for major infrastructure” by Dominic Maxwell, Julian Mills, and Stuart Shilson
- “Infrastructure’s central role in China’s ‘new urbanization’” by Xiaodong Ming
- “Critical issues in the next decade of China’s infrastructure effort” by Zuo Kun



# finance

The infrastructure finance market continues to mature: more investors, higher allocations in long-term portfolios, and an increased flow of investable assets and bankable deals. Among governments, there is also a growing understanding of the constructive role that private finance can play.

The debate among GII participants highlighted four priorities to help overcome inefficiencies and deliver benefits for governments, society, and private capital providers:

- **Building** capabilities among commissioning authorities to increase the quality of assets and processes coming to market
- **Applying** financial innovation by learning from other jurisdictions to reduce project life cycle costs and find new sources of revenue
- **Bringing** local sources of capital into the market to manage currency and stakeholder risks
- **Managing** sovereign risk by educating governments and regulators on private-sector requirements for regulatory stability and return on capital.

## Building public-sector capabilities

A common refrain was the need to build finance capabilities in government across the infrastructure value chain, including to package deals that are investable and bankable from a capital markets perspective. “Governments have to make sure that the bureaucratic resources are available to facilitate the entry of capital into these projects,” said one investor.

Capability building in this context is not shorthand for giving the private sector an easy ride. Lee McIntire, Executive Chairman, CH2M Hill Companies, said, “we like clients who are really knowledgeable and really tough. They are the easiest clients to deal with.”

Nor is it an issue just for national governments, as 60-70 percent of infrastructure investment takes place at state and local levels.

*“We like clients who are really knowledgeable and really tough”*

One possible approach is the creation of national centers of excellence to define and promote best practices across agencies at all levels. For example, the Indonesian Infrastructure Guarantee Fund works with national, state, and local agencies to screen, appraise, and supervise PPPs. It sees its role as enhancing the capacity of contracting agencies to package deals and bring them successfully to market, and ensure that public-sector agencies properly understand their obligations under the terms of a deal.



Claudette Christian (right)  
Partner  
Hogan Lovells

Clare Akamanzi (left)  
Chief Executive Officer  
Rwanda Development Board



Reinier de Graaf  
Partner  
Office for Metropolitan  
Architecture (OMA)



*“It doesn’t matter whether the rules are tough or easy – they have to be stable”*

Zhang Yue  
Chairman and CEO  
BROAD Group



Nazir Alli  
Chief Executive Officer  
South African National  
Roads Agency



Kevin Rudd  
26th Prime Minister  
of Australia



A particularly important public-sector capability is running a bidding process that is consistent, transparent, and well designed. Opacity undermines confidence that contracts will be awarded fairly, and discourages investors from committing the resources required to prepare high-quality proposals.

- “The biggest single barrier to private-sector investment is corruption and the perception of corruption,” said one attendee.
- “It is incredibly important to give the private sector and particularly financial investors enough time to respond to the RFP [request for proposals] process to review deals thoroughly,” added Nick O’Neill, Chief Executive Officer, Macquarie Infrastructure and Real Assets (MIRA).

### Financial innovation

GII participants agreed that capable, confident government agencies are also more likely to promote financial innovation — new ways to share gains, allocate risks, and reduce full life cycle costs. Specific financial innovations highlighted during the conference, which offer quick, tactical options, included:

- Use of staple financing negotiated by government agencies, under which a standard financial package is offered to all bidders. This lowers the

complexity of the procurement process and, by decreasing risk, reduces the cost of capital

- Use of standardized insurance packages across PPPs, negotiated by government agencies to reduce costs. In North America, insurance can account for up to 15 percent of total costs
- Creation of alternative revenue streams; for example, selling air rights as stock or gifting land to PPPs, with development gains shared between private and public sectors
- Tax increment financing to ensure that development gains accruing to existing property owners contribute to the life cycle economics of a project.

### Bringing local investors into the market

As infrastructure finance expands beyond OECD economies, GII participants called for greater participation by local investors and lenders.

Local financing helps manage currency risk, as long-dated swaps are often unavailable or prohibitively expensive.

More importantly, it also brings an on-the-ground perspective to help manage overall project risk. Macky Tall, Senior Vice President, Infrastructure, La Caisse de dépôt et placement du Québec, pointed out, “we want to partner with local investors. They will have a better understanding of the local stakeholders than a Canadian pension fund.”

## “We want to partner with local investors”



Ana Fernandes  
Chairwoman  
EDP

The leader of a development bank described their program to bring more domestic investors and lenders into the infrastructure market. He noted that local investors remain wary of construction risk because they usually have only limited experience in greenfield projects.

