A Practitioner's View of CEEQUAL: *'Transport Scotland's experience of using CEEQUAL on Forth Replacement Crossing'*

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Transport Scotland is involved in three major areas: Major Projects, Network Operations (maintenance) and Agency Wide Considerations. Today I will be primarily focusing on two Major Projects which we have put through the CEEQUAL Assessment process and that I have been involved in:

1. The Upper Forth Crossing at Kincardine (Clackmannanshire Bridge); and
2. The Forth Replacement Crossing.

The Upper Forth Crossing at Kincardine (Clackmannanshire Bridge)

I had the privilege of being the Project Manager for the Clackmannanshire Bridge whilst it was being launched across the river from the north side. It is a push launch concrete bridge which crosses very sensitive environmental areas such as a salt marsh Ramsar site.

The CEEQUAL rating was 'Very good'. The major issue was that the CEEQUAL Award Scheme was identified towards the end of the project. We believe that the Kincardine Project has excellent environmental and social benefits due to best practice Specimen design delivered by our consultants Jacobs. However, there was a lack of evidence of consideration of some wider CEEQUAL questions and we couldn't justify our decisions. We did get a lot of benefit from our Contractor's (Morgan Vinci JV) diligent approach to the environment and construction.

Forth Replacement Crossing

I moved to the Forth Replacement Crossing project team from the construction area in 2008. When I moved onto the project team Transport Scotland hadn't questioned the sustainability aspect of the project. I do believe as designers and contracts that we do carry out environment and sustainable best practice but we do not record and publicise our achievements.

Introduction

The bridge crosses the river at North Queensferry/ Queenferry, which is historically the natural route for a crossing. The Forth Road Bridge was opened in 1964 and is maintained by the Forth Estuary Transport Authority (FETA). It was designed for 2 million vehicles per year. Today the bridge takes nearly six times that with approximately 70,000 vehicles per day crossing it. It is a vital link and economic lifeline for the east of Scotland, and for Scotland as a whole.

However, it is a Grade A listed Structure and despite maintenance the bridge is deteriorating due to:

- Increasing traffic weight;
- Increasing traffic volume; and
- Effects of weather.

Maintenance works becoming more come as the bridge ages. This deterioration is not uncommon to other suspension bridges across the world.

Overview 2004/2005

Corrosion was found in the main suspension cables of the Forth Road Bridge which lead to approximately 8% loss of strength. If the corrosion continued at this rate it was predicted that the Forth Road Bridge would have to close to HGV's in 2013 and close to all traffic in 2019. Having no crossing was no option as the bridge is the lifeline (economically and socially) of Scotland. A decision was taken to explore the creation of a new bridge.

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Forth Replacement Crossing Study

The Forth Replacement Crossing study was undertaken in 2006 &/2007 by Jacobs/Faber Maunsell Joint Venture. The purpose of the study was to identify the scope, form and function of any potential replacement crossing. The team used the Scottish Transport Appraisal Guidance (STAG) methodology (an evidence led, objective based appraisal) to carry out the study. All study reports were published and are available online at www.forthreplacementcrossing.info

The Appraisal Process

Transport Scotland looked at 65 different options, including 5 corridors, the option of a tunnel rather than a bridge. Corridors developed from physical and environmental features and options were developed and sifted against Study objectives. The Appraisal was undertaken against five government criteria: economy, environment, integration, safety and accessibility & social inclusion. The best performing options balancing all issues were taken forward.

Environmental Importance

The Upper Forth and Kincardine area is as an area rich in environmental features many of which are protected by legislation including:

- Special Protected Areas for migratory and rare birds
- Wetlands of International Importance
- Site of Special Scientific Interest
- Gardens and Designed landscapes

The area not only had local constraints but also environmental ones. We have eight transport planning objectives that are constantly being monitored. The team, project and construction of the Forth Replacement Project will be assessed against each of these criteria.

The transport planning objectives are as follows:

1. Maintain cross-Forth transport links for all modes to at least 2006 levels.
2. Connect to the strategic transport network.
3. Improve reliability of journey times for all modes of transport.
4. Increase travel choices and encourage use of alternative types of transport.
5. Improve accessibility and social inclusion.
6. Minimise impacts of maintenance.
7. Support sustainable development and economic growth.
8. Minimise the impact on people, the natural environment and the cultural heritage of the Forth.

Ministerial Announcement

The Ministerial Announcement was published on the 19 December 2007. In which it was announced:

"...the Government has come to the view that the Forth Replacement Crossing should be a cable-stayed bridge with multi-modal capacity on a route slightly to the west of the existing Road Bridge.

