

Engineering Justification Paper

CPM5070 Luffness Mains (Aberlady-North Berwick MP)

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2 Introduction

Reinforcement has been identified within the Aberlady - North Berwick MP system, specifically relating to an anticipated system capacity failure at North Berwick. This project is part of a wider programme of reinforcement associated with the RIIO-GD2 Business Plan Appendix for Capacity Management.

2.1 General Background

The SGN distribution system is built to ensure security of supply for all our customers. Our networks operating at pressures below 7bar, are designed to meet a peak six-minute demand level that could be experienced under 1:20 conditions, supporting a safe, secure and reliable service to those customers and meeting requirements outlined within our Licence Condition, including but not limited to Condition 16 contained therein.

Link: [Gas Transporters Licence – Standard Conditions](#)

Where capacity constraints are identified that are likely to impact on SGNs ability to ensure security of supply to all customers, Network Planning will look to establish optimum, cost-efficient reinforcement strategies to mitigate that risk. Such constraints may arise as a result of a number of factors, but the most common is increased demand levels, often resulting from new connections.

SGN has initiated an extensive programme of stakeholder engagement, working closely with Local Authorities, both in Scotland and the South of England, to establish a fully informed and independently sourced picture of planned development.

This engagement has provided SGN with confidence that the sites identified will progress to development and, to support this level of growth, SGN has developed a programme of reinforcement across its network.

2.2 Site Specific Background

Development within the Aberlady-Tranent IPMP Grid is covered by the East Lothian Local Development Plan (LDP) and associated documents. The LDP sets out how and where the requirements of the Strategic Development Plan (SDP) for East Lothian can be met.

East Lothian's population has grown steadily since the mid/late 1980's. The 2011 Census indicates that East Lothian's total usually resident population was 99,717, an increase of 10.7% per cent over the equivalent 90,100 figure at 2001. This growth is largely as a result of the area's proximity to Edinburgh and because it is part of the wider Edinburgh labour market as well as housing market areas.

Furthermore, the National Records of Scotland 2010 population projection (published 2012) anticipates that by 2035 East Lothian's population will increase by 33% to around 129,229, the highest percentage rate of growth in Scotland during this period.

The driver(s) for this reinforcement project are five committed GT sites, all with planning permission.

3 Equipment Summary

The Aberlady-Tranent Grid is supplied via two TRS.

Tranent IP is supplied via Tranent TRS which feeds a section of IP main to Tranent, running around and beyond the town, before terminating at Fishergate DPG to the north. In addition, the IP system feeds the villages of Ormiston and Pencaitland to the south and east, along with a short section of MP main within the town of Tranent.

Fishergate DPG operates in tandem with Aberlady TRS, both feeding the MP system which runs along the coast. Aberlady TRS is the sole feed east to North Berwick via Gullane, with Fishergate DPG supplying Prestonpans, and both combining to feed Longniddry.

Security

4 Problem Statement

Why are we doing this work and what happens if we do nothing?

New connections to our networks reduce available capacity and when pressures are predicted to fall below minimum acceptable levels it is necessary to reinforce or increase pressures to facilitate increased capacity in the system.

In the case of the Aberlady – North Berwick MP system, significant on-going committed development at existing GT sites will see the network approach capacity in the early part of RIIO-GD2.

Failure to reinforce the network will restrict the delivery of these developments.

What is the outcome that we want to achieve?

Maintain SGN’s Licence Conditions to ensure security of supply and support economic prosperity by not becoming a blocker to development.

How will we understand if the spend has been successful?

On completion of the proposed reinforcement, SGN will monitor system performance to ensure expected system pressures are maintained. This will take the form of regular system performance checks and localised pressures surveys to ensure a successful outcome has been achieved.

At a customer level, SGN will have delivered a reinforcement that ensures a safe and secure network, meets stakeholder aspirations and ensures developments progress timeously.

4.1 Narrative Real-Life Example of Problem

The Aberlady-North Berwick MP system is close to capacity and requires reinforcement to supply accepted, committed demand. Additionally, the elongated MP leg is sensitive to relatively small increases in demand at North Berwick. As such, committed development at several existing GT sites in Dirleton and North Berwick will drive reinforcement in the early part of RIIO-GD2.

