Dear Mr Farrell

Infrastructure and Capital Investment Committee

Forth Replacement Crossing Update 17

I refer to the commitment given by Transport Scotland to provide regular updates in relation to the Forth Replacement Crossing (FRC) Project. Update 17 covers the following topics:

- Progress Update
- Stakeholder Engagement
- FRC Public Transport Strategy

Photographs illustrating progress can be found at Annex A.

Progress Update

The project remains on time and within a further reduced budget range of £1.325 - £1.35 billion. In December 2015, a further £50 million was released from the project budget which means that a total of £245 million worth of savings have now been released since construction started in June 2011.

Since the last update, significant progress has been made on the North and South approach roads and the Queensferry Crossing.
Significant milestones achieved in the past few months include:

- Road construction including laying of road surfacing on the south side approach road (Photograph 1), realignment of the A90 northern approach and construction of the Ferrytoll Junction is progressing well when weather conditions allow.
- South Approach Viaduct – third east side deck concrete pour completed on 3 February with 2 concrete pours completed on west side. (Photograph 2 and Photograph 3)
- Pier S1 – 19 concrete pours (out of 23) completed.
- Pier S2 – 10 concrete pours (out of 23) completed.
- Precast deck sections – precast concrete decks have now been constructed on 54 of the deck units, in the Marine Yard at Rosyth. (Photograph 4)
- North Tower – Final concrete pour completed on 16 October (Tower at full height). 14 deck units erected. (Photograph 5)
- South Tower – Final concrete pour completed on 11 November (Tower at full height). 13 deck units erected. (Photograph 6)
- Centre Tower – Final concrete pour completed on 3 December (Tower at full height). 13 deck units erected. (Photograph 7)
- 40 deck units (out of 110) erected by 19 February. (Photograph 8)
- Fifth and sixth deck shipments from China arrived in Rosyth on 8 February and 15 February respectively. Final shipment expected to arrive early March.
- North Approach Viaduct launch started on 6 February and by 18 February was over 65% complete, having moved over 158 metres out of 230 metres. (Photograph 9) It is expected to be completed by the end of February, weather permitting.
- Average speed cameras on A90 Southbound from Admiralty to Scotstoun went live on 14 January. Enforcement is already taking place Northbound and delivering high levels of compliance.

**Stakeholder Engagement**

Community relations continue to be excellent with the North Community Forum and South Community Forum meetings taking place on 17 and 24 February respectively.

The project continues to attract a great deal of interest from a variety of stakeholders, including the general public, schools, colleges, universities, industry, international visitors and the media.

Since the last update, the project has undertaken a variety of stakeholder engagements, maximising use of the dedicated FRC Contact and Education Centre, engaging with communities in a proactive, open and transparent manner.

Annual project update briefings were held on 26, 27 and 30 January 2016 for elected representatives, media, wider stakeholders and six sessions for the public. There were 230 attendees across the three days.

The Project Exhibition re-opened on Saturday 30 January and will remain open every Saturday until project completion.
The Presentation Series which was held on the last Friday of every month from March – October 2015 will recommence on Friday 26 February. In order to meet the demand from members of the public, it will also take place on the last Saturday of every month from Saturday 27 February until project completion.

The overall Outreach and Education Programme has now attracted almost 45,000 individuals across all activities.

The project’s social media channels also remain popular. To date, over 131,000 people have viewed videos on the Queensferry Crossing YouTube channel, with 364 users subscribing. The official Queensferry Crossing twitter account @FRC_Queensferry has 1939 followers.

The latest Project Update was published in January 2016, a copy of which is attached for your interest.

**FRC Public Transport Strategy**

The FRC Public Transport Strategy Working Group continues to meet on a bi-annual basis, the most recent meeting was on 25 January.

The A8/A89 Corridor Study to identify potential improvements in public transport access on the corridor and through Newbridge junction itself has recently reported emerging findings. These are currently being considered by Transport Scotland, the City of Edinburgh Council and West Lothian Council and it is intended that these will be discussed between parties over the coming months.

Yours sincerely

David Climie CEng FICE
FRC Project Director
Annex A

Photograph 1 – South side main approach road construction (2 Feb 2016)

Photograph 2 – South Approach Viaduct (2 Feb 2016)
Photograph 3 – South Approach Viaduct (15 Jan 2016)

Photograph 4 – Marine Yard (2 Feb 2016)
Photograph 5 – North Tower (2 Feb 2016)

Photograph 6 – South Tower (15 Jan 2016)
Photograph 7 – Centre Tower (15 Jan 2016)

Photograph 8 – Overview (2 Feb 2016)
Photograph 9 – North Approach Viaduct (2 Feb 2016)
Top of the world!
A spectacular view of the team celebrating the topping out of the North Tower in October. This was followed by the topping out of the South Tower in November. And, in December, a major milestone for the Queensferry Crossing Project was achieved with the topping out of the Centre Tower, meaning that the construction of all three tower structures has now been completed. The towers are now at their full height of about 210 metres above mean sea level. This makes them the tallest bridge structures in the UK.

