

# Rame Peninsula Traffic Management Phase II Feasibility

## Antony Junction Improvement and Crafhole Circulatory System

EDG0205/F2

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CORMAC Consultancy

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# Rame Peninsula Traffic Management

## Antony Junction Improvement and Craffhole Circulatory System

Issue & Revision Record						
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EDG 0205\_F\_31 – ‘Antony – Cornwall Council owned land at junction’.

EDG 0205\_F\_32 – ‘Antony and Crafhole Circulatory System (ACCS)’.

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## **APPENDIX B**

Sheviok Community Emergency Plan: Recommended road diversion routes



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# 1 INTRODUCTION

## 1.1 Overview

1.1.1 In 2014 Cornwall Council commissioned Cormac Solutions Ltd to prepare a feasibility report analysing area traffic management in the Rame Peninsula. This focused on traffic congestion in Millbrook and Crafhole and the movement of heavy goods vehicles (HGV's).

1.1.2 The Parish Councils of Rame continue to be concerned with congestion and HGV movement throughout the area and have joined to work together with Cornwall Council for improvements and efficiencies in travel. To this end the Rame Peninsula Neighbourhood Plan Transport Infrastructure Sub-committee took particular interest in the original report and the document also fed in to development of the Rame Peninsula Neighbourhood Plan.

1.1.3 This original report was referenced EDG0205/F1 and titled:-

- **'Rame Peninsula Traffic Management; Feasibility Study (ref: EDG0205/F1);**

1.1.4 In summary the study:-

- *Identified a potential circulatory traffic system around the Rame peninsula for HGV's*
- *Examined the possibility of reducing the volume of traffic through the village of St John*
- *Developed outline options for a new junction in the village of Antony and restrictions through the village of Crafhole*
- *Considered congestion at Hounster Hill in Millbrook*

1.1.5 Following the issue of the Rame Peninsula Traffic Management report in 2014 Cormac Solutions Ltd have now been commissioned by Cornwall Council to continue to advance detailed feasibility and design work and also consider diversion routes in the area for special events and incidents.

1.1.6 The CC client brief has been adjusted to further examine some of the suggested ideas. The aim being to move towards an understanding of the cost and highway implications of the potential schemes. The schemes that have been selected from the report by CC are:-

- *Option 1 : Antony Junction (Original Report) – reversal and widening of the one way system on a secondary junction and implementation of advisory route signing.*
- *Option 8 : Antony Junction (Original Report) – Ghost Island Junction.*
- *Antony Junction alternative options, including Double Orbital Junction (DOJ) option provided by the Rame Peninsula Highway Manager.*

- 1.1.7 Cornwall Council require these options to be developed in relation to 'DMRB' (Design Manual for Roads and Bridges) and the 'MfS' versions 1 and 2 (Manual for Streets). DMRB in general applies to arterial routes and trunk roads. MfS applies to residential streets with a speed limit of 30 m.p.h. Antony village has a limit of 30 m.p.h.
- 1.1.8 Cornwall Council have requested attention be given to the impact on pedestrian safety and crossings and the wider network. An extension of this has been to consider the alignment and layout of the A374 and the nature of its interaction with the settlement pattern of the village, the Antony 30 m.p.h limit and surrounding pedestrian access and routes. We have also considered diversion routes in the area for special events and incidents.
- 1.1.9 This report will be discussed with the Local Parish Councils and Members and the Rame Peninsula Transport Steering Group and Cornwall Council.

## **1.2 Report Structure**

Following the introductory section this report is set out in the following sections:

- Section 2 – History, Background and Study Area
- Section 3 – Antony Junction Improvement
- Section 4 – Antony and Crafhole Circulatory System (ACCS)
- Section 5 - Diversions
- Section 6 – Summary and Conclusion

## **2 HISTORY, BACKGROUND AND STUDY AREA**

### **2.1 Description of Study Area**

2.1.1 The area of study is shown in drawing EDG0205\_F\_1. The main road through the Rame Peninsula is the A374 and the Torpoint Ferry links this road to Plymouth and Devon via the Tamar River. This river crossing represents logical HGV access from Devon and the East, however an 18 tonne weight limit forces some HGVs to access the Peninsula via the A38 Trunk Road from the west in Cornwall.

2.1.2 The area falls within the following classifications:

- Area of Outstanding Natural Beauty (AONB)
- Area of Great Landscape Value
- Conservation Area

### **2.2 Existing Traffic Flows in the Study Area**

2.2.1 The Annual Average Daily Traffic figures show that for 2012 access to the Peninsula was split approximately half through Crafhole and half through Antony. 70 Buses and Coaches and HGV's greater than 3.5 tonnes were recorded daily on average through Crafhole, with the figure being 140 at Antony.

2.2.2 A more detailed breakdown of movements by heavier vehicles in the area is provided in the following table.

## 2.2.3

**Table 2.1 – Traffic flows at Polscoe, Antony, Crafhole, Freathy and Kingsand.**

<b>12 Hour goods vehicle movement (any direction)</b>	<b>Polscoe Junction</b> <i>Apr-12</i>	<b>Antony Junction</b> <i>Sep-12</i>	<b>Crafhole</b> <i>Oct-14</i>	<b>B3247 Military Road at Freathy</b> <i>Sep-13</i>	<b>Kingsand / Cawsand at Jackman Meadow</b> <i>Sep-14</i>
<b>6 Axle Artic</b>	10	6	0	6	0
<b>5 Axle Artic</b>	13	8	14	10	0
<b>4 Axle Artic</b>	12	11	4	0	4
<b>3 Axle Artic</b>	4	6	0	0	0
<b>4 Axle Rigid</b>	4	16	10	14	4
<b>3 Axle Rigid</b>	29	18	0	38	6
<b>2 Axle Rigid</b>	96	106	50	122	20
<b>Medium Goods</b>	63	49	38	124	28
<b>Light Goods</b>	836	666	546	1094	380
<b>Bus and Coach</b>	55	54	26	96	86

## 2.2.4

Larger delivery vehicles use the B3247 through Crafhole currently. The alternative via the village of Antony requires travelling to the outskirts followed by a difficult 'U-turn' in an informal 'lay-by' on the main road. A certain amount of HGV traffic is local businesses operating in the rural areas of the peninsula and some of these businesses are known to instruct delivery drivers to use the informal 'lay-by'.

## 2.2.5

It is predicted HGV activity will increase in the Rame peninsula. The DS Smith foam factory has recently relocated part of its national business to its Millbrook premises. The City of Plymouth has been awarded a large fund for investment in marine business growth so boatyard activity on the Rame Peninsula will increase. European funding has been sought to develop business activity at Millbrook Business Park.

## 2.2.6

Bus and Coach movements are also important particularly in the summer holiday season. There are numerous Coach movements to the National Trust Property at Mount Edgcombe. In researching this report the County Councillor for the area has suggested that German tourist coach movements can occur at up to ten a day due to the success of the televised Rosamunde Pilcher novels in Germany which feature Edgcombe House.

### **3 ANTONY JUNCTION IMPROVEMENT**

#### **3.1 Overview**

- 3.1.1 Various villages within the Rame study area have been traffic calmed. A road safety scheme in Antony was completed in 2003; this was implemented in several phases. Geometry was restrictive and the scheme required tailoring.
- 3.1.2 Traffic calming in Antony is distinctive because an internal storage system of traffic calming is used. Vehicles from any direction have to give way to vehicles travelling out of this internal area. The traffic calming works on a 'first come first served' basis for either direction.
- 3.1.3 Within Antony the current layout of the highway means right turn movements in to the B3247 side road and left turns out of the B3247 side road by HGV's are restricted. This means the majority of HGV traffic heads through Crafhole or uses an informal 'lay-by' to 'U-turn' in the main road located 160 metres to the East of the main junction in Antony.
- 3.1.4 A speed limit review of the entire length of the A374 was conducted between Trerulefort Roundabout and Torpoint in March 2009. Cornwall Council then took the view in relation to guidance on speeds at the time that Antony should be considered a 'village' which enabled Cornwall Council to initiate a 30 mph limit. There are gateways symbolising the start and end of this 30 mph limit at the main approaches to Antony on the A374 and B3247. The 30 mph is also signed throughout the village.
- 3.1.5 In terms of the A374 and B3247 that link Antony with the peninsula Antony junction restricts movements for larger vehicles especially for those arriving from the west. The island in the centre of the junction does not enable articulated HGV's to turn right.
- 3.1.6 The original report included a focus on improving the acute nature of the junction and changing the location of the pedestrian crossing island.

### 3.2 Methodology and existing constraints at Antony junction

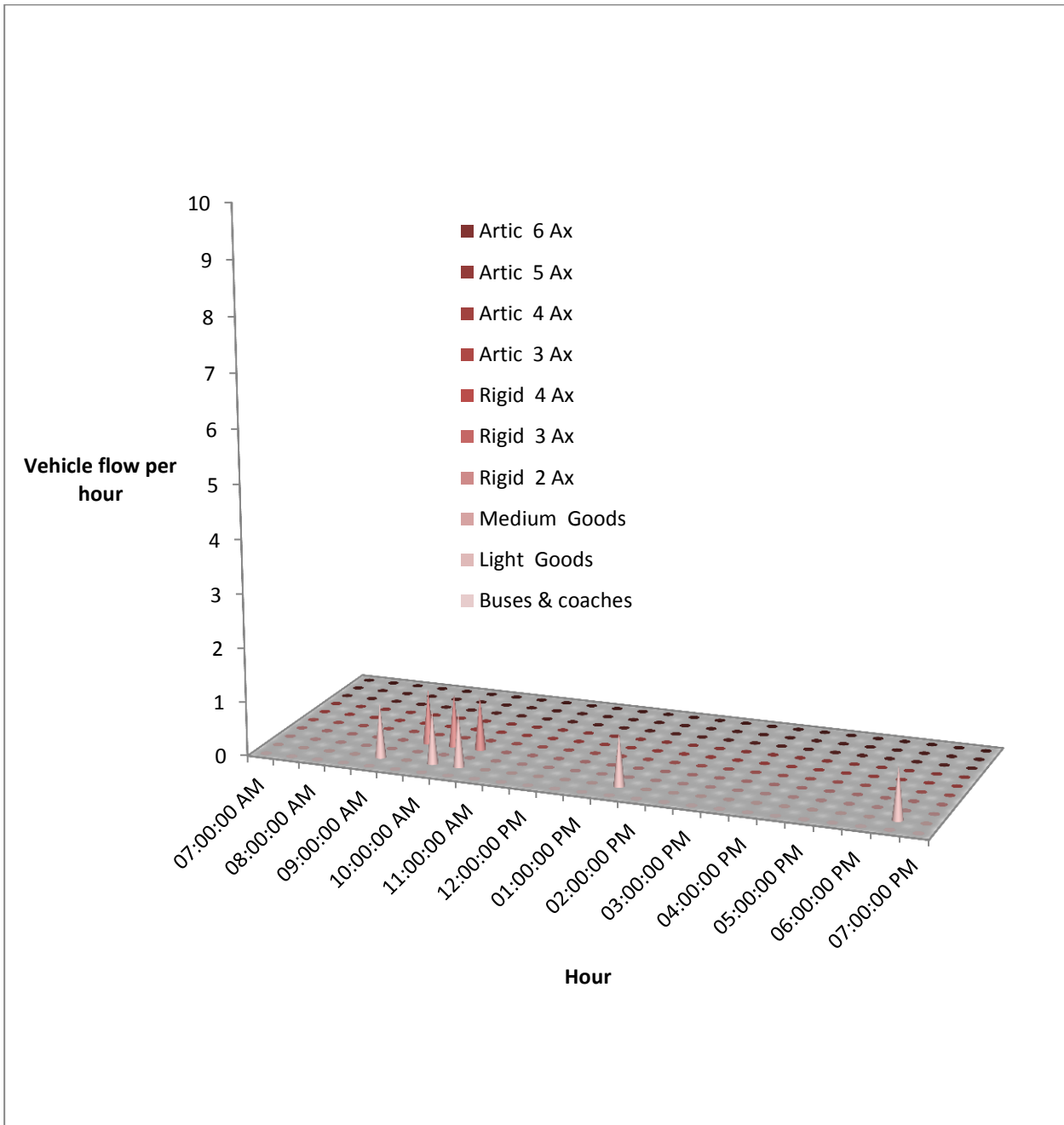
- 3.2.1 The Antony junction improvement options have been analysed and developed through visiting site and taking measurements to enhance Ordnance Survey information. This has been used to develop the options in the absence of a full topographical, speed and traffic turning count survey.
- 3.2.2 The next stage in the process has been to work up the junction to standards contained in (DMRB) and Manual for Streets 1 and 2 (MfS) as described in paragraph 1.1.7.
- 3.2.3 Vehicle Tracking software has been used to ascertain the viability of a maximum legal 16.5 metre (m) articulated trailer passing through the designs. Existing legal agreements and traffic orders in the area, accident statistics and the location of underground services in the locality will have to be considered further if any of the options are progressed.
- 3.2.4 A land search has been undertaken along with research in to current land values. This has examined the current purchase price of land and property that may be involved. Some of the land around the existing junction is already owned by Cornwall Council. This is shown in drawing EDG0205\_F\_31.
- 3.2.5 In respect of the options to achieve improved circulation of vehicles in the peninsula we have looked at a wide range of alternatives. It has been specifically important to consider how bus, coach and goods vehicles access the Torpoint Ferry using the Antony Junction. With specific regard to this we have examined in detail, a 2012 traffic count. This showed that between 07:00 to 19:00 goods vehicles flows were as per the following table:-

<b>Goods Vehicle Flow 12 hour (07:00 – 19:00) Junction with A374 / B3247 At Antony Survey date 10/9/2012</b>	<b>From B3247 Minor Arm</b>	<b>To B3247 Minor Arm</b>	<b>To and from movements combined</b>	
<b>6 Axle Artic</b>	0	0	0	
<b>5 Axle Artic</b>	1	0	1	
<b>4 Axle Artic</b>	4	3	7	<b>Total Artic</b>
<b>3 Axle Artic</b>	1	2	3	<b>22</b>
<b>4 Axle Rigid</b>	1	1	2	<b>Total Rigid</b>
<b>3 Axle Rigid</b>	2	1	3	<b>45</b>
<b>2 Axle Rigid</b>	22	18	40	
<b>Medium Goods</b>	11	7	18	
<b>Light Goods</b>	147	99	246	
<b>Bus and Coach</b>	10	10	20	