A recent example of good planning to meet customer expectation, whilst also ensuring security of supply, occurred following the acceptance of a quotation to supply a new development at New Mills Balerno (P17141081).

Network analysis confirmed a requirement to reinforce SGN’s system in advance of connecting the fully developed site load. However, network analysis also confirmed an interim load/connection of 30 new properties in advance of reinforcement, thereby meeting the GT/Developer’s schedule of works.

Reinforcement to supply the full development was subsequently planned and completed in advance of connections beyond the interim load, ensuring security of supply to approximately 350 new/existing customers.

The developments driving this reinforcement projected are listed in Table 1 below:

Table 1: Development Summary

| Development Name | Site Usage | Site Status | Confidence |
|------------------------------------|----------------------------------|-----------------------|-----------------------------------|
| Renaissance Golf Complex, Dirleton | Non-Domestic | Committed Development | Highly probable (>90% confidence) |
| Archerfield Golf Complex, Dirleton | Mixed Dev. (Incl. 164 houses) | Committed Development | Highly probable (>90% confidence) |
| Mains Farm, North Berwick | Mixed Dev. (Incl. 470 houses) | Committed Development | Highly probable (>90% confidence) |
| Ferrygate Farm, North Berwick | 140 houses | Committed Development | Highly probable (>90% confidence) |
| Tantallon Road, North Berwick | 125 houses | Committed Development | Highly probable (>90% confidence) |

Please see Appendix A of this document which gives further details of the criteria applied when determining the attributable 'confidence' level of the above sites progressing to development.

Through this determination SGN has deemed the requirement for this reinforcement within the RIIO-GD2 period as 'High' and has therefore included the funding request in both our Base Growth and High Growth scenarios.

The spend associated with these reinforcement works provides capacity within the Aberlady – North Berwick MP system to support projected development during RIIO-GD2.

The monies associated with these works ensures security of supply for existing customers and connection of planned development to the network. Costs have been prepared using average contracted rates at depot level and validated against known costs for similar, completed projects.

Not included within this spend are the costs for subsequent phases of reinforcement required to support demand out-with the RIIO-GD2 period and/or any costs associated with reinforcement of the upstream Edinburgh-Borders Transmission system.

5 Probability of Failure

As development identified for this area progresses, the Aberlady – North Berwick MP Network is predicted to fail to maintain minimum system pressures at 85% peak demand by winter 2025/26, putting at risk supplies to approximately 3,500 customers at Dirleton and North Berwick.

5.1 Probability of Failure Data Assurance

Model Validation

To ensure the accuracy of the Network Analysis models, validation is carried out in line with the published requirement under Section 17 of SGN's Safety Case and is a fundament of SGN's Licence to Operate.

Validation ensures that the current models are an accurate representation of the actual gas transportation system and can be used to predict network behaviour under a variety of conditions, including the 1 in 20 design condition.

In addition to the Validation Programme, a robust model maintenance process and annual winter system performance checks ensure that the models continue to be accurate and fit for purpose.

The latest system performance review confirmed the accuracy of the model against actual pressures recorded on 31st January 2019.

Table 2: System Performance Review – 31st January 2019 (82% peak demand)

| System | Site | System Pressure (82% Pk hr) | | Yr1 System Pressure (1 in 20) | |
|--------------------------------|-------------------|--------------------------------|-----------|----------------------------------|-----------|
| | | Recorded | Modelled | Minimum | Modelled |
| | | Actual | Predicted | Acceptable | Predicted |
| Aberlady – North Berwick MP | Dunbar Road DG | 1.10bar | 1.19bar | 0.35bar | 0.73bar |

Security

Network Growth

The East Lothian Local Development Plan and associated documents have been reviewed and an assessment made as to the probability of sites contained therein progressing to construction (see Table 1).

The resulting outputs have been applied to the network model, providing confidence that pre-emptive repair of the network (i.e. reinforcement) will be required during RIIO-GD2 to ensure SGN meets its Licence Conditions, maintaining minimum supply pressures under all demand conditions.

