Portishead Branch Line DCO scheme
(MetroWest Phase 1)
Environmental Impact Assessment

Draft Transport Assessment

Prepared for
West of England Councils

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Acronyms and Abbreviations

ALCRM	All Level Crossing Model
AQMA	Air Quality Management Area
AVTM	Ashton Vale Temple Meads scheme
BCC	Bristol City Council
B&NES	Bath and North East Somerset Council
CTMP	Construction Traffic Management Plan
DCO	Development Consent Order
DCLG	Department for Communities and Local Government
DfT	Department for Transport
DMRB	Design Manual for Roads and Bridges
EIA	Environmental Impact Assessment
ES	Environmental Statement
GBATS	Greater Bristol Area Transport Model
GJT	Generalised Journey Times
GPD	General Permitted Development
GRIP	Governance for Railway Investment Projects
GTA	Guidance for Transport Assessment (Archived)
HE	Highways England
JTLP3	Joint Local Transport Plan 3 (West of England authorities 2011 to 2026)
IEP	Intercity Express Programme
IP	Interpeak
LDF	Local Development Framework
LEP	Local Enterprise Partnership
LGV	Light Good Vehicle
LMVR	Local Model Validation Report
LP	Local Plan
LSTF	Local Sustainable Transport Fund
LTN	Local Transport Note
MfS	Manual for Streets
MoD	Ministry of Defence
MOVA	Microprocessor Optimised Vehicle Actuation
NC	Near Certain Development
NE	Natural England
NMU	Non-Motorised User
NPPF	National Planning Policy Framework
NPS	National Policy Statement
NPS NN	National Policy Statement for National Networks
NR	Network Rail
NRTF	National Road Traffic Forecasts
NRTS	National Rail Travel Survey
NSC	North Somerset Council
NSIP	Nationally Significant Infrastructure Projects
OA	Output Area
ORR	Office of the Rail Register
OSGR	Ordinance Survey Grid Reference
PCU	Passenger Car Unit
PDFH	Passenger Demand Forecast Model
POD	Portishead Line
PRoW	Public Right of Way
RDM	Rail Demand Model
RF	Reasonably Foreseeable Development

RFC	Ratio of Flow to Capacity
RUS	Route Utilisation Strategy
SADMP	Site Allocations and Development Management Policies
SEB	Statutory Environmental Bodies
SEP	Strategic Economic Plan
SGC	South Gloucestershire Council
SPD	Supplementary Planning Document
TA	Transport Assessment
TEMPRO	Trip End Model Presentation Program
TPH	Trains per Hour
TQEZ	Temple Quarter Enterprise Zone
UWE	University of the West of England
VDM	Variable Demand Model
WoE	West of England

Glossary of terms

Term	Description
Governance Definitions	
'the four West of England Councils' or 'the WoE Councils'	The four West of England Councils comprise; Bath & North East Somerset, Bristol City, North Somerset and South Gloucestershire Councils.
JTB	The four West of England Councils' Joint Transport Board
WoE LEP	The West of England Local Enterprise Partnership
Definitions used to clarify the Areas of Works being considered	
'the Portishead Branch Line DCO scheme (MetroWest Phase 1)' or 'the DCO scheme'	The Development Consent Order (DCO) scheme includes a 13.7 km section of railway, which comprises; the Nationally Significant Infrastructure Project (NSIP) works and the Associated Development works. The DCO scheme includes the red line boundary for railway infrastructure, rail stations, car parks, pedestrian /cycle /highway infrastructure and maintenance compounds from Portishead to Ashton Junction in south Bristol.
'the NSIP works'	The NSIP works includes 5.45 km section of railway from a new station at Portishead to Portbury Dock Junction then to the new junction at Pill.
'the Associated Development works'	The Associated Development works comprise; • New railway station at Portishead; • Car parks, pedestrian / cycle / highway infrastructure at Portishead including re-alignment of Quays Avenue and a new footbridge near Trinity Primary School; • Re-opening the former Pill station (southern platform) including car parks, pedestrian / cycle / highway infrastructure; • New maintenance compounds from Portishead to Pill Junction; • Works to the Portbury Freight Line; • Construction compounds between Portishead and Ashton Junction; • New maintenance compounds between Pill and Ashton Junction, Works to upgrade the existing Portbury Freight Line from Royal Portbury Dock to Ashton Junction, to enable operation of both passenger train and freight train services and associated works to pedestrian /cycle /highway infrastructure including modifications to the NCN26.
'the General Permitted Development works' or 'GPD works'	The General Permitted Development (GPD) works include; the South Bristol Parson Street Junction upgrade (including signalling cabling/equipment to Ashton Junction), Bedminster Down Relief Line (partial re-instatement), Severn Beach / Avonmouth Signalling Enhancement and Bathampton Turnback.
'the Portbury Freight Line' or POD Line	The Portbury Freight Line is the existing operational freight line from Portbury Dock to Parson Street Junction.
'the Portbury Dock Spur'	The Freight Dock Spur is a section of 500 metres of railway from Portbury Dock Junction to Royal Portbury Dock, owned by Bristol Port Company. The Spur forms part of the POD line.

Term	Description
'Portbury Dock Junction'	Portbury Dock Junction is located west of Pill where the POD Line diverges from the route of the disused railway to Portishead. The junction is not in operational use and the POD Line is formed of plain track at this location.
'Pill Junction'	Pill Junction is a proposed junction east of Pill station on Pill Viaduct where the tracks that will be in parallel through Pill Station will join to form the western end of the single line section from Clifton Junction.
'Ashton Junction'	Ashton Junction is the existing junction located in south Bristol on the Portbury Freight Line forming the eastern end of the single line section through the Avon Gorge approx. 1km west of Parson Street Junction.
'Parson Street Junction'	Parson Street Junction is an existing junction located in south Bristol connecting the Portbury Freight Line with the Bristol to Taunton main line.

