Forth Estuary Transport Authority

Capital Plan to 2023/2024

20 February 2009

1. Purpose of report

1.1 To provide members with a brief update of bridge schemes included in the long term Capital Plan to 20023/2024.

2. Main Report

2.1 The FETA Order 2002 details the functions of the Authority in section 7, i.e.

(a) It shall be responsible for the management, maintenance and operation of the bridge and

(b) may develop, support and fund such schemes and measures which it considers appropriate to reduce road traffic congestion on the bridge or encourage an increase in the use of public transport across the Forth.

2.2 In practice, following the abolition of tolls and the direct funding of bridge maintenance and operation by the Scottish Government, FETA's role is now restricted to bridge schemes. The bridge schemes listed in the long term Capital Plan are those schemes that are considered to be essential for the maintenance and safe operation of the bridge.

2.3 As will be noted in other reports to the Board, the announcement of a firm commitment by the Scottish Government to a definite programme for the construction of the Forth Replacement Crossing, has allowed for a review of the Authority's maintenance programme to be carried out. This review will examine whether or not schemes that cause major traffic disruption can be deferred and, given the proposed change in use of the existing bridge after 2016, will also allow a re–appraisal of certain schemes that are direct result of traffic loading effects. The replacement of the expansion joints is the first of these schemes to be reviewed and others will follow in due course

The plan has been developed on the assumption that there will be no replacement of the main expansion joints until 2016.

2.4 No allowance has been made in the Capital Plan for the possible replacement/augmentation of the main cables or any work on the main cable anchorages apart from the investigation into their long term structural integrity.

2.5 The Capital Plan sets out as far as possible to identify the major improvement and strengthening works that will be required on the bridge over the next 15 years. Many of the schemes are unique and some have yet to be fully determined in nature and extent and this makes estimating project costs difficult. Optimism Bias has not been included in the estimates shown and all are at 2008/9 costs.

2.6 Carriageway or lane closures will be required to carry out many of the planned works and each carriageway or lane closure will be fully utilised to minimise the impact of disruption. Most of these carriageway or lane closures will be carried out overnight. However, weekend restrictions will be required to carry out waterproofing and resurfacing works and expansion joint inspections.

Intermittent closures of the footway/cycletracks will also be required to carry out some of these schemes. However, one footway/cycletrack will remain open at all times.

3. Bridge Schemes

The following describes some of the more significant schemes included in the Capital Plan

3.1 Main Cable Acoustic Monitoring and Inspection

Commissioning of the system was completed in August 2006 and both main cables are being continuously monitored for wire breaks and 42 wire breaks have been confirmed to date. Three panels (two of which were opened previously in 2004) on the east cable were opened in early 2008 and as reported to Members whilst the main cable was found to have suffered further strength loss due to corrosion, the rate of loss of strength was not as great as had been predicted in 2004. Further internal inspections have been allowed for in the Capital Plan, the first of these being in 2011/12.

3.2 Main Cable Dehumidification

All of the west cable has now been wrapped and dry air is being pumped throughout its whole length. All three dehumidification plant enclosures have been placed in the gap between the carriageway and footpath under the west cable. Installation of the monitoring sensors to establish the exhaust relative humidity levels over the length of the west cable is scheduled to be completed by April 2009. Work on wrapping the east cable is continuing and the project is still on programme to be completed by the end of 2009. Extensive weekend carriageway closures had been envisaged for both 2008 and 2009 to enable this work to be carried out but these have not been necessary due to the use of innovative platforms designed to travel along the cable.

As reported, the 2011/12 internal inspection of the main cable will be the first determination of the effectiveness of the dehumidification system.

3.3 **Anchorages Investigation**

Work is progressing on the tender documents for the investigation work. Unfortunately, there was a poor response to the Authority's notice in the Official Journal of the European Union (OJEU). The OJEU notice informs contractors of the works and invites them to apply for inclusion on the tender list. Given the poor response a further notice is being posted in the journal and it is hoped that the response will be better to allow tenders to be issued this summer**.**

3.4 **Tower Impact Strengthening and Localised Wind Barriers at Towers**

Both these schemes are still at feasibility study stage. Once the feasibility studies are completed a report on both schemes will be brought to Members later this year.

3.5 **Parapet and Barrier Replacement**

Following the success of the testing programme on the suspended span parapets and barriers arrangements work is continuing to determine whether or not some minor insitu modification need to be made to the parapets and barriers and it is envisaged that a report will be brought to Members later this year.

Preparation of the testing programme to determine whether or not the viaduct parapets will need to be replaced has now started.

3.6 **Replacement of Main Expansion Deck Joints**

A separate report on this scheme has been prepared.

3.7 **Replacement of Viaduct Bearings**

The consultants are preparing the contract documents and are awaiting further testing work to be carried out. Works on site are programmed to take place over a three year period 2010 to 2013.

3.8 **Resurfacing Main and Side Spans**

An allowance has been included to resurface the main span Southbound in 2013-14 and similarly on the Northbound in 2016/2017.

3.9 **Main Tower Painting**

Painting of the south tower was completed in 2008 and work on site to remove the dropped object canopy from the south tower has commenced on site using

overnight carriageway and full bridge closures which are limited in both number and duration. The dropped object canopy will be refurbished and then is programmed to be erected at the north tower to allow painting of the north tower above deck between 2010 and 2012.

3.10 **Suspended Span Painting**

The scheme to replace the protective coating system on the stiffening truss has been put back until there is confirmation on the outcome of the de-humidification scheme. Should it become necessary to replace or augment the main cable it is likely that significant structural modification would be required to the truss.

3.11 **Suspended Span Truss Assessment and Strengthening (including Truss End Links)**

The assessment work has now been completed and an independent check is being commissioned. Strengthening work on the truss has also been put back until there is confirmation on the outcome of the de-humidification scheme. However, work on the truss end links is scheduled to start in 2010/11 following completion of the independent check.

3.12 **Replace Bridge Variable Message Signs**

The work to replace the signs is nearing completion with commissioning and testing being carried out during the first weeks of February 2009.

3.13 **Cathodic Protection**

Over the past few years inspection and monitoring of the cathodic protection to the main tower pier defences has highlighted that some of the components making up the system have broken down. A scheme to repair and refurbish the system is now being prepared and is programmed to commence in 2009/10.

3.14 **Cable Band Bolts**

The investigation work into the cracking of the cable band bolt nuts is almost concluded and it is expected that a report will be brought to the April 2009 Board meeting.

3.15 **Improvements to deck half joints**

The existing half joint detail causes significant maintenance problems as well as increased loads on the deck and poor ride quality for users. There have been several attempts in the past to try to reduce the problem within the traffic management constraints of minimising delays to users. These past efforts have not eliminated the underlying problem. Following work carried out between Fairhurst (consulting engineers) and FETA's own staff a new detail has been identified. It is intended to produce a detailed design of a prototype

which is programmed to be installed in 2012/13. Once installed the prototype will be monitored and if successful all the half joints will be modified as part of the truss strengthening/ painting scheme following the results of the main cable dehumidification inspection in 2011/12.

4. Recommendation

4.1 It is recommended that members note this summary of schemes included within the indicative capital plan.

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Appendices	Capital Plan 2023/24
Contact/tel	Barry Colford / 0131 319 3092
Background Papers	