6 Consequence of Failure

Loss of Supply to Customers

Failure to reinforce will put at risk the supply to approximately 3,500 customers at the extremity of the Aberlady – North Berwick MP system, resulting in a failure to meet SGN’s Licence Conditions, attracting adverse publicity and damage to the company’s reputation.

Financially, after the first 24 hours, affected householders will be compensated for time without gas. Domestic customers will receive £41 for each 24-hour period without gas, small businesses will receive £69 for each 24-hour period without gas.

Table 3: Projected RIIO-GD2 Pressures (2025/26) without Reinforcement

| Location | Min Required Pressure (bar) | Min. Modelled Pressure (bar) |
|----------------|-----------------------------|------------------------------|
| Dunbar Road DG | 0.35 | -1.73 |

Security

Safety Impact of Failure

Reinforcement of the Aberlady – North Berwick MP system is required to meet the obligations of our Licence Condition.

In this instance, a failure to reinforce will result in a system failure during peak winter conditions. The resulting loss of supply may have serious health and safety implications for vulnerable customers who rely on gas for essential heating and cooking facilities.

Environmental Impact

A system failure on this scale will result in a major recovery exercise. Environmental impacts will include increased travel to site by SGN operatives, leading to an increase in greenhouse gas emissions and disruption to the public.

On site, the use of fossil fuels to power plant and equipment required in the restoration of supplies will further increase greenhouse gas emissions, as will subsequent travel/plant in use for the reinstatement of public highways following the conclusion of these works.

7 Options Considered

Options Summary

In accordance with the guidelines set out in the Ofgem guidance document '*Engineering Justification Paper Frameworks for RIIO-GD2 and RIIO-GT2*' – Appendix B (Section 7), the following options have been considered:

Replace on Failure

Wait until the network fails then replace the system. This option has been discounted due to non-compliance with SGN's Licence Condition.

Repair on Failure

Mains reinforcement after the network has failed. This option has been discounted due to non-compliance with SGN's Licence Condition.

Pre-emptively Replace

This option has been discounted as asset replacement does not inherently provide additional capacity.

Pre-emptively Repair

Mains reinforcement and/or Interruption based on model data prior to network failure. Four options have been considered for further investigation, three of which are main-laying solutions

Security

Do Nothing

Not considered practicable as on-going committed development at existing GT sites, combined with potential development identified/programmed within the LDP/HLA and associated documents, will see the Aberlady – North Berwick MP system approach capacity towards the early part of RIIO-GD2.

7.1 First Option Summary: Luffness Mains

The technical detail of the option i.e. capacity, system rating, availability etc.

The first option considered for further investigation, **Luffness Mains**, involves the construction of approximately 2.6km x 315mm/355mm PE MP or equivalent ST.

The basis for the cost estimate/unit cost

Costs for this option, amounting to £0.975M, have been prepared using average contracted rates at depot level and validated against known costs for similar, completed projects.

The perceived benefits of the option

The proposed works provide capacity for committed/planned development identified for construction during RIIO-GD2.

Delivery timescales

This project has been scheduled to commence in 2021/22 and is expected to be completed in the same financial year.

Key assumptions made

Disruption to the public is minimised by the adoption of a route away from the busy A198 coastal road.

The village of Drem has been earmarked for a significant expansion, involving the construction of up to 6,000 new homes.

Future connection costs for the Drem development are reduced by following a route which extends the network closer to the village.

Any other items that differentiate the option from the others considered

The proposed reinforcement can be downsized from 355mm to 315mm downstream of the recommended point of connection for Drem, further reducing project costs.

7.2 Second Option Summary: Luffness House

The technical detail of the option i.e. capacity, system rating, availability etc

The second option considered for further investigation, **Luffness House**, involves the construction of approximately 2.2km x 355mm PE MP or equivalent ST.

The basis for the cost estimate/unit cost

Costs for this option, amounting to £0.939M, have been prepared using average contracted rates at depot level and validated against known costs for similar, completed projects.

