

Forth Estuary Transport Authority (FETA) - Capital programme in Spending Review 2010

Portfolio	Finance and Sustainable Growth
Level 2 Budget heading in 2010-11	Forth and Tay Roads Bridges
Programme title	Forth Estuary Transport Authority – Capital Programme

This template captures information on the future requirement for programme spend which scores under Scottish Government Capital DEL. Programme spend is defined as expenditure in support of the capital expenditure by third parties (e.g. local government or health block grant).

You are asked to complete one template for each area of capital programme spend, providing the following information:

1. the scale of the potential funding requirement over SR2010;
2. the outcomes and specific outputs that are planned for delivery in SR2010; and
3. expected impact on the programme of reduced capital budgets.

Please provide as much detail as you consider necessary to provide the evidence base for considering the allocation of capital funding in the Spending Review. Please also ensure that the anticipated spending profile in Section 1 is reflected in the separate Level 1 summary table.

1. Scale of the potential funding requirement over SR2010

Please provide your best estimate of the anticipated expenditure profile of the programme at least until 2014-15 (and beyond that if there is a reasonable basis for a longer-term projection). If necessary, you may provide a range for funding requirements for some or all years. Where appropriate, please separate the total anticipated funding requirement into two components: (i) the creation of new capacity or facilities; and (ii) the maintenance of existing capacity or facilities.

Year	2010/11	2011/12	2012/13	2013/14	2014/15	SR Total	2015/16	2016/17
New capacity								
Maintenance	11,319*	9,743 - 13,002	7,808 - 14,844	12,135 – 11,484	11,485 – 9,495	41,171 – 48,825	9,345 – 6,160	18,470 – 16,650
Total (£ million)	11,319*	9,743 - 13,002	7,808 - 14,844	12,135 – 11,484	11,485 – 9,495	41,171 – 48,825	9,345 – 6,160	18,470 – 16,650

*Grant In Aid funding in 2010/11 £8,730 – difference of £2.6m will be met from FETA reserve

**The essential amounts required come first in all entries, where the first sum is larger than the second it is a consequence of deferment and reprofiling.

1. Scale of the potential funding requirement over SR2010 (*continued*)

Notes: Please outline here the key financial assumptions associated with the anticipated expenditure profile that you have provided above, including any projections concerning the future level of capital receipts related to the programme.

Discussions have taken place with FETA in relation to funding requirements. As a result of these discussions FETA have revised the budget approved by their Board in February 2010 to contain only those items essential to maintaining the structural integrity of the Forth Road Bridge. Opportunities for smoothing spend over a number of years; deferment of projects and the impact of these choices has been discussed and is included to support the evidence base in the following pages.

The excel files detailing both budget approaches are attached at the end of section 3 for information.

- FRB 15 Year Capital Plan 2010/11 to 2025/26 entitled Approved Budget
- FRB 15 Year Capital Plan 2010/11 to 2025/26 entitled Plan 1 – Essential 140710

This results in a difference between the Approved Budget and the Essential Plan over 4 years of £(48.825 – 41.171) = £7.654 million

2. Outcomes and specific outputs that are planned for delivery in SR2010

Please provide details of the purpose of the capital programme; the policy outcomes and objectives it will help to support; and the specific outputs that the capital programme spend will deliver over the course of the Spending Review period from 2011-12 to 2014-15.

This spend fits with the first tier of the Transport Scotland Investment Hierarchy as defined in the Strategic Transport Projects Review (STPR December 2008)

1. **Maintaining and Safely Operating Existing Assets**
2. Making Better Use of Existing Capacity
3. Targeted Infrastructure Improvements

The purpose of the Capital Programme on Forth Road Bridge is to ensure the structural integrity and long term durability of the bridge. It is also to ensure the safety of users and those that have to maintain and operate the bridge. The programme also ensures that all statutory obligations and standards are met and that delays to users are minimised.

The capital programme will deliver certainty of the provision of service for the 24 million vehicles that will cross the bridge every year over the Spending Review period, linking businesses, communities and visitors between Scotland's capital and Fife, Dundee, Perth and points beyond.