Development banks continue to play a pivotal role in this dimension: “we focus on risks that the market cannot take. Once assets are generating income, however, local debt and equity finance are becoming more available” said Roberto Zurli Machado, Managing Director, BNDES.

### Managing sovereign risk

Spain’s decision to reduce feed-in tariffs for solar energy providers following the 2008 financial crisis, and later to introduce a retroactive tax, threw into turmoil what was considered among the world’s most attractive renewable energy markets, and was frequently cited as an episode that underlined how sovereign risk is not just an issue for infrastructure investors in developing economies.

While GII participants agreed that regulatory and tax risk will never be eliminated completely, they called on governments to do more to maintain stable legal and regulatory frameworks. “We need to understand the rules of the game. It doesn’t matter whether the rules are tough or easy – they have to be stable,” said Macky Tall, Senior Vice President, Infrastructure, La Caisse de dépôt et placement du Québec.

For governments entering the infrastructure finance market for the first time, investors are looking for consensus across political movements about the constructive role that private capital can play. “We need some comfort,” noted a senior American businessman, “that contracts are going to survive changes of power that can range from multiparty elections to military coups.”

Investors can help themselves, by clearly communicating their need to earn a rate of return greater than their cost of capital.

Even with these conditions in place, participants agreed that development banks and national export-import banks will continue to play an important role, mediating between private capital and national, state and local governments. This role goes beyond the provision of long-term financing, credit enhancement, swaps, and other instruments. In the words of Fred Hochberg, Chairman and President, Export-Import Bank of the United States, “nobody wants to default on the US government.”

### Further information

See articles in *Rethinking Infrastructure: Voices from the Global Infrastructure Initiative*:

- “Using PPPs to fund critical greenfield infrastructure projects” by Thierry Déau and Julien Touati
- “Making a better match between institutional investors and infrastructure investments” by Frédéric Blanc-Brude
- “Keeping 21st-century cities on the move” by Jay H. Walder
- “Energy infrastructure: Seizing the opportunity in growth markets” by Arif Naqvi

# build



Darya Borisova  
McKinsey & Company

The infrastructure challenge is perhaps most acute when it comes to the “build” phase. There are opportunities around:

- **Improving productivity**, with ways to share lessons and mobilize industrial manufacturing
- **Building trust and collaboration**, with the right tone, risk sharing, and incentives
- **Investing in talent and expertise**, with the right balance across the team, with both managerial and technical skills, and with the managers’ responsibilities growing gradually over time.

## Improving productivity with mobile labor and industrial manufacturing

As one presenter noted, McKinsey research indicates an improvement potential of 15 percent in overall project costs in the delivery phase alone by systematically employing best practices across procurement, using prefabricated materials, and applying lean construction principles.

*“The industry needs a scientific approach to construction”*



Lee McIntire  
Executive Chairman  
CH2M Hill Companies

The poor quality of initial budgets and baselines has always been debated.

“In my career, I am yet to see a tunnel project that does not end up costing at least 50 percent more than the initial estimate,” noted a global E&C executive.

To address consistently low labor productivity in the delivery of infrastructure projects, the construction industry needs to rethink how it operates and use new technology and approaches.

*“I am yet to see a tunnel project that does not end up costing at least 50 percent more than the initial estimate”*



Abrahão Pio dos Santos Gourgel  
Minister of the Economy  
Republic of Angola



Robert Palter  
McKinsey & Company



A simple but effective way to improve labor productivity was shared by a mining project in Chile. Bilingual craftsmen were brought in from the US, Australia, and elsewhere, and mixed with local laborers. Productivity tripled: concreting that was initially done using scaffolding, taking 20-25 hours per cubic meter placed, ended up with seven to nine hours per cubic meter placed using the rebar technique.

### *“Engineering candidates do not have the tools to operate in the real world”*

New approaches and technology that challenge the conventions of the construction industry are also central to the Broad Group. The Broad Group’s use of industrial manufacturing approaches and new materials in building construction in China has led to a dramatic impact on labor productivity, cost and time of construction as well as the environmental and carbon footprint. “The industry needs a scientific approach to construction,” argued Zhang Yue, Chairman and CEO of the Broad Group.

### **Building trust and collaboration**

Relationships between project sponsors and contractors can be unproductive and antagonistic. Communication between parties suffers, along with the ability to define common objectives and incentives that will help deliver a better project.

The UK and Australia were said to be at the forefront of better practices. For example, “alliance contracts” and “alliancing” help allocate and share project risks, and create a collaborative tone.

They require both parties to work together at an early stage to understand project requirements and the specific risks associated with the project’s scope.