The perceived benefits of the option

The proposed works provide capacity for committed/planned development identified for construction during RIIO-GD2.

Delivery timescales

This project has been scheduled to commence in 2021/22 and is expected to be completed in the same financial year.

Key assumptions made

While this option is the shortest of the identified solutions and marginally the least costly option, there is some uncertainty over the viability of the proposed route.

This solution is contingent on securing Land Easements, requiring detailed negotiations with several land owners. Based on previous experience, an allowance of £56K has been included for Land Easements for this solution.

Additional future industry costs, due to higher connection costs for a supply to the proposed Drem expansion, results in higher overall costs compared with Option 1.

Any other items that differentiate the option from the others considered

The presence of areas of dense mature trees may mean a direct cross-county route is impracticable with additional costs incurred to avoid these areas, most likely by diverting onto the busy A198.

The reinforcement main will be 355mm PE along its full length to support a future connection to Drem at the eastern extremity of the new main.

7.3 Third Option Summary: A198

The technical detail of the option i.e. capacity, system rating, availability etc

The third option considered for further investigation, **A198**, involves the construction of approximately 2.5km x 355mm PE MP or equivalent ST.

The basis for the cost estimate/unit cost

Costs for this option, amounting to £1.119M, have been prepared using average contracted rates at depot level and validated against known costs for similar, completed projects.

The perceived benefits of the option

The proposed works provide capacity for committed/planned development identified for construction during RIIO-GD2.

Delivery timescales

This project has been scheduled to commence in 2021/22 and is expected to be completed in the same financial year.

Key assumptions made

Of the three options identified, this solution is likely to result in the greatest disruption to the public as the route passes through Aberfeldy and along the busy A198 coastal road.

This is the costliest reinforcement solution and, as with Option 2, additional future industry costs may be incurred due to increased connections costs for a supply to the proposed Drem expansion.

Any other items that differentiate the option from the others considered

This solution is slightly shorter than Option 1 but, as is the case with Option 2, the reinforcement main will be 355mm PE along its full length to support a future connection to Drem at the eastern extremity of the new main.

This is the costliest reinforcement solution and, as with Option 2, additional future industry costs may be incurred due to increased connections costs for a supply to the proposed Drem expansion.

7.4 Fourth Option Summary: Interruption

In addition to the above, consideration was given to Interruption.

As part of Interruption Reform, also known as the Mod 90 process, SGN has the option to offer a tender for interruptible contracts to customers to offset the need to invest for capacity.

Interruptible consumers receive discounted transportation charges for the flexibility they provide to the system for demand side management at times of high demand.

There are currently no sites within Aberlady – North Berwick MP Network that meet the criteria for an interruptible supply. This option has been discounted.

7.5 Options Technical Summary Table

Table 4: Options Technical Summary Table

| Option | First Year of Spend | Final Year of Spend | Volume of Interventions | Design Life (years) | Total (£M) |
|-------------------|---------------------|---------------------|-------------------------|---------------------|------------|
| 1/ Luffness Mains | 2021/22 | 2021/22 | 1.5km x 355mm PE MP | 10 | 0.975 |
| | | | 1.1km x 315mm PE MP | | |
| 2/ Luffness House | 2021/22 | 2021/22 | 2.2km x 355mm PE MP | 10 | 0.939 |
| | | | Land Easements | | |
| 3/ A198 | 2021/22 | 2021/22 | 2.5km x 355mm PE MP | 10 | 1.119 |

7.6 Options Cost Summary Table

Table 5: Options Cost Summary Table

| Option | Volume of Interventions | Cost Breakdown (£M) | Total (£M) |
|-------------------|-------------------------|---------------------|------------|
| 1/ Luffness Mains | 1.5km x 355mm PE MP | Commercial Cor | 0.975 |
| | 1.1km x 315mm PE MP | | |
| 2/ Luffness House | 2.2km x 355mm PE MP | Commercial Cor | 0.939 |
| | Land Easements | | |
| 3/ A198 | 2.5km x 355mm PE MP | Commercial Cor | 1.119 |

Note: Options 2 & 3 do not include additional future "connections" costs Commercial Confidentiality for 1.0km x 315mm PE MP approach main to Drem

8 Business Case Outline and Discussion

Validation of the network analysis model, a robust model maintenance process and system performance checks have confirmed the accuracy of the Aberlady - Tranent IPMP model for use in network analysis.