Part D	**Other Frequently Used Railway Terms**
BASRE	Bristol Area Signalling Renewal and Enhancement
Filton Four Track	The relaying of two additional tracks from Bristol Temple Meads to Filton
FOC	Freight Operating Company
GRIP	Governance for Railway Investment Projects
GWML	Great Western Main line
NE	Natural England
NPS	National Policy Statement
NSIP	Nationally Significant Infrastructure Project
NRIL/Network Rail	Network Rail Infrastructure Limited
Occupation Crossing	Privately operated crossings over or under railway lines to allow landowners access to land that would have been severed by the construction of the railway.
PSP	Principal Supply Points for signalling equipment
RRAP	Road Rail Access Point
REB	Relocatable Equipment Building for signalling and other rail equipment
TOC	Train Operating Company
NCN26	National Cycle Route 26, managed by Sustrans

Addendum

Section 1

Introduction

1.1 Background

CH2M has been appointed to prepare a Transport Assessment (TA) in support of the Portishead Branch Line Development Consent Order (DCO) scheme (MetroWest Phase 1) proposal to reopen the Portishead line with stations at Portishead and Pill in North Somerset ("the DCO scheme"). The overall MetroWest Phase 1 project seeks to enhance rail services on the Severn Beach line and for local stations between Bristol Temple Meads and Bath Spa together as well as the re-opened Portishead line.

The MetroWest Phase 1 project comprises the delivery of infrastructure and passenger train operations to provide enhanced services on the Severn Beach line, local stations on the Bath to Bristol line and for a reopened Portishead Branch Line with stations at Portishead and Pill. The re-opened Portishead Branch Line will maintain the existing freight train operations as well as re-introduce passenger train services on an hourly basis. The project is being led by North Somerset Council on behalf of the four West of England (WoE) councils, as a third party promoted rail project, funded by the four councils and the WoE Local Enterprise Partnership (LEP). The project includes infrastructure to be consented through a DCO and infrastructure which falls within Network Rail's General Permitted Development rights (the GPD works). The passenger train service is to be delivered through either the Department for Transport's re-franchising process or via a bi-lateral agreement between the four councils and a train operating company (TOC). The project is to be delivered by the rail industry and the four councils.

1.2 Scheme overview

1.2.1 The MetroWest Programme

The West of England (WoE) councils are progressing plans to invest in the local rail network over the next ten years through the MetroWest programme. The MetroWest programme comprises:

- The MetroWest Phase 1 project;
- The MetroWest Phase 2 project;
- A range of station re-opening/new station projects; and
- Smaller scale enhancements projects for the WoE local rail network.

These projects range from relatively large major schemes, entailing both infrastructure and service enhancement, to smaller scale projects.

MetroWest is being jointly promoted and developed by the four WoE councils; Bath & North East Somerset Council (B&NES), Bristol City Council (BCC), North Somerset Council (NSC) and South Gloucestershire Council (SGC). The MetroWest programme will address the core issue of transport network resilience, through targeted investment to increase both the capacity and accessibility of the local rail network. The MetroWest concept is to deliver an enhanced local rail offer for the sub-region comprising:

- existing and disused rail corridors feeding into Bristol;
- increased service frequency; cross-Bristol service patterns (eg Bath to Severn Beach); and
- a Metro-type service appropriate for a city region with a population which exceeded 1 million in 2016.

The MetroWest Programme will complement the investment being made by Network Rail (NR) and extend the benefits of projects such as the electrification of the Great Western main line. The proposals are supported by the rail industry and are being developed with NR, Great Western Railway (GWR), freight train operators and the Department for Transport (DfT). The programme is to be delivered over the next five to ten years during Network Rail Control Period 5 (2014 to 2019) and Control Period 6 (2019 to 2024).

The MetroWest programme will also extend the benefits of strategic transport interventions that are either in the process of being delivered or have been delivered by the West of England councils. These include the three MetroBus schemes (Ashton Vale to Temple Meads, South Bristol Link and North Fringe to Hengrove Package), Bath Package, Weston Package and the Local Sustainable Travel Fund programme. The delivery of these projects, together with the MetroWest programme, will result in better modal integration between rail, bus and active modes, providing an important step towards seamless modal transfer at key hubs across the West of England.

1.2.2 MetroWest Phase 1 project

The MetroWest Phase 1 project comprises the delivery of infrastructure and passenger train operations to introduce new/enhanced rail passenger services across Bristol with a service pattern between Portishead, Bath Spa and Severn Beach, with intermediate stops. This will entail upgrading the existing freight only line between Parson Street junction and Portbury Dock junction (Pill), reinstatement of the current disused line between Portbury Dock junction and Portishead, and various minor works to facilitate the operation of the Phase 1 train services. A new station will be required at Portishead and the former station at Pill will be re-opened.

MetroWest Phase 1 comprises the delivery of infrastructure and passenger train operations to provide:

- Half-hourly service for the Severn Beach line (hourly for St. Andrews Road station and Severn Beach station);
- Half-hourly service for Keynsham and Oldfield Park stations on the Bath Spa to Bristol line; and
- Reopened Portishead Branch Line with stations at Portishead and Pill, initially an hourly service, but ultimately providing 2 trains per hour.

The MetroWest Phase 1 project was mobilised in 2013 and originally included proposals to operate a half hourly passenger train service on the Portishead Branch Line. The project feasibility stage (including GRIP Stage 2) was completed in 2014 and reported in the Preliminary Business Case and endorsed by the WoE Joint Transport Board. The Preliminary Business Case demonstrated the project has a strong case for intervention, provides good value for money, has a sound commercial footing, and is financially affordable and deliverable by 2019/2020.

