



# Aberdeen Rapid Transit

Detailed Options Appraisal

Technical Note C – Integration of Existing Bus Network

On behalf of:

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nestrans

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## Document Control Sheet

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# 1 Introduction

## 1.1 Overview

- 1.1.1 This technical note discusses the work undertaken to integrate the underlying bus network with the ART network, as is assumed for Options 3, 3A and 5, 5A and 5P and as then utilised within the modelling of Option 5.
- 1.1.2 The approach recognises that ART is envisaged to operate high frequency bus services along four corridors but that the ART services will duplicate services on existing routes and so if ART is to be part of an integrated and efficient city-wide bus network, changes will be required to existing bus routes and services.
- 1.1.3 This technical note describes the possible changes to the existing network based on the extent to which ART services overlap the existing bus network, but also examines what this could mean for people's access to their nearest bus stop i.e., the connectivity of the bus network.
- 1.1.4 **It should be noted that this exercise by no means seeks to establish the exact nature of any changes to the underlying bus services if ART were implemented. The analysis here has helped establish an appropriate bus network model for the purposes of testing Option 5 as part of the appraisal. The work has also fed into an understanding of the potential commercial implications to bus operations in terms of ensuring an efficient and more commercially viable bus network for Aberdeen and into Aberdeenshire. The more precise nature of changes that may be required to the existing network needs greater consideration as the ART project progresses.**
- 1.1.5 For the purposes of this exercise, the four ART corridors, as assumed for the purposes of the ASAM testing has been assumed, namely:
- **North** A956 (N): Bridge of Don P&R to city centre via Ellon Road with possible extension to Ellon P&R
  - **North - West** A96: Craibstone P&R to city centre via A96 (Auchmill Road, Great Northern Road, Powis Terrace, Powis Place, Causewayend) and Gallowgate
  - **West** A944: Westhill to city centre via the A944 (Straik Road, Lang Stracht and Westburn Road) and then Skene Square/ Denburn Road via the Berryden Corridor Improvement Scheme (BCIP)
  - **South** A92 (S): Portlethen to city centre via A92, Great Southern Road (B9077) and Holborn Street (A9013)
- 1.1.6 In terms of services, the two cross city ART services connecting Bridge of Don Park & Ride to Westhill, and Craibstone Park & Ride to a new Park & Ride site at Portlethen are assumed.

## 1.2 Objective and Assumptions

- 1.2.1 The objective of the analysis is to understand at a high level, what the bus network in Aberdeen would look like with dedicated ART routes integrated with existing bus routes and services i.e., as described in Option 5).
- 1.2.2 The analysis assumes the following:
- The existing bus network is made up of city (intra-urban) and long distance (inter-urban) routes. City routes are located within the urban extents of Aberdeen City and are mainly operated by First, while long distance routes serve wider residential settlements and

employment zones beyond the proposed ART network and are operated predominantly by Stagecoach but also Bains Coaches. These city and long-distance routes are listed in the table below

- To ensure connectivity to the wider bus network, no change is proposed to the long-distance routes to ensure the ART network does not reduced opportunities for those living in Aberdeenshire and beyond.
- Bus stops on the existing bus network are retained where they do not overlap the ART network. Where there is an overlap, the existing bus stops are rationalised so that they are spaced approximately every 800 metres along the ART corridor. Both ART, long distance buses and, to a limited extent, city route services will use these rationalised stops.

1.2.3 The conclusion of this work is to provide a revised bus route network that integrates ART services.

Table 1.1: City and long distance bus routes serving Aberdeen City

Routes	Operator	Destinations
<b>City Routes</b>		
1	First	Danestone – Bridge of Don – Aberdeen – Garthdee (RGU)
1B <sup>1</sup>	First	Shielhill - Bridge of Don – Aberdeen – Garthdee (RGU)
2	First	Middleton Park - Bridge of Don – Aberdeen – Garthdee (RGU)
3, 3A, 3B	First	Mastrick – Aberdeen – South Loirston/ Cove Bay
4	Stagecoach	Countesswells - Aberdeen
5, 5A	Stagecoach	Westhill – Aberdeen
6, 6A	Stagecoach	Westhill - Aberdeen
8	First	Aberdeen - ARI – Danestone – Middleton Park - Shielhill
11, 11A	First	Northfield – Aberdeen – Woodend/ Craigiebuckler
12	First	Heathryfold – Aberdeen - Torry
13	First	Heathryfold – Mastrick – Aberdeen - Footdee / Hillhead of Seaton
14 <sup>1</sup>	Stagecoach	Kingswells – Aberdeen
15A	Stagecoach	Craigiebuckler - Aberdeen
16B	First	Countesswells Playing Fields - Aberdeen
15, 15B	First	Countesswells – Airyhall – Aberdeen - Torry
17, 17A	First	Dyce – Newhills - Aberdeen - Kincorth
18	First	Dyce - Bankhead – Aberdeen - Kincorth
19	First	Hilton – Aberdeen – Cults – Bieldside – Milltimber - Peterculter
20	First	Aberdeen – Hillhead of Seaton
23	First	Heathryfold – Aberdeen - Sheddocksley
31	First	School service
52	First	School service
59	Stagecoach	Northfield – Torry (Sunday only)
62	First	School service