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Capital Scheme	2011/2012	2012/2013	2013/2014	2014/2015	Total
Viaduct Bearing Replacement *	7,094 – 6,044	528 – 3,960	210 – 714	0	7,832 – 10,718
Truss End Linkages	0 – 1,500	0 – 1,500	1,500 - 50	1,500 - 0	3,000 – 3,050
Tower Wind Barriers/ Impact Strengthening	0 – 1,500	0 – 1,500	1,500 – 90	1,500 - 0	3,000 – 3,090
Suspended Span Painting	0	0	175	6,000	6,175
Main Cable Investigation	50	1,680	1,000	0	2,730
Anchorage Investigation	800	3,500 – 2,500	2,500	700	7,500 – 6,500
TOTAL	7,944 – 9,894	5,780 – 11,140	6,885 – 4,529	9,700 – 6,700	30,237 – 32,263

*This project is already committed.

As before, ranges of costs are included with the figures with the essential spend profile coming first in the range and the Board approved budget second. These items relate to 73% of the essential spend profile and 66% of the approved budget spend.

Support economic recovery and contribute to delivering sustainable economic growth

Maintenance and safe operation of the Forth Road Bridge will enable it to continue to operate at current level of service thereby contributing to the national indicator of;

- Reducing the proportion of driver journeys delayed due to congestion

As well as supporting the following national outcomes;

- We live in a Scotland that is the most attractive place for doing business in Europe.
- We value and enjoy our built and natural environment and protect it and enhance it for future generations;

3. Expected impact on the programme of reduced capital budgets

Please provide an assessment of the impact on the delivery of policy outcomes and specific outputs if funding was to be reduced significantly below the level you have projected in Section 1 of this template. Please be as specific as possible about the potential impact on delivering the Scottish Government's key policy goals and any reductions in the capacity to deliver a viable service.

There are a number of projects which FETA are already committed to, these are shown in Table 1. below.

Table 1 – Committed Projects, and Remainder

Project	2011/12	2012/13	2013/14	2014/15	SR Total	2015/16	2016/17
Viaduct Bearings Replacement	7,094 – 6,044	528 – 3,960	210 – 714	0	7,832 – 10,718	0	0
Main Cable Dehumidification	15	15 - 0	15 - 0	15 - 0	60 - 15	0	0
Main Expansion Joint Replacement	55 - 50	0	0	0	55 - 50	0	7,000
Parking Areas, Landscaping and Reconstruction	5 - 0	0	0 – 1,000	0	5 – 1,000	0	0
M9 Spur Extension/ A800 Upgrade	139 - 153	175 - 194	0	0	314 - 347	0	0
Main Cable Acoustic Monitoring	100	0	900 - 0	50 - 0	1,050 - 100	0	0
Total Committed Spend	7,408 – 6,362	718 – 4,154	1,125 – 1,714	65 – 0	9,316 – 12,230	30 – 30	7,000
Remainder	2,335 – 6,640	7,090 – 10,690	11,010 – 9,770	11,420 – 9,495	31,855 – 36,595	9,315 – 6,130	11,470 – 9,650
Total (£million)	9,743 – 13,002	7,808 – 14,844	12,135 – 11,484	11,485 – 9,495	41,171 – 48,825	9,345 – 6,160	18,470 – 16,650

If funding were reduced significantly from that submitted in Section 1 then certain projects would have to be cancelled or deferred. As outlined in Table 2. There are also some areas where it is not possible to give a high degree of certainty over the capital costs. These are highlighted in grey.

Table 2 - Comments on Projects within Capital Plan 1 - Essential

Schemes	Comments
Viaduct Bearing Replacement	Committed project currently in progress.

