

Extended Tay Estuary Rail Study

Master Option List

Report

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POTENTIAL CHANGES TO EXISTING SERVICES

PROPOSED NEW SERVICES

1 Introduction

- 1.1 This document reports the long list of options developed by the project team to input to the sifting process and then the STAG part 1 appraisal.
- 1.2 Significant effort has been expended in ensuring all options proposed can be implemented and an estimate of resource (trains), capital expenditure and timescales has been provided where appropriate.
- 1.3 Specific stopping patterns for each option have not been considered at this stage. These would have increased the (already large) number of options considerably and the sift would not have been able to distinguish between many. Options which pass the sift and the STAG part 1 appraisal will have their stopping patterns reviewed in detail and determined in the detailed development phase based upon:
 - Demand forecasting;
 - Timetable constraints; and
 - Resource constraints.

2 Changes to existing services

2.1 The following options were identified to change existing rail services in the Glasgow - Aberdeen corridor which could deliver the sought improvement to rail services in the study area.

TABLE 2-1 CHANGE TO EXISTING SERVICES

Option Ref	Option	Comments
Exist A.1	Service a new Bannockburn station through adding additional stops into existing Dunblane - Glasgow, Dunblane - Edinburgh and Alloa - Glasgow services.	Adding an additional stop into all existing services is likely to result in a significant detrimental performance impact to the central belt rail network. Detailed modelling is required to assess the extent of this impact. Direct northbound connectivity as far as Dunblane only.
Exist A.2	Stop existing express services from Aberdeen, Perth and Inverness at a new Bannockburn.	Provides good northbound connectivity but more limited to Glasgow, Edinburgh and Stirling. Additional stop will impact end to end journey times of intercity services. Probable performance impact in Stirling - Glasgow Queen Street corridor. Detailed modelling required to assess the extent of this impact
Exist A.3	Combination of Exist A.1 and Exist A.2 providing local and express services to Bannockburn station.	Good connectivity to Glasgow, Edinburgh and Stirling as well as northbound. Likely to bring a significant detrimental performance impact to the central belt rail network. Detailed modelling is required to assess the extent of this impact.
Exist B.1	Change stopping pattern of Aberdeen - Glasgow express	Maintains same end to end journey time. Dunblane, Gleneagles get a peak only service. Arbroath has hourly calls with Carnoustie two hourly. Limited scope to meaningfully change stopping pattern.
Exist B.2	Increase stopping pattern of Aberdeen - Glasgow express	Increases end to end journey time. Probable performance implications in Stirling - Glasgow Queen St corridor.
Exist C.1	Change stopping pattern of Perth / Inverness - Glasgow express	Maintains same end to end journey time. Dunblane, Gleneagles gets a peak only service. Very limited scope to change stopping pattern.

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Exist C.2	Increase stopping pattern of Perth / Inverness - Glasgow express	Increases end to end journey time. Probably performance implications at Glasgow Queen St.
Exist D.1	Change stopping pattern of Aberdeen - Edinburgh express	Maintains same end to end journey time. Arbroath has hourly calls, Carnoustie peak only. Limited scope to meaningfully change stopping pattern.
Exist D.2	Increase stopping pattern of Aberdeen - Edinburgh express	Increases end to end journey time. Probable performance implications at Haymarket and Edinburgh Waverley.
Exist E.1	Combined options Exist B.1, C.1 and D.1 (change stopping patterns of all current express services)	Outwith the major interchanges of Stirling, Dundee and Perth, Arbroath and Carnoustie are the only locations which receive a regular service. Limited scope to meaningfully change stopping pattern.
Exist E.2	Combined options Exist B.2, C.2 and D.2 (increase stopping patterns of all current express services)	Increases end to end journey time. Probable performance implications at Glasgow Queen Street, Haymarket and Edinburgh Waverley.

2.2 These service options are shown schematically in Appendix A

3 Proposed new service options

- 3.1 The following new service options were identified as being able to deliver parts or all of the sought improvement to rail services in the study area.
- 3.2 The options showing new services have been developed to recognise infrastructure and operational constraints on the existing railway as well as committed and proposed future projects.
- 3.3 The implementability of each option has also been considered. Those which require infrastructure changes or additional rolling stock are identified as medium and longer term solutions (refer to paragraph 2.15). It has been assumed that through rolling stock deployment cascades required as a result of the Airdrie - Bathgate opening, up to 3 DMU's could be available for December 2011. For medium term proposals, it is assumed further DMU's would not be available until completion of EGIP in December 2016.
- 3.4 The short and medium term options have been developed to complement existing and proposed rail services in the Glasgow - Aberdeen rail corridor.