<sup>1</sup> Under the ASAM modelling of Options 2 and 3, services along these routes are strengthened to operate 10 buses per direction per hour during the day to provide 'ART' levels of service

<b>Routes</b>	<b>Operator</b>	<b>Destinations</b>
172	First	Dyce – Newhills – CC - Kincorth
181, 182, 183	First	School services
727 <sup>1</sup>	Stagecoach	Aberdeen – Aberdeen Airport
X27	First	CC – TECA – Airport - Dyce
<b>Long Distance Routes</b>		
7 <sup>1</sup> , 7A, 7B, 7S	Stagecoach	Stonehaven - Aberdeen
8A, 8C	Stagecoach	Stonehaven – local service (outside the study area)
9	Stagecoach	Inverurie - Aberdeen
10, 10B	Stagecoach	Inverness - Aberdeen
21A	Stagecoach	Local Cove Bay service
22, 22A, 22B	Stagecoach	Local Inverurie service
35	Stagecoach	Elgin - Aberdeen
37	Stagecoach	Inverurie - Aberdeen
49	Stagecoach	Inverurie - Ellon (outside study area)
50	Stagecoach	Ellon - Aberdeen
53, 53A	Stagecoach	Ellon - Aberdeen
61	Stagecoach	Peterhead - Aberdeen
64	Central Taxis	North Tarbothill - Aberdeen
68	Stagecoach	Fraserburgh - Aberdeen
70A, 70B, 70C	Stagecoach	Portlethen - Newtonhill
201	Stagecoach	Retain. Braemar - Aberdeen
218	Stagecoach	Alford - Aberdeen
220	Stagecoach	Alford - Aberdeen
290	Stagecoach	Aberdeen – Methlick
291	Stagecoach/ Watermill	Aberdeen – Methlick
305	Bains	Oldmeldrum – Aberdeen
777	Bains	Oldmeldrum – Aberdeen
M9	Stagecoach (Megabus)	Glasgow - Aberdeen
M92	Stagecoach (Megabus)	Edinburgh - Aberdeen
X7	Stagecoach	Perth - Aberdeen
X20	Stagecoach	Kemnay or Alford- Aberdeen
X60	Stagecoach	Peterhead - Aberdeen
X63	Stagecoach	Peterhead - Aberdeen
X67	Stagecoach	Fraserburgh - Aberdeen
X68	Stagecoach	Fraserburgh - Aberdeen

## 2 Methodology

### 2.1 Overview

2.1.1 Three key elements were undertaken to identify change to the underlying bus network:

- Route Assessment, informed through analysis of bus patronage impacts obtained from the Option 4 modelling (which considered layering ART cross-city services onto the existing network without any underlying changes) and therefore provides an indication of abstraction onto ART from the underlying bus network
- Bus Stop Connectivity Assessment

### 2.2 Study Area

2.2.1 The assessment area covers the urban extents of Aberdeen City and outlying residential/employment areas including Bridge of Don, Dyce / Kirkhill Industrial Estate, Kingswells / Prime Four, Westhill / Skene, Cults / Bielside / Milltimber / Peterculter, Cove Bay and Portlethen and is shown in the figure below.

