

Glenfarg water treatment works

Road safety assessment



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1 Introduction

1.1 Background

This report has been commissioned by Efficient Service Delivery to provide a safety assessment of the preferred haul route from the Glenfarg Water Treatment Works to the classified road network.

1.2 Locality

Glenfarg Water Treatment Works (WTW) are located in rural Perthshire, approximately 1km to the west of the village of Glenfarg. The surrounding area is primarily rural agricultural and forestry.

The water works are accessed from the local unclassified road network which is mostly narrow single carriageway rural roads.

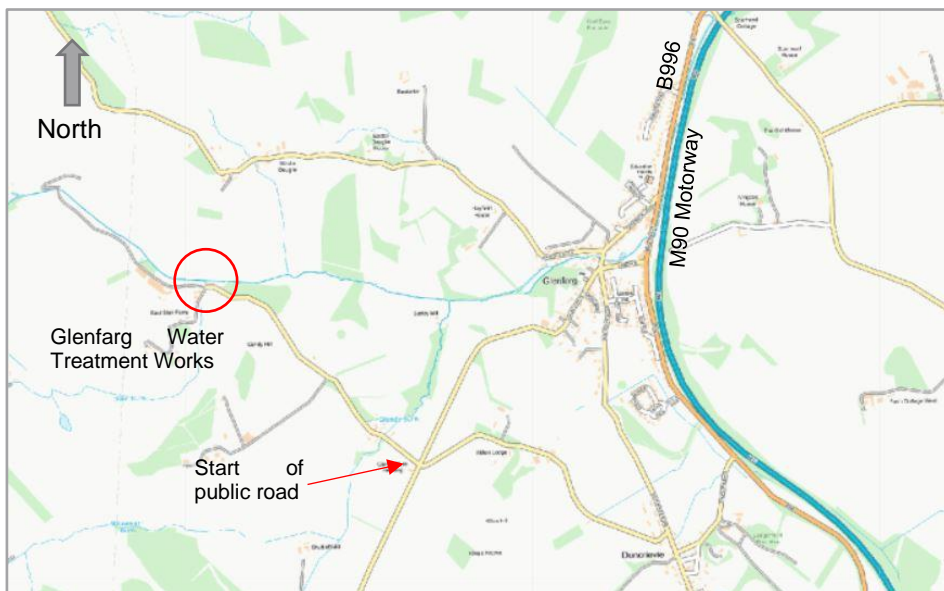


Figure 1-1: Location Plan

2 Route assessment

2.1 Strategic routing

2.1.1 Proposed route

The proposed haul route for goods vehicles accessing the site is via the B996 to Glenfarg village, using Greenbank Road or Ladeside to access Church Road as shown in Figure 2-1. The B996 is a good quality two lane single carriageway which formed part of the Edinburgh to Perth Trunk Road prior to the opening of the M90 between Junction 8 Arlary and Junction 9 Muirmont in the 1980s.

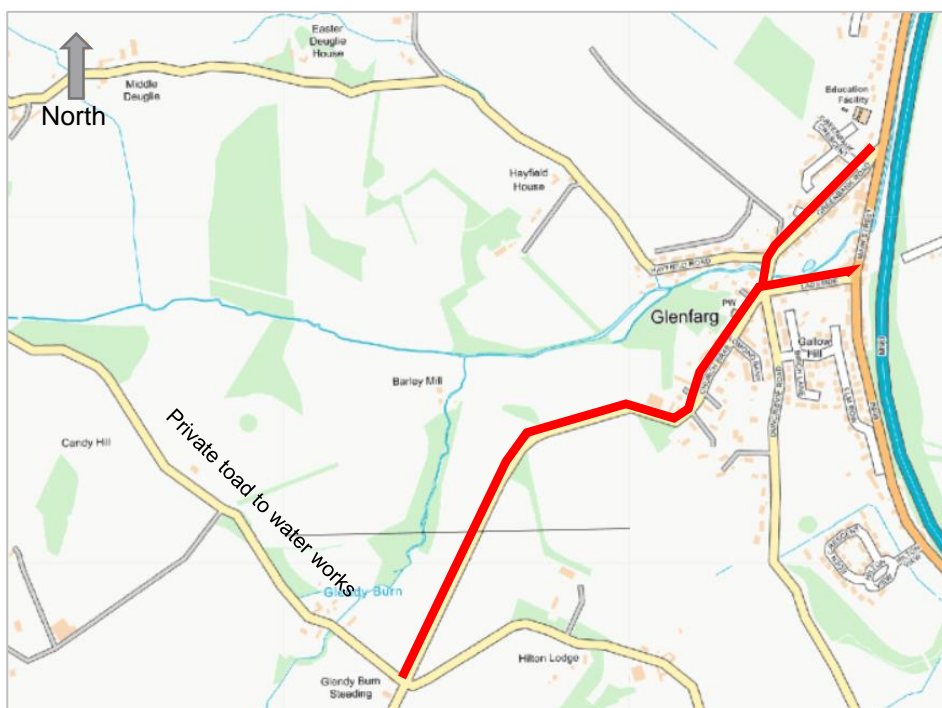


Figure 2-1: Proposed route

2.1.2 Alternative routes

Alternative routes are available to the site, and these have been assessed for suitability for use by large goods vehicles as follows:

- From site to the A91 at Milnathort via Middleton.
 - This route is approximately 5.5 km in length and follows an unclassified road which is approximately 4m wide and would require passing places constructed to allow two-way traffic flow. It passes through residential areas with 30mph speed limits in Middleton and Milnathort, and a 20mph limit in Milnathort.
 - There are three junctions with other unclassified roads between the Glenfarg WTW junction and Milnathort.
 - The junction with the A91 is a mini roundabout within a busy residential and retail area with limited room for manoeuvre.
 - The route runs through an agricultural area thereby increasing the risk of goods vehicles meeting large agricultural vehicles, and construction work at

the north end of Milnathort increases the risk of meeting large goods vehicles within the restricted streets.

- Footway is only available within Milnathort.



Figure 2-2: Milnathort via Middleton Route

- From site to the B996 via Duncrievie
 - This route would exclude Glenfarg and take vehicles onto the B996 or A91 at Arlary.
 - The route is generally about 4m wide from Duncrievie to Arlary, however the first section (approximately 1.2km in length) is 3m wide with tight corners, steep gradients and poor visibility.
 - A 30mph speed limit is present in Duncrievie and Drunzie.
 - The full length is 4.6km and like the Middleton route is heavily used by agricultural vehicles, therefore requiring passing places.
 - Only short sections of footway are available in Duncrievie and Drunzie.

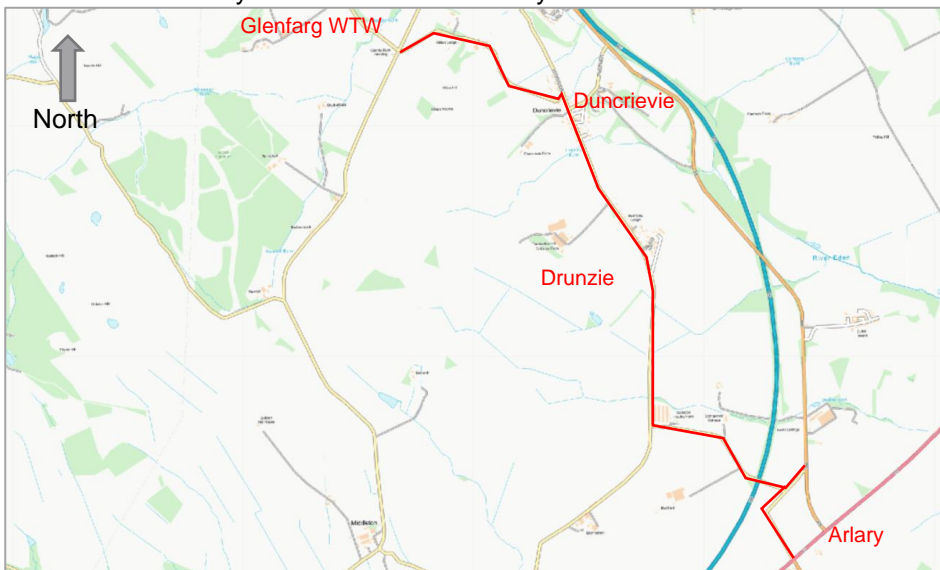


Figure 2-3: Duncrievie Route

2.1.3 Summary

The proposed route is likely to cause the least disruption due to its short length. It will also reduce the risk of damage to roadside verges due to the short length of the rural section. The

route via Duncreevie is the most challenging for large vehicles with road widths of 3m or less in places.

2.2 Local features

2.2.1 General

The proposed route is about 1.5km in length, with road width on the rural section of about 4m wide. This would require passing places to allow goods vehicles to comfortably pass opposing traffic.

The approach to Church Brae in Glenfarg has overhanging vegetation which would restrict visibility and may be struck by larger vehicles.

2.2.2 Junctions

The junction of Church Brae with Greenbank Road is a crossroads, which provides good visibility in both directions (Figure 2-4).



View left

View right

Figure 2-4: Church Brae junction with Greenbank Road

The junction eastbound from Ladeside on the B996 provides good visibility in both directions (Figure 2-5).