TABLE 3-1 POTENTIAL NEW SERVICES

Option Ref	Option	Comments	Time frame
New A.1	Extension of proposed electric Glasgow - Dunblane service to new Dunblane North Station.	Can realistically only be delivered with EGIP. Estimated £5m for station plus £4m for OLE works.	Dec 2016
New A.2	Extension of proposed electric Glasgow - Dunblane service to new Greenloaning station.	Can realistically only be delivered with EGIP. Estimated £5m for station plus £10m for OLE works.	Dec 2016
New A.3	Extension of proposed electric Glasgow - Dunblane service to new Blackford station.	Estimated £5m for station plus £20m for OLE works. Additional rolling stock probably required.	2017+
New A.4	Extension of proposed electric Glasgow - Dunblane service to Gleneagles station.	Estimated £3m for station and road improvements plus £22m for OLE and signalling works. Additional rolling stock probably required.	2017+
New A.5	Extension of proposed electric Glasgow - Dunblane service to Perth station.	Estimated £50m for OLE and signalling works. Additional rolling stock required. Not specifically identified in STPR	2017+

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New B.1	Hourly Glasgow - Perth service (extends to Inverness some hours)	This is a priced option in the current ScotRail franchise and can be delivered with current resources. Would form the basis of a 2 hourly service to Inverness once HML complete.	Dec 2010
New B.2	Hourly Glasgow - Dundee service	Extension of option New B.1. Would require 2 or 3 additional DMU's for the hours which the New B.1 service ran through to Inverness. Pathing conflicts with HML and access to Glasgow Queen St. Difficult to implement until national timetable recast complete.	Dec 2016
New B.3	Hourly Glasgow - Perth service with two hourly extension to Dundee	Extension of option New B.1 running alternatively between Inverness and Dundee. Requires slightly less resource than option New B.2 and less pathing conflicts.	Dec 2011
New B.4	Hourly Glasgow - Arbroath service	Requires 3 or 4 additional DMU's plus minor signalling works at Arbroath. Pathing conflicts issues with HML and access to Glasgow Queen St. Difficult to implement until national timetable recast complete.	Dec 2016
New B.5	Hourly Glasgow - Perth service with two hourly extension to Arbroath	Extension of option New B.1 running alternatively between Inverness and Arbroath. Requires slightly less resource than option New B.4 and less pathing conflicts. Minor signalling works still required at Arbroath.	Dec 2011
New B.6	Hourly "all stations" Glasgow - Aberdeen service	Requires 4 or 5 additional DMU's plus major infrastructure works at Usan (£50m+). Pathing conflicts with HML and access to Glasgow Queen St. Difficult to implement until national timetable recast complete.	2017+
New B.7	Hourly Glasgow - Perth service with two hourly extension to Aberdeen	Requires slightly less resource than option New B.6 and possibly less infrastructure works at Usan (still significant at £10m+). Pathing conflicts with HML and access to Glasgow Queen St but more manageable than in option New B.6. Difficult to implement until national timetable recast complete.	2017+
New C.1	Hourly Stirling - Perth service	Requires upgrade of Platforms 4 and 5 at Stirling at circa £2m and 2 additional DMU's. Realistically can only be implemented once EGIP and national timetable recast complete.	2017+

