



Focus on building preservation

In our podcast format, we shed light on current topics in dialogue with those directly involved. Here, Henning Schrewe, Head of the Civil Division for Germany, and Patrick Roth, Project Manager Innovation and New Business Models, discuss recipes to combat the bridge collapse. Here is the transcription of the conversation.

Ulli Janett: Welcome to Implenia Talk! In this podcast format, we shed light on topics and developments that characterise our working environment and let our employees have their say. I'm Ulli Janett from Corporate Communications and I'll be your guide through this programme. Today I welcome you:

- Henning Schrewe, Head of Civil Germany at Implenia; and
- Patrick Roth, Project Manager for Innovations and New Business Models

Henning Patrick, welcome!

And that's what it's all about today: even bridges get on in years. More frequently at the moment: According to current estimates, around 4,000 bridges on motorways alone in Germany need to be renovated or replaced immediately or in the next few years. This is complex, expensive and brings

traffic to a standstill, much to the annoyance of the population. How can the federal, state and local governments increase the availability of their engineering structures, both immediately and in the long term? What are the benefits of systematic construction management across all phases of their life cycle? And how can private providers support the public sector in preventing a bridge collapse?

Henning: You lead the division for Germany. When did you build your first bridge? And perhaps more importantly, is it still standing?

Henning Schrewe: Yes, it was opened in 1992. It was a bridge over the Elbe, one of the first bridges after reunification. And yes, it's still standing, it's in good condition. I've also visited it a lot. Apparently we put a lot of effort into it back then and made it very carefully.

Ulli: Well, there's nothing wrong with the bridge, but not so much with German bridges in general. How big is the problem?

Henning: Yes, you've already mentioned it briefly and the federal government has already published that there are probably more than 4,000 (non-performing bridges, editor's note), but these are only those under the responsibility of the federal government on the major motorway routes, in the large municipalities in Germany. We suspect that the problem is much bigger than that. There are still federal states, municipalities and local authorities, and it is impossible to say for sure. But there are certainly another 10,000 bridges that are the responsibility of this organisation. We also analysed this in a study.

Patrick Roth: The results confirm what you have already said: The need is great in Germany. Many bridges are in very poor condition, and in some cases the exact condition of the structures is not really known. We summarised the results in a white paper, which we published at the end of October and which is also available to download from our website.



Recipes against the bridge collapse?

Click here for the white paper "[Bridges in German municipalities](#)"

Ulli: So, things are not going well for German bridges. How did it get this far?

Henning: Yes, that is certainly complex. Maybe I'll start like this: An incredible number of infrastructure projects were built in the 70s and 80s. They were built using prestressed construction methods and the technology was certainly not yet fully developed everywhere. Decking was underestimated and too few concrete decks were used, and in this respect, many structures have simply reached the end of their useful life in terms of construction. Corrosion plays a role, due to salt ingress, and aggressive air also plays a role, which can then enter the cracks in these bridges. All of this simply leads to wear and tear. Another point is certainly the constantly increasing volume of traffic. The loads from the increased number of crossings have become greater and greater. We have an incredible amount more heavy goods traffic, we have more container movements on the roads, and this also means that the structures reach their service life earlier. And then there's the fact that Germany decided at some point to work on the standards within Europe and consistently recalculate the condition of bridges. And this recalculation has also led to the fact that it has now been possible to determine end times for these bridge utilisation periods in many places.

Ulli: Patrick, you told me an interesting detail in the preliminary discussion. When a lorry drives over a bridge, it puts more strain on the bridge than a car, that's obvious. But what's amazing is: how much more load does a lorry put on a bridge compared to a car?

Patrick: Yes, I didn't want to believe it either when I first heard it, and the figures do fluctuate. But the fact is that a fully loaded lorry puts 15,000 times as much strain on a bridge as a car. This means that for every lorry, 15,000 cars could drive over the structure with the same load.

Ulli: And that of course means, Henning, what you just mentioned, that if heavy goods traffic specifically increases, that poses a particular problem for bridges, for the existing structures. We've heard that. So we're talking about 14,000 or so bridges in need of renovation in Germany. The public sector is facing a mammoth task. How can it even be managed?

Henning: Yes, the first thing is certainly the realisation that you have to do something. The second is how can we work against it? Firstly, you need money available in the budget to tackle this problem. But then you also need the right procedures, the right methods, so that you can plan a new building early enough, for example. Because we always have to imagine: If you take a bridge out of service and build a new bridge in the same place, you need several years to do it, such a structure needs a **pre-planning period**. In other words, if you only start thinking about replacing the bridge now, then you have lead times of sometimes up to ten years before you actually have this new bridge in operation, and that is simply far too long. In many places today, we can no longer wait for that.

Ulli: That's a dilemma. Is there a solution?

Patrick: There are technologies that we can use. The problem here is that these are sometimes unknown or it is too expensive or too complex to install them. This problem is particularly acute in local authorities: There, the people who are responsible for the buildings are usually also responsible for a number of other issues. That's why we launched our offer at the end of October, which is specifically aimed at local authorities. **We want to ensure that the lack of resources in local authorities does not continue to be a problem, that buildings cannot be maintained efficiently, and we want to offer these missing resources.** In this way, we can reduce maintenance costs. We can ensure that the bridge is as available as possible and at the same time ensure that safety is guaranteed both for users of the structures and for the environment.