Figure 2-5: Ladeside junction with B996

The junction westbound from Ladeside at Greenbank Road has poor visibility, particularly to the right towards Greenbank Road (Figure 2-6).



Figure 2-6: Ladeside junction with Greenbank Road



Figure 2-7: Glenfarg

2.2.3 Speed limits

A 20mph speed limit is present on Greenbank Road and Ladeside. Church Brae and the B996 have 30mph speed limits. The rural section from Church Brae to the site is classed as cycling and walking friendly route with a 40mp speed limit.

2.2.4 Parking

Church Brae

There is parking on Church Brae in the vicinity of the Greenbank Road junction which could impede the safe movement of large vehicles.

Greenbank Road

The parking on Greenbank Road reduces the carriageway width to one vehicle, and parking on opposing sides restricts the ability for long vehicles to negotiate the street. The restricted width also restricts the ability for large vehicles to pass opposing traffic.

Ladeside

Ladeside is also a narrow street which is reduced to a single vehicle width due to parking. The introduction of large vehicles on this route presents two main hazards:

- Ability to manoeuvre due to parked vehicles
- Ability to pass opposing traffic due to road width and parked vehicles.



Greenbank Road

Ladeside

Figure 2-8: On street parking

2.3 Private Access

2.3.1 Location

The access road from the public highway to the site location provides private access to the current Water Treatment Works (WTW), Candy Farm and a small number of residential properties as shown in Figure 2-9.

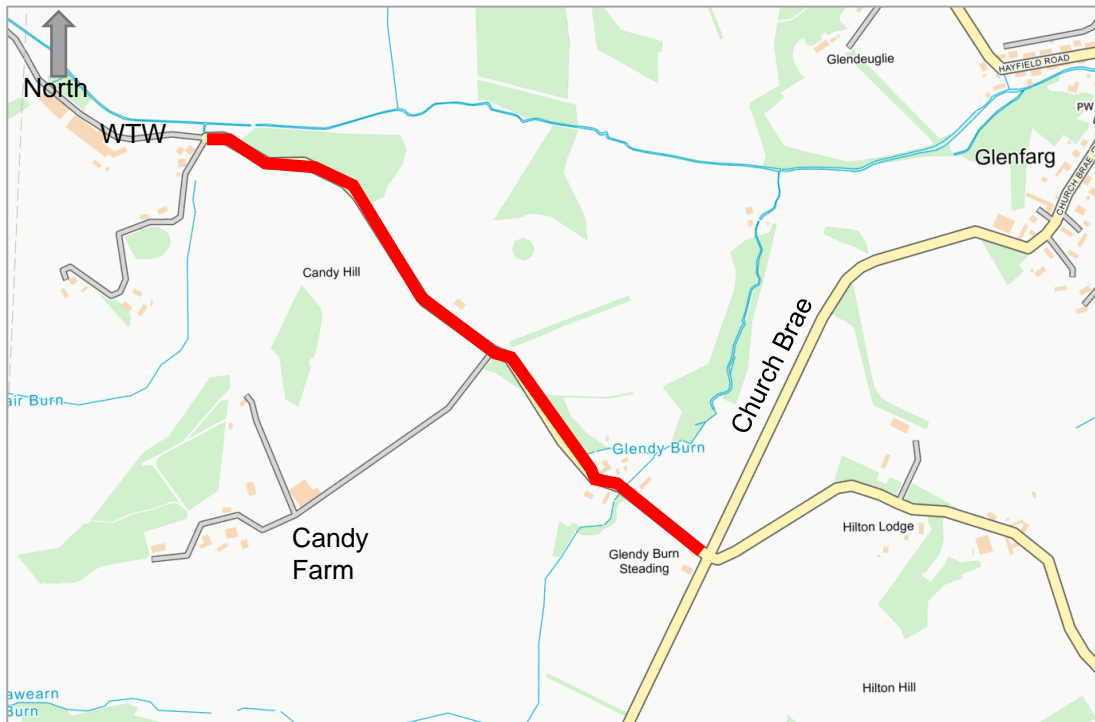


Figure 2-9: Private access location plan

2.3.2 Alignment and Geometry

The access is a single-track road with passing places and passes through wooded areas with tight bends and steep gradients particularly between the Church Brae and Candy Farm access. These affect the forward visibility as shown in Figure 2-10.



Figure 2-10: Visibility on private access

The existing passing places along the route are not large enough to cater for large goods vehicles and in many cases are not surfaced (see Figure 2-11) and would therefore likely deteriorate quickly and become unusable if subjected to heavy vehicle loading.



Figure 2-11: Private access passing place

2.3.3 Speed Limit

Being a private access this part of the route is not covered by a traffic regulation order for a speed limit, however, national speed limit signs are provided at the entry from Church Brae, with temporary signing provided stating a 15mph speed limit and on the wooden information sign at the junction it states 20mph.

