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Official Report

FORTH CROSSING BILL COMMITTEE

Wednesday 24 February 2010

Session 3

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FORTH CROSSING BILL COMMITTEE
2nd Meeting 2010, Session 3

CONVENER

*Jackson Carlaw (West of Scotland) (Con)

DEPUTY CONVENER

*Hugh O'Donnell (Central Scotland) (LD)

COMMITTEE MEMBERS

*Joe FitzPatrick (Dundee West) (SNP)
*David Stewart (Highlands and Islands) (Lab)

*attended

THE FOLLOWING GAVE EVIDENCE:

David Anderson (Transport Scotland)
John Carson
Garry Clark (Scottish Chambers of Commerce)
Barry Colford (Forth Estuary Transport Authority)
Mike Glover (Transport Scotland)
Frazer Henderson (Transport Scotland)
John Howison (Transport Scotland)
Ewan Kennedy (City of Edinburgh Council)
Graeme Malcolm (West Lothian Council)
Dave McDougall (West Lothian Chamber of Commerce)
Bob McLellan (Fife Council)
Marshall Poulton (City of Edinburgh Council)
Alan Russell (Fife Chamber of Commerce and Enterprise)

CLERK TO THE COMMITTEE

Sarah Robertson

LOCATION

Committee Room 3

Scottish Parliament

Forth Crossing Bill Committee

Wednesday 24 February 2010

[The Convener *opened the meeting at 10:34*]

Decision on Taking Business in Private

The Convener (Jackson Carlaw): Good morning, everyone, and welcome to the second meeting of the Forth Crossing Bill Committee, and the first at which we will take evidence. I apologise to the witnesses: committee room 3 is a bit like the state dining room at Windsor castle, and they are all at the far end of what seems like a very long dining table. However, this is the committee room that we have been able to obtain, and I hope that, with the assistance of the audio equipment, we will not need to shout at one another in order to make ourselves heard.

The first item of business is for the committee to decide whether to take item 4, under which the committee will consider the evidence heard during the meeting, in private. Does the committee agree to take item 4 in private?

Members *indicated agreement.*

Familiarisation Visit

10:35

The Convener: Item 2 is the familiarisation visit that the committee went on a fortnight ago. I am pretty sure that I speak for us all when I say that we are relieved that the trip did not take place this morning but on a bright, sunny, dry winter's day. Members have before them a note by the clerk, summarising our visit. No member wishes to comment on the note, so I think that we agree that there are no revisions to be made to it. The note has already been published as part of the papers for the meeting.

Forth Crossing Bill: Stage 1

10:35

The Convener: Item 3 is consideration of oral evidence on the general principles of the Forth Crossing Bill. At this meeting, we will concentrate on first principles. We will consider why there is a need for a new crossing and, indeed, what the implications would be if there were no new crossing. We will also consider how one goes about putting a figure on the cost of such a crossing. For those who are following our proceedings elsewhere, we intend to bring together panels of witnesses to give evidence. We have three panels this morning. The members of the first panel are Graeme Malcolm, head of transportation at West Lothian Council; Bob McLellan, head of transportation services at Fife Council; Marshall Poulton, head of transport at the City of Edinburgh Council; and Ewan Kennedy, policy and planning manager at the City of Edinburgh Council. I welcome you all.

We do not intend to go into opening statements. We have received quite lengthy submissions from each of the various authorities and organisations that are represented. We will put questions and invite each of you to contribute as you wish to the question in hand. We will work our way through a range of detailed questions. When we get to the end of those questions, if there are any other points that you feel are relevant and that you would like to raise with us, please do so. However, I ask you to avoid the temptation to go into a range of different areas in answer to a single question. Let us assume that during the course of our questioning, we will make our way through all the issues.

I will kick off. Will you each sum up your individual council's input to the development of the Government's plans for the proposed new crossing?

Bob McLellan (Fife Council): When discussions on the development of the new crossing were taking place, reference groups were formed, which were, I think, very much based on regional transport partnerships as opposed to local authorities. Having said that, the parent regional transport partnership—the south east of Scotland transport partnership—engaged with the local authorities in its area. The direct answer to the question is that, through the regional transport partnerships, we had the opportunity to participate, although initially we did not have a direct opportunity.

Throughout the development of the project we have had a number of meetings with Transport Scotland and its consultants. More recently, we have discussed in detail with Transport Scotland and its consultants the development of a public transport strategy alongside the progression of the crossing.

Ewan Kennedy (City of Edinburgh Council): Good morning. To follow on from what Dr McLellan said, our council put in a statement during the consultation process leading up the introduction of the bill. As we say in our written submission, the City of Edinburgh Council had fairly serious concerns about the level of engagement with us. That is documented from about 2006 right through to the introduction of the bill. Various items of correspondence and reports to committees highlight the council's concerns.

As Bob McLellan outlined, the general approach was engagement through the regional transport partnership. It is fair to say that the regional transport partnership was not particularly comfortable with that approach and wrote to Transport Scotland to request that the council—which comprises the roads authority, the planning authority and the environmental authority—be part of the process.

I do not intend to give a logical, chronological account of what took place because our submission does that. One of our main areas of concern about the development of the crossing related to the concept of a managed crossing strategy, what that meant and what it should embrace. We strenuously made the case that it should embrace a public transport strategy, which we thought should have been developed in parallel with the bill and should have formed part of it. The fact that that has not occurred is part of the objection that we have put before the committee.

The Convener: I have read that; I have it in front of me. Have any of those matters been addressed in the intervening period or is that pretty much still where you are?

Ewan Kennedy: It is fair to say that since the bill was introduced, there has been activity by the promoter and its consultants on the development of a public transport strategy. Many useful features of that strategy are coming out that we feel will contribute to a proper managed crossing strategy. In answer to your question, we feel that we are now making progress but that an opportunity was missed in the lead-up to the introduction of the bill.

Graeme Malcolm (West Lothian Council): Good morning. I do not have much to add to what the two previous witnesses said. West Lothian Council started to have some engagement with Transport Scotland as far back as March 2007, when it carried out strategic transport projects review work and Scottish transport appraisal guidance work on the Forth crossing. Between

then and the introduction of the bill, there was sporadic consultation of the parties at key points. In advance of ministerial announcements, for example, we would be given far more detail. There would then be a period of scheme development followed by more engagement. The amount of two-way discussion has been limited, but we have been engaged at certain key points of the process.

The Convener: A housekeeping point that I should have addressed when I opened the meeting is to ask everyone to ensure that if they have a mobile phone or a BlackBerry, it is switched off, otherwise it can play havoc with our technical equipment—that is a note to me as much as to anyone else. Thank you.

Hugh O'Donnell (Central Scotland) (LD): We will be speaking to the promoter, Transport Scotland, about the points that the witnesses have raised, and we will certainly ask some interesting questions about those observations.

I have a question for everyone at the far end of this very long table. There has been a lot of talk about the value to the area of a new crossing. Can you give specific examples of how the proposed crossing will aid the area's economic development and social regeneration? Does anyone have views on that?

Bob McLellan: As we know, the existing crossing suffers from significant congestion, certainly at peak times, and there is no doubt that that has consequences for the economic wellbeing of the south-east of Scotland and beyond. The purpose of the development of the crossing was to relieve congestion. The condition of the existing bridge was an issue as well, but a main aim was to provide public transport opportunities.

Many people do not own cars—in most council areas, one in three people do not have a car. If they are to travel to work, we must improve the public transport options. The existing bridge will not allow that, as there is no space available that could be dedicated to public transport. For example, if one lane were taken up by public transport, the queues would stretch even further back. A feature of the development of the new crossing was the opportunity that it offered to provide better public transport, which would allow people to access job opportunities in a wider area than is currently possible.

10:45

I have an equally important point about the economic wellbeing of the Rosyth port. Now that we have got back the ferry service to and from Europe, the last thing that we want is traffic crossing the bridge to Fife to catch the ferry being unable to access it.

There are a number of issues for people travelling to and from Edinburgh and Fife to access jobs; there is also the importance of the port itself to consider. If congestion on the bridge got worse, the peak period would get even longer and there would be more congestion, more delays, more lost productive business time and a net negative effect on the wider economy.

Ewan Kennedy: Bob McLellan's point was really about equality and was well made. Public transport is key to applying fairness around the population. A public transport policy recognises the fact that car ownership is not universal and that people who do not own or have access to a car still need to be able to access jobs and employment. The crossing strategy needs to recognise that and make adequate provision for those people. We think that there are concerns about that.

On the strategic role of the crossing, a road crossing in the vicinity of North and South Queensferry is absolutely necessary at the national level because it carries strategic traffic: Scottish traffic and traffic to England and beyond. There is no doubt about the need for a crossing. At a regional level, the crossing plays an important role by connecting the south-east regional centres of commerce and economic activity with labour markets, and it services the local commute during the morning peaks.

The new bridge will bring with it many opportunities, but we also must recognise that it will bring potential risks and downsides. That is where the concept of a managed crossing strategy is absolutely key. We have to manage the risks that the bridge will bring, such as possible increases in car traffic, delays, congestion and air pollution, and negative carbon effects. Unless the bridge is managed as part of a wider package of measures, we face the prospect of not realising the maximum benefits that it could bring.

I will not go into too much detail because I know that the committee is not looking for that today, but it is worth pointing out that when we look at the potential impact of the proposed infrastructure, we see that there will be a 14 per cent increase in traffic levels crossing the bridge in comparison with what the levels would be if the bridge was not built at all. We have serious concerns about that. Measures could be brought to bear to mitigate or minimise that increase and limit the traffic levels to those that would exist if the bridge was not built, if you understand what I mean.

There are key economic development areas in West Lothian and in the west of Edinburgh in particular. It is probably worth highlighting the west Edinburgh planning framework, which is being master-planned by the Scottish Government. That very large strategic development is roughly the

size of Edinburgh Park, which is also on the west side of Edinburgh. The bridge has an important role to play in relation to future growth in that location and access to employment, but it must play it in a way that is equitable to all.

Marshall Poulton (City of Edinburgh Council): I may be able to add to what my colleagues have said. The crossing is of national and regional significance, certainly from a tourism aspect and for the economic vitality of Fife, Edinburgh, West Lothian and beyond.

From an Edinburgh perspective, it is fair to say that, given the number of car journeys coming across the bridge, there is a limit to capacity on Queensferry Road—both link capacity and capacity at the junctions. However, there are some opportunities with a public transport strategy to improve the flow of people, which will ease the flow of goods in and around the area.

An increase in rail patronage has been noticed over the past years, with more people coming into Waverley and Haymarket stations. The bus operations are also good, and they have seen increased patronage too, although they took a bit of a hit last year as a result of a variety of road and tram works; the economic downturn may also have had an impact. We believe that a managed crossing over the Forth is absolutely essential and of national, regional and local significance.

Hugh O'Donnell: Does Graeme Malcolm have anything to add?

Graeme Malcolm: The strapline for the most recent version of our economic partnership strategy is "West Lothian—Scotland's economic hub". West Lothian is often viewed as the bit in the middle of Scotland—the bit that joins the west and east together. More accurately, however, West Lothian is a hub for the entire central belt as it integrates Scotland on a wider basis. The economic connections to the north and south are of equal importance to West Lothian, and the bridge will provide those connections over time.

The economic base in West Lothian has increased by 18 per cent since 1999, and our sector strengths—this point is important to the committee—are that 10 per cent of all our jobs are in distribution and transport, 10 to 11 per cent are in construction, and a further 7.2 per cent are in engineering and fabrication. With a project of this size, there are immediate benefits from the construction of the bridge, but in the longer term the project will also open up connectivity, with better access to the bridgehead area.

Hugh O'Donnell: Thank you.

David Stewart (Highlands and Islands) (Lab): As members of the panel will be well aware, the Forth crossing will be the biggest investment programme by the Scottish Government since devolution, with a median cost estimate of £2.044 billion. That is more than the cost of the M74, the Edinburgh trams, the Borders railway and the Scottish Parliament building added together. How comfortable are you with the value-for-money analysis and the opportunity cost, considering the projects such as the Glasgow airport rail link that either are not being carried out or are being pushed into the future?

Bob McLellan: Obviously, Fife Council has not been directly involved in the costs, but we have seen work that Transport Scotland and its consultants have done and we have no reason to doubt any of the figures that have been put forward. There has been a variance, with the cost going from an initial £4.5 billion to about £2.5 billion, but at the moment that includes optimism bias and seems to be a more than realistic cost for doing the job.

You mentioned the other projects that could be done. Without trying to overburden the £2.3 billion or whatever, I recommend the public transport measures that we have talked about briefly so far. The new bridge is predicated on any additional journeys being carried out by public transport rather than private car. For the sake of less than 1 per cent of the overall cost of the project, we could have park-and-ride facilities at Halbeath and Rosyth and bus priority measures both north and south of the bridge, at Newbridge and in other places. Certainly for the projects north of the bridge, £25 million would provide dedicated bus lanes from Halbeath to the bridge and dedicated public transport on it.

Without being rude, I would turn the question round slightly: can we afford not to build the bridge? Considering the congestion, pollution and disruption to the economy at large of not building it, I think that we have to build it. Not doing so is not an option, and we have to pay whatever the going rate is to make it a credible project, bearing in mind that we are looking forward well in excess of 100 years. There is no point in doing a half-baked job—in inverted commas. It must be done properly.

As I said, it is essential that we include the public transport element, even before the bridge is constructed. If Scotland wants to be one of the leading green countries in the world and meet its carbon emissions targets, we cannot exclude projects such as the Forth crossing from that aim. We want to demonstrate by leading from the front, and if we build in those elements, we can encourage and achieve a huge modal shift to buses and public transport.

