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Pàrlamaid na h-Alba

Official Report

INFRASTRUCTURE AND CAPITAL INVESTMENT COMMITTEE

Wednesday 3 February 2016

Session 4

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INFRASTRUCTURE AND CAPITAL INVESTMENT COMMITTEE
5th Meeting 2016, Session 4

CONVENER

*Jim Eadie (Edinburgh Southern) (SNP)

DEPUTY CONVENER

*Adam Ingram (Carrick, Cumnock and Doon Valley) (SNP)

COMMITTEE MEMBERS

*Clare Adamson (Central Scotland) (SNP)
*Alex Johnstone (North East Scotland) (Con)
*Mike MacKenzie (Highlands and Islands) (SNP)
*Siobhan McMahon (Central Scotland) (Lab)
*David Stewart (Highlands and Islands) (Lab)

*attended

THE FOLLOWING ALSO PARTICIPATED:

John Evans (Flint & Neill Ltd)
Richard Fish
Peter Hill (Humber Bridge Board)
Sharon White (Ofcom)

CLERK TO THE COMMITTEE

Steve Farrell

LOCATION

The Adam Smith Room (CR5)

Scottish Parliament

Infrastructure and Capital Investment Committee

Wednesday 3 February 2016

[The Convener opened the meeting at 09:30]

Ofcom (Draft Annual Plan 2016-17)

The Convener (Jim Eadie): Good morning, everyone, and welcome to the fifth meeting of the Infrastructure and Capital Investment Committee in 2016. I remind everyone to switch off mobile phones, as they affect the broadcasting system. Meeting papers are provided in digital format, so tablets might be used during the meeting. No apologies have been received.

Agenda item 1 is oral evidence on Ofcom's draft annual plan 2016-17. I welcome Sharon White, the chief executive of Ofcom, and invite her to make a short opening statement.

Sharon White (Ofcom): It is an absolute pleasure to be here. This is my first time at a parliamentary meeting in the Scottish Parliament and it is a great delight for us to get some feedback and comment.

As you know, the Scotland Bill will mean that there is a more formal and structured role for Parliament on our annual plan. As chief executive, I am focused on ensuring that communications work for consumers. There are all sorts of issues and priorities for us in relation to access, availability and speed of service. There are big issues of rurality, which come to life particularly in Scotland. We are keen to get your feedback today so that we can ensure that the needs of Scotland's populace are properly reflected.

The Convener: Thank you very much. We are pleased to have you in front of the committee this morning.

You mentioned the Scotland Bill, which is currently going through Westminster. That will bring about a number of changes to the way in which Ofcom operates in relation to Scotland. Will you provide a short update on the progress that has been made towards the agreement of a memorandum of understanding between the two Governments on Ofcom's relations with the Scottish Parliament?

Sharon White: As you say, the Scotland Bill will further strengthen the relationship between Ofcom and Scotland. We are working hard on the memorandum of understanding with colleagues in the Scottish Government and the United Kingdom Department for Culture, Media and Sport. I hope that we are weeks away from agreement. The MOU will set out some clear formal structures for consultation, not least with a Scottish member of the Ofcom board, which we consider to be a positive step.

The Convener: Will you say a little bit more about the difference that you think that appointment will make to the way in which Ofcom operates and the benefits that there will be for consumers in Scotland?

Sharon White: It will make a big difference. My main priority as chief executive is to think about UK connectivity looking 10 years ahead. Although the market has been competitive and has generally worked well, there are still some very significant parts of the UK—they are more than pockets—not least in Scotland, where that is not the case for businesses as well as for residential consumers.

To take the practical example of the universal service obligation, the issues in the Highlands and Islands will be very different from those in the Welsh valleys or in the city not-spots that we have in London. There will be different technological demands and requisites. Having an Ofcom board member from Scotland who is able not only to speak to all our agenda but to represent and understand needs in a more granular way is really important. It is one of the reasons why I am also increasing the size of Ofcom's presence in Scotland. We are setting up a new Edinburgh office, and I hope to have more of our engineers, technologists and consumer experts on the ground here.

The Convener: Do you see the role of the Ofcom board member as being Ofcom's person in Scotland or the person on the board who represents Scottish consumers?

Sharon White: It is a bit of a fudge to say both.

The Convener: We are used to fudge.

Sharon White: I know—it is my civil service background.

The ideal candidate for the position of Scotland representative would not only be able to speak to the broader Ofcom agenda—our remit is very broad and goes from broadcasting and determining which parties are rightly due party election broadcasts right through to some of the telecommunications issues—but have a real understanding and appreciation of the priorities in Scotland that can feed into the decision taking on our wider priorities. I do not quite see that person as Scotland's consumer champion, but I do see them as someone who is credible to the

committee and the broader populace in Scotland. That is critical.

The Convener: Will the memorandum of understanding provide any detail on the positive engagement that Ofcom will have with the Scottish Parliament and this committee? What issues will it cover?

Sharon White: That is still up for debate. I suspect that some of the discussions will be about how much more, or less, specificity there will be. For me, what is really important about the MOU is that it sets out a positive agenda and a positive story for engagement. That applies at a working level but I hope that we can get into a routine in which the Parliament feels able to call us more routinely for evidence and there is early engagement on annual planning. I hope that it will be a continuing dialogue rather than a once-a-year discussion. For me, it is really critical to have Parliament much more tightly knit into our engagement and priority setting.

The Convener: Do you anticipate that Ofcom will provide more detailed information at a local level in Scotland—that it will provide more granularity to the data?

Sharon White: Yes, very much so. Some of you may have seen a report that we did last autumn called "Connected Nations 2015", which represents not the start but the building up of our desire to have much more granular information. We are now able to publish postcode data on mobile availability, which we have not been able to do in the past. Some of you have seen our mobile checker maps. You can now tap in your postcode in any part of the UK or Scotland, see whether you are able to make a mobile phone call and compare different providers in your area.

That is why I come back to the consumer. We are really keen to understand what connectivity is like for the individual consumer. I hope that, over the course of the next year, we will be able to do that at the household level, not just the postcode level, because many people combine mobile and wireless connectivity as well as having fixed-line connectivity.

That is a strong yes.

The Convener: I understand that the strategic review of digital communications is expected to report this month. I am not asking you to breach the embargo, but will you give us a flavour of the likely initial conclusions of that review? Obviously, Ofcom will be charged with implementing those. What key benefits will arise from that for businesses and consumers in Scotland?

Sharon White: I can give the committee a sense of the headline issues that we are covering. Much of the media attention over the past few months has been about Openreach and its relationship with the BT Group board, but the review is much broader than that.

Our starting point is that we are trying to step back as a regulator. We have not done a strategic review for 10 years and the market has changed a lot in that period. We are trying to look ahead to set out how we, as a regulator, can best support markets and communications working for all consumers over the next 10 years. We will consider issues such as availability, which we have just touched on. What can we do, working with Government and industry, to ensure that there is universal access to a decent service?

This is probably a question more for urban areas than for rural ones, but we will be looking at how we can maximise competition so that consumers are not reliant on an incumbent or a single provider but have a choice of, ideally, two or three providers.

We will be looking at quality of service. Some people have determined that communications have become the fourth utility, and we all rely on them. Customer service issues are therefore really important, so we will be looking at what our role as a regulator is there.

We will be looking at deregulation. We like to think of ourselves as a proportionate regulator. Given that technologies change—again, this is not an issue for much of Scotland, but in some parts of the country, mobile has become more of a substitute for land-line use—is there scope for having less regulation without leaving many people, particularly the most vulnerable, disadvantaged?

We will also be looking at Openreach, again in the context of the consumer. Would the consumer benefit from a different form of separation between Openreach and the broader BT Group? When we launched our discussion paper last summer, we said that we would be looking at four options—the status quo, the possibility of deregulation if there is more network competition for Openreach, the current model of functional separation, and a fuller and more structural solution whereby there would be a change of ownership.

The Convener: Thank you. That is helpful. I hand over to my colleague David Stewart, who will ask some questions about the universal service obligation.

David Stewart (Highlands and Islands) (Lab): I say at the outset that, like Mike MacKenzie, I represent the Highlands and Islands. As you can imagine, broadband is a huge issue there, and speed of broadband and intermittent broadband are among the greatest areas of contention for my constituents. Some constituents have argued that having a minimum broadband speed should be a

basic human right. Perhaps that slightly overstates it, but I am sympathetic to that view. What is your view?

Sharon White: I am sympathetic. Whether we talk about broadband being a basic human right or the fourth utility, it is the same idea. If we were sitting in this committee room five or maybe even three years ago, we would feel that it was a nice to have, but it has now become fundamental to people's ability to have community, social and economic engagement.

Some interesting reforms are taking place in Scotland on public services and moves towards digitisation, and if a decent level of broadband is not available to both residential and business consumers, that will be not just an inconvenience but something that will potentially have serious deleterious impacts on both wellbeing and economic activity.

David Stewart: Let me give an example that I have picked up. A couple who moved to the Western Isles wanting to run a small guesthouse have found that they cannot use their booking system because of the lack of broadband. Do you accept that that is a real constraint on economic development?

Sharon White: I completely agree. Each week, probably 90 per cent of the concerns that are raised in my MPs mailbag are about broadband speed and quality of service. Ofcom encouraged the Government to introduce a USO, and I am delighted that one has now been announced. In the 2015 budget, a 5 Mbps universal service obligation was announced, and that was doubled in the Prime Minister's speech last November. I will certainly want to work closely with the Government to ensure that that is implemented in such a way that everybody has a right to request a decent service and have it made available.

David Stewart: In fairness, the broadband delivery UK funding to Highlands and Islands Enterprise, which BT is now developing, has been a huge boost. We have had regular briefings about the work that is being carried out, and I welcome that.

However, the "Connected Nations" report in 2015 said:

> "Scotland has the highest proportion of rural premises (57%) that are unable to receive more than 10Mbit/s."

There is therefore an issue with rural areas being neglected. I am sure that the same applies in England, Wales and Northern Ireland, but since we are in Scotland, I just thought that I would flag up the Scottish issue. Do you accept that there is a real worry that rural areas are still losing out with regard to decent broadband speeds?

09:45

Sharon White: I think that we are in violent agreement with each other. One of the reasons why we were keen to give more visibility to availability issues—this brings me back to the convener's point about granularity—was to make it clear that although broadband expansion had been hugely positive for many people there were still issues in big chunks of the country, including in Scotland.

Small to medium-sized enterprises are another issue. For other historical reasons, many SMEs are caught in the big gap that still exists between the services that are available to residential consumers and the very high-end services, which they cannot afford. Over the coming period, one of my big priorities as chief executive of Ofcom is to close that gap, and I think that the proper implementation of the USO and the patchwork of things that are already happening through broadband delivery UK, the digital Scotland superfast broadband programme and some community initiatives need to deliver universality at a decent speed.

David Stewart: What might seem like a left-field issue that has been raised with me by some academics relates to corporate planning across all services and Government. Let me give you an example. There has been a serious increase in the amount of road building in the north, including the A9, which is one of the longest, if not the longest, trunk road in the country. It has been argued that fibre optic cable, as a minimum, should be laid across the country while that massive road building activity is going on, instead of the roads being dug up later on. It just seems that there is a lack of corporate planning across departments and, perhaps, across Governments. Does that issue fall within your remit and responsibilities? Has it already been raised with you?