Working in the Community
10,000 school pupils have now come to the Project’s Contact & Education Centre to learn all about how bridges are built in the modern era.

Photo Update
Our double page photo spread brings you up-to-speed with all the latest action on-site.

Technical Focus
We take a look at how the all-important Approach Viaduct North will be launched out into position.
Spanning the Forth!

Welcome to the first edition of the Queensferry Crossing “Project Update” of 2016. Once again, we return to a “photo special” format, believing in the old adage that a picture is worth a thousand words. As always, a great deal of construction activity has taken place since the last issue so, first of all, here’s a brief summary of the significant progress made across the Project over the past three months. Please turn to the Centre Spread for the photographic evidence!

In December, the Centre Tower topped out at a staggering 210 metres above average sea level. The North and South towers topped out in October and November respectively. Completing all three towers (the highest bridge towers anywhere in the UK) is a major milestone for the Project and congratulations go to our tower construction colleagues and the concrete batching and delivery team on a job well done. The focus now is on completing the internal access infrastructure which includes the installation of an elevator system in each tower as well as the completion of the internal stairways. The enormous yellow cranes next to each tower (also the highest in the country) will stay in place for many months yet as they are being used for the installation of the 288 stay-cables which will support the road deck below.

Talking of the road deck, the complex operations to lift the deck segments into position are now in full swing. At the time of writing, we have installed 26 deck segments since the first was lifted up on to the North Tower in early September. In total, 110 deck segments, weighing on average about 750 tonnes each, will be installed before the bridge is completed. It is very exciting for all of us involved in the construction programme – and, we hope, for members of the public, too – to see the gaps between the towers steadily narrowing as the road deck begins to emerge and the “fans” created by the stay-cables take shape. Again, congratulations to all involved. This is leading edge civil engineering technology at its best.

Also at the forefront of civil engineering know-how is the imminent launch of the northern approach viaduct into position. Though shorter than its counterpart on the south shore, which was launched out incrementally over several months, the 5,600 tonnes north viaduct will be launched in a single, technically challenging operation which, we believe, will break new ground in terms of moving such a vast structure out over piers. Turn to the back page for details of how the launch will be achieved.

Turning to the network connections, the major demolition of the old B800 bridge over the A90 dual carriageway outside South Queensferry was successfully completed on schedule in October. We are grateful to local residents and the wider travelling public who heeded the advance notices about this operation and minimised any traffic disruption by staying away from the area over the two weekends concerned. On the north side, construction of the new Ferrytoll gyratory is proceeding well and late October saw one northbound lane of A90 traffic successfully diverted on to the first stretch of the new M90 motorway on the Project, supported by new structures recently completed for the new gyratory below. The second northbound lane was diverted at Christmas.

So, as you can see, it is full steam ahead on the Queensferry Crossing! After a fairly wild summer; it was good to have a relatively calm early autumn which allowed us to make excellent progress on all fronts. Weather, and especially wind, is the main factor with which we have to contend. Conducting operations at great heights in such exposed conditions means we are constantly at the mercy of the wind, so let us hope for an easy-going winter as we maintain our schedule to have traffic flowing over the bridge by the end of 2016.

In the interests of safety, may we urge everybody with children in their care to remind them to stay well away from our sites on both sides of the Forth. Construction sites may seem like attractive playgrounds to youngsters but they can be dangerous places to unauthorised, unaccompanied visitors. Our sites are fenced off and monitored 24/7 by CCTV cameras and security staff to keep people safe.

Finally, as part of our on-going community liaison initiatives, it was a pleasure in the autumn to welcome the 10,000th school pupil to visit the Contact & Exhibition Centre since it opened in 2013.

On behalf of everybody on the Project, we wish you a very Happy New Year.