**Table 3.1 – Traffic flows at Antony in 2012**

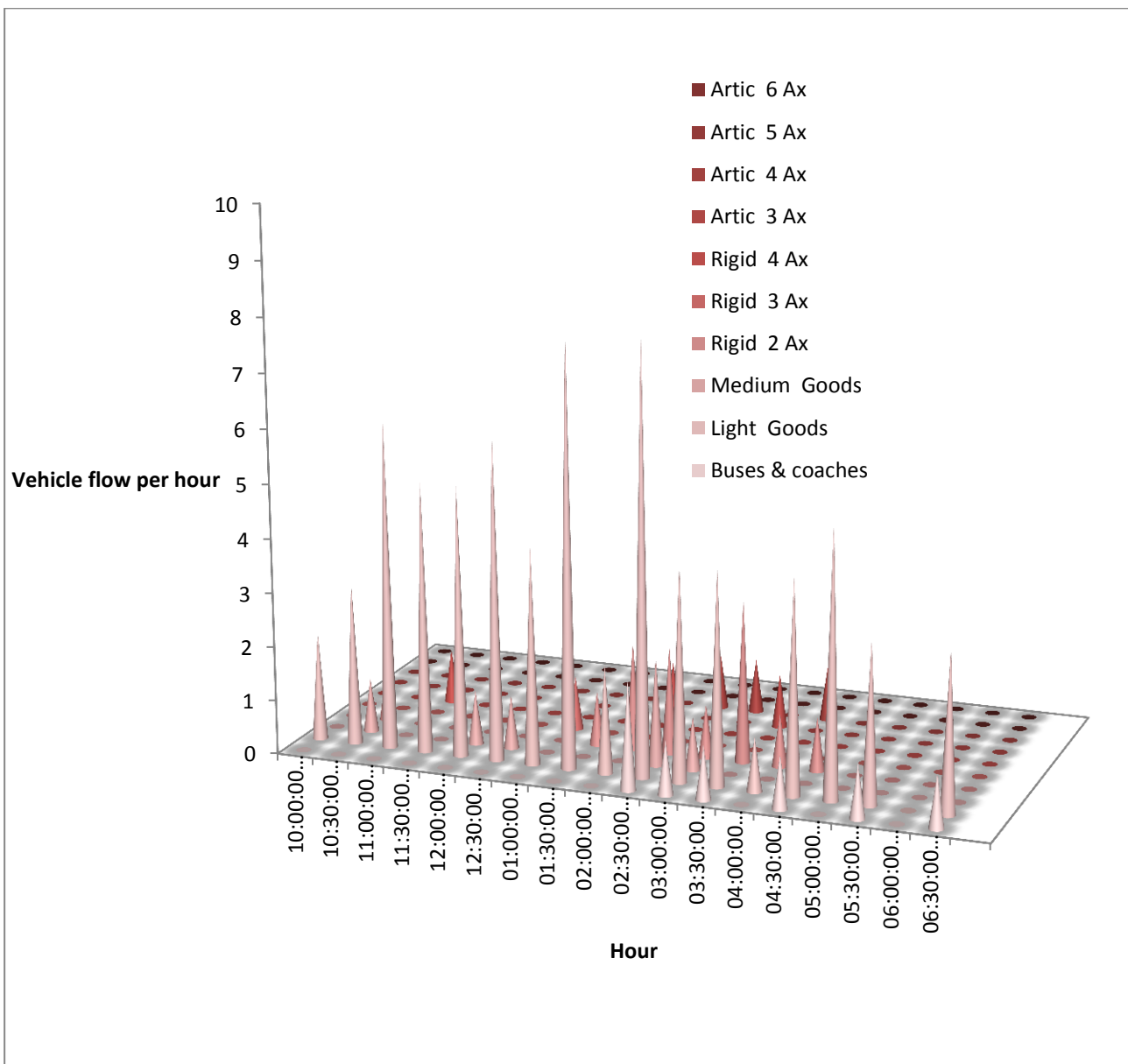
3.2.6

This count shows a number of rigid and articulated goods vehicles moving through the junction to and from the B3247 minor arm at Antony in 2012. It was felt these would need careful consideration in relation to the options and so the data has been examined in more detail. The following graphs, show time and type of vehicle making the left and right turn manoeuvre.



**Graph 3.1 showing left turning vehicles from the B3247 in September 2012.**





**Graph 3.2 showing right turning vehicles from the B3247 in September 2012.**

- 3.2.7 It is important to consider this data in the context of junction operation. The vehicle movement to and from Torpoint involves a relatively low turning angle in the current junction layout. This situation would be adjusted if some of the options were to be implemented; particularly for the journey towards Torpoint.
- 3.2.8 The Torpoint Ferry has an 18 tonne weight limit so vehicles under this weight could be travelling to Torpoint to use the ferry. The largest articulated vehicles may be making a delivery in Torpoint.
- 3.2.9 The swept paths on some of the plans show a low margin for error. The base map is using OS data so a margin of inaccuracy will be present. Possible land purchase has been highlighted involving the 'Ring O Bells' pub. This land would have associated costs.

3.2.10 Alternatively, given the recorded data the larger vehicles could be prohibited from making the manoeuvre. Based on the 2012 count this would apply to 6 articulated vehicle movements in 12 hours which would have implications for signing and the configuration of the Antony and Crafhole Circulatory System (ACCS). This has been covered in the next section. An option for the eastbound / Torpoint HGV prohibition within the ACCS has been included. Photo 3.1 shows a larger vehicle making this right turn manoeuvre in the existing junction layout.



**Photo 3.1 – Coach turning right at existing Antony junction**

3.2.11 Some of the junction options in this report would replicate existing behaviour at the intersection. Drivers of cars and light goods vehicles have been observed currently using the unclassified link at the back of the 'Ring O Bells' pub rather than the main A374 / B3247 'T' Junction. Upon closer investigation this is due to site lines which are of higher standard for the unclassified link turning out from the B3247 to the A374. Speaking to drivers making this manoeuvre they also prefer the side road stopping angle which is nearer 90 degrees to the main road when compared to the main junction that has an equivalent angle of approximately 160 degrees. This link is shown in photo 3.2.



**Photo 3.2 – Existing one – way link at Antony junction**

3.2.12 Photo 3.3 shows the site line visibility of this link for vehicle egressing on to the A374 at approximately 90 degrees.



**Photo 3.3 – Side road site line angle compared to main road**

3.2.13 It may be possible to achieve some of the schemes with no land take and within existing highway limits subject to detailed topographical survey. The manner in which vehicles access local properties will need consideration. This is shown over the page with reference to the particular property on Antony Hill called 'Yet An Lor'. It was noted that currently a traffic cone is being employed potentially to assist with vehicular access at this house which is shown in photo 3.4

3.2.14 Consideration will need to be given to the effect of a slight increase in traffic using the one-way link on access to property in the immediate area.

3.2.15 There may be a conflict between the resident/s and increased volume of drivers using the currently unclassified link within any future redesign.



**Photo 3.4 – Private access at apex of existing one – way link**

3.2.16 Access to the 'Ring O Bells' Pub will also need to be examined shown below



**Photo 3.5 – 'Ring O Bells' Public House with car park and access**

3.2.17 Thought will need to be given to pedestrians moving along the edge of the A374 carriageway between local housing and facilities such as the post office / village store and pub. An elderly pedestrian was observed on site making this journey using the footway to the right as shown in the photo 3.6 and crossing the unclassified link road at the rear of the 'Ring O Bells'.



**Photo 3.6 – Footway linking housing at Antony junction**

3.2.18 Antony is within the Tamar Valley Area of Outstanding Natural Beauty (TVAONB) area and the TVAONB team have been involved in early discussion regarding design options for this project. They have been working on a permissive footpath from Wacker Quay to Antony and the 'Ring O Bells' pub. Agreement with Antony Estates has been reached and volunteers have been working on this path which starts at Wacker Quay takes the route past an old monastery and enters Antony via Abbotscourt Lane. The intention is to form a circular route back to Wacker Quay using the old Tregantle military railway. If a crossing point over the A374 is included in any junction redesign this would complement these plans and therefore accord with the client brief for this project.

### **3.3 Relationship between junction design options and the Antony and Crafhole Circulatory System**

3.3.1 The Antony and Crafhole Circulatory System is outlined in the later section of this report and is shown in drawing EDG0205\_F\_32. This is particularly important within the context of the junction design options. The Antony and Crafhole Circulatory System needs to be combined with some of the proposals for the traffic management options to work.

### **3.4 Option 1 'Reversal of one way' (with ACCS)**

3.4.1 This option was covered in the original report and examines potential widening of the road adjacent to the western boundary of the 'Ring O Bells' Public House. The option is shown in drawing EDG 0205\_F\_27. Currently the road has a one way system and the idea behind the junction design is to reverse this one-way system to allow vehicles travelling from the West to access the Rame Peninsula through Antony.

3.4.2 Land purchase would be required as shown on the drawing. A land search has been conducted to check ownership of the relevant land and property. Vegetation clearance is required along the one-way system. Some of the land is already owned by Cornwall Council.

3.4.3 This option will need to be accompanied with the Antony and Crafhole Circulatory System because the junction design will not allow HGV's to safely manoeuvre out from the B3247 on to the A374 at Antony. HGV traffic would still need to use a route via the village of Crafhole when travelling westbound out of the peninsula using the Antony and Crafhole Circulatory System. The original report stated that a detailed topographic survey would be required to accurately determine the widening works of this option, with the original assessment showing 1-2m required from adjacent properties.

3.4.4 This option has implications for the existing traffic calming in the village. This is because right turning vehicles will encounter the westbound uphill give way line part way through the right turn manoeuvre. This is likely to cause a 'face to face' blocking scenario where vehicles egress the internal area within the traffic calming. A new build out has been included with a give-way line by the property known as 'The Cottage' as shown in drawing EDG 0205\_F\_27. This new give-way line position is intended to replace the existing speed management system and halt downhill traffic in the presence of right turning vehicles emerging from the redesigned one way link at the back of the pub.

### **3.5 Option 1 Costs**

3.5.1 The cost of this option is estimated at **£109,442**

### **3.6 Option 2: 'Orbital Junction: All movements without extra lane – without ACCS'**

3.6.1 Option 2 is shown in drawing EDG0205\_F\_28 and involves formation of a one way 'clockwise' circular arrangement. This would be achieved by converting a short length of the B3247 to a one way layout for westbound traffic. This short one way length would run from the main 'T' intersection. The effect would be that all traffic, including goods vehicles, would not be able to use the main 'T' junction when emerging from the B3247. Instead road users would be guided left down the currently unclassified link road behind the 'Ring O Bells' Pub in the existing direction on the link.

3.6.2 Right turning vehicles from the A374 would move directly on to the B3247 at the existing 'T' junction which would be converted to one way including removal of the external lighting unit and illuminated bollard. The tree adjacent to the pub car park that is on the edge of the junction will need assessing and considering in light of any predicted conflict with turning high sided vehicles. These measures would allow larger articulated vehicles to take a swept path within the current highway limits.

3.6.3 From site observations it is apparent that this junction design replicates existing behaviour at the intersection. Drivers have been observed currently using the unclassified link at the back of the 'Ring O Bells' pub. This is as opposed to using the main A374 / B3247 'T' Junction. Upon closer investigation this has been revealed as being down to site lines which are of higher standard when using the unclassified link when turning from the B3247 to the A374. This is shown in photo 3.3.

3.6.4 As with the previous option care would need to be taken in relation to people walking along the edge of the A374 carriageway between the housing that fronts the A374 and local facilities such as the 'Ring O Bells' and the village store, post office and bus stop.

3.6.5 The land take that would be required for this option consists of

- a part of the rear yard of the 'Ring O Bells' Pub
- a part of a private garden
- a small strip of an agricultural field already owned by Cornwall Council.

### **3.7 Option 2: Costs**

3.7.1 The cost of this option is estimated at **£152,635**

### **3.8 Option 3: Design Manual for Roads and Bridges (DMRB)**

3.8.1 Various options were looked at following design criteria set out in the DMRB. The decision was made not to take the designs or costs based on the DMRB design further. The initial speed limit review in 2009 recommended 40 mph through the village and site observations suggest a speed of nearer 40mph rather than the existing 30mph. Drawing E0205\_F\_029 for Option 3 shows DMRB design speeds of 60kph and 70kph giving stopping site distances of 90m and 120m respectively. Concern was raised that Option 3 would increase the speeds through the village further. The site lines required in Option 3 would need a substantial amount of land and could require earthworks and the inclusion of a vehicle restraint system.

There is a desire that the village environment of Antony is improved so that community severance is reduced, making it easier for the residents of Hollong Park and Abbotscourt Lane to access the village amenities. The new permissive footpath created by the Tamar Valley Area of Natural Beauty team will also benefit. The need to improve the village environment has required a change in design standards used in this report. The principal design standards to be used are those found in the 'Manual for Streets' 1 and 2 (MfS) and also Cornwall Council guidance on speed management. This dictates that Option 3 is not in keeping with the ethos of the approach taken in this report.

3.8.2 The change from DMRB standards in Option 3 to MfS would require the reduction of existing speed to the 30mph speed limit or lower by the use of speed management techniques as shown on Drawing EDG0205\_F\_026. Before this design is finalised speed readings will have to be taken to identify the reduction in speed required and therefore the type and extent of the traffic management system.

### **3.9 Option 3 Costs**

3.9.1 The cost of this option has not been estimated due to the reasons outlined.

### **3.10 Option 4: 'Orbital style one – way junction with ACCS'**

3.10.1 This design is shown in EDG0205\_F\_30 and is a variation on a layout forwarded by the Regional Highway Manager for Rame. It involves formation of a one way circular arrangement. This would be achieved by converting a short length of the B3247 to a one way layout for west bound traffic. This short one way length would run from the main 'T' intersection to the existing external uphill give way line for the traffic calming chicane. The effect would be that no traffic would be able to use the main 'T' junction when egressing from the B3247. Instead drivers would be guided left down the currently unclassified link behind the 'Ring O Bells' Pub. Large goods vehicles from the A374 would move directly on to the B3247 by turning right from the main road at the main 'T' junction which would be converted to one way on the minor arm by removing the central island kerbs, electrical equipment and possibly the tree.



3.10.2 Larger articulated vehicles would be prohibited from travelling Eastbound on the B3247 and would have to use the Antony and Crafhole Circulatory System.

**3.11 Option 4 Costs**

3.11.1 The cost of this option has been estimated at **£90,995**

## 4 ANTONY AND CRAFTHOLE CIRCULATORY SYSTEM (ACCS)

### 4.1 Overview and Introduction

4.1.1 A one way circulation system through the Rame Peninsula for HGVs and coaches has previously been designed. This was suggested in the original report 'Rame Peninsula Traffic Management' (EDG0205/F1). This was proposed to be a voluntary circulatory route to be used for goods vehicles in the peninsula. The idea behind this was to reduce the impact of goods vehicles through changing the distribution of traffic and paths of travel to minimise the level of conflict. For example where two larger goods vehicles may come face to face in areas of narrow carriageway or at points where the geometry of the highway is challenging. This applies to Millbrook, the B3247 through Crafhole and the B3247 between Crafhole and Tregantle.

4.1.2 The proposed route was significantly longer than current journey paths taken and so it was felt that in order to successfully establish this voluntary system the highway signing would have to be changed. Alongside this, marketing and promotion would be required to achieve 'buy in' to the scheme. It was suggested the Parish Councils' of the Rame Peninsula should approach businesses in the area. In terms of highway signing care would need to be taken in terms of the proliferation of signs and environmental impact.

4.1.3 In general the report stated that several sections of the route were narrow and so parking restrictions may be required and the role of satellite navigation would need to be discussed.

4.1.4 Following a meeting held with Cornwall Council on Tuesday 10<sup>th</sup> of November 2015 the project plan underlying this report was revised and re-issued. In terms of analysis of this Rame Peninsula Circulatory system (described above) preference was expressed to attend to issues in Antony and Crafhole first with examination of the Rame Peninsula circulatory system being required at a later date.

4.1.5 A report was drafted accordingly. A second meeting was then held on the 7<sup>th</sup> of December 2015 involving the County Councillor for the area, Cornwall Councils Environment Liaison and Events Officer and the Chair of the Rame Transport Steering Group. It was agreed to widen the scope further to include all traffic within the Antony and Crafhole Circulatory System. Therefore, in terms of a voluntary one way system, this report focuses on directing

- ***All traffic around the A374 and B3247 through Antony and Crafhole.***

4.1.6 This circulatory route is shown in Drawing EDG0205\_F\_32 and herein is to be referred to as the '**Crafhole and Antony Circulatory System**'.

- 4.1.7 Satellite navigation issues will present a challenge. In particular making the driver ignore their satnav which is likely to instruct them to turn right and drive through Craffhole as they approach Polscoe Bridge junction, as opposed to continuing along the A374.
- 4.1.8 Local deliveries will be informed by a combination of Parish Council circulars to local business, local signing and experience of the traffic problems in Craffhole. Outside deliveries that rely on satnavs will need consideration.
- 4.1.9 Due to the variations in junction design contained in the previous section the Antony and Craffhole Circulatory System has been analysed in terms of it running in a clockwise direction only from west to east. This is because two of the designs requires goods vehicles to make a right turn traveling from the west, turning from the A374 to the B3247 therefore a clockwise Antony and Craffhole Circulatory System is required. This would encourage vehicles to take a path from the west to Antony and return through Craffhole

## **4.2 Methodology (ACCS)**

- 4.2.1 The methodology adopted for investigating the Antony and Craffhole Circulatory System has been to:-
- Review current types of vehicles and weights.
  - Check the full range of regulatory highway signing that is available to direct vehicles within the Traffic Signs Regulations and General Directions.
  - Following the meeting on 7<sup>th</sup> December include all vehicles and not just goods traffic.
  - Conduct a review of all current plate signing in and around the route in all directions.
  - Analyse latest traffic flows data at key junctions in and around the route.
  - Review schemes in other areas of the country where goods vehicles have been redirected through signing strategy, including through use of non-standard signs.
  - Examine any highway benefits to the scheme that could be obtained through using the latest technology.
  - Account for possible changes to emergency signing layouts (*part of separate commission proposal currently submitted to Cornwall Council following meeting on 7<sup>th</sup> December 2015*).
- 4.2.2 The following table summarises how the junction designs in the previous section relate to the need for, and proposed design of the suggested Antony and Craffhole Circulatory System.