Sharon White: It has already been raised with us. I know from my past life at the Treasury that the issue is very much a feature of the implementation of the planning rules, but we are very aware of it. I believe that 66 per cent of Scotland is served by BT, which means that 34 per cent is not, and if we are talking about laying networks in a very large geographical area, that gets us into practical questions such as, "How many times do I want my road and my streets to be dug up?" Although it is not our responsibility, we certainly recommend that the planning rules be implemented in a way that makes it more likely that the networks will be laid.

In other countries, utilities open up their ducts and say, "Dear providers, you have six months to lay your fibre", and afterward they place a moratorium on that activity for two years. That incentivises all the competitors to come in at the

same time and demonstrates to residents that they will not be put through perpetual building work.

Clare Adamson (Central Scotland) (SNP): I have a very quick supplementary. Because I represent an urban area, my problems are the opposite of those that are being highlighted by my Highlands and Islands colleagues. The figures suggest that coverage is very good, but the problem is that what always seems to be taken is the low-hanging fruit—in other words, the areas that are easy to get to. In our area, cable and fibre optic broadband options are available, but for new estates, there is only fibre optic broadband, and those are the areas where most of the complaints come from. Is there anything that you can do to encourage the planning system and local authorities to ensure that when new estates are being built good coverage is available?

Sharon White: Although dealing with that matter is not in our direct gift, we are certainly involved in conversations about it. Indeed, your question about new build raises a broader issue, in that similar issues have been raised with us about business parks that, paradoxically, have been bypassed for fibre optic cable. We are working behind the scenes on the matter. I am having discussions with operators, and other discussions are now being convened by Westminster politicians through the digital infrastructure task force, which I sit on and which is looking actively at the issue.

Moreover, in the strategic review, we will make it clear that universality cannot just be written down on a piece of paper. A whole series of very practical steps need to be taken, and we feel that the first vital step is to make the gaps visible to ensure that we all have the same data to work from.

David Stewart: My next question, which is a bit of a chicken and egg one, is about rural areas. You will know that the Highlands and Islands is an area larger than Belgium with the population of Brussels—that is the shorthand that we occasionally use. From the market point of view, there is probably lack of demand. However, there is also a lack of operators. That leads me nicely on to the calls for BT to sell off Openreach, which you touched on in your opening statement. You explained that there are four different options. How likely is such a sell-off? Would it help the market and provide more competition, more operators and a better standard of broadband?

Sharon White: You will appreciate that, given that we have not quite concluded, I am slightly limited in what I can say. However, what I will say is that we will look at the issue of Openreach not as a sort of academic question about different models of governance but from the point of view of whether a different structure will encourage more investment and a better quality of service. We will approach the issue from the point of view of those metrics and criteria.

As you say, there will be some areas of the country where, with the best will in the world, one's top priority is just to get access. There is not necessarily any likelihood of having a number of competitive rivals in Orkney and Shetland. Nevertheless, there is an interesting question about whether we can get some good competition between types of technology, so that you are not necessarily reliant on a fixed-line connection because wireless operators might be able to come in, too. Although I am afraid that I am unable to say more definitively about where we are going on the issue of Openreach, I hope that I can give some assurance to the committee that we will be judging that issue from the perspective of whether we will get more investment, whether the roll-out will be faster and whether we will get a better quality of service from a different model.

David Stewart: My final question is on my contention that broadband development is probably one of the most vital ways of increasing economic activity in the Highlands and Islands and indeed throughout the United Kingdom, particularly in rural areas. You will know that some of the technical solutions are not just about fibre optic because, in very hard-to-reach communities, broadband, wi-fi and 4G will require satellite development. Of course, there are problems with 4G as well. Can you give any comfort to the committee about developments with some of those technologies? Does Ofcom have a role in the technical aspects of broadband provision?

Sharon White: We are in a similar place to you, particularly when we think about the implementation of the USO. We would love to do that through a variety of technologies, partly because, as you say, fixed lines will not necessarily be the best solution for very remote communities. Also, from our perspective, we want there to be choice, and more competition in the way in which further access is rolled out.

David Stewart: I said that that was my final question, but I think that I was having a senior moment, because I had forgotten my other question.

The Convener: Just keep going.

David Stewart: I will do. I am quite interested in Government's role in the award of contracts in which wi-fi and broadband is seen as a function, for example Caledonian MacBrayne's Clyde and Hebridean ferry services. In a previous role, when I chaired the Public Petitions Committee, schoolchildren in Harris were very keen that there should be wi-fi provision on the ferries. The company picked that up and, in future tenders, wi-

fi provision will be a condition. You will be aware that that is a condition in tenders for the east coast rail service to London and, increasingly, for ScotRail. That is another way in which Government can lead—by making that a minimum service condition. What is your view on that?

Sharon White: I agree. Given the priority to ensure that, whether you are going by road or by rail, wherever you are going about your daily life, you can have mobility of connectivity, we are strongly supportive of finding ways in which one can apply conditions on greater connectivity, along similar lines to the example that you gave. I know that, south of the border, the Government is looking at that in relation to rail franchising.

All of this needs to be on the table, and we are strongly supportive of it. We will advise on some of the technical details and the technological solutions, but we have got exactly the same objective, which is that, over the next period, good connections will be established everywhere.

The Convener: I want to ask about the voluntary codes that apply to business broadband speeds and residential broadband speeds. How is that proceeding? Is it proceeding well? Are you getting buy-in from internet service providers? Will businesses and consumers have access to information that allows them to see how companies are performing and what particular service individual businesses and consumers are receiving from them?

Sharon White: It is early days. The committee will know that, last summer, we published a voluntary code. Certainly, all the big internet service providers such as BT and Virgin are in there. The companies have committed to making it easier for residential consumers who feel that the service that they have signed up to is not the one that they are getting to walk away without a fixed penalty, and we have done something similar in the past couple of weeks for small businesses. The issue ties to the issue about consumers thinking that they are signing up to a service of up to 10Mbps or 20Mbps but getting a service that might be appreciably lower than that, for a variety of reasons. Through the code, providers have signed up to being much more transparent and clearer at the point of sale, which means that, if things go wrong, the customer does not have to get into an argument about having to pay some sort of early termination fee.

It is too early for us to have data, but I think that we will get good evidence over the coming months about whether the code has had to be invoked or whether the fact that we have this voluntary agreement means that the point of sale has developed into a more robust process.

The Convener: Are there any other outcomes that you would expect as a result of the introduction of the codes?

Sharon White: I hope that the codes will lead to consumers shopping around a bit more. I know that that is practically hindered in a situation in which you do not have a choice of providers. However, even with regard to a choice between cable providers and BT, it will be better for consumers to have clarity at the point of sale about what is being provided by companies, rather than having to look through a contract with 20 pages of small print and tick the terms and conditions before jumping out of the shop as quickly as possible. I hope that consumers will be able to exert more pressure at the point of sale, where there is competition.

The Convener: Earlier, you mentioned that the possibility of separating Openreach from the broader BT group was being considered. Can you tell us a bit more about that process, what the timescales for it are and how you will go about evaluating the advantages and disadvantages of each of the four options that you referred to earlier, including the status quo?

Sharon White: We launched the review of the communications market last March and in July we published what we called a discussion paper, which essentially set out the half a dozen or so areas that we were keen to examine: deregulation, quality of service and so on. The Openreach question was included in that. At that stage, we set out our preliminary view of what had worked well over the past 10 years and what had worked less well, and we used the discussion document as a call for evidence.

Between July and October, we received a number of encyclopaedias of evidence, mostly from the companies but also from broader stakeholders. As an organisation, we have had lots of meeting to follow up on that evidence. Since October, we have been evaluating the evidence and checking it against the issues that we flagged up in July to identify where we have not got things right or have not attached the right priority and need to modify our approach. With a fair wind, we hope to set out initial conclusions at the end of this month.

10:00

The Convener: When will a final announcement be made?

Sharon White: The initial conclusions at the end of this month will set out the results of our deliberations. As you may know, in applying such recommendations to our practical regulatory tools, there is a process that we follow through Europe, so, as Europe requests us to do, we will review

each individual market every three years. For example, if we recommend deregulation in a particular area, when the market review for that area comes up, we will take the initial conclusions that are reached at the end of February and start to apply them in detail to our regulatory tools. The implementation process will go on for a period of several years from now.

The Convener: Regardless of which of the four options you finally go with, what are you looking for when it comes to how Openreach can better serve Scotland's broadband infrastructure needs?

Sharon White: As I have said, the starting point is to consider how consumers up and down the country can get the service that they deserve, bearing in mind that consumer expectations are rising by the day. We will certainly look at quality of service, regardless of any discussions that take place about the structure of Openreach.

The committee might be aware that, a couple of years ago, we were very concerned—to BT's credit, it was equally concerned—about quality of service on the business side. I am talking about big businesses that were having bespoke superfast cables installed, which involves construction in the streets and having cables routed up buildings. There were long delays of several months. That was the first time that we dipped our toe in the water as a regulator to set minimum quality standards for BT. As a regulator, one feels quite conflicted about doing that, because we are an outside body. I feel that for an outside body to be setting the standards for a company that operates across the UK is a slightly second-best situation.

We will look at the experience of the impact of those quality-of-service standards—which, to BT's credit, it has hit subsequently—and consider how we should go forward. We will think about whether we should strengthen the standards or set different, tougher targets. All that is up for consideration.

The Convener: Alex Johnstone has some questions.

Alex Johnstone (North East Scotland) (Con): On the issue of competition, one of the concerns that have been expressed is that BT is squeezing the margin between wholesale and retail prices in order to squeeze out competition in areas where it has a near-monopoly. Does Ofcom still have concerns about the wholesale price of superfast broadband?

Sharon White: You probably know that we regulate that price. We have something that in the technical jargon is called the VULA—virtual unbundled local access—margin. We require BT to ensure that there is a big enough gap between its wholesale price and its retail price to allow other companies to come in and still make a profit. BT has an existing network and a historical cost advantage, so we have set a margin to allow companies such as TalkTalk and Sky to come in. That is a regulated price. It has to be said that we are currently in litigation—the regulated price is being contested by BT as we speak. At the moment, we set that to ensure that competitors are not squeezed out because of BT's historical cost advantage.

Alex Johnstone: As you said, BT is contesting that. Without speculating on what the outcome of that might be, do you have any alternative approaches to ensuring that competition remains viable in that area?

Sharon White: What I can say very strongly is we are absolutely committed to ensuring that, where there is a market, consumers get a choice of provider. I cannot speculate on whether the VULA margin will be struck down. If it is, or if it is modified, clearly we will have to look at alternatives, with the objective in mind of ensuring that there is competition.

Alex Johnstone: In the broader sense, what is Ofcom doing to help consumers and businesses make informed decisions about the best telecommunications deals available?

Sharon White: Pricing is an interesting area on which we want to do more, because the market is becoming more complex. As you know, increasingly people are moving to what are called triple-play bundles—we are buying our telly, phone line and broadband together. With the BT and EE merger, we may move—like the rest of the continent has moved—to quad-play bundles. It has become more complicated for people to compare deals, and there are headline prices, discounts and so on.

We have been very supportive of the Advertising Standards Authority, which is trying to get better transparency on pricing. The committee might have picked up the issue of deals that say "Superfast broadband free" in a big-font headline and then say, in a rather smaller font, "By the way, you're still paying your £16 monthly land-line charge." We have been very keen to get more transparency at the point of sale.

