

PUBLIC TRANSPORT STUDY UPDATE



SYSTRA

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1. INTRODUCTION

1.1 Background

- 1.1.1 The purpose of this study is to update the proposals for new bus routes to serve the proposed Dargavel Village development on the former Royal Ordnance site to the south west of the railway line at Bishopton in Renfrewshire. The original public transport study was undertaken in 2006/07 and it has been updated on a number of occasions. The most recent update was completed in 2015.
- 1.1.2 The railway station at Bishopton is served by frequent electric trains on the Inverclyde Line from Gourock, Greenock and Wemyss Bay to Glasgow. Since the original study was undertaken in 2006/07 there have been changes to the local rail passenger service including an increase in train capacity resulting from a combination of timetable enhancement and the deployment of new and longer trains on the Inverclyde and Ayr Lines. The station is the focal point for the bus services that currently serve the local community.
- 1.1.3 There is an hourly local bus service circulating around Bishopton village; an hourly service to Erskine; and a service between Greenock and Clydebank via Bishopton in daytime on Mondays to Saturdays. There are no direct bus services to Renfrew or Glasgow city centre and Bishopton has no evening or Sunday bus services. As a result, people living in the village are heavily dependent upon rail to provide access by public transport to destinations outside the immediate locality.
- 1.1.4 There have been significant changes to the scale and composition of the development and since the last study update in 2015. This study takes account of those changes.

1.2 Scope of work

- 1.2.1 In the original study and subsequent updates, the output of the Transport Assessment was used to identify places that needed to be linked with Dargavel Village, Bishopton by public transport and to provide a basis for quantifying demand for travel by bus. Proposals were developed for new or improved bus services to provide access for people living or working in the proposed development. Estimates were provided of the additional cost of introducing new or extended bus services, and forecasts were made of the additional patronage and revenue expected to be generated. This provided the basis for an assessment of the financial sustainability of proposed bus services and an estimate of the level of financial support that would be necessary as the development takes place.
- 1.2.2 The Section 75 Agreement with Renfrewshire Council included a sum to contribute towards the cost of providing financial support for improvements to local bus services needed to meet growing demand for sustainable travel as the planned Dargavel Village developments take place.
- 1.2.3 In addition, there is a Planning Condition to be satisfied that is worded as follows: “Prior to the commencement of any development on the site details of the provision of either new or extended bus services within the development, including details of operating hours, frequency of services, route and timescale for introduction, together with evidence of an agreement with a public transport operator to provide this service, shall be submitted to and

approved in writing by the Planning Authority, after consultation with Transport Scotland Trunk Road Network Management Directorate.” The Transport Scotland functions are now undertaken by the Network Operations team in the Trunk Road and Bus Operations Directorate.

- 1.2.4 A ‘public transport’ analysis differs from the assessment of traffic impact in two important ways:
- Account needs to be taken of bus patronage and revenue from internal trips within Bishopton which will contribute to the viability of the local bus service in the community.
 - An off-peak analysis is needed to build up a picture of total potential additional bus patronage and revenue predicted to arise as a result of the proposed development.
- 1.2.5 The access strategy is based on the construction of a new northern access road (Slateford Road) and a new southern access road (Barrangary Road). The northern and southern access routes are already connected to Dargavel Village centre at the Village Square by one of the internal key roads. This enables the operation of bus services through the site.
- 1.2.6 By 2026, the internal key road network will be complete. The last phase of the key internal road network is a road looping through the western side of the development site that will enable the bus route to serve the full development and provide a good level of accessibility. The road network is illustrated in Appendix A.
- 1.2.7 The objectives remain to ensure that all parts of the site are within reasonable walking distance of bus stops and/or the railway station and to develop proposals for new bus services that will become financially self-sustaining once the development reaches a critical mass.
- 1.2.8 Demand for bus services will build up over time as development proceeds. There is also a need to provide reasonably attractive public transport choices for people moving in to the development and for employees of companies choosing to locate in the development at the formative stage of their travel behaviour in order to minimise traffic impact. There will therefore be a need to provide financial support to bridge the gap between operating cost and revenue as demand builds up towards forecast levels.

1.3 The proposed development

- 1.3.1 Dargavel Village will consist predominantly of residential development with ancillary employment, retail and community facilities. Since the last update of the Public Transport Study, there have been significant changes to the content of the development.
- 1.3.2 A lack of interest in the land set aside for employment and the availability of sites elsewhere that will benefit from the investment arising from the Glasgow and Clyde Valley City Deal has resulted in a decision to reduce the employment component of the development and to increase the number of new homes to be provided. In addition, an expansion of the north-west sector of the site is proposed to provide land for additional housing. There is no change to the planned key primary road network that is suitable for use by bus services. The expansion area is virtually all within acceptable walking distance from the key primary road network.

- 1.3.3 There are two planning applications, one for the north-western expansion area with 350 homes and the other for the change of use from employment to housing.
- 1.3.4 The current indicative land use and development phasing plans for the proposed development can be seen at Appendix B. The phasing of the development and the expected build-out rate are shown in Tables 1 and 2 respectively.

Table 1. Phasing of housing development

PHASE	YEARS	NUMBER OF HOMES
1-2	2012-2020	1,564
3	2018-2024	801
4	2021-2022	60
5	2024-2029	415
6	2026-2031	569
7	2028-2034	671
Total		4,080

Table 2. Housing build-out rate

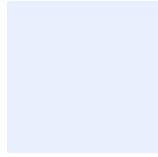
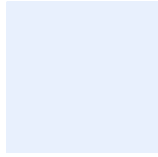
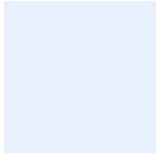
YEAR	NUMBER OF HOMES	CUMULATIVE TOTAL NUMBER OF HOMES OCCUPIED
2012-2016	569	569
2017	200	769
2018	200	969
2019	200	1,169
2020	200	1,369
2021	200	1,569
2022	200	1,769
2023	200	1,969
2024	200	2,169

YEAR	NUMBER OF HOMES	CUMULATIVE TOTAL NUMBER OF HOMES OCCUPIED
2025	200	2,369
2026	200	2,569
2027	200	2,769
2028	200	2,969
2029	200	3,169
2030	200	3,369
2031	200	3,569
2032	200	3,769
2033	200	3,969
2034	111	4,080

- 1.3.5 Land is identified for retail use in Dargavel Village Core close to the Village Square and railway station. It has the capacity for about 3,500 metres² of retail floor space. It is assumed that a convenience store with floor space of 2,000 metres² will be opened in 2022 with the remaining floor space being developed later in the building programme.
- 1.3.6 The remaining employment in Dargavel Village will take the form of 9,600 metres² of commercial / office development close to Dargavel Village Core. The timing of this development will depend to an extent on market circumstances but, for the purpose of this study, it is assumed that it will come on line at 2023.
- 1.3.7 The development proposal includes a primary school and a health centre. The primary school with capacity for 440 pupils is due to open in 2021 and the health centre is scheduled to be opened in 2022.

1.4 Structure of the report

- 1.4.1 The report continues in Chapter 2 with a review of existing public transport services in Bishopton. Chapter 3 contains an assessment of trip generation and trip distribution. It also provides quantification of potential demand for travel between Bishopton and a range of destinations by public transport on completion of each of the four phases of development.
- 1.4.2 Chapter 4 contains our proposals and assessments of additional annual cost and revenue for the new bus service. It concludes with a review of the level of financial support needed for



each proposed bus service at each phase of development. A summary and conclusions are provided in Chapter 5.

2. PUBLIC TRANSPORT PROVISION

2.1 Local rail services

- 2.1.1 Bishopton is an intermediate station on the ScotRail Inverclyde Line services between Glasgow, Paisley and Gourock / Wemyss Bay. It is the focal point for public transport in Bishopton as the Inverclyde Line service provides the principal means of access to/from the village by public transport.
- 2.1.2 During the last decade there has been considerable investment in increasing train capacity through the introduction of new, longer trains and enhancement of frequencies. Current service provision is summarised in Table 3

Table 3. Train frequencies (trains per hour)

DAY AND TIME OF WEEK	BISHOPTON - GLASGOW	BISHOPTON - GOUROCK	BISHOPTON – WEMYSS BAY
Monday – Friday morning peak	5	4	1
Monday – Friday inter-peak	5	4	1
Monday – Friday evening peak	5	4	1
Monday – Friday evening	3	2	1
Saturday daytime	5	4	1
Saturday evening	3	2	1
Sunday daytime	2	1	1
Sunday evening	3	1	1

- 2.1.3 ScotRail was consulted about the potential impact of the Dargavel Village development in previous studies when the proposed residential element of the development was around 2,500 homes. The increase in demand for train travel to/from Bishopton Station resulting from the increase in the number of homes proposed to 4,080 will be significant but the available capacity should be able to accommodate the extra demand.