We cannot avoid undertaking the project, and we need to do it properly by including public transport.

Marshall Poulton: I totally concur with what Bob McLellan says. It is essential that we go ahead with the project, although we must build in certain caveats.

I have no reason to doubt that the project is good value for money. Transport Scotland has put in a lot of time and effort to get the initial costings of around £4 billion for the whole project down to between £1.7 billion and £2.3 billion. I do not want to comment on other possible national projects such as GARL.

The overall Forth replacement crossing project must include a managed crossing strategy. My colleague Ewan Kennedy referred earlier to our very positive meeting on 19 January—if my memory serves me correctly—with the minister and Transport Scotland to consider a public transport strategy, which in our view is essential to the smooth running of the crossing.

Early indications—I stress that they are early—suggest that such a strategy will come with a rough price tag of £50 million. I still think that we need to go a bit further with regard to building in some of the projects in the STPR. The elements that relate to the constraints on the motorway and trunk road network, especially around the A720, need to be accelerated.

Although the current cost estimate for the crossing is between £1.7 billion and £2.3 billion, it is essential that a public transport strategy is built into the bill process.

David Stewart: Do any other panel members wish to comment?

Graeme Malcolm: The benefit to cost ratio is reported as being 4.31, which is quite high and reflects the benefits that the cable-stayed option will bring. With regard to the public transport aspect, I know that there are cost pressures in the round, but for a very small additional cost we could realise a significantly greater benefit from the project. We should be mindful of that in future discussions.

The Convener: Dave Stewart will develop his question in a moment, but Joe FitzPatrick is keen to follow up on that point.

Joe FitzPatrick (Dundee West) (SNP): With regard to public transport, the plans for the crossing have been slightly adapted. The previous plans allowed for two lanes each way with a hard shoulder that could only be used as such, but I understand that it will be possible for the hard shoulder to be adapted for use as a bus lane and for other public transport uses in certain circumstances. How important will that be in constructing a crossing that is future-proofed?

Bob McLellan: The existing bridge will become the public transport corridor, but in the event that it has to close—for maintenance purposes, accidents or other reasons—it is essential that the new crossing can cater for public transport on the hard shoulder. The hard shoulder should certainly be wide enough to take public transport.

To give you a flavour of the public transport benefits, 876,000 single-occupant vehicle trips across the Forth could be saved if we implement the park-and-ride services on the north side that we have discussed. It is important that we do not rely only on the bridge; there is little point in giving public transport priority on the bridge if we do not give adequate priority to public transport north and south of the Forth. Some priority is given at the moment, but the situation needs to be improved if there are to be significant benefits.

The figures from the Fife side show that 876,000 trips could be avoided if the park-and-ride schemes at Rosyth and Halbeath came to fruition; people would use public transport instead, which would only be to the benefit of the existing bridge and any future bridge, our carbon footprint, a green Fife Council and a green Scotland.

11:00

Marshall Poulton: On the 876,000 trips that could be saved, the new crossing would provide a great opportunity to build in intelligent transport systems and build on the very good experience from down south in relation to active traffic management on the M42, which gets more cars through the motorway system, and the controlled motorway on the M25. Indeed, much closer to home, the M8 through Glasgow uses ITS. Such systems provide great opportunities for hard-shoulder running. As Bob McLellan said, building in connectivity should be an integral part of the project, not only for the crossing itself but so that people can get from the park-and-ride or park-and-choose sites to the connection roads, on to the main roads and across the bridge. For people who cross the bridge from Fife to get to Edinburgh, we can look at public transport priorities and get buses moving more quickly along Queensferry Road.

The Convener: I have travelled along the M42, and I was very impressed with the traffic management there and the way in which the hard shoulder is utilised. However, there is certainly a broader question for the Government in Scotland, because the problem with some of our roads is that they are so old and have bridges that interfere with the possibility of traffic management.

Hugh O'Donnell: Parties from both sides of the river have adequately described the need for the public transport approach and the relatively small additional expenditure that would be required. Will we get maximum value from the investment in the

bridge in terms of economic benefit if we do not include the public transport option? When will we reach the stage at which we have to include it before the traffic loading becomes impossible? If we do not include it in the costing for the bridge, who will subsequently pick up the tab for it when it becomes—as is almost inevitable—needed?

Bob McLellan: As has been said, it is likely that there will be a 39 per cent increase in traffic crossing the bridge by 2017. The existing bridge plus the new bridge provide no additional lanes for cars. How will that 39 per cent increase be catered for, if not by public transport? The design and principles of the new crossing are based on public transport. Essentially, the equation involves the people who make up the additional 39 per cent being encouraged on to public transport. However, to do that after the event—after the bridge is in place—would be a chase-the-tail job for a significant amount of time and would cost a lot more. In terms of value for money, cost benefit and, indeed, the principle of getting people out of their cars and on to public transport as a real choice—and not just as a second-rate choice—in order to reduce emissions, our carbon footprint and so on, in my view it is essential that public transport is put in place up front. The local councils concerned have certainly been making the case for public transport over the past two or three years.

Hugh O'Donnell: Thank you for that—it is now on the record.

David Stewart: Can I follow on from Hugh O'Donnell's point? I am sure that many of us share the view of panel members and want to see an increase in public transport for the reasons that Mr McLellan mentioned, such as climate change, efficiency and capacity issues. The panel will be aware that the ForthRight Alliance has strong things to say about the issue. It states that, in 2006, northbound traffic had 11.8 million vehicles but fewer than 1 per cent of the vehicles were buses; it therefore asks how credible the approach is of using the existing bridge just for public transport in the future.

Mr McLellan has mentioned my other point, which is that, by 2017, traffic will have increased by a phenomenal 40 per cent. As the key transport officials in various local authorities, you must be very concerned about the prospects of massive traffic congestion if adequate public transport is not put in place. Although we have agreed that the existing crossing should be reserved for public transport, will that work in practice?

Ewan Kennedy: I do not want to go into too much detail about the ForthRight Alliance's figures, but it is useful to remember that each single-decker bus carries 40 to 50 people, which equates to about 40 cars at an occupancy rate of 1.2. It is dangerous to compare buses with cars; instead of thinking in terms of vehicles, we should be thinking about person trips.

As for the importance of public transport and the question whether the proposals for the existing bridge will work, as our responses this morning might have already made clear, we feel that public transport is critical to the project's success. There must be a strategy that encompasses a number of elements or packages acting together to deliver the desired outcomes and benefits and to manage the risks to which I have alluded.

The peak hours are critical in the operation of the bridge. During times of congestion, quite small differences in traffic flow can have quite significant effects on congestion, queue lengths and delays. If in peak hours we can get, say, 1,000 trips off the network through 1,000 people parking at a new park-and-ride site at Halbeath and being transported down to and across the bridge in high-quality bus services that then follow priority lanes into West Lothian or Edinburgh, we will make a significant impact on the degree and effects of congestion, levels of pollution and the carbon footprint.

That is the core of our concerns. We welcome the bill's proposal for the existing bridge to be set aside for public transport; we also welcome proposals for connections to the road network at the north and south bridgeheads to have bus priority, although we think that they could be improved. What are missing, however, are the links to a new park-and-ride site at Halbeath. Public transport operates most efficiently where there is a concentration of interchange. The reason why Edinburgh, for example, has a very successful public transport network is because of the intensity of people in a small area who use the system. Where there are travellers with more dispersed origins, a park-and-ride site can focus them in one location and offer the private sector the opportunity to operate commercial bus services to interface with and pick up passengers. Providing the infrastructure that gives priority and reliability to destinations makes those destinations attractive.

To be honest, there is already a track record in this respect. Ferrytoll park and ride, for example, was constructed by Fife Council; at the same time, the City of Edinburgh Council introduced bus priority on the south side using a queue management system. These are success stories. Hundreds of trips that would otherwise have involved driving across the bridge are parked at Ferrytoll park and ride.

Marshall Poulton: Public transport has been a great success story, particularly now that we work with bus operators to make buses more reliable, more punctual and more comfortable with, for

example—and setting aside the cost implications—the availability of wi-fi.

Without getting too technical, even using Transport Scotland's figure of 83,000 vehicles a day using the bridge in a situation in which there is no new bridge, and the figure of 92,000 vehicles in a situation in which the new bridge is in place, the theoretical capacity of the lane is 1,800 vehicles an hour. With the intelligent transport system tools that Transport Scotland is saying that it wants to put on to the bridge and the connecting roads, the capacity could be increased up to 2,100 vehicles an hour. There is evidence of such a rise on the M42, the M25 and other roads—those are the benefits of intelligent transport systems. The lowest increase with intelligent transport systems will be 6 per cent, and the current throughput improvement is between 6 and 8 per cent. Further, intelligent transport systems bring safety benefits of around 10 per cent. I cannot remember the figures for the environmental benefits, but they take the form of reduced carbon emissions and better monitoring.

Not only is the public transport strategy essential, it will be a success.

Graeme Malcolm: We are focusing quite heavily on the north-south flow from Fife to Edinburgh. However, about 12 per cent of traffic south goes to West Lothian and a further 8 per cent goes to the south and the west. The modelling data from Transport Scotland suggest that, by 2022, 25 per cent of the traffic will go to West Lothian and 12 per cent will go to the south and the west.

We must make the connections now in terms of public transport. If we do not put in that provision in parallel with this project, we will end up with more concentration of traffic, as people will still want to travel on those routes.

The Convener: Joe FitzPatrick has a question on a slightly different angle, but one that develops the same point.

Joe FitzPatrick: How would the new crossing attract people into your area for work, leisure or educational opportunities? Is there any evidence of population trends being impacted on either by the current inadequacies of the bridge or by any uncertainty about the bridge project?

Bob McLellan: The current version of Fife's structure plan envisages a significant population increase over the period that it is concerned with. As I have said, it is evident that the existing bridge cannot cope with the current volume of traffic. That is already having an impact on the economy, and the problems that exist at the peak times will increase if there is no new crossing, and those peak times will lengthen.

With regard to freedom of movement, as has been alluded to, the quality of people's journeys is important, as are journey time and reliability—employers do not want their employees turning up at different times every day. People might have flexible working hours, home-working arrangements and so on but, nevertheless, there must be some kind of certainty in the journey time for people who are going about their business. Accuracy of timing is extremely important.

For the past six years, I have used the bus services between Fife and Edinburgh every day and can say that the quality of that journey is now second to none. It is not a second-choice option. I have a car and I could go by train, but the buses have wi-fi and leather seats and the journey from St Andrew's Square to Glenrothes takes one hour, which is exactly the same time as it takes in a car, if you obey the speed limits.

We advertise Fife as a place to work in, invest in, visit and so on, and the journeys to and from Fife are important to that.

As has been demonstrated by crossings such as those at Dartford in London or over the Severn, there comes a point at which the capacities of existing crossings are no longer fit for purpose. We have a great opportunity to curtail the capacity for cars and provide no additional space for cars and, at the same time, provide one of the best public transport connections in the country, which many people in the central belt will use to travel between West Lothian, Fife, Edinburgh and elsewhere.

11:15

Ewan Kennedy: It is clear that Edinburgh is a focus in the region that connects the labour force, employment and economic activity. That is placing strains on the transport system—that is evidenced by the service level on the existing bridge and by congestion around it.

On top of that, the City of Edinburgh Council is pursuing four key economic growth areas—the city centre, north Edinburgh, south-east Edinburgh and west Edinburgh, which I have mentioned. It is clear that bioscience research in the south-east will expand, that a lot of housing will be built in the north of the city and that international business gateway activities will take place in west Edinburgh. Those developments will occur in and around Edinburgh, but they are also significant to the south-east region and to Scotland as a whole. Graeme Malcolm referred to the importance of access and connectivity. We cannot overestimate the role that connectivity across the Forth will play in the success of those developments. We see that already and we seek future growth and employment.

I return to the opening remark that the crossing offers huge opportunities but carries potential risks, which we must manage to maximise the benefits. That is all linked to facilitating growth in and around the city, which will benefit the region and Scotland.

Graeme Malcolm: Under the Edinburgh and the Lothians structure plan, West Lothian Council has a commitment to deliver about 23,000 houses in the plan period. The houses are spread out among three core development areas in West Lothian, one of which is in the Winchburgh area, which members probably visited last week. That development area alone will have 3,500 houses, 16,800m^2 of office space, 45,000m^2 of business park area and 11,000m^2 of industrial development. Such development areas are large and the bridge forms part of the equation of their access and connectivity to the wider region.

The proportion of people who work in West Lothian but do not live there has stayed at about 28 per cent in the past period. I do not know whether the bridge will influence that, but that indicates a relationship between employment and commuting.

The Convener: Graeme Malcolm has touched on housing development and I was going to ask a question about future housing development that could be predicated on the new crossing's existence. Does either of the other councils have anything to say about that?

Ewan Kennedy: I touched on the four growth areas in Edinburgh. The approach in Edinburgh is to create sustainable communities in which development is focused on areas that have good public transport and good cycling and walking connectivity and where people live close to employment opportunities, which minimises the need to travel. However, that goes only so far. We do not suggest for a moment that everybody will live and work in such areas, but we hope to maximise that potential.

That leads to the point that some people will locate outside the city and wish to commute into it for employment. We must acknowledge that the road system is constrained and we must consider efficient forms of transport to enable such commuting.