We are also starting to collect much more pricing data. We have started to find—the committee is probably aware of this—that, although the market in aggregate is still very competitive, some prices, particularly land-line prices, have started to rise. That is particularly the case for customers who are over 75, who are more vulnerable and do not tend to switch providers.

As part of the communications review, we will be looking at options for greater transparency of

pricing information. There is a careful balance to tread. In making prices more transparent, we do not want to standardise tariffs, because that would remove competition. However, we want to find better ways by which people can compare prices in what is an increasingly bundled and complicated market.

Alex Johnstone: Where competition exists, the ease of switching provider is often a big challenge and, in some cases, is a barrier. What is Ofcom doing to make it easier for people to switch providers?

Sharon White: We are looking at making the process of switching easier. The team carried out a lot of work last summer, and the process is now much easier. If you are with a provider on the Openreach network, such as BT, Sky or TalkTalk, all you now need to do is ring up the company that you are trying to move to, and it will make the switch for you in one move—we call it "one touch".

We are looking to do something similar for mobile. We have done some research. We are trying to make the process of ringing up one company and using the porting authorisation code to switch to another company a little bit easier. We have also said that we will look at triple play.

To my mind, there is a broader question that comes back to your point about pricing and complexity. We are all pretty inert and not many of us have time to spend calling a call centre to switch. Although we are looking at making the process easier, I am quite interested at looking over the longer term at whether there are other ways by which one can encourage consumers to switch. Even if we have a faster process, unless our service is really poor most of us will stick with the people we know.

When companies start to consolidate, I think that Ofcom needs to look at the process by which consumers switch and at how they can be encouraged to be less inert. Some of the other regulations have taken quite innovative approaches to this. This area is critical because, as soon as you move to bundle products, people stop switching. The rate of switching for those with triple play is about 7 per cent. They would lose everything if they switched, so why would they do that? It is a critical issue. We are making some progress, but I think that this is part of a broader piece of work that we need to look at.

Alex Johnstone: For my information, do deals that offer broadband, land-lines, mobiles and, perhaps, television supply play a major part in excluding companies that cannot compete at the highest level?

Sharon White: That is a very interesting question, which plays to the sort of changes in market structure that we see at the moment.

In Europe, quad play—mobile, land-line, broadband and TV—is a much more typical way of selling. We have seen BT become a television company and we have seen it going back to mobile with Cellnet. A merger has been proposed between the mobile companies O2 and Three. Sky said that it is going to do a tie-up deal with O2 later this year. You can see that companies are starting to converge. The telcos look more like TV companies and the TV companies need to get into broadband, particularly because mobile has become a device for viewing programmes.

It is absolutely true that we will see growing convergence, and we could possibly catch up with the continent, buying more of our services in a four-package bundle.

Clare Adamson: I was very interested in what you said about consumer information and choice where they are looking, and I was particularly interested in the postcode areas that you were talking about. Ofcom has a map that shows fixed broadband information by administrative authority, but that map has not been updated since 2013.

Sharon White: We are about to do it.

Clare Adamson: You are about to do it. That is fantastic.

The Convener: That was the right answer.

Sharon White: Exactly. I think that it is now due in March. We are trying to pull together the updated mobile data on whether you can make a phone call on a smartphone with updated fixed-line data. Ultimately, we will try to splice those two things together by household. That is the plan over the course of this year, but we will get the fixed-line data out very shortly.

Clare Adamson: Excellent, thank you very much.

Mike MacKenzie (Highlands and Islands) (SNP): I was pleased to hear you mention the Highlands and Islands in your opening statement, because Dave Stewart and I both represent the Highlands and Islands.

I am not sure that Dave Stewart fully articulated the scale of the problem. Despite the theoretical coverage, if you were to go to the Highlands and Islands and draw a map, I think that it would be the equivalent of a medieval map that says, "Here be dragons." When you disappear over the digital divide, my personal assistant says that you are about to go dark; I think that she watches too many spy thrillers, but that is the reality.

Over many years, I have talked to colleagues of yours and I have been reassured constantly that things are just about to get better. However, things are not getting better; they are getting worse. The digital divide is like the Grand Canyon, and it is

getting both deeper and wider. Part of the reason for that seems to be that there is more demand and that more people are using digital services.

Another part of it seems to be the content and the services that are available. What used to be a simple newspaper website now has loads of theatrical stuff going on, such as embedded films. Shortly, no doubt, people will have avatars that pop out of their phone and dance across the table. Such content is driven by good availability of service provision elsewhere in the country. The contrast is getting wider and wider between the services that my constituents can get and those that other people can get.

If I have understood it correctly, part of the game changer is the new Scottish board member. Will that be a game changer? Will I be able to go back and look my constituents in the eye and say to them with integrity that things will get better and not worse over the coming years?

10:15

Sharon White: I completely recognise the picture that you have just painted, and the issue is at the top of our in-tray. Consumer expectations are in a completely different place. Even two, three, four or five years from now, it will not just be about your dancing avatars, but about whether you will be able to get through to the NHS and search all your medical records and figure out whether your kids are going to school or whether you will be able to set up a business without having to leave the Highlands and Islands and head off to Glasgow. Those issues are fundamental. The conversation about utilities or human rights is at the core.

The Scottish board member is important. My character is such that, if there is a problem, I need to figure out how we will fix it. Key for me is how the universal service obligation gets implemented for the Highlands and Islands—that is the test case. For all the reasons that you have mentioned about geography, the costs of getting backhaul out and all the rest of it, along with the questions about the choice of technologies and how wireless technology will work, we will need to provide the service in such a way that, by the time that the Highlands and Islands has coverage, we are not finding that 40Mbps has become the new 10Mbps. The trick of putting in the foundation stone in a way that allows the gearing up in line with consumer expectations—our desire to do stuff, and without necessarily having to take a car or a train—is important.

Part of that is about the Scottish board member; to be frank, part of it is about my colleagues' understanding and my understanding as chief executive as we progress the USO, which we expect to implement once the Government has set out the policy parameters.

I ask my teams questions, such as, "What does this mean for connectivity, not in Aberdeen but in the Highlands and Islands? Over what timescale will that happen? What's the roll-out?" It is clear that there will be a cost premium, so as a matter of practicality I ask how that will be shared and provided for—by an individual user or by a broader community, given that, in a sense, we all benefit. However, although governance matters, the test for me is universality with a regulator that puts the consumer first. That is a top priority.

Mike MacKenzie: What will 3G and 4G coverage look like in Scotland over the next year?

Sharon White: The next year is critical. As you know, there is a lot of proposed market structure change among the mobile network operators. There is a commitment to have coverage by 2017. Partly through making it more visible who is providing what services and where in Scotland, we will be working—I am sure that there will be constructive engagement—with the mobile network operators to see where they are in meeting their 90 and 95 per cent coverage obligations on geography and on premises over the next year. I cannot quite believe that I am in 2016 already. The deadline is becoming very close.

Mike MacKenzie: To be fair, Inverness, which is the city within the Highlands and Islands, gets reasonable 4G coverage and so on. However—this is where we must be careful—we talk about 10Mbps being unacceptable, but a very high proportion of my constituents would die for 10Mbps. The speed is maybe closer to 2Mbps; sometimes, it is 500Kbps. It is very poor, to the point at which it is almost not worth having.

Similarly, when we talk about 90 per cent coverage, it is always the same 10 per cent who are left out. We all understand why that is. You might describe it as market failure. Surely it is a definition of regulatory failure to have a missing 10 per cent. Are there any plans to address the issue of that missing 10 per cent?

Sharon White: As you will know, the Government's initiative to try and fill the rest of the gap that the commercial providers had not set out in their coverage obligations—the mobile infrastructure projects or MIPs—has had a difficult history in Scotland.

In this case, one looks to the regulator, but one also looks to the regulator working with companies and the Government. For example, there are plans on the emergency services front involving a mobile infrastructure. That will be UK-wide. There is a really interesting opportunity to use that roll-out to get broader coverage. That does not just involve

your ability to make a 999 phone call on your mobile; it means getting broader coverage. That is part of the work of the digital infrastructure task force; that is the conversation that we are keen to have.

To give you some assurance, although this stuff is hard to deliver, I start at 100 per cent, not 90 per cent. Forty per cent of the UK does not get 10Mbps today. We are talking about a very differentiated story, which is mostly because of rurality.

The Convener: Both Mike MacKenzie and David Stewart have articulated the challenges around the digital divide in rural and remote parts of Scotland. Could you specifically address the issues around digital exclusion that face people on low incomes and people in receipt of benefits, as well as how you, as a regulator, seek to address those issues?

Sharon White: This is partly why we have been focused on issues of pricing. Our particular focus—as a regulator, not as Government—is to try, where we can, to maximise competition. I know that that has limits in Scotland. Where that is commercial is relatively limited. The key way in which we have observed that we can get prices down and get the most affordable prices is through having rival players that are competing for business.

On the question about what happens with pricing in rural areas, that takes us to where we regulate pricing. Where BT is a dominant player, as a regulator we have tools to apply what we call charge controls. That ensures that, in the prices that BT charges to other wholesale operators and, potentially, the prices that it charges directly to consumers, advantage is not taken of its dominant power in the market. Ninety per cent of BT Openreach's prices are regulated by us directly.

The Convener: You spoke earlier about this being the "fourth utility". In other utilities, energy companies in particular will seek to provide a different tariff for people in receipt of benefits. What is the equivalent in this sector?

Sharon White: There are some equivalents. We have spoken a bit about land-lines. From everything that we know, that is the area where there is the greatest reliance by the most vulnerable people and the most vulnerable consumers. BT and others have basic tariffs that try to ensure that vulnerable people are able to get a decent service even if they are on a fixed or unstable income.

More generally, I want to look into that area over the next period, because of the concern—although this is not yet realised—about whether consolidation in the sector may have an impact on pricing and because of the concern about what that does not just for people who are able to pay but for people on low and fixed incomes in particular. Whether it then becomes necessary for the regulator to come in or whether a public policy intervention is required is a different question.

The Convener: Are you as the regulator doing enough? What more can you do?

Sharon White: As I said, you can always argue about whether you are doing enough. I think that we are at a potential turning point in the market. If you look at the last 10 years in aggregate—as it is in aggregate, I take the point about the people at the end—we have been paying about the same for a much broader set of services. Technology and so on has meant that, particularly on the mobile side, we have basically been getting more for less.

Companies are converging and wanting to consolidate. The evidence that we see from other countries is that that can have a material impact on pricing, particularly in what we call the horizontal mergers, such as a mobile company buying another mobile company. That is why we are starting to do much more detailed analysis of pricing. If there appears to be a regulatory problem in that area, we will act.

Adam Ingram (Carrick, Cumnock and Doon Valley) (SNP): I want to change the subject. You mentioned earlier that you see a switch happening from land-lines to mobiles. I have also noticed a change in how land-lines are used; a lot of calls are going straight to voice mail. A lot of that is created by what we can call nuisance calling but is often more like harassment—the constant calls that we get about payment protection insurance compensation or boiler replacements, the computer-generated calls or calls from foreign call centres. Such calls are the reason why people stop using their land-lines as they used to do.

First, do you think that that is a problem, particularly for people who may be vulnerable? Secondly, what are you going to do about it?