Henning: Basically, we want to help the public sector because we believe that as planners, as a private company, we can react more quickly to many things. And then **we take responsibility for a bridge package from a local authority**, monitor it, support it, carry out repairs and thus guarantee long-term availability. And we are also available to the customer if a new construction is then due.

Ulli: So we have a kind of all-round carefree package for local authorities. They can hand over their engineering structures, such as a bridge, to a company like Implenia. Implenia knows its stuff, can guarantee monitoring and safety, extend the operating time as long as possible and at the same time plan the necessary steps for renovation or new construction without local authorities having to have all the expertise in-house. Have I understood that correctly?

Henning: Yes, that is precisely our vision, and that is exactly what we still have to find the right ways to achieve together. There are certainly still **contractual constructs** to be clarified, there are competition issues to be resolved, but we have now set out to find good solutions.

Ulli: You just mentioned the word contract. What can a contract look like?

Patrick: There are various possibilities that you can imagine. We could offer these services that we have just described as an **advisory service**, i.e. we could analyse the condition of the building, develop concepts based on this and propose an appropriate solution to the local authorities. But there is also the second option, the **all-round carefree package**, as you have already mentioned. We actually see this as the greatest benefit for the local authority, because they don't actually have to worry about anything and we can

ensure that the bridge is always available and always safe. We also have completely different **access to new innovative technologies**. We are constantly working with universities and innovative start-ups in both Germany and Switzerland. At the forefront of this is the topic of sensor technology, which is necessary for predictive maintenance (editor's note). There are a huge number of developments in this area that we are analysing, testing and supplying to customers.

Ulli: Do you already have an example? What could something like this look like?

Patrick: For example, we are working with two start-ups in Switzerland that are developing a sensor system that records not just one measured value, but several at once, such as moisture or the corrosion density in the concrete, and at several points in the structure, in order to be able to map the progress of corrosion and develop forecasts for the future. The idea is that we implement measures at exactly the right time, not too early because otherwise it would be uneconomical and also not good for sustainability, but also not too late to ensure the corresponding availability and safety.

Ulli: Can you give some examples?

Patrick: It's about **sensor technology**. Sensor technology has always been around, but there are so many new developments that make sensor technology smaller or cheaper or make applications easier, and this sensor technology provides data. We can derive information from the data to create a condition forecast and plan how to maintain the building more efficiently.

Ulli: What does that mean in concrete terms for such a bridge? How do you obtain efficient data and what can you do with it?

Henning: We have already explained what the difference means when a lorry and a car cross a bridge, for example. For example, we could now see the effects on our computer when a heavy lorry drives over a bridge. What does this do to the structure? How great are the loads, does it lead to overloading? And we could monitor a structure virtually in real time and then use this data to draw the necessary conclusions as to whether we need to intervene here, replace something, renovate something, perhaps lower the load class of the bridge so that not quite so heavy lorries are allowed to drive over it, and all this can be done with the new technologies.

Ulli: Patrick, you mentioned sensor technology as an innovative technology. Are there any others?

Patrick: There are many other technologies. The topic of **drones is on** everyone's lips, including in the maintenance of buildings. The use of drones is super interesting. If you look a few years into the future, there is the possibility of drones inspecting buildings completely autonomously, recording damage and even analysing it directly using artificial intelligence.

Ulli: You are already using digital twins for this. Is that right?

Patrick: Yes, **digital twins** is a term that comes up again and again. It's actually the image of the real state of a building in digital space, and it goes beyond the three-D model. It is, so to speak, a 3D model equipped with real-time information about a building. Temperature, humidity and even the load on the building can be measured and modelled in the digital twin.

Ulli: What advantages does a local authority have if it orders such an all-round carefree package from you?

Patrick: Our overarching goal is to bring the technologies that are already available on the market closer to the municipalities. We want to enable local authorities to benefit from the advantages that arise from these technologies. **We want to take the burden of managing structures off the shoulders of local authorities** and talk about bridge maintenance or the maintenance of engineering structures. This ranges from the planning and execution of inspections to the development of maintenance concepts, the application

of monitoring systems and refurbishment measures. We would plan, organise and carry out all of this ourselves.

Ulli: And why are you focussing this offer on local authorities?

Henning: We think that we can help the local authorities best because some of them don't have the specialised staff themselves. We can offer the best service with our specialists as a first step. If we succeed in this and find good solutions, then I also think it is quite possible to extend the service to the federal government.

Ulli: So we have a completely new business model here, which is intended to clear this renovation backlog on German bridges to a certain extent, and you are looking positively to the future. Is that right?

Henning: The problem has been recognised, the problem is big, and we will only solve it together. And this is precisely where I see the opportunity for a **close partnership between public authorities and a construction company like Implenia to get out** of this problem. Because one thing must be clear to us every day: Our infrastructure is the prerequisite for a progressive and good life and a functioning economy. That's why we have to treat our infrastructure well and do a lot for it tomorrow too.

Ulli: We have reached the end of our conversation and I would like to thank my guests Henning Schrewe and Patrick Roth. The white paper "Bridges in German municipalities" was published in October 2023 and can be downloaded [here](#).

Did you like the podcast? Do you have any requests or suggestions for topics and possible guests? Then write to us at redaktion@implenia.com! We look forward to an exciting exchange and will stay tuned to the topics that are close to your heart. See you next time!