Concrete evidence of success: some statistics

The topping out of the Queensferry Crossing’s three towers is an excellent time to mark the outstanding contribution which FCBC’s concrete batching and logistics colleagues have made to the towers’ successful construction. Here are some impressive statistics which put our concrete operations at the forefront of the industry:

- A total of 170,000m³ produced at 99.8% compliance
- The batching plant has operated for 3.5 years without a significant breakdown
- A total of 107,000m³ delivered to the marine structures on concrete delivery barges. That’s more than 1,500 trips!
- Over 20,000 concrete deliveries by the FCBC fleet of 11 mixer trucks
- Over 2,500 concrete pours executed across the Project since June 2012
- 21 of the pours in excess of 1,000m³
- A world record continuous underwater pour of 16,869m³ achieved in 2013 (15 days non-stop)
- All tower concrete successfully pumped up to a height of over 200 metres for each tower

Hats off to the concrete team – always top of the range!
VIADUCTS: A view of the Approach Viaduct South and view of its supporting piers. Looking out, unlike a hilly Spanish fort, the North Abutment seen completion in time for the launch of the Approach Viaduct North (see article on back page). The Approach Viaduct South. Note that the steel cables on the left of the piers will all be removed on completion of the Queensferry Crossing so that the piers will not stick out of the water. Aerial view of the Approach Viaduct North being prepared for its launch. Note the reinforced concrete deck being laid at the rear end which is provided before launching the beam of the viaduct. The rest of the concrete deck is formed in situ while the viaduct is launched out of position. Approach Viaduct North: work on-going on laying 800m of reinforced concrete deck on the two box girders at the rear end of the structure prior to launch out over the piers towards the North Tower. Indeed, some of the Approach Viaduct South becomes clear in the aerial views. Looking south from the top of the recently completed South Tower towards the Approach Viaduct South and, at the background, the new stretch of M90 roadway outside South Queensferry which will allow traffic to move from the existing trunk road network.

DECK: Aerial view of road deck segments ready to be launched in the Forth Road Bridge yard to have reinforced concrete decks fitted in the nearby Fabrication Yard – this is the Fabrication Yard – and fabricated segments being laid to be transported by barge out to the towers in mid硬度. Note the winding crane is visible. Once the reinforced concrete decks have been fitted, deck segments (pumping up to a height of 780 tonnes) are carefully ramped on board one of FCBC’s barges and then lifted into place over the North Tower. Once in the barge, the segments can then be hoisted out of the water and laid into position on the road deck of the North Tower. The North Tower topped out in October. The major segment of the Approach Viaduct North is being cast in situ, and these segments are then piled onto the North Tower to complete the road deck. An aerial view of the South Tower, showing the lengthening road deck below and the early stages of the emerging “fans” created by the installation of the stay-cables which support each deck segment.

TOWERS: A majestic view of the Queensferry Crossing’s three towers and proof that we had some sunny days during the summer. The steel cables at the top of the towers will be removed in due course as the towers reach their final height, so that the towers will not stick straight out of the tops. A Season of steel and mellow frost in the morning... the sun rises more than to face the day for most of us, but at least it provides the opportunity for seeing the new bridges in many different lights. Examples are the view of the Centre and South Tower tops and their attendant tower crane, now the highest crane in the UK at 230m high, and another with the Forth Road Bridge in the background.

ROADS: An aerial view of the approach roads along which, after the Queensferry Crossing opens, the new Ferrytoll viaduct which will carry motorway traffic to and from the Ferrytoll area just north of the new crossing. The new alignment sits on top of motorway portals which will be removed and diverted on to the first stretch of newly completed M90 motorway taking traffic west and south of South Queensferry with the new Queensferry–North Queensferry connection both to the north and south of the crossing. The new ferry toll near the North Tower which will carry motorway traffic is on the right and the completed Queensferry Crossing on the left. The demolition of the old B800 bridge over the A90 dual carriageway took place during the night over two consecutive weekends. The bridge has been replaced by a new £220 million bridge which opened to traffic in the summer. Night-time work on-going during the demolition of the old B800 bridge over the A90 dual carriageway which covers traffic between the North Road Bridge and Rosyth. Night-time work on-going during the demolition of the old B800 bridge over the A90 dual carriageway which covers traffic between the North Road Bridge and Rosyth. A cemented beam, the team working around concrete to prevent the removal of the reinforced concrete or top of the new ferry toll. The new alignment of the A90 dual carriageway route is by the new Ferrytoll viaduct.
A Bridge to the Future

Thousands of school pupils have visited the Project to learn all about the Queensferry Crossing construction programme.

The visit of fifty S4–S6 pupils from Greenfaulds High School, North Lanarkshire, in October 2015 marked a milestone for the Project – the 10,000th pupil to visit the Contact & Education Centre (CEC). This has been achieved in only two full academic years, a mark of Transport Scotland’s commitment to forging a lasting educational legacy. Since the Schools Programme began in 2013, over 400 primary and secondary school visits have taken place with schools from all over Scotland coming on-site to find out more about the construction of the Queensferry Crossing and undertake Science, Technology, Engineering and Mathematics (STEM) related challenges.

