

**NORTH LANARKSHIRE COUNCIL
PLANNING AND REGENERATION SERVICE
AND
ROADS AND TRANSPORTATION SERVICE**

BACKGROUND REPORT

Date: 21 January 2015

DATE: 21 JANUARY 2015
SUBJECT: GARTCOSH:GLENBOIG COMMUNITY
GROWTH AREA:

INTERNAL STRATEGIC TRANSPORT
ASSESSMENT REPORT.

(REVIEW OF SUBMITTED GARTCOSH:GLENBOIG
STRATEGIC TRANSPORT ASSESSMENTS).

Purpose of Report:

- To provide a comparative assessment and analysis of Strategic Transport Assessments submitted as part of Planning Permission in Principle (PPP) applications for development areas within the Gartcosh:Glenboig Community Growth Area (CGA).
- To provide recommendations regarding the best practicable solutions in terms of new or improved infrastructure and necessary sustainable travel measures required to ensure efficient and sustainable travel as a result of the development of the Community Growth Area.
- To identify outline costs for the delivery of the infrastructure and other measures recommended.
- To provide supporting information to Planning and Transportation Committee when considering whether to support infrastructure recommendations.

1. Three separate Strategic Transport Assessments (STAs) have been prepared by the following transport consultants.

Consultant	Client	Date
Atkins	Paradigm Ltd (Deuchny Property)	March 2014
Transport Planning	Glenboig Consortium	July 2014
Waterman	Persimmon Homes and Gladedale Estates Limited	September 2014

2. The contents of these STAs have been summarised and tabulated below. The STAs forwarded by Atkins and Transport Planning are based on an earlier Strategic Capacity Assessment (SCA) which was also prepared by Atkins consultants in August 2013.
3. An alternative STA was also forwarded by Atkins in July 2014 on behalf of Paradigm Limited which redistributed and removed a number of dwellings from the CGA east of the M73 to reduce the severance impact of the M73 and therefore some previously proposed infrastructure mitigation measures. Due to the proposed redistribution of much of the CGA to Gartcosh, that proposal does not meet with the requirements of the CGA and the contents of that STA have not been considered. The developer of the alternative STA was asked to confirm whether they wished to formally submit the alternative STA as part of the planning application process but has not done so.
4. The STA forwarded by Waterman (September 2014) was prepared independently and makes no reference to the Strategic Capacity Assessment of (August 2013).

Base Calculations and Surveys.

5. Trip rates indicated in the Strategic Capacity Assessment (August 2013) were derived from a survey carried out at the junction of B804 Main Street, and Garnqueen Crescent, both Glenboig which, while being significantly smaller in scale, is considered to be representative of traffic generated by the CGA proposals. Using the TRICs database, trip rates for similar developments were found to be lower than those obtained from survey. The trip rates obtained from the survey results are more robust and have been used in the preparation of the SCA.

6. The trip rates used by Waterman in the preparation of their STA are less robust than those used in the SCA particularly in the morning peak when these are some 20% lower. A gravity model was used in the SCA prepared by Atkins and the STA prepared by Waterman. Waterman only apply background growth to 2016 whilst Atkins and Transport Planning apply growth to 2013. This difference would load tested traffic networks more heavily in future capacity assessments in the latter two STAs.
7. The trip rates by Waterman are TRICS based and additionally not based on a survey such as that by Atkins SCA which surveyed actual local trips. Additionally, the modal split proposed by Waterman applies reductions for modal shift of 10% and 25% for “linked” trips (ie trips where journey-to-work trips are combined with other purposes such as retail trips), compared to a 5% reduction for modal shift carried out in sensitivity tests carried out by Atkins and Transport Planning. The linked trip and modal shift applied by Waterman is considered overly optimistic.
8. **Atkins STA (March 2014)** Analysis was carried out by Atkins using a micro simulation model to produce a Strategic Capacity Assessment (August 2013) which is the basis of the STA submitted. The analysis was based on junction surveys carried out in 2013 and a number of scenarios tested in both the AM and PM peaks as indicated in Table 1 below.
9. **Mitigation Measures** Six strategic infrastructure measures (Mitigation Measures M1 – M6) are identified to mitigate the effects of CGA-generated traffic including the provision of a Glenboig Link Road. These are shown in a comparison table at the end of this report along with indicative costs prepared by Atkins. The analysis carried out by Atkins predicts that with inclusion of the mitigation measures the average journey times across the network will be similar to those predicted in the future base model at 2031. The analysis still predicts that congestion will occur on the network with slight decreases in speed occurring to the M73 Link Road (on its western approaches), at Station Road, Muirhead and at Avenuehead Road, Moodiesburn.
10. The remaining levels of congestion are shown to be controlled within the period modelled but suggest the network is operating at capacity at certain times of the peak hour. A sensitivity test based on a different scenario was also carried out using a 5% reduction to CGA traffic for modal shift to other travel modes. This indicates only a slight reduction in journey time will result of 0.5% and 0.1% in the morning and evening peaks respectively, the same congestion points are still predicted to occur. (However, it should be noted that developer contributions towards infrastructure measures should only result in current traffic flows being no worse at the Year of Completion of the CGA. If the aim is to improve traffic flows from its current position as part of CGA development, further investment from other sources would potentially be required).
11. Analysis within the STA also predicts that with the inclusion of the mitigation measures except the Glenboig Link Road extreme levels of congestion will occur. An increase of journey times by 182% in the morning and 17% in the evening peaks are predicted with extensive delays likely to occur along Lochend Road and Johnston Roads, Gartcosh; Station Road, Muirhead and Avenuehead Road, Moodiesburn. Therefore the STA indicates that the Glenboig Link Road provides major relief of congestion at these points.
12. The cost of providing the mitigation measures with the exception of the Glenboig Relief Road (M1) are stated to cost £196 per dwelling based on 3000 dwellings. This estimate appears to exclude any land cost. The cost of the Relief Road is not stated in the STA however the developer has stated in elsewhere that the cost would be £5,600,000. This would bring the total costs to £6,188,570 or approximately £2062 per dwelling for roads infrastructure improvements only, ie. Excluding other sustainable mitigation measures such as the inclusion of new footways or park and ride facilities.
13. **Transport Planning (TP) STA (July 2014)** used the SCA prepared by Atkins as the basis of the STA which has also been submitted. In addition the consultant considered how individual sites can be accessed and the impact on traffic of this and have identified potential access points for each site. In some instances the number of units being served by these proposed access points exceed limits normally accepted, e.g. two access roundabouts are proposed to access the area west of Johnston Loch which is projected to have a future capacity of up to 1400 dwellings as opposed to the 200 or 300 units dependent on circumstances and road layout normally permitted as the maximum at each access. An assessment of site access options is provided at sections 35– 46 below.