A full review of the relevant Local Development Plans and associated documents, followed by close engagement with stakeholders, has provided confidence in the level of development expected during RIIO-GD2.

The development outputs have been applied to the validated network model which predicts a failure at 85% peak demand by winter 2025/26, putting at risk supplies to 3,500 customers.

To mitigate this risk and meet Licence Conditions it will be necessary to pre-emptively reinforce the network during the RIIO-GD2 period.

There have been no external costs incurred in assessing the options considered as these have been prepared by the in-house Network Planning and Design teams.

8.1 Key Business Case Drivers Description

Pre-emptively Repair: Option 1, Luffness Mains

This option provides a robust reinforcement solution in support of sites identified by the East Lothian LDP and associated documents for development during RIIO-GD2.

Disruption to the public is minimised by the adoption of a route away from the busy A198 coastal road.

Initially a slightly more expensive solution (+3.7%) than Option 2, Luffness House. However, when future connections costs are factored in this solution is significantly less expensive (-31.2%).

Pre-emptively Repair: Option 2, Luffness House

This option provides a robust reinforcement solution in support of sites identified by the East Lothian LDP and associated documents for development during RIIO-GD2.

This solution is contingent on securing Land Easements, requiring detailed negotiations with several land owners. The presence of areas of dense mature trees may mean a direct cross-county route is impracticable with additional costs incurred to avoid these areas, most likely by diverting onto the busy A198.

Additional future industry costs, due to higher connection costs for a supply to the proposed Drem expansion, results in higher overall costs compared with Option 1.

Pre-emptively Repair: Option 3, A198

This option provides a robust reinforcement solution in support of sites identified by the East Lothian LDP and associated documents for development during RIIO-GD2.

Of the three options identified, this solution is likely to result in the greatest disruption to the public as the route passes through Aberfeldy and along the busy A198 coastal road.

This solution is slightly shorter than Option 1 but, as is the case with Option 2, the reinforcement main will be 355mm PE along its full length to support a future connection to Drem at the eastern extremity of the new main.

This is the costliest reinforcement solution and, as with Option 2, additional future industry costs may be incurred due to increased connections costs for a supply to the proposed Drem expansion

Table 6: Summary of Key Value Drivers

| Option No. | Desc. of Option | Key Value Driver |
|------------|-----------------|--|
| 1 | Luffness Mains | Least cost, long-term industry solution |
| 2 | Luffness House | Least cost, medium-term industry solution |
| 3 | A198 | Most expensive, medium and long-term industry solution |

8.2 Business Case Summary

This project is driven by SGN’s Licence Conditions to ensure security of supply

Table 7: Business Case Matrix

| | Luffness Mains | Luffness House | A198 |
|--------------------------------|--|---|---|
| Cost (£M) | 0.975 | 0.939 | 1.119 |
| Positive Benefit (Pros) | A robust reinforcement solution. Minimise disruption to public. A holistic design, providing the least cost, long-term, industry solution. | A robust reinforcement solution. The least cost reinf. solution. Opportunity to phase works. | A robust reinforcement solution. Opportunity to phase works. |
| Negative Impact (Cons) | In following this route there is no opportunity to phase these works. | Route wholly dependent on securing land easements. Route partially follows the busy A198. Potential additional “connections” costs (£0.341M). | The most expensive solution. Route follows the busy A198. Potential additional “connections” costs (£0.341M). |

Costs inclusive of Overheads and Efficiencies

9 Preferred Option Scope and Project Plan

9.1 Preferred option

Pre-Emptively Repair - Option 1, Luffness Mains: 2.6km x 315mm/355 PE MP

9.2 Asset Health Spend Profile

Table 8: Summary of Schedule of Spend

| Asset Health Spend Profile (£M) | | | | | | |
|---------------------------------|---------|---------|---------|---------|---------|----------|
| Pre GD2 | 2021/22 | 2022/23 | 2023/24 | 2024/25 | 2025/26 | Post GD2 |
| 0 | 0.975 | 0 | 0 | 0 | 0 | 0 |