The replacement crossing is about more than just the crossing itself: the connections at either side are equally important. Providing a link to the M9 from the new Forth Crossing will allow greater choices and opportunities in West Lothian, while the construction of improved junctions to the north will protect and promote access to the development areas of Fife. Including dedicated public transport will provide opportunities for those who travel into and around Edinburgh and offer improved opportunities for links more widely between Fife, Edinburgh and the Lothians."

It was thus decided that the Forth Replacement Bridge would be a three pylon cable stayed bridge and would cross the river at corridor 'D'.

Programme

At the end of 2007 Transport Scotland was given 9 years to complete this project (2016). The emphasis was on speed of continuing forward in the process, speed of construction, speed of parliamentary process for the submission of authorisation. They were tight and robust timescales (see below) but I am pleased to say we have met every target so far.

Programme:

• Cabinet Decision to proceed	end 2007
• Complete feasibility studies	2009
• Complete Design development	2009
• Submit for authorisation	2009
• Authorisation process	2009-2010
• Tendering process	2010-2011

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- Construction period 2001-2016
- Delivery of new crossing 2016

Overview of 2007

By the end of December 2007 the feasibility study had been completed, in which it was presumed that the Forth Road Bridge would not be available for future use. The Forth Replacement Bridge Scheme would protect an essential link across the Firth of Forth. The new Cable Stayed Bridge would be Scotland's biggest infrastructure project for a generation and include 22 km of connecting roads, and improved junctions. The cost of the total scheme would be £3.2 -£4.2 billion.

Overview of 2008

2008 saw the team start and complete the survey works which included:

- Ground investigations
- Marine investigations
- Environmental surveys
- Topographical surveys
- Land searches

In 2008 there was an improved prognosis for the Forth Road Bridge cables which would allow it to be retained for sustainable transport. Therefore, Transport Scotland created a strategy where the load would be relieved from the existing infrastructure (Forth Road Bridge) and the existing infrastructure would be used solely for public transport travel. The two bridges would allow for increased capacity but would allow the creation of a narrower new crossing, less new road construction. This would lead to a saving of approximately £1.7 billion of public sector funding – economically more sustainable.

This was announced by Stewart Stevenson, Minister for Transport Infrastructure & Climate Change on 10 December 2008.

The Statement to Parliament announced:

"The condition of the existing bridge continues to deteriorate... although the existing bridge... may be deteriorating less rapidly than was previously thought, it is clearly not certain that it will provide a reliable and resilient crossing for the current weight of traffic.

Safeguarding that vital connection in Scotland's transport network remains absolutely essential to the nation's economy.

Updating findings from FETA have allowed us to consider the future of the existing bridge. We have concluded that it can be retained, alongside the new bridge, as a dedicated public crossing as part of a managed crossing strategy."

Overview 2009

When the Scheme started there was no Sustainability Appraisal System in place. I came along with the background of a chartered civil engineer who has always been interested in the environment and sustainability within the industry. When I joined the Forth Replacement Crossing project team I brought with me the ethos of Sustainability Appraisal and Carbon Management. We went down the route of creating our own Sustainability Appraisal System. Later, The Forth Replacement Crossing Board gave approval for the project team to run a CEEQUAL Assessment in parallel with their own Sustainability Appraisal System. This would allow Transport Scotland to assess whether the Sustainability Appraisal System created was robust and to compare the two systems.

Further development in the year included:

- Extensive public consultation, information & Exhibitions were carried out
- Ongoing design development, land searches, Ground Investigations were completed
- An Environmental Statement and Code if Construction Practice were published
- Procurement commenced (OJEU June, Tender November)
- Bill preparation and Introduction 16 November to Parliament.

2011 and beyond:

Project Timeline:

- January 2011 Royal Assent
- January 2011 Principal Contract Tenders
- Spring 2011 Award of Principal Contract

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- Summer 2011 — Award of Fife ITS and M9 Junction 1A Contracts
- Summer 2011 — Work commences

We have now been on site for a year and we are on track for finishing the Scheme for December 2016.

Transport Scotland and CEEQUAL:

Transport Scotland published the Forth Replacement Crossing's Sustainability Policy (a first for Transport Scotland). Within the Sustainability Policy Transport Scotland developed a group of objectives, indicators and targets that were based around the eight transport planning objectives.
These were set before construction began and we hope to achieve the targets set out in the document.

The Forth Replacement Crossing Sustainability Appraisal and Carbon Management are available on the website.

As previously discussed CEEQUAL was adopted as a dual concurrent assessment with the Forth Replacement Crossing Sustainability Appraisal to allow evaluation of future use of CEEQUAL on Major Projects.