Antony Junction Feasibility Design Option	Antony and Craffhole Circulatory System (ACCS) required?
Design Option 1	Yes
Design Option 2	No
Design Option 3	No
Design Option 4	Yes

**Table 4.1 – Table showing the need for circulatory system**

### 4.3 Regulatory Plate Signs Available (ACCS)

- 4.3.1 Generally a Regulatory sign is intended to instruct users on what they must or should do (or not do). A legal order is required in order to back up the sign and police enforcement is required to impose the sign.
- 4.3.2 In respect of the goods vehicle aspects of the ACCS all available current signing has been reviewed and is outlined as follows:-
- 4.3.3 Sign 622.1A 'Goods vehicles exceeding the maximum gross weight indicated'



4.3.4 Sign 622.1A 'End of prohibition for goods vehicles exceeding the maximum gross weight indicated'



4.3.5 Sign 622.4 'No articulated vehicles'



4.3.6 Sign 629 'Vehicles exceeding width indicated prohibited'



4.3.7 Sign 629.1 'Vehicles or combinations of vehicles exceeding length indicated prohibited'



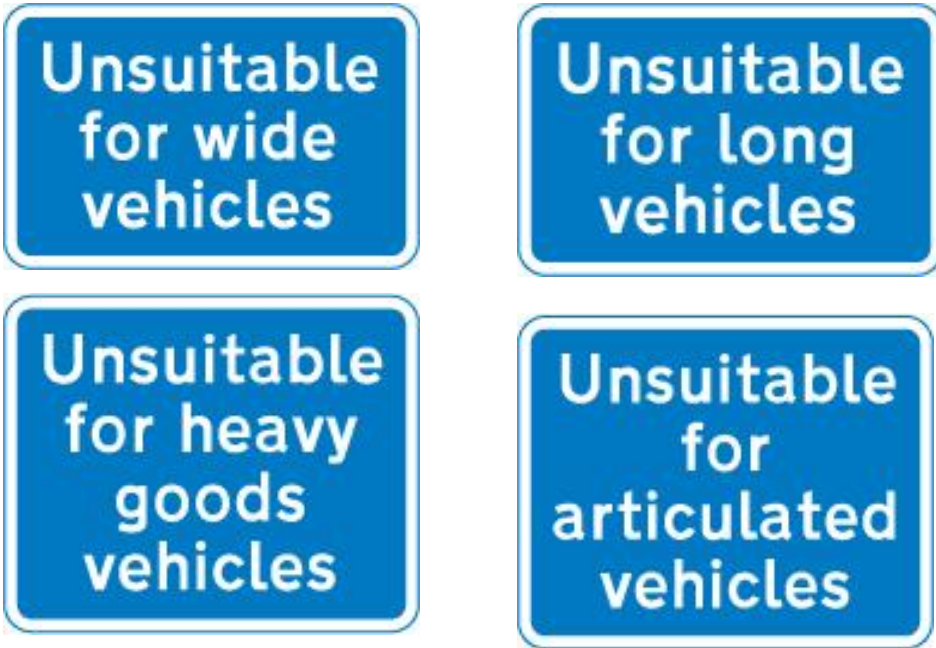
#### 4.4 Non Regulatory Signs

4.4.1 A Non regulatory sign is intended to provide information to users. There is no requirement for a legal order to create and back up the sign. Applicable non regulatory signs for this project are listed as follows:-

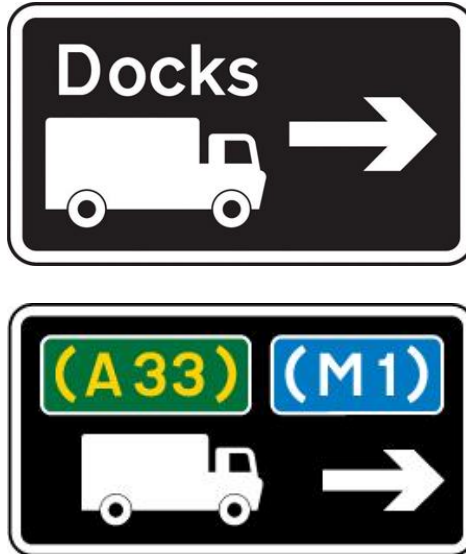
4.4.2 Sign 818.4 'Alternative route'



4.4.3 Sign 820A Road unsuitable



Sign 2805 'Goods vehicle route differs from normal traffic'.



4.4.4 Sign 2806 'Goods vehicle route differs from normal traffic'



#### 4.5 Recommended Regulatory Plate Sign Changes for the ACCS

4.5.1 Drawing EDG0205\_F\_32 shows the sign changes required to achieve the ACCS. This highlights locations where plate sign changes are required. The final configuration of these signs will vary depending on the final wishes of Cornwall Council particularly in respect of any width restriction to be used as part of a new layout at Antony junction.

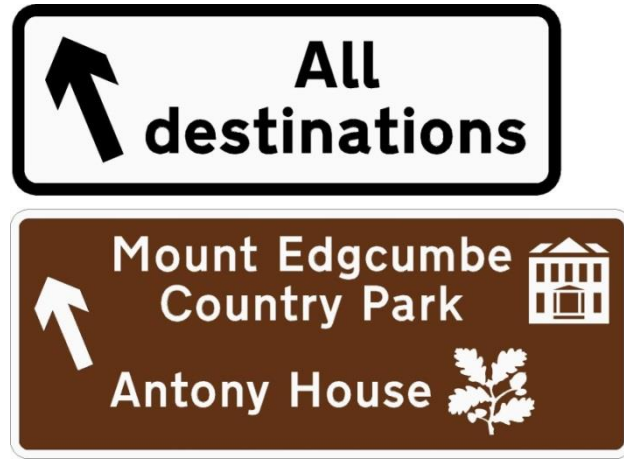
4.5.2 To make the ACCS successful a critical location is the Polscoe Bridge Junction that intersects the A374 and B3247. This is shown in photo 4.1.



**Photo 4.1 – Existing plate sign flags at Polscoe Bridge Junction at the intersection of the A374 and B3247**

4.5.3 At this junction it will be important to direct all vehicles to Antony. **It is recommended traffic to Rame is therefore directed left and all signing to Crafhole be removed.** All of the signs shown in the above photograph should be removed and replaced with the two signs shown in figure 4.1.





**Figure 4.1 – Proposed replacement plate signs for Polscoe Bridge Junction**

4.5.4 The arrangement of the signs at Polscoe Bridge junction is outdated. There are currently moves to reduce the number of plate signs so it would be opportune to rationalise the signing arrangement at this and other junctions. This would be supported by the Tamar Valley Area of Natural Beauty Team.

4.5.5 Polscoe Bridge junction performs a role as the key 'A Road' access point to the Rame peninsula. Given the importance of this gateway it is recommended signing should be repeated on the approach to the junction. There is potential to achieve this because wide verges exist and approach site lines that are of reasonable standard. It is recommended a high visibility electronic L.E.D sign is installed. This is covered in the following sections exploring technology options.



**Photo 4.2 – Approach to Polscoe Bridge junction and position of electronic L.E.D colour Variable Message Sign (VMS)**

- 4.5.6 At Antony it will be important to advertise the new right turn facility on the approach to the junction to all traffic. It is recommended the existing sign is modified in photograph 4.3.



**Photo 4.3 – Existing plate sign on western approach to Antony junction**

- 4.5.7 It is recommended this sign should direct all vehicles to turn right if travelling to **Cawsand, Millbrook, Crafhole, Portwrinkle and Downderry.**
- 4.5.8 At the junction itself it is recommended this message is repeated.



**Photo 4.4 – Existing plate sign at right turn from the B3247 at Antony junction**

4.5.9 When vehicles have completed the right turn manoeuvre and passed through Antony they will travel along the B3247 and arrive at the lower Tregantle Junction. This is shown in photograph 4.5.



**Photo 4.5 – Existing plate sign flags at Lower Tregantle junction (B3247)**

4.5.10 The Tregantle junction marks the end of the inbound route where vehicles can then continue left to Rame Peninsula destinations including Cawsand, Kingsand, Rame and Millbrook or right to Crafhole, Portwrinkle, Downderry and to exit the peninsula. The final configuration of the sign will be subject to discussion with Cornwall Council.

4.5.11 *This signing would complete the inbound sector of the circulatory route*

4.5.12 Signing the westbound 'return' sector of the route may not be necessary. It may be helpful however to reinforce the fact that drivers are travelling on a new circulatory route which could be done at the Lower Tregantle junction. Site lines at this junction are very good and the verges are very wide. Use of a high visibility electronic L.E.D sign would be of benefit and this is discussed in the next section.



**Photo 4.6 – Existing plate sign flags at Lower Tregantle junction of B3247**

4.5.13 In a similar fashion it may be helpful to reinforce the fact that a new circulatory route exists on the approach to Crafhole at the location shown below by again using sign 2805. This may require installation of a new post and plate sign.



**Photo 4.7 – proposed site of pole and plate sign for circulatory route**

- 4.5.14 Depending on the final junction design option selected it may be necessary to prohibit eastbound / Torpoint HGV traffic from using Antony. This will require a traffic order and possibly signing at the Lower Tregantle junction using sign 622.1A which prohibits goods vehicles exceeding the maximum gross weight indicated.
- 4.5.15 This weight could then be adjusted to suit the swept turning vehicle path achievable for vehicles turning out of the B3247 on to the A374 at Antony. Police co-operation will be required to enforce a traffic order. Other signs that could be used are 622.1A, 629,818.4, 820A stating 'width limit at Antony'. Care must be taken to not adversely affect existing bus routes; these are covered later in this report.



**Photo 4.8 – Lower Tregantle junction of B3247 heading to Antony**

4.5.16

The signing prohibiting eastbound / Torpoint traffic will be need to be combined with similar prohibition signing at Antony within the new junction design. This option will require civils work. Further examination of the final configuration of the sign will dictate the need for illumination. If illumination is required this will increase costs. Electrical access network points are present in nearby fields. The costs of these signs and the other sign changes recommended in this section to achieve the ACCS are summarised in the next section.

Sign Location	Sign Changes Required	Estimated Cost	Notes
Plate Signs			
<b>Antony junction</b>	<i>No entry signs</i> <i>Direction Signs</i>	£300	
<b>Polscoe Bridge junction</b>	Replace all signing	£400	
<b>Crafthole</b>	New post and sign	£250	
<b>Lower Tregantle</b>	New illuminated signs	£5,500	Includes electrical connection estimate
Electronic High Visibility Full Colour L.E.D VMS Signs			
<b>Polscoe Bridge junction</b>	Variable Message Sign	£50,000	Approximate cost with electrical and communications
<b>Lower Tregantle junction</b>	Variable Message Sign	£40,000	Approximate cost with electrical and communications

**Table 4.2 – Cost of recommended sign changes to achieve circulatory system**

**4.6 Traffic Capacity**

4.6.1

Given that traffic would be re-assigned from Crafthole to Antony the effect on the capacity of links and junctions on the routes needs to be considered. Using vehicle flow data the link volumes of all vehicles has been investigated. This is summarised in the following table.

Traffic Count Information from Crafthole on 13/10/2014 and Antony on 10/9/2012	<b>B3247 mini-roundabout at Crafthole</b>	<b>Antony Hill at Antony</b>
<b>12 hour two way vehicle flow</b>	1257	2451
<b>Peak hour (15:00) vehicle flow</b>	88	249

**Table 4.3 – Antony and Crafthole traffic flows**

4.6.2 These flows are too low to warrant any form of detailed capacity assessment. If all of the peak hour traffic in Crafhole were to re-assign to Antony this would consist of 88 extra vehicles which averages to 6 vehicles every 4 minutes.

#### 4.7 Bus Routes

Bus routes need considering because the intention is to reduce vehicle conflict by routing drivers through Antony instead of Crafhole. The bus time tables have been examined and some consideration should be given to adjusting the following bus routes:

Service	Direction	Action / Notes
<b>Citybus 32</b>	Outbound	Does not conflict
<b>Citybus 32</b>	Inbound	Bus needs to travel from Tregantle through to Antony junction and Torpoint
<b>Citybus 32A</b>	Not affected	Not affected
<b>Citybus 32B</b>	Inbound and Outbound	Request service uses the ACCS between Crafhole and Antony
<b>Citybus 32C</b>	Inbound	Already uses planned ACCS
<b>Citybus 32C</b>	Outbound	Not affected
<b>Citybus 70</b>	Inbound	Not affected
<b>Citybus 70</b>	Outbound	Bus needs to travel from Tregantle through to Antony junction and Torpoint
<b>Citybus 70A</b>	Inbound	Not affected
<b>Citybus 70A</b>	Outbound	Bus needs to travel from Tregantle through to Antony junction and Torpoint
<b>Citybus 70B</b>	Inbound	Not affected
<b>Citybus 70B</b>	Outbound	Bus needs to travel from Tregantle through to Antony junction and Torpoint
<b>Citybus 71</b>	Inbound	Not affected
<b>Citybus 71</b>	Outbound	Bus needs to travel from Tregantle through to Antony junction and Torpoint

**Table 4.4 – Summary of existing bus activity and recommended changes to be explored in relation to proposed circulatory route**

## 4.8 Non Regulatory Options – Barnstaple Case Study

4.8.1 Other options exist for signing goods vehicles using non regulatory signing such as that employed by Devon County Council to direct vehicles around Barnstaple. This system directs goods vehicles to particular industrial estate locations using a system of colour coding. Some photos of this system are shown over the page. Signs have been placed at key entry locations on the gateway approaches to Barnstaple as shown in photo 4.9.



**Photo 4.9 – Barnstaple goods vehicle signing**

4.8.2 Signs have then been placed around the town in order to direct vehicles to industrial estates as shown in Photo. 4.10.





**Photo 4.10 – Barnstaple goods vehicle signing**

4.8.3 Cornwall Council would need to authorise use of signs like these on the highway as they cannot be generally issued because they are not found in the Traffic Signs Regulations and General Directions.

#### **4.9 Technology Options Available for the ACCS**

4.9.1 In addition technology could also be used to assist with any successful implementation of a circulatory system. To help understand the general concept some examples of technology currently used for Transport Planning and Highway management in Cornwall are given as follows :-

- **Weather monitoring** includes humidity detection and highway temperature sensing; this uses the internet to communicate data from site to Cornwall's weather forecasters.
- **Closed Circuit Television (CCTV)** involves moving image capture of vehicle movements at important junctions and at rising bollard locations in town centres. This captures moving images that are recorded locally on hard drives, these moving images are used to resolve issues on site and accessed through the internet.
- **Trunk Road Variable Message Signs** involve large electronic signs on the A38 and A30. These display messages to drivers regarding diversions, traffic congestion and journey times. They are connected to the National Traffic Control Centre in Birmingham using mobile phone technology. This system is owned and operated by Highways England.