2.2 Local bus services

- 2.2.1 Since the original public transport study in 2006/07, the level of bus service provision in Bishopton has declined. The main change was the withdrawal of direct peak period services to/from Renfrew, Braehead and Glasgow city centre when Arriva ceased bus operation in the area.
- 2.2.2 Strathclyde Partnership for Transport (SPT) provides financial support for two local bus services on Mondays to Saturdays operated by McGill's using a single vehicle. The two services both operate hourly – Service 520 is the Bishopton Local Service and Service 521 provides a link between Bishopton and the Bridgewater Shopping Centre in Erskine. First and last journeys on both services are sufficiently early and late respectively to cater for bus/rail interchange by Glasgow commuters.
- 2.2.3 Service X22 linking Greenock, Port Glasgow, Bishopton and Clydebank was introduced by McGill's with financial support from SPT in the form of Network Enhancement Grant, a form of funding intended to 'kick-start' a new or enhanced service by providing financial support as demand builds towards a break-even position. McGill's now operate Service X22 on a commercial basis on weekdays and Saturdays every 70 minutes in each direction.
- 2.2.4 Bishopton village is within the area of operation of the Renfrew dial-a-bus service (MyBus M45) provided for people who live in remote areas, are unable to use or have difficulty in using mainstream public transport. Bishopton is also a possible destination for the Gryffe Valley MyBus Service 965 but it is not intended to meet the travel needs of Bishopton residents. Travel on both services must be booked in advance and services are available between 09:00 and 18:00 daily.
- 2.2.5 Existing bus services are described in Table 4.

Table 4. Local bus services in Bishopton

OPERATOR	SERVICE NUMBER	ROUTE	MONDAY – SATURDAY DAYTIME
McGill's	X22	Greenock - Clydebank	Every 70 minutes
McGill's	520	Bishopton Local	Hourly
McGill's	521	Bishopton - Erskine	Hourly
Glasgow Citybus	521	Bishopton – Erskine via Hewlett Packard	One evening peak journey
N/A	MyBus M45	Renfrew Dial-a-Bus	Demand responsive (09:00 – 18:00)

2.3 Park and Ride

- 2.3.1 The Dargavel Village development is complemented by investment in park and ride at Bishopton Station. The first phase of the enhanced park and ride with 150 parking spaces is fully operational. It is served from the upgraded Station Road. The second phase will be accessed only from Dargavel Village (Craigton Drive) and is intended to provide a facility for those neighbourhoods in the Village that are beyond reasonable walking distance of the rail station. As development in these neighbourhoods is programmed to take place later, the second phase of the Park and Ride will be built before 2,200 houses are occupied, implying completion by 2024/25. This is a commitment in the planning obligation, and will remain a commitment as part of the refreshed application.
- 2.3.2 There will be no vehicular link between Station Road and the wider Dargavel development

2.4 The changed approach to bus service design

- 2.4.1 An approach to providing bus services based on a mix of modification of existing bus services and introduction of new bus services was adopted in the original Public Transport Study in 2006/07. The same approach was taken in previous updates of the Study. This approach was discussed at meetings with the former Strathclyde Passenger Transport Executive and no objections were raised.
- 2.4.2 The Strathclyde Partnership for Transport (SPT) response to the last update of the Public Transport Study indicated a need to take a different approach. Key comments from SPT were:
- that any new bus service to Dargavel should not duplicate or abstract passengers from existing bus services, whether operated on a commercial basis or with subsidy from SPT; and
 - the new service should be freestanding – implying that the modification of existing services including SPT supported Services 520/521 would not be acceptable.
- 2.4.3 The proposals outlined in Chapter 4 therefore comply with the above principles.

3. DEMAND FOR PUBLIC TRANSPORT

3.1 The Transport Assessment

- 3.1.1 Previous updates of the Public Transport Study relied on the Transport Assessment undertaken in 2008 as the source for some of the parameters used. A Scoping Report was prepared in 2016 followed by a new Transport Assessment both with a focus on changes to the composition of the Dargavel Village development and the impact of the additional area of housing to the north west of the site.
- 3.1.2 Information from the Transport Assessment and Scoping Report has been used together with information derived from a variety of other sources to quantify the potential market for public transport in order to provide a basis for the development of financially sustainable proposals to provide a bus service to Dargavel Village. Trip rates and other factors drawn from the Scoping Report have been applied to the current planned quantum of development on the site and the phasing of that development. The trip rates in the Scoping Report have been approved by Renfrewshire Council and Transport Scotland.
- 3.1.3 Transport Assessments focus on demand for travel in peak hours in order to provide a basis for assessing the network impact of the additional traffic generated by the proposed development.
- 3.1.4 The scale of provision of new or improved local bus services is governed by the need to cater for demand in peak periods but, in addition, it is also essential to make an estimate of total demand at peak and off-peak times in order to forecast annual revenue and, by comparison with annual operating costs, to quantify any need for revenue support and to establish prospects for long term financial sustainability. The implication is that trip rates are needed for the peak and off-peak periods rather than simply the morning and evening peak hours.
- 3.1.5 The general approach adopted in this Study Update is to quantify trip generation for the completed development at 2034 and to use that data to determine annual demand for bus services as build-out takes place over time.
- 3.1.6 The methodology and results of the peak period people trip assessment and the trip distribution outlined in this chapter have been agreed by both Transport Scotland and Renfrewshire Council.

3.2 Trip Generation

Residential development

- 3.2.1 The number of people trips generated by the development has been estimated from the TRICS trip generation database. Tables 5 and 6 indicate the residential trips rates obtained and the resultant people trips associated with the residential element of the proposed development at the end of each phase of the development. Table 5 considers the morning and evening peak periods and Table 6 addresses the inter-peak period and evenings.
- 3.2.2 The peak period trip rates have been updated from Proposed Change of Use Scoping Report produced by JMP Consultants Ltd in August 2016. The trip rates for the inter-peak period and evenings are unchanged since the last update of the Public Transport Study in 2014.

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Table 5. Residential people trip generation (peak)

	YEAR	NUMBER OF HOUSES	MORNING PEAK PERIOD			EVENING PEAK PERIOD		
			IN	OUT	TOTAL	IN	OUT	TOTAL
Residential trip rate per house	---	---	0.22	0.77	1.00	0.73	0.52	1.25
Number of residential trips	2018	969	223	746	969	707	504	1211
	2021	1,569	361	1208	1569	1145	816	1961
	2025	2,369	5445	1824	2369	1729	1232	2961
	2029	3,169	729	2440	3169	2313	1648	3961
	2034	4,080	938	3142	4080	2978	2122	5100

Table 6. Residential people trip generation (off-peak)

	YEAR	NUMBER OF HOUSES	INTER-PEAK PERIOD			EVENINGS		
			IN	OUT	TOTAL	IN	OUT	TOTAL
Residential trip rate per house	---	---	2.22	2.72	4.95	0.53	0.56	1.09
Number of residential trips	2018	969	2151	2635	4796	513	543	1056
	2021	1,569	3483	4268	7751	831	879	1710
	2025	2,369	5259	6444	11703	1256	1326	2582
	2029	3,169	7035	8620	15655	1680	1774	3454
	2034	4,080	9058	11098	20157	2162	2285	4447

Employment development

3.2.3 The last update of the Public Transport Study was based on an employment element with 138,000 metres² of employment floor space and 8,000 metres² of commercial land uses. The areas allocated for employment are now intended to be developed for housing leaving only an area of 9,600 metres² of commercial / office floor space close to the core of Dargavel Village.

3.2.4 People trip rates for the commercial / office development have been derived from the TRICS database. Peak period trips rates were taken from the JMP Proposed Change of Use Scoping Report (2016) and are based on information taken from the TRICS 7.1.3 database. The inter-peak trips rates were also derived from TRICS but are the rates that were used in the 2015 update of the Public Transport Study.

3.2.5 People trips generated by the commercial / office use and based on these trip rates are shown in Table 7.

Table 7. Employment person trip generation

	GROSS FLOOR AREA (METRES ²)	MORNING PEAK PERIOD			EVENING PEAK PERIOD			OFF-PEAK PERIOD		
		IN	OUT	TOTAL	IN	OUT	TOTAL	IN	OUT	TOTAL
Employment trip rate per 100 metres ²	---	1.867	0.316	2.183	0.28	1.995	2.275	3.24	1.75	4.99
	9,600	179	30	209	27	191	218	311	168	479

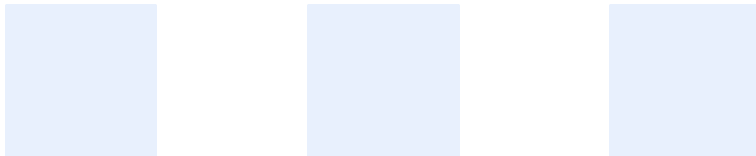
3.2.6 It is necessary to determine the number of trips that are internal to the Dargavel Village development and the number that are external with one trip end outside the development.

3.2.7 The 2008 Transport Assessment provided an analysis of Census 2001 data to determine the number of employees living and working in the same ward. It was necessary to continue to use the 2001 data as this information is not available from the 2011 Census. The analysis covered the Bishopton and Erskine S.E./Inchinnan wards and indicated that 16.7% of residents lived and worked in the same ward. It has therefore been assumed that 15% of people of working age living in Bishopton also work in Bishopton.

3.2.8 Table 8 shows the results of applying this relationship to the employment expected on completion of the Dargavel Village development.