Sharon White: The issue of nuisance calls is incredibly important. I talked about my mail bag; when the complaints that I get are not about the quality of service, they are almost entirely about nuisance calls. As you say, not only are such calls frustrating but, particularly for vulnerable people, they can be very distressing.

As an aside, I would say that another part of the reason for the shift from land-line to mobile is the smartphone. We can just do more stuff with the mobile.

We are working closely with the information commissioner on nuisance calls. We have a very particular division of labour, in that Ofcom has statutory responsibilities for silent and abandoned calls and the information commissioner has

responsibility for calls related to classic PPI mis-selling. However, we work in a very co-ordinated way. Both Ofcom and the Information Commissioner's Office now come under the Department for Culture, Media and Sport, which I think has helped. As a matter of practicality, we, and particularly my technical experts, have been looking at working with the communications providers and the ICO to get more technical fixes for nuisance calls. Fingers crossed, we think that we are making quite a lot of progress.

As you know, a lot of those calls originate overseas. Lots of them are not necessarily wrong numbers, but they mask their number with a real number and they bounce around various points of contact before they come to the user. We think that we might have a technical fix that could have a significant impact on the number of calls that are coming through. I hope that shortly we will be able to say more about it publicly. It is absolutely a critical issue.

Adam Ingram: I take your point about technical solutions, but eventually people tend to get round them. Is there not a case for stronger legislation?

10:30

Sharon White: You probably know that, in the previous parliamentary session, the Government took stronger powers in the area of nuisance calls. Partly on the back of that, the information commissioner is now taking much tougher enforcement action and issuing higher fines. When I refer to technical fixes, however, I do not want to give the sense that I am being naive and that I do not know that if you squeeze one bit of the balloon it bursts somewhere else.

At the same time, it is interesting that I have lots of difficult conversations with a number of the companies that we regulate and nuisance calls is probably the area in which there is the strongest and clearest consensus that something needs to be done. The technical side is important, but I do not think that it is the whole picture by any means.

The Government has already taken new powers for the information commissioner, and I am not sure whether it will want to come up with new statutory obligations. If the committee has ideas for what more can be done, I would be interested in taking them away.

The Convener: Clare Adamson has a question.

Clare Adamson: It is an idea.

Sharon White: My pen is poised.

Clare Adamson: One of the ways in which to limit, if not stop, nuisance calls would be for consumers to be able to not accept anonymous numbers. A lot of service providers charge people to use that service. Can you do anything to encourage the service providers to provide that as a free service to customers?

Sharon White: We will definitely take that idea away with us. As you know, we have been doing work with some of the premium numbers and we are reviewing some of the changes that we introduced last summer to see whether transparency is leading to prices falling. I will certainly take that idea away. Thank you.

David Stewart: I have a technical question on the back of that. A number of constituents have written to me about nuisance calls. They are part of the Telephone Preference Service, my understanding of which is that people opt into it and should not get those calls. However, some companies have responded by saying that they are exempt because they are a marketing company. Have you come across that? Is that a reason for exemption from the Preference Service?

Sharon White: One of the things that happens with the TPS is that, when someone is buying something on the internet, for example, they might accidentally tick the box. They think that they are ticking the box to say that they do not want any marketing but they have ticked the box to say that they do want marketing. If someone signs in to marketing, inadvertently or not, they will still get calls. That is one of the issues that we need to make clearer to consumers.

When marketing companies say that they are exempt, they will have a form or an email from a consumer that says, "Yes, I have bought some theatre tickets and I am happy to hear about a whole bunch of other things that I didn't think I'd signed up to."

David Stewart: When constituents are signing up to things, they should be clear about what they are signing and watch that. Is the solution then to go back and sign up to the Preference Service again or does that not make any difference?

Sharon White: I dug around to find out about that because, when I came into the job, I surprised to find that the TPS has a hole in it. It was news to me that the fact that someone has agreed that they are happy to receive marketing material—the question might have been in a very small font—means that the company has taken it that they are happy to receive all marketing material. The message needs to get to consumers but there also needs to be greater clarity about what the TPS can and cannot do.

David Stewart: If a company breaches the terms of the TPS, what sanctions can be used? I presume that you have a role in regulating that.

Sharon White: If you have constituents who have signed up to the TPS but are still being bombarded with calls, they should get in touch with Ofcom and the Information Commissioner's Office.

David Stewart: Might that be a role for your new Scottish representative?

Sharon White: Yes. They can take some of my letters.

The Convener: As members have no further questions, are there any final comments that you would like to place on the record, Ms White?

Sharon White: This has been a huge pleasure. Thank you.

The Convener: The feeling is mutual. We have found today's session to be useful and we welcome your attendance and your positive and constructive engagement with the committee.

The committee will keep a close eye on developments, foremost among which is the strategic review on digital communications. We will also look at what difference the new Ofcom board member for Scotland will make, the voluntary codes of practice for business and residential broadband speeds and the review of Openreach's provision of superfast broadband.

There is clearly a huge agenda that is relevant to the committee and the people of Scotland and we welcome your engagement with the committee. We hope that this will not be your final session with us.

Sharon White: I hope that you will invite me back.

The Convener: You can be sure of that.

10:35

Meeting suspended.

10:40

On resuming—

Forth Road Bridge Closure

The Convener: Agenda item 2 is for the committee to continue its inquiry into the circumstances surrounding the closure of the Forth road bridge. We will hear this morning from independent bridge experts. I welcome John Evans, who is a consultant at Flint & Neill Ltd, Richard Fish, who is an independent engineering consultant, and Peter Hill, who is general manager and bridgemaster with the Humber Bridge Board. Good morning, gentlemen. We go straight to questions, with Alex Johnstone to kick-off.

Alex Johnstone: Please correct me if I am wrong, but I understand that the panel members have expertise on the Humber, Tamar and Severn bridges. We have heard from experts from whom we previously took evidence that rather than follow Department of Transport recommendations, the Forth bridge took a risk-based approach to inspections that often resulted in the frequency of inspections being higher than would have been recommended. Can you explain to us what the frequency of inspections is at the Humber, Tamar and Severn bridges and whether you, too, have adopted a risk-based approach?

John Evans (Flint & Neill Ltd): I will kick off. I believe that it is correct to say that the first very formal attempt at using a risk-based approach was done on the Severn bridge. In my opinion, the reason for that was largely commercial rather than its being purely an engineering reason. The Severn bridge was going to become part of the concession agreement for construction of the second crossing and operation and maintenance of both bridges throughout the concession period. You can imagine that the concessionaires were very interested in knowing, among other things, what kind of moneys and resource they would have to expend on inspecting and maintaining the new bridge that was under their control and the—by that time—40-year-old bridge that they were taking over to run, as well.

On timing, the approach came at the end of a series of contracts for strengthening and uprating the Severn bridge. That work was undertaken by our firm on behalf the Department for Transport and, originally, the then Highways Agency. For that reason, we were deemed to know as much about the structure as probably anybody would. It was part of my individual personal duty to develop the maintenance manual for the Severn bridge, which became volume 12—I think—of the concession agreement, so it was very much a contractual document.

To go back to your question, the concepts of vulnerability and criticality were built into that inspection regime and a number of different periods of inspection were allocated to different elements of the structure. They were based largely on engineering—in other words, what the structure would suffer in terms of stressing, straining, movement and so on. However, the inspection periods were also based on the experience of operating the bridge up to that point.

Have I answered your question sufficiently?

Alex Johnstone: Yes, I think that we have got that answer.

10:45

Peter Hill (Humber Bridge Board): I will extend that point with regard to matters on the Humber bridge.

Commercial aspects play a part, but there are also practicalities in relation to such huge structures. The risk-based approach makes it practical to ensure that we have a sustainable system for inspection that does not overload the organisation by demanding unnecessary resources or providing unnecessary data.

As the committee may be aware, the standard format for inspection includes two-yearly general inspections and six-yearly principal inspections. Those levels were set by the Department of Transport. They are set in general for owners of large stocks of bridges, but we are the owners of a large bridge at the Humber, rather than a large stock of bridges. We therefore also found that a risk-based approach is more appropriate through its looking at both the risk of failure of any element and the consequences of the failure.

In certain areas, such as the abutments, which take the load from the cables at either end and are big blocks of concrete, intensive inspection is perhaps not practical or sensible—in 10 years they will still be big blocks of concrete—whereas other more flexible elements on the bridge require greater monitoring and more frequent inspection. That is also why we have adopted a risk-based approach.

Richard Fish: For the record, I no longer have direct responsibility for the Tamar bridge; sadly that ended in about 2008, when I left the public sector and moved into the private sector. Since that time I have developed my own business working in bridge management and bridge maintenance. I can give my answers to the question drawing on both my experience at Tamar and my more recent experience.

In the old days of the Tamar bridge, the frequency of inspections was just as Peter Hill has described—general inspections every two years and principal inspections every six years. The concept of risk-based inspections was first introduced at the time of the changes around the United Kingdom Bridges Board having developed a code of practice for highway structures. In the interim, the Tamar bridge has moved towards a risk-based approach.

It is important that inspections should not just be prescriptive. The risk in that is that you just end up ticking a lot of boxes—saying to yourself, “What bits do I have to look at today? Yes, I’ve done that. Tick, tick.” It is necessary to be more reactive to the behaviour of the bridge and how it is performing. If there are areas of concern—little hotspots—that you think need to be looked at more in detail, you would instinctively want to increase the inspection frequency. That has, at the same time, to be recorded and regulated.

That is the shift to a risk-based approach in which the idea is developed that some parts of the structures will not change over decades—as Peter Hill has described—whereas others may change over months and years, which is where inspections are targeted. That is a more efficient and—dare I say it?—safer way to approach inspection.

The Convener: Mr Fish, could you explain for the benefit of laypeople—on the committee and elsewhere, watching our proceedings—what the difference is between general inspections and principal inspections?

Richard Fish: Yes. As you might expect, a general inspection means—I hesitate to use the word “superficial”—that you have only to look at elements of the structure from a distance, although if you can get up close that is all to the good.

There are two issues around principal inspections. First, they should be carried out by a chartered civil or structural engineer. Secondly, every part of the bridge should be accessed within touching distance.

The Convener: That is very helpful.

Alex Johnstone: Big bridges, even if they have similar designs, are all unique structures. We are focusing on the truss end links, which have been shown to be the weak link in this case. I presume that each of the bridges that we have talked about has components that are similar to the truss end link. Is that the case?

Richard Fish: I think that the Tamar bridge is the closest, in that it and the Forth bridge both have stiffening trusses, whereas the Severn and Humber bridges have aerofoil section boxes, which is a slightly different arrangement.

The Tamar bridge is very similar to the Forth bridge in that at the end of the trusses, where they

arrive at the tower, there are vertical connections—pintles with the pins—that do the same job as on the Forth bridge.

Alex Johnstone: Under the risk-based approach, how often would you expect critical components of the bridge to be inspected and how often would you inspect a component such as a truss end link?

Richard Fish: As a general statement, I think that the pintles are perhaps the most overlooked part of a traditional truss-type suspension bridge. Everyone focuses on cables, hangers, towers and the steelwork of the trusses, but the pintles tend to get overlooked, which is not to say that they are not inspected. At Tamar, I have personally gone down and accessed them and checked for movement, but they are very difficult to inspect, especially because you are relying on the movement for articulation of the bridge.