4.9.2 This report has so far been concerned with the design and layout of junction changes and alteration to the routes taken by vehicles. It will be important to monitor vehicles to understand the success of any measures implemented and technology could help with this. Technology may also have a role in making the schemes a success in relation to driver guidance and signing. The technology recommendations are therefore as follows:-

#### **4.10 Variable Message Signs (VMS)**

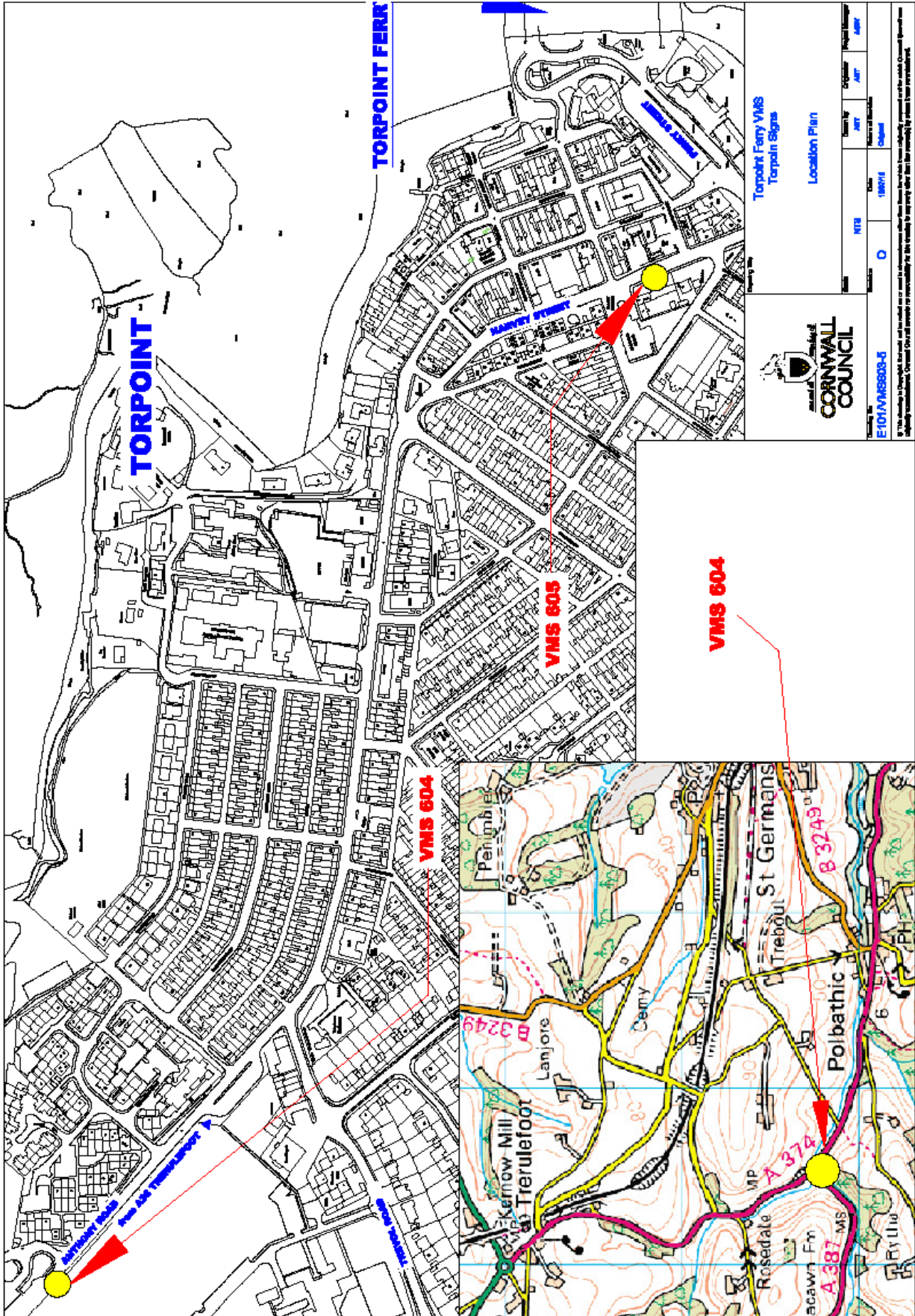
4.10.1 Vehicle routing in the area is already controlled to an extent through the use of a variable message system on the highway that has been funded and is operated by the Torpoint Ferry and Tamar Bridge Joint Committee.

4.10.2 This system uses three VMS in South East Cornwall and three VMS in Plymouth, Devon to inform travellers and control vehicle movements. This is depending on:-

- Weather conditions
- Capacity of the Ferry
- Operating status of the Ferry.

4.10.3 The signs use high visibility electronic L.E.D messaging and are all connected through the internet to the Tamar Bridge and Torpoint Ferry Office. The Cornwall Council Highways Electrical Section at Scorrier also have secondary control and access for fault finding and management.

4.10.4 The plan below shows the location of these signs in Cornwall and the photograph below shows the Torpoint VMS under test with all L.E.D's illuminated. This demonstrates the conspicuous nature of the equipment.



**Figure 4.2 – Existing Torpoint, SE Cornwall and Plymouth electronic single colour L.E.D sign locations**



**Photo 4.11 – Torpoint L.E.D Variable Message Sign**

- 4.10.5 In order to enhance and enforce the Antony and Crafhole Circulatory System this technology could also be used. A VMS sign could display information about the preferred route.
- 4.10.6 Power and communications are a key consideration when installing such technology in a rural location. The costs of any new VMS would reflect the need to establish communications and power. The Traffic Advisory leaflet TAL 1/15 contains guidance about the use of such signs. It also contains legends for use on Variable Message Signs in the UK. Using this guidance a default message for display on this new suggested sign could possibly be:-

**FOR RAME**

**USE ANTONY A374**

- 4.10.7 At the meeting with Cornwall Council, Cormac Solutions Ltd and Local Councillors on 7th December 2015 it was agreed a VMS of this nature was required at Polscoe Bridge Junction. As stated previously in this report the interchange is very important as it represents a gateway. The location is shown in the following photo. The site has been checked for power and communications these do exist at the junction however extra civils work would be required to take these services to any previous VMS sign location.



**Photo 4.12 – Polscoe Bridge junction of A374 and B3247**

4.10.8

An additional benefit of such technology could be use of the VMS to manage accidents and or special events in SE Cornwall such as the international fireworks competition in Plymouth Sound or the annual classic car rally at Edgcombe. Also if, due to satellite navigation, drivers fail to change route a message to 'ignore sat nav' could be displayed. An example of a full colour message being displayed in Cornwall using the latest technology is shown in phot 1.13.



**Photo 4.13 – Cornwall Council full colour electronic L.E.D Variable Message Sign**

## **4.11 Automatic Number Plate Technology (ANPR)**

- 4.11.1 Cornwall Council has also entered a partnership with Devon and Cornwall Police to use ANPR Camera technology. Cameras are installed at Trerulefort Roundabout, The Tamar Bridge and also Torpoint. The photo 4.14 shows ANPR at Antony.



**Photo 4.14 – Existing Antony A.N.P.R system**

- 4.11.2 These cameras are connected to the internet and read number plates to a high degree of accuracy. They communicate to servers held by Cornwall Council in Truro and Devon and Cornwall Police in Exeter. This information is used collaboratively for highway planning and monitoring and also crime prevention and reduction. Due to the effectiveness of the technology Devon and Cornwall Police have historically funded the ANPR however consultation with the Police is required to ascertain their continuing support and funding.
- 4.11.3 In general this technology can be tailored to serve a variety of purposes, for example Cornwall Council has installed them at Household Waste and Recycling Centres (HWRC) to specifically monitor goods vehicles.

4.11.4 In the context of this project at Antony and Crafhole the technology could be used to monitor the effectiveness of any scheme and if applicable help with enforcement. For example ANPR cameras can be linked to the DVLA database to identify the type of vehicle. A letter could be issued to any companies with goods vehicle that are not using any new circulatory system and continuing to drive through Crafhole against the preferred direction. As these cameras require power and communications they could be combined with any VMS installations at Polscoe bridge junction. If ANPR cameras were situated at locations to capture traffic on the circular route this would also provide 'origin destination' (OD) data that could be analysed to ascertain the level of success of any new system. This data could be used to understand the nature of the problem where drivers are not using the new route. For example the type of vehicle and the time of day and year when the new circulatory system is being ignored.

## **5 DIVERSION SIGNING**

### **5.1 Introduction**

5.1.1 Cornwall Council has requested Cormac Solutions Ltd to investigate, summarise and analyse diversion signing for emergency situations and special events in the Rame Peninsula. This work has been requested as an additional task to relate to, and follow on from our analysis of the Antony Junction Improvement and Crafhole Circulatory System.

5.1.2 In particular we have been requested to review work undertaken to date by Cornwall Council and Sheviock Parish Council and investigate if this can be usefully integrated in to our recommendations.

### **5.2 Methodology to review diversions**

5.2.1 We have sought to contact relevant individuals such as:-

- Local highway manager
- Cormac Solutions Ltd Temporary Traffic Order team.
- Cornwall Council Streetworks section
- Cornwall Council Events Section
- Friends of Mount Edgcumbe Country Park Traffic Management Co-ordinator

5.2.2 We have considered special events in the area that have large trip attraction including the Summer Fayre and American and Classic Car Show held at Mount Edgcumbe Country Park at Cremyll (normally first Sunday in August). We have also reviewed and analysed the following applicable documents:-

- Chapter 8 of the Traffic Signs Manual 2009 'Traffic Safety Measures and Signs for Road Works and Temporary Situations' *Department for Transport / Highways Agency*
- Community Emergency Plan: Recommended road diversion routes, *Sheviock Parish Council, 15th May 2011*
- Highway Diversions, A374 Trerulefoot to Torpoint, *Cornwall Council, May 2013*
- Event Notification, Traffic Management Plan and correspondence , *friends of Mount Edgcumbe Park - relating to the Mount Edgcumbe Summer Fayre and American and Classic Car Show*

5.2.3 The following is a summary of these documents. Please also refer to the drawing EDG 0205\_F\_33 which visualises the diversions from the documents.



### **5.3 Community Emergency Plan: Recommended road diversion routes, Sheviock Parish Council, 15th May 2011**

- 5.3.1 This document recommends four diversions that are considered to be necessary in appropriate circumstances on the B3247 and A374. These are shown on EDG 0205\_F\_33. These were formulated by Sheviock Parish Council (SPC) for the consideration of the highway authority.
- 5.3.2 Sheviock Diversion 1 is a diversion route in the SW of the Rame Peninsula applying to the B3247 between Crafhole and the Downderry area. 13 temporary black on yellow information signs are recommended to achieve this diversion.
- 5.3.3 Sheviock Diversion 2 is a diversion route applying to the B3247 to the east of Crafhole. This B road links Crafhole to the Tregantle Fort area. This section of highway is also a key part of the Antony and Crafhole Circulatory System recommended in this report (in chapter 6). 14 temporary black on yellow information signs are recommended to achieve this diversion.
- 5.3.4 Sheviock Diversion 3 is an emergency detour to be invoked following an applicable incident on the A374 between Polbathic and Polscoe. This diversion involves unclassified roads that are significantly narrower than the A379.
- 5.3.5 This route (3) potentially may involve the conversion of highway that is normally two-way to one-way only for the period of the diversion. This route itself involves an unclassified section of road through Sconner Wood and Polbathic Wood and also uses a large section of the unclassified route C0227 passing through Higher Pandreda and Triffle to link with the B327. 11 number temporary black on yellow information signs are recommended to achieve this diversion.
- 5.3.6 Sheviock Diversion 4 involves a route that Sheviock Parish Council (SPC) would like to be used in light of any potential incident on the A374 between Antony and Polscoe. It must be noted this section of highway is also a key part of the Antony and Crafhole Circulatory System recommended in this report (in the next section). The recommended route involves use of the B3247 through Lower Tregantle and Crafhole. 14 temporary black on yellow information signs are recommended to achieve this diversion.

### **5.4 Official Highway Diversions, A374 Trerulefoot to Torpoint, Cornwall Council, May 2013**

5.4.1 In 2013 Cornwall Council undertook a formal review of diversion routes across the County. This review was conducted in two phases. The first phase is complete and covers the following A roads.

- A39 Falmouth to Carland (A30)
- A39 Indian Queens (A30) to Devon
- A388 Carkeel (A38) to Launceston (A30)
- A390 Chiverton Cross (A30) to Arch Hill Truro (A39)

- A390 Union Hill, Truro (A39) to Doublebois (A38)
- Innis Downs (A30) to St Austell (A390)
- Pentire, Newquay to St Columb Road (A39)
- Newtown Roundabout (A30) to Treliever Roundabout (A39)
- Kennards House (A30) to Davidstow (A39)

5.4.2 This first phase was required to cover the busiest routes in Cornwall in greatest need of an official diversion plan should an incident occur. The second phase covered routes where vehicle flow exceeded 5000 average daily movements (but had not been included in the first tranche). The 5000 flow figure was the trigger point for allocation of an official diversion to the route.

5.4.3 37 routes were included in phase 2. Within this phase of particular relevance to this report is the phase 2 diversion which is referred to as '**A374 Trerulefoot (A38) to Torpoint**' which was the only route in Rame meeting the criteria for an official Cornwall Council diversion based on the trigger point flow of 5000 average daily movements.

5.4.4 Within this route 6 separate diversions were created. These are shown in drawing EDG 0205\_F\_33 – Diversions Overview. They are included in the appendices and listed as follows:-

- A374 Section 1 - Trerulefoot roundabout to junction with A387
- **A374 Section 2 - A387 to B3247 Crafhole**
- **A374 Section 3 - B3247 at Crafhole to B3247 at Antony**
- A374 Section 4 - B3247 at Antony to Trevol Road at Longlands Junction
- A374 Section 5 - Trevol Road Western Junction to Trevol Road Eastern Junction
- A374 Section 6 - Trevol Road to Ferry Street

5.4.5 The relevant diversions from this list that need to be considered in relation to the Antony Junction improvement and Crafhole Circulatory System are Sections 2 and 3. These are highlighted in bold in the list above.

## **5.5 Commentary, analysis and review of the diversions**

5.5.1 The following section contains a commentary and analysis of the diversions. In particular this review has been conducted to account for any proposed relevant link to the Antony Junction Improvement and Crafhole Circulatory System options recommended in this report in the following section (6).

- 5.5.2 Sheviock route 3
- 5.5.3 Regarding the Sheviock route 3 this would involve use of a narrow unclassified road that has width for one vehicle only at various points. Due to these width issues it may not be suitable for running as a 2-way road under diversion. If a one-way diversion was required the Traffic Order team have analysed this and suggested it would be potentially challenging to establish a one-way only at certain times combined with a temporary / permanent order. If it were possible to create this Traffic Order then it has also been pointed out by the team that there are various properties along the route that would need to be consulted. If property owners objected it may mean the Traffic Order would not be implemented by CC.
- 5.5.4 Sheviock routes 1 and 2
- 5.5.5 Regarding Sheviock routes 1 and 2 these fell under the 5000 AADT threshold for consideration in 2013 as an official CC diversion. They affect two B roads which have comparatively low flow in proportion to other B roads in the County. 27 individual, location specific black on yellow information signs are shown. Cornwall Council would need to consider the resource implications related to procuring, storing and using these.
- 5.6 Recommendation**
- 5.6.1 In this report looking at the Antony Junction Improvement and Craffhole Circulatory System we have recommended various options to establish the Antony and Craffhole Circulatory System which include signing changes and options for the use of technology. These are outlined in the following section (6). Cornwall Council effectively adopted Sheviock diversions 2 and 3 in 2013.
- 5.6.2 We have analysed the Sheviock Parish Emergency Plan and found that one of the four diversion routes recommended in May 2011 (Sheviock route 4) exactly mirrors a Cornwall Council diversion route developed in 2013 (Cornwall Council Diversion A374 Section 03). This is an established diversion using the B road to divert traffic in light of an incident on the A road.
- 5.6.3 When this diversion is used then our proposal to install a VMS at Polscoe Junction would help the situation as advanced information could be provided to drivers accordingly.
- 5.6.4 The signing we are recommending in this report at the Tregantle junction would complement this diversion by encouraging NW bound traffic to use Craffhole rather than head to Antony.
- 5.6.5 Regarding Sheviock route 3 again this is encapsulated within a Cornwall Council diversion route developed in 2013 (Cornwall Council Diversion A374 Section 02).
- 5.6.6 Regarding the A road diversion routes contained in the Sheviock Community Emergency Plan of 2011 these have now been incorporated in to the Cornwall Council diversions of 2013.