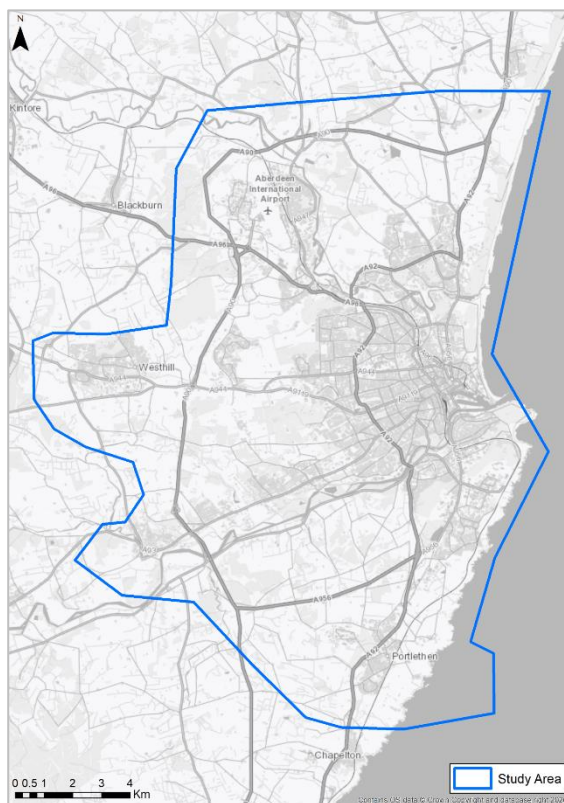


Figure 2.1: Assessment area

### Route Assessment

#### Method

2.2.2 The method used to recommend changes required to the existing bus network is as follows:



- The existing bus network was reviewed to identify those routes (city and long distance) that overlap or closely parallel the proposed ART routes
- Depending on the extent of the overlap or parallel running, initial bus services were identified as candidates for:
  - Retention of the route
  - Removal of the route
  - Cutting-back or shortening of the route
- Analysis was undertaken of the outputs from the Option 4 modelling where ART services were layered onto the existing bus network. Passenger boarding information obtained from ASAM was analysed to identify impacted services which had lost patronage to the ART network which was used to evidence and justify the changes identified through the route review, established through the first two tasks as set out above
- Establish the negative impacts of either removing or cutting-back routes such as leaving certain areas with no bus service or where overall route frequencies significantly reduce
- Mitigate these negative impacts by suggesting one of the following:
  - Route extensions to reconnect urban areas to the bus network
  - Service frequency increased on retained routes to maintain capacity
- The outcome of this process was that each bus route (city and long distance) operating within the study area could be categorised into one of the following:
  - Retain
  - Remove
  - Cut-back
  - Extend
  - Increase (service frequency)

## 2.3 Bus Stop Connectivity

### Overview

- 2.3.1 To understand how potential changes to existing services would affect people's ability to catch a bus, a bus stop connectivity analysis was undertaken. This was used to sense check and refine the above decisions and make sure the combined changes did not leave areas without a bus service or with a significantly reduced service compared to the current provision.
- 2.3.2 The analysis was only interested in the walk time to the bus stop from the local area and not the overall bus journey time. This approach was felt to be justified given the frequency and routing of local bus services on the existing network is likely to change as a result of the ART network.
- 2.3.3 For local bus services (city and long distance), connectivity to the bus network was defined as having a journey origin (e.g., home, work) within 400 metres of a bus stop or in the case of an ART stops, 600 metres. The increased catchment walk time used for ART stops, assumes people would be willing to walk further to access the higher frequency / higher quality and

therefore more attractive public transport service, more similar to that assumed for railway stations.

2.3.4 These walk isochrones were calculated for each bus stop using the Network Analyst tool - an extension of ArcMap GIS software. Network Analyst produces service area polygons (walk isochrones) from defined facilities (in this case bus stops) based on defined walking distances and using the HERE road network which includes footpaths. In the case where bus stop walk isochrones overlapped, only the common area was used to calculate the total catchment area across all bus stops. This measure was then used as a proxy for how connected the local bus network is to the surrounding residential, employment and retail/ leisure areas.

2.3.5 To understand the combined impact of removing, cutting-back and extending bus routes, three scenarios were considered.

#### **Scenario 1: Existing bus network**

2.3.6 This baseline scenario included all the existing bus stops in the assessment area used by both city and long-distance routes.

2.3.7 Figure 2.2 shows the area covered by a 400 metre walk from each of these bus stops with the combined area calculated as 67,292,396 m<sup>2</sup> (67.3 km<sup>2</sup> approx.)

#### **Scenario 2: Core ART network**

2.3.8 This network removed all bus stops exclusively used by city routes and, in ART corridors, rationalises existing bus stops so that they are spaced approximately 800 metres apart.

2.3.9 Figure 2.3 shows the area covered by a 400 metre walk to bus stops used by long distance services and a 600 metre walk to bus stops along the ART corridors (used by both ART and long distance services). The combined area calculated as 37,106,466.5 m<sup>2</sup> (37.1 km<sup>2</sup> approx.)

#### **Scenario 3: Proposed bus network with ART**

2.3.10 This network used the Scenario 2 network and added the city routes not removed as part of the Route Assessment described above. Bus stops were also excluded from those routes where a cut-back was proposed. Route extensions were not identified so no new bus stops were added.