However, the estimated capital cost of this proposal, when ascertained in early 2017, was greater than the available budget. As a result, the four WoE councils determined to take a staged approach to the delivery of the MetroWest Phase 1 project as follows:

- An initial rail passenger hourly service to Portishead.
- Deliver the full two trains per hour passenger service to Portishead at a later date.

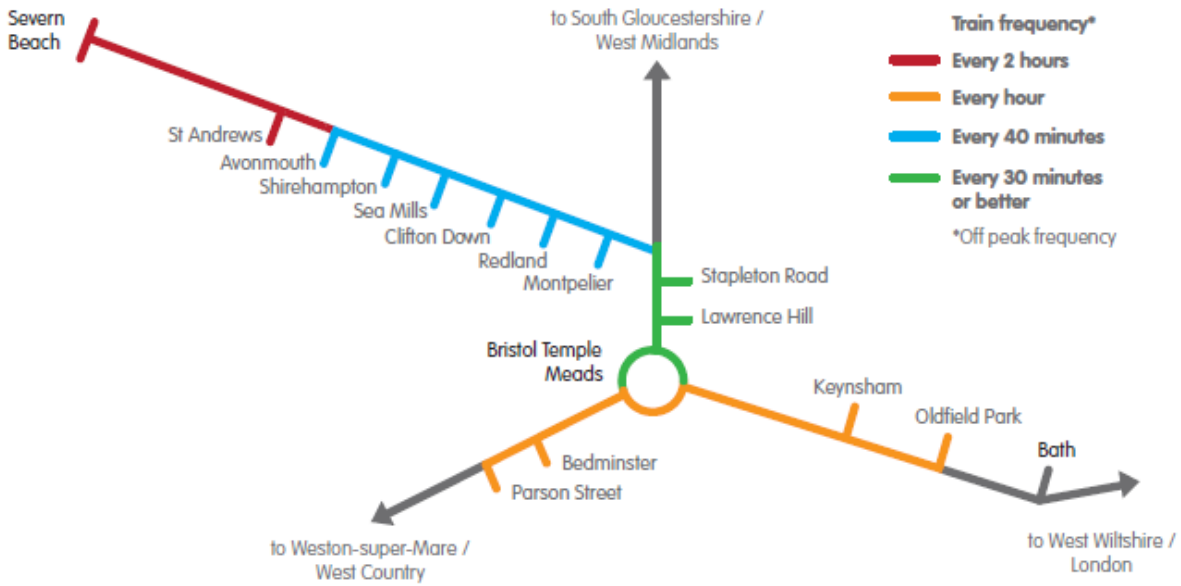
Figure 1.1 shows a schematic overview of both the existing network and proposed MetroWest Phase 1 Scheme, including full implementation of the project.

The proposals for the Severn Beach Line and Bath Spa to Bristol Line remain unchanged. The proposals for the Portishead Branch Line are to be delivered in two stages. Initially this would entail delivery of infrastructure to operate an hourly service. A second stage will be promoted separately, after delivery of the initial stage, to upgrade the infrastructure to be capable of operating a half hourly passenger train service. This second stage will require further separate statutory processes, business case and funding package, and will not be progressed until after the delivery of the initial stage. There is currently no estimated opening date for the second stage.

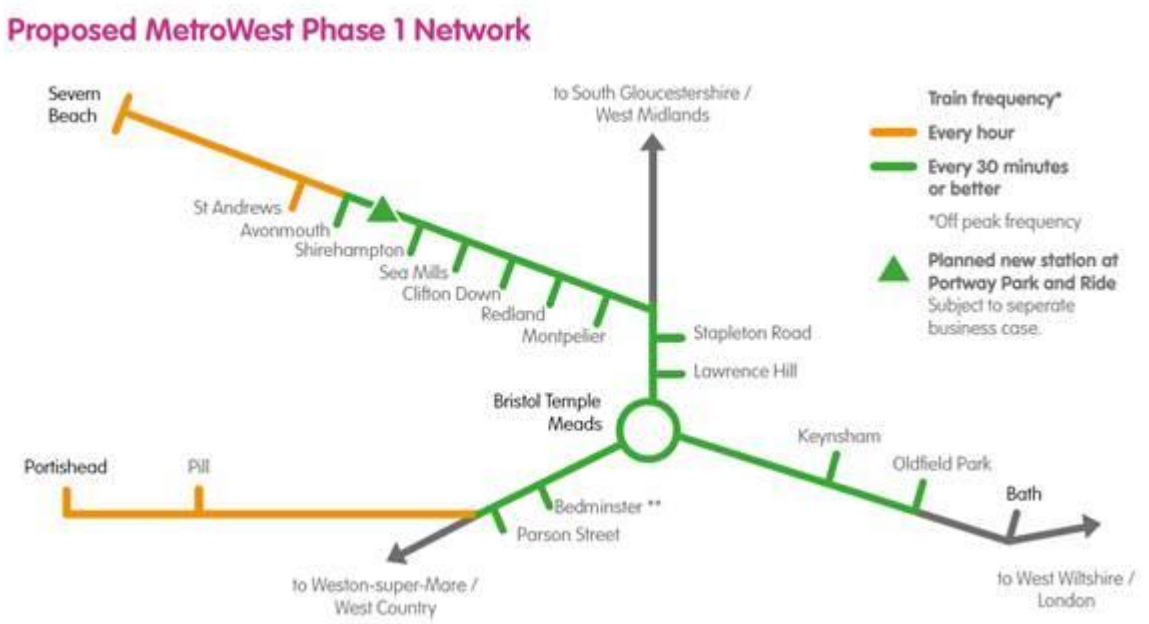
The hourly service for the Portishead Branch Line entails; passenger trains operating hourly all day between Portishead and Bristol Temple Meads, calling at Pill, Parson Street, and Bedminster. This provides up to 18 passenger trains in each direction per day (Mon-Sat), with approximately 10 passenger trains in each direction on Sundays. The alternative hourly service plus for the Portishead Branch Line entails; passenger trains operating every 45 minutes during the morning and evening peak and hourly off peak, between Portishead and Bristol Temple Meads, calling at Pill, Parson Street, and Bedminster. This