I spoke to the bridge manager at Tamar the other day and he said that as soon as the news about Forth came out, the first thing that he went to look at was the pintles on Tamar.

Peter Hill: At Humber, we have elements that move in the same way—they are not truss end links, but they are structural elements that rotate on a bearing point. We have very recently replaced them because they were inspected and found to have failed. However, the mechanism of failure was excessive wear, which becomes quite apparent over time. Even a general inspection—or a superficial inspection, which is more of a walk past—could identify that type of failure in the case of the Humber. However, such inspections would not identify whether an element had seized. With our pins, the bearings had formed an oval, rather than a circle, for the pin to move in due to wear, so it became visually apparent. That is perhaps the difference.

I am talking about the Humber but, coincidentally, I was talking to the bridge manager of the Tamar yesterday when we had one of our annual meetings of bridge managers. They have a similar issue with similar elements at the Tamar bridge, which is again being observed through wear.

John Evans: Severn is slightly different again. During the assessment for the new loadings, it was discovered that the original end props from the 1960s design, which are much shorter with a shallower box, were overloaded for the new system. Part of the strengthening process involved replacing those props completely with bigger props that were more outboard. As part of the replacement process, we refurbished the inner ones and provided them with a jacking facility so that, in a planned operation, we could come back and jack again and inspect the outer ones more carefully; we could check the loads as well as making a visual inspection. For that reason, by 1990 the equivalent system on Severn had been completely renovated. The original problem was twofold: it was overloaded and there was wear.

Alex Johnstone: There was wear rather than seizing.

John Evans: Yes.

Alex Johnstone: Are you aware of any examples of a similar mechanism seizing in any other bridge?

John Evans: We had a little talk just before we came here; I think that the closest example that I can identify is some bridges in America that had a suspended middle span. They hung on links and I believe that there were problems with those. There was one catastrophic collapse. They were a family of bridges on an interstate road so they were all refurbished. It is possible that the M50 bridge is not dissimilar, but I have never worked on it so I do not know.

Alex Johnstone: Do you know of any bridges where special inspection or monitoring techniques are used to check whether the pins are moving correctly? If so, what methods are used?

John Evans: I do not know of any system that checks whether the pins are moving. There are systems that check the movement of the bridge by checking the whole link. As I think Richard Hornby told you, the forces that are involved are enormous, so there is more likely to be damage if there is a jammed pin. However, I do not know of anything that checks whether the pins are turning. As the committee has discovered, we cannot see the pins.

Alex Johnstone: Is it an easy thing to check? I imagine that, although flexibility is essential in the element, the movement must be extremely small.

Richard Fish: The rotation on the pin is a small movement. However, if that movement is not taking place, the structure will still move. As it moves, strains develop and material becomes stressed and potentially overstressed against its original designed loads.

I echo John Evans's point: I am not aware of anything that can specifically detect movement—

Alex Johnstone: In normal weather conditions, if we stood beside the pin and looked at it, there would not usually be much movement. Is that right?

Richard Fish: It would be difficult to discern the movement visually.

What may well come out of all of this is that the people who do structural health monitoring and so on will devise something to help to detect

movement, or the lack of it, but we would not want to sit in front of a pin all the time trying to see whether it is moving. I am sure that a remote sensor can be developed, but at present structural health monitoring—or, as I like to think of it, structural performance monitoring—is more geared to the performance of the whole structure, including how it is working and articulating and what the deflections are compared with the loads. We get a picture of everything that is going on, but small issues cannot be diagnosed with a global structural performance system.

Peter Hill: As I think has been discussed, the movement of elements of the structure away from the pin bearing may be of the order of tens of millimetres, but once movement is transferred back to the pin mechanism, it is remarkably small. However, in the absence of that movement, the forces that are transmitted can be very large.

We installed a replacement system at the Humber that monitors the stresses not in the pin bearing but in adjacent materials, to ensure that we are not overloading the structure. However, we have not monitored the pin bearing.

The Convener: The committee has inevitably focused a lot of attention on the truss end link member and the seizure of the pin. Given that you have all outlined the limitations of structural health monitoring, I ask you the question that I put last week to Barry Colford, who is a former bridgemaster of the Forth road bridge. Do you believe that the issue could have been foreseen?

Peter Hill: I refer back to what was said at the start of the questions about a risk-based inspection. If we monitored every single element and joint, it is possible that a detailed analysis of the information from every point of the bridge could give some indication of some trouble in some part of the bridge, but that would be a huge exercise.

Suspension bridges have a web of elements; that is particularly the case with the Forth road bridge trusses. If the action of one part of the web was restrained or slightly different from what it was designed to do, it would be an enormous task to monitor that and to determine what the results might be.

11:00

The Convener: I am not sure whether that was a yes, a no or a maybe. [*Laughter*.] You can come back to that, if you like.

Peter Hill: I am having difficulty in answering the question with a definitive yes or no. The amount of data mining that would be necessary to give the information that would point us to a specific element causing distress would require a very large team of people looking at the results 24 hours a day. That might be possible, but it is probably not practical or economically viable.

The Convener: I put the same question to Mr Fish.

Richard Fish: It is difficult to divorce hindsight from all this, because we know what happened and are trying to wind the clock back a couple of months to assess whether what happened could have been anticipated and avoided. The structural performance monitoring on the Forth bridge is mostly geared at the cables, but it also gives an indication of deflections in the main truss. That could have been used to describe what was going on with the articulation at the bridge. If the conclusion was that the pintles and the linkages were, as I described earlier, a potential hotspot for a problem, an inspection regime would say only that there was potentially an issue with the whole element; it would not necessarily conclude that a failure involving a fracture in the metal above the pin would be the outcome.

We can say with hindsight that that should have been examined and that some analysis should have been done to assess the loads in the end posts on the truss. However, as I said to my fellow witnesses before the meeting, the irony is that the Forth bridge is one of the most well-managed bridges in the whole United Kingdom. I have a huge regard for Barry Colford, who had such a thorough understanding of the bridge. It seems unlikely that something would be overlooked and I would have thought that, at the very least, those issues would have been addressed.

I am sorry that that, too, was not a yes or no answer.

John Evans: My experience of this sort of thing is that, when the joints begin to jam up, there is usually evidence from noise, which is always what we look for. As far as I can tell from all that has been said here, there was no evidence of creaking or groaning. For those who do not know, if that kind of thing happens on a bridge structure, it resonates through the whole structure and there are very loud noises. As far as I know, there has been no report of that in this case.

If the pin jams up and there are internal stresses on the connection between the fabricated bit and the pin, we get no evidence of that. What happens is that an imperfection—I will not call it a defect—becomes overstressed and we can get a sudden failure, which transfers quickly across the weld line and into the material. My experience is that we would not find such a failure until it was there.

The Convener: That is a fairly definitive no.

David Stewart: My question on structural health monitoring has been covered, but I will look at the

issue from a different angle. It is fair to say that structural health monitoring is not a silver bullet that will solve every problem that occurs on the bridge. Some witnesses have already identified the fact that it is expensive to do that and that it can take up a lot of staff time. You could well have staff monitoring screens 24 hours a day, at a huge cost to the organisation. Is that a fair point?

John Evans: I think that it is. We have to add one other factor, which is that the people who are looking at the data have to be experienced enough to understand what they are seeing.

Richard Fish: I agree. The big issue with what is got out of structural health monitoring concerns the translation from data to information. People can get bombarded with millions and millions of bits of data, but they have to be interpreted.

The more recent developments in structural performance monitoring have led to what is called post-processing. The structure is modelled from the point of view of structural analysis, and what is happening on the bridge is compared with what the computer model says. As soon as there is a difference between what is happening on the bridge and what is happening in the computer model, the lights flash and the bells ring. That provides people with the information so that they do not necessarily have to go through vast amounts of data.

That approach is at an embryonic stage. A lot of bridges are putting on new structural performance monitoring, but the post-processing is needed to turn data into information.

David Stewart: That seems to make a lot of sense. That would be some form of exceptions warning.

Richard Fish: Exactly.

David Stewart: As you know, the new bridge will have some of that. However, the new bridge will have up-to-date design and will probably not need structural performance monitoring to the same extent as the bridge that was built in 1964. In terms of best practice around the world, are you aware of bridges that have put in structural health monitoring because of particular problems?

Richard Fish: A lot of retrofitting has gone on. As you intimated, it is easier to put a system into a new bridge, as it can be designed in from the outset. A lot of structures that are being built have built-in structural health monitoring systems and a lot of data collection. It is not quite so easy to retrofit older bridges, because we do not really know what has gone on in their history. Some elements will have moved because of creep or shrinkage, and applying a new system after such movements have taken place means that we will not necessarily be getting the full picture. A lot of retrofitting is going on, but people are still falling into the trap of having a vast amount of data and not necessarily a lot of information.

David Stewart: That is a good point.

Peter Hill: I can only reiterate what has been said. On a new bridge, it is sensible and worth while to install equipment that is capable of monitoring the structure, even if we do not have 100 per cent credible methods for analysing that data at the moment. There is a risk from data mining that we collect data but no one knows what to do with it. However, undoubtedly, the picture is always improving.

David Stewart: Mr Evans's point about abnormal noise was interesting. As a non-engineer, my view is that you can have all the structural health monitoring you want, but you should not forget about the day-to-day, commonsense approach, which involves considering noise and conducting visual inspections, too.

Peter Hill: That is why we have a range of inspection protocols. Even though, as is the case for the big bridges, we generally do not subscribe to the fixed general inspection and the principal inspection, we still expect our inspectors to report unusual noises. Having a team that is dedicated to the structure, with people who know the structure inside and out—which was the case with Barry Colford's team—is essential.

David Stewart: I will stick with you for my next question, Mr Hill. The committee has been told that the truss end links at the Humber bridge have recently been replaced. Will you describe when the problem was identified, what the problem was and when the work was completed?

Peter Hill: Certainly. They were not truss end links; they were called A frames, which were torsional and rotational members on the Humber bridge—

David Stewart: I am sorry to interrupt but, for the layman and woman watching the meeting, and for committee members, will you explain the difference between the two elements?

Peter Hill: Suspension bridges do not have conventional bearings. The loads are not transferred from the deck down to supports under the bridge; they are transferred up to the cables. Nevertheless, if the ends of the bridge were left free to rotate, they could twist in mid-air horizontally, vertically and laterally. There needs to be a restraint to stop those movements. Theoretically, those do not take vertical load, but in reality, they do, because they are structural elements. Those are the elements that we replaced at the Humber bridge. However, the truss end links on the Forth bridge were expected to

take load and to restrain the bridge in the different directions.

Our replacement was for the A frames, as they were called. It was first identified that they were wearing in around 2005 or a little before that. That was identified because they had been moving and they had worn. Without getting too technical, I will say that the pins travelled through bushes, which were specially machined to allow the rotation. The pins were grooved to allow grease to be forced in to facilitate that rotation.

David Stewart: So that we are clear, were the pins on the Humber bridge visible so that you could detect the issue with a visual inspection?

Peter Hill: The ends of the pins could be made visible. They had cover plates, but we could remove them to see the pins. However, we still would not have detected any rotation by sitting looking at them, because it is microscopic.

It was subsequently found that the pins had locked into the bushes, which was perhaps a similar form of failure to that on the Forth bridge. The bushes themselves had then rotated within the A frames, which caused wear that became visible. That was the indication of the failure.