2.3.11 Figure 2.4 shows the area covered by a 400 metre walk to bus stops used by long distance and adjusted city services and a 600 metre walk to bus stops along the ART corridors used by both ART and long distance services. The combined area is calculated as 56,784,841 m<sup>2</sup>. (56.8 km<sup>2</sup> approx.)

2.3.12 Ideally this value would be closer to the calculated area for the existing bus network (Scenario 1) however a review of Figure 2.4: Connectivity to bus stops (long distance, ART and modified city routes - Scenario 3) suggests this loss of connectivity could in part, be explained by:

- Peripheral residential areas of Westhill due to the removal of Routes 5 and 6
- Kingswells due to the removal of Route 14
- Sclattie Park due to the removals of Route 17
- The Kirkhill Industrial Estate due to the removal of Route X27
- Aberdeen Airport due to the removal of Route 727

2.3.13 In all cases, there was no obvious opportunity to extend or divert an existing route to cover these areas, but this issue is explored in greater detail in the conclusions section.

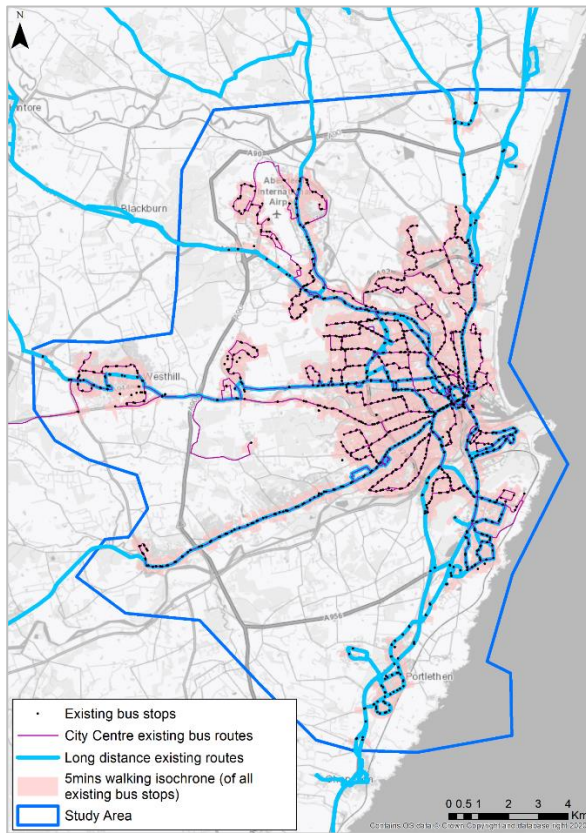


Figure 2.2: Connectivity of the existing bus network (Scenario 1)

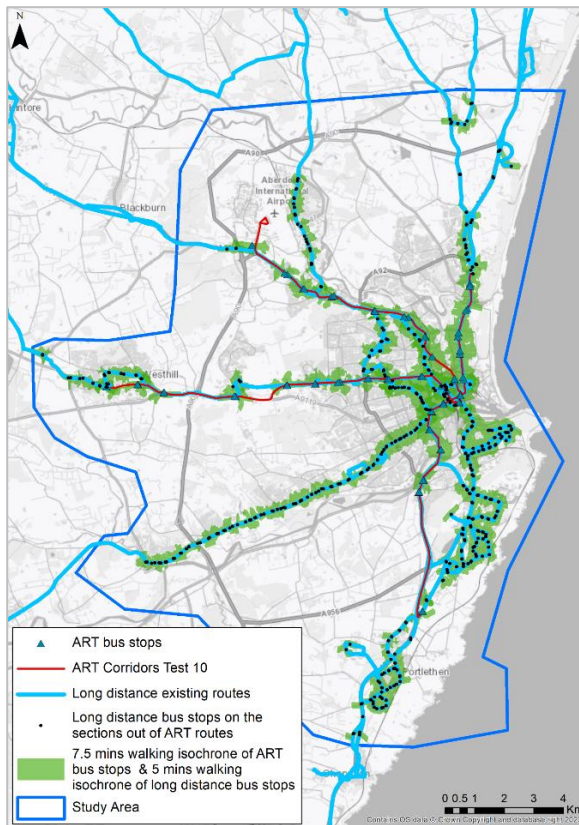


Figure 2.3: Connectivity to bus stops (long distance and ART routes only - Scenario 2)