Table 8. Employment person trip generation

	MORNING PEAK PERIOD			EVENING PEAK PERIOD			OFF-PEAK PERIOD		
	IN	OUT	TOTAL	IN	OUT	TOTAL	IN	OUT	TOTAL
Total employment generation	179	30	209	27	191	218	311	168	479
Internal trips (15 per cent)	27	4	31	4	29	33	47	25	72
External trips (85 per cent)	152	26	178	23	162	185	264	143	407



Primary education

- 3.2.9 The original development proposal included 2,642 houses. Previously Renfrewshire Council’s Education Department considered that this scale of residential development would generate 550 additional pupils when complete and fully occupied. This number of additional primary school pupils has been factored up to take account of the increase in the number of houses to 4,080 on completion of the development. This gives a new figure of 854 additional primary school pupils.
- 3.2.10 A new primary school with capacity for 440 pupils is required as part of the development and will be opened in 2021. It is understood that Renfrewshire Council Education Services consider that existing schools in the area have sufficient capacity to accommodate the remaining additional children of primary school age.
- 3.2.11 Analysis of a database containing all the schools in the Renfrewshire Local Authority area revealed the following ratios of full time equivalent (FTE) staff to pupils: Primary – 1 FTE staff member to every 20 pupils. Applying the findings of this analysis of staff numbers to the expected capacity of the school reveals the people trip generation characteristics for staff members.
- 3.2.12 Table 9 shows the people trip generation for the primary school staff associated with the proposed development. It has been assumed that an additional 9 support staff will be required at the school. This gives a total of 31 staff.

Table 9. Primary school staff trip generation

PUPILS	STAFF RATIO	STAFF NUMBERS
440	1 teacher per 20 children	22
	1 support staff per 50 children	9

- 3.2.13 It has been assumed that all trips in the morning peak period are arrivals and that trips at the end of the school day are all departures and are split equally between the inter-peak and evening peak periods.
- 3.2.14 Over the development stages the number of primary education people trips is assumed to grow at the same rate as the ongoing residential development. All primary school trips are assumed to be within the development area and are assumed not to be made by local public transport. For the purposes of this study, it is assumed that children will not use the local bus service for travel to and from the primary school.

Secondary education

- 3.2.15 Secondary school pupils living in the residential areas of the proposed development will need to travel to schools outside the development site. It is anticipated that they, like secondary school pupils now living in Bishopton, will travel to schools in Erskine and elsewhere.

- 3.2.16 Table 10 shows the basis of the calculation of the number of additional secondary school pupils generated by the Dargavel Village residential development. It shows the percentage of pupils in the 12 to 15 age band in the Bishopton, Bridge of Weir and Langbank ward taken from 2011 census data. This percentage has been applied to the Dargavel population at full development giving a total of 550 pupils aged between 12 and 15 years. This is factored by an additional 40% and rounded to take account of pupils aged 16 and 17 years giving an overall total of 771 pupil trips per day.
- 3.2.17 It is assumed that all of these pupils will travel to and from Erskine by dedicated school buses provided by Renfrew Council under contract.
- 3.2.18 Over the development stages the number of secondary education people trips is assumed to grow at the same rate as the ongoing residential development to reach the maximum value in 2033.

Table 10. Number of secondary school pupils

NUMBER OF HOUSE	HOUSE OCCUPANCY FACTOR	TOTAL POPULATION BISHOPTON, BRIDGE OF WEIR & LANGBANK WARD	PERCENTAGE OF BISHOPTON, BRIDGE OF WEIR & LANGBANK POPULATION AGE 12-15	DARGVEL TRIPS BY PUPILS AGE 12-15 (BY APPLYING BISHOPTON PERCENTAGE)	FACTOR BY +40 PER CENT FOR PUPILS AGE 16-17	TOTAL DARGAVEL PUPILS
4,080	2.72	11,097	4.96	550	1.40	771

Retail trips

- 3.2.19 Table 11 indicates the people trip generation associated with retail development in the site using trip rates derived from the TRICS database. Trip rates for the peak periods were taken from the JMP Proposed Change of Use Scoping Report (2016). Trip rates for the inter-peak period are unchanged since the 2015 update of the Public Transport Study. All trips associated with the local facilities are assumed to be internal to the site.

Table 11. Retail person trip generation

	MORNING PEAK PERIOD			EVENING PEAK PERIOD			OFF-PEAK PERIOD		
	IN	OUT	TOTAL	IN	OUT	TOTAL	IN	OUT	TOTAL
Trip rate per 100 metres ²	15.927	15.619	31.546	13.31	15.227	28.537	13.32	11.22	24.54
Number of trips	319	312	631	266	305	571	266	224	490

Leisure trips

- 3.2.20 Trip purpose data presented within the Scottish Household Statistics report (TRN/2005/2) indicated that approximately 5-7% of trips made during the peak hour are for entertainment or leisure purposes.

3.2.21 Therefore, we have assumed that 5% of the total residential trip generation will be internal trips to the local residential community (i.e. trips from one house to another) and leisure facilities such as the park. Internal trips associated with the leisure and community facilities are as shown in Table 12. The figures presented differ from those in the last update of the Public Transport study in that they are based on 4,080 housing units and not 2,642 as in the previous update. This is important as it reduces the number of residential person trips to/from places outside the Dargavel Village development.

3.2.22 Over the development phases the number of internal residential leisure trips is assumed to grow at the same rate as the overall development.

Table 12. Leisure person trip generation

YEAR		MORNING PEAK PERIOD			EVENING PEAK PERIOD			INTER-PEAK			EVENING		
		IN	OUT	TOTAL	IN	OUT	TOTAL	IN	OUT	TOTAL	IN	OUT	TOTAL
2018	Residential trips	223	746	969	707	504	1211	2151	2636	4787	513	542	1056
	Leisure trips (5%)	11	37	48	35	25	60	107	132	239	25	27	52
	Reduced residential trips	212	709	921	672	479	1151	2044	2504	4548	488	515	1004
2021	Residential trips	361	1208	1569	1145	816	1961	3483	4267	7750	832	878	1710
	Leisure trips (5%)	18	60	78	57	41	98	174	213	387	41	44	85
	Reduced residential trips	343	1148	1491	1088	775	1863	3309	4054	7363	791	834	1625
2025	Residential trips	545	1824	2369	1729	1232	2961	5259	6443	11702	1255	1327	2582
	Leisure trips (5%)	27	91	118	86	62	148	263	322	585	63	66	129
	Reduced residential trips	518	1733	2251	1643	1170	2813	4996	6121	11117	1192	1261	2453
2029	Residential trips	729	2440	3169	2313	1648	3961	7035	8620	15655	1679	1775	3454
	Leisure trips (5%)	36	122	158	116	82	198	351	431	782	83	89	172
	Reduced residential trips	693	2318	3011	2197	1566	3763	6684	8189	14873	1596	1686	3282
2034	Residential trips	938	3142	4080	2978	2122	5100	9057	11098	20155	2162	2285	4447

YEAR		MORNING PEAK PERIOD			EVENING PEAK PERIOD			INTER-PEAK			EVENING		
		IN	OUT	TOTAL	IN	OUT	TOTAL	IN	OUT	TOTAL	IN	OUT	TOTAL
	Leisure trips (5%)	47	157	204	149	106	255	452	555	1007	108	114	222
	Reduced residential trips	891	2985	3876	2829	2016	4845	8605	10543	19148	2054	2171	4225

3.2.23 Data from Tables 8 and 12 is used to determine the number of internal people trips when the Dargavel Village site is fully developed and occupied. The results are shown in Table 13.

Table 13. Internal people trips at full development of site (2034)

	MORNING PEAK PERIOD			EVENING PEAK PERIOD			OFF-PEAK PERIOD		
	IN	OUT	TOTAL	IN	OUT	TOTAL	IN	OUT	TOTAL
Residential to employment trips	27	4	31	4	29	33	47	25	72
Residential to retail trips	319	312	631	266	305	571	266	224	490
Total	346	316	662	270	334	604	313	249	562

3.2.24 Table 14 shows the calculation of external person trips to and from places outside Dargavel Village in both peak periods. Internal trips, primary school pupil trips and secondary school pupil trips are subtracted from total residential person trip generation and the external primary school teacher and support staff trips are added in.

3.2.25 Table 15 applies the same process to the off-peak and evening time periods.

Table 14. Peak period external trips at full development of site (2034)

	MORNING PEAK PERIOD			EVENING PEAK PERIOD		
	IN	OUT	TOTAL	IN	OUT	TOTAL
Residential trips	938	3142	4080	2978	2122	5100
Deduct internal residential to employment trips	27	4	31	4	29	33
Deduct internal residential to retail trips	319	312	631	266	305	571
Deduct internal leisure trips	47	157	204	149	106	255
Deduct secondary school trips	0	771	771	0	0	0
Deduct primary school pupil trips	0	854	854	0	0	0

	MORNING PEAK PERIOD			EVENING PEAK PERIOD		
	IN	OUT	TOTAL	IN	OUT	TOTAL
Total residential trips to external destinations	545	1044	3235	2559	1682	4241
Add employment trips from outside Dargavel Village	152	26	178	23	162	185
Add external teacher trips to primary school	31	0	54	0	27	27
Overall total external people trips	728	1070	3467	2582	1871	4453

Table 15. Off-peak period external trips at full development of site (2034)

	INTER-PEAK PERIOD			EVENING		
	IN	OUT	TOTAL	IN	OUT	TOTAL
Residential trips	9058	11098	20156	2162	2285	4447
Deduct internal residential to employment trips	47	25	72	0	0	0
Deduct internal residential to retail trips	266	224	490	0	0	0
Deduct internal leisure trips	452	555	1007	108	114	222
Deduct primary school trips	854	0	854	0	0	0
Deduct secondary school trips	771	0	771	0	0	0
Total residential trips to external destinations	6668	10294	16962	2054	2171	4225
Add employment trips from outside Dargavel Village	264	143	407	0	0	0
Add external teacher trips to primary school	0	27	27	0	0	0
Overall total external people trips	6932	10464	17396	2054	2171	4225

3.2.26 The external employment trips have already been quantified in Table 8.

3.3 Trip distribution and mode share

- 3.3.1 The trip distribution is different to that used in the recent updates of the Public Transport Study. The trip distribution used in this report is taken from the 2016 Scoping Report and has been agreed by Renfrewshire Council and Transport Scotland.
- 3.3.2 Table 16 shows the distribution of residential trips for all modes based on the trip distribution from the 2016 Scoping Report.
- 3.3.3 The overall distribution of commercial / office employment trips is shown in Table 17. It is assumed that there are no employment trips after the end of the evening peak period.