14. **Mitigation Measures** The original Atkins SCA (March 2013) looked at five model testing scenarios (p.30 – p.38 of SCA). Without mitigations extreme delays occurred under each scenario. Delays were shown to be most acute at the junctions of Lochend Road/Johnston Road, and at Lochend Road/Mowbray Avenue roundabout (both Gartcosh). A series of mitigation measures were therefore proposed from minor widening to a Glenboig Link Road.

15. The mitigations proposed in the Transport Planning STA are largely similar to those proposed in the Atkins STA, and are outlined below and in the comparison table(s) at the end of this report.

16. Mitigation Measure 1 (M1). Glenboig Link Road. The Transport Planning STA provided a set of route options (p.51- p.58) for a Glenboig Link Road whose purpose is proposed to link Glenboig with the M73 by a more direct route thus relieving the congestion impact of the CGA to and from Glenboig on junctions at Lochend Road/Johnston Road, Lochend Road/Woodneuk Avenue and the western approach road to the M73. These are:

- **Option A.** A route from Johnston Road to western access roundabout of the M73. This route was discounted by the STA as it bisects a development site and the difficulty in technical terms to deliver an additional arm to the existing roundabout due to design and topographical issues.
- **Option B.** A route from Johnston Road (east of the M73 to the existing eastern accesses of the M73. This option is constrained by significant differences in ground levels. Additionally the route cuts through a Local Nature Reserve (LNR) for 500m.
- **Option C.** A route from Glenboig through the Gartcosh Business Park to a point on internal Business Park roads. This route would cross the LNR for 110m and would bisect one of the development plots within the Business Park.
- **Option D.** Begins at the same point as Option C but crosses the LNR for only 60m before reaching Business Park roads. This route is also located further away from some existing residential dwellings. and is the favoured option within the STA.
- **Option E.** Begins from a point within the development site and crosses the LNR for 290m.
- **Option F.** This involves improving the railway bridge at the eastern edge of Glenboig to allow better connectivity southwards to Coatbridge. Improvements here are constraints in bridge headroom and width and the fact that improvements would not improve linkages to Gartcosh, Gartcosh railway station or the Business Park.

The proposed Link Road has an outline cost indicated in the STA of £5.6m excluding land costs and the cost of a new roundabout at its eastern terminus.

17. Mitigation Measure 2 (M2). Junction Improvement/Signalisation M73 southbound off slip. This measure consists of providing traffic signals and widening the existing roundabout at the southern off slip. Cost is c.£200,000

18. Mitigation Measure 3 (M3) Junction Widening (Johnston Rd/A752). This measure involves widening Johnston Rd to two lanes at its approach to Lochend Road (A752). The distance required Distance required not mentioned. Cost £75,000.

19. Mitigation Measure 4 (M4) Left Turning Lane at A752/Mowbray Avenue. This involves widening the A752 approach to the Mowbray Avenue roundabout and providing a free-flow left turn lane. This allows traffic arriving in a southward direction on the A752 better access to the M73 junction and Business Park. An existing signalised pedestrian crossing point to M73 will be retained. Cost: (See M5)

20. Mitigation Measure 5 (M5). This consists of carriageway widening of the A752 southwards to the M73. I.e. Widening the M73 link from the Mowbray Avenue roundabout to the M73 western dumbbell roundabout to two lanes in an eastbound direction. Cost: M4+M5 c.£250,000.