Costs inclusive of Overheads and Efficiencies

9.3 Investment Risk Discussion

The requirement for reinforcement of the Aberlady-North Berwick MP system is demand driven, primarily development that SGN is committed to supplying. However, a risk does exist that the planned development does not materialise. Indeed, while the network is close to capacity and requires reinforcement to supply accepted demand, actual demand at the long-standing GT sites at Dirleton (Archerfield & Renaissance Golf Complexes) is lower than the accepted demand, maintaining minimum system pressures at North Berwick.

Contact has been made with GTC, who operate both Dirleton GTs, to confirm future load projections. This dialogue has resulted in an agreement with GTC for a re-nomination of the accepted site load at Renaissance, and a significant reduction in committed demand for this site. Nevertheless, these developments will continue to be a primary driver for reinforcement in this area.

In addition to a review of committed demand, a full assessment has been made of planned development contained within the East Lothian Local Development Plan and associated documents, resulting in a clear understanding of development planned for RIIO-GD2 and beyond.

Through this determination SGN has identified this requirement for reinforcement within the RIIO-GD2 period.

SGN has prepared costs using average contracted rates at depot level and has validated them against known costs for similar, completed projects. Nevertheless, whilst all reasonable steps have been taken to ensure accuracy of costs outlined in this paper, it is recognised that external variables may change and subsequently impact on actual costs at the time of construction. Examples of such could include unforeseen increases in contractor rates driven by a surplus of market demand for labour or sharp cost increases for materials.

Factors such as market driven demand linked to the economy, the UK's potential exit from the European Union, emerging decarbonisation strategies and industry innovation can potentially impact on the scope of works outlined in this paper. SGN has proposed a volume driver funding mechanism to de-risk underspend/overspend for these works and further details of our proposal can be found in Section 6.2 in the RIIO-GD2 Business Plan Appendix for Capacity Management.

As stated in our Environmental Action Plan, and in line with current Scottish Governments targets, SGN's long term target is to achieve Net Zero emissions by 2045. This means a decarbonisation of the energy network and supporting the transition to an environmentally sustainable low-carbon energy system. Indeed, SGN recognise that there have been preliminary government targets set facilitating a move toward a renewable or low carbon heat solutions by the end of the RIIO-GD2 period. As such, throughout the RIIO-GD2 period we will continue to closely monitor this emerging heat strategy with a view to refining any potential impact on current growth forecasts.

Appendix A - Categorisation of Potential Load Growth

The following Table sets out the manner in which identified potential load growth has been categorised and applied, leading to customer driven reinforcement, when looking to establish the optimum investment strategy for our networks.

| DEFINITION TABLE | | | | |
|-----------------------------------|---|--|-------------|-------------|
| Confidence | Definition | Factors to be considered | Base Growth | High Growth |
| Highly probable (>90% confidence) | Connection expected in RIIO-GD2 for all sites | <ol style="list-style-type: none"> 1. Quotation accepted but not yet on stream 2. Building is in progress. 3. Detailed planning permission granted. 4. Economic conditions indicate that sites for consumers of a particular type are likely to be developed, e.g. <ol style="list-style-type: none"> a. Domestic sites where there is a high demand for housing and there is a shortage of land available. b. Interest has been shown in having a connection made to a non-domestic site and economic factors suggest development will go ahead. | ✓ | ✓ |
| Probable (>75% confidence) | Connection Likely in RIIO-GD2 for majority of sites | <ol style="list-style-type: none"> 1. Outline planning consent has been granted. 2. Recent development has been carried out in the area. 3. The land is a prime site for development, but no connection enquires have yet been received. 4. Adopted Local Plan Site | ✓ | ✓ |
| Good prospects (>50% confidence) | Connection expected for some sites in RIIO-GD2 | <ol style="list-style-type: none"> 1. Proposed Local Plan Site 2. No indication of planning permission being granted for the site. 3. The site is outside existing gas supply areas. 4. The site would involve physical problems in delivering a gas supply. 5. The site would require substantial additional infrastructure, e.g. additional roads, schools. 6. Site marked “reserve” in Local Plan. 7. Site is known to be contaminated ground. 8. Site has “protection” orders served over it – e.g. SSSI. | | ✓ |
| Poor prospects (<50% confidence) | Significant time or investment required to progress | <ol style="list-style-type: none"> 1. Does not meet the above planning criteria. 2. Site has been deemed as ‘speculative’. 3. The site would require significant additional infrastructure, e.g. additional roads, schools. | | |