- 5.6.7 Regarding the two Sheviock Community Diversions that relate to the B Roads (Sheviock 1 and 2) Cornwall Council would need to consider the resourcing issues and practicality of employing these local diversions.
- 5.6.8 Regarding the Antony junction improvement and Crafhole Circulatory System if it were to be installed this would complement all of the diversions we have analysed. The VMS we have recommended at Polscoe would also compliment any diversions that are operating. The recommended plate signing and VMS at Tregantle would also compliment traffic flow.
- 5.6.9 In terms of event planning the junction improvement recommended in this report would in general complement event planning.
- 5.6.10 In terms of the traffic management plan for the Edgcumbe House Summer Fayre and Classic and American car show the proposals in this report would assist with the latest 2015 iteration of the Traffic Management plan. However it will also be important to reconsider routing outbound traffic through Antony from any event and instead direct vehicles through Crafhole to mirror the permanent routing we are recommending in this report.
- 5.6.11 In terms of signing it would be worth installing a black on yellow (BOY) flip down sign at Polscoe to state 'all event traffic' and mirror this at Tregantle. This BOY information sign would be in keeping with Chapter 8 guidance. This suggests these colours to draw attention to the fact the signs are applicable in special instances only and for events. Therefore they can be differentiated from black and white permanent signs.

## **5.7 Further Actions Regarding Diversions**

- Based on the recommended option reconsider routing outbound traffic from special events via Antony and instead use Crafhole. Install black on yellow flip sign at Tregantle to confirm this and therefore mirror the permanent signing recommended in this report.
- Undertake Risk assessments for this temporary signing in line with Chapter 8 Chapter 8 of the Traffic Signs Manual 2009 'Traffic Safety Measures and Signs for Road Works and Temporary Situations' Department for Transport / Highways Agency

## 6 SUMMARY

### 6.1 Introduction

Table 6.1 provides a cost summary. This involves the approximate charges to establish the Antony and Craffhole Circulatory System and the approximate expenditure needed for each of the Antony junction design options (although this does not include the Design Manual for Roads and Bridges (DMRB) option because it is felt this approach to design for the site would not be suitable)

Name of Option and equivalent drawing number	Rame Peninsula Traffic Management Phase 2 Estimated Costs (£)				Total including TM
	Main Works	Statutory Undertakers	Road Closures and Surveys	Land Costs	
Option 1 'Reversal of One Way with ACCS' EDG0205_F_27	£59,376	£0	£5,500	£11,000	£109,442
Option 2 'Orbital all moves' EDG0205_F_28	£57,319	£22,000	£5,500	£22,000	£152,635
Option 3 'Design Manual RB all moves' EDG0205_F_29					
Option 4 'Orbital restricted moves with ACCS' EDG0205_F_30	£44,852	£2,000	£5,500	£11,000	£90,995
Antony Craffhole Circulatory System Signing (ACCS)	£1,257	£5,000			£6,257
Variable Message Sign at Polscoe Bridge junction **					£50,000
Individual Automatic Number Plate Recognition Camera ***					£10,000
* Cost is estimate only as based on Cornwall Council Integrated Technology Contract. Communications and power connections are known to be very close to possible sign location. Traffic Management costs are not included in this price.					
** Cost is estimate only as based on Cornwall Council Integrated Technology Contract. Communications and power connections will require approx 80 m of trench this is reflected in the estimate					
***Note Final Cost includes Design, Supervision and CDM Fees with Traffic Management estimated at 25% of scheme cost					
***Approximate cost taken from Cornwall Council Integrated Technology Contract					

**Table 6.1 – Summary of costs**

### 6.2 Recommendation

- It is recommended to install:
  - **Antony junction design option 4 'Orbital junction with restricted moves'**

This will enhance the general environment of the village. Traffic will be slowed on the approach to the village and pedestrian safety will be improved with the effect of reducing community severance. The scheme will compliment partially completed work by the Tamar Valley Area Of Outstanding Natural Beauty team to create a circular pedestrian route involving the 'Ring O Bells' pub to and from Wacker key using the old monastery site and Abbotscourt Lane.

- As shown in Table 4.1 this junction design option requires installation of the
  - **Antony and Craffhole Circulatory System**

Which is therefore also recommended.

### 6.3 Further actions

- If the recommendations contained in this report go ahead then the following actions should take place. This list is not exhaustive.

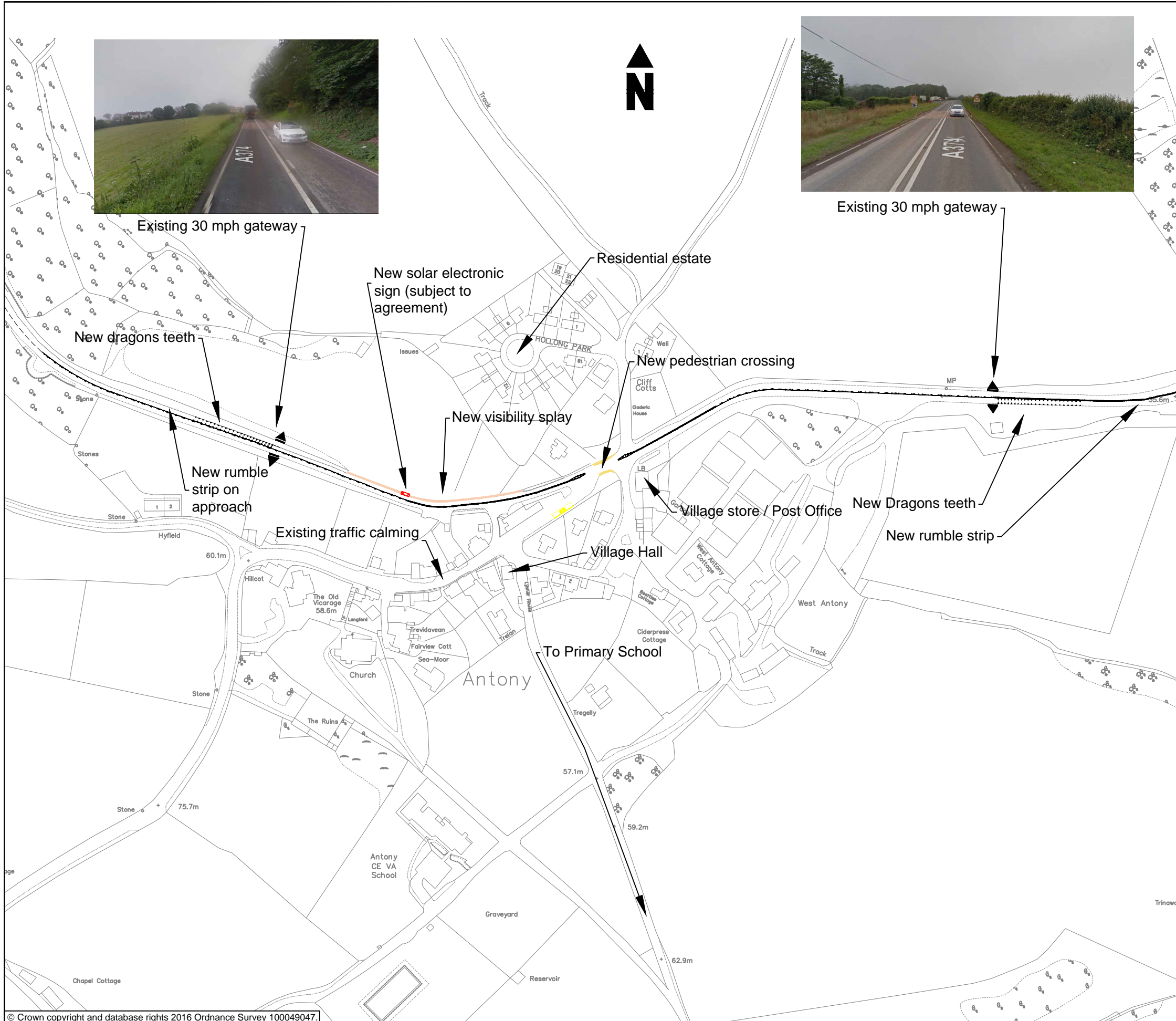
- Work up detailed design and take the scheme to official consultation. Topographical, speed and traffic flow surveys will be required. An early task will be to clear the vegetation from the existing one-way link prior to the topographical survey.
- Consult CC Highways Electrical Section and Tamar Bridge and Torpoint Ferry Joint Committee regarding maintenance, monitoring and operation of any technology to be installed.
- Address the issue of satellite navigation through further research and an approach to satellite navigation suppliers.
- Stay abreast of any developments in the creation of an emergency diversion project which is subject to a separate commission and proposal currently with Cornwall Council.
- Agree the final configuration and position of plate signs to achieve the Antony and Crafhole Circulatory System with Cornwall Council.
- Possible adjustment of current bus routes will need to be explored and taken forward.
- Engage in early discussion with key local freight operators that we have identified in the process of writing this report including Agricola Growers Ltd, J P Mathews and Sons at Blerrick Farm and the Anthony Estate.
- Commence detailed discussions with the Conservation Officer and Tamar Valley Area of Outstanding Natural Beauty
- Reconsider routing outbound traffic from special events via Antony and instead use Crafhole. Install black on yellow flip sign at Tregantle to confirm this and therefore mirror the permanent signing recommended in this report.
- Undertake Risk assessments for this temporary signing in line with Chapter 8 Chapter 8 of the Traffic Signs Manual 2009 'Traffic Safety Measures and Signs for Road Works and Temporary Situations' Department for Transport / Highways Agency

# **Appendix A**

## **Drawings**

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- NOTES:**
1. All dimensions are in metres unless otherwise stated.
  2. Do not scale from this drawing.

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-	07/03/16	FIRST ISSUE

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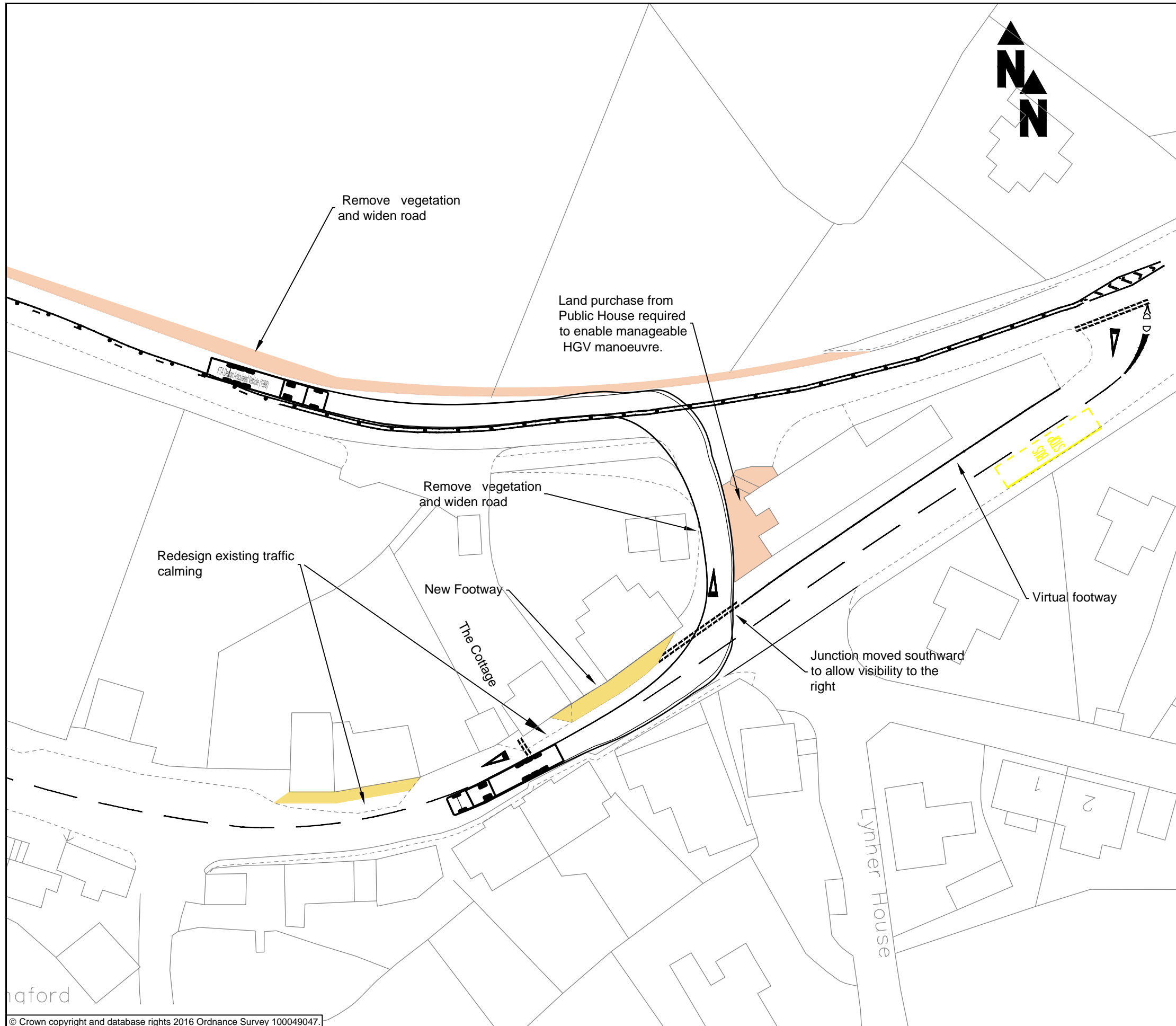
PROJECT:  
**Rame Traffic Management Phase II**

DRAWING TITLE:  
**Traffic Calming layout**

SCALE: **N.T.S**

PROJECT MANAGER: RFJ	DRAWN BY: AS
CHECKED: RFJ 02/03/16	APPROVED: NSH 04/03/16
DRAWING NO: <b>EDG 0205_F_26</b>	REVISION:

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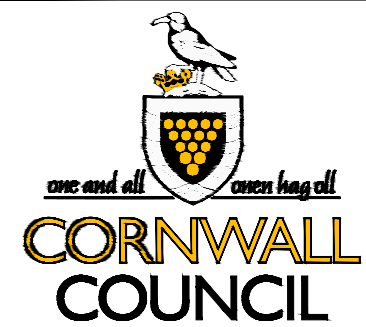
- NOTES:**
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**Key**

Landtake 

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**CORNWALL COUNCIL**

PROJECT:  
Rame Traffic Management Phase II

DRAWING TITLE:  
Antony Junction Option 1  
Reversal of One Way

SCALE: 1:500 @ A3

PROJECT MANAGER: RFJ    DRAWN BY: AS

CHECKED: RFJ    07/07/16    APPROVED: NSH    03/03/16

DRAWING NO: EDG 0205\_F\_27    REVISION:

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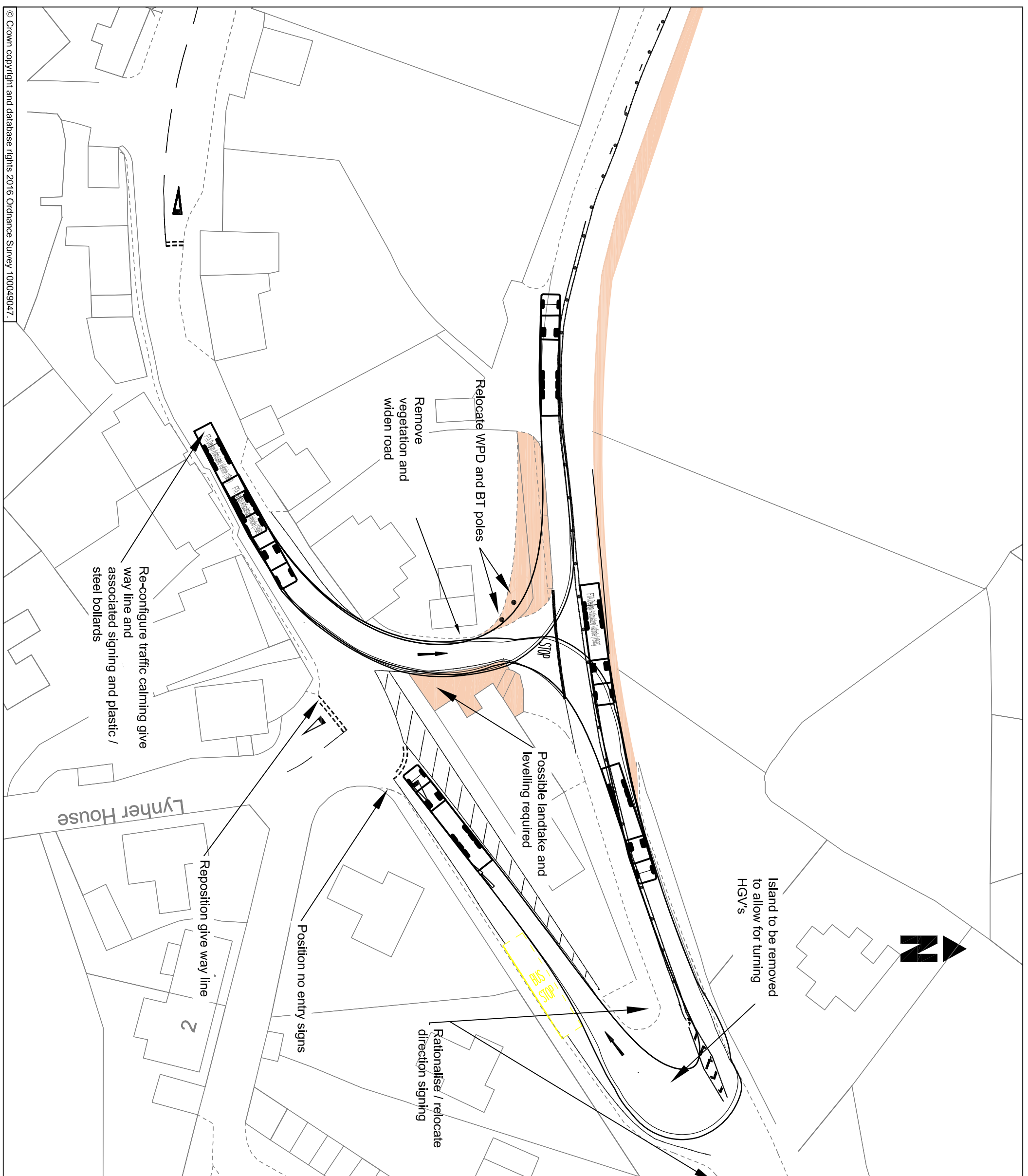
PROJECT:  
Rame Traffic Management Phase II

**CORNWALL COUNCIL**

DRAWING TITLE:  
Option 2 : Antony orbital junction all moves  
Using existing property  
'Manual For Streets'

SCALE: 1:500 @ A3

PROJECT MANAGER:	RFJ	DRAWN BY:	AS
CHECKED:	RJF	APPROVED:	NSH
DRAWING NO:	EDG 0205_F_28	DATE:	07/07/16



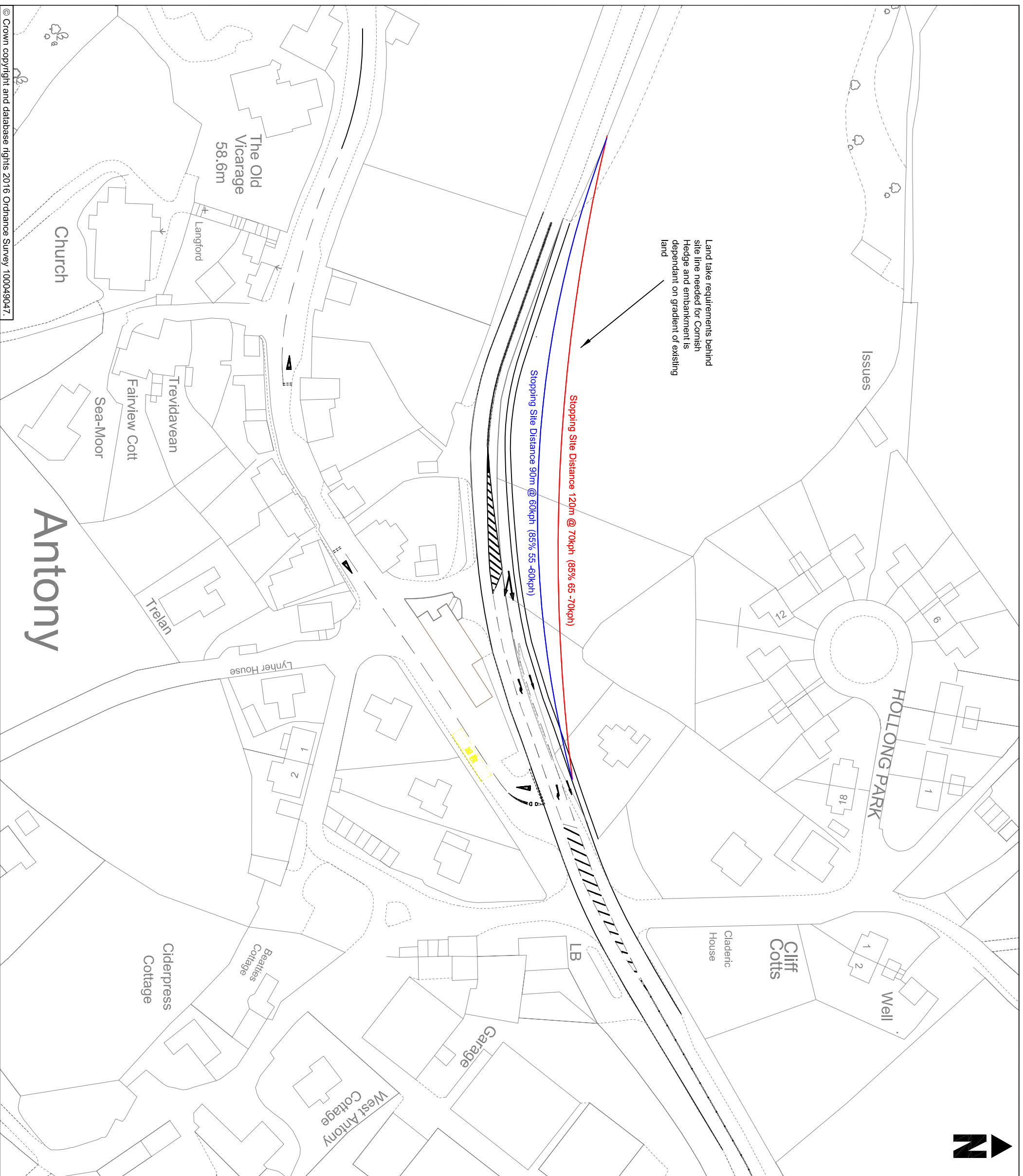


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Land take requirements behind site line needed for Cornish Hedge and embankment is dependant on gradient of existing land



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PROJECT:  
Rame Traffic Magament Phase II

DRAWING TITLE:  
Option 3 - DMRB Design Ghost Island

SCALE:  
1:1000 @ A3

PROJECT MANAGER:	RFJ	DRAWN BY:	RFJ
CHECKED:	RFJ	APPROVED:	NSH
DRAWING NO:	EDG 0205_F_29	REVISION:	07/07/16

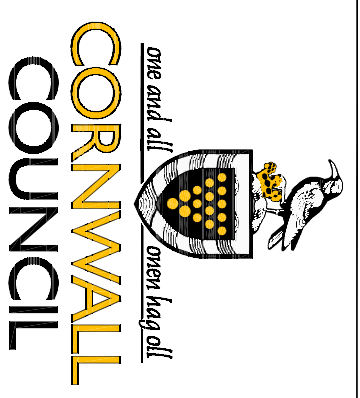
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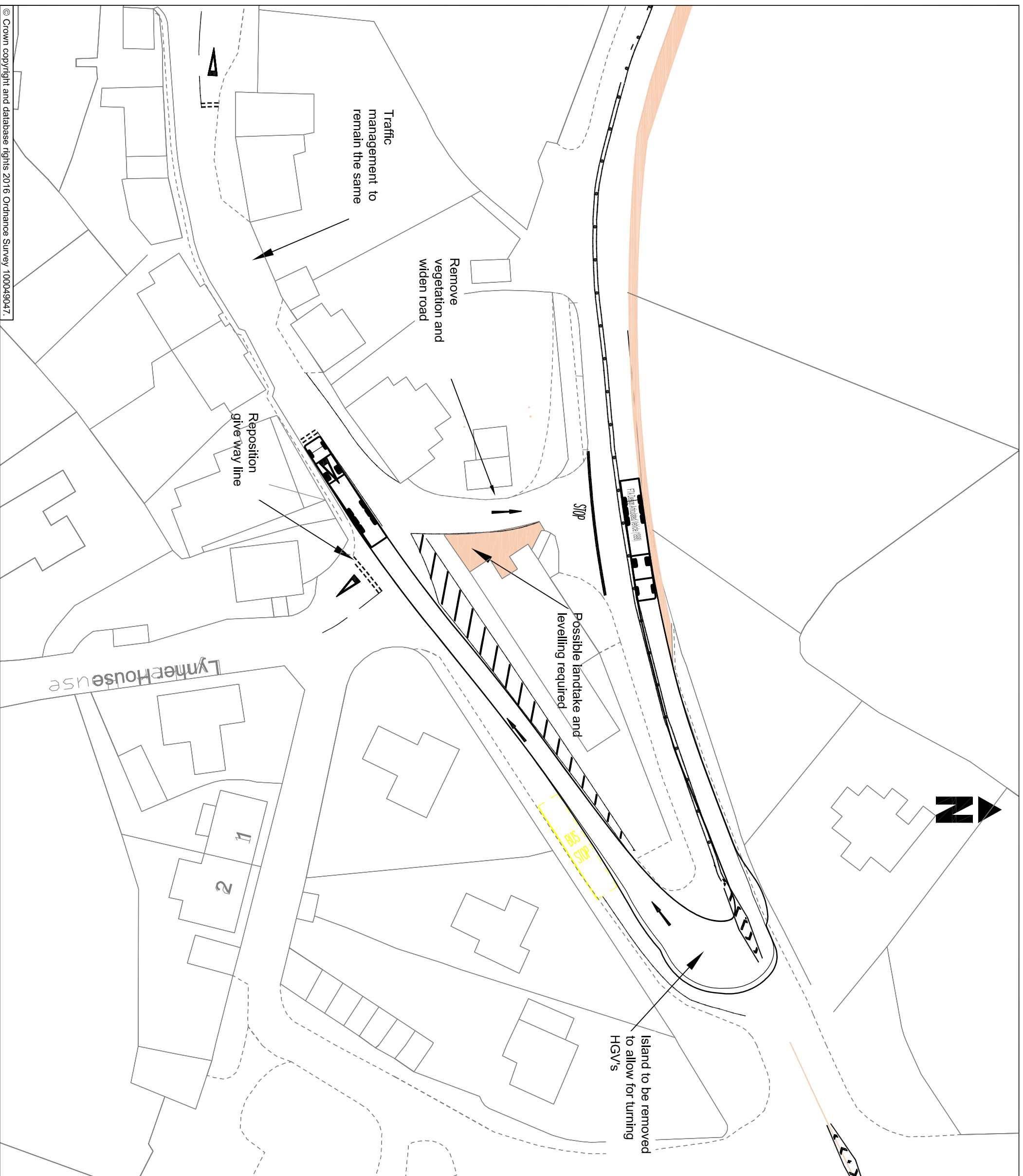


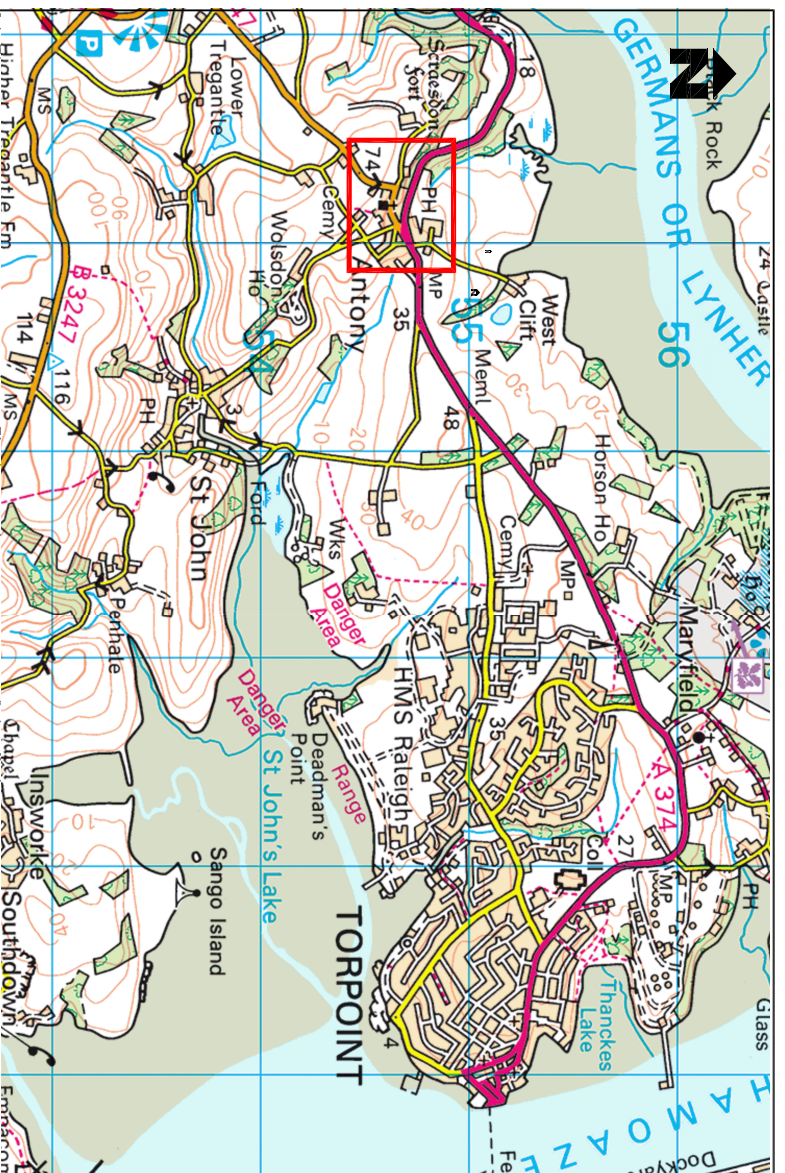
**PROJECT:**  
Rame Traffic Magement Phase II

**DRAWING TITLE:**  
Option 4 : Antony orbital junction  
with restricted 'outbound' movement for HGVs  
'Manual For Streets'

**SCALE:** 1:500 @ A3

<b>PROJECT MANAGER:</b> RFJ	<b>DRAWN BY:</b> AS
<b>CHECKED:</b> RFJ	<b>APPROVED:</b> NH
<b>DRAWING NO:</b> EDG 0205_F_30	<b>REVISION:</b> 07/07/16





## LOCATION PLAN

Grid reference SW 39936 546781



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**KEY**

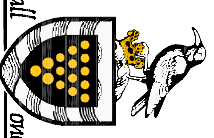
Approximate area of Cornwall Council  
ownership as shown in Land  
Registry Title Plan



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*one and all  
over haa all*

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**PROJECT:**  
Rame Peninsula Traffic Management

**DRAWING TITLE:**  
Antony Village  
Land owned by Cornwall Council  
Title Number CL262231

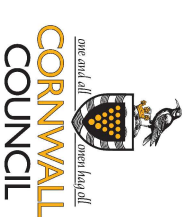
<b>SCALE:</b> NTS	<b>DRAWN BY:</b> AS
<b>PROJECT MANAGER:</b> RFJ	<b>APPROVED:</b> NSH
<b>CHECKED:</b> RFJ	<b>DATE:</b> 25.02.2016
<b>DRAWING NO.:</b> EDG0205/F31	<b>REVISION:</b>