21. Mitigation Measure 6 (M6) Provision of a MOVA controller at the junction of the A752 and Cumbernauld Road, Muirhead. Cost: £55,000
22. The overall costs of measures M2-M6 is estimated at £580,000 without land acquisition/utilities services realignment etc. With the addition of the Glenboig Link Road this cost rises to £6,180,000
23. A graduated scale of contributions is proposed by Transport Planning to meet the costs of providing necessary mitigation including the Glenboig Link Road based on overall infrastructure costs of on the number of bedrooms in each unit. A contribution ranging between £1,600 for units with one bedroom and £2,400 for those with five or more is suggested as opposed to a fixed rate of approximately £2,000 per unit based on 3,000 completed dwellings. The actual figures would be £2060.
24. Given the Link Road's significant cost, if a developer was to provide that mitigation measure early in the development process, a reimbursement or some other financial offsetting would probably be required during the CGA development period. It should be noted that each of the elements proposed by the consultants and whether land acquisition costs are included may require to be independently reviewed to ensure that developer contributions required are accurate.
25. Both the Transport Planning and Atkins STAs advise that a Glenboig Link Road is necessary to deliver the approximately 3000 dwellings projected for the Community Growth Area. The Atkins STA states (at p44 – p45 and Scenario 5b, p.56) that a reduced CGA (40%) with all mitigations measures proposed except the Glenboig Link Road can be accommodated on the local highway network.) The Transport Planning STA also highlights that a Glenboig Link Road enables direct connectivity between Glenboig CGA sites and the M73 J2A/Gartcosh Railway Station and that with the Link Road average journey times currently and after completion of the CGA would be similar.
26. **Waterman STA (August 2014)** The TA forwarded by Waterman was prepared using traditional methods of analysis, ARCADY, PICADY and LINSIG. Three scenarios were tested in both the AM and PM peaks at each junction as indicated in the table below. The scenarios were without a Glenboig Relief Road, with Glenboig a Relief Road and Kilgarth Sensitivity Test.
27. It would appear Waterman has analysed a number of existing junctions which exceeded the 10% threshold assessment to determine the level of mitigation, if any, required to accommodate traffic generated by the CGA. In addition to the reduced trip rates applied by Waterman in comparison to the other STAs and noted at Table 1 below, further reductions of 10% have been applied for modal shift along with a 25% reduction for linked trips as the STA expects that there will be an increase, currently assumed to be 15%, in the number of residents who live and work in the area due to the proximity of the Business Park. The STA (Table 2, p.17) indicates a 23.7% modal split to buses and 9.3% to pedestrians against 45.9% and 9.3% respectively to car drivers and car passengers. These figures for sustainable transport modes seem overly optimistic.
28. These reductions also appear to have a significant impact on the levels of traffic expected to be generated, further clarification may be required from Waterman. Traffic generated by schools is assumed to all new trips and no reduction has been applied.
29. Eight strategic mitigation measures have been identified in the STA to mitigate the effects of the traffic generated by the CGA, five of which are at locations also identified by Atkins, along with others at additional three locations. No costs associated with the provision of these measures have been indicated. In addition, different mitigation is indicated by Waterman at two junctions to that indicated by Atkins.
30. It would appear that junctions have been analysed initially without the Glenboig Relief Road included, to determine the level, if any, of mitigation required. The junctions have then been assessed with the Glenboig Relief Road being provided and it is noted in the STA that the mitigation proposals already identified would still be required. This may be as a result of using reduced generation figures and applying the mitigation before considering the impact of the Relief Road.
31. It is also stated in the Waterman STA that there is no significant benefit from the Glenboig Relief Road in terms of the operational assessment of the road network other than providing a direct link between the Glenboig and Gartcosh growth areas and between Glenboig and Gartcosh Railway

Station and the business park.

32. The Waterman STA implemented three sensitivity tests that comprised of the following scenarios:

- Without Glenboig Relief Road.
- With Glenboig Relief Road.
- Without Glenboig Relief Road but including a potential Kilgarth Freight Terminal.

33. The scenario testing was applied to 22 junctions and results indicated that all junctions could still operate albeit with some having increased queues if other mitigation measures proposed were implemented but not the Glenboig Relief Road. Provision of a Relief Road had the effect of reducing queuing. The third scenario which included of a potential Kilgarth Freight Terminal but no Relief Road resulted in a need for other mitigation measures at some junctions. The Waterman STA concludes, (p61), that there is no significant benefit from a Glenboig Relief Road.

34. **Sustainable Mitigation Measures** The STAs also included proposals for sustainable mitigation measures in the form of footways and cycleways, Park and Ride facilities and increased levels of public transport. These are detailed at Table 3 below.

35. **Site Access Proposals.** Generally site access junctions would be regarded as on-site costs attributable to individual developers and can only be regarded as part of the common infrastructure and subject to communal developer contributions where they also contribute to the efficient functioning of the wider local roads network. Only the STA by Transport Planning provided significant detail regarding site access proposals. Access proposals identified are listed below.