Bob McLellan: Obviously, we in Fife have not developed housing policy around the fact that a new bridge would be put in place. However, as Ewan Kennedy said, one of the main aims of a structure plan is to locate housing developments where good public transport is in place whenever that is possible or where there is a good opportunity to develop public transport. For example, in Cupar there is a rail link and reasonable bus services to Edinburgh and north to Dundee, so there are allocations for housing in Cupar in the structure plan. There is also a sizeable housing allocation in Kirkcaldy to assist in the regeneration of central Fife. It is predicated on being close to the road interchange, but with a view to there being a park and ride roughly at the Redhouse roundabout. There are congestion problems at the Redhouse roundabout and at a number of other transport interchanges well away from the bridge, such as Sheriffhall in this part of the country.

On the planning side, we do all that we can to keep new development and in particular housing away from known problem areas. Nonetheless, the existing bridge has shown over the years that it will generate more traffic. We have to provide an option for people who use their cars to go across it.

The Convener: All three councils have emphasised repeatedly the importance of the public transport infrastructure to all this. Are there any negative impacts on economic development that could follow from the crossing that need to be addressed and averted, or do you see it as, essentially, only a positive development?

Marshall Poulton: I think, certainly from Edinburgh's perspective, that we see it as all being positive. We have certainly focused on the need for the public transport strategy. Bob McLellan raised that point and I stress its importance. The public transport strategy is essential rather than desirable, and it would have to be implemented before the opening of the new bridge.

The Convener: I think that we have absorbed that. For the sake of not repeating that point, does anyone have anything separate to add?

Bob McLellan: The only negative impact would be if the new crossing was not to happen—I know that that is probably saying the same thing. The embarrassment of having continued congestion and pollution and putting out the wrong advert for carbon reduction does not bear thinking about. As I have said many times already, if we are going to put a new crossing in, we should do it properly with public transport provision as well.

Graeme Malcolm: In the scenario that has been reported through the Forth Estuary Transport Authority—I know that Barry Colford is coming to the committee later this morning—there are a number of key issues in the general maintenance of the existing bridge that must be tackled over the next period of time. FETA carried out a detailed study of the impacts of doing that work and what comes to the fore is that travel delays cost £650,000 a day for a weekday closure of the bridge. Maintenance needs are becoming more regular on the bridge. We have also had a higher incidence of severe weather, such as high winds. I

know that FETA has worked hard on bringing in a high-wind policy.

If we take it to the extremes, if we do not build a new bridge, we must also factor in the negative aspect of the delays and the cost to the economy and to the communities in the bridgehead area, because they would come under immense pressure as a result of traffic congestion. If you are looking to establish what are the negatives, you should flip it round and say, "These are negatives, but on a separate pitch."

The Convener: I think that Hugh O'Donnell has reflected on one of the previous answers and is not sure that he got an answer to part c of his question, so I will let him push that a little further.

Hugh O'Donnell: You have all, rightly, been eloquent about the public transport strategy. If they are not part of this project and they have to be put in retrospectively, who will pay for the park and rides and the public transport strategies? What are the implications of that for the local authorities that might have to pick up the tab?

Bob McLellan: I preface my comments by saying that, as you know, Fife Council has not objected to the bill. We have commented on public transport, and we continue to do that, but we are keen not to do anything that might delay the bill, such as trying to encompass additional things to happen concurrently that might elongate the process.

Some of the projects that we have talked about have already been identified by the Scottish Government and Transport Scotland through the strategic transport projects review, so they are not new projects that are associated solely with the bridge. The Halbeath and Rosyth schemes were both identified in the projects review as having positive cost benefit ratios and they have been appraised using the Scottish transport appraisal guidance techniques that Transport Scotland uses. Technically, those projects have already been identified for future funding from the Scottish Government. That takes us back to the question of when we will do them. Will we wait until money is available under the projects review, which might be after the new crossing is in place? The construction affords us a golden opportunity to get people on to public transport, educate them and get a positive outcome, and the sooner we do that, the better. If the work is not done in time, we run the risk that people will continue to travel by car or—dare I say it?—move from public transport back to the car during the construction.

In our continuing meetings with the Scottish Government and Transport Scotland, we have identified the benefits that will accrue, certainly north of the bridge and I would imagine to the south as well, if we put public transport in place at the same time as or before the construction. If Ferrytoll is enhanced as part of the scheme, people will not revert to their cars. If people start dropping off at Halbeath earlier, they will be on public transport earlier.

Marshall Poulton: Edinburgh's perspective is slightly different from Fife's in that we lodged an objection, as you can see from the papers that are before you. We do not object to the principle of the bill and we certainly support the development of the new crossing strategy, but we object to certain elements. One of our biggest concerns is the need for a public transport strategy, which we talked about earlier.

We had a productive meeting on 19 January with the minister and Transport Scotland and we see that as the key to building a public transport strategy into the bill process. However, if there were, in parallel to that process, a memorandum of agreement and a definite, ring-fenced funding package to deliver a strategy before the crossing opens, we would welcome that.

On who pays, we would obviously say that the costs will be a result of the bridge coming on line, and the public transport strategy has got to be a part of that, but we would certainly be open to discussion on the matter.

Graeme Malcolm: I do not have much to add. The crux of the question is what will happen if we do not put a public transport strategy in place now. Everybody understands that it would cost more and be more complicated to deliver a strategy in future. We have an opportunity to integrate it into the bridge works and to maximise the benefits during the construction period. There will be severe road works on the motorway corridors. How will they be sold to the public? In my world, it would be good to be able to say that we have put in park-and-ride facilities in advance and given buses priority in order to give people alternatives. That will take pressure off the road network.

Hugh O'Donnell: Thank you.

Joe FitzPatrick: Marshall Poulton commented on this, but do the witnesses who represent Fife and West Lothian believe that it would be an acceptable approach for the public transport strategy to be developed in parallel with the bill rather than as part of it?

Bob McLellan: The main reason why Fife has not objected to the bill is that we want to take forward the public transport strategy in parallel with it, but with a commitment to funding. We are concerned that, otherwise, the bill might be delayed. Having said that, the important thing is not how the strategy is put in place but the fact that that happens. As you know, Fife has taken the design and development of Halbeath and Rosyth almost to the planning stage. The local authorities

are not just waiting for everything to be done. We are keen to work in partnership and to deliver.

11:30

Graeme Malcolm: From the point of view of West Lothian, Marshall Poulton's suggestion is sensible. The council is not objecting to the principle of the bridge, although it has some objections on certain points of detail. We are looking for a resolution to the situation. If a parallel stream of work can be created and a commitment given by this committee or the Government, that would be helpful and would go a long way towards meeting the council's concerns.

The Convener: We would be happy to receive any suggestions that you want to make in support of the submissions that you have made in that regard.

I realise that you all have season tickets to our deliberations, gentlemen, and we will be hearing from you again when we deal with road infrastructure issues. We have certainly absorbed the public transport message. Is there anything more that you would like to say to us at this time?

Ewan Kennedy: I would like to make an observation. The existing bridge, which was designed around 1960 and opened in 1964, provided facilities for pedestrians and cyclists, segregated from the road traffic. The designers at that time should be congratulated on their foresight, as policy initiatives for cyclists and pedestrians were non-existent at that time.

The current proposals for the new bridge make no provision for cycling and walking, the rationale for that being that the existing bridge will cater for them. However, the existing bridge is almost 50 years old and the new bridge is expected to last for 125 years or so. Will the existing bridge still be there in 50 years' time? Will we rue the decision not to cater for cyclists and pedestrians on the new bridge?

One of the benefits of the new bridge is weather protection. If there were ever a group of people who would benefit from that, it would be cyclists and pedestrians.

The Convener: We are discussing obesity in the chamber this afternoon. If we are to believe some of our briefings, none of our population will be capable of walking in the timescale that you identify.

11:32

Meeting suspended.

11:34

On resuming—

The Convener: I welcome our second witness panel. We do not have written submissions from them, although I think that I am right in saying that there will be broad support for the general principles of the bill. We have with us Dave McDougall, who is the chief executive of West Lothian Chamber of Commerce; Alan Russell, who is the chief executive of Fife Chamber of Commerce and Enterprise; and Garry Clark, who is the head of policy and public affairs with the Scottish Chambers of Commerce. Fife seems to have had the centre seat at the table on each occasion—I am sure that that is accidental.

Alan Russell (Fife Chamber of Commerce and Enterprise): No; we are on the right this time.

The Convener: I ask the witnesses to sum up their organisations' input to the development of the Government's plans for the proposed new crossing.

Alan Russell: Good morning, and thank you for inviting us. On the input that chambers of commerce have had—I use the collective term because we have worked closely with West Lothian Chamber of Commerce and Edinburgh Chamber of Commerce under our umbrella organisation, the Scottish Chambers of Commerce—it is probably three years since we first highlighted our deep concerns about the state of the Forth road bridge and the absolute need, based on capacity, to construct a new crossing. Members might recall a fairly substantial campaign that was run by *The Scotsman*, which we were behind. We have continued to lobby vigorously on the need for a new crossing and to consult businesses on their perceptions and concerns. We will not rest until such time as the new crossing is in place, because it is absolutely vital to the whole Scottish economy.

The Convener: Before I invite the other two witnesses to comment, I will ask a supplementary question and the other witnesses can address both questions at the same time. What would be the economic impact, locally and regionally, were such a new crossing not to proceed?

Alan Russell: On the assumption that if the new crossing does not proceed, the existing crossing will have to close at some point, we estimate that that would cost the Scottish economy almost £1.5 billion per annum. The bridge might have to close for a three-year period while refurbishment works take place to replace cables or whatever else needs to be done, so it is much cheaper to build a new bridge than it is to have that disruption to the economy. We cannot calculate a regional figure for the absolute and utter damage that that would do to Fife. One fairly

significant business leader—I cannot mention his name—told me recently that if the new crossing does not go ahead, the last person out of Fife should switch off the lights. It is that damning.

The Convener: I wonder where he got that from.

Alan Russell: That was a reference to the fact that his business would move out of Fife, and that many others would be in that camp.

The Convener: I understand the point. I ask Garry Clark to address the potential consequences of the new crossing not going ahead and the question about input into the development of the Government's plans.

Garry Clark (Scottish Chambers of Commerce): Alan Russell summed up the length and substance of our input. For four or five years now, we have been working to try to get a new Forth crossing to the top of the agenda. Our minds have been concentrated by the series of reports since about 2004 on the condition of the cables on the existing bridge and the long-term sustainability of that bridge. Alongside those arguments over the condition of the existing bridge, there is the fact that, when the current bridge opened in 1964, it carried 2.5 million vehicles per year. The most recent figures that I could find on FETA's website show that, in 2008, the figure was more than 21 million—nearly 22 million—which is more than double the design capacity, so there are issues about the condition of the existing bridge and capacity issues crossing the Forth.

On the wider economic impact should the new crossing not go ahead, as Alan Russell said, taking into account the increased cost of transport, the increased costs for consumers and commuters, the public transport delays and the increased use of private cars to make the journeys that are currently made using the existing bridge, the costs would be in the region of £1.5 billion per annum. I am happy to pass those figures to the committee for consideration.

We have a long-standing campaign. We have worked with the previous Scottish Executive and the current Scottish Government to get the Forth crossing on the agenda, and we are happy that both have stressed their commitment to it. We look forward to working with Administrations right through until the project is delivered.

The Convener: I do not expect that Dave McDougall will take a different line, but do you want to comment on the two issues?

Dave McDougall (West Lothian Chamber of Commerce): Yes. Fife Chamber of Commerce and Enterprise and West Lothian Chamber of Commerce agreed early on that a crossing is needed. It would be daft for each chamber of commerce to campaign individually for that crossing, so we have campaigned through the Scottish Chambers of Commerce, with Fife Chamber of Commerce and Enterprise leading. We have been happy to go along with that. I always ensure that a West Lothian angle is given.

On the overall need for the bridge, members have only to consider occasions when high winds or road works, for example, have disrupted use of the current bridge. The impact of such disruption is immediately seen in West Lothian, and it is devastating. It would be an absolute disaster for the Scottish economy if the new bridge did not go ahead for any reason.

The Convener: Out of interest, will you define what you mean by the word "devastating"? That would help those who are less familiar with the immediate impacts of closures.

Dave McDougall: A number of larger companies in West Lothian have facilities in Fife, and obviously it is necessary for them to be integrated all the time. A huge number of small and medium-sized enterprises in West Lothian do business in Fife, and vice versa. Every company of any size in West Lothian has employees who go over the bridge every day. If that was not available, it would completely change how the country would work. Much of it would just grind to a halt.

The Convener: Thank you. That is illustrative.

David Stewart: Members of the panel will be well aware that the Forth replacement crossing will be the biggest investment project that a Scottish Government will have carried out since devolution. You will be familiar with the median cost of around £2.044 billion which, as you may have heard me say in a question to the previous panel, is more than the cost of the M74, the Edinburgh trams, the Borders railway and the Scottish Parliament building added together. How comfortable are members of the panel with the value-for-money analysis and the opportunity cost? What about projects such as the Glasgow airport rail link that are not being carried out or are being pushed into the future?

Garry Clark: The cost of the project reflects its value to the Scottish economy as a whole. The project has united all our member chambers of commerce throughout Scotland. Yesterday, I was in Aberdeen, where I was pestered about what is happening with the Forth crossing. The week before that, I was in Dundee, where people said exactly the same thing to me. The replacement bridge is massively important throughout Scotland, from the Borders and the east coast in particular, to the Highlands, and to chambers of commerce in the west of Scotland.