'hourly service plus' option provides up to 20 passenger trains in each direction per day (Mon-Sat), with approximately 10 passenger trains in each direction on Sundays. Both the 'hourly service' and an 'hourly service plus' option require exactly the same infrastructure.

FIGURE 1.1
Existing MetroWest Phase 1 Network (Not currently MetroWest branded)



Proposed MetroWest Phase 1 Network



Note that the assessments presented in this draft TA report are based on a different, and more intensive half-hourly rail service pattern than the hourly patterns that is currently proposed. The Environmental Statement and associated documents will report updated transport assessments.

1.2.3 MetroWest Phase 1 Objectives

The MetroWest Phase 1 principal business objectives are:

- To support economic growth, through enhancing the transport links to the Temple Quarter Enterprise Zone (TQEZ) and into and across Bristol city centre, from the Portishead, Bath and Avonmouth and Severn Beach arterial corridors;
- To deliver a more resilient transport offer, providing more attractive and guaranteed (future-proofed) journey times for commuters, business and residents into and across Bristol, through better utilisation of strategic heavy rail corridors from Portishead, Bath and Avonmouth, and Severn Beach;
- To improve accessibility to the rail network with new and reopened rail stations and reduce the cost (generalised cost) of travel for commuters, business and residents; and
- To make a positive contribution to social well-being, life opportunities and improving quality of life, across the three arterial corridors.

In addition, the MetroWest Phase 1 supporting objectives are:

- To contribute to reducing traffic congestion relative to a 'Do Minimum' scenario (as opposed to current levels of congestion) on the Portishead, Bath and Avonmouth, and Severn Beach arterial corridors;
- To contribute to enhancing the capacity of the local rail network, in terms of seats per hour in the AM and PM peak; and
- To contribute to reducing the overall environmental impact of the transport network.

1.2.4 MetroWest Phase 1 – A committed policy

The MetroWest programme of improvements has been a long-standing aspiration of all the West of England authorities and is identified in their Core Strategies. It therefore has an established and agreed policy context and complements the overarching development plans for the local area. The MetroWest Phase 1 is identified in the Joint Local Transport Plan 3 (JLTP3) (referenced as Greater Bristol Metro and Portishead line) as a future priority scheme following delivery of the current three bus rapid transit schemes and the Weston and Bath package.

The MetroWest programme is to be delivered over the next five to ten years during Network Rail Control Period 5 (2014-2019) and CP6 (2019-2024). The MetroWest programme will also extend the benefits of strategic transport interventions that are either in the process of being delivered or have been delivered by the West of England councils. These include the three MetroBus schemes (Ashton Vale to Temple Meads, South Bristol Link and North Fringe to Hengrove Package), Bath Package, Weston Package and the Local Sustainable Travel Fund programme. The delivery of these projects, together with the MetroWest programme, will result in better modal integration between rail, bus and active modes, providing an important step towards seamless modal transfer at key hubs across the West of England.

1.3 Consenting regime

The Planning Act 2008 introduced the DCO as the means of seeking planning permission for developments categorised as Nationally Significant Infrastructure Projects (NSIPs). NSIPs can include railway schemes where the railway will be constructed wholly within England, be part of a network operated by an approved operator, and the construction is not permitted development.

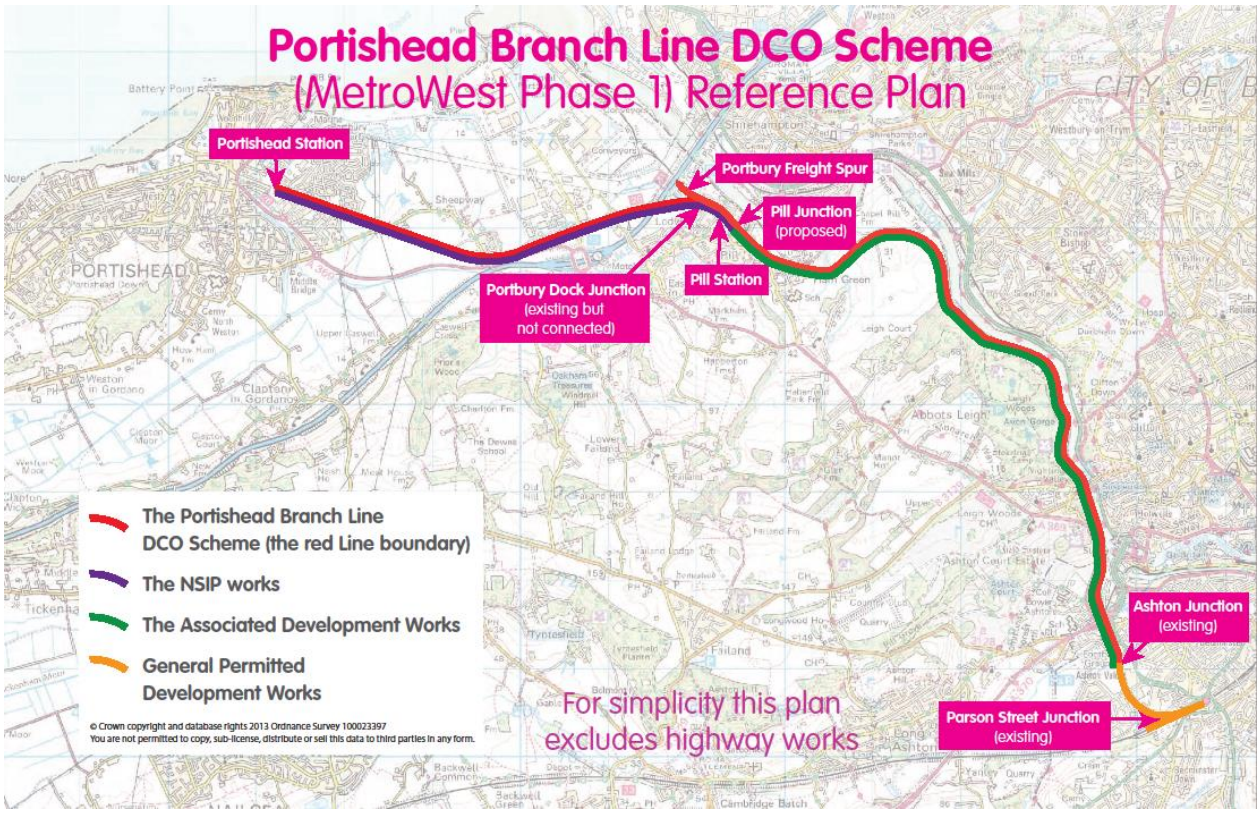
Under the Planning Act 2008, the scheme is classed as a NSIP and therefore needs to obtain development consent from the Secretary of State for Transport.