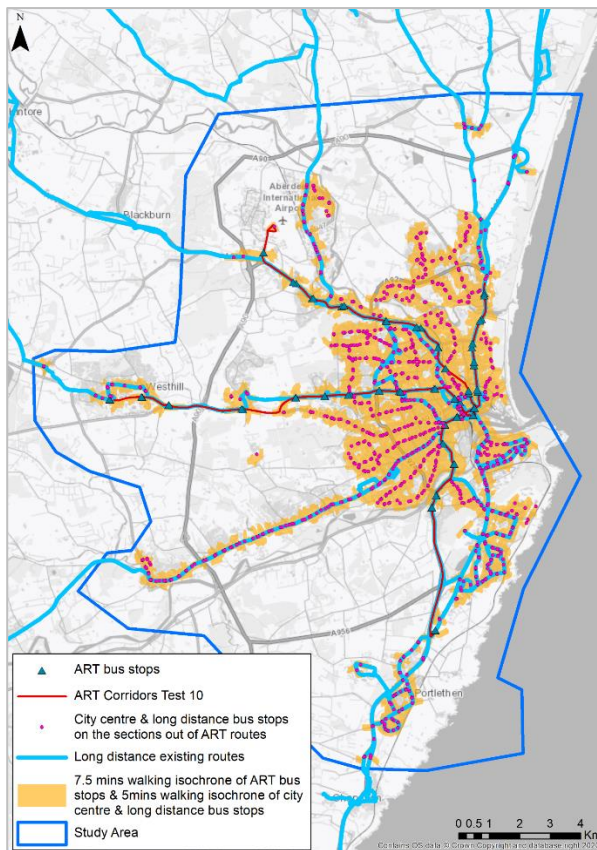


Figure 2.4: Connectivity to bus stops (long distance, ART and modified city routes - Scenario 3)

### 3 Outcomes

3.1.1 The table below sets out the outcome of the assessment and the rationale for all proposed changes based on the route and bus stop connectivity assessment, with a summary table presented in Table 3.2.

Table 3.1: Proposed existing network services changes

City Routes	Retain/Modify/Remove	Comments
1	Retain	<ul style="list-style-type: none"> <li>■ <b>Route Assessment:</b> Significant overlap with ART routes but retain because route has important connections at its northern and southern ends. Testing of Option 4 in ASAM showed a 33% reduction in patronage on the service by 2045.</li> <li>■ <b>Connectivity Assessment:</b> Include bus stops that do not overlap with ART routes i.e., from the Ellon Road j/w North Donside Road to Danestone (in the north) and from the Holborn Street j/w Great Sothern Road to RGU (in the south). Between these junctions Route 1 services will use ART stops on King Street, Union Street and Holburn Street.</li> </ul>
1B	Remove	<ul style="list-style-type: none"> <li>■ <b>Route Assessment:</b> Significant overlap with ART routes so remove route. This will result in a loss of connectivity to Cloverhill/ Mundurno. Testing of Option 4 in ASAM showed a 67% reduction in patronage on the service by 2045.</li> <li>■ <b>Connectivity Assessment:</b> Remove all bus stops exclusively used by Route 1B services</li> </ul>
2	Retain	<ul style="list-style-type: none"> <li>■ <b>Route Assessment:</b> Significant overlap with ART routes but retain route because it provides connections to areas not served by the ART network (e.g., to the Bridge of Don area and Robert Gordon University). Testing of Option 4 in ASAM showed a 33% reduction in patronage on the service by 2045.</li> <li>■ <b>Connectivity Assessment:</b> Include those bus stops from the Ellon Road j/w North Donside Road to the Bridge of Don residential area and from the Holborn Street j/w Great Sothern Road to RGU (these will have been added by Route 1). Between these junctions Route 2 services will use ART stops on King Street, Union Street and Holburn Street.</li> </ul>
3, 3A, 3B	Modify	<ul style="list-style-type: none"> <li>■ <b>Route Assessment:</b> Significant overlap with ART routes but retain modified route that operates only between the city centre and Cove Bay. This assumes ART services directly serve the ARI. Testing of Option 4 in ASAM showed a 30% reduction in patronage on the 3 service and 35% reduction in the 3A service by 2045.</li> <li>■ <b>Connectivity Assessment:</b> Include those bus stops used between the city centre and Cove Bay and remove those exclusively used between the city centre and ARI</li> </ul>
4	Retain	<ul style="list-style-type: none"> <li>■ <b>Route Assessment:</b> Short overlap with ART routes but uses the A9119 to serve Kingswells and Countesswells, and parallel 5 and 6 services will be cut so retain.</li> <li>■ <b>Connectivity Assessment:</b> Include all bus stops used by Route 4 services</li> </ul>