We need to ensure that we get the bridge's price tag right: it needs to be subjected to scrutiny. We need to ensure that we deliver the best possible value for money to the taxpayer, if we ultimately go down the taxpayer route to pay for the bridge, but we must also recognise that we have a once-in-a-generation—perhaps once-in-a-lifetime, given the length of time that it is hoped the bridge will be in operation for—opportunity to get things right. We need to get things right first time.

David Stewart: You have made a point about the project's costs and the worries about overrun. As you will be aware, there have been real worries in the past about transport projects overrunning. I am not making a party-political point; there have been such worries under this and the previous Administrations. Transport projects probably have characteristics that mean that their costs overrun, but are you concerned that the cost of the bridge on completion might be much more than £2.044 billion?

11:45

Garry Clark: We need to ensure that we get value for money. The costs need to be subjected to constant scrutiny to ensure that that happens. We also need to ensure that what we get meets the needs that it requires to meet. It must meet connectivity needs on either side of it and connect with our wider transport infrastructure—the M8, the M9, the M90, the A90 corridor and through the A720 to the A1 corridor. We need to scrutinise costs to ensure that it is fit for purpose and that it represents value for money.

Alan Russell: The first bridge across the Severn had the same problems as the existing bridge across the Forth, and a quick decision was made on capacity grounds to build a new bridge across the Severn. There are now two bridges; we have only one, but the figures for vehicle movements are much the same. Given the cost to our economy if we do not construct a new bridge across the Forth, a £2 billion project absolutely represents value for money. We cannot afford to delay it, but neither can we afford to let the ultimate cost get out of control, which is down to having the right people in place to manage the contract and to design the bridge in the first place in order to ensure that it cannot go wrong. We need to ensure that all the preparatory studies have been done so that we do not get any surprises. People can do that in foreign parts, using British engineers, so why cannot we do it in Scotland for civil engineering projects? It seems strange that we have a track record of allowing our civil engineering projects to escalate in cost. Before we get into the biggest contract that we have ever placed, we need to find ways of controlling it, and we need to learn from others who have carried out similar projects successfully. It is essential that we manage the contract—it has to offer value for money.

Dave McDougall: I endorse those comments. I would add that it is really important that we do not end up favouring one project over another and setting different parts of Scotland against each other. Scotland needs a world-class transport infrastructure; if we are going to grow the Scottish economy, we have to keep planning to put in place the things that will allow that to happen. To do that, transport almost has to take the lead because if we do not have the transport infrastructure in place, we are kidding ourselves about what we can achieve at a local level anywhere.

David Stewart: As you know, Transport Scotland estimates that in 2017 the crossing will carry 92,000 vehicles a day. According to the previous panel, that is approximately a 40 per cent increase in traffic. What is your perspective on the traffic congestion implications for business if that figure is correct?

Alan Russell: First, the issue of capacity on the new bridge comes into question because we have a capacity issue at the moment, with what is, in effect, a dual carriageway. Provided that nothing happens, such as accidents or breakdowns, we will have a plain drive through, but if additional traffic comes on board, it will lead to congestion. I know that there are plans for intelligent traffic management systems, but I have my concerns about them. If you travel through Glasgow, and the flashing lights that say "40mph" are on and you stick to that, you are the slow person; everyone else is still travelling at 50mph or 60mph. There needs to be a more positive system than that. I think that there can be, but I have some scepticism about how it will work.

An increase in traffic is almost inevitable if we are to have a growing economy, and we need a growing economy in order to sustain the lifestyles that we enjoy. There are ways in which the impact of additional traffic can be softened. As we heard from the previous witnesses, there is the public transport strategy—there is an absolute need for that. Some business users can be persuaded to get out of their cars and use public transport for meetings in Edinburgh and West Lothian, if the public transport alternative exists for them and they are made aware of it. There are limitations on that at present.

Garry Clark: As previous witnesses have said, and as Alan Russell has just mentioned, public transport will play a large part in the future strategy for cross-Forth travel. We certainly support the aim of increasing the public transport options in order to make such travel attractive to people who want to cross the Forth. Most of our members who

transport goods around the country rely predominantly on road, so road capacity will still be required, but there are ways in which we could make public transport a more attractive option for people. If public transport is made more attractive through investment in high-priority lanes and so on, we can make that a positive choice for people. That would, we hope, reduce private-car traffic on the Forth crossings. Public transport is very much a way forward.

David Stewart: Does Mr McDougall have anything to add?

Dave McDougall: Let me add just a small bit.

Most employers do not particularly want their staff to have to travel by car all the time. If a good public transport alternative is available that provides flexibility so that people do not all have to arrive at the same time, people will welcome that. We are very keen to see a good public transport infrastructure put in place.

The Convener: I am aware that some of the panel's responses to our questions have touched on themes that will be raised in the questions that follow, which may seem a little bit circular, so forgive us if you sometimes think, "Haven't we just said that?"

Hugh O'Donnell: Dave McDougall's warnings about divisiveness brought to mind the story of the bridge of Arta in Greece that took a thousand years to build. Ultimately, the engineer had to sacrifice his wife to get the bridge completed. I hope that we do not get to that stage.

We have heard the panel's observations about the public transport aspects, which will bring economic benefits. Does the panel—like the previous panel that we heard from—support a public transport strategy's being part of, or running in parallel with, the project? What would be the advantages of doing that? What costs might arise from only subsequently including public transport as part of the infrastructure project?

The witnesses may answer in reverse order if they prefer. I have no preference.

Dave McDougall: I think that not doing both things in parallel or in tandem would be daft. We need to make most of the situation while we have the initial opportunity. To try to add on a public transport strategy later would be cumbersome and would probably put most of the public off the whole idea, so it would be unproductive. Doing the two things in parallel is the only way that makes any economic sense, so it is important that a public transport strategy be included. The public relations aspect is also important, because the local communities need to buy into the project from the very start. It is important that people can see that this is a good way forward from which we will all benefit.

Garry Clark: Absolutely. As Dave McDougall just suggested, what is the point in building a bridge and then turning around and asking what we will do with it? We need to ensure that we have in place a public transport strategy. Certainly, high-priority lanes would be welcomed by the bus companies as a way of enabling them to make public transport a positive choice for commuters and others who want to travel across the Forth. From that point of view, yes—the public transport strategy should run at the same time, as part and parcel of the project.

Alan Russell: On Hugh O'Donnell's first point, we had a similar experience with the A8000, which took almost as many years to be rectified.

Hugh O'Donnell: Fair comment.

Alan Russell: The point that I want to make is that one of the main issues that a strategy must deal with is capacity. As we have just heard, capacity problems will get worse because there will be increased traffic. The only way to reduce the number of vehicle movements is to get people out of their cars and on to public transport. If we do not invest now in public transport to run alongside the project, we will create problems down the line. The two things need to happen in tandem.

Hugh O'Donnell: Thank you for that. Are there businesses in your areas that think that the new crossing is a reason for them to locate in the area? Conversely, would any see a five-year disruption as a disincentive to developing or opening up a new business in the area?

Alan Russell: As far as Fife is concerned, I am aware of three or four projects in the past through which investment has not come to Fife. One reason why is concern about congestion in terms of accessing Fife. From an inward investment point of view, the uncertainty about what will happen has damaged Fife.

As far as existing companies are concerned, our members are constantly asking me for an update on the current state of the bridge and repairs, which I get from FETA. Businesses also lobby me to ensure that we put the case for them. I will not name them, but I know of four businesses that have a minimum of 200 lorries going over the bridge every week to take goods to the market. Those businesses have concerns about moving supplies. I know that they would have to seriously consider their position should the new bridge not go ahead. That is not a threat that they will move elsewhere although, in the past, one of those businesses has threatened to move to Nottingham, where it has another facility.

Garry Clark: Alan Russell has hit the nail on the head. Let us say that a business is making an inward investment decision and is looking at Fife as an option. One of the factors that it would consider is cost. If it costs a business more to get goods in and out of Fife as a result of having to travel the long way round to get to its main market in Edinburgh, it will look elsewhere. We have looked at the overall cost to the Scottish economy. Many businesses could make that sort of decision—they could be making it as we speak—if there is any uncertainty whatever about the future of the bridge.

Dave McDougall: I endorse that last point: we need to remove uncertainty. There is enough difficulty in the economy just now. In planning ahead, companies will try to avoid uncertainty. Delays, debates or disputes about the bridge discourage any kind of investment in the central belt.

Joe FitzPatrick: What do you see as being the biggest opportunities and challenges to business and commerce during the construction phase and once the costing has been completed?

Garry Clark: During the construction phase, there will be a substantial contract and a number of sub contracts. Construction of the bridge in itself would provide a boost to the construction industry in Scotland right down the supply chain from the biggest to the smallest companies. Once we start building and look to completion dates, that will provide some of the certainty that Dave McDougall and I mentioned. That is extremely positive in trying to market Scotland, particularly the east of Scotland, as a place to do business. It is important to recognise that the bridge is a boost not just to the city region of Edinburgh and to Fife but to the whole of Scotland.

I said earlier that colleagues in Aberdeen, Dundee and the Highlands want the bridge to happen. Equally, colleagues in Newcastle want the bridge to happen, because it is on their route along the north-east coast of the United Kingdom. From all those points of view, the bridge is a positive thing.

We have estimated that, if the new bridge were not to go ahead for any reason, and if availability of the existing bridge to heavy goods vehicles or to all vehicles had to be reduced, the cost would be £1.5 billion per year which, after a year and a bit, would exceed the cost of constructing the new bridge. In our view, there is no debate to be had; we just need to get ahead and do it.

12:00

Dave McDougall: I hope that in the short term, opportunities are created for local subcontractors and local employment. West Lothian has been incredibly successful over the past 15 years, but in the past two years our unemployment rate has, for the first time, gone above the UK average. We are particularly concerned about youth unemployment. Any such major investment will create economic activity that will help to reduce unemployment.

On the bigger picture, I agree with Garry Clark.

Alan Russell: As has been said, major opportunities exist for smaller companies to undertake contracts, and Fife has a major opportunity to attract the main construction yard—facilities exist for that.

Some of the challenges are about minimising disruption during the construction phase, both on the existing bridge—I am sure that you will hear from Barry Colford about how that can be done—and on the road network as the new link roads are constructed. The Forth road bridge is a vital link. Think of the Scottish road network as making up the main arteries of our body—Scotland. What would happen if one of those arteries, the Forth bridge—one of the main routes in Scotland—were severed? When you sever an artery, you start to bleed to death. That is what would happen to the Scottish economy, so we cannot afford disruption to the extent that the bridge has to be closed. We need to keep it open and we need to minimise disruption.

It is perfectly correct to say that a new bridge will provide a major boost not just to the Fife economy, but to the economies of Dundee, Perth, Inverness and Aberdeen, because it will open things up and remove people's perceptions that there is a blockage and that it is not possible to access markets.

Joe FitzPatrick: I will stick with Alan Russell so that he has the chance to go first this time. You talked about the new bridge providing a major long-term boost to the economy. If a decision were made to fund the bridge at least partly from tolling, how would that impact on the economic opportunities?

Alan Russell: The current suggestion that the bridge should be funded through the normal capital expenditure budgets of the Scottish Government will put enormous pressure on other projects and will probably result in their not going ahead, so people in other parts of Scotland, who perhaps do not recognise the overall national importance of construction of a new Forth crossing, will start to oppose the expenditure on it of £2 billion or so—which is a massive figure in everyone's eyes—in the hope that their lower cost construction projects can proceed.

We need to consider various funding options. As a last resort, I do not think that the business community would have many objections to paying tolls to cross the new bridge, provided that their

vehicles and their drivers did not have to sit in congestion, which is a more expensive cost to them, and provided that any tolls were set for the duration of the period that it took to pay off the capital costs. Tolls can certainly contribute to the costs of the bridge: that would be an acceptable funding method.

Dave McDougall: The key as far as any private sector organisation is concerned is to avoid the real cost to them of having a bridge that is not big enough or that results in delays. They would be willing to pay tolls to do that, but it would be a bit strange if one project were isolated as being the one that deserves to have tolls. We might need to look at the bigger picture and ask whether we should use tolls for other projects as well, so that the new Forth crossing would not be an exception. I would be extremely alarmed if it were deemed to be the only case that justified the use of tolls. The priority for the private sector is to get the thing done. If tolls would make that happen more quickly, they would be acceptable, but if tolls are to be considered, they should also be considered as an option for other projects.

Garry Clark: As Dave McDougall and Alan Russell said, we ought to look at every option to make the bridge happen because, ultimately, all of us want it to happen. We need clarity on the funding structure. The Scottish Government has made it clear that the bridge will be funded from its annual capital budgets, but we need a way of ensuring that that is set in stone; it should be clear for all to see that the decision is irreversible and that funding will continue, regardless of whether there is a change of Government or a change of emphasis by the present Government. We need to ensure that funding is in place. It could come from the Scottish Government, from introducing private capital into the scheme or, as a last resort, from some form of limited-time tolling.

The Convener: We will return to the issue of funding at a separate committee meeting later in our timetable. I will again play devil's advocate, as I did with the previous panel. Can you identify any negative aspects of the new crossing that may need to be addressed in planning?

Alan Russell: The proposals have been scaled down from the previous ones and there is no direct link from the new crossing to the M9, which is disappointing. I know that there are additional costs to having a direct link to take traffic west. However, such a link would help to reduce the congestion eastwards of the bridge at peak times by taking it directly on to the M9, instead of having traffic trundling down the old road, through the village of Newton, which is not built to deal with that level and volume of traffic.

Garry Clark: As I said, we have a once-in-a-lifetime opportunity to get this right. The existing bridge opened in 1964, and the M9 spur opened a couple of years ago. That kind of planning cannot be allowed to happen this time—we need to get it right.