36. The final designs, dimensions and costs of site only accesses would be determined by individual site TAs at the time these developments would be subject to detailed planning applications. The stage at which communal infrastructure is required and delivered will be determined by building rates in each area of the CGA and how individual and cumulative phases of development will impact upon the wider local network traffic flows. However certain mitigation elements will have more significant impact than others and these will be discussed as part of the developer contributions and s.75 processes.

37. (Area West of Lochend Road) (Northern Access Option) from Lochend Road.

- Option 1: new access just north of existing tearoom access and removal of hedgerow/trees to allow adequate sight line
- Option 2: new roundabout 32m DIA just below access to Lochend House.

38. (Area West of Lochend Road) (Southern Access Option) from Lochend Road.

- Option 1: new T-junction access on A752 Coatbridge Rd
- Option 2: new roundabout 36m DIA at same location.

39. In the Transport Planning STA only Option 2 is assessed as not resulting in significant queuing whereas the Waterman STA indicates that a T-junction is sufficient. A decision on the preferred junction option may relate to whether the junction accesses a smaller site (less than 300 dwellings) or has the function of serving the wider Johnston Loch development area.

40. (Garnqueen Farm, Glenboig)

The Transport Planning STA advises that a minimum of two access points are required onto the local road network. Three access points are proposed which would accommodate the proposed capacity of the site.

- An access off a new 4 arm roundabout the other arms consisting of two exits onto the existing Glenboig Road/Main Street, Glenboig (B804) and a fourth arm consisting an access to the Glenboig Relief Road.

- A priority T-junction from Main Street (B804) opposite the Community Centre and a third access from a T-junction to the existing Garnqueen Crescent near its junction with the B804.

Of these options only the 4 arm roundabout could potentially be regarded as communal as part of it forms an access to the proposed Glenboig Relief Road.

41. (Area West of Lochend Road) Access from Drumcavel Road (A752)

None of the STAs assess access options from the north at Drumcavel Road into the area west of Lochend Road. The Transport Planning STA notes that if an access was provided at this point it would change the balance of traffic entering and leaving the area and a fresh appraisal of traffic impacts would be required.

42. (Johnston Farm North Area) from Johnston Road

The Transport Planning STA advises that two access points are required onto the local road network. These access options only serve sites north or south of Johnston Road and are not therefore considered as requiring wider communal developer contributions

- Option 1. A fourth arm to be added to the existing roundabout at Inchnock Avenue and a new right turn island access going north from Johnston Road.
- Option 2. A fourth arm to be added to the existing roundabout at Inchnock Avenue and a 36m DIA roundabout which would also have the potential for a fourth arm going south to the Johnston Farm South Area

43. (Johnston Farm South Area) from Johnston Road

- Option 1. A new 4 arm roundabout (36 m DIA not given) at junction of Johnston and Inchnock Avenue with an arm into the Johnston Farm South Area.
- Option 2. A single new roundabout (36m DIA) accessing both Johnston Farm North and South Areas.

These access options only serve sites north or south of Johnston Road and are not therefore considered as requiring wider communal contributions.

44. (Croftfoot Farm, Glenboig)

A single site access off a new roundabout (36m DIA) at the junction of Glenboig Road and Johnston Road

45. (North Marnoch, Glenboig)

A single site access from Glenboig Road and a subsidiary/temporary access point at the end of Marnoch Drive.

46. (Area West of Lochend Road) Key information not included in currently submitted STAs relates to the area of the CGA west of Lochend Road, Gartcosh, and around Johnston Loch. None of the STAs provides a strategic internal roads layout for that area or detailed confirmation of required access provision. Since the mitigation measures proposed and contained within Table 5 of this report are considered to provide the necessary solutions required to address the CGA's transport impact on the local and national road network the remaining issues of internal roads layouts and access west of Lochend Road still require to be demonstrated by transport assessment by the developers, landowners or other parties wishing to develop that area.

47. Summary of Assessments.

48. The submitted STAs agree in principle on most infrastructure mitigation measures required such as similar junction improvements, or widening to existing roads. Some alternative proposals were also proposed in the Waterman STA regarding some additional junction upgrades. The key infrastructure proposal where there is significant variance between STAs is a proposal for a Glenboig Relief Road which would create a new link between Glenboig and Gartcosh Business Park and railway station and additionally provide more direct access from Glenboig to junction 2a of the M73 motorway.