Table 16. Residential trip distribution all modes (excluding employment)

	PERCENTAGE		MORNING PEAK		EVENING PEAK		INTER-PEAK		EVENING	
	AREA	LOCAL	IN	OUT	IN	OUT	IN	OUT	IN	out
Total residential trips in scope	---	---	728	1070	2582	1871	6932	10464	2054	2171
Bishopton (area around main settlement)	30	10	73	107	258	187	693	1046	205	217
Erskine West		18	131	193	465	337	1248	1884	370	391
Erskine Central		2	15	21	52	37	139	209	41	43
Glasgow Airport	24	11	80	118	284	206	763	1151	226	239
St. James		3	22	32	77	56	208	314	62	65
Erskine SE & Inchinnan		3	22	32	77	56	208	314	62	65
Linwood (East & West)		2	15	21	52	37	139	209	41	43
Houston / Bridge of Weir / Brookfield / Craigend / Langbank		3	22	32	77	56	208	314	62	65
Dumbartonshire / Argyle		2	15	21	52	37	139	209	41	43
Paisley		6	50	75	181	131	485	732	144	152
Johnstone	1	7	11	26	19	69	105	21	22	
Glasgow (remainder)	42	28	204	300	723	524	1941	2930	575	608
Port Glasgow & part Inverclyde		2	15	21	52	37	139	209	41	43
Kilmacolm		0	0	0	0	0	0	0	0	0
Renfrew / Braehead		3	22	32	77	56	208	314	61	65
Inverclyde (remainder)	4	7	29	49	103	75	277	419	82	87

Table 17. External employment trip distribution all modes

	PERCENTAGE		MORNING PEAK		EVENING PEAK		INTER-PEAK	
	AREA	LOCAL	IN	OUT	IN	OUT	IN	OUT
Total residential trips in scope	---		152	26	23	162	264	143
Bishopton (area around main settlement)	15	8	12	2	2	13	21	11
Erskine West		3	5	1	1	5	8	4
Erskine Central		3	5	1	1	5	8	4
Glasgow Airport	29	2	3	1	0	3	5	3
St. James		7	11	2	2	11	18	10
Erskine SE & Inchinnan		5	8	1	1	8	13	7
Linwood (East & West)		6	9	2	1	10	16	9
Houston / Bridge of Weir / Brookfield / Craigend / Langbank		3	5	1	1	5	8	4
Dumbartonshire / Argyle		5	8	1	1	8	13	7
Paisley		50	15	23	4	4	24	40
Johnstone	6		9	2	1	10	16	9
Glasgow (remainder)	20		30	5	5	32	53	29
Port Glasgow & part Inverclyde	3		5	1	1	5	8	4
Kilmacolm	1		2	0	0	2	3	1
Renfrew / Braehead	4		6	1	1	6	11	6
Inverclyde (remainder)	6	6	9	2	1	10	16	9

3.3.4 Table 18 shows the relationship between mode share and distance travelled to work for residents of Bishopton derived from the Census 2001. This has been applied to the data in Tables 16 and 17 to determine potential trips by bus and train by residents generated by the Dargavel Village development. The outputs are shown in Tables 19 and 20.

Table 18. Mode share by distance travelled to work by Bishopton residents

mode	Percentage mode share			
	0-5 KILOMETRES	5-10 KILOMETRES	10-20 KILOMETRES	20+ KILOMETRES
Walk	24	2	0	0
Cycle	2	1	0	0
Bus	15	2	1	2
Train	15	11	30	14
Car	22	76	63	71
Other	23	8	6	13
All modes	100	100	100	100

Table 19. Residential trip distribution bus mode share (excluding employment)

	BUS MODE SHARE	MORNING PEAK		EVENING PEAK		INTER-PEAK		EVENING	
		IN	OUT	IN	OUT	IN	OUT	IN	out
		Bishopton (area around main settlement)	15	11	16	39	28	104	157
Erskine West	20	29		70	51	187	283	55	59
Erskine Central	2	3		8	6	21	31	6	7
Glasgow Airport	2	2	2	6	4	15	23	5	5
St. James		0	1	2	1	4	6	1	1
Erskine SE & Inchinnan		0	1	2	1	4	6	1	1
Linwood (East & West)		0	9	1	1	3	4	1	1
Houston / Bridge of Weir / Brookfield / Craigend / Langbank		0	1	2	1	4	6	1	1
Dumbartonshire / Argyle		0	0	1	1	3	4	1	1
Paisley	1	1	1	2	1	5	7	1	2

	BUS MODE SHARE	MORNING PEAK		EVENING PEAK		INTER-PEAK		EVENING	
		IN	OUT	IN	OUT	IN	OUT	IN	out
Johnstone		0	0	0	0	1	1	0	0
Glasgow (remainder)		2	3	7	5	19	29	6	6
Port Glasgow & part Inverclyde		0	0	1	0	1	2	0	0
Kilmacolm		0	0	0	0	0	0	0	0
Renfrew / Braehead		0	0	1	1	2	3	1	7
Inverclyde (remainder)	2	1	1	2	1	6	8	2	2
Total	---	39	58	141	102	379	572	112	118

Table 20. Residential trip distribution train mode share (excluding employment)

	TRAIN MODE SHARE	MORNING PEAK		EVENING PEAK		INTER-PEAK		EVENING	
		IN	OUT	IN	OUT	IN	OUT	IN	out
Bishopton (area around main settlement)	15	11	16	39	28	104	157	31	33
Erskine West		20	29	70	51	187	283	55	59
Erskine Central		2	3	8	6	21	31	6	7
Glasgow Airport	11	9	13	31	23	84	127	25	26
St. James		2	4	9	6	23	35	7	7
Erskine SE & Inchinnan		2	4	9	6	23	35	7	7
Linwood (East & West)		2	2	6	4	15	23	5	5
Houston / Bridge of Weir / Brookfield / Craighend / Langbank		2	4	9	6	2	35	7	7
Dumbartonshire / Argyle		2	2	6	4	15	23	5	13
Paisley	30	15	22	54	39	146	220	43	17
Johnstone		2	3	8	6	21	31	6	7
Glasgow (remainder)		61	90	217	157	582	879	173	182
Port Glasgow & part Inverclyde		4	6	15	11	42	63	12	13
Kilmacolm		0	0	0	0	0	0	0	0

	TRAIN MODE SHARE	MORNING PEAK		EVENING PEAK		INTER-PEAK		EVENING	
		IN	OUT	IN	OUT	IN	OUT	IN	out
Renfrew / Braehead		7	10	23	17	62	94	18	20
Inverclyde (remainder)	14	4	6	14	10	39	59	12	12
Total	---	145	214	516	374	1386	2092	410	413

3.3.5 Tables 21 and 22 show the bus and train mode shares for the external employment trip distribution.

Table 21. External employment trip distribution bus mode share

	BUS MODE SHARE	MORNING PEAK		EVENING PEAK		INTER-PEAK	
		IN	OUT	IN	OUT	IN	OUT
Bishopton (area around main settlement)	15	2	0	0	2	4	2
Erskine West		1	0	0	1	1	1
Erskine Central		1	0	0	1	1	1
Glasgow Airport	2	0	0	0	0	0	0
St. James		0	0	0	0	0	0
Erskine SE & Inchinnan		0	0	0	0	0	0
Linwood (East & West)		0	0	0	0	0	0
Houston / Bridge of Weir / Brookfield / Craigend / Langbank		0	0	0	0	0	0
Dumbartonshire / Argyle		0	0	0	0	0	0
Paisley	1	0	0	0	0	0	0
Johnstone		0	0	0	0	0	0
Glasgow (remainder)		0	0	0	0	1	0
Port Glasgow & part Inverclyde		0	0	0	0	0	0
Kilmacolm		0	0	0	0	0	0
Renfrew / Braehead		0	0	0	0	0	0
Inverclyde (remainder)	2	2	0	0	0	0	0
Total	---	6	0	0	4	7	4

Table 22. External employment trip distribution train mode share

	TRAIN MODE SHARE	MORNING PEAK		EVENING PEAK		INTER-PEAK	
		IN	OUT	IN	OUT	IN	OUT
Bishopton (area around main settlement)	15	2	0	0	2	3	2
Erskine West		1	0	0	1	1	1
Erskine Central		1	0	0	1	1	1
Glasgow Airport	11	0	0	0	0	1	0
St. James		1	0	0	1	2	1
Erskine SE & Inchinnan		1	0	0	1	1	1
Linwood (East & West)		1	0	0	1	2	1
Houston / Bridge of Weir / Brookfield / Craigend / Langbank		1	0	0	1	1	0
Dumbartonshire / Argyle		1	0	0	1	1	1
Paisley	3	7	1	1	7	12	6
Johnstone		3	0	0	3	5	3
Glasgow (remainder)		9	2	1	10	16	9
Port Glasgow & part Inverclyde		1	0	0	1	2	1
Kilmacolm		0	0	0	0	1	0
Renfrew / Braehead		2	0	0	2	3	2
Inverclyde (remainder)	14	1	0	0	1	2	1
Total	---	31	3	2	33	31	29

3.3.6 The next step in the process is to amalgamate the residential and commercial/office employment trip forecasts for bus and train. The results are shown in Tables 23 and 24.