Alan Russell and, I am sure, Dave McDougall would identify the A904 link to the M9 as a potential weak point in the present plans. I am familiar with the road, which HGVs coming off the bridge use to access the M9 further west. It is not an ideal bit of road. We do not want to be left waiting 40 years for an essential piece of road infrastructure for the new bridge, as we did with the old bridge.

Dave McDougall: The only negative side that I would like to highlight is the potential for cost overruns. We must ensure that those do not happen. We need really good, tight project management. From the beginning, we must not accept that there may be big overruns; we must not let that culture come into the planning. If the project starts to go way over budget, all the negative issues in the economy that we have discussed will come into play. We must ensure that it is so tightly managed that that cannot happen.

The Convener: It is not for me to broaden the committee's remit, but if you have nominations for public sacrifice, please send them on a postcard to the clerks, who will collate them. I am grateful to you for your contribution. There will be another short interval while witnesses swap over.

12:09

Meeting suspended.

12:11

On resuming—

The Convener: I welcome our third and final panel of witnesses. Mr John Carson is a civil engineer who worked with the team that financed and built the Skye bridge and is a member of the Forth tunnel action group. Barry Colford, who has been mentioned in dispatches this morning, is the bridgemaster and chief engineer of the Forth Estuary Transport Authority. From Transport Scotland, we have John Howison OBE, the interim project director; Mike Glover, the commission project manager; David Anderson, head of transport economics, analysis and research; and Frazer Henderson, the bill manager.

This is the first time that the committee has heard from the bill's promoter, so it might be useful for Transport Scotland to set the scene and to make some brief opening remarks about what the bill seeks to achieve. Questions will flow from that and from the preceding evidence that we heard this morning. Who will take on the challenge?

Frazer Henderson (Transport Scotland): I will be the sacrificial lamb. Good afternoon. I will say a few words about the policy objective and the bill. With your indulgence, convener, I will then pass over to John Howison for some colour and context on the project and its history.

The Government's policy objective is clear. It is

"to provide, in the light of uncertainties about ... the Forth Road Bridge, a continuing and reliable primary road link"

across the Forth

"to safeguard the economy, particularly of the east coast".

That policy objective was key to the statement in 2007 by the Cabinet Secretary for Finance and Sustainable Growth advising that there would be a new crossing and to the announcement in 2008 by the Minister for Transport, Infrastructure and Climate Change on the residual use of the existing Forth road bridge as part of a managed crossing scheme. It was also included in national planning framework 2, which was debated in committee and the chamber last year.

The bill provides the legislative vehicle to drive forward and realise the policy objective. As members are aware, the bill is large, detailed and supported by voluminous documentation. I hope that I can distil all that into three short statements. At its heart, the bill seeks authority from the Parliament for three principal powers: first, the power to construct the new bridge, create new roads and upgrade existing roads and junctions; secondly, the power to acquire compulsorily or, where appropriate, to occupy land that is necessary to give effect to the scheme; and thirdly, the power to change the designation and responsibility of the existing roads, to provide an integrated trunk road network over the Forth and thereby facilitate the implementation of intelligent transport systems. It is worth emphasising that none of the powers is novel; they are well precedented in other schemes, are appropriate and are consistent with those that are necessary to deliver such an infrastructure project.

I will make one further point before, with your indulgence, I pass over to John Howison. The bill has no general application. It is limited in its purpose, which is to provide a new crossing. It is limited in its geographical extent, and it is time limited—the powers in the bill must be exercised within five years so as to ensure that the scheme is in place before the end of 2016.

12:15

John Howison (Transport Scotland): Frazer Henderson explained the principal reasons for going ahead with the project. In 2004, FETA saw the first indications of corrosion in the cables, and it has been working on the problem since then. We must bear it in mind, however, that we need a new bridge not just because of the corrosion in the cables—Barry Colford will be able to say more about that later—but because of the operational problems that we have. The existing bridge is a dual two-lane road with no hard shoulders, which means that any disruption results in a queuing of traffic and that any maintenance has to be done in the face of competing use of space for traffic. At the end of 40 years, we are clearly reaching a point at which the existing bridge is not the resilient bridge that we need to support the economy of Fife and the east coast. One option for dealing with the corrosion would be to repair the cables, but that would bring substantial disruption to the network.

That brings us to the proposal for a new bridge. It will have to last many generations and there will be unforeseen changes in requirements over that period, so we need to ensure, at this stage, that we build in the functionality to cope with that. The new bridge and the connecting roads are the part of the managed crossing strategy—which we heard about from the councils—for which we are seeking specific powers through the bill. The project was announced to the Parliament in December 2008 as a solution that both makes appropriate use of the existing assets and provides a resilient crossing on what is a strategically essential link.

Although that approach has resulted in a reduction in the price of the project, the design of the new bridge still retains flexibility in how it can be used. That means that we will deliver a dual two-lane motorway road with more efficient connections to the national motorway network, improved junctions to support the development areas of Fife, including Rosyth's ferry terminal, and improved access for West Lothian, which will provide the missing west-facing links that we heard about earlier. The design also brings about the potential for improved public transport infrastructure and, in leaving pedestrians and cyclists on the existing bridge, coincidentally we end up with an improved environment for them.

The importance of the project has been demonstrated by its inclusion in the national planning strategy. We are confident about the project and, in parallel with the bill and always subject to it being approved, procurement arrangements are proceeding to secure the implementation of the plan in 2016, thereby minimising the risk of restrictions that might have to be imposed on the existing crossing.

The development of the proposals has been a fairly lengthy process, but ministers acted very quickly after the initial warnings about the existing bridge in 2004. Initially, the Forth crossing study looked at a raft of solutions, refining them to fixed

links on five corridors and thereafter refining them again to options of tunnels on three corridors in the general proximity of Queensferry and two bridge options on the central corridor option.

Following the choice of a cable-stayed bridge, a number of options for the road network south and north of the bridge were examined, culminating in two options to the north and two to the south of the bridge, with a further reference case south of the Forth. They are well described in the stage 2 corridor report, which is published on our website.

In 2008, the work that FETA was doing gave a better prognosis for the existing bridge, so we looked at how it might be accommodated in an overall strategy. As a result of that, the managed crossing strategy was developed, which is documented in the scheme definition report that is on the website. Following that, there has been a refinement of the proposals, both through local consultation and the development of the scheme, which is included in the bill. Again, that is documented in the stage 3 engineering report. No doubt, you will ask for more information about those later in the process.

What we are aiming to achieve is best looked at from the perspective of the objectives that we set for the project in 2004. First, we aimed to maintain the cross-Forth links for all modes to at least the level of service offered in 2006. The level of service in 2006 was free running on the bridge for the majority of each day, but susceptible to congestion during peak times. You will be glad to hear that we are now aiming at something better than that and will achieve free-flowing mainline running on the year of opening. We feel that that is an appropriate aspiration, having regard to the congested nature of the surrounding network and the need to provide for increased use of public transport in the future.

The second objective was to connect to the strategic network to aid optimisation of the network as a whole. The project connects to both air and sea links and is part of the essential east coast roads spine connecting to the central belt. It also connects the bus network into the bus priority lanes into Edinburgh in a seamless way. So, there is connectivity in relation to sea, air, public transport and the general roads network.

The third objective was to increase travel choices and improve integration across modes to encourage modal shift for people and goods, linking into the existing and potential park-and-ride sites. That is a compatible part of our plan linking the Forth crossing to the wider aspirations in the strategic transport projects review. Whether that will all be affordable immediately is something that time will tell, but there is no difference in philosophy between ourselves and other witnesses—we all believe that public transport is an essential part of the programme. It is absolutely necessary to equate space for transport with the travel demand across the wider network.

The fourth objective was to improve accessibility and social inclusion through the freer movement of traffic, better road design and the implementation of the intelligent transport system. Again, there is the potential to develop and support public transport.

A fifth objective was to minimise the impacts of maintenance on the effective operation of the transport network. The new crossing will need less maintenance and has been designed to facilitate maintenance. For example, the cables on the new bridge have been designed to be taken down for a half-life refurbishment without interfering with the running of the bridge. The new bridge will also have hard shoulders so that resurfacing can be done without closing a carriageway. Accompanied by the use of the intelligent transport system, the hard shoulders will also provide greater management opportunities, increasing the reliability and resilience of the network and the predictability of journeys.

The penultimate objective was to support sustainable development and economic growth. The project avoids the damage to the economy that would be caused during repair of the Forth road bridge. It will also provide a more appropriate use of the strategic corridor, avoiding congestion and providing more efficient transport.

The final objective was to minimise the impact on people and the natural and cultural heritage of the Forth area. Across the whole community, we are balancing a reduction in the effects of impacts from the existing network against the creation of new impacts that will be caused by the new transport corridor.

Essentially, we are bringing forward a well-conceived project using the existing infrastructure and providing a balanced facility for both private and public transport.

The Convener: Thank you very much. Although most of our questions will be relevant to Transport Scotland, we have a number of questions for Mr Carson and a number of points on which we would very much like him to comment. If you wish to make a comment at some point, Mr Carson, you should let me know.

Before we move to questions I think that, for those who might be following our proceedings elsewhere, it would be useful if Mr Barry Colford from the Forth Estuary Transport Authority, hereinafter referred to as FETA, could provide us with an update on work to assess the current bridge's condition.

Barry Colford (Forth Estuary Transport Authority): Although the Forth road bridge is a great piece of engineering, it was designed in the late 1950s and is, as John Howison made clear, an ageing structure. Its main cables, main expansion joints and half-joints, which, at every 18m along the bridge, give that distinctive thudding sensation when you cross over, all need to be substantially refurbished and maintained, resurfacing has to be carried out and we will have to replace the hangers, which are the main means of supporting the deck on the main cables. Of course, such work is not uncommon on suspension bridges throughout the world. My colleagues on other bridges in other places face the same issues and challenges.

Prior to the internal inspection of the main cable in 2004, we were aware of a number of issues that would cause significant congestion on the bridge. The bridge is in a fairly unique position. As we know, the nearest crossing is at Kincardine, some 32km away. The new Clackmannanshire bridge relieves traffic at Kincardine, but drivers still face a substantial detour when we carry out works on the Forth road bridge. Of course, that affects not only maintenance of but operations on the bridge. If the bridge has to be closed or vehicles have to be restricted due to high winds or other incidents—things that occur fairly regularly at this time of year when the winds pick up—people have to make a fairly tortuous detour to get to Kincardine.

FETA was aware of and had highlighted these issues, making it clear that they would cause substantial congestion on the bridge. When, for example, we resurface a carriageway, we close it at the weekend. From 7 o'clock on Friday night, when we start putting out traffic management equipment, until 5 o'clock on Monday morning, when we uplift it all to avoid the morning peak, the contractor has 54 hours to carry out the work. We carry out works at the weekend primarily because there is a 10 per cent drop in traffic in any case; however, on the weekends when works are taking place we manage through publicity and advertising to persuade 30 per cent of users to stay away. Despite that, it is not uncommon for a weekend closure of one carriageway to cause delays of an hour and a half in crossing the bridge on Saturdays and Sundays. We are certainly aware of the significant effect that we can have on the local and national networks and on how people plan to get from A to B, especially on the east coast of Scotland. In fact, our advice is that when resurfacing is going on drivers are better to sit for an hour and a half or up to two hours in the queue to cross the bridge than to detour via Kincardine, because that journey will take longer. We pointed out that those difficulties were likely to arise on the Forth road bridge when we came to refurbish the main expansion joints and half-joints, replace the hangers and waterproof and resurface the decks.

12:30

In 2004, we carried out our first internal inspection of the main cables, which are a very important element of a suspension bridge. That followed on from work that we were aware was going on in the United States, where they were beginning to see difficulties and problems in the main cables of some of their older bridges. When we opened our main cable, we did not expect to find much in the way of corrosion, but we found fairly significant corrosion, which we reported to ministers at the time. We estimated that we had about an 8 per cent loss of strength in the cable at that time, but the difficult question was how we could predict the loss of strength in the future. That was a difficult question to answer at the time and it is still difficult to answer, mainly because we are taking a very small sample from the wires in the main cable. There are more than 11,000 parallel wires in each cable, each of which takes about 14,000 tonnes of load. That is a substantial and highly stressed element in the bridge. We are taking a small sample to try to extrapolate what the strength is now and what it will be in the future.

We knew what the strength of the cables was in 1964 when the bridge opened. We had an estimate of strength loss in 2004 of 8 per cent. At the time, we estimated an envelope of what would be likely to happen to the cables in the future. All things in life decay and deteriorate. We knew that if we did not take action, the decay in and deterioration of the main cables would continue. We did not know where we were in the slope of that decay line, if you like—whether we were looking at steep decay or shallow decay.

In 2008, we carried out another inspection, which was more limited, and discovered that we were probably on the more optimistic side of the decay line, but we were still decaying. We estimated that there was a loss of strength of about 10 per cent. At that point, we tried to predict the future. In 2004, we said that there was a possibility of restrictions on the bridge in 2014 if the decay continued. In 2008, we were able to push that about three years further into the future.

We looked around the world to see what we could do to stop the decay. We were aware that in Japan several bridges had been dehumidified by a method of passing dry air into the spaces in the cable where there are gaps where the wires are touching. Any circular wires that are touching each other in a tightly compacted cable will leave spaces. There was a view that we could pass dry air through those spaces and try to get rid of one of the elements that causes corrosion: moisture. That was the plan. We knew that work was being

done in Japan, but it was mainly work on younger and new bridges. The Forth road bridge was the oldest bridge to have these problems on which people decided to try dehumidification.