David Stewart: Was that picked up at one of the standard inspections or was it picked up because of an exceptional issue on the bridge?

Peter Hill: The failure did not cause a significant issue for the bridge's serviceability or operation. The visible wearing of the hole and the dropping of the A frame structure were picked up through inspection.

David Stewart: That is helpful.

I turn to Mr Fish and Mr Evans. Has similar work been carried out at the Tamar and Severn bridges?

Richard Fish: The Tamar bridge went through quite an elaborate strengthening and widening project in the late 1990s and early 2000s. That involved a lot of work with supplementary cables and replacing a concrete deck with a steel orthotropic plate. During that process, the analysis looked at the existing linkages—the pintles—and it was deemed that no work was required. That work was a major milestone in the history of the Tamar bridge and, if other work had been needed, it would have been done at that point. Nothing has been done subsequent to that.

John Evans: I touched on what was done at the Severn bridge. To follow the train of thought, the structural analysis indicated that the inner links would be overstressed under the new loadings. That meant that we designed the outer links to a new standard, so we did not suffer problems, but when we took them apart, we found wear in the bushes.

I am not absolutely sure about this, but I think that they were a kind of self-lubricating bush—I think that it is called sintered bronze. The bushes were definitely wearing.

11:15

David Stewart: Based on their engineering experience, would the witnesses like to make any comments on the specific failure on the Forth road bridge?

John Evans: As I said earlier, I suspect that the failure happened between the two inspections—the inspection in May and the inspection when it was picked up, in early December. Because of the nature of steel, when an imperfection starts to grow, it grows very quickly.

Richard Fish: I support what John Evans just said. Another point to remember is that, when the steel for the Forth bridge was being fabricated, steel quality was not of the same quality as it is now. The Tamar bridge was finished a bit earlier—it was finished in 1961—and the Forth bridge was finished in 1964. When we did the recent work on the Tamar bridge, we could see that the quality of the existing steel was mixed. There were some areas where there were a lot of impurities—holes and thin blowpipes—in the steel. The quality of the steel cannot be guaranteed. I am not saying that that was a factor, but it should be recognised that, in the 1960s, steel quality was not the same as it is now.

David Stewart: In simple terms, will you explain why there has been such a change in steel quality since the 1960s?

Richard Fish: I think that that is largely because the industry was being built up in the post-war period. Levels of quality control increased through the 1970s and the 1980s. There was a demand for steel after the war, and it was perhaps more important to produce quantity than it was to produce quality.

David Stewart: Is that not necessarily just a UK thing? I know that a lot of the steel for the new Forth crossing is from China.

Richard Fish: Yes—do not get me started on Chinese steel.

Alex Johnstone: We are building a bridge with it.

David Stewart: On the basis of that, we could certainly have done with more domestic steel being used.

The Convener: That probably falls outwith the remit of our present inquiry, although it would be an interesting diversion.

Peter Hill: I agree that such a failure—if it happened in the way that I believe that it did—would occur very quickly, particularly in a material of unknown quality.

David Stewart: Do you echo Mr Fish's comments about variable steel quality?

Peter Hill: That was certainly the case in the past in the UK, but we believe that even the Chinese steel is now manufactured to a much better standard than was perhaps the case in the past.

David Stewart: I do not want to get told off by the convener for pursuing a steel inquiry, so I will leave it there.

Adam Ingram: I will talk about the response to the failure. As Mr Evans pointed out, the truss end link was seen to have failed on 1 December. The bridge was closed and it reopened to all traffic except heavy goods vehicles on 22 December. Was that a reasonable length of time to take to carry out the emergency work? From what you know about the repair work, was the solution appropriate?

John Evans: I am absolutely confident that the work was a remarkable achievement. I have come into this only since the event, and I have been following what has been going on. The fact that all 16 end links were dealt with in that time, in difficult conditions in the middle of winter in the middle of the Forth, given the problems with the old steel that we have discussed, makes it a remarkable achievement.

Adam Ingram: Do you think that an appropriate solution was engineered?

John Evans: Yes. One of my disciplines is welding and I would have been nervous about welding on the steels involved. We have discussed their age and quality. I might have gone for a bolted solution, but the people involved appear to have achieved what they set out to do.

Richard Fish: I echo John Evans's comments entirely. We were sent some outline drawings of the solution, which I thought was innovative, practical and easy to build. The time that it has taken has been exemplary. I have absolutely no criticism of the outcome or the time taken to deliver it.

Peter Hill: This needs to be tempered by the fact that the solution may not prove to be permanent—I do not know. However, the team working on the problem seems to have come up with an excellent solution and installed it promptly. I was certainly impressed.

Adam Ingram: Thank you for those observations. Has any of you ever closed a bridge that you were responsible for—the Humber, the Tamar or the Severn—to all traffic?

Peter Hill: About 12 hours ago, actually. [*Laughter*.] Due to the high winds on Monday night, I was on the Humber bridge at half past 10 with a full closure in place. That was not for a structural issue, though; it was because, unfortunately, a vehicle had overturned.

Richard Fish: Yes, for operational reasons I have had to close a bridge. However, that has not been for structural reasons; it has been because of suicide incidents, or vehicles turning over or breaking down.

John Evans: My experience is that we managed to strengthen the whole of the Severn crossing—not just the Severn but the Wye bridge—with only two four-hour complete closures in the middle of one night. We, too, have had wind incidents.

The committee will be aware of the time when the Erskine bridge was hit by an oil rig. I spent the next six weeks on site with emergency repairs. For the first week, we had to close the bridge until we were satisfied that we were not going to get a complete failure—a catastrophic collapse of the structure. That led to all the difficulties of controlling the traffic. You might remember that that went on for quite a few months.

Adam Ingram: Yes, I remember that.

Therefore, in summary, a closure such as the one on the Forth road bridge would be a very rare event. It begs the question whether, in your opinion, it could have been foreseen and prevented.

John Evans: As we have discussed, I do not think that it was possible to have foreseen the particular failure. However, the idea of having contingency measures in place for when something catastrophic happens might be looked at in future. The obvious thing straight away was to stop the heavies, because it is very difficult to control heavy goods. They tend to go in gaggles, which is the very thing that we do not want on the loading of bridges. Pre-planned diversion routes and that kind of thing are not uncommon these days. They lessen the impact, but they would not have prevented the problem.

Richard Fish: There is a cause-and-effect issue here. As we discussed, the cause would have been very difficult to predict, and the effect—the closure of the bridge—is a decision that was not taken lightly.

The safety of the travelling public is absolutely paramount. I would not question the decision made by the engineers who were at the sharp end

and faced with the issue. I do not have the evidence to ask, “Could the bridge have been kept open with just two lanes running instead of four?” I do not know. However, a decision had to be taken around public safety.

Peter Hill: I can only say that, knowing the competencies of Barry Colford’s team, I cannot see that the incident could have been predicted or determined in any other practical way. The subsequent action of the team that reacted to the emergency and is currently looking after the bridge seems to have been entirely appropriate.

Adam Ingram: Thank you, gentlemen.

I turn to consideration of future maintenance, repair and strengthening works. Are there lessons to be learned elsewhere from the experience on the Forth?

Peter Hill: We have a strong, international community that shares information, and most of our maintenance programmes are based on information that is shared around the world.

I believe that the Forth bridge had a type of forward maintenance plan similar to ours. I have a 60-year major maintenance programme, which is informed by the experience of similar structures throughout the world. Of course, 60 years is an impossible time to look ahead at maintenance. The intention is to ensure that we identify the areas of risk and the elements that we know have had to be maintained on similar structures around the world and to ensure that they are in the programme to be addressed at an appropriate time.

Richard Fish: The key point is linking the inspections to the maintenance, so that you determine when to intervene.

This is not a strict comparison, but let us compare the Forth bridge to a formula 1 car. The ideal for a formula 1 car is that, as soon as it crosses the finishing line, all the components fail. That is the design life and that is what is intended for such a car. Every component of a formula 1 car is given a design life, and structures and bridges are exactly the same—except that you want to have some sort of contingency and reassurance.

You can look at the results of inspections and structural performance monitoring and come up with a regime of maintenance intervention. It might say that, at this point, it would be sensible to replace cable band bolts because you do not want them to fail—I give that example because I know that that has been done on the Forth bridge. There is an intervention point somewhere ahead of failure.

On lessons to be learned, there is an international suspension bridge conference this June and I hope that the lessons of the Forth bridge will be able to be learned at that. I assume that that is down to Transport Scotland and whether it is willing to release the information. There are only four big suspension bridges in the UK, but there may be about 400 in the United States and around the world. It is vital for those owners to learn lessons from the Forth, as well as for those of us in the UK.

John Evans: The one lesson that I would take from the events is that the end links are an element for which one could provide an alternative load path, as we did on the Severn bridge. We did it on Severn for a different reason, and we were lucky to be able to do it. It might be an idea to have in mind a way of dealing with the failure of any one link.

Adam Ingram: Thank you.

Clare Adamson: Good morning. I want to ask about the capital planning for the bridge and how you capital plan in your areas. We have heard certain terms during evidence to the committee: the engineers mentioned a wish list that they always had, the Forth Estuary Transport Authority provided an indicative capital plan, and there are also committed projects at any one time. Can you shed some light on those terms and tell us your understanding of them? How long do you have a capital plan in place for your bridges?

11:30

Peter Hill: I know that Barry Colford would not refer to such a plan as a wish list. We all recognise that there are financial constraints on maintenance. We do not have an infinite pot, but we need to look to the future and identify projects that may or may not, subject to inspection, require to be undertaken.

My maintenance plan is over 60 years. The plan for the Humber bridge has such a long extent because we are still working to repay the capital debt for its construction, which has around 30 years to run, and I was looking at a programme of maintenance to at least double that timescale. That is why I am working on 60 years.

A more reasonable return period from maintenance for a structure without that kind of constraint is probably around 20 years. It is still impossible to look into the future for 20 years to determine what will be necessary. However, it is important for operational and serviceability reasons—to keep the bridge safe and fit for purpose—to ensure that we are aware of the projects that are likely to become necessary to at least consider based on experience from the global community. It is also important to plan appropriately for those projects to ensure that we do not end up with a huge amount of work all to do in one year but that we are able to space it out and

to plan for the financial outlay that is necessary for it.

Richard Fish: At the Tamar bridge, we used to work to horizons of five, 10 and 15 years, but that was fluid because, if an issue was discovered during an inspection, the programme had to change.

It is broadly possible to separate work into essential and desirable projects. Some interventions can be put off. The obvious one is painting. If we put a painting scheme off for two, three or five years, the bridge will not collapse but the intervention that we will have to make at the future point is likely to be more expensive, so there is a fine balancing act between setting the priorities and determining the most efficient way of managing and maintaining the bridge.

Smaller structures are treated as a bridge stock rather than individual bridges but, for every structure of any size, it is necessary to have a long-term capital plan. It would have to be fairly fluid and linked to the optimum time for maintenance interventions.

That is how the budget would be planned. The big question, which is clearly as much a political one as an engineering one, is whether the budget drives the maintenance or the maintenance drives the budget. I know which way round I would want it to be, but I am in the real world as well.