The scheme comprises the re-construction of the disused railway line between Portishead and Pill, the construction of a new station at Portishead, refurbishment of the disused station in Pill and the enhancement works to the Portbury freight line, is being sought under the DCO process.

NSC as the lead council, has been working closely with NR to ensure that all the work streams required to deliver the design, planning approvals and construction are progressed in tandem.

Figure 1.2 shows the location of the DCO Scheme (red line).

FIGURE 1.2
Portishead Branch Line DCO scheme (MetroWest Phase 1) – Indicative Red Line Boundary



The NSIP as defined under the Planning Act 2008, comprises of the reconstruction of 4750 metres of disused railway from Quays Avenue in Portishead, North Somerset (OSGR ST471765) to Pill in North Somerset (OSGR ST520762) with 750 metres of new parallel track through Pill village. The NSIP in summary includes a permanent railway of approximately 5450 metres long from Quays Avenue in Portishead to the existing operational railway (Portbury freight line) to the east of the M5 Motorway, then running parallel to the existing operational railway to a new junction east of Pill Viaduct (Pill Junction), to connect with the existing operational railway. The NSIP works comprises; the works to deliver the railway infrastructure, rail stations, car parks, pedestrian / cycle / highway infrastructure and maintenance compounds from Portishead to Pill Junction

The other works required for the Scheme, such as the new stations, works to the highway at Portishead and Ashton Vale Road and the alterations to the railway between Pill and Ashton Vale Level Crossing are defined as Associated Development under Section 114 of the Planning Act 2008.

Only the proposed infrastructure for the Portishead Branch Line is included in the DCO Scheme, as all the other works are within the existing operational railway and can be delivered utilising Network Rail's GPD rights. The GPD works include; the South Bristol Parson Street Junction upgrade (including signalling cabling/equipment to Ashton Junction), Bedminster Down Relief Line (partial re-instatement), Severn Beach / Avonmouth Signalling Enhancement and Bathampton Turnback.

1.4 The applicant

The MetroWest programme is being jointly promoted and developed by the four WoE councils. The Portishead Branch Line DCO scheme (MetroWest Phase 1) scheme is being promoted by NSC.

1.5 Scope of the report

1.5.1 Transport Assessment scoping

As part of the preparation, a TA Scoping Report has been written and a copy is located at **Appendix A**. This document has been informed by feedback and discussions with the Planning Inspectorate, NSC, BCC and Highways England (HE). The content of the TA has been further informed by the stage 1 stakeholder consultation that was undertaken by NSC during summer 2015. **Appendix A** also contains a copy of notes of the meetings held.

A number of matters were raised as part of the scoping and this TA seeks to address them directly. These include (this list is not exhaustive):

- Greater assessment of the construction impacts of the scheme on the highways network. Whilst dependent to a certain extent on the accompanying GRIP3 work, this should consider delivery routes and interim arrangements;
- A wider assessment of the parking impacts particularly in Portishead – taking into account existing parking demand and behaviour at other equivalent railway stations; and
- The need to look at the A369/St Georges Hill at Easton in Gordano junction, M5 J19 and a wider consideration of increased level crossings closures at Ashton Vale Road.

1.5.2 Consultation

The scheme has been subject of public consultation and stakeholder engagement. This is reported fully in the Consultation Report that supports the DCO.

In particular this TA has been informed by the consultation that was undertaken by NSC between 22 June 2015 and 3 August 2015. A total of 856 responses were received for the consultation and have been grouped into common topics and are outlined in **Appendix A**.

The results show that the vast majority of people support the scheme overall – 95% support them entirely or mainly. When asked what people's main concerns were overall, there was a clear indication that most people had no concerns (47%). 21% of respondent's states were concerned about 'traffic or parking'.

Of relevance to the TA, are the comments about:

- General concerns over the impact on parking, congestion and traffic surrounding the stations;
- Adequacy of parking spaces at the stations;
- Concerns relating to safety;
- Impacts to existing cycle paths;
- Concerns relating to pedestrian access; and
- Impacts on local roads during construction works.