“Changing the nature of the relationship between owner and contractor is not difficult — all we ask for is one day to sit down and align on needs and incentives,” said one participant.

The executive of one engineering and project management firm said, “I am in the ‘translation business’ — helping owners and contractors understand the needs of the projects.”

The result is often win-win situations, where both parties share the upside if the project is delivered successfully – for example, the incentive system for contractors created by Transnet, the South African freight rail company. Based on a multitiered weighting system related to quality, cost, schedule, and safety, contractors have access to a bonus pool, rewarding project outcomes.

*“All we ask for is one day to sit down and align on needs and incentives”*

It helps when the relationship is seen as a partnership, spanning a portfolio of projects, rather than one transaction. Transnet has been successful in building such partnership relationships by being open and transparent with contractors on their full portfolio of projects and their intention and interest in building long-term relationships to deliver them.



Emma Sri Martini  
President Director  
PT Sarana Multi Infrastruktur (Persero)

## Investing in talent and expertise

As with the other pillars, project delivery needs good talent in project management on both the owner and the contractor side.

But what makes a good project manager? The discussion highlighted the following:

- Project management is not only about an individual, but about the team, including different profiles, skills, and experiences. A right mix between specialist and managerial profiles is needed
- Training should cover both the formal technical and the management aspects of the role, including finance, communication, and the use of supporting systems and tools. There should be a greater focus on project management at universities, and for it to be included as a central part of engineering degrees
- These skills need to be developed over time by gradually giving project managers exposure to larger and more complex projects, with appropriate coaching and training.

## Further information

See articles in *Rethinking Infrastructure: Voices from the Global Infrastructure Initiative*:

- “Maximizing revenue from government-owned assets” by Robert Palter and Stuart Shilson
- “Inspired infrastructure” by Uwe Krueger
- “Infrastructure and the resilience dividend” by Judith Rodin
- “Rethinking conventional construction: An interview with Broad Group’s Zhang Yue”

# operate

The ability to change how existing infrastructure is run is gathering pace, with the help of new technologies, approaches, and ideas. There are new ways to respond to users' need to achieve more with less.



Aminu Diko  
Director General  
Infrastructure Concession  
Regulatory Commission  
Federal Republic of Nigeria



Henry Ritchie, McKinsey & Company (left)  
Marcelo Odebrecht  
Chief Executive Officer, Odebrecht

Participants discussed:

- Improving demand management and making use of data
- Improving maintenance, in particular by involving the public
- Maximizing ancillary revenue.

## Improving demand management and making use of data

Price remains the most powerful way to manage demand, and participants shared ideas on how best to use pricing:

- In Israel, dynamic pricing has been introduced for the fast lane of a highway, which not only allows for yield management, but also keeps the traffic moving
- The taxi company Uber is educating users in dynamic pricing around the world
- Interestingly, the willingness of individuals to pay for access to a motorway fast lane is not just a question of income: lower-paid people on an hourly wage, such as plumbers, are often prepared to pay more than people who earn more, but are salaried professionals.

## *“We need to move from asphalt to silicon”*

But as well as pricing, sharing data with customers can also be effective for demand management: letting them know when traffic is at its peak and how they can avoid the costs and delays involved in it.

More generally, as Carlo Ratti, founding partner of the Carlo Ratti Associati and Director of the Senseable City Laboratory at the Massachusetts Institute of Technology says, “we need to move from asphalt to silicon,” and data can reduce the need for physical infrastructure by increasing capacity of existing infrastructure.

- Improvements in traffic light timings led to a 30 percent increase in traffic flow in one country. In the future, if driverless cars become widespread, traffic lights will be replaced by a “first come, first served” rule
- Technology allows hard shoulders to be selectively opened when traffic levels demand it, but immediately closed so that emergency vehicles can still have access in the event of an accident
- Automated trains and more data-driven time-tabling substantially increase the maximum throughput of rail



## *“First we provided products, then we added services, and now data is just as important. It is the third leg of the stool”*

- GPS-enabled changes made to air traffic control can add the capacity equivalent to one landing in eight
- Microtransmitters are being developed for freight, similar to small cell phones, which periodically broadcast their location. They add only about \$10 a month to the price of a container, but allow for precise management of cargo flow.

Data and communications can also bring new physical capacity to the market. The travel rental web site Airbnb brought 15,000-20,000 new apartments onto the market in Paris simply by providing an online platform to book accommodation, with no new building required.

Similarly, ride sharing has been around since the 1960s, but mobile platforms will soon allow for precise and real-time matching of origins and destinations for pairing passengers with similar journeys.