City Routes	Retain/Modify/Remove	Comments
5/ 5A	Remove	<ul style="list-style-type: none"> <li>■ <b>Route Assessment:</b> Significant overlap with ART route serving Westhill so remove. This will result in a lost connection to Echt and the peripheral residential areas to Westhill. Testing of Option 4 in ASAM showed a 60% reduction in patronage on the service by 2045.</li> <li>■ <b>Connectivity Assessment:</b> Remove bus stops exclusively used by Route 5/ 5A services</li> <li>■ <b>Note:</b> Frequency on Route 11 services to be increased improve the frequency of buses on the A9119 between Hazelwood and the city centre</li> </ul>
6, 6A	Remove	<ul style="list-style-type: none"> <li>■ As 5/ 5A. Testing of Option 4 in ASAM showed a 60% reduction in patronage on the service by 2045.</li> </ul>
7/ 7A/ 7B	Remove	<ul style="list-style-type: none"> <li>■ <b>Route Assessment</b> Routes 7 and 7B follow the same alignment as ART services proposed between Portlethen and the city centre using the A92, Great Southern Road and Holburn Street. These routes should therefore be removed but Route 7A retained and frequency increased to mitigate the loss of Route 7B services between Stonehaven and Portlethen. Testing of Option 4 in ASAM showed a 43% reduction in patronage on the 7 service, a 6% reduction in patronage in the 7A service and 32% reduction in patronage in the 7B service y 2045.</li> </ul>
8/ 8A	Modify	<ul style="list-style-type: none"> <li>■ <b>Route Assessment:</b> Short overlap with ART routes within the city centre but also connection to ARI. Retain a modified route that keeps the section between the city centre and Murcar. This assumes ART directly serve the ARI. Testing of Option 4 in ASAM showed a 25% reduction in patronage on the 8 service and an 18% reduction in the 8A service by 2045.</li> <li>■ <b>Connectivity Assessment:</b> Remove bus stops used exclusively on the section between the city centre to ARI section and retain the bus stops between the city centre and Persley, Bridge of Don and Mundurno i.e., only include bus stops north of the Powis Terrace j/w Erskine Street because up to this point (from the city centre) services will use the ART stops.</li> </ul>
11, 11A	Retain Increase	<ul style="list-style-type: none"> <li>■ <b>Route Assessment:</b> No overlap with ART routes so retain route but increase service frequency to compensate for the loss of Routes 5 and 6 along the A9119.</li> <li>■ <b>Connectivity Assessment:</b> Include all bus stops used by Route 11/ 11A services</li> </ul>
12	Retain	<ul style="list-style-type: none"> <li>■ <b>Route Assessment:</b> No overlap with ART route so retain route. Existing high frequency route which will help compensate for the proposed loss of Route 23.</li> <li>■ <b>Connectivity Assessment:</b> Include all bus stops used by Route 12 services</li> </ul>
13	Retain	<ul style="list-style-type: none"> <li>■ <b>Route Assessment:</b> No overlap with ART routes so retain route.</li> </ul>

City Routes	Retain/Modify/Remove	Comments
		<ul style="list-style-type: none"> <li>▪ <b>Connectivity Assessment:</b> Include all bus stops used by Route 13 services</li> </ul>
14	Remove	<ul style="list-style-type: none"> <li>▪ <b>Route Assessment:</b> Overlap with the ART routes along the A944 so remove route. Testing of Option 4 in ASAM showed a 50% reduction in patronage on the service by 2045.</li> <li>▪ <b>Connectivity Assessment:</b> Remove all bus stops exclusively used by Route 14 services</li> </ul>
15, 15A, 15B	Retain	<ul style="list-style-type: none"> <li>▪ <b>Route Assessment:</b> No overlap with ART routes so retain route</li> <li>▪ <b>Connectivity Assessment:</b> Include all bus stops used by Route 15, 15A, 15B services</li> </ul>
17, 17A	Remove	<ul style="list-style-type: none"> <li>▪ <b>Route Assessment:</b> Significant overlap with ART routes so remove route This will result in a loss of connectivity to the Scattie Park, Ferryhill and Kincorth areas. Testing of Option 4 in ASAM showed a 62% reduction in patronage on the 17 service and a 64% reduction in the 17A service by 2045.</li> <li>▪ <b>Connectivity Assessment:</b> Remove all bus stops exclusively used by Route 17/ 17A services</li> </ul>
18	Retain	<ul style="list-style-type: none"> <li>▪ <b>Route Assessment:</b> Significant overlap with ART routes but retain route to keep connections to Dyce in the north and Kincorth in the south.</li> <li>▪ <b>Connectivity Assessment:</b> Include only bus stops north of the A96 j/w A92 (i.e., along Mugiemooss Road and A947 Stonewood Road) and Kincorth, including south of Kincorth (Provost Watt Drive, Arbroath Way, Abbotswell Crescent). Between these points Route 18 services will use ART stops</li> </ul>
19	Retain	<ul style="list-style-type: none"> <li>▪ <b>Route Assessment:</b> No overlap with ART routes so retain route</li> <li>▪ <b>Connectivity Assessment:</b> Include all bus stops used by Route 19 services</li> </ul>
20	Remove	<ul style="list-style-type: none"> <li>▪ <b>Route Assessment:</b> No overlap with ART routes but is a significant parallel route so remove route. Testing of Option 4 in ASAM showed a 14% reduction in patronage on the service by 2045.</li> <li>▪ <b>Connectivity Assessment:</b> Remove all bus stops exclusively used by Route 20 services</li> </ul>
23	Remove	<ul style="list-style-type: none"> <li>▪ <b>Route Assessment:</b> Significant overlap with ART routes so remove route. Testing of Option 4 in ASAM showed a 52% reduction in patronage on the service by 2045.</li> <li>▪ <b>Connectivity Assessment:</b> Remove all bus stops exclusively used by Route 23 services</li> </ul>
59	Retain	<ul style="list-style-type: none"> <li>▪ <b>Route Assessment:</b> No overlap with ART routes so retain route</li> <li>▪ <b>Connectivity Assessment:</b> Include all bus stops used by Route 59 services</li> </ul>