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New C.2	Hourly Stirling - Dundee service	As option New C.1 with 3 additional DMU's required.	2017+
New C.3	Hourly Stirling - Perth service with 2 hourly extension to Dundee	Estimated as requiring same resources as option New C.2	2017+
New C.4	Hourly Stirling - Arbroath service	As option New C.1 with 4 or 5 additional DMU's required. Minor signalling works required at Arbroath.	2017+
New C.5	Hourly Stirling - Perth service with 2 hourly extension to Arbroath	Estimated as requiring same resources as option New C.4	2017+
New C.6	Hourly Stirling - Aberdeen service	As option New C.1 with 5 or 6 additional DMU's required. Major infrastructure works at Usan (£50m+)	2017+
New C.7	Hourly Stirling - Perth service with 2 hourly extension to Aberdeen	Estimated as requiring slightly less resource (5 DMU's) than option New C.6 with possibly less infrastructure work at Usan (still significant at £10m+)	2017+
New D.1	Hourly Perth - Dundee service	Terminating trains at Perth requires shunting movements so despite short journey time 2 additional DMU's required.	Dec 2011
New D.2	Hourly Perth - Arbroath service	As option New D.1 with 2 or 3 additional DMU's required. Minor signalling works required at Arbroath.	Dec 2011
New D.3	Hourly Perth - Dundee service with 2 hourly extension to Arbroath	Estimated as requiring same resources as option New D.2	Dec 2011
New D.4	Hourly Perth - Aberdeen service	As option New D.1 with 4 or 5 additional DMU's required. Major infrastructure works at Usan (£50m+)	2017+
New D.5	Hourly Perth - Dundee service with 2 hourly extension to Aberdeen	Estimated as requiring slightly less resource (4 DMU's) as option New C.4 with possibly less infrastructure work at Usan (still significant at £10m+)	2017+
New E.1	Hourly Dundee to Arbroath service	Estimated as requiring 2 additional DMU's and minor signalling infrastructure works at Arbroath.	Dec 2011
New E.2	Hourly Dundee to Aberdeen service	Estimated as requiring 3 or 4 additional DMU's and major infrastructure works at Usan (£50m+)	2017+

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New E.3	Hourly Dundee to Arbroath service with two hourly extension to Aberdeen	Estimated as requiring same resources as option New E.2 with possibly less infrastructure work at Usan (still significant at £10m+)	2017+
New F.1	Hourly Perth - Aberdeen service with reduction in express services	<p>Aberdeen - Glasgow and Edinburgh express would run as a combined unit, splitting at Dundee. The path freed up would be used by a new stopping service.</p> <p>Performance risk for combining Aberdeen bound services at Dundee, ie. one set will be delayed en-route causing the other to wait.</p> <p>No infrastructure works required.</p> <p>Estimated 4 additional DMU's required.</p>	Dec 2016
New F.2	Hourly Dundee - Aberdeen service with reduction in express services	As option New F.1 but with potential to require 3 additional DMU's.	Dec 2011
New G	Sensitivity - Terminating services at Carnoustie	For options New B.4; B.5; C.4; C.5; D.2; D.3 and E.1 services could be terminated at Carnoustie rather than Arbroath. This would avoid minor signalling works and possible reduce the number of additional units required for each option by 1 because of the shorter distance and easier turnback operation at Carnoustie compared with Arbroath.	
New H	Sensitivity - remove stops from express services if local services provided	Journey time benefit may be obtained if stops are removed from existing express services if the interconnectivity is replaced through a new local stopping service.	

3.5 These potential new services are shown schematically in Appendix B

4 Packages of new service options

4.1 The following options can be packaged to deliver benefit in an incremental manner.

TABLE 4-1 PACKAGES OF OPTIONS

Option Ref	Option	Comments	Time frame
Pac A.1	Hourly Glasgow - Perth service plus hourly Perth - Dundee service	Options New B.1 and D.1	Dec 2010 and then Dec 2011
Pac A.2	Hourly Glasgow - Perth service plus hourly Perth - Arbroath service	Options New B.1 and D.2	Dec 2010 and then Dec 2011
Pac A.3	Hourly Glasgow - Perth service plus hourly Perth - Dundee service with 2 hourly extension to Arbroath	Options New B.1 and D.3	Dec 2010 and then Dec 2011
Pac A.4	Hourly Glasgow - Perth service plus hourly Perth - Aberdeen service	Options New B.1 and D.4	Dec 2010 and then 2017+
Pac A.5	Hourly Glasgow - Perth service plus hourly Perth - Dundee service with 2 hourly extension to Aberdeen	Options New B.1 and D.5	Dec 2010 and then 2017+
Pac A.6	Hourly Glasgow - Perth service plus hourly Dundee - Arbroath service	Options New B.1 and E.1	Dec 2010 and then Dec 2011
Pac A.7	Hourly Glasgow - Perth service plus hourly Dundee - Aberdeen service	Options New B.1 and E.2	Dec 2010 and then 2017+
Pac A.8	Hourly Glasgow - Perth service plus hourly Dundee - Arbroath service with 2 hourly extension to Aberdeen	Options New B.1 and E.3	Dec 2010 and then 2017+
Pac A.9	Hourly Glasgow - Perth service plus hourly Perth - Aberdeen service (with reduction in express paths)	Options New B.1 and F.1	Dec 2010 and then Dec 2016
Pac A.10	Hourly Glasgow - Perth service plus hourly Dundee - Aberdeen service (with reduction in express paths)	Options New B.1 and F.2	Dec 2010 and then Dec 2011
Pac B.1	Hourly Glasgow - Dundee service plus hourly Dundee to Arbroath service	Options New B.2 and E.1	Dec 2011 and then Dec 2016
Pac B.2	Hourly Glasgow - Dundee service plus hourly Dundee - Aberdeen service	Options New B.2 and E.2	Dec 2016 and then 2017+