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Main Cable Dehumidification	Costs identified are for ongoing maintenance which was included in the installation contract. Committed.
Main Expansion Joint Replacement	Payment in 2011/12 is release of retention for works completed in 2010/11. Committed.
Parking Areas Landscaping & reconstruction	Payment in 2011/12 is release of retention for works completed in 2010/11. Committed.
M9 Spur extension / A8000 upgrade	Committed expenditure. Residual costs from M9 Spur project associated with compensation claims, etc.
Bridge Specific Assessment Live Load	Required to enable a reduced loading to be used to assess the structure. Continual monitoring required on two yearly basis essential to structural integrity of the bridge.
Improvements to Deck Half Joints	There is a long term problem with the half joints between the deck panels on the suspended structure. This is due to the original design of these joints which are not accessible for maintenance. As a result the joints have become worn and adjacent deck panels are now misaligned. This affects ride quality and long term structural integrity of the deck; it also requires a large Maintenance input to reduce the effect on the structure. Two prototype designs have been developed and it is intended to install these on the bridge to assess their suitability as a long term replacement for the existing joints. This project is essential.
Main Cable Acoustic Monitoring	Expenditure in 2011/12 is for installation of permanent cabling system as a present system operates on a temporary cable network. Additional costs required to modify system to increase number of sensors which will improve reliability and accuracy of the system. The existing system was one of the first installed on the main cables of a suspension bridge and these systems have developed since installation. Risk of not funding is a lack of available data to understand the full extent and impact of wire breaks within the main cable – this information is essential to maintain the structural integrity of the bridge.
Main Cable Investigation	An internal inspection of the main cables was carried out in 2004 and 2008 and corrosion of these vital elements was found. A dehumidification scheme was installed and a further inspection is planned in 2012/13. It is essential that this work is carried out in order to determine the status of the cable at this point in time. This is critical to understanding of the structural integrity of the Forth Road Bridge.
Truss End Linkages	An assessment of the connections between the main towers and the suspended structure has identified that several key elements in these connections have overstress indices greater than 1.0 at the ULS even when using the reduction afforded by Bridge Specific Live and Footway Loadings. There is no structural redundancy in these key elements. Historic Scotland likely to have an input which may increase cost. This work is essential to maintain the structural integrity of the bridge and cannot be deferred without placing the structure and those who use it and work on it at risk.
Tower Wind Barriers/Impact Strengthening	These are in essence two separate projects which given their proximity would likely be carried out by single contractor. Tower impact strengthening/protection is to strengthen or provide a barrier to the towers to reduce potential impact damage by HGVs. Localised Wind Barriers at main towers are for operational reasons to reduce risk of empty curtain sided vehicles blowing over in high winds. As well as potential risk to other users such incidents are likely to cause significant traffic congestion.

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Suspended Span Painting	<p>To achieve full value from applying new paint system, work programmed to start in 14/15. This would be 30 years since the last major re painting of the truss. Expenditure required to provide full containment system to allow painting of the truss. Works will involve the installation of a large temporary gantry system. If the painting of the suspended span truss and the viaduct boxes (see below) was to be deferred there is an increased risk that corrosion in the steel will get worse and there will be an increased difficulty in removing the corrosion pits. This would in turn lead to a reduced lifespan for the paint system and as almost £70million is the required spend on these two projects it is essential to try and achieve as much life and value from them as possible between repainting. Deferment of these projects would be in conflict with the Scottish Government's environmental and efficiency targets.</p> <p>[It should be noted that if the dehumidification of the main cables fails and replacement cables are required then significant additional work would be required to the truss as part of the truss strengthening scheme and painting would have to be delayed until those works were completed.]</p>
Suspended Span Truss Strengthening (Capital element)	The full extent of this work is yet to be confirmed by the Cat 3 Checker. It will go ahead slightly in front of the painting works using that access. It is not possible at this time to determine the impact of postponement of this work.
Suspended Span Gantry Refurbishment	One of the main drivers of this refurb is to change the mode of powering the gantries to remove the need for personnel to walk ahead on the open steelwork. This would significantly improve safety for workers on the bridge.
Anchorage Investigation	The anchorages on the Forth Road Bridge are of a unique design and this work is essential to ascertain the structural integrity of the main cable anchorages.
Viaducts Painting Access	To achieve full value from applying new paint system work programmed to start 13/14. This would be 30 years + since the last major re painting. Expenditure required to provide full containment system to allow painting of the viaduct box girders, Works will involve the installation of permanent anchors in the underside of the viaduct to allow a hanging scaffold to be installed to undertake the work. (See Suspended Span Painting for impact of deferring project)
Tower Painting/Dropped Objects Canopy	The Dropped Object Canopy, which is a temporary structure, requires to be dismantled and removed from the Bridge once the North Main Tower painting programme has been completed. Reprofiled to smooth capital requirement but essential that this is removed.
Vehicle Replacement	Rolling programme of vehicle replacement. £100k spend in 2011/12 is to allow for replacement of tower wagon and breakdown recovery vehicle which are now more than 10 years old. If this spend were to be deferred it would compromise our ability to clear the carriageway resulting in congestion, delays and possibly an increase in accidents on the bridge.
Landscape Works	Works required to trim trees in area around Administration Offices at South Queensferry to maintain views of existing Bridges and FRC. This is not an expensive capital investment but is essential give the Bridge's iconic structural status in Scotland and the fact that the area outside the admin block is often used by tourists and others as a viewing platform. Were it not to be funded it would compromise the view and result in a poor impression for visitors and inward investors.
Resurface Main Span South	Resurfacing of southbound carriageway on main span programmed for 2012/3. If surfacing on main span deck panels is not acting compositely with waterproofing membrane and deck plate then there is a risk of the deck plates becoming overstressed leading to fatigue cracking at stiffener/plate interface.