There were only two options for us. The Americans had looked at oiling—opening up the cables and pouring oil in—but I was not convinced by the science or engineering behind that. Dehumidification seemed to me to be the best way forward. Our whole team and the consulting engineers that we employed agreed on that. We put together a contract for dehumidification, which is now installed on both cables. That job was completed in 2009. I have a degree of confidence that we can pump dry air into cables and get dry air out and that we can surround most of the voids within the cable with dry air. That dry air has a relative humidity of about 40 per cent, which, in theory, will stop galvanised steel corroding.

I cannot give an absolute guarantee about whether the cracks within the steel wires that have already corroded will form breakages in the future. We hope that we can slow down that process or stop it to an extent that we can flatten the curve to the point where the strength of the cable is able to provide a service life for the bridge to carry public transport in the future, but I cannot give an absolute guarantee about that.

The Convener: Thank you for that.

A report that is now in the public domain—and which I believe is being presented to a meeting on 26 February—sets out in considerable detail what you have summarised. That being in the public domain has led to press speculation that the case for a second bridge is predicated on out-of-date assumptions about the lifespan and potential future capacity of the existing bridge. Basically, what you have said is that, at each turn in inspecting the outcomes of the initiatives that have been undertaken, doing so has caused you to be more optimistic rather than pessimistic about the bridge's future. However, you clearly do not want to go beyond a certain point. I do not want to put words in your mouth, but I do not think that you would say that the existing bridge will be capable of sustaining all that is required of it in perpetuity.

Barry Colford: It is doubtful whether, at any point in the future, anyone could get me, as a professional engineer, to give an absolute guarantee on the main cable on the Forth road bridge. You would not get such a guarantee from any engineer, whether on the Golden Gate bridge, the George Washington bridge or any of the Japanese bridges, simply because we do not know. We do not know what the mechanism of failure is that causes the cracking and wire breaks. A lot of research is going on, but we do not know what those mechanisms are. Therefore, it is an engineering judgment. My engineering judgment is that, although I am hopeful that dehumidification can either reduce or significantly slow down the corrosion, I cannot give an absolute guarantee. You are right that my confidence will increase the more times that I examine the situation, but I will never be able to give an absolute guarantee.

The Convener: This is a difficult question to answer but, supposing that politicians and the public had not been aware of the remedial actions that are under way because they had just been happening quietly in the background, but we were now being made aware of them and of their potential success and your increasing optimism, would that have affected the wider public debate?

Barry Colford: I would hate to speculate on what politicians would make of the results of an engineering inspection. There has been comment on the reports that FETA has put into the public domain as we have reported to our board. When we first discovered in 2004 that we had an issue, we considered whether we could stop the cable corroding and the best available method of doing so, which was dehumidification. We also put acoustic monitoring on the bridge, which allows us to listen for future wire breaks. Unfortunately, acoustic monitoring does not tell us the past or the future; it tells us only what is happening now. Acoustic monitoring is another fairly new engineering application on main cables of suspension bridges. A lot of work is starting now in the US to get a validation of acoustic monitoring, but the technique is still fairly new. It is an early-warning device. It does not reduce corrosion, but it gives us an idea of wire breakages. As I have reported, we have had 50 of those since 2006, which in the context of the whole cable is not a great deal.

We also conducted a main cable replacement or augmentation study. Augmentation means supplementing the main cable, perhaps with smaller cables. We considered what would happen in the worst case if dehumidification did not work and we could not stop the corrosion. We carried out a study with a consulting engineer and an economist to consider what would happen to the economy if we carried out certain refurbishment works on the cable.

It was fairly clear from the beginning of the replacement study what the best way was. We considered the very few cable replacements and augmentations that have been done—on the Tagus bridge, the Tancarville bridge and the Aquitaine bridge in France. We found that the best approach would be to close the Forth road bridge for three years to replace the cable; that would be the most economical way of doing it and it would eliminate risk to users. Any approach that involved keeping the bridge operational would leave a residual risk to users. We could not eliminate risk

because 65,000 to 70,000 vehicles a day would be passing below a work area that was 90m up in the air.

Managing that risk was a big part of the study. We looked at minimising disruption, and the study said, "Yes, you can replace the main cable on the Forth road bridge." The cost that came out of the study was £122 million, but that cost excluded risk, optimism bias and inflation—I caution that it is at the low end of cost. However, the capital cost was outweighed by the consequences of having to close carriageways for 26 weeks at a time. I mentioned the chaos and congestion that is caused when we resurface one carriageway for a weekend. If we had to close a carriageway for 26 weeks, with 32km to the next crossing, the public outcry would be fairly substantial, to say the least.

The Convener: Ironically, it is an option but only if the new bridge has been constructed first.

Barry Colford: I have said that we can replace the cable, which would take between seven and nine years. For two and a half of those years, we would have substantial traffic management issues, which would cause significant disruption for our users. There would still be a managed risk to users because we would be 90m up in the air, putting large pieces of steel above the heads of those crossing beneath. It is difficult, although not impossible, to manage such work. Operationally, we have had full closures of the bridge for periods, and carriageway closures for substantial periods. As the chambers of commerce mentioned, the effects on the economy were substantial. Our economist considered the issue. Using figures from the Treasury, we estimate that there would be £650,000 a day in road user delay costs to close one carriageway of the bridge—Graeme Malcolm referred to that earlier. If we were to close it for 26 weeks, the costs would be significant. That excludes the wider cost to the economy, and the jobs that would be lost in Fife—that came out at more than £1 billion.

The Convener: Yes. We touched on that earlier.

Barry Colford: Our economists noted that there would be approximately 3,000 job losses in Fife over the period, some of which would be permanent, unfortunately.

The Convener: On your inspection of the remedial actions, the increments that you feel confident about predicting tend to be in years rather than decades. Looking forward to future inspections, do you expect increments to be on that scale, or on larger timescales?

Barry Colford: That is an interesting point. Guidelines that came out in 2004 are the only guidelines on the inspection and strength evaluation of main cables—they were developed by the National Academies in the United States, and are a riveting read for engineers but perhaps not so much for the layperson. We were involved in workshops in the States to bring the document into being. The National Academies had recognised that there was an issue with the large stock of American suspension bridges. We had the first draft copy in 2004, which we used to inspect the cables; it gave guidelines on inspection frequency, depending on the findings, which varied between five and 10 years. Engineers and scientists love it when there are long periods between points that curves can be fitted on to show how trends are going, but obviously we want to know what is happening within the cable at shorter intervals. Between five and 10 years is an interval that could perhaps be established once we get an idea of further points on the strength curve. It is about establishing those points to get confidence.

Hugh O'Donnell: My understanding is that there are question marks over not just the cabling but the anchoring of the existing bridge. What is the position with regard to the anchoring? If remediation work needs to be done on that at the same time as the new crossing is being constructed, am I right in thinking that there could be a double impact on the communities on both sides of the river? Is that an accurate portrayal of what might come to pass?

12:45

Barry Colford: We have some concerns over the anchorages of the Forth road bridge simply because we cannot inspect them. They are in buried concrete tunnels. There was a fantastically innovative idea of strengthening the tunnels by putting in post-tensioning wires, which are strands that are used to strengthen the concrete in the rock tunnels. As you can imagine, with each cable taking a load of about 14,000 tonnes, the load needs to be anchored somewhere. The anchorage is a rock tunnel—there are four of them—on both sides of the river. The rock tunnels were used because there was a plentiful supply of good rock, especially on the north side, which seemed an ideal way to anchor the cables. Regrettably, they are fairly unique in the world because they have post-tensioning in them. However, concrete is not a very good material in tension. Given that there is 14,000 tonnes of load trying to pull a concrete plug out of rock, post-tensioning was used to strengthen the concrete within the tunnel. Unfortunately, post-tensioning was used in bridge decks and other road bridges in the 1960s and 1970s and was then found to have problems due to corrosion getting into the voids in the grout that was used to fill the post-tensioning ducts.

Journals written at the time of the bridge's construction mentioned those issues. In 2005, we received some papers from a private source that told us that the journals had perhaps not quite got to the bottom of the problem. That led to the notion that we should go down and try to find out the condition of the post-tensioning within the rock tunnels, but it is difficult to get there. Having worked on the issue for some time, we have come up with a scheme to excavate down to the tunnel to try to expose the post-tensioning to find out its condition. That scheme is on-going, but we have not yet finalised it and we are not even out to tender on it. That scheme will go ahead at the same time, or just before, the new bridge is constructed. At the earliest, we expect to find out the results of that inspection in around 2014. At the moment, I cannot predict what those results will be. We will not know that until we can go down and see what is there.

Hugh O'Donnell: That confirms my conjecture that we will have two lots of construction sites. If the construction of the new bridge and the inspection of the anchoring of the existing bridge happen simultaneously, there will be a double whammy for the communities on both sides of the river.

Barry Colford: In fact, we hope to limit the work to the south side of the river. We have chosen the south side simply because we are likely to find the worst conditions there, so that is the best place to look.

Excavating near an existing viaduct and down to a rock tunnel will be a significant and challenging piece of civil engineering. However, the work will be contained pretty much within the south anchorage compound, which is fairly remote in South Queensferry. We do not expect that there will be any impact on users of the bridge, but there will be impact on the community. We have fairly close links with South Queensferry community council, which we meet regularly and we have aired these issues. We will have significant consultation with the community when the investigation is being carried out.

Joe FitzPatrick: Obviously, most of the discussions on the maintenance concerns about the existing bridge stem from the cabling issues, but we have now heard in response to Hugh O'Donnell's question that there are questions around the anchorages. Are there any other maintenance issues of concern? Why would those issues be less of a concern if we could remove the heavy traffic from the bridge?

Barry Colford: We have already rescheduled one of our main contracts, which was the replacement of the expansion joints on the bridge. If you pass over the bridge, you will see at the main towers the expansion joints, which allow the bridge to move backwards and forwards not only for temperature variation but due to wind—it is a fairly lively structure—and traffic loading. We have rescheduled their replacement until after the second crossing is built to minimise disruption to users, because we would have to close the carriageway for a period to carry out the works.

There are other issues. Heavy goods vehicles cause a significant impact on the bridge deck. When the bridge was opened in 1964, the maximum weight of goods vehicles was 22 tonnes to 24 tonnes and there were not that many of them on our roads. However, 40 tonne vehicles are now very common and have a significant effect on the bridge deck. The surfacing is only 38mm thick in total. That is very thin, and it was made that way to keep down the cost of material because most of the load on the bridge is the weight of the structure itself.

We are reviewing a number of projects to determine whether we can put them off until the new bridge is opened or cancel them because traffic will move elsewhere.

There are also environmental loads on the Forth road bridge. We cannot stop painting the bridge because traffic is removed. Our biggest capital project within the next 15 years is the maintenance painting of the bridge. Similarly to our sister bridge just downstream, painting costs a lot of money because of the encapsulation and access. We think that it will cost us about £65 million to paint the truss alone on the bridge. That is a significant sum of money. We have to paint the bridge regardless of whether we have public transport on it or it is open to full vehicular use.

The Convener: Thank you. We have quite a lot of ground to cover and limited time, so we had better press on.

David Stewart: What financial constraints are in place to prevent cost overruns in the massive £2 billion-plus project? What has been learned from previous transport projects in which there have been problems with the project being over budget when it is completed?

John Howison: The primary vehicle to constrain cost overruns is to take forward the project as a design and build contract, with substantial risk and responsibility transferred to the contractor. I mentioned that we had run a pre-qualification exercise and that we now have two bidders working with us to provide tenders for the project, which should be available next December. Our experience of design and build contracts is that, once we reach the point of a tender and the award for contract, the amount of overrun is normally limited to 3 to 4 per cent. That should be compared with the normal type of civil engineering contract, which we call measure and value, in

which the overrun has been found to be 26 to 30 per cent. However, in this case, because of the duration of the contracts, the public sector would carry the risk in relation to inflation.

David Stewart: In your experience, have there been examples of design and build projects that have also had cost overruns? Is there any guarantee that, just because it is design and build, that will not happen?

John Howison: The Scottish Office moved from measure and value contracts to design and build contracts in about 1990. The evidence shows that, before that, the average cost overrun was about 30 per cent—you will appreciate that that is an average; some contracts came in at about 60 per cent. Following the change, the average cost overrun has been 3 per cent.

David Stewart: There is another factor, which you mentioned: because it is a longer-term project, if the public sector gets the inflation figures wrong, that could also lead to an overspend.

John Howison: There is an inevitability to that. The question is whether we can transfer that sort of risk to a contractor over the length of period involved. It is common practice to transfer that risk and pay a premium for it for contracts of up to two and a half years. However, at five years, the potential for inflation and associated costs would go way beyond the normal allowance for profit margins within a contract and would put at risk the contractor's ability to continue and complete the works. That would not be in our interest.

David Stewart: On a slightly techie point, we are not just talking about the retail prices index. Presumably, inflation is higher for construction materials than the normal spread of—

John Howison: That is exactly right. Construction is based mainly on labour, plant and materials. In the 1970s—the last time that inflation was very high—the Department of Trade and Industry invented a specific formula using a number of indices and the formula and indices have been maintained since then. The process is well established and fairly stable, and we will use it with the added sophistication of looking at a combination of the various elements averaged over the span of the contract and how they will relate to the road networks, the general civil engineering construction of the main crossing, and the steel work for the deck. There will be three separate targeted indices.

David Stewart: Time is tight, so I will move on, unless anyone else wants to come in.