Table 23. Combined trip distribution - bus

	MORNING PEAK		EVENING PEAK		INTER-PEAK		EVENING	
	IN	OUT	IN	OUT	IN	OUT	IN	OUT
Bishopton (area around main settlement)	13	16	39	30	107	159	30	33
Erskine West	20	29	70	51	188	283	55	59
Erskine Central	3	3	8	6	22	32	6	6
Glasgow Airport	2	2	6	4	15	23	5	5

	MORNING PEAK		EVENING PEAK		INTER-PEAK		EVENING	
	IN	OUT	IN	OUT	IN	OUT	IN	OUT
St. James	1	1	2	1	5	6	1	1
Erskine SE & Inchinnan	1	1	2	1	4	6	1	1
Linwood (East & West)	0	0	1	1	3	4	1	1
Houston / Bridge of Weir / Brookfield / Craigend / Langbank	1	1	2	1	4	6	1	1
Dumbartonshire / Argyle	0	0	1	1	3	4	1	1
Paisley	1	1	2	31	5	8	1	2
Johnstone	0	0	0	0	1	1	0	0
Glasgow (remainder)	2	3	7	6	20	30	6	6
Port Glasgow & part Inverclyde	0	0	1	0	1	2	0	0
Kilmacolm	0	0	0	0	0	0	0	0
Renfrew / Braehead	0	0	1	1	2	3	1	1
Inverclyde (remainder)	1	1	2	2	6	9	2	2
Total	44	59	141	137	387	577	112	118

Table 24. Combined trip distribution - train

	MORNING PEAK		EVENING PEAK		INTER-PEAK		EVENING	
	IN	OUT	IN	OUT	IN	OUT	IN	OUT
Bishopton (area around main settlement)	13	16	39	30	107	159	31	33
Erskine West	20	29	70	51	188	283	55	59
Erskine Central	3	3	8	6	22	32	6	7
Glasgow Airport	9	13	31	23	84	127	25	26
St. James	4	4	9	7	25	36	7	7
Erskine SE & Inchinnan	3	4	9	7	25	36	7	7
Linwood (East & West)	3	3	6	5	17	24	5	5
Houston / Bridge of Weir / Brookfield / Craigend / Langbank	3	4	9	7	24	35	7	7

	MORNING PEAK		EVENING PEAK		INTER-PEAK		EVENING	
	IN	OUT	IN	OUT	IN	OUT	IN	OUT
Dumbartonshire / Argyle	2	2	6	5	17	24	5	13
Paisley	22	24	55	47	157	226	43	17
Johnstone	5	4	8	9	26	34	6	7
Glasgow (remainder)	70	91	218	167	598	888	173	182
Port Glasgow & part Inverclyde	6	7	16	13	44	64	12	13
Kilmacolm	0	0	0	0	1	0	0	0
Renfrew / Braehead	8	9	24	19	66	96	18	20
Inverclyde (remainder)	5	6	15	12	41	60	12	12
Total	177	219	521	407	1441	2122	410	413

3.3.7 The trips identified in Tables 23 and 24 represent potential demand. Some of the destinations listed cannot be accessed directly from Dargavel Village by bus or train or by means of one interchange between buses or between bus and train. The analysis in Chapter 4 is based on the identification of the demand that can be served by direct bus or train services or with one change of bus or mode.

4. PROVIDING ACCESS BY PUBLIC TRANSPORT

4.1 Bus service key requirements

- 4.1.1 Bus is very much the minority form of public transport in Bishopton. At the time of undertaking the detailed assessment in this update, the only commercial bus service is McGill's Service X22 between Greenock, Bishopton and Clydebank which operates once every 70 minutes in each direction in daytime on weekdays and Saturdays.
- 4.1.2 Existing local Services 520/521 and the Mybus demand responsive service are dependent upon financial support from SPT. The existing bus route network in Bishopton is shown in Appendix C.
- 4.1.3 The Dargavel Village development extends up to 1.5 kilometres away from Bishopton Station and the bus turning circle in Station Road. The railway acts as a barrier precluding direct walking routes between the housing in Dargavel Village and existing bus stops on the A8 Greenock Road. There is therefore a need for a new bus service to penetrate the development to ensure that all parts of the site are within walking distance of a bus stop.
- 4.1.4 SPT comments on the previous update of the Public Transport Study indicated a need to:
- provide a new bus service and not to modify any existing commercial or SPT supported bus services; and
 - avoid duplication of any existing bus services to prevent any transfer of passengers and revenue to the new service.

4.2 Proposed bus services

- 4.2.1 Two options were developed to satisfy the conditions set by SPT:
- Option 1 - A shuttle bus linking Dargavel Village with the mini transport hub at the western end of Station Road, Bishopton: This provides interchange with:
 - Inverclyde Line trains at Bishopton Station either by a short walk from the Village Square in the Dargavel development or at the bus terminus on Station Road in Bishopton.
 - existing bus service 521 from Bishopton to the Bridgewater Shopping Centre in Erskine.
 - Option 2 - A peak period shuttle bus linking housing areas in Dargavel Village with Bishopton Station with an interpeak extension to the Bridgewater Shopping Centre in Erskine:
 - This would follow a route to Erskine via the A8 Greenock Road and the A726 to avoid abstraction from existing Service 521.
 - It also creates the possibility of interchange with bus services to Renfrew and Braehead at Erskine.
- 4.2.2 Unfortunately, existing commercial Service X22 Greenock – Clydebank via Bishopton operates to a service interval of 70 minutes. This precludes interchange between buses to/from Dargavel Village and Bishopton that will operate to a regular clock face timetable in the inter-peak periods.

- 4.2.3 The western link road serving the western side of the Dargavel Village development is due to be open at the start of Phase 6 of the housing programme. It is assumed that it will be available for use by buses by the start of 2026. The bus route will change as soon as this new road is available with buses operating in a loop through Dargavel Village.
- 4.2.4 The western link road is key to providing public transport access for people living in the northern extension of the Dargavel Village development. The northern extension is within 400 metres of the western link road. Careful siting of bus stops on the western link road and a closer than usual spacing of bus stops will be needed to minimise walk distances. This being the case, there will be no need to vary the bus route from that previously proposed.
- 4.2.5 There is also no need to vary the bus route to serve the land that is subject to a change of use from employment to housing. This part of the development will be within acceptable walking distance of the proposed bus route on the western link road and Barrangary Road.
- 4.2.6 The route through Dargavel Village in the short-term versions of Options 1 and 2 makes use of both the northern (Slateford Road) and southern (Barrangary Road) access routes into the development. This route is longer than the route proposed in the long term (2026 and beyond) when the western link road is available. Reliance on the long route in the period up to and including 2025 results in higher bus operating costs with no additional patronage and revenue. The result is a higher subsidy requirement each year.
- 4.2.7 The bus service in Dargavel Village will benefit when the Transport Scotland vision of a multi-modal, multi-operator smart ticketing scheme is realised. At present, public transport users have to pay separate fares when they interchange between buses or between bus and train. A smart ticketing system will be more convenient for users and will reduce the time taken by interchange between buses or public transport modes.
- 4.2.8 In this analysis it is assumed that the rail station will remain the hub of the local bus network in Bishopton and will provide opportunities for interchange between bus and rail and between the local services in Bishopton and services to and from places further afield. Bus/rail interchange will be available via the existing bus terminus on Station Road or by walking around 100 metres from the Village Square in the new development.
- 4.2.9 The bus service proposals developed in this report offer the same level of service to Dargavel Village as is available for residents of Bishopton. This means that no late evening service and no Sunday service is proposed. Travel to Paisley, Glasgow and towns in Inverclyde remains possible by train at these times.
- 4.2.10 The principles used for developing the proposals for a bus service to Dargavel Village are summarised below:
- In the morning peak period connections are provided to as many trains to Glasgow as possible.
 - In the inter-peak period, either:
 - provide connections with existing bus Service 521 at Bishopton; or
 - operate a service to/from the Bridgewater Shopping Centre at Erskine via a route that does not duplicate existing Service 521 and at times that do not compete with Service 521.

- In the evening peak period connections are provided with as many trains from Glasgow as possible.

4.3 Demand, revenue and operating costs

4.3.1 A spreadsheet model was used to determine:

- the number of passengers in each year of the housing build-out programme for each bus service option;
- the revenue accruing in each year of the housing build-out programme for each bus service option; and
- the bus operating cost for each option.

4.3.2 There are several assumptions made in the spreadsheet model:

- An interchange penalty is included to take account of the reduced attractiveness of public transport if a journey includes an interchange between buses or modes.
- Fares are set at levels comparable with existing bus services in the Bishopton area.
- Account is taken of the reduction in revenue resulting from the acceptance of concessionary fares.
- Bus operating costs are taken from the SYSTRA database of bus operating costs.

4.3.3 The same approach to interchange was used as in the previous updates of the Public Transport Study. The interchange penalty has been calculated as follows:

- A direct journey time was based on the combined journey time of the two bus services
- The interchange option took the journey time outlined above in addition to the wait time which was doubled
- An average journey purpose elasticity of -0.30829 was used.

