Can
BIG DATA
transform
infrastructure?

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WHAT TO EXPECT

Marianne Fay brings her background in infrastructure and climate change issues to her role as Chief Economist for the World Bank's Sustainable Development Group, focusing on the future of infrastructure. Here, she talks to Handshake about what the world can expect as infrastructure projects begin to see the impact of Big Data.

Interview by Alison Buckholtz

Q **Do you think that Big Data can make a difference for infrastructure, as it has in other fields?**

A I'm incredibly hopeful because infrastructure is a domain in which we have ridiculously little information in general. I mean, if you compare infrastructure with public health, or poverty, or education, we're the laggards.

Q Why is there so little data?

A There are a few reasons. Even though trillions of dollars are spent every year on infrastructure, there isn't one global agency in charge of infrastructure. The World Health Organization, for example, has a mandate to collect health data; UNESCO has a mandate to collect education data. That's their job. No agency that is truly global has a mandate to collect information on infrastructure. That's been part of our challenge.

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The second problem is that a lot of the data that we are interested in is geospatial. Until recently, from a technology point of view, it was very expensive to geospatially reference this material. If we can move from the current system to remote sensing and satellite design in order to do this in real time with regular monitoring, we're better positioned. That's where Big Data becomes incredibly helpful.

Some of our colleagues have been innovative in promoting the use of crowdsourcing.

The combination of geospatial referencing and crowdsourcing will be helpful to get us into a completely different world. They are also looking at how this can be used to develop algorithms that can read satellite imagery and produce data about rural electrification, urban mobility, and similar things. But we're at the beginning, we're not there yet. I am convinced that within five years we'll have the ability to monitor the quality, location, and availability of our infrastructure in a way we've never been able to, and this could really change our ability to make the sectors more efficient.

Q Is there an explicit link between Big Data and efficiency?

A Yes. We have moved from a message that we need more money in infrastructure to the idea that we need to spend better. We don't have firm numbers, but various estimates, some of which I'm responsible for, suggest that infrastructure spending needs in developing countries could be around $1 to $2 trillion. At the height of the financial crisis when we were disbursing like mad, the multilateral development banks were distributing $90 billion per year on infrastructure. For PPPs, it plateaued around $150 billion a year, of which half is only truly private. We're so far off from what's needed that there's no doubt that the public sector will have to continue financing a lot of this, and that the flows remain way too low. So there's no choice but to spend much more efficiently.

Spending more efficiently means picking the right projects, disbursing properly, managing to procure well, spending appropriately on operations and maintenance. If you have real-time data that can feed back on how quickly a road deteriorates, or the frequency of water shortages, and if we really knew what governments are spending, it would be a lot easier to monitor and therefore promote this efficiency agenda.

> " We ask several important questions: What do we want, how can we achieve it, how can we reduce the cost, and how can we make good use of these investments? How can we spend more and spend better?

Q **What role does crowdsourcing play in data collection?**

A This is about the right data, and the intelligent use of that data. One of the challenges we face is that some governments and agencies are very uncomfortable sharing information. Some governments consider detailed analysis of their transportation networks, for example, to be very sensitive information. So we need to move away from that approach and focus instead on crowdsourcing, where there's Big Data on quality of service, it's all open, and people can develop the right applications for it.

Q **What's standing in the way of progress, or complicating it?**

A There's a general feeling that after the privatization of the 1990s, a lot of countries have lost their planning capacity—particularly their intersectoral planning capacity, but also within the sector. Unfortunately, this is at a time where you have budget crunches almost everywhere, alongside a burgeoning middle class in developing countries with completely different expectations for quality and service than they did 15 to 20 years ago. This group also has access to consumer credit, which has massively changed demand for energy and transport. And on top of it you have the impact of climate change. So it's become very challenging. Even high income countries, the UK for example, are bemoaning the loss of their planning capacity.

Q **What are some questions you ask yourself about this, and encourage your staff to ask?**

A We're working hard to revisit infrastructure needs and come up with estimates based on careful modeling. We ask several important questions: What do we want, how can we achieve it, how can we reduce the cost, and how can we make good use of these investments? How can we spend more and spend better? Finding answers to these questions will be doubly rewarding because if we can make better use of public money, I have no doubt that will help encourage the private sector to come in.