Transport Scotland applied for a Whole Project with Interim Award and has subsequently added two work packages to the CEEQUAL Assessment. The Project is using the Version 4 methodology which has a total of 2,000 points to possibly achieve. In the Interim Assessment there has been one question that has been scoped out permanently. This was question:

"6.3.1 Have measures to conserve water and reduce water consumption during operation of the completed project been incorporated into the design?"

This was scoped out on the basis that road schemes are not consumers of water when in operation.

This left a maximum score at the Interim stage of 710. There were also a number of questions temporarily scoped out as the answers were reliant on the contract final design.

I am pleased to say that the Forth Replacement Crossing achieved at Interim Client & Outline Design Stage an 'Excellent' rating with a score of 92.7%. We were especially pleased with the result as we had introduced CEEQUAL after we had started all the feasibility work. I would like to see Transport Scotland doing a Sustainability Appraisal earlier on in the process in regards to route choice. Listening to Roger Venables (Chief Executive, CEEQUAL) earlier, it looks like CEEQUAL has made this progress in their methodology update.

Benefits of CEEQUAL:

I would like to stress that these are my initial thoughts about the use of CEEQUAL on the project. We will get a firmer view on the benefits and problems faced when the project has been completed in 2016.

CEEQUAL does help encourage a sustainable thinking across the whole multidisciplinary design team. Transport Scotland appointed 'Sustainable Champions' in-house and that helped streamline and improve communication between the Assessor and each of the teams. In most cases the 'Sustainable Champions' were the same people as the 'CEEQUAL champions'. I do believe that CEEQUAL does provide something measurable in terms of sustainability, whereas a 'Sustainability Agenda' is normally qualitative.

Problems & Challenges:

It may be advantageous for CEEQUAL to be considered earlier to allow the process to be more proactive than reactive. If CEEQUAL is not adopted early in the process it may lead to additional work.

Transport Scotland had to go through the statutory process to assess the project and we believe that Transport Scotland has done best practice. Transport Scotland has carried out design manuals, Environmental Impact Assessments and delivered an Environmental Statement. This was very useful as a lot of evidence needed to answer CEEQUAL Questions were lifted out of the Environmental Statement. However, it resulted in the same questions being asked again and questioning of

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the real difference CEEQUAL would make in some sections, for example historic environment, ecology & biodiversity, and landscaping.

Evidence List:

Transport Scotland used over 100 documents to achieve our 'Excellent' CEEQUAL rating. Below is an example list of the evidence Transport Scotland provided to answer CEEQUAL questions and justify the Assessor's scoring:

1. A16.2 Noise and Vibration Policy
2. Code of Construction Practice
3. Specialist Staff CVs
4. Feedback and Outcomes Report 2009
5. Industry Even Attendance List
6. Marine GI Environmental Report (Section 4.4)
7. Prequalification Questionnaire
8. Report to Inform and Appropriate Assessment for the River Teith SAC
9. South Bus Link Drawing – ES Figure 4.1b
10. Strategic Transport Projects Review (STPR) – Environmental Report
11. Sustainable Resource Management Framework (Appendix to Sustainability Report)

All 100 documents have been handed over to the construction team to continue the CEEQUAL Assessment.

Next Steps for Forth Replacement Crossing:

The Scheme is now in the construction phase. After the Interim award the project was split into three packages to allow local contractors to enter in the biding process:

1. Fife ITS – Intelligent Transport System and carriageway refurbishment.
    a. Awarded June 2011 to John Graham (Dromore) Ltd
    b. £13m
    c. To complete summer 2012

2. M9 Junction 1a
    a. Awarded July 2011 to Sisk/Roadbridge
    b. £26m
    c. Complete Spring 2013

3. Principle Contract – main contract and connecting roads
    a. Awarded April 2011 to FCBC
    b. £790m
    c. Complete 2016

Each package has different timescales of completion and contractors appointed. With this in mind it was decided by Transport Scotland to have each package to be assessed separately. This will gives credit to each contractor's achievement upon completion of their individual package. For ease of communication the lead Assessors during the construction phase are from the Contractors companies and receive support from the employer's team. Upon completion on the principle contract in 2016 each package result will be used to calculate a full Forth Replacement Crossing Project Award Score.

Transport Scotland has built CEEQUAL into the contractors' contracts and encouraged the ethos of best practice throughout all the teams. Within the contracts Transport Scotland has encouraged the Contractors to achieve and maintain the 'Excellent' CEEQUAL rating awarded in the Interim Client & Design stage.

I am pleased to say that the project teams are working well and Teams working well and that Transport Scotland is on track to maintain the 'Excellent' CEEQUAL rating on the project.