- 49.** The internal STA assessment report prepared by the Council concludes a link road is necessary between Glenboig and Gartcosh Business Park if a Community Growth Area of the proposed scale of 3000 dwellings is to be delivered. Without the link road, one STA (Atkins) indicates a reduced CGA of approximately 40% of the proposed capacity (ie. 1200 dwellings) could be achieved. The third STA (Waterman) indicates no significant benefit from the link road in terms of road network operation other than providing a direct link between Glenboig and the Gartcosh business park, railway station and Gartcosh itself. However the roads authority assessment of that STA is that it is less robust than the other STAs in terms of the parameters and predicted destinations used to assess CGA transport impacts.
- 50.** The internal STA assessment report considers that, in addition to direct link benefits, the link road removes the need for traffic travelling from Glenboig to the motorway to make a significantly longer trip across an M73 over-bridge and through part of Gartcosh before reaching the M73. More significantly, two of the STAs indicate that if all projected CGA traffic wishing to use the M73 were to approach from the west on existing roads, significant congestion of the motorway junction and adjacent approach roads would result during peak travel times.
- 51.** The link road route proposed also crosses Gartcosh Local Nature Reserve (LNR) for a distance of approximately 80m. Whilst the potential environmental impact of the link road is largely outwith the scope of this report significant mitigation measures would be required. This could include mitigation measures such as amphibian underpasses based on the advice of Scottish Natural Heritage as the protected species licensing authority. In addition appropriate landscaping is required to minimise visual and noise impacts of the road proposal, and compensatory buffering should be provided between the LNR and housing development.
- 52.** Key information not included in currently submitted STAs relates to the area of the CGA west of Lochend Road, Gartcosh and around Johnston Loch. None of the STAs provides a strategic internal roads layout for that area or detailed confirmation of required access provision.
- 53.** The mitigation recommendations detailed in Table 5 and 6 of this Report are considered necessary to address the CGA's transport impact on the local and national road network, therefore issues of internal roads layouts and access west of Lochend Road still require to be demonstrated by transport assessment by the developers, landowners or other parties wishing to develop that area.

Table 1: Parameters Used in Strategic Transport Assessments.

	Atkins	Transport Planning	Waterman
NTRF Growth Factor Used	None – Local Roads Central - Motorway	Low - Local Roads Central – Motorway	Low - Local Roads Central – Motorway
Assessment Year	2031	2031	2030
Committed Development Indicated	Crime Campus Inkjet Production Facility Other Business (100,000 m ² General Industrial and Distribution) Kilgarth Freight Terminal	Crime Campus Inkjet Manufacture Other Business (100,000 m ² General Industrial and Distribution) Kilgarth Freight Terminal	Gartcosh Business Park <i>including;</i> <i>Crime Campus</i> <i>Inkjet Production Facility</i> Moodiesburn Mixed Use Development Woodneuk Kilgarth Freight Terminal
Trip Generation (Arrival/Departure)	AM (07.00-10.00) 1.635 (0.354 /1.281) PM (15.30-18.30) 1.625 (1.156/0.469) From observation Am (07.00-10.00) 1.075 (0.269/0.806) Pm (16.00-19.00) 1.492 (0.968-0.524) From Trics Not Used Sensitivity test carried out using 5% reduction to CGA traffic for modal shift.	AM (08.00-09.00) 0.844 (0.156/0.688) PM (17.00-18.00) 0.687 (0.510/0.177) From observation Sensitivity test carried out using 5% reduction to CGA traffic for modal shift.	AM 0.668 (0.174/0.494) PM) 0.675 (0.452/0.223) From Trics School journeys taken into account. Reductions applied for modal shift (10%) and linked trips (25%)
Distribution	Gravity Model	Gravity Model	Gravity Model
Analysis Method	Micro Simulation	Micro Simulation - SCA Traditional – Site Accesses	Traditional
Extent of Assessment	A total of eight network scenarios tested as part of the SCA. 1 Do Nothing (Base) 2 Future Year 2031 3a Do Something (No CGA mitigation) 3b Do Something (With CGA mitigation) 3c Do Something (Sensitivity test with CGA Mitigation & travel plan measures) 4 Do Something (Sensitivity test with mitigation and Kilgarth) 5a Do Something (With mitigation except Glenboig Link Road) 5b Do Something (CGA reduced to 40% with mitigation except Glenboig Link Road) AM and PM Peaks	A total of eight network scenarios tested as part of the SCA. 1 Do Nothing (Base) 2 Future Year 2031 3a Do Something (No CGA mitigation) 3b Do Something (With CGA mitigation) 3c Do Something (Sensitivity test with CGA Mitigation & travel plan measures) 4 Do Something (Sensitivity test with mitigation and Kilgarth) 5a Do Something (With mitigation except Glenboig Link Road) 5b Do Something (CGA reduced to 40% with mitigation except Glenboig Link Road) AM and PM Peaks	Three scenarios tested for each junction. 1 Without Glenboig Relief Road 2013 Base 2016 Projected Base + Committed 2016 Projected Base + Committed + CGA (3000 units) 2016 Projected Base + Committed + CGA (3000 units) + Mitigation. 2 With Glenboig Relief Road 2016 Projected Base + Committed + CGA (3000 units) 2016 Projected Base + Committed + CGA (3000 units) + Mitigation 3 Kilgarth Sensitivity Test 2030 Projected Base+ Committed + CGA (3000 units) 2030 Projected Base + Committed + CGA (3000 units) + Mitigation AM and PM Peaks

Table 2: Mitigation Measures Proposed and Costs (where provided).