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Pac B.3	Hourly Glasgow - Dundee service plus hourly Dundee - Arbroath service with 2 hourly extension to Aberdeen	Options New B.2 and E.3	Dec 2016 and then 2017+
Pac B.4	Hourly Glasgow - Dundee service plus hourly Dundee - Aberdeen service (with reduction in express paths)	Options New B.2 and F.2	Dec 2011 and then Dec 2016
Pac C.1	Hourly Glasgow - Perth service with two hourly extension to Dundee plus hourly Dundee to Arbroath service	Options New B.3 and E.1	Dec 2011 and then Dec 2016
Pac C.2	Hourly Glasgow - Perth service with two hourly extension to Dundee plus hourly Dundee to Aberdeen service	Options New B.3 and E.2	Dec 2011 and then 2017+
Pac C.3	Hourly Glasgow - Perth service with two hourly extension to Dundee plus hourly Dundee to Arbroath service with 2 hourly extension to Aberdeen	Options New B.3 and E.3	Dec 2011 and then 2017+
Pac C.4	Hourly Glasgow - Perth service with two hourly extension to Dundee plus hourly Dundee - Aberdeen service (with reduction in express paths)	Options New B.3 and F.2	Dec 2011 and then Dec 2016
Pac D.1	Hourly Stirling - Perth service plus hourly Perth - Dundee service	Options New C.1 and D.1	Dec 2011 and then Dec 2016
Pac D.2	Hourly Stirling - Perth service plus hourly Perth - Arbroath service	Options New C.1 and D.2	Dec 2011 and then Dec 2016
Pac D.3	Hourly Stirling - Perth service plus hourly Perth - Dundee service with two hourly extension to Arbroath	Options New C.1 and D.3	Dec 2011 and then Dec 2016
Pac D.4	Hourly Stirling - Perth service plus hourly Perth - Aberdeen service	Options New C.1 and D.4	2017+
Pac D.5	Hourly Stirling - Perth service plus hourly Perth - Dundee service with two hourly extension to Aberdeen	Options New C.1 and D.5	2017+
Pac D.6	Hourly Stirling - Perth service plus hourly Dundee - Arbroath service	Options New C.1 and E.1	Dec 2011 and then 2017+
Pac D.7	Hourly Stirling - Perth service plus hourly Dundee - Aberdeen service	Options New C.1 and E.2	2017+
Pac D.8	Hourly Stirling - Perth service plus hourly Dundee - Arbroath service with two hourly extension to Aberdeen	Options New C.1 and E.3	2017+