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LOCATION  
Rame Peninsula

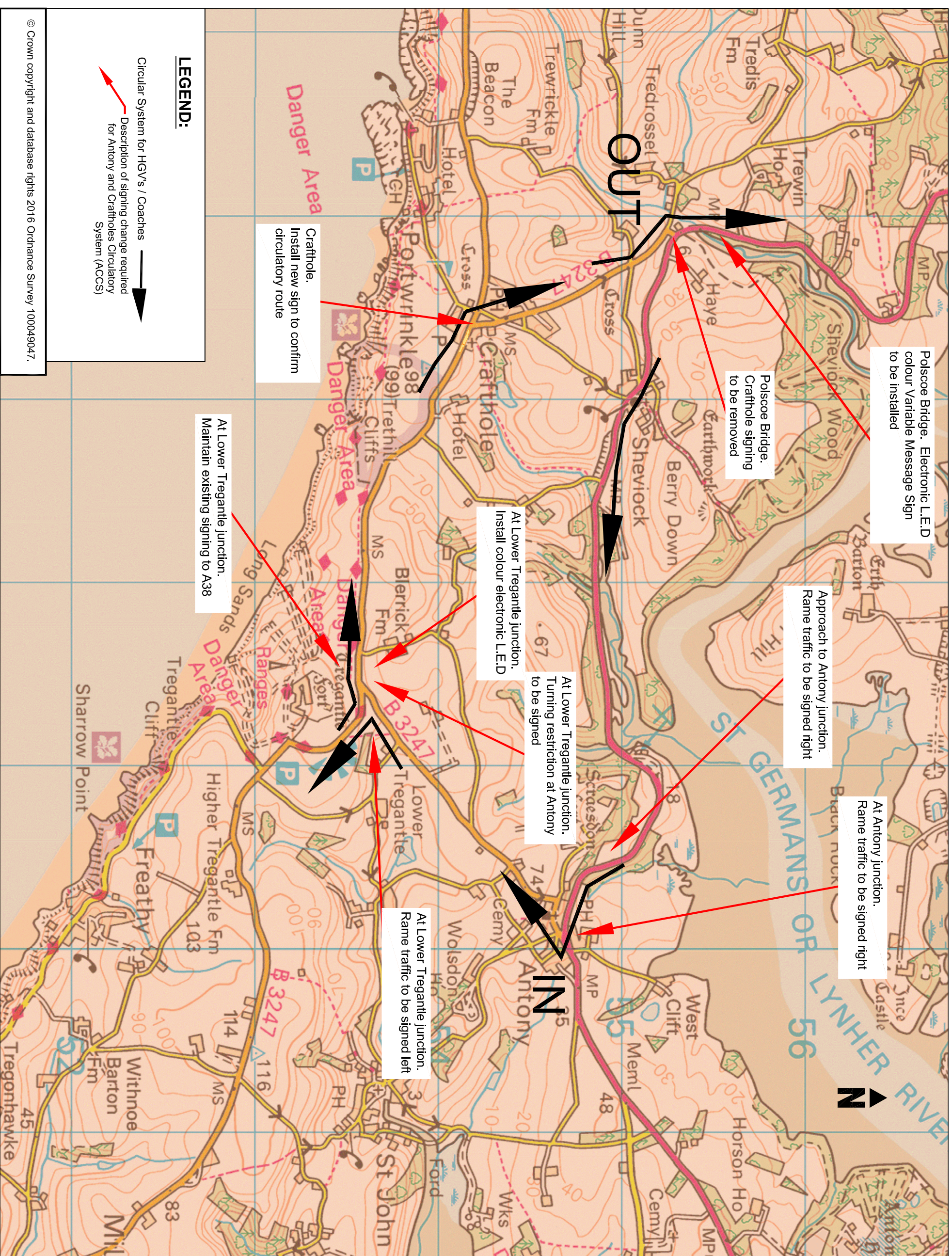
PROJECT  
Rame Peninsula Traffic Management

DRAWING TITLE  
Crathole - Antony  
Proposed Circular System  
Route selected and signing required

PROJECT MANAGER CS  
DRAWN BY ROH CHECKED RFJ APPROVED CS

SCALE  
N:1.5

DRAWING NO EDO0205\_F\_32 SCALE @ A3 REVISION



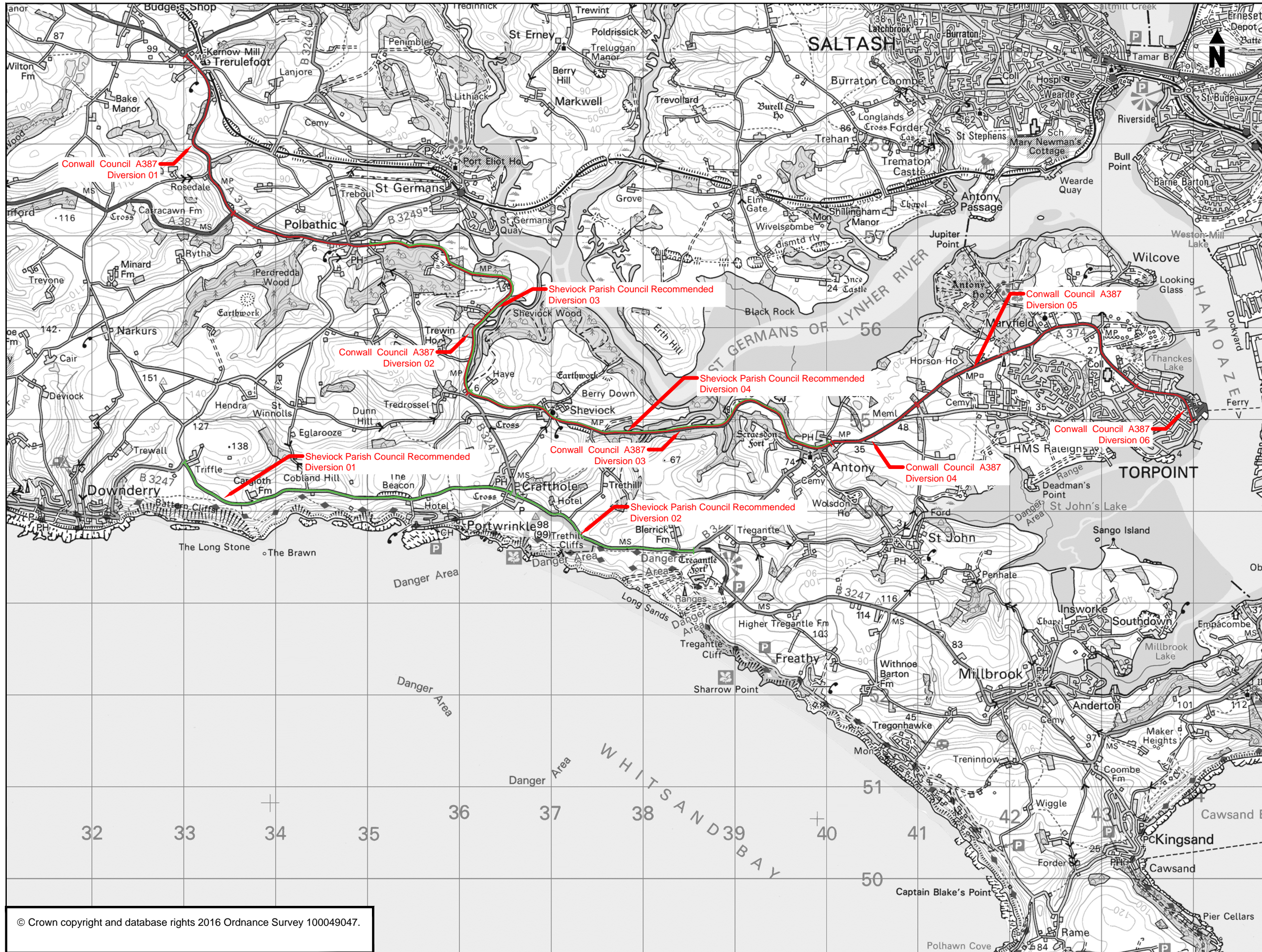
**LEGEND:**

- Circular System for HGV's / Coaches →
- Description of signing change required for Antony and Cratholes Circular System (ACCS) →

Crathole.  
Install new sign to confirm  
circulatory route

Danger Area

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**NOTES**  
 Shevioc Parish Council Proposed Diversion Routes:

- No.
1. This diversion is for a section of road that currently has no specified diversion route
  2. This diversion is for a section of road that currently has no specified diversion route in place
  3. This diversion is for a section of road that currently has a diversion route (CC Route 02) but provides a shorter option for road closures between Polbathic and the junction with the B3247
  4. This diversion replicates CC Diversion Route 03

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LOCATION: Rame Peninsular  
 PROJECT: Rame Peninsular Traffic Management  
 DRAWING TITLE: Diversion Overview

PROJECT MANAGER: NSH	SCALE: N.T.S.	APPROVED: NH
DRAWN BY: RDH	CHECKED: RFJ	REVISION: -
DRAWING NO: EDG0205_F_33		



## **Appendix B**

### **Sheviock Community Emergency Plan: Recommended road diversion routes**

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**SheviocK Parish Council**

## **Community Emergency Plan: Recommended road diversion routes**

Date of Plan 15<sup>th</sup> May 2011.

This Plan is next due for review on 15<sup>th</sup> May annually.

**Supported by**



**If an emergency occurs your first action should always be to contact the emergency services by dialling 999 and ask for the Police.**

## **Recommended diversion routes**

For the Parish of Sheviock diversion routes are only considered necessary if an incident blocks the B3247 or and A374.

The A374 is a single carriageway with one lane in each direction carrying a moderate level of traffic. The B3247 is a single carriageway road, much of it single lane with passing places carrying light traffic flows and dependent on a processes of 'Give and Take' to maintain two-way flow.

If the B3247 has to be closed diverting traffic onto the A374 will be sufficient as that road should be able to safely deal with the additional traffic. The signage required is shown in the following Maps 1 and 2 with associated sign diagrams.

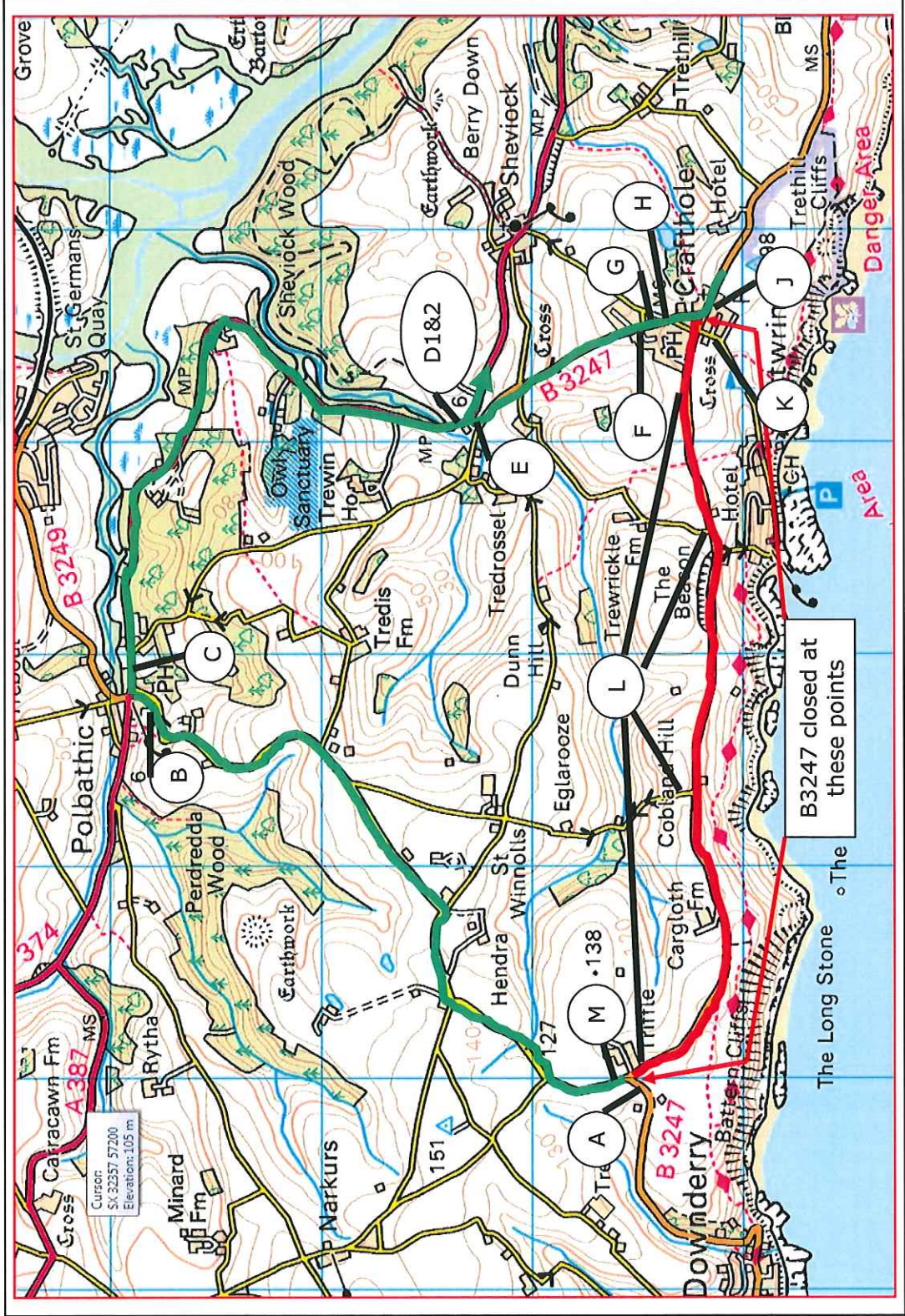
If the A374 needs to be closed then the other local roads are not able to cope because the level of traffic flow becomes such that 'Give and Take' is no long practicable. Thus for closure of the A374 between Polbathic and Sheviock a system of one way diversions should be signed as shown in Map 3 with its associated sign diagrams.

For closure between Antony and Sheviock more drastic diversions are considered with

- traffic travelling from Plymouth to destinations beyond Antony, St John, Millbrook Cremyl, Cawsands and Kingsands being diverted on the approach to the Ferry in Plymouth to travel via the Tamar Bridge and approach via Trerulefoot;
- traffic travelling from beyond Trerulefoot to Torpoint and Plymouth being diverted at Trerule foot to travel via the Tamer Bridge.

The diversions for this section of the A374 are shown in Map 4 together with its associated sign diagrams.