There are, however, barriers to applying data in infrastructure: lack of transparency — as multiple interdependent stakeholders collect their own data but do not share it; inequitable sharing — as the goals of individual players are not aligned; and regulations.

Often, to break through this, a “shaping force” is needed: government, the concession holder, or a neutral party.

### Improving maintenance — involving the public

Maintenance is in many ways a political problem. As the head of a government agency noted, “you can’t cut ribbons when you invest in maintenance.”

An open discussion is needed with the public about priorities. Instead of maintenance, it should be rebranded as “asset preservation.”

Nazir Alli, Chief Executive Officer, South African National Roads Agency SOC Ltd., called for an end to talks of a “maintenance gap” or “maintenance backlog”: one can always spend more, but the challenge is to deliver the best service possible with the budget available. “We should rather be talking of ‘asset preservation’ terminology that purse holders understand.”

Others noted that it may help to publicly post the service requirements of infrastructure, in the same way a car displays the distance until a checkup is needed.

Or we could pursue “gamification” of priorities with the public, such as simulations of infrastructure to show how it responds to declining maintenance, so citizens can spend virtual currency on different projects and see the results.



Deborah Wetzel  
Country Director  
World Bank



Prof. Dr. Wolfgang Maennig  
Department of Economics  
Hamburg University

Technology has its place in maintenance, too, and participants are using it to increase the ability to do preventative maintenance, using robotics and x-ray equipment to survey the decks of bridges.



Luciano Coutinho  
President  
Brazilian Development Bank  
(BNDES)

### Maximizing ancillary revenue

The return on investment in ancillary revenue is high, and there are many opportunities.

Infrastructure can be an opportunity for revenue from billboards, tower access for telcos, and power generation from on-site thermal or renewables. Waste, such as water, can often be monetized. Data on traffic or logistics can be valuable for customers. Customer contacts, such as bills, can include a space for advertising. Land holdings can be leased. Nearby development, such as industrial parks, can be encouraged to increase the flow of local goods and services.

For on-site retail, an executive with experience in airport and motorway commercial development recommended that owners take a “whole-customer” perspective, looking not just at what passengers might need on this journey, but at everything they might purchase over the day.

### “What will be the Airbnb of infrastructure?”

Examples of maximizing ancillary revenue, which could be rapidly adopted by other companies, included:

- In a North American airport, revenue per passenger doubled within three weeks of outside service providers being brought in
- Some Austrian and German train operators will soon brand their whole buffet car as Starbucks
- In one airport, a customer survey was conducted every six months, with retail concessions facing the potential for significant bonuses for good results. Agreements such as these align incentives to grow the whole business.

### “Take a ‘whole-customer’ perspective”

#### Further information

See articles in *Rethinking Infrastructure: Voices from the Global Infrastructure Initiative*:

- “Maximizing revenue from government-owned assets” by Robert Palter and Stuart Shilson
- “Keeping 21st-century cities on the move” by Jay H. Walder

# conclusion

After the debate and exchange of ideas, the discussion of major trends, and the sharing of challenges, what can we do differently tomorrow? What are the simple, short-term, tactical actions that could address the infrastructure challenge?

Across the diversity of the 25 actions, three themes stood out: invest early in preparation; build skills, both in industry and government; and involve the public.

The journey and debate will continue. Following the GII meeting in Rio and the publication of *Rethinking Infrastructure: Voices from the Global Infrastructure Initiative*, we will publish a new collection of essays in the autumn. Contributors include former US Secretary of State Madeleine Albright, President of Bechtel's civil business Peter Dawson, and Vice Chairman of GE John Rice.

The organizers of the GII would like to again thank each of the attendees for their contributions and ideas, and look forward to welcoming you at the next meeting.





# attendees

## Mustafa Abdel-Wadood

Partner and Chair, Management  
Executive Committee  
The Abraaj Group

## Anton Affentranger

Chief Executive Officer  
Implenia AG

## Laudemar Aguiar

Head, International Relations  
Office of the Mayor of Rio de Janeiro

## Clare Akamanzi

Chief Executive Officer  
Rwanda Development Board

## Salem Mohammed Al Marri

Chief Financial Officer  
Msheireb Properties

## Dr. Madeleine Albright

Chair  
Albright Stonebridge Group and  
Albright Capital Management LLC  
Former US Secretary of State  
Albright Stonebridge Group

## Nazir Alli

Chief Executive Officer  
South African National  
Roads Agency SOC Ltd.

## Abdulla Hassan Al-Mehshadi

Chief Executive Officer  
Msheireb Properties

## Fahd Al-Rasheed

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