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Pac D.9	Hourly Stirling - Perth service plus hourly Perth - Aberdeen service (with reduction in express paths)	Options New C.1 and F.1	Dec 2016 and 2017+
Pac D.10	Hourly Stirling - Perth service plus hourly Dundee - Aberdeen service (with reduction in express paths)	Options New C.1 and F.2	Dec 2011 and 2017+
Pac E.1	Hourly Stirling - Dundee service plus hourly Dundee - Arbroath service	Options New C.2 and E.1	Dec 2011 and then 2017+
Pac E.2	Hourly Stirling - Dundee service plus hourly Dundee - Aberdeen service	Options New C.2 and E.2	2017+
Pac E.3	Hourly Stirling - Dundee service plus hourly Dundee - Arbroath service with two hourly extension to Aberdeen	Options New C.2 and E.3	2017+
Pac E.4	Hourly Stirling - Dundee service plus hourly Dundee - Aberdeen service (with reduction in express paths)	Options New C.2 and F.2	Dec 2011 and then 2017+
Pac F.1	Hourly Stirling - Perth service with two hourly extension to Dundee plus hourly Dundee - Arbroath service	Options New C.3 and E.1	Dec 2011 and then 2017+
Pac F.2	Hourly Stirling - Perth service with two hourly extension to Dundee plus hourly Dundee - Aberdeen service	Options New C.3 and E.2	2017+
Pac F.3	Hourly Stirling - Perth service with two hourly extension to Dundee plus hourly Dundee - Arbroath service with two hourly extension to Aberdeen	Options New C.3 and E.3	2017+
Pac F.4	Hourly Stirling - Perth service with two hourly extension to Dundee plus hourly Dundee - Aberdeen service (with reduction in express paths)	Options New C.3 and F.2	Dec 2011 and then 2017+
Pac G.1	Hourly Glasgow - Perth service, plus hourly Perth - Dundee service, plus hourly Dundee - Arbroath service	Option New B.1, D.1 and E.1	Dec 2010, then Dec 2011 and then Dec 2016
Pac G.2	Hourly Glasgow - Perth service, plus hourly Perth - Dundee service, plus hourly Dundee - Aberdeen service	Option New B.1, D.1 and E.2	Dec 2010, then Dec 2011 and then 2017+
Pac G.3	Hourly Glasgow - Perth service, plus hourly Perth - Dundee service, plus hourly Dundee - Arbroath service with two hourly extension to Aberdeen	Option New B.1, D.1 and E.3	Dec 2010, then Dec 2011 and then 2017+

5 Stations

5.1 Our review of the study area has identified a number of options for existing and new stations.

TABLE 5-1 STATION OPTIONS

Option Ref	Option	Comment	Time frame
Stn A.1	New Bannockburn station	New station located with access from A91. Assume 200-300 car parking spaces required. Station cost circa £6m. Modelling is required to determine if capacity exists for existing services to make an additional station stop without network performance impact. 4 potential locations identified. To be delivered with or following EGIP. Note - has been already rejected for inclusion in EGIP scope due to the detrimental impact this additional stop has on the performance of the rail network.	Dec 2016 if linked to EGIP
Stn A.2	New Dunblane North station	New station located with direct access from A9 north of Dunblane. Assume circa 200 car parking spaces. Would be new terminus for Glasgow - Dunblane services upon completion of EGIP. Topography difficult to accommodate station. Station cost circa £5m plus £4m OLE & signalling works. Deliver with EGIP.	Dec 2016 if linked to EGIP
Stn A.3	New Greenloaning Station	New station located within town. Cost circa £4m.	2017+
Stn A.4	New Blackford Station	New station located within town. Cost circa £4m.	2017+
Stn A.5	New Dundee West Station	New station located to west of Dundee. Two locations under consideration - either side of existing Invergowrie station. Cost circa £4m.	2017+
Stn B.1	Enhance car parking at Dunblane	Link to EGIP improvements. Make more effective use of local authority car park adjacent to station.	Dec 2016
Stn B.2	Enhance car parking at Bridge of Allen	Link to EGIP improvements. Acquire additional land to construct car park.	Dec 2016