Following the consultation work, further localised consultation work was carried out in 2016 about:

- Pill station; and
- Ashton Vale Road area.

Details of this consultation work are set out in the Pill Station and Ashton Vale Industrial Estate Alternative Access micro-consultations report (June 2016). Further consultation work has been undertaken in November/December 2016 in relation to the Ashton Vale Road alternative access with the relevant report yet to be published.

However, as the estimated capital cost of the project was substantially greater than the available budget, the four WoE councils agreed to that a staged approach to the delivery of the project as described in section 1.2.2. The delivery of Stage 1 alone has eliminated the requirements for an alternative access to Ashton Vale industrial estate due to the reduction in level crossing closures.

However, in the medium term after the delivery of Stage 1 of the scheme, it is likely that an alternative highway access will be required should funding for Stage 2 (when additional passenger trains will be added to the network i.e. 2 tph) be identified.

Note therefore that the assessments presented in this draft TA report are based the more intensive half-hourly rail service pattern than the hourly patterns that is currently proposed. The final Environmental Statement and associated documents will report updated transport assessments.

1.6 TA Guidance

Where possible, published guidance and standards have informed the structure of this TA. The DfT Guidance for Transport Assessment (GTA) was formally archived in October 2014. Nationally, this document has been replaced by two principal elements - 'Transport evidence bases in plan making and decision taking' and stronger reference to the existing National Planning Policy Framework (NPPF). At a local level, local authorities have been adopting new standards which largely replicate the GTA but reflect local priorities and circumstances.

The Transport Evidence Bases in Plan Making is less prescriptive than the previous guidance but cites a number of headings that need to be followed particularly in relation to the analysis of the transport impacts of local plans.

In the NPPF, paragraph 32 sets out all developments or schemes that generate significant amounts of transport movement should be supported by a TA or a Transport Statement (TS). Local planning authorities must make a judgement as to whether a proposal would generate significant amounts of movement on a case by case basis.

In identifying a need for a TA, the scale and level of detail should be established early in the development management process. This may include:

- The planning context of the development/scheme proposal;
- The area, scope and duration of the study;
- Assessment of public transport capacity, walking and cycling provision and highway network capacity;
- Road trip generation and trip distribution methodologies and assumptions about the development proposal;
- Measures to promote sustainable travel;
- Safety implications of the development/scheme; and
- Mitigation measures where applicable including scope and implementation strategy.

The scope and level of detail in a TA will vary from site to site but the following should be considered in defining the scope of the proposed assessment:

- Information about the proposed development/scheme, site layout including the proposed transport access and layout across all modes of transport;
- Information about neighbouring uses, amenity and character, existing functional classification of the nearby highway network;
- Data about the existing public transport provision including the provision and frequency of services and the proposed public transport changes;
- A qualitative and quantitative description of the travel characteristics of the proposed scheme, including movements across all modes of transport that would result from the development and in the vicinity of the site;

- An assessment of trips from all directly relevant committed development in the area (essentially development where there is a reasonable degree of certainty that development will progress within the next three years);
- Data about current traffic flows on links and at junctions within the study area and the identification of critical links and junctions;
- An analysis of injury accident records in the most recent three or five-year period;
- An assessment of the likely associated environmental impacts of transport related to the development (such as air quality management areas);
- Measures to improve the accessibility of the location (such as footway and cycleway links);
- Description of parking facilities in the area and the parking strategy of the development;
- Ways of improving sustainability by reducing the need to travel; and measures to mitigate the residual impacts of the development.

NPPF states that assessments should be based on normal traffic flow and usage conditions (for example, non-school holiday periods, and typical weather conditions). Projections should use local traffic forecasts such as TEMPRO drawing where necessary on National Road Traffic Forecasts (NRTF). In assessing the impacts, this TA goes beyond this and also utilises outputs from a rail demand model based on the West of England stations and a strategic transport model for Bristol and the surrounding area. The process is explained in Section. 5

The timeframe that the assessment covers should be agreed with the relevant consenting authority in consultation with the relevant transport network operators and service providers. However, in circumstances where there will be an impact on a national transport network, this period will be set out in the relevant Government policy.

NSC produced a Supplementary Planning Document (SPD) on TAs which was published in December 2015, located within the Highway Document Design Guide. The document offers guidance on the thresholds required for a Transports Assessment and guidance on the scope of the Transport Assessment.

The DfT Circular 02/2013 sets out the way in which Highways England will engage with communities and the development industry to deliver sustainable development and, thus, economic growth, whilst safeguarding the primary function and purpose of the strategic road network. The document states that Highways England should provide the local planning authority or other relevant consenting bodies with its assessment of the transport impact, as generally derived from a TA or TS incorporating a Travel Plan as required in the NPPF, produced by the promoter of the development concerned in line with current DfT guidance or on a basis otherwise agreed with Highways England. Where appropriate, conditions may be agreed to offset any unacceptable impacts that may be identified through the assessment process.

The planning guidance document 'The Strategic Road Network –Planning for the Future' provides guidance on the approach taken by Highways England to engaging in the planning system and the issues looked at when considering draft planning documents and planning applications. It offers advice on the information Highways England would like to see included in a planning application. The document specifies that TAs should generally be carried out in line with prevailing government guidance in agreement with Highways England, through pre-application and scoping.

1.7 Structure of this Transport Assessment

Based on the above approach and methodology, this TA is structured as follows:

- **Section 2 Policy Context.** This section outlines the pertinent national and local policies that need to be considered as part of the scheme. The aim of this section is to demonstrate the extent to which the scheme is aligned with these policies.