John Evans: My experience is slightly different. I cannot tell what happened with the Severn bridge between the end of the construction in 1966 and when the strengthening started in the 1980s. It was in the hands of a local authority during that period, and I do not know how the authority budgeted. However, the strengthening works were all costed. They were done through competitive tendering, so the funds were provided by Government.

Once the bridge moved into the concession period, there was another set of considerations. The key consideration that Clare Adamson is talking about is that, at the end of the concession period, whenever that is—it is either temporal or financial—the bridge is to be handed back to the owner, which is the Government, in the condition that it was intended to be in. Therefore, it starts its life again.

Whoever takes over after that—we do not know at the moment who that will be—will have to have some financial plan and budget. There will be the usual financial constraints on that, but I hope that they will know more clearly what they will have to allow for in the way of inspection and maintenance.

Clare Adamson: In terms of your annual budget for running the bridges, do you have any capital reserves or contingency funds in case the unforeseen happens? Can you give me an idea of the level of those reserves in an annual budget?

Richard Fish: There were always reserves for contingencies with the Tamar maintenance budgets. I cannot recall what the level was as a proportion, but there would effectively be a revenue budget for the operation and management of the structure, and there would be a capital budget for planned maintenance. There would also need to be a budget for reactive maintenance. That may have been taken from the reserves, or it may have been at the expense of other planned maintenance. However, I am afraid that I do not know the detail about the level of the reserves in proportion to the overall budget.

Peter Hill: At the Humber we hold a small reserve. Generally, that is incorporated within our major maintenance fund. Many of the projects on a bridge the size of the Humber bridge are big projects, just because of the size of the bridge. They cost significantly more than what we can collect in any one year.

We have a maintenance fund, which we build up in consideration of the major maintenance programme, so that it can be expended at the appropriate time. If any contingent works need undertaking, we will often take what is required from that fund and we will then increase payments over subsequent years to get back up to the level that we need for future projects.

Clare Adamson: What do you understand as the difference between work that is essential to maintain the long-term integrity of the bridge and safety-critical work? What would have happened if the work had been identified as safety critical?

Peter Hill: The term “safety critical” is quite unusual. I would recognise safety as being one of the paramount elements that we consider in prioritising works. In any risk-based assessment, we obviously consider the risk and the consequences of failure, including the financial and operational consequences and the consequences of any failure for safety. That would help to prioritise work at the bridge.

John Evans: I am not party to the concessionaires’ shareholdings, but I suspect that they are big enough not to specifically identify reserves. They will be big enough to provide anything that is necessary to meet their commercial obligations.

Clare Adamson: On long-term capital planning, was it reasonable to review the non-committed projects in light of the decision to build the new Forth crossing?

John Evans: I say yes.

Richard Fish: Knowing a little bit of the history around both the new and the old Forth road bridges, I would say that you had to consider the two in the round. The similarities with the Severn are fairly strong. There was an existing bridge, and a new one was built alongside it, although the process through which the project here is being delivered is very different.

You must take a couple of steps back and consider the future transport links across the Forth. You cannot separate the two.

John Evans: I ought to clarify—and Richard Fish may not know this—that the strengthening of the Severn bridge was decided on before the second crossing was on the cards. The bridge was the only link at the time.

Peter Hill: From a public governance of funding perspective, I am sure that it would be appropriate to consider the maintenance of one structure with an adjacent new structure. However, I would not like to say that that was actually done—basically, I do not know.

Clare Adamson: Finally, as a result of the review that it undertook, FETA identified a trial repair to the bit of the truss end link that it was worried about, which is not the bit that broke and closed the bridge. Have you been able to look at that repair and identify that that approach is a reasonable repair strategy for the future of the truss end links at that point?

Peter Hill: Personally, I have very limited knowledge about that. I am aware of what was undertaken, but I do not know enough about the mechanism of loads there to comment on it.

Richard Fish: I have seen the copies of the original drawing, so I understand how it worked, but I do not know anything about what was proposed as a repair.

John Evans: Again, I have only superficial knowledge about that, but it is not unusual to do a trial when before adopting something, if it is possible to do a trial. I would have thought that it was reasonable to do the trial and find out all the bugs before lashing into the work.

Mike MacKenzie: I think that some of the questions I intended to ask have already been covered.

I will take you back a wee bit. I am quite interested in how you go about the inspection regime. In the absence of some of the high-tech solutions that are available now, it seems to me that you are talking primarily about a visual inspection. Mr Evans talked about sound, which makes sense to me. I know a mechanic who often diagnoses faults with an engine just by listening to it. Am I correct to say that, in the absence of any sound, you do a visual inspection, and that you are looking for defects such as stress cracks? If so, it would tend to be a binary thing, in which the element you are looking at either looks okay or does not look okay. Am I correct that that is the best outcome that that kind of inspection can deliver, as currently practised?

Richard Fish: You are correct. A lot of it is down to the experience of the engineer or bridge inspector. The most useful tool that I take to bridge inspections is a hammer. That brings us back to the issue of sound. Whether it is a bit of masonry or a bit of metal, you tap it and there is a sound to it that gives you confidence that it is intact. Once you find an issue, you will be more intrusive and try to define the problem a bit more. At first sight, it is a visual inspection using the inspector's experience and, occasionally, a bit of brute force.

Mike MacKenzie: That is very useful, thank you.

I go back to the tension between the budget—nobody has an absolutely open-ended budget—and on-going maintenance, repairs and so on. How do you prioritise projects when they cannot all be carried out within a budget?

John Evans: We have touched on the concept of things being safety critical. Again, I am a bit nervous about using that term. To me, if something that is safety critical fails, the whole structure fails—it is not just an operational failure that might mean that you have to close the bridge. If you come across something that is truly safety critical, there is no option; you have to go in and do the work, and somebody has to find the money to sort it out. With other things, such as painting or surfacing, as Richard Fish says, you can put them off, although only up to a point—there are standards even in surfacing to do with road condition. However, with an element such as a jammed-up expansion joint that puts the structure out of operation, you just have to do something straight away and the money has to be found for it, whether from a commercial operation or from central funds.

11:45

Mike MacKenzie: That leads me very nicely into my final couple of questions. The committee has received written evidence from Mr Bob Hopewell, a retired engineer who looked after some bridges in North Ayrshire. Of course, those bridges were not on the same scale as the ones that we are talking about, but a number of similarities can be drawn. He said:

> "No public bridge authority would refuse to fund essential maintenance that was considered to present an unacceptable risk to the travelling public."

Do you regard that statement as being generally correct?

John Evans: Yes.

Peter Hill: Absolutely. The Humber bridge acts call on us to provide a safe method of crossing the Humber estuary for our customers.

Mike MacKenzie: Thank you. My final question—

The Convener: I am sorry, Mr MacKenzie, but does Mr Fish want to answer that question?

Richard Fish: No, convener. That is fine.

Mike MacKenzie: My apologies.

The same chap, Mr Hopewell, says:

"In my opinion, the integrity of a bridge manager would mean that it would be a resigning matter if funds were refused and the bridge were allowed to remain open against his/her recommendation."

Do you agree with that statement?

Richard Fish: I must admit that when I read Mr Hopewell's submission that bit made me smile. However, what he is saying brings us back to the shift from an engineering decision to a political decision.

The Convener: We know that there is honour among bridgemasters.

Richard Fish: I, too, am an ex-local authority bridge engineer, and I recall situations in which, without wanting to put any pressure on elected members, I had to say to them, "You've got to realise the implications of any decision to slightly reduce or not have a maintenance regime." I sympathise with Mr Hopewell's sentiment, but I would never go so far as to say that it should be a resigning matter; it would be a case of the person in question having a bit of a tantrum. Given today's financial climate, resignations would be taking place all over the country.

Peter Hill: The point has obviously been made in an emotive way, but I would expect anyone in that position who identified what I would term a safety-critical event to ensure that no one was going to be put at risk. I would not consider it a resigning matter—I would simply close the bridge.

Mike MacKenzie: Thank you. That was very useful.

The Convener: Do you wish to add anything, Mr Evans?

John Evans: I tend to agree with what has been said. The difficulty with deciding to close the bridge is that you need to have that responsibility. Peter Hill has total responsibility, and I would say that the concessionaire of the Severn bridges has as good as total responsibility. However, unless the failure was actually a structural one, they would talk to the Department for Transport, the Welsh Government and so on before they said, "We've got to close the bridge."

Mike MacKenzie: Thank you very much, gentlemen. That has been very useful.

The Convener: If I heard you correctly, Mr Hill, I believe that you talked about the risks and consequences of failure.

Peter Hill: I did, yes.

The Convener: With regard to risk management, Mr Colford described in evidence to us last week what appeared to be a hierarchy of risk, with the most safety critical—and I know that people hesitate to use that phrase—being the safety of bridge users, by whom I mean the travelling public and the people who operate the bridge. After that comes the bridge's long-term structural integrity and then operational safety. Is that a fair characterisation?

Peter Hill: It is. If a situation that posed a significant danger to life and limb were to present itself, the consequences of that risk would obviously be uppermost in any consideration of what action should be taken.

On the long-term integrity of the bridge, we might come across something that was critical to the long-term viability of the structure. However, there is often more than one way to skin a cat in such a scenario, so it might be appropriate to pause. Certainly, if it is just a matter that inconveniences the public or the operator, that would be a lesser consequence.

Richard Fish: I certainly agree that there is a hierarchy in risk management. Assessing both the likelihood of a risk occurring and its consequences presents an objective way of rationalising and prioritising risks. I agree that the sort of hierarchy that, as the convener said, Mr Colford described is appropriate.

John Evans: I would add just one point, which is that we have also to take cognisance of the emergency services, because they come into the equation. They deal with the operation on the carriageway, as it were, which might not be particularly structurally important. However, they can certainly intervene and close the bridge to traffic.

The Convener: Thank you for that. Clare Adamson spoke about the indicative capital plan and we have had a bit of a discussion about how you prioritise maintenance works given the budgetary constraints within which you operate. Clearly, part of the committee's discussion and inquiry is around the postponement of a particular piece of work: the replacement of the entire truss end link assembly, which had been costed at an estimated £10 million to £15 million. Do you have a perspective, based on your own engineering

experience and what you have learned about what happened at the Forth road bridge, on whether the decisions that were taken were consistent with the hierarchy of risk that we have just been discussing? In other words, were the decisions to postpone capital maintenance works correct?

John Evans: As Barry Colford said, that is a fairly hypothetical question now. We know what failed, but I do not think that anybody at the time thought that those particular links were going to fail.

On the consequences of overloaded upper brackets, with my limited knowledge from reading and seeing what has happened in the past few days, I do not think that it was an unreasonable decision to go for the trial and then see what came out of that, in light of the £10 million to £15 million budget for the whole thing.

The Convener: So there was a risk, but it was an operational risk. Is that a fair assessment?

John Evans: In effect, yes.

Peter Hill: I have certainly reprioritised work in the past by smoothing out not only the cost profile but the practicality of undertaking work when other works were going on at the same time on the bridge. We cannot start cutting several structural elements at once, so sometimes there is a need to reprioritise on that basis. If the consequences of the risk appear to be only to do with the serviceability of the bridge rather than being a critical risk to it, reprioritising is perfectly reasonable.

The Convener: Mr Fish, do you have a perspective on that?