4.3.1 Fares used in the assessment are set out in Table 25.

Table 25. Bus fares

FROM	TO	FARE
Dargavel Village	Dargavel Village	£1.35
Dargavel Village	Bishopton Station	£1.35
Dargavel Village	Erskine Bridgewater Shopping Centre	£2.05

4.3.2 35 per cent of bus journeys in Scotland are concessionary trips. This information was derived from <https://www.transport.gov.scot/publication/scottish-transport-statistics-no-35-2016-edition/SCT01171871341-05#tb2a>. A reimbursement figure of 48 per cent was then applied. This is the lowest reimbursement figure known to SYSTRA. These two factors were multiplied

together to determine the percentage deduction from revenue required to take account of concessionary fares.

- 4.3.3 Table 26 sets out the bus operating cost assumptions used to calculate the annual cost of operating each of the short and long term bus service options.

Table 26. Bus operating cost assumptions

COST ITEMS	RATE PER UNIT
Wheel turn cost per kilometre	£0.92
Maintenance cost per kilometre	£0.46
Driver per hour	£13.35

- 4.3.4 All figures quoted in this report are at current prices and no allowance is made for future cost inflation or increased revenue resulting from future fares increases.

- 4.3.5 It is assumed that the subsidy required will be on a net cost basis – the subsidy would equate to annual operating costs minus annual revenue.

- 4.3.6 The quantification of potential demand for bus and train presented in Tables 23 and 24 provides the basis for bus service design and for forecasting demand and revenue. Some of the destinations listed cannot be accessed directly from Dargavel Village by bus or train or by means of one interchange between buses or between bus and train. Our spreadsheet model identifies the element of the potential demand shown in Tables 23 and 24 that could be served by direct bus or train services or with one change of bus or mode. It excludes demand for travel to/from all other places.

- 4.3.7 At this stage of the process, the option of a shuttle bus service linking Dargavel Village with Bishopton Station and the bus terminus on Station Road, Bishopton (Option 1) was rejected for the following reasons:

- It would provide minimal benefits for residents of Dargavel Village: Whilst it would connect with the convenience store in the development and existing shops on Station Road, it would not provide a direct link to a higher level shopping centre with a supermarket.
- As a consequence, residents of Dargavel Village would have a lower level of accessibility than people living in Bishopton.
- A direct service to the Bridgewater Shopping Centre in Erskine would open up interchange opportunities for journeys to more different destinations (e.g. Braehead, Renfrew).
- Forecast revenue for the shuttle bus was low for two reasons:
 - The small number of people using the service.
 - The relatively low fare for short distance journeys.
- Forecast revenue fell far short of annual operating costs requiring a substantial subsidy for most of the duration of the housing build-out period.

4.3.8 Table 27 shows the estimate of annual operating costs, forecast annual revenue before and after taking account of the impact of concessionary fares, and subsidy required (annual operating cost minus annual revenue) for Option 2 – a bus service connecting with trains at Bishopton Station in peak periods and continuing to Erskine in the inter-peak period. All figures are at 2017 prices.

Table 27. Financial performance - Dargavel to Erskine bus service

OPTION	YEAR	ANNUAL OPERATING COST (£'000)	ANNUAL REVENUE (£'000)	ANNUAL REVENUE AFTER CONCESSIONS (£'000)	SUBSIDY (£'000)
Option 2 – short term	2018	140.15	90.72	77.11	63.04
	2019	140.15	109.63	93.22	46.93
	2020	140.15	128.54	109.32	30.83
	2021	140.15	147.45	125.43	14.72
	2022	140.15	166.36	141.54	0.00
	2023	140.15	185.27	157.64	0.00
	2024	140.15	204.18	173.75	0.00
	2025	140.15	223.37	190.09	0.00
Option 2 – long term	2026	233.75	242.56	206.42	27.33
	2027	233.75	261.76	222.76	10.99
	2028	233.75	280.95	239.09	0.00
	2029	233.75	300.14	255.43	0.00
	2030	233.75	325.89	277.33	0.00
	2031	233.75	300.14	299.24	0.00
	2032	233.75	325.89	321.15	0.00

OPTION	YEAR	ANNUAL OPERATING COST (£'000)	ANNUAL REVENUE (£'000)	ANNUAL REVENUE AFTER CONCESSIONS (£'000)	SUBSIDY (£'000)
	2033	233.75	351.63	325.65	0.00
	2034	233.75	377.67	330.16	0.00
Total subsidy needed					193.84

4.3.9 Table 30 indicates that a bus service connecting Dargavel Village with Bishopton Station in peak periods and with Erskine Bridgewater Shopping Centre in the inter-peak would require a subsidy totalling £193,840 covering the years 2018-2021 and 2026-2027.

4.3.10 In the period up to 2025 one bus would operate a one-way loop in Dargavel in peak periods with an extension to Erskine Bridgewater Shopping Centre in the inter-peak period. The route in Dargavel Village uses the northern (Slateford Road) and southern (Barrangary Road) accesses to the development. The route in Dargavel and Bishopton is shown in Appendix D.

4.3.11 The inter-peak extension to Erskine uses the A8 Greenock Road and the A726 to avoid competing with existing Service 521. The times of services to and from Erskine can be adjusted to avoid the risk of abstraction of patronage and revenue from Service 521.

4.3.12 After completion of the western link road (i.e. from 2026), the route in Dargavel Village is changed to follow a loop serving both the Village Square and the western link road. Buses would enter and leave Dargavel Village via the southern access road (Barrangary Road). The route in Dargavel and Bishopton is shown in Appendix E.

4.3.13 From 2026 one bus is required to operate the peak period service connecting Dargavel Village with Bishopton Station and the bus terminus on station Road, Bishopton. In the inter-peak period, a second bus is added to provide a two-way service around the loop in Dargavel Village and enable an hourly service to be provided between the Village and Erskine via the A8 and A726. The enhanced service reflects:

- the extended route coverage; and
- the growing population of Dargavel Village.

4.3.14 The following conclusions can be drawn from the analysis in Table 27 and the explanation of the proposals in paragraph 4.3.3:

- The additional patronage and revenue resulting from adding an inter-peak link to the Bridgewater Shopping Centre in Erskine more than offsets the increase in operating costs resulting in a reduced level of subsidy.
- In the short-term buses will follow a one-way loop through Dargavel from north to south. This is not ideal in terms of accessibility, but it is unavoidable as there is no space available to construct a temporary bus turning circle that would obviate the need to use the long route via the northern access (Slateford Road).

- In the long term (2026 and beyond) buses will enter and leave Dargavel Village via the southern access road. This is a shorter and lower cost route through the village.
- The addition of a second bus in the inter-peak improves accessibility in Dargavel Village considerably by allowing the operation of both a two-way service around the loop in the Village and a link to Erskine.
- The total subsidy required is £193,840 at 2017 prices.

4.3.15 The subsidy is lower than required in previous updates of the Public Transport Study. This is not surprising given the greatly increased number of homes in the development and the reduction in self-containment resulting from the replacement of employment land by housing land.

4.3.16 A more satisfactory solution may be feasible at some stage in the Dargavel build-out period by combining the Dargavel service with existing SPT-supported Services 521 and 522. This would utilise the bus used to operate Services 520 and 521 and the bus/buses used to serve Dargavel. This is beyond the scope of this report but it has the potential to benefit residents of both Dargavel and Bishopton.

4.3.17 SPT has used Section 75 funds provided by developers on a number of occasions to provide the funding needed to provide financial support for new or improved bus services as demand and revenue builds towards break even and eventually to a profitable situation. This is the obvious approach to implementation with SPT arranging the provision of services using the Section 75 funds to meet the costs of bus operating contracts secured through competitive tendering by SPT.

4.3.18 It is anticipated that this Report will be supported in due course by a Letter of Intent from SPT.

4.4 The impact on rail services

4.4.1 Two factors will increase the demand for rail travel via Bishopton Station compared with the previous proposals for the development of Dargavel Village:

- The increase in the number of houses from 2,642 to 4,080.
- The replacement of the main employment element of the development by housing will reduce the degree of self-containment of the development as a whole.

4.4.2 Estimates of rail travel via Bishopton Station in the 2015 update of the Public Transport Study were higher than those in this update. The two estimates are not directly comparable as a consequence of changes in peak period trip rates and mode split contained in the 2016 Scoping Report for a Transport Assessment and agreed by Renfrewshire Council and transport Scotland.

4.4.3 It is considered that application of these rates to a development of 4,080 houses would generate no more than 220 rail trips towards Glasgow in the morning peak hour. Given that ScotRail considered that there would be enough capacity to cater for additional demand generated by the Dargavel Village development in previous updates of the Public Transport Study when the estimates were higher, there should not be a train capacity problem.