Junction/Road and Mitigation Measure.	Atkins	Transport Planning	Waterman
	Identified from SCA prepared by Atkins	Identified from SCA prepared by Atkins	Identified in STA Development Access Strategy proposed. Mitigation measures are not presented in as much detail as other two STAs.
Glenboig Link Road	M1 Link Road <i>B804 Main St Glenboig – Gartcosh Business Park</i> <i>Not costed.</i>	M1 Link Road <i>B804 Main St – Gartcosh Business Park</i> <i>Tested 5 route options. Option D favoured. Crosses Local Nature Reserve for 60m.</i> <i>Outline Cost: £5.6m without land acquisition costs or cost developing access roundabout at Garnqueen Farm (Banks Access)</i>	STA states no significant benefit from the Glenboig Relief Road in terms of the operational assessment of the road network. <i>Only benefits stated are providing a direct link between the Glenboig and and Gartcosh growth areas and between Glenboig and Gartcosh railway station.</i>
(M2) M73 southbound off-slip and junction roundabout.	M2 Junction Improvement & Signals <i>M73 Junction 2A</i> <i>Outline Cost: £216,050.</i>	M2 Junction Improvement & Signals <i>M73 Junction 2A</i> <i>Outline Cost: c. £200,000.</i>	M73 Access Road / M73 Southbound Slip Roundabout <i>Reduction of circulatory carriageway and introduction of gyratory arrangement proposed to replace roundabout along with widening of Auldyards Road approach to roundabout.</i> <i>Not costed.</i>
(M3) Johnston Road/A752)	M3 Junction Widening to two lanes at approach to <i>A752 Lochend Rd/B804 Johnston Rd.</i> <i>Outline Cost:£75,119</i>	M3 Junction Widening to two lanes at approach to <i>A752 Lochend Rd/B804 Johnston Rd</i> <i>Outline Cost:£75,000</i>	A752 Lochend Rd / B804 Johnston Rd Junction <i>Priority junction to be replaced by 35.5m ICD roundabout.</i> <i>Not costed.</i>
(M4) A752 Lochend Road/M73 to Mowbray Avenue (Left turn land at Mowbray Avenue).	M4 Left Turn Lane <i>A752 Lochend Rd/M73 Link/Mowbray Ave.</i> <i>Outline Cost: (See M5 below).</i>	M4 Left Turn Lane <i>A752 Lochend Rd/M73 Link/Mowbray Ave.</i> <i>Widening of M73 exit road approach to the Mowbray Avenue roundabout and provide a free-flow left turn lane.</i> <i>Outline Cost (See M5 below).</i>	<i>Left Turn Lane A752 Lochend Rd/M73 Link/Mowbray Avenue.</i> <i>Not costed.</i>
(M5) A752 Carriageway Widening M73 link eastbound to M73	M5 Carriageway Widening A752 M73 link eastbound from A752 roundabout to M73 <i>Outline Cost: £242,414 (M4 and M5).</i>	M5 Carriageway Widening A752 M73 link eastbound from A752 roundabout to M73 <i>Outline Cost:£250,000</i>	A752 Lochend Rd / M73 Access Roundabout <i>Widening of A752 southbound approach to roundabout proposed to form left turn dedicated lane from A752 southbound. Widening of westbound approach from M73 access road and link to Mowbray Ave.</i> <i>Not costed.</i>
(M6) (A752)Station Rd Cumbernauld Road, junction Muirhead.	M6 A752 / Cumbernauld Rd <i>Install MOVA at signals.</i> <i>Outline Cost: £54,987.</i>	M6 A752 / Cumbernauld Rd <i>Install MOVA at signals.</i> <i>Outline Cost £55,000</i>	A752 Cumbernauld Rd / A752 Station Rd Junction <i>Amendments proposed to existing carriageway markings to provide additional lanes along Cumbernauld Road approaches to signals.</i> <i>Not costed but minimal.</i>

Cumbernauld Rd A752/ Lindsaybeg Rd, junction, Muirhead.	No mitigation proposed.	No mitigation proposed.	A752 /Cumbernauld Rd Lindsaybeg Rd Junction <i>Introduction of traffic signals proposed. Not costed.</i>
A752 Coatbridge Rd/ Gartloch Rd.	No mitigation proposed	No mitigation proposed.	<i>A752 Coatbridge Road / Gartloch Road Mini Roundabout Signal operation proposed to replace mini roundabout. Not costed.</i>
A752/ Townhead Rd, Coatbridge.	No mitigation proposed	No mitigation proposed.	<i>A752 Gartcosh Road / Townhead Road Junction Signal operation proposed to replace priority junction. Widening required on all approaches.</i>
	NB Indicative arrangements only shown for each proposal. Horizontal and vertical geometry along with visibility details required to demonstrate proposed mitigation can be provided within land controlled by applicants.	NB Indicative arrangements only shown for each proposal. Horizontal and vertical geometry along with visibility details required to demonstrate proposed mitigation can be provided within land controlled by applicants.	NB Indicative arrangements only shown for each proposal. Horizontal and vertical geometry along with visibility details required to demonstrate proposed accesses can be provided within land controlled by applicants.
Other Junctions Surveyed/ Assessed.	Atkins STA – No other junction mitigations proposed.	Transport Planning STA – No further junction mitigation proposed.	Waterman STA. Junctions below: STA indicates no mitigation required. A80 Cumbernauld Road / M80 Crowwood Roundabout. A80 Cumbernauld Road / A752 Cumbernauld Road Junction. A752 Coatbridge Road / Lochend Road Junction. A752 Coatbridge Road / Old Gartloch Road Junction. A752 Coatbridge Road / Access to Railway Station Junction. A752 Gartcosh Road / Lochend Road Junction. A752 Cuilhill Road / Commonhead Road Junction. A752 Gartcosh Road / A89 Coatbridge Road Roundabout. B804 Johnston Road / Glenboig Road Junction. B804 Main Street / Marnoch Drive Junction. B804 Main Street / Gainside Road Junction. B804 Main Street / Garnqueen Crescent Junction.