City Routes	Retain/Modify/Remove	Comments
172	Remove	<ul style="list-style-type: none"> <li>▪ <b>Route Assessment:</b> Significant overlap with ART routes and similar to Routes 17 and 18 so remove route</li> <li>▪ <b>Connectivity Assessment:</b> Remove all bus stops exclusively used by Route 172 services</li> </ul>
727	Remove	<ul style="list-style-type: none"> <li>▪ <b>Route Assessment:</b> Significant overlap with ART routes so remove. Testing of Option 4 in ASAM showed a 65% reduction in patronage on the service by 2045.</li> <li>▪ <b>Connectivity Assessment:</b> Remove all bus stops exclusively used by Route 727 services</li> </ul>
X27	Remove	<ul style="list-style-type: none"> <li>▪ <b>Route Assessment:</b> Significant overlap with ART routes so remove route. This assumes ART services are extended to Aberdeen Airport via Brent Road and the existing bus stops. Testing of Option 4 in ASAM showed a 55% reduction in patronage on the service by 2045.</li> <li>▪ <b>Connectivity Assessment:</b> Remove bus stops exclusively used by Route X27 services</li> </ul>

Table 3.2: Proposed existing network services changes - Summary

Service	Change	Comment
1B	Remove	Remove due to significant overlap with A956 (N) ART services
3/ 3A	Cut-back	Remove Mastrick - City Centre section. Retain Cove - City Centre
3G	Cut-back	As above for Route 3/ 3A
5/ 5A	Remove	Remove due to significant overlap with A944 ART services
6/ 6A	Remove	Remove due to significant overlap with A944 ART services
7/ 7B	Remove	Remove due to significant overlap with A92(S) ART services
8/ 8A	Cut-back	Remove ARI - City Centre section. Retain Cloverhill - Persley - City Centre
11	Increase	Increase to 6 buses/hr in each direction Frequency of Route 11A remains the same
14	Remove	Remove due to significant overlap with A944 ART services
17/ 17A	Remove	Remove due to significant overlap with A96 ART services
20	Remove	Remove due to significant parallel with A956 (N) ART services
23	Remove	Remove due to significant overlap with A96/ A944 ART services
727	Remove	Remove due to significant overlap with A96 ART services
X27	Remove	Remove due to significant overlap with A96 ART services

3.1.2 No route extensions were identified as part of this process, so the changes included only route removals and cut-backs.

3.1.3 The proposed removal of Routes 5 and 6 will significantly reduce the frequency of services on the A9119 Queens Road. To compensate, the proposal is to increase the frequency of Route 11 services from 2 to 6 buses per hour. This uplift in service frequency will also help mitigate the proposed removal of Route 23 which serves a similar area to Route 11 north of the A944 around Northfields and Cummings Park. It should be noted that this proposed service frequency increase does not affect the bus connectivity analysis as the bus stops along Route 11 remain the same. While Route 7/ 7B services are removed, those operating along Route 7A



are retained because they provide additional connections to Cove Bay, the Altens Industrial Estate and Balnagask. With Route 7B removed it is suggested that the frequency of 7A is increased to maintain a similar level of service between Stonehaven and Portlethen.