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High Mast Light Replacement	The existing lighting system on the plaza area at the south end of the Bridge dates from the mid1970's and consists of a mixture of high mast lighting supplemented by lower level lighting around the periphery of the area. The high masts are of particular concern as they have exceeded their design life and there are concerns about the structural integrity of the masts. The lighting heads on the masts are maintained by lowering the head via a hoist system built into the mast. Due to the design of the masts we are unable to meet our statutory obligations regarding the inspection of the hoist systems. A feasibility study report has been prepared which recommends the replacement of the existing system with lower level lighting columns which will be easier to maintain, more environmentally friendly, will be cheaper to operate and less visually intrusive.
Main Towers Cathodic Protection (Piers)	Expenditure is required to repair the existing cathodic protection to the main tower pier defences which is not operating fully.
Cable Band Bolt Replacement	During the main cable dehumidification project a number of nuts on the cable band bolt assemblies were found to be cracked. As access was available as part of the dehumidification project, the damaged nuts were replaced at that time. However, further investigations have identified further nuts which are cracked and which will require replacement. These are highly stressed elements which are critical to the integrity of the structure.
North Approach Rock Cut Stabilisation	The condition of the rock faces in the cutting on the north approach to the Bridge are a cause for concern. A geotechnical report has advised that works to stabilise the rock faces should be undertaken. Part of the rock cut area will be required by Transport Scotland as part of the FRC project but FETA will remain responsible for approximately 50% of the existing length of the cutting.
South Anchorage build ext & storage area	The existing storage shed located within the south anchorage compound will be demolished as part of the anchorage investigation project. The south anchorage compound area will also be unusable during the anchorage investigation works as this area will be required for the works. These facilities will require to be reinstated on completion of the anchorage investigation project.
Viaduct Outrigger Beams	Project Deferred - works programmed for 2013/14 in Board approved programme - deferred until 2015/16.
Comp House Improvements	Project Deferred. The existing air compressors which feed the Bridge ring main are approximately 30 years old and will require to be replaced at some point.
Suspended Spans Underdeck Access Study	The walkway and staging board system on the suspended structure is approaching 30 years of age and a feasibility study report has been commissioned to ascertain the condition of the existing system and advice on future refurbishment/replacement options. The staging boards, which are removable, have a finite life span and there are also manual handling issues with these elements of the system.
Suspended Spans Underdeck Access Improvements	Project Deferred. Future project, the extent of which will be determined by the outcome of the Suspended Spans Underdeck Access Study detailed above.
Resurface Viaducts and North Approaches	Project Deferred - Works programmed for 2013/14 deferred until 2015/16. Viaducts were last resurfaced in 2000 and have no waterproofing membrane. Surfacing has shown increasing signs of distress in recent months. Deferring work will increase interim revenue cost of patching and localised repairs to deck.
External Repairs to Buildings	Works programmed for 2013/14 in Board approved programme - deferred until 2015/16.

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Approved Budget
(February 2010) 150:

Board Approved Capital Programme -



Capital Plan 1
Essential 140710.xls

Essential Capital Programme -