5. SUMMARY AND CONCLUSIONS

- 5.1.1 The village of Bishopton has a limited network of local bus services and bus is very much the minority form of public transport in Bishopton.
- 5.1.2 SPT provides financial support for two local bus services operated by Scottish Travel in daytime on Mondays to Saturdays using a single accessible vehicle. The two services both operate hourly – Service 520 is the Bishopton Local Service and Service 521 provides a link to the Bridgewater Shopping Centre in Erskine. In addition, commercial McGill’s Service X22 provides a link between Greenock, Port Glasgow, Bishopton and Clydebank. There are no bus services in late evenings or on Sundays or Bank Holidays.
- 5.1.3 Bishopton is an intermediate station on the electrified Inverclyde Line linking Gourock and Wemyss Bay with Paisley and Glasgow Central. In daytime on weekdays and Saturdays Bishopton is served by four trains an hour in each direction between Glasgow Central and Gourock and a fifth between Glasgow and Wemyss Bay. The Inverclyde Line provides the main means of travel from Bishopton to Paisley and Glasgow city centre. It is also the only form of public transport available on Sundays and Bank Holidays.
- 5.1.4 A bus turning circle on Station Road close to the railway station is the main focal point for bus services in Bishopton and caters for bus/rail interchange.
- 5.1.5 A new bus service is required for Dargavel Village:
- to penetrate the development to ensure that all new development is within walking distance of a bus stop; and
 - to cater for the additional demand generated by the proposed development.
- 5.1.6 SPT comments on the previous update of the Public Transport Study indicated a need to:
- provide a new bus service and not to modify any existing commercial or SPT supported bus services; and
 - avoid duplication of any existing bus services to prevent any transfer of passengers and revenue to the new service.
- 5.1.7 Two options satisfying the conditions set by SPT have been tested:
- Option 1 - A shuttle bus linking Dargavel Village with the mini transport hub at the western end of Station Road, Bishopton.
 - Option 2 - A peak period shuttle bus linking housing areas in Dargavel Village with Bishopton Station with an interpeak extension to the Bridgewater Shopping Centre in Erskine.
- 5.1.8 The shuttle bus option (Option1) has been rejected for the following reasons:
- It will only connect with the convenience store in the development and existing shops on Station Road, it would not provide a direct link to a higher level shopping centre with a supermarket.
 - Residents of Dargavel Village would have a lower level of accessibility than people living in Bishopton.

- A direct service to the Bridgewater Shopping Centre in Erskine would open up interchange opportunities for journeys to more different destinations (e.g. Braehead, Renfrew).
- Forecast revenue for the shuttle bus was low because of the small number of people using the service and the relatively low fare for short distance journeys.
- Forecast revenue fell far short of annual operating costs requiring a substantial and unacceptable level of subsidy for most of the duration of the housing build-out period.

5.1.9 The option of a bus service connecting Dargavel Village with Bishopton Station in peak periods and with Erskine Bridgewater Shopping Centre in the inter-peak (Option 2) is the preferred solution. It would require a subsidy totalling £193,840 at 2017 prices covering the years 2018-2021 and 2026-2027. The reduction in subsidy compared with previous versions of the study reflects the larger number of homes and the increased reliance on out-commuting resulting from the replacement of employment development by housing.

5.1.10 Both the housing in the proposed northern extension of the development and the land on the western side of the site that is subject to a change of use from employment to housing lie within acceptable walking distance of the proposed bus route using the western link road and Barrangary Road. There is therefore no requirement to vary the route of the proposed bus service in the Dargavel Village development.

5.1.11 The mechanism proposed for delivery of the new/improved bus services to serve the proposed development at Bishopton remains management and administration by SPT using Section 75 Agreement funding.

5.1.12 Rail provides the principal and fastest means of travelling to Paisley and Glasgow city centre by public transport. Changes in the trip rate and mode share assumptions have been made in this update to be consistent with the trip rate and mode share assumptions that were updated in the 2016 Scoping Report for a Transport Assessment. The forecast demand for peak period rail travel made using these assumptions is comparable with the forecasts in earlier updates of the Public Transport Study using the 'old' trip rate and mode share parameters. It is therefore considered that there should be no major peak period train capacity issues resulting from the changed Dargavel Village development.

Report Appendix A

Phasing of key road network



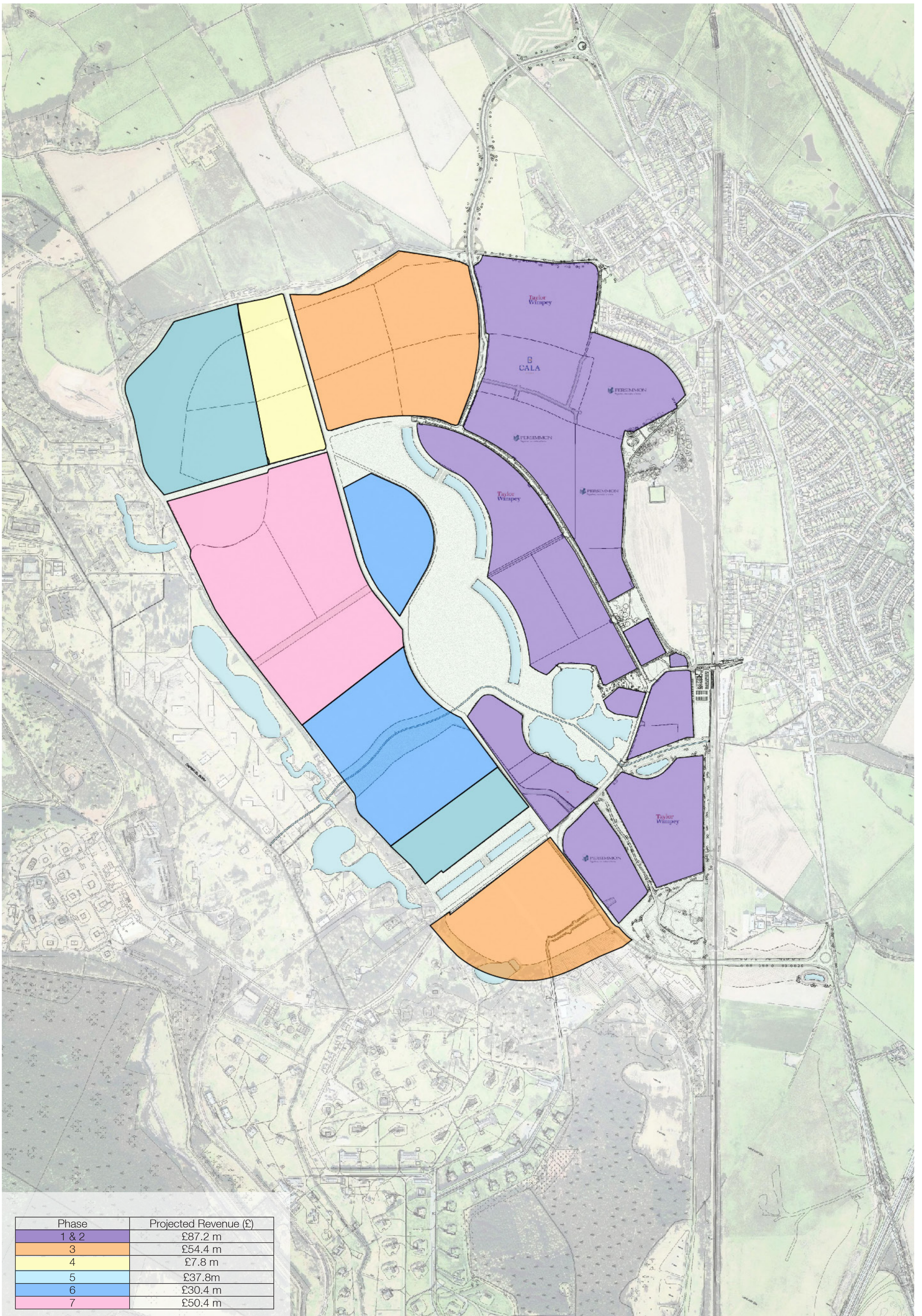
Key

- Phases 1&2 Roads and associated infrastructure
- Phase 1&2 Off-site Drainage
- Phase 1&2 Off-site Power
- Phase 3 Roads and associated infrastructure
- Phase 5 Roads and associated infrastructure
- Phase 6 Roads and associated infrastructure
- Phase 6 Power Updates



Report Appendix B

Indicative land use plan



Phase	Projected Revenue (£)
1 & 2	£87.2 m
3	£54.4 m
4	£7.8 m
5	£37.8m
6	£30.4 m
7	£50.4 m