John Carson: I have a couple of small points to make about what has been said. I welcome the thought of there being a public service facility for crossing the Forth, but the average bus in the United Kingdom has about nine passengers on it over the course of a day; buses do not run with 45 passengers on them every minute and hour of the day. That should be borne in mind in any consideration of the existing bridge being used as a public service route. A lot of the buses are empty, effectively.

To stem the growth in traffic flow on the bridge, we would have to build a new Ferrytoll facility in Fife every year. Pretty soon, Fife would become one big car park. I do not think that the park-and-ride facility strategy holds up. That should also be borne in mind.

Barry Colford talked about suffering two and a half years of delays in the middle of the seven years for recabling the bridge. Believe it or not, we will suffer delays of that sort just by building the northern gyratory on the north side of the new crossing. The fact that traffic has to merge, and that a new road will have to be built very close to an existing road—it will go below that road in places—will lead to huge delays. Every time that the traffic backs up going north on the bridge and Barry Colford turns on his traffic lights, the whole south side of the bridge will totally seize up. People must have experienced that in trying to go north when the bridge has been closed, even just because of wind; the whole of Edinburgh, Queensferry, Broxburn, and Kirkliston are seized up for hours. The bridge might well bring a bit of relief, but it will not come without pain.

David Stewart: That brings me nicely to my next question. Transport Scotland gave us figures—you might want to confirm or deny them—that show an estimated 40 per cent increase in car use over the new crossing by 2017. What traffic studies has Transport Scotland done? That ties in with Mr Carson's point. Is that estimated figure correct?

John Howison: Those are the figures for the transport model for Scotland, which is a powerful analytical model. The starting point is the planning predictions for development in areas across Scotland.

The majority of the traffic increases that we have been talking about and the situations that we would have—with or without a new bridge—are brought about by development pressures. There is also an increase in car use with regard to the construction of the new bridge across the Forth at that particular time.

13:00

I draw members' attention to the stage 3 scheme assessment report, which considers various cordons. It shows an 11 per cent increase in cross-Forth traffic—the figures are 83,000 vehicles a day under do-minimum traffic and

92,000 vehicles a day under managed crossing traffic—but the total amount of traffic across the crossing would not increase by 11 per cent; it would go up by around 6,000 vehicles a day, which is around 3 per cent in total. The reason for that is that, as traffic on the Forth increased, there would be a reduction at Kincardine to offset it. Similarly, on traffic going into the west of Edinburgh, there would be very little increase in the traffic going into Barnton on the A90, and there would be an offsetting decrease in traffic running through the A71. There would be extra traffic in the system as a result of planning pressures, but much of the additional traffic on various routes that would arise from the construction of the new bridge is to do with traffic moving around a very large network.

John Carson: I would like to pick up on a point about inflation that John Howison talked about earlier. I found out something only yesterday from a report that the clerk sent me from EC Harris. I have been involved in very big projects throughout the world, and it is not my experience that the Government will take the inflation rates. All the major private finance initiative projects that I have worked on have involved RPIX—RPI minus mortgage interest payments. Escalations in costs have been linked to a formula and an RPI adjustment. Most PFI projects on which I have worked have had that almost as an intrinsic clause.

I caution members about allowing Transport Scotland to sign a contract that has no link to inflation. As John Howison said, inflation was up at 22 per cent in the early 1970s. Believe it or not, I was a contractor then. Contractors made money hand over fist simply by playing the costs over a few months. Members can imagine that people could have bought something in one month and delayed claiming for it for another six months. With inflation running at 22 per cent, 11 per cent would be picked up on material costs just by delaying claiming for them. I caution against taking that approach.

David Stewart: I suspect that the discussion could run and run, but I am conscious of time.

Hugh O'Donnell: Mr Henderson's description of the Government's three objectives was succinct and nicely put. However, if I understand things properly, they involve the closing down or taking to itself of various powers that currently protect communities throughout Scotland. Those powers are to do with noise abatement, pollution and the management of hours worked, which would normally rest with the City of Edinburgh Council, I think. Therefore, the piece of work is not quite as straightforward and ordinary as Mr Henderson's eloquent description indicated. That is the wider framework.

We have heard from previous panels that public transport is a critical part of the proposal. To what extent have public transport, park-and-ride facilities, issues relating to access to the M9 and the impact on communities on the route been taken into account? What is being done to mitigate impacts?

John Howison: On policy, the Forth replacement crossing and the strategic transport projects review need to be considered together. The latter contains a number of public transport and road management elements that complement the Forth crossing. Of course, many STPR projects would not work without the new bridge being in place. It is clear that it must be in place to provide opportunities for those other elements.

Hugh O'Donnell: It is equally true that the new crossing will not work as effectively without the public transport mechanisms, or even cycle and foot access to the new crossing. Is that not also a consideration? There is a balance between the two, I would have thought.

John Howison: A limited number of the public transport initiatives would be of value during the construction period. I am thinking of the Halbeath park-and-ride site and some limited use of hard shoulders by buses during that period. Once the new bridge is in position, we expect it to work with or without the public transport provisions.

To accommodate increased travel and public transport use thereafter—we are just talking about the year of opening—we will clearly need to rely on a larger proportion of travel being by public transport. We are not proceeding with the scheme with a predict-and-provide approach to working out how much road capacity will be required 30 years beyond construction. We are considering replicating and slightly improving—but without a step change—on the 2006 situation at the year of opening. Thereafter, public transport is required to cope with additional travel. We have been clear about that.

From that point of view, I agree with the witnesses who spoke earlier, but with this exception: my answer to the question whether it is essential to have the public transport mechanisms in place on the day of opening is that it is not, but it would be desirable for most of them to be in place at an early stage. They can follow when they are affordable.

Cycling and walking are catered for on the existing road bridge, which will be a much better environment because the traffic will move away from it. It is important for walking and cycling still to be catered for on the existing bridge, as the national and local cycle networks concentrate on Queensferry. Is such provision required on the new bridge? Essentially, no. The new bridge will

be a motorway, and we do not expect there to be cycling there. Would it be cheap to provide cycling provision? No; that would substantially increase the width of the bridge, which would be fairly expensive. Provision for cycling and pedestrians on the new bridge would cost not tens of millions of pounds but something several orders of magnitude above that.

Should something happen to the existing crossing that is unforeseeable at the moment, such that it does not exist in the future, could there be some form of facility to carry pedestrians across the new bridge? Yes, not to the extent of providing dedicated pedestrian ways, but there is a central area between the two carriageways where pedestrians could be carried over by footbridges and taken off at the other end, should that be necessary.

Hugh O'Donnell: I return to the question that I asked about dual operation, the construction of the new crossing and repairs to and maintenance of the existing bridge. If the existing bridge were to be closed down, there is no alternative provision for cyclists or pedestrians in the proposal for the new bridge. Effectively, would we stop people doing what they currently do if both sets of works were going on simultaneously?

John Howison: There are a number of assumptions there. The first is that the works on the existing bridge would close down the cycling and footway facility. Should that happen, however, footbridges could put in place across the carriageways to carry pedestrians on to the central reserve of the new bridge, and they could walk along that and be carried off at the other end. Therefore, it is not precluded, but it is not something for which we are making an allowance.

Hugh O'Donnell: Would Mr Colford be happy with pedestrians walking on his bridge when the cables were being repaired?

Barry Colford: We have managed successfully to keep at least one cycle track and footway open during all the works that we have done in the past 25 years. We work hard to do that. We consider that cyclists and pedestrians are as important as is the other traffic on the bridge and we ensure that that facility is available to them. That has not been an issue in the past and we have managed to keep the track open when we have undertaken significant works on the bridge such as strengthening the towers and replacing the hangers. I cannot give an unconditional guarantee that such an issue will never arise, but we do not foresee it—we expect to be able to accommodate cyclists and pedestrians.

John Carson: John Howison knows much more about the new bridge than I do, but I understand that it will be held up on three circular towers that come up between the carriageways. It is difficult to see how footbridges could go up the middle of the bridge, because people would immediately face the three large circular towers, which would put them back on to the carriageways. I think that people would be run over.

Mike Glover (Transport Scotland): John Carson does not understand the construction of the towers. Through each tower is an opening that is 1.5m wide and 2m-plus high, which goes from one bank to the other. A person can access the bridge from one abutment—in fact, there is a staircase on the south side that goes up to the central reservation for that purpose—and go across the bridge, through the towers and on to the other abutment. That is the detail; a tower will not be an obstruction.

Hugh O'Donnell: Right, gentlemen—that is all very interesting, but perhaps the debate is for another session.

The STPR has three principal priorities:

"maintaining and safely operating existing assets ... promoting a range of measures, including innovative solutions, that make better use of existing capacity; and ... promoting targeted infrastructure improvements where these are necessary, affordable and practicable."

How does the proposed crossing fit with those priorities and into the STPR?

John Howison: The proposed crossing is one element of the STPR. David Anderson can better explain the situation.

David Anderson (Transport Scotland): The STPR contains 29 recommendations, an early part of the work for which was the Forth replacement crossing study. That work was based on all the background that we have seen, and it recommended that the crossing needed to be replaced, on the basis of the eight objectives that John Howison described. The initial study considered whether we could do nothing, if we assumed that the existing bridge could be fixed. The feeling was that that would not address the planning objectives of providing new opportunities for public transport and so on. As John Howison has said on previous occasions, that means that we have a distress purchase. The assumption is that the existing crossing is not available to us in the fashion that we would like it to be.

The STPR makes recommendations that apply around Scotland. Its first recommendation is maintaining and implementing the strategic road safety plan and its second recommendation is continuing to maintain and operate the rail network. The recommendations are based on the evidence about the various corridors and nodes around Scotland. Several of those corridors and other areas have accident rates that are higher than is desirable. Part of our thinking is that we

have a big asset—the rail network and the road network—so our first priority is to maintain and operate safely what we have.

We then move into the STPR's second-stage elements, which include improving intelligent transport systems and so forth, which allow us to manage the network better as it experiences increasing pressure.

We then finally reach the targeted infrastructure improvements to which Hugh O'Donnell refers, many of which deal with small and targeted areas and with specific problems around Scotland—for example, one intervention concerns providing opportunities for bypasses and new connections. Such projects involve not creating a major expansion of the network but using what we have better. I hope that that answer helps.

13:15

Hugh O'Donnell: It does indeed.

David Stewart: I will combine my questions because of the time—they are for Transport Scotland, but John Carson can also comment.

The STAG process—I am summarising its findings—deemed that the immersed-tube tunnel, which Mr Carson suggested was cheaper and more efficient, was in fact more expensive and more involved. My general question is: who guards the guards? Has Transport Scotland carried out an external review of the STAG process? What special challenges have to be considered in determining whether a river crossing should be a bridge or a tunnel?

John Howison: David Anderson will take that question.

David Anderson: The underlying appraisal process—the Forth replacement crossing study—comprises the five documents with which I am sure you are all familiar by now. It began by examining the planning objectives and worked its way through in a logical fashion, by considering, in the light of those objectives, the possible options for developing solutions. It then sifted those options against the appraisal criteria—the five Government criteria of safety, economy and so on—and the planning criteria.

That initial sift allowed us to recognise that the options consisted of bridges and tunnels—one can only go over or under the water, so the options are pretty limited. We sifted out ideas for barrages and so on quite early in the process, because of the environmentally sensitive nature of the upper Forth. That left us with options for bridges and tunnels in the same area as the existing Forth crossings.

We considered the impacts on the areas upstream and downstream of the narrow part of the river, which included the impact on environmental special protection areas in the Forth, and on the visual setting of the world heritage site that is the existing Forth rail bridge and the grade-A listed structure that is the existing Forth bridge.

We dealt with those factors and narrowed the options down to one bridge location, which was pretty much adjacent to the existing crossing, and three tunnel options, which we examined to determine whether they could be developed. Part of the difficulty with tunnels is that the land on either side of the Forth is at a higher level, and the river is in the middle. We would have to go under that, which would mean that we would end up with some pretty long tunnels.

In what is known as corridor E, which is downstream of the existing Forth rail bridge, the profile of the bed meant that the construction of a roadway to get vehicles under the river bed with sufficient cover to produce a safe tunnel would involve building an enormously long tunnel. We examined that corridor, and considered putting an immersed tube in the centre section to keep the profile up so that the tunnel came out at a sensible gradient. The work on that was difficult, and it took a long time.

We worked during the summer of 2007 on the option of putting an immersed-tube tunnel in corridor C. That still presented us with the challenge, given the bed profile, of putting an immersed tube in the bed of the river. We would still have needed enough cover to ensure that ships did not impact on the tunnel.

Such a tunnel would have to be connected on either side to get the roadway back up to the higher level that I described earlier. That would involve more than simply putting an immersed tube into the river, as it would have to be connected to some fairly long tunnels on either side. For all those reasons—I am sorry that this is a very long description—we came out of that process with the particular costs that you have seen.

We had the opportunity, throughout that process, of discussing the approach and the costs involved in that option with a number of contractors and with various people who are involved in designing tunnels around the world. They broadly accepted the plan and talked us through it. We also had the opportunity of speaking about the approach to the chaps who are at a similar stage in the work on the new Tyne crossing, which is an immersed-tube tunnel, and their work has borne out our thinking on that. We had comfort that what we were proposing was

reasonable, and that the cost could be worked through logically.

David Stewart: Before I bring in Mr Carson, can you confirm whether there is an independent or external review of the STAG process?

David Anderson: The STAG process is a way of providing information to decision makers. It is open and the documents are readily available. There is not a routine audit of STAG appraisals. During the process, we had the benefit of a peer review by some civil engineers who are far more eminent than I am, to ensure that we were on the right lines. Although we have not had a formal audit of the process, we have had a peer review of the outputs.