MAP 1 DIVERSION ROUTES FOR B3247 CLOSED WEST OF CRAFTHOLE



General Comment  
 Y. Good idea  
 Fits nicely with  
 CC diversion routes  
 but need to be more  
 generic so that  
 signing has walki-use  
 ie for both B3247  
 and A374.  
 Priority  
 - A374 Full route from  
 Trevelfrost roundabout.  
 , then look at B3247

## Section Closed B3247 west of Crafhole – all vehicles

**SPECIAL SIGNING. Flap Signs as shown below.**

*No need for this sign*

**Location A** ✓



**Location B** ✓



**Location C** ✓



**Location D1**



**Location D2** ✓



**Location E**



**Location F**



**Location G**



*DIVERGED TRAFFIC*



*DON'T UNDERSTAND WHERE THIS SIGN IS.*

**Location H**

**B3247 DIVERSION**  
←  
FOLLOW DIVERSION  
FOR DOWNDERRY  
AND SEATON

**Location J**

**B3247 CLOSED**  
→  
FOLLOW DIVERSION  
FOR DOWNDERRY  
AND SEATON

**Location K**

**B3247 CLOSED  
NO LEFT TURN  
FOR DOWNDERRY  
AND SEATON  
FOLLOW  
DIVERSION**  
↑

**Location L**

**B3247  
ROAD CLOSED**

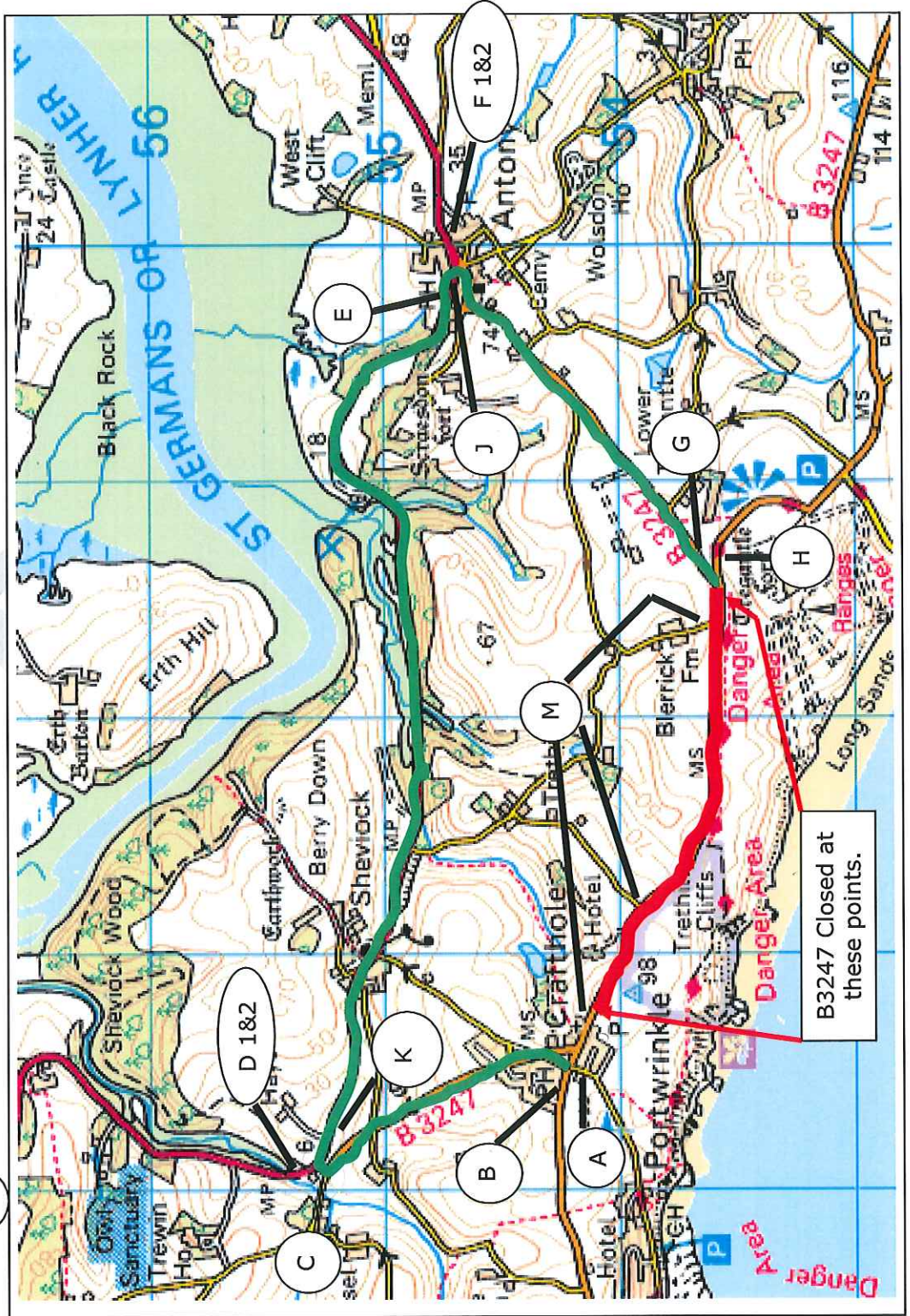
*are these necessary?*

**Location M**

**B3247 DIVERSION  
ENDS  
→  
DOWNDERRY AND  
SEATON  
NO LEFT TURN**

### MAP 2 DIVERSION ROUTES FOR B3247 CLOSED EAST OF CRAFTHOLE

At Polbathic





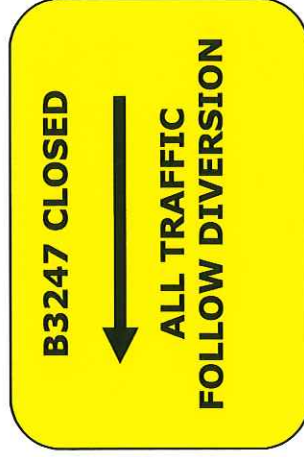
## Section Closed B3247 east of Craffthole – all vehicles

**SPECIAL SIGNING. Flap Signs as shown below.**

**Location A**



**Location B**



**Location C**



**Location D1**



**Location D2**



**Location E**



**Location F1**



**Location F2**



**LOCATION G**

**B3247 DIVERSION ENDS**  
↓  
**TURN LEFT FOR MILLBROOK KINGSAND CAWSAND**

**LOCATION H**

**B3247 CLOSED**  
→  
**ALL TRAFFIC FOLLOW DIVERSION**

**LOCATION J**

**B3247 DIVERSION**  
↓  
**FOLLOW DIVERSION CRAFTHOLE PORTWRINKLE DOWNDERRY SEATON**

**LOCATION K**

**B3247 DIVERSION**  
↓  
**TURN LEFT FOR CRAFTHOLE PORTWRINKLE**

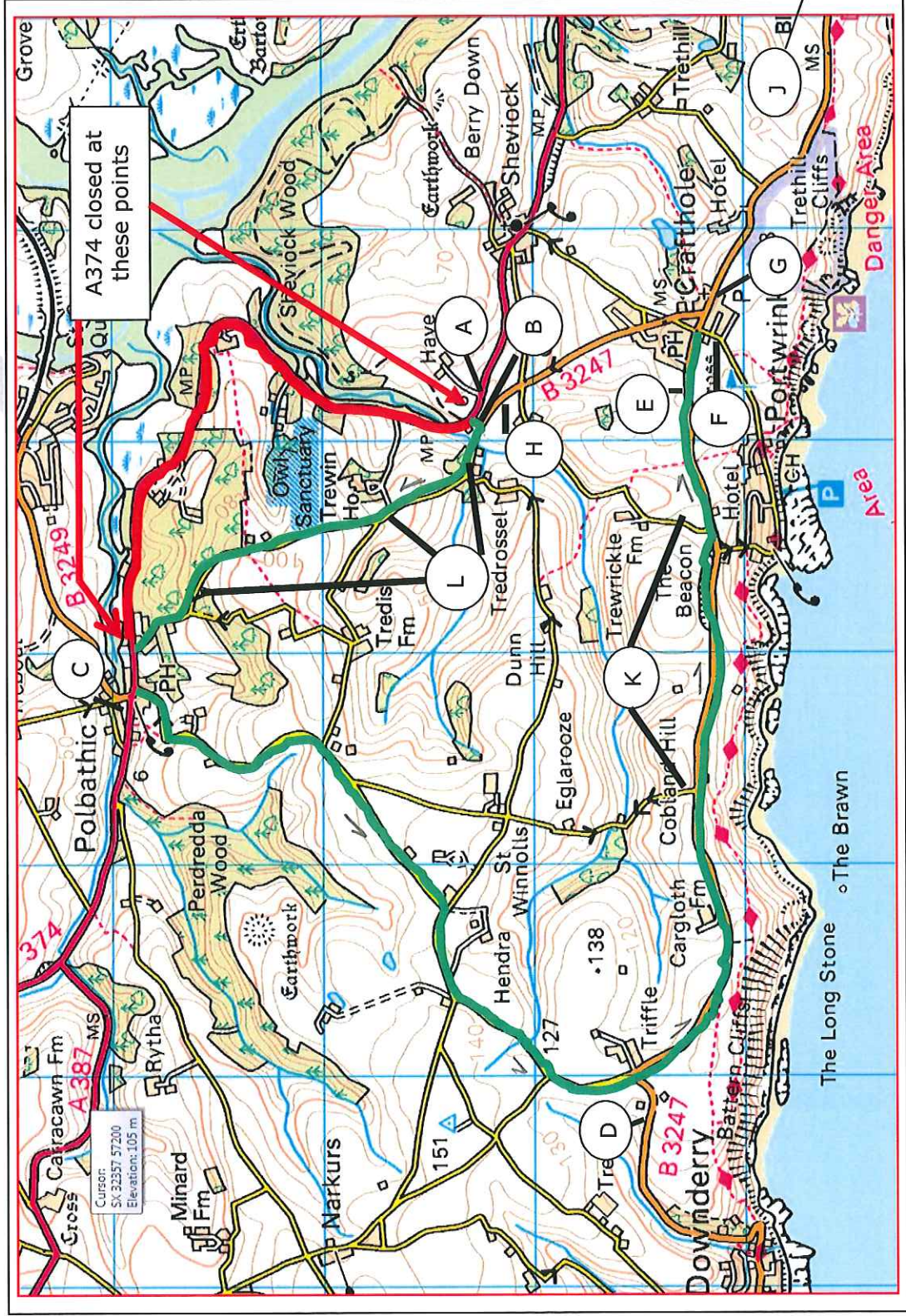
**LOCATION L**

**B3247 DIVERSION**  
↓  
**TURN LEFT FOR DOWNDERRY SEATON**

**LOCATION M**

**B3247 CLOSED**

MAP 3 DIVERSION ROUTES FOR A374 CLOSED BETWEEN POLBATHIC AND JUNCTION WITH B3247

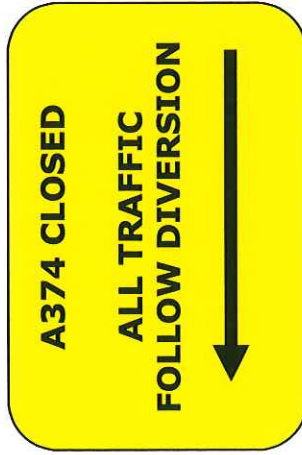


Some issues here  
eg traffic from Downderry  
Wanting to go east on A374?

## Section Closed A374 Polbathic to Junction with B3247 near Sheviock East and west bound – all vehicles

**SPECIAL SIGNING. Flap Signs as shown below.**

**Location A**



**Location B**



**Location C**



**Location D**



**Location E**



**Location F**



**Location G**



**Location H**



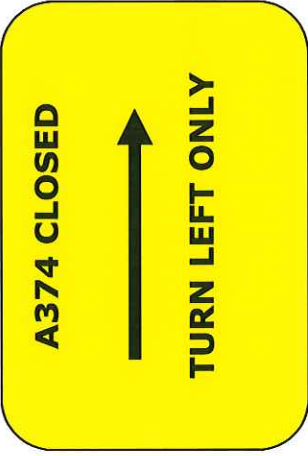
**Location J**

**A374  
DIVERSION ENDS  
LEFT TURN TO JOIN  
A374  
ANTONY  
AND TORPOINT**



**Location K**

**A374 CLOSED  
TURN LEFT ONLY**



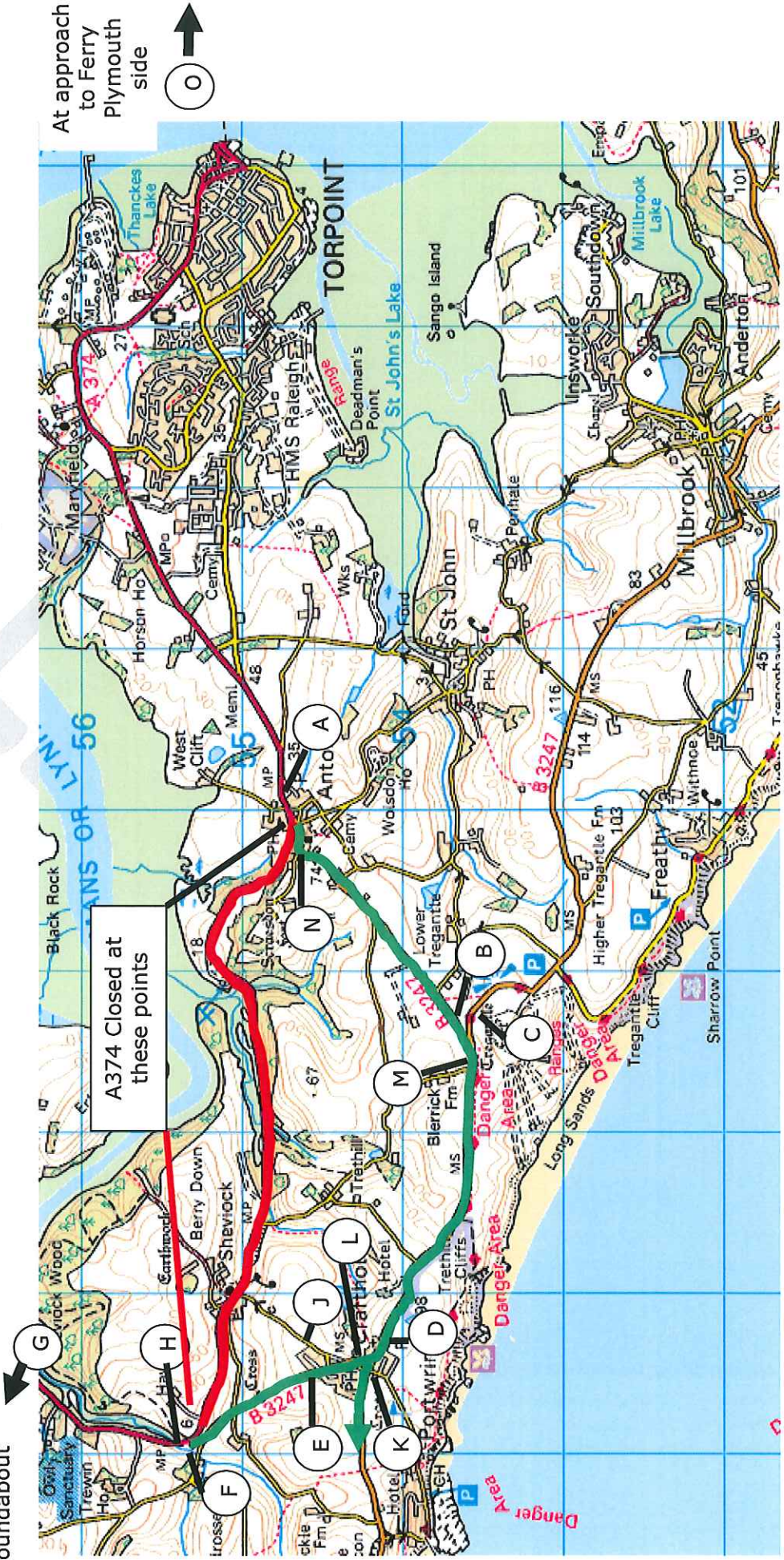
**Location L**

**A374 DIVERSION  
STRAIGHT ON**



### MAP 4 DIVERSION ROUTES FOR A374 CLOSED BETWEEN ANTONY AND SHEVIOCK

At Trerulefoot roundabout



## Section Closed A374 Antony to Junction with B3247 west of Shevick East and west bound – all vehicles

**SPECIAL SIGNING. Flap Signs as shown below.**

**Location A**



**Location B**



**Location C**



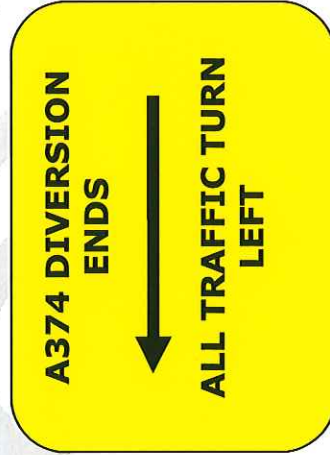
**Location D**



**Location E**



**Location F**



**Location G**



**Location H**



**Location J**

**A374 CLOSED  
AHEAD  
NO ACCESS EXCEPT  
SHEVIOCK**

**Location K**

**A374 CLOSED  
AHEAD  
TURN LEFT FOR  
ANTONY TORPOINT  
AND PLYMOUTH VIA  
THE FERRY**

**Location L**

**A374 DIVERSION  
STRAIGHT ON**

**Location M**

**A374 DIVERSION  
TURN LEFT**

**Location N**

**A374 DIVERSION  
ENDS  
ALL TRAFFIC  
TURN RIGHT**

**Location O**

**A374 CLOSED AT  
ANTONY  
USE TAMAR BRIDGE  
FOR CRAFTHOLE  
DOWNDERRY  
SEATON POLBATHIC  
AND BEYOND**