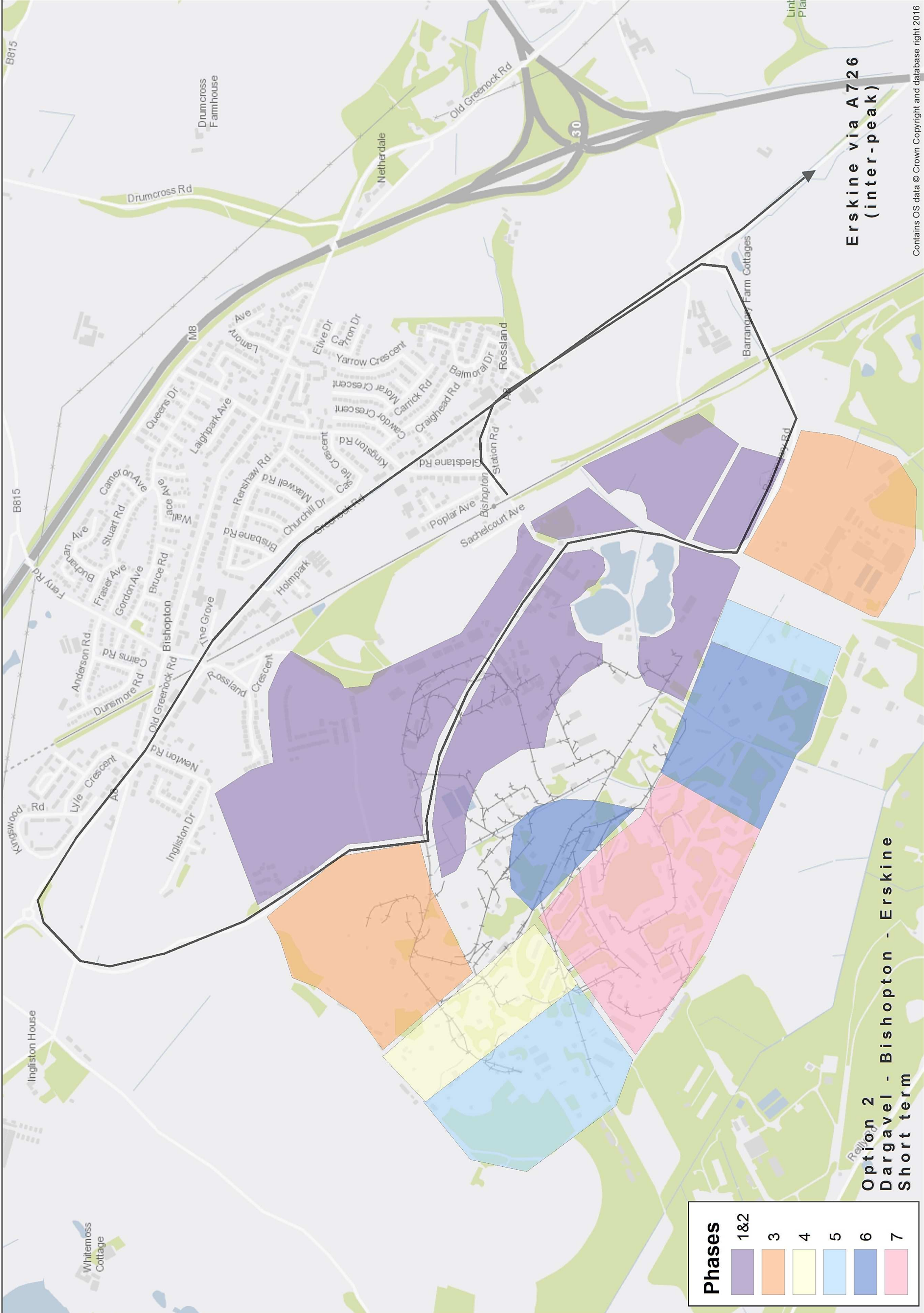
Report Appendix C







Existing bus services in Bishopton



Report Appendix D

Proposed bus route in Dargavel Village – short term



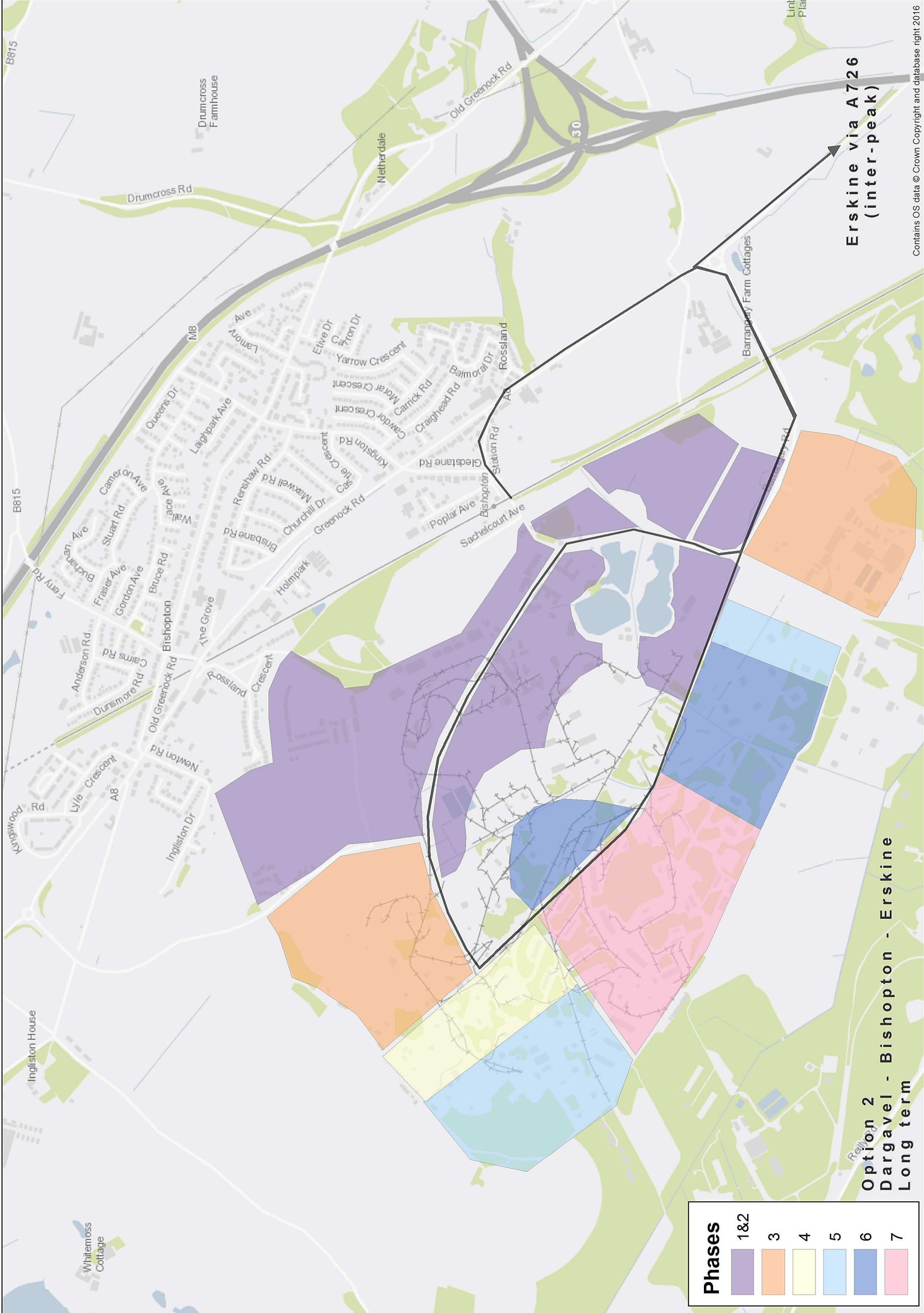
Phases	
	1&2
	3
	4
	5
	6
	7




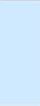


Option 2 - Bishopton - Erskine
Dargavel - Short term

Erskine via A726
(inter-peak)

Report Appendix E

Proposed bus route in Dargavel Village – long term



Phases	
	1&2
	3
	4
	5
	6
	7

Option 2 - Bishopton - Erskine
Dargavel - Bishopton - Erskine
Long term

Erskine via A726
(inter-peak)

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Birmingham – Newhall Street

5th Floor, Lancaster House, Newhall St,
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T: +44 (0)121 233 7680 F: +44 (0)121 233 7681

Birmingham – Innovation Court

Innovation Court, 121 Edmund Street, Birmingham B3 2HJ
T: +44 (0)121 230 6010

Bristol

10 Victoria Street, Bristol, BS1 6BN
T: +44 (0)117 922 9040

Dublin

2nd Floor, Riverview House, 21-23 City Quay
Dublin 2, Ireland
T: +353 (0) 1 905 3961

Edinburgh – Thistle Street

Prospect House, 5 Thistle Street, Edinburgh EH2 1DF
United Kingdom
T: +44 (0)131 220 6966

Edinburgh – Manor Place

37 Manor Place, Edinburgh, EH3 7EB
Telephone +44 (0)131 225 7900 Fax: +44 (0)131 225 9229

Glasgow – St Vincent St

Seventh Floor, 124 St Vincent Street
Glasgow G2 5HF United Kingdom
T: +44 (0)141 225 4400

Glasgow – West George St

250 West George Street, Glasgow, G2 4QY
T: +44 (0)141 221 4030 F: +44 (0)800 066 4367

Leeds

100 Wellington Street, Leeds, LS1 1BA
T: +44 (0)113 397 9740 F: +44 (0)113 397 9741

Liverpool

Cotton Exchange, Bixteth Street, Liverpool, L3 9LQ
T: +44 (0)151 230 1930

London

5 Old Bailey, London EC4M 7BA United Kingdom
T: +44 (0)203 714 4400

London

Seventh Floor, 15 Old Bailey
London EC4M 7EF United Kingdom
T: +44 (0)20 7529 6500 F: +44 (0)20 3427 6274

Manchester – 16th Floor, City Tower

16th Floor, City Tower, Piccadilly Plaza
Manchester M1 4BT United Kingdom
T: +44 (0)161 831 5600

Manchester, 25th Floor, City Tower

25th Floor, City Tower, Piccadilly Plaza
Manchester M1 4BT United Kingdom
T: +44 (0)161 236 0282 F: +44 (0)161 236 0095

Newcastle

PO Box 438, Newcastle upon Tyne, NE3 9BT
United Kingdom
T: +44 (0)191 2136157

Perth

13 Rose Terrace, Perth PH1 5HA
T: +44 (0)1738 621 377 F: +44 (0)1738 632 887

Reading

Soane Point, 6-8 Market Place, Reading,
Berkshire, RG1 2EG
T: +44 (0)118 334 5510

Woking

Dukes Court, Duke Street
Woking, Surrey GU21 5BH United Kingdom
T: +44 (0)1483 728051 F: +44 (0)1483 755207

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