- **Section 3 Scheme Proposals.** This section outlines both the context and the detail of the scheme. It then examines the scheme proposals, particularly in the context of Portishead and Pill stations, Ashton Vale Road, the rail service pattern and the impacts on existing level crossings.
- **Section 4 Existing Conditions.** The aim of this section is to outline and fully understand the existing baseline conditions within the scheme area. This includes a review of existing land uses and committed development. The existing highway network is considered with a focus on both principal and local links and junctions. The section sets out an analysis of both the existing highway flows and parking conditions based on the surveys undertaken in the early part of 2015. The section also sets out accident data for the five year period by severity and looking at causal factors. Section 4 examines sustainable transport networks by reviewing both public transport provision and walking and cycling. This includes an analysis of the existing opportunities to access the station sites by sustainable means and includes a review of Non-motorised User (NMU) data. The Section concludes by considering the existing level crossings.
- **Section 5 Impact Methodology and assumptions.** This part of the TA outlines the methodology that has been used to determine the likely demand for the scheme. In doing so, a number of assumptions have had to be made and these are outlined here together with their rationale.
- **Section 6 Strategic Operational Impact Assessment.** This part of the TA outlines the strategic impact of the scheme on the highway network, and public transport.
- **Section 7 Local Operational Impact Assessment.** Within this section the local highway impacts of the scheme are assessed. The extent of the impacts and assessment are based on the scoping discussions that were held – with certain junctions, parking and walking and cycling networks being specifically identified.
- **Section 8 Construction Impact Assessment.** This part of the TA outlines the impact of the scheme construction on the local road network and Public Rights of Way (PROWs).
- **Section 9 Traffic Impacts.** This section builds upon the impact assessment and tests measures that may mitigate some of the concerns that have been identified.
- **Section 10 Transport Implementation Strategy.** This part of the TA summarises the measures that need to be implemented in support of the scheme. These include the additional infrastructure that will be required as well as the Construction Traffic Management Plan and the Outline Station Travel Plans.
- **Section 11 Conclusions and Recommendations.** The final section outlines the main conclusions of the TA with recommendations relating to the transport impacts of the scheme.

Section 2

Policy Context

2.1 Introduction

This section outlines the national and local transport and planning policies that the scheme needs to take account of. The emphasis throughout is to demonstrate the extent that the scheme is aligned to these policies and priorities.

2.2 National Policies and Strategies

The DCO Scheme will be determined in accordance with the decision-making framework set out in the Planning Act 2008 and National Planning Statement for National Networks (NPS NN) for Nationally Significant Infrastructure Projects (NSIP), and with consideration of other nationally important or relevant policies, such as those within the NPPF. The national legislative and policy framework relevant to the DCO Scheme are described in Table 2.1.

2.3 Local Policies and Strategies

The local planning framework comprises a number of key adopted documents which form the statutory development plan for each authority, against which proposals seeking planning permission are assessed. These comprise saved policies from extant Local Plans as well as new emerging policy documents.

MetroWest Phase 1 affects all four West of England Authorities while the DCO Scheme lies within the jurisdiction of two of the local planning authorities, NSC and BCC. Table 2.3 summarises the local planning framework for NSC and BCC. The main planning policies relevant to the DCO Scheme are presented in Chapter 6 of the EIA.

2.4 Emerging Policies and Strategies

The aim of this section is to note emerging policies and strategies. It is important to stress that these policies have not yet been adopted at the time of writing and as such as do not have satisfy the requirements. The emerging policies relevant to the DCO Scheme are described in Table 2.4.

2.5 Summary of Key Issues

This section has outlined the national and local transport policies and strategies pertinent to the scheme. The review indicates that the scheme is well placed to meet these policies by promoting modal shift towards sustainable transport, provide an alternative mode between Portishead and Bristol and would facilitate economic regeneration and growth. MetroWest Phase 1 has been a committed scheme for the WoE authorities for some years and is therefore committed in policies, and has shaped subsequent policies and strategies. There are, however, a certain number of outstanding policy matters for the scheme as follows:

- The scheme currently sits outside the vehicle and cycle parking standards for NSC and so will take account of NSC Local Plan policy CS11;
- Within Bristol, the impacts of increased level crossing downtimes, under policy DM23 Transport Development Management of the SADMP, need to be considered; and
- The highway design (including footways, cycleways and right of ways) will need to take account of the requirements of the adopted NSC Highways Development Design Guidance.

Note that the assessments presented in this draft TA report are based the more intensive half-hourly rail service pattern than the hourly patterns that is currently proposed. The final Environmental Statement and associated documents will report updated transport assessments.