Appendix B - Summary of Towns

North Berwick (Population 6,605)

North Berwick was a staging post on the pilgrim route from Lindisfarne to St Andrews. In the 19th century fishing was its main economy. In the 20th century it was known as the Biarritz of the North attracting holiday makers from Edinburgh. Today it is a residential and commuter town although still popular with summer visitors.

This type of medium-sized town is a suburban or commuter locality with a prevalence of higher income and private housing. A large proportion of the population are over 45, and many are retired. Many people own their home. There is also a high proportion of people in professional employment and a high proportion of residents are educated to HNC level or above. Many residents own two or more cars.

Gullane (Population 2,568)

Gullane is a seaside residential town with leisure facilities. This type of small town is a suburban or commuter locality with a prevalence of higher income and private housing. A large proportion of the population are over 45, and many are retired. Many people own their home. There is also a high proportion of people in professional employment and a high proportion of residents are educated to HNC level or above. Many residents own two or more cars.

Aberlady (Population 1,116)

Aberlady dates from early Anglo-Saxon times. It also served as the port for Haddington. The village was developed by the local estate owner in the 19th century. Today it is best known for its RSPB reserve and for its golf course.

This type of small town is a suburban or commuter locality with a prevalence of higher income and private housing. A large proportion of the population are over 45, and many are retired. Many people own their home. There is also a high proportion of people in professional employment and a high proportion of residents are educated to HNC level or above. Many residents own two or more cars.

Source:

[Scotland's Towns Partnership](#)

Appendix C - Acronyms

| Acronym | Backronym (spelled out acronym) | Definition / explanation |
|---|--|---|
| Pressure Tiers ○ IP ○ MP ○ LP | ○ Intermediate Pressure ○ Medium Pressure ○ Low Pressure | ○ Intermediate Pressure i.e. 2 – 7bar ○ Medium Pressure i.e. up to 2bar ○ Low Pressure i.e. up to 75mb |
| CSEP | Connected System Exit Point | A connection point for one of more Individual System Exit Points, most usually supplying a GT Network (see GT below). |
| DG | District Governor | Pressure regulator primarily used for reducing pressures from IP and MP tiers to LP. |
| DPG | Distribution Pressure Governor | Pressure regulator primarily used for reducing pressures from IP tier to MP. |
| GT | Independent Gas Transporter | GT networks are directly connected to the Gas Distribution Network (GDN) via a Connected System Entry Point or indirectly to the GDN via another IGT. |
| HDPE | High Density Polyethylene | Pipe material for use in 7bar rated systems. |
| HLA | Housing Land Audit | Local Authority planning document. |
| LDP | Local Development Plan | Local Authority planning document. |
| PE | Polyethylene | Pipe material. |
| RIIO-GD1 | Revenue=Incentives + Innovation + Outputs – Gas Distribution 1 | 8-Year price control period (2013-2021) |
| RIIO-GD2 | Revenue=Incentives + Innovation + Outputs – Gas Distribution 2 | Proposed 5-Year price control period (2021-2026) |
| SHP | SHP File Format | SHP is a file extension for a Shapefile shape format used in geographical information systems (GIS) software. |
| ST | Steel | Pipe material. |
| TRS | Transmission Reduction Station | Pressure regulator primarily used for reducing pressures from Local Transmission System tier to IP/MP. |
| 1:20 | 1:20 Demand Conditions | Designing a network to operate whilst experiencing demand conditions historically only seen every 20 years, during severe weather events. |