2.3.4 Junctions

The junction of the private access onto Church Brae has restricted visibility as shown in Figure 2-13. Although the visibility will not be as restrictive to a larger goods vehicle with a higher driver eyeline, the combination of topography and vegetation restricts the view.



National speed limit and 20mph restriction

National speed limit and 15mph restriction

Figure 2-12: Private access speed limits



View left from private access at Church Brae



View right from private access at Church Brae

Figure 2-13: Private access junction visibility

3 Safety baseline and objective

3.1 Safety baseline

A safety baseline has been considered for the route options which considers the current safety record of the proposed and alternative routes for users, workers and other parties. These groups are identified in Table 3-1.

Table 3-1: Affected populations

Population	Description
Users	Users of the public road which includes all forms of transportation including walking, cycling and horse-riding. It also covers emergency workers.
Workers	Persons employed by the road authority or maintainers who carry out cyclic, reactive and planned maintenance of the road.
Other parties	Adjacent properties, residential and business who may be affected by activities taking place on the road.

The safety record for users has been obtained from reported injury collisions. Due to the low traffic flows on the routes, data over the 20-year period from 2001 to 2020 has been used.

There is no comparable data available for incidents involving workers and other parties.

Table 3-2: Safety baseline

Population and route	Period for baseline	Annual average collisions	Annual average casualties
Users – proposed route	2001-2020	0.1	0.15
Workers – all route	Not applicable		
Other parties – all route	Not applicable		

3.2 Safety objective

Safety objectives for each population have been set to ensure that any hazards associated with the proposals are identified and mitigated.

Table 3-3 shows the safety objectives for each population.

Table 3-3: Safety objectives

Population	Safety Objective 1 – Annual average number of casualties is less than	Safety Objective 2 – Annual average number of collisions is less than	Safety Objective 3 – Collision rate per 100 million vehicle kilometres is less than
Users – Proposed route	0.15	0.1	22.35 ¹
Workers	An ALARP (As Low as Reasonably Practical) approach has been adopted.		

¹ Table 5 of Reported Road Casualties 2019 – Average for 2015-2018

4 Recommendations

4.1 Introduction

The following recommendations have been made following:

- site visits of the proposed and alternative routes
- a review of the reported injury collision data
- a review of the road alignment and gradients
- consideration of the environmental impact

4.2 Strategic route

The proposed route via Church Brae into Glenfarg is the shortest route to a good quality classified road. It includes a built-up area which in the most part has footways for pedestrian traffic.

The alternative routes are significantly longer, pass through multiple settlements and are on roads that would be unable to accommodate two-way traffic with large goods vehicles. This is likely to lead to a high degree of verge overrun and deterioration of the road haunch. The rural nature of the alternative routes means there is little pedestrian footway, and for the most part including within the settlements, pedestrians are sharing the carriageway with vehicles.

It is therefore considered that the proposed route is the most appropriate.

4.3 Proposed route

Although a better option than the alternatives, the proposed route still presents challenges for the safe flow of site traffic. The following recommendations are intended to assist with the safe movement along this route:

- Development of passing places on the rural section from the site access to Glenfarg village.
- Clearance of overhanging and roadside vegetation to improve visibility along the route.
- Introduction of waiting restrictions on Church Brae, Ladeside and Greenbank Road to assist with the safe movement of large vehicles.
- Introduction of a one-way traffic order on Greenbank Road and Ladeside to maximise the parking provision for local residents and business, and to facilitate the safe movement of vehicles.
- The direction of the one-way system should be dictated by the available visibility at the junction. The junction with the worst visibility is from Ladeside towards Church Brae at Greenbank Road.
 - Ladeside one way from Church Brae to the B996
 - Greenbank road one way from the B996 to Church Brae

4.4 Private access

Challenges to the safe movement of large goods vehicles is presented on the private access between the Public Road network at Church Brae and the site due to the alignment and

geometry. The following recommendations are intended to assist in the safe movement along this route:

- Clarification of the speed limit of the route with repeater signs provided to encourage compliance.
- Improvement of existing passing places to cater for large and heavy vehicles.
- Improved visibility along the access.
- Improvements to visibility at the junction with Church Brae.
- Warning signing for the access at Church Brae.
- Controlled access to prevent two large goods vehicles meeting on the access.

5 Conclusions

5.1 Achieving the safety objectives

The proposed route is most likely to achieve the safety objectives when compared with the alternative routes. However, the increase in traffic loading on the route will increase the likelihood of conflict that may will increase the levels of risk.

It is proposed that the recommendations in Section 4 are adopted to mitigate the effects of the increased traffic and ensure that the safety objectives are achieved.