3.1.4 A **new bus route** connecting Westhill, Kingswells, Sclattie Park and the Kirkhill Industrial Estate to mitigate the loss of bus services in these areas<sup>2</sup> is proposed. It is proposed the route operate at a frequency of four buses per hour (7-10am and 4-7pm) and two buses per hour (10am-4pm). It is proposed that this route operates along the following roads using existing bus stops unless stated:

- **Start/ End:** Old Skene Road j/w Broadshade Road. The first and terminating bus stops would be the paired 'Dawson Drive' stops on Old Skene Road with buses using the roundabout to get from the terminating stop (Stop ID: 23625497) to the first stop (Stop ID: 23634387)
- Old Skene Road (Broadshade Road to Hay's Way)
- Hay's Way (Old Skene Road to Westhill Drive)
- Westhill Drive (Hay's Way to Straik Road)
- A944 (Westhill Drive to Kingswells Causeway)
- Kingswells Causeway to Kingswells P&R to Kingswells Drive
- Kingswells Drive and Kingswells Crescent
- Fairley Road (Kingswells Crescent to Kepplehills Drive)
- Kepplehills Drive to Kepplehills Road to Sclattie Park – new paired bus stops on Kepplehills Road and on Sclattie Park (Kepplehills Road to Kepplehills Drive)
- Sclattie Park (Kepplehills Drive to Sclattie roundabout)
- A96 (Sclattie roundabout to Craibstone P&R)
- Airport Way (Craibstone P&R to Dyce Drive) – non-stop
- Dyce Drive (Airport Way to Pitmedden Road)
- Pitmedden Road (Dyce Drive to Victoria Street)
- Victoria Street (Pitmedden Road to Station Road)
- **Start/ End:** Dyce railway station. New bus stops/ stands, and bus turnaround facility required.

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<sup>2</sup> Although this new route operates orbitally, opposed to the radial routes it is intending to replace, the route would include good connections to ART operating on the A944 and A96, allowing bus users to interchange for trips to and from the city centre.

## 4 Summary & Conclusions

### 4.1 Conclusions

4.1.1 The key output of this work was to provide a revised bus network that includes ART for testing in ASAM. It is proposed that this network includes:

- ART services operating along the proposed ART corridors with a frequency of 6 buses per hour and bus stop spacing of approximately 800 metres. All other bus stops on the ART corridor are to be removed
- The ART bus stops would serve all bus services that pass the stops including those on city and long distance routes
- Long distance routes will continue to serve their existing bus stops outside the ART network
- The removal of nine city routes (1B, 5/ 5A, 6/ 6A, 14, 17/ 17A, 20, 23, 727 and X27)
- The cut-back or shortening of 2 city routes (3/ 3A and 8)
- An increase to the service frequency of Route 11 from 2 to 6 buses per hour to compensate for the removal of Routes 5, 6 and 23
- The extension of the ART route from the Craibstone P&R to the Airport (non-stop) via Airport Way and Argyll Road using the existing stops on Brent Road (currently used by X27) as the terminating and first stops
- A new bus route connecting Westhill, Kingswells, Sclattie Park and the Kirkhill Industrial Estate to mitigate the loss of bus services in these areas<sup>3</sup>. It is proposed the routes operate 4 buses per hour (7-10am and 4-7pm) and two buses per hour (10am-4pm).

4.1.2 Finally, the following point of clarification is given relating to the usage of ART stops. Where the adjusted city routes overlap the ART network, they will use the ART bus stops. While this will put additional pressure on the capacity of these stops this should be manageable for the following reasons:

- The extent to which city routes use ART stops will be limited because many of the routes that overlap the ART corridors have been removed as part of the route assessment process
- While it is proposed that long distance services also use these stops, these routes generally have lower service frequencies and there is a further opportunity to reduce the risk of bus on bus congestion at stops by considering these services have a more limited stopping schedule when operating along the ART corridors

**4.1.3 To reiterate that noted above, this exercise by no means seeks to establish the exact nature of any changes to the underlying bus services if ART were implemented. The analysis here has been undertaken purely to establish an appropriate bus network model for the purposes of testing Option 5 as part of the appraisal. The nature of any required**

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<sup>3</sup> Although this new route operates orbitally, opposed to the radial routes it is intending to replace, the route would include good connections to ART operating on the A944 and A96, allowing bus users to interchange for trips to and from the city centre.

**changes to the existing bus network needs more detailed analysis as the ART proposals progress.**