Table 3: Sustainable Mitigation Measures Proposed and Costs (where provided).

Costs	Atkins	Transport Planning	Waterman
	B804 Johnston Rd <i>Footway proposed along north side to link Gartcosh and Glenboig. Not costed.</i>	B804 Johnston Rd <i>Lack of continuous footway noted along with scope for a footway to be provided on at least one side due to presence of verges. 600m approx. Outline cost £36,000.</i> <i>Cycle route (ie shared with footway). Not costed. Introduce a 40mph speed limit and provide street lighting. Not costed.</i>	B804 Johnston Rd <i>Investigate potential to complete northern section of footway within verge space. Provide drop kerb crossing arrangement at junction with Glenboig Road.</i>
	<i>B804 Glenboig Road 3 non-controlled pedestrian crossings. Not costed.</i>	<i>No proposal.</i>	B804 Glenboig Rd <i>Investigate potential to complete eastern section of footway within verge space. Provide drop kerb crossing arrangement to connect proposed length of new footway to existing on west side.</i>
	A752 Lochend Rd <i>Footway proposed along west side between Old Gartloch Rd and Lochend Rd and pedestrian crossings. Not costed. May be an on-site cost related to site application.</i>	A752 Lochend Rd <i>A scheme to provide a footway along west side between Old Gartloch Rd and Lochend Rd should be developed. Not costed. May be an on-site cost related to site application.</i>	<i>No proposal indicated.</i>
	Marnoch Development Sites <i>Footway proposed to link development site to existing network. Not costed.</i>	<i>No proposal indicated.</i>	<i>No proposal indicated.</i>
	Rail <i>Policing of car park proposed to ensure used only by rail commuters. Increased capacity created by expansion of car park likely to be taken up by business park employees. Improved bus links proposed.</i> <i>Identification of need for future park and ride expansion at Gartcosh railway station.</i>	Rail	Rail <i>Investigate improved links of bus network to railway station.</i> <i>Investigate potential to increase cycle parking at railway station</i> <i>Investigate potential to increase bus parking.</i>
	Cycling <i>No proposals indicated, considered to be viable form of commuter transport.</i>	Cycling/ Walking Routes – <i>measures and costs not specified.</i>	
	Bus Services <i>No proposals for developer subsidy of bus services. New residential areas to be designed to enable bus penetration should business case be identified.</i>	Public Transport – measures and costs not specified. <i>(detailed appn)</i>	
Other Sustainability	<i>Not indicated.</i>	Safer Routes to School and Travel Planning – measures not	More specific elements, such as Travel Plans, public transport

Measures		specified. Outline cost: est. £100,000.	facilities and Safe Routes to School are considered to be addressed at future stages within detailed planning submissions.
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Table 4: Potential Site Access Points. (The access proposals below are as stated in each STA).

Areas being Accessed	Number and form of accesses identified;	Number and form of accesses identified;	Number and form of accesses identified in separate TA;
Area west of Lochend Road.	Western CGA (1400 Units): <i>An internal distributor road proposed to permit access into a number of individual land owners' sites. Indicative line of route. No internal road layout provided.</i>	G1 & G9 (West of Lochend Road) <i>Two access roundabouts serving a total of 1400 units onto A752 Lochend Road. No internal road layout provided.</i>	Access to Land South of Johnston Loch (Site Ref 10.3.3) <i>Single access for 300 units proposed via a priority junction from A752. No wider internal road layout provided.</i>
Area north and south of Johnston Road.	Central CGA (555 Units) <i>Accessed by two three arm roundabouts located on B804 and A752 to provide direct access.</i>	G2 & G3 <i>Two options to serve G2, north of Johnston Road from two roundabouts, one on Inchknock Avenue and either a roundabout or a priority junction on Johnston Road 350 units. G3, south of Johnston road, 150 units, being served by one access from either of the proposed roundabouts on Johnston Road.</i>	
Site immediately west of M73	<i>No information provided.</i>	G4 <i>Connection of 55 units to existing road presently serving 51 units.</i>	Site access Information not provided for site other than site South of Johnston Loch.
Glenboig Sites	Eastern CGA (1040 Units) <i>Glenboig Road / Johnston Road</i> <i>A four arm roundabout proposed to replace existing priority junction to provide access into site.</i> Glenboig Road <i>A roundabout south of Glenburn Gardens to provide access to proposed Link Road and site.</i> <i>A priority junction on Garnqueen Crescent to provide access to site.</i> Main Street <i>A priority junction east of Garnqueen Crescent to access site.</i>	G5 (Garnqueen Farm Site). <i>Three access points shown to serve 330 units, roundabout on Main Street, and two priority junctions onto Garnqueen Crescent and Main Street. Analysis results only provided for roundabout and eastern priority junction.</i> G6 (Croftfoot Farm Site). <i>Single access roundabout on Glenboig Road serving 80 units.</i> G7 (North Marnoch Site). <i>Priority junction on Glenboig Road along with emergency access onto Marnoch Road serving 250 units.</i>	Site access Information not provided for site other than site South of Johnston Loch.