John Carson: Where do I start? What David Anderson said about the immersed-tube tunnel is partly true as regards the location that has been decided on, but I do not want to get into justifying an immersed-tube tunnel. My objection is partly to do with the fact that the sifting process was wrong.

I will give you an example of how wrong it was. A figure of £9 billion was put on the tunnel that David Anderson talked about, which would have run adjacent to the existing rail bridge. The Swiss are tunnelling a distance of 150km from France to Italy, under the Alps, for £6.9 billion. That puts the issue in perspective. As anyone who has driven into Switzerland from Germany and then into Italy will know, it is mountainous country. That mountainous country is being tunnelled under for 150km at a cost of £6.9 billion. I do not need to provide any more examples to prove that the sifting process was heavily biased towards a bridge. That said, I accept some of the things that David Anderson said.

There is an ideal site for an immersed tube to the west of the dockyard at Rosyth; indeed, there is a dry dock at Rosyth where the tube could be built. Since I got the information from the clerk last night about the EC Harris paper, I have extracted some information for the committee. Our near neighbours in Denmark are experts at building immersed tubes and big cable-stayed bridges. The Øresund crossing is a fine example of both. The Danes are currently planning a 19km to 20km crossing across the Baltic from Denmark to Germany.

A question was asked about independence in the process of looking at designs. The Danish Government decided to commission two sets of consultants, of which one was commissioned to look at a bridge crossing. I have a paper that I am sure the clerk will hand round if members would care to have a look at it. The bridge that is being designed in Denmark is substantially larger than the Forth crossing bridge and has three main spans rather than two navigation spans. The cost that is quoted is a 2008 cost.

In the paper that I have circulated, I have taken the Danish costs and, in the same way as EC Harris did, I have reduced them to produce equivalent costs for a Forth crossing to the west of Rosyth, which is ideal for an immersed tube, and for a cable-stayed bridge in the area that Transport Scotland has chosen. The prices that I have produced are way below the cost that Transport Scotland is predicting. The cost of the bridge is three to four times higher than it should be. Worse still, Transport Scotland has conditioned the market, which means that it will not get a cheaper price even if it goes through the whole tendering process again. The contractors now expect to get that money from Transport Scotland.

The Transport Scotland estimate does not stack up. Ask the Danish Government. The information that I have used is freely available on the internet. The Danes are experts—they have built such bridges. I do not think that any of the guys from Transport Scotland have on their CV anything that would come close to having built a project of the proposed size.

Mike Glover: I am sorry, but I must answer that.

John Howison: Convener, you invited me to come in if I thought that I needed to provide a balance.

The Convener: Before you do, it is important to say that Mr Carson is a witness and not a member of the committee, in case you feel that you have to respond to his points, but please go ahead.

John Howison: The Scottish Parliament information centre has recently done an international comparison, which stands for itself. I will hand over to Mike Glover, as someone who has been involved in constructing this class of work, to provide some perspective.

Mike Glover: My first point is that the same designers who did the Øresund bridge and the Stonecutters bridge are doing the new Forth crossing bridge.

John Carson: I know.

Mike Glover: When you say—

The Convener: Things might deteriorate if we start all that.

Mike Glover: I am sorry. When it comes to track record, the bridges are directly comparable. I must emphasise that every big bridge or crossing has unique characteristics. It is not possible to just lift one up and put it down somewhere else.

The most important point is that a number of factors affect the cost of the crossing, because

there can be many differences. I will list the parameters in a second, but the only sure-fire way to get a reliable estimate of the work is to do what we call a bottom-up estimate. In other words, you cost it in exactly the same way as a contractor would. You estimate the resource that you require, the number of people that you require, the length of time for which you require them and the skills that you require, and you speculate on where the material would come from. You arrive at a profile for materials, labour and plant. You then put costs against those—those costs will apply to the community in which you are working. That is the way in which we approached the estimate on this project, using our experience and knowledge. We have done exactly the same as any contractor would do. It is not about taking lumps of concrete and multiplying them by £X per cubic metre; it is a matter of assessing the requirements of the task. That is the only way that you can do a major bridge.

Secondly, I want to point out where the difficulties arise in making a comparison—it is easy just to pluck numbers out of the air.

The first issue is the nature of the crossing. Øresund, which Arup is very proud of, is basically a viaduct. It has one big bridge in the middle, which has a span of about 490m, but the approach viaducts are much cheaper. The other point about Øresund is that the sea depth is quite modest and, more important, the geology is consistent from bank to bank. Indeed, the foundations used simple caissons that were floated out and sunk into the sea. That is not the case in the Forth, where there is very deep water and a very fractured geology. In other words, the geology is very different from the south to the north and changes throughout. Those factors affect the cost of the project.

The second issue is the accountancy that is used in a particular community—basically, how it costs a project. I was interested in the Freeman-Bell calculations, for example. The Danes take a 10 per cent contingency.

Another point is that it is very dangerous to look at estimated costs or, indeed, tender costs in isolation, because the honesty and transparency in some countries are not what you expect them to be. I am not suggesting by any stretch of the imagination that that is the case in Denmark, but many countries do not apply taxation to their projects. The Stonecutters bridge is a classic example: no taxation is applied to any of the costs and there are subsidies for materials and so on. It is wrong to pluck numbers out of the air and use them as comparators, particularly when all those other parameters are not taken into account.

The other very important aspect is the contract form. As John Howison outlined, we have a design and construct strategy with, I emphasise, work that is very fixed in scope. David Stewart raised a point about how we control overruns. Some design and build contracts go very badly wrong because the scope of the work changes after the contract is awarded. Change is the big issue. We have therefore put tremendous effort into trying to define and constrain the scope of the work. That is one of the reasons why we—I can speak personally here, I hope—have tried to keep the public transport issues separate. It is not that we do not believe that they are important; it is that they confuse the scope of the project and make it less certain that we can deliver it in the form that we envisage. Often contracts are not let for work whose scope is fixed, so the figure that you read—it is often called the tender price—bears no resemblance to the outturn price.

The last item is the honesty and transparency of the estimates that we have put together. If you go through the sequence that I have described and ask what the differences are between each of the locations, you will find remarkable differences between them—to the extent that you cannot compare one with another in that way. You have to do a bottom-up estimate.

The Convener: Does David Stewart want to come back on that point?

David Stewart: I am sure that this debate could last for most of the afternoon. Given the time, however, I hand back to you.

13:30

The Convener: Thank you. I want to move on to economic and sustainable development and social inclusion. Joe FitzPatrick will start on that.

Joe FitzPatrick: I will try to condense my questions as much as I can. What assessments were made of the impact of the project on the wider economy, and how important is the project as a driver for increasing economic activity?

John Howison: The standard method of undertaking a cost benefit analysis in such cases is to look at the transport efficiencies that the project will bring about. In this case, that was done through a high-level transport model for Scotland and, at a more detailed level, a paramics microsimulation model, which looks at individual cars moving across the network rather than just the global picture. That allowed us to assess the additional advantage that the intelligent transport system would bring to the project. Layered on top of that was a wider economic benefit assessment, which is reported in the policy memorandum and came out with a cost benefit ratio of more than 2. Is that a particularly high cost benefit ratio? It is not as high as those for some of our other projects because this is not an elective scheme whereby we are seeking to improve the transport network;

this is a distress purchase whereby we are trying to avoid going backwards and losing a facility that we already have. As you heard from the chambers of commerce, it is not so much about what the project will add as about what we will lose if the project does not go ahead.

Joe FitzPatrick: On what we could lose, what impact would there be on planned levels of residential and commercial development if the project were not to go ahead?

John Howison: I can give you only a personal assessment of that, which is probably less than you received from the previous witnesses. The project is about the integration of Scotland and people's ability to live in one place and work in another and to be mobile in terms of their jobs. Would Edinburgh be able to exist without the dormitory facilities of Fife? Conversely, would Fife industry be able to survive without the ability to transfer labour and supplies across to Edinburgh? Those are the big, related questions.

Having said that, the mathematical modelling is based on the planning assumptions that were brought to the process by the various councils. As you can see, the major part of the analysis shows that there will be a significant increase in flows with or without the bridge. At the beginning of the study, we were looking at a different situation entirely, in which the bridge did not exist. That meant that lots of trips that take place now would not take place and that those that did take place would have to be diverted via Kincardine. The cost benefit analysis that was undertaken at that time was bigger, by an order of magnitude, than the one that we are working with at the moment, which relies on the presumption that, even if the bridge did not go ahead, at least the existing bridge would be repaired.

Joe FitzPatrick: That probably covers most of the problems. Are you aware of any businesses that have said either that they have not located in the area because of the uncertainty or that they will locate in the area when the new bridge is built? The question was answered by our earlier witnesses, but are any of you aware of any such examples?

John Howison: The most effective review of that was the one that was undertaken as part of the FETA examination.

Barry Colford: We carried out a survey as part of our main cable replacement study by Roger Tym & Partners, the noted economists in Glasgow. We surveyed businesses in Fife, the Lothians and Edinburgh on what would happen if access to the bridge was unavailable or restricted for long periods for main cable replacement. The survey showed that if the Forth road bridge was out of action or access to it was restricted for any reason, that would have a significant effect on the local economies, most significantly in Fife where, as I think I said earlier, we would be talking about more than £1 billion of lost turnover and a significant number of potential job losses.

The Convener: I think that we have covered some of the issues that we were going to ask about, so we move on to David Stewart.

David Stewart: I have a brief question on costs. What are the latest estimated costs of the project? Do they differ from the figures that are set out in the financial memorandum? Just so that we are completely clear, if there are only a couple of bidders—we do not know the state of play yet—will there be any funding for the unsuccessful bidder?

John Howison: The figures in the financial memorandum are the most up-to-date figures for the scheme that is brought forward in the bill and represented in the environmental statement. The figures have not been updated.

There are two forms of support for contractors that bid for the work. As we are taking the tendering forward in parallel with the bill, there is always the risk that Parliament may not wish to grant us consent to go ahead. That is not a situation in which we normally find ourselves—normally, we secure the statutory consents before moving forward. However, to obviate the risk of finding ourselves with restrictions on the existing bridge and no new bridge in place, we have fast-tracked the tendering to take it and the bill forward in parallel.

If the process is compromised or abandoned, each bidder would receive the costs that it incurred to that date, up to a cap of £10 million each. That is a contingent liability. It has been reported to Parliament through the Finance Committee and was approved in October.

The second form of support is called the unsuccessful bidders premium. That provides half of an unsuccessful bidder's costs up to a cap of £5 million. The aim is to ensure that, once the bidders start on the process, they continue to be motivated to see the process through and to maintain competition throughout the bidding process.

David Stewart: In your experience, are those sums unusual? As a layman, they seem highly unusual to me—I do not know whether other committee members have the same view. I presume that we are talking about public funding through the Scottish Government's transport budget.

John Howison: The contingent liability is fairly unusual, because normally we expect the statutory provisions to be in place before we start the tendering process.

We have provided support for bidders on a number of occasions before, largely because we are in competition with other clients—clients who move forward with different forms of contract that do not impose the rigour during the tendering process that our scheme does. We have applied such support on the A830 scheme, which recently opened near Morar, the Kincardine bridge and the M74 in Glasgow, so it is not uncommon to support bidders.

David Stewart: I have a final question so that I am clear in my mind. We do not know the position yet, but hypothetically would any unsuccessful bidder be eligible for sums under both categories of support?

John Howison: No, it is a case of either/or.

David Stewart: I think that the second category of support was up to £5 million.

John Howison: Yes.

David Stewart: So in theory, the support could be £5 million or, in the case of the first category, it could be higher than that—you said that such funding would cover the costs of the project to date.

John Howison: In both cases, the support is a reimbursement of costs. In the case of abandonment of the process, the reimbursement would be 100 per cent of costs up to a cap of £10 million. The unsuccessful bidders support is for 50 per cent of costs up to a cap of £5 million. Clearly such support is necessary so that there is an incentive not just to take part in but to win the competition.

David Stewart: That is fine, thank you.

The Convener: That brings us towards the end of the evidence session. Mr Carson, is there anything further that you would like the committee to consider? You have spoken eloquently to the principal arguments in the paper that you submitted, so we understand them.

John Carson: Yes, I have a couple of points over which I take issue with David Anderson and Mr Glover.

David Anderson referred earlier to a peer review. I do not know whether any of the committee members has looked at the peer review, but every time that the group met it came up with two real problems: first, that the project has never been consulted on properly and that it was therefore in danger; and secondly, that it does not have an appropriate, experienced project director. The committee can decide for itself, but those were the criticisms from the peer review.

Mr Glover made a point about scaling up bricks and mortar and the like. That is exactly what the SPICe report does: it takes the spans of various bridges throughout the world and tries to apportion the costs to rationalise them back to a bridge price that is unjustifiable. Ask the Danes: they are building the bridge.

The Convener: I do not know whether the Transport Scotland witnesses want to say anything further or whether they stand by their previous contributions.

David Anderson: We can provide you with the names of the peer reviewers, who are two previous presidents of the Institution of Civil Engineers and a man who was very closely involved in the Øresund crossing. Their CVs, I hope, will speak for them.

John Carson: But what were the findings?

The Convener: I am sorry, but we do not work quite like that.

John Howison: May I make one point?

The Convener: Yes, of course.

John Howison: John Carson has left one or two things on the table. I presume that the committee will seek evidence from us later on those points.

The Convener: You can rest assured that we will.

That is it for this morning; I thank everyone very much.

13:42

Meeting continued in private until 13:52.

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