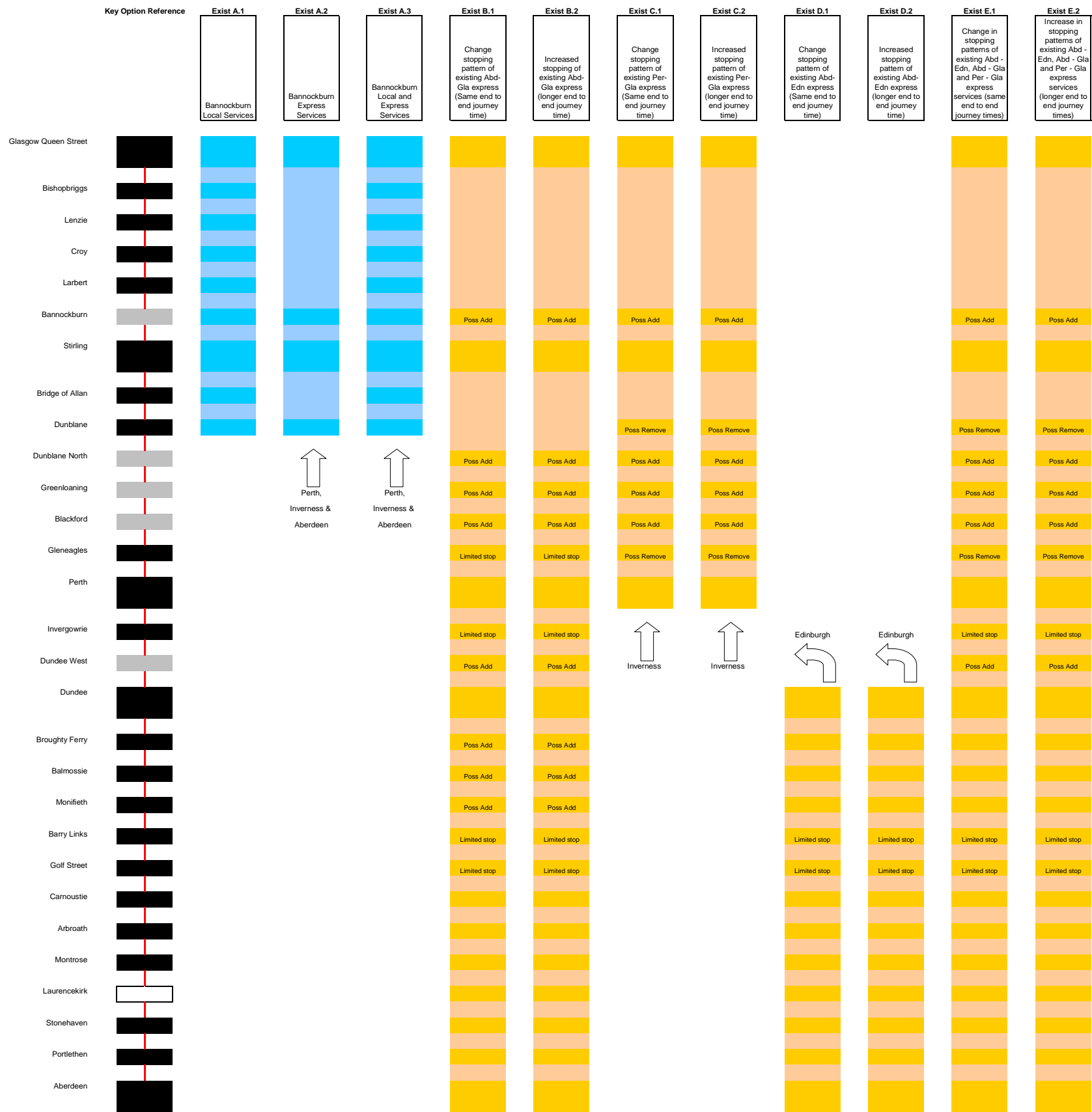
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Stn B.3	Enhance Gleneagles Station	Improve road access from A9. Provide additional car parking. Provide enhanced public transport. Link to Ryder cup in 2014. Cost of road improvements required under review but estimated as £2m+	May 2014
Stn B.4	Enhance existing stations between Dundee and Arbroath	Improve car parking, lighting, public amenity. Assume minor works and TACTRAN funded. Otherwise 2017+	Dec 2011
Stn B.5	Enhance existing stations between Dundee and Arbroath where service frequencies are improved.	As with option Stn B.4 but only at stations which experience an improved level of rail service. Assume minor works and TACTRAN funded. Otherwise 2017+	Dec 2011

APPENDIX

A

POTENTIAL CHANGES TO EXISTING SERVICES



Key: Poss Add: New station call to be considered based on demand forecasting criteria
 Poss Remove: Existing station call to be considered for removal based on demand forecasting criteria
 Limited Stop: Existing station with current poor service - unlikely to benefit from change

APPENDIX
B
PROPOSED NEW SERVICES

CONTROL SHEET

Project/Proposal Name Extended Tay Estuary Rail Study

Document Title Master Option List

Client Contract/Project No.

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ISSUE HISTORY

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