Richard Fish: I endorse what the others have said. In any maintenance budget there will be pressures from the amount of money in the budget and from other maintenance needs and interventions that need to be carried out, which have to be balanced with one another. With hindsight, we can say that the work that has been referred to should not have been removed from the programme. However, given a reducing budget and increasing demands elsewhere, it is quite understandable that that decision was taken.

Siobhan McMahon (Central Scotland) (Lab): In your experience of your bridge, how involved would the board be in accessing money in order to prioritise work?

Richard Fish: I assume that you are referring to the political dimension. The board would make the final decision on the recommendation of the engineer or the bridgemaster—whoever was taking a view. I do not really know what that relationship is. There needs to be an element of trust. The board cannot say that its priority is to maintain the bridge if it is not going to allocate funds to do that. The bridge manager also has to have implicit trust in the engineering side.

Siobhan McMahon: Is that your experience of your bridge?

Richard Fish: Yes, very much so. It has almost become a joint decision. Both have to recognise the territory in which the other operates and, at the same time, there has to be a real will for the board to sign up to what the engineer says or we end up in the position that Mr Hopewell described.

John Evans: Again, Severn crossings are slightly different. Let me try to draw the closest parallel. The concessionaire is ultimately responsible during the concession period, but there is a Government representative who oversees.

Somebody talked about taking a light touch. I hate the idea but I was Government representative for some years and, during that period, if the concessionaire wanted to do something that fell outwith the work envisaged in the maintenance and inspection manual and all the other volumes of the concession agreement, we were in a position to say no. However, we would do that only if we really felt that it was something that would be totally unwise for the bridge. Nonetheless, there was somebody just behind the board, overseeing it.

Siobhan McMahon: I suppose that, in that example, if there was critical work and the budget had not been guaranteed, that would be a resigning matter, as Mr Hopewell said.

When there are people who oversee the board, if the budget is not allocated for safety-critical work that comes up because the money for that year—or for the next three or five years or whatever—has been spent, who is ultimately responsible for allocating funds? How are those funds generated if safety has been impacted but there is no money? How does that work?

John Evans: Again, my experience is slightly unusual. The shareholders are very conscious of the safety of the travelling public so they would find the funds.

Siobhan McMahon: What would happen if it was a Government matter?

Richard Fish: The Government would have to intervene or it would have to give us permission to borrow the funds.

Siobhan McMahon: Would local authorities be involved in that at any point?

Richard Fish: Although it was similar to FETA in a way, the Tamar bridge was unusual because it was managed by a joint committee of two local authorities. In order to do the strengthening and widening work, we needed additional funds, and

the two local authorities subsidised the work using their own reserves. That was the equivalent of going to central Government.

Siobhan McMahon: I was going to come on to that. How was that work budgeted for or prioritised at the beginning? Who were the partners?

Richard Fish: I will try to keep a long story short. The bridge is a joint undertaking with a ferry operation that uses chain ferries across the Tamar. The local authorities had a reserve to replace those ferries. It was a classic decision about two crossings, and the decision was to defer the replacement of the ferries. The money was shifted to the bridge, which gave us a capital allowance.

The Tamar bridge was tolled both during and before the works, so we were able to source a fairly static toll income. Therefore, we started the strengthening work—I hesitate to say this—without enough money in the bank to finish it. We had to keep the bridge open to traffic during all the work so that we could collect the tolls. We went into the red to the tune of about £2 million for a period of about six months. As I said, that was funded by the two parent authorities under a fairly loose borrowing arrangement. Initially, we went to central Government for funding but their response was, "No. You charge tolls. There's your income—use that to pay for the work."

The structures are very similar, but they are all very different in terms of governance and funding.

12:00

Siobhan McMahon: It is certainly complicated.

Richard Fish: Yes.

Siobhan McMahon: That is helpful. Thank you.

The Convener: Do members have any further questions?

Alex Johnstone: I am going to explore some dangerous territory. I went into this last week, but I will briefly do so again.

The work on the truss end links was deferred. That work was associated with the opposite end of the link, which has not failed. If that work had been carried out when it was originally mooted, would it have led either to the discovery of a problem in the area that failed or to maintenance to that area that would have prevented the problem?

Peter Hill: I am afraid that, without a far more detailed understanding of the mechanism, it would be impossible to say whether that is the case.

Alex Johnstone: The question that I intended to ask after that is: how often do you find yourself in a position in which planned maintenance work on a major structure leads to additional maintenance work that may immeasurably defer cost, or danger, in the longer term? How integrated is the process? Can it be separated into its individual parts?

Richard Fish: In theory, it can be separated, but in practice it hardly ever is. It can almost certainly be separated.

When you decide to do some work, you undertake that work based on an assumption about what the problem is. Once you start, you find the reality of the problem. The Forth cable investigations is a classic example of that. Those investigations had to be done to determine the problem. They led to other maintenance interventions, such as the dehumidification to help to resolve the problem with the cable.

I think that the same process would have applied if the investigation had started at the tower connection rather than the truss connection. You cannot know where that might have led. It might have led to an analysis that said that the problem was not up there but down at the bottom. Who is to say? The one-word answer is "Possibly".

Peter Hill: I would suggest that it is fairly unusual for planned works to uncover unknowns, because we tend to plan such works over a significant period of time. We investigate what the impacts on other structural elements may be and we plan for those impacts. Therefore, it is quite rare that we start with one problem and find half a dozen others. In certain elements, we might not find what we were expecting, and that leads to a different solution, but we do not tend to find other things that we were not aware of.

John Evans: Again, I might be able to give a parallel. At the beginning of the concession period, there was a joint inspection by the potential concessionaires and the Government's representative staff—my staff. It was intended that that joint inspection would flag up anything that might need to be done during the concession period. After that, the only thing that could get extra money for the concession was something that could not have been found during that inspection. You might say that that is a kind of Government-backed reserve.

Equally, as far as the strengthening works were concerned—as I said, it was a competitive tender—there was a large contingency. That is to say, there was a contingency sum of 10 to 12 per cent, not all of which was spent. However, we knew that, once we got into the work in deep detail, we would find things that we had not seen before.

Alex Johnstone: Is it in the nature of maintenance that the unforeseen will be found if you maintain something and that, as a

consequence, if you defer maintenance, there is an element of risk?

John Evans: I think that there is a larger element of risk if you defer maintenance.

Richard Fish: The risk that results from keeping your head in the sand and not knowing what is going on is far greater than if you have a maintenance regime that can at least give you an indication of what is going on.

As an aside, when you do not really know the extent of the problem, the issue around some of the maintenance works is arriving at an estimate for budgetary purposes at the outset. As I understand it, that is why the estimate was—as I think the convener said—between £10 million and £15 million. People might say that that is a big range, but you just do not know the extent of the cost until you start work, which is why building in a contingency is a very sensible thing to do when you are developing budgets for maintenance.

Alex Johnstone: Thank you for indulging me.

The Convener: Not at all. I think that that was a very helpful line of questioning. Do members have any further questions?

Do any of our witnesses want to place any final points on the record?

John Evans: I would like to reiterate what I said at the beginning. I am amazed at how much has been accomplished in such a short time. I know that a huge amount of resource was put in, but it was still a major effort and all involved are to be congratulated.

Richard Fish: I endorse that statement.

It is very healthy that the committee is conducting this inquiry. I am sure that the impact was felt very hard among the travelling public in Scotland, but it was also national and international news among the bridge community. As John Evans described, a potential problem was very quickly turned into a success. Well done to those concerned, and to your committee for conducting this inquiry. Thank you for the invitation to come along and talk to the committee.

The Convener: Thank you. It appears that you have the last word, Mr Hill.

Peter Hill: I can only really build on what the other two have said and assure you that, internationally, this discussion will continue for quite some time. As Richard Fish mentioned, we will be attending the international cable supported bridge operators' conference. I expect that Barry Colford will attend that as well, and I am sure that we will discuss the issue there.

The Convener: On behalf of the committee, I thank our witnesses for making their considerable experience and expertise available to the committee this morning. Their contribution has been invaluable in informing our work on the inquiry.

12:08

Meeting suspended.

12:10

On resuming—

Subordinate Legislation

Public Contracts (Scotland) Regulations 2015 (SSI 2015/446)

The Convener: The third item for today is the consideration of an instrument that is subject to negative procedure. Paper 5 summarises the purpose and prior consideration of the regulations. Members might wish to note that the committee will receive an update from the Cabinet Secretary for Infrastructure, Investment and Cities on the suite of secondary legislation on public procurement reform when it considers the draft Procurement (Scotland) Regulations 2016, which are an affirmative instrument, at a future committee meeting.

The committee will now consider any issues that it might wish to report to Parliament on the regulations. Members should note that no motions to annul have been received. I invite comments from members.

David Stewart: As the convener has rightly pointed out, this is a negative instrument and there have been no motions to annul. I have some points to put on the record for passing on to the cabinet secretary.

The regulations are fine as far as they go, but there is a big gap in that there is no reference to or substantial action on tax dodging. I support the moves by Christian Aid, the Scottish Trades Union Congress, Unison and others to restrict from Government procurement companies that avoid paying tax. I draw members' attention to my entry in the register of interests, which shows that I am a member of Unison.

It is difficult to ascertain the unpaid tax for the UK, but the estimate from the group that I have just mentioned is that there is around £25 billion in unpaid tax because of aggressive tax avoidance. We probably all want to secure tax justice, and I believe that the regulations before us today have a big gap in that regard.

Europe has had a lot of positive things to say about tackling tax avoidance and I would support Europe-wide tax reporting to ensure that large companies such as Amazon do not get round domestic tax laws. I believe that Scottish firms are losing out because of tax dodging because, unlike multinational firms, they are less able to use aggressive tax avoidance, and we would not want them to do that.

There is clear economic, social and community benefit in companies that want to benefit from the public pound paying their fair share of tax.

The Convener: Thank you. It is helpful to have your comments on the record. I am not entirely clear that the issue that you raise falls within the remit of the regulations or the primary legislation. However, I might have a solution, which would be for us to write to the cabinet secretary to ask him to provide further clarification on the issues that you have raised, should the committee be minded to do so.

Alex Johnstone: I simply want to comment on the difference between tax avoidance and tax evasion, one of which is a criminal offence while the other is a practical management issue.

I also note that the UK Government is doing quite a lot to tighten up the regime and close some of the doors that have been left open. Along with one or two other significant points, the matter was discussed extensively when the Procurement Reform (Scotland) Bill went through Parliament; we had these arguments then.

With the one reservation that the regulations are something of a telephone directory of secondary legislation and the instrument can be difficult to assess, the regulations appear to give effect to the provisions of the bill as it was when we passed it in the chamber. I am therefore content with the instrument.

The Convener: Are there any further comments?

Siobhan McMahon: If I am correct, all members have received a briefing from Unison on the regulations. I received it just as an MSP; it was not specifically for my attention. The committee has been asked about the issues that we want to report to Parliament, so we should say that we have been approached by organisations outwith Parliament that have concerns and it is not just MSPs who are concerned. That should be put on the record.

The Convener: That is helpful. Are members content to write to the cabinet secretary in advance of his appearance at the committee to ask for further clarification on the issues that have been raised?

Members *indicated agreement.*

The Convener: All the issues that members have raised can be put directly to the cabinet secretary when he appears before the committee. Are we agreed that we do not wish to make any recommendation to Parliament on the regulations?

Members *indicated agreement.*

The Convener: Thank you.

12:15

Meeting continued in private until 12:28.

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