Cabinet Secretary Keith Brown presented the group with photographs of the construction of the new bridge and special Queensferry Crossing souvenirs. Helping the pupils with a group exercise, he said: “The Queensferry Crossing continues to be a remarkable project for a whole host of reasons and one of the most pleasing for me is an outstanding commitment to capturing imaginations and fostering an educational legacy among our young people. It has been great to meet pupils from Greenfaulds High School today. They join over 10,000 of their fellow young people from Scotland who’ll one day be able to tell their children and grandchildren about the day they visited the construction of the world famous bridge. Hopefully, many of them will go on to build bridges of their own in the future.

“We have never lost sight of how inspiring the construction of the Queensferry Crossing would be, especially being situated alongside the other two iconic Forth Bridges. The popularity of the CEC has been a real vindication of the importance we have placed in community engagement from day one. The Outreach and Education Programme, which includes school visits, technical presentations and a public exhibition, has attracted over 40,000 people so far and we anticipate interest growing further as the bridge reaches its final stages.”

Prior to the start of the 2015/16 academic year, Transport Scotland again wrote to invite schools from across Scotland to participate in the Education Programme and slots are filling up. This year, Transport Scotland has also developed lesson plans for teachers and associated distance learning materials which are available to schools to use in conjunction with, or independent of, a visit to the Project.

The final sessions in the 2015 CEC Presentation Day series took place in October, attracting over 200 members of the public. The series will re-start in late February.

In November, 100 Galliford Try graduate civil engineers and apprentices visited the Project during a two-day induction programme. Morrison Construction, one of FCBC’s partner companies, is a subsidiary of Galliford Try. FCBC’s Community Liaison Manager, Ewen Macdonell, gave the group a full technical presentation on current progress on the new bridge.

A FORTH REPLACEMENT CROSSING PROJECT BRIEFING UPDATE AND INFORMATION DAY, JANUARY 2016

The Forth Replacement Crossing (FRC) team will be holding Project Briefing Updates and an Information Day in January 2016 to update members of the public on the progress of the FRC project.

PROJECT BRIEFING UPDATE

Project Briefing updates will be held over the following days:

Tuesday 26 January: 15:00 – 16:30 and 19:00 – 20:30
Wednesday 27 January: 15:00 – 16:30

Members of the project team will be on hand to answer any questions you may have.

PROJECT EXHIBITION & INFORMATION DAY

The Project Exhibition at the CEC will re-open on Saturday 30 January and continue every Saturday from 10:00 – 16:00.

Members of the public are invited to attend an Information Day on 30th January with presentations at 10:30 – 12:00 and 13:00 – 14:30.

The presentation from senior project staff will give an overview of progress to date on the construction of the Queensferry Crossing, connecting roads and associated project works. The update will also provide information on the changes and developments you can expect to see over the coming year as the Project moves forward towards completion.
The operation to launch out the Queensferry Crossing’s Approach Viaduct North (AVN) is set to get underway soon. Here, Juan Jose Consuegra Perez, FCBC Approach Viaducts Manager, explains why this is one of the most technically challenging tasks in the whole construction programme.

Firstly, the AVN is actually a combination of the relatively short viaduct itself (76m of twin box girders) and a 146m length of full width main crossing deck (12 deck segments which had to be delivered flat packed, then welded and bolted together on the north shore). These segments cannot be lifted conventionally from a barge by erection traveller hoists since they are to be located either too close to the shallow north shoreline or over dry land.

This explains the presence of the very visible large white tent on the north shore which provided a weather-proof workshop for our welders over the past nine months.

The nett result is a 222m long structural steel superstructure with 40m of the reinforced concrete deck cast on the twin box girders at the north end to provide vital ballast during the critical launching process.

The second main challenge lies in the fact that the leading edge of the North Launch has to be lifted up by 2m during the launch process so that the whole structure is positioned at the correct angle to meet the constructed deck coming from the North Tower. This will be achieved by “pivoting” the structure (rather like a see-saw) by using the first of the two supporting piers (Pier N2) as a fulcrum. Once the viaduct has been launched out beyond N2, the trailing, ballasted end of the structure will travel down temporary “ramp walls” at the north Abutment. This, with the help of a king post and cable set-up similar to that used in the Approach Viaduct South launch, will lift the leading edge sufficiently to allow the structure to continue its journey over the second pier (Pier N1) and on towards the road deck emerging northwards from the North Tower.

The AVN is an enormous structure. It will be pulled out using the same hugely powerful, hydraulic ‘strand jack’ system which successfully launched the Approach Viaduct South. With a total weight well in excess of 5,000 tonnes, this will be an extremely challenging engineering process, one of the largest and most complex operations of this type ever attempted.

Its successful completion will mark another significant milestone in the construction of the amazing Queensferry Crossing.