	NB Indicative locations only shown for each proposal. Horizontal and vertical geometry along with visibility details required to demonstrate proposed accesses can be provided within land controlled by applicants.	NB Indicative arrangements only shown for each proposal. Horizontal and vertical geometry along with visibility details required to demonstrate proposed accesses can be provided within land controlled by applicants.	
Link Road Alternatives	Not considered.	A total of six alternatives considered concluding proposed link to Business Park most suitable option.	Not considered.
Costs	Mitigation measure total £588,570 excludes M1 (Link Road), and land costs, should land outwith boundary of public road and control of applicant be required.	Link Road estimated at £5,600,000 and approximately £600,000 for other mitigation measures and land costs, should land outwith boundary of public road and control of applicant be required, appears to be based on costs prepared by Atkins.	No costs indicated

Table 5. (Below) Transportation Infrastructure Mitigation Measures Assessed as Required for Gartcosh:Glenboig Community Growth Area.

Junction/Road Mitigation Measure	Description	Cost Estimate.
Glenboig Link Road (M1)	Link Road B804 Main St – Gartcosh Business Park 5 route options tested by one STA. Option D favoured. Crosses Local Nature Reserve for 60m.	Outline Cost Estimate: £5.6m.
M73 southbound off-slip and junction roundabout (M2)	Junction Improvement & Signals M73 Junction 2A	£200,000 to £216,050
(Johnston Road/A752) (M3)	Junction Widening to two lanes at approach to A752 Lochend Rd/B804 Johnston Rd.	Outline Cost: £75,000.
A752 Lochend Road/M73 to Mowbray Avenue (Left turn lane at Mowbray Avenue). (M4)	Left Turn Lane A752 Lochend Rd/M73 Link/Mowbray Ave. Widening of M73 exit road approach to the Mowbray Avenue roundabout and provide a free-flow left turn lane.	Outline Cost: (See M5 below).
A752: Carriageway Widening M73 link eastbound to M73. (M5)	Widening of Carriageway. A752/M73 link eastbound from A752 roundabout to M73	Outline Cost: £242,414 - £250,000.
(A752) Station Rd/ Cumbernauld Road, Junction, Muirhead. (M6)	Installation of MOVA traffic control system at signals.	Outline Costs: £55,000.
M73 Northbound off-slip and junction. New Mitigation (M7)	Investigate requirement for signalisation and left turn lane provision on northbound M73 slip.	Not yet confirmed.

(nb. Indicative arrangements only were provided in each Strategic Transport Assessment for each proposal. Horizontal and vertical geometry along with visibility details will be required to demonstrate the proposed mitigation can be provided within land controlled by the applicants. Detailed specifications and final cost will be confirmed following completion of detailed specifications).

Table 6. Sustainable Transportation Mitigation Measures.

Mitigation Measure	Description	Cost Estimate.
B804 Johnston Rd New Footway (S1)	Continuous footway along with scope for a cycleway to be provided on at least one side of B804 between Gartcosh and Glenboig. 600m approx.	Outline cost £36,000.
B804 Johnston Rd 3 No. Non- Controlled Pedestrian Crossings. (S2)	Locations to be confirmed.	Not yet confirmed.
A752 Lochend Road New Footway. (S3)	Footway along west side between Old Gartloch Rd and existing footway on Lochend Rd. Pedestrian crossings. May be an on-site cost rather than communal	Not yet confirmed.
Marnoch Development Site New Footway. (S4)	Footway to link development site to existing network.	Not yet confirmed.
Gartcosh Railway Station (S5)	Future Park and Ride Expansion at Gartcosh Railway Station. Cycle Parking. Improved bus links to station.	Not yet confirmed.
Cycling and Walking Routes and Linkages (S6)	Links between development sites and existing network	Not yet confirmed
Travel Plans/Public Transport (Bus)	Travel Plan information for new residents/subsidy to bus operators	To be determined at detailed application stage.