TABLE 2.1
National Policies

Policy	Description	Objective/Relevance to TA	Ref. to EIA
Planning Act 2008	The Planning Act 2008 introduced the DCO regime as the means of seeking planning permission for developments categorised as NSIPs. These include railway schemes, where the railway when constructed [or altered] will be wholly within England, is part of a network operated by an approved operator, and where the construction is not permitted development	The proposed works to build the new railway between Portishead and Pill on NSC and Network Rail land is considered to be a NSIP for the following reasons: • The scheme when built will be wholly in England. • The scheme will form part of a network operated by an approved operator. The proposed new section of railway exceeds the threshold length of 2km.	Sections 6.3.2 to 6.3.10
The National Policy Statement on National Networks (December 2014)	This statement focuses upon the development of nationally significant infrastructure including road and rail networks. The document generally provides planning guidance for the promoter and the basis for examination for the examining authority and the Secretary of State where appropriate	Much of the statement concentrates upon the development and improving the resilience of the strategic highway network. The document states that the rail network should: • Offer a safer and reliable route to work; • Should facilitate an increase in both business and leisure travel; • Support existing public transport provision; • Facilitate better access to public services; and • Enable the transport of freight across the country including to and from ports. The proposed scheme is aligned with the national statement as it would offer a robust alternative to the A369 corridor between Portishead and Bristol where congestion in the peak hour is a major concern. It will enable both Portishead and Pill to be linked to the national rail network for the first time since the 1960s which will facilitate greater business and economic activity. Table 2.2 sets out the NPS areas that should be addressed in the TA.	Sections 6.3.134 to 6.3.7825
National Planning Policy Framework (the NPPF) (March 2012)	NPPF published by the Department for Communities and Local Government (DCLG) sets out the planning policies to achieve sustainable development. The NPPF seeks to promote growth whilst creating a high quality built environment underpinned by vibrant communities.	The pertinent aspects of the NPPF that need to be considered as part of a TA include: • Promoting sustainable transport (policy 4): This policy supports development that reduces greenhouse gases and reduces congestion, facilitates the use of sustainable modes of transport and develops strategies for the provision of viable infrastructure. • Requiring good design (policy 7): Good design is seen as a key aspect of sustainable development, is indivisible from good planning and should contribute positively to making places better for people. Good design applies to individual buildings, public and private spaces and wider area development schemes. Good design should not only enhance the aesthetic appearance of the development, but ensure that the development functions well, optimises the potential of the site, and creates safe and accessible environments for all.	Sections 6.3.7926 to 6.3.9138

TABLE 2.1
National Policies

Policy	Description	Objective/Relevance to TA	Ref. to EIA
		• Promoting healthy communities (policy 8): Developments can contribute to promoting healthy communities by providing safe environments free from crime, good access, and protecting and enhancing walking and cycling routes. There is a presumption in the NPPF in favour of sustainable development which is underpinned by a number of core principles as follows: • To proactively drive and support sustainable economic development to deliver the infrastructure that the country needs; • To support the transition to a low carbon future in a changing climate; • To contribute to conserving and enhancing the natural environment and reducing pollution; and • To actively manage patterns of growth to make the fullest possible use of public transport, walking and cycling. The promotion of sustainable modes of transport is intrinsically linked to the above. The NPPF aims to integrate planning and transport by noting that transport policies can help facilitate sustainable development as well as contributing to wider sustainability, health and economic objectives. Sustainable transport also improves accessibility to consumer and labour markets for businesses and improving access to jobs for the labour force. The scheme represents a considerable enhancement of public transport in the WoE as it will provide Portishead and Pill with a new and additional public transport alternative and satisfy the requirements of NPPF.	
Network Rail Long Term Planning Process (LTPP)	The LTPP focusses on the strategic planning of the rail network. The process is designed to be flexible so as to take into account the different requirements and demands on the network from various stakeholders.	The LTPP includes the preparation of market studies, route studies and cross-boundary analyses – of which the Great Western Route Utilisation Strategy is one	Section 6.6.3931
Great Western Route Utilisation Strategy (March 2010)	The existing Network Rail Great Western Route Utilisation Strategy (RUS) seeks to establish the strategic direction of the railway from a systematic analysis of the future requirements of the network. The RUS seeks to balance the capacity, passenger and freight demand, operational performance and cost whilst addressing the requirements of funders and stakeholders. The current iteration of the RUS focuses on the 10 year period to 2019 but also considers the implications of the growth in demand over a 30 year period.	The RUS identifies a number of issues with the rail network within the West of England area. These include: • Overcrowding on local services into Bristol Temple Meads particularly during peak periods; • Bottle necks on the Filton Bank between Dr Days junction (east of Bristol Temple Meads) and Filton Abbey Wood; • Track and signalling constraints particularly at junctions and crossovers at Bristol East, St Anne's and towards Parson Street; and	Section 6.6.3830

TABLE 2.1
National Policies

Policy	Description	Objective/Relevance to TA	Ref. to EIA
		• Limited standard pattern timetable services into Bristol including the Severn Beach Line. The RUS has a number of interventions and infrastructure improvements. These include the four tracking of the Filton Bank which will also be used by the electrification of the Great Western Main Line. Improvements to capacity at Bath Spa and increase in line speeds between Bristol Temple Meads and Bridgwater	
Network Rails Hendy Review	In November 2015 Sir Peter Hendy reported to the Secretary of State for Transport on the replanning of NR's Investment Programme. The purpose of the review was *"... to conduct a thorough review of the enhancement programme in England & Wales to see what can be delivered in an affordable and timely way within the funding period to 2019."* A subsequent 'Enhancements Delivery Plan Update' report was published in January 2016, which included a chapter covering projects that make up the 'Great Western Capacity Programme and Electrification'	MetroWest Phase 1 is not specifically dependant on Great Western Main Line electrification being complete in the Bristol area, so deferral of sections of electrification does not directly impact on MetroWest Phase 1. However, there are knock-on effects relating to MetroWest Phase 1 dependency on elements of related infrastructure. There are also linkages with the electrification programme in terms of the detail and timing of rolling stock cascades within the Great Western franchise fleet, and the types of trains available to run services. MetroWest Phase 1 services have been planned as part of the timetable envisaged when Intercity Express Programme (IEP) trains are operational, and specifically the timetable assuming that all IEPs are electrically powered. Deferring electrification is possible because IEP trains for the Great Western Main Line are all being built as bi-mode trains that can run on diesel power where electrification is not in place, but it is likely that they will not be able to achieve the previously envisaged (all electric) timetable. This has the effect of increasing the constraints on other services on the network in the area, including proposed MetroWest Phase 1 services. Hence, infrastructure changes associated with the electrification programme deliver capacity benefits needed by MetroWest Phase 1 services. Specifically, MetroWest Phase 1 services are dependent on Bristol East Junction remodelling and Filton Bank 4-tracking. In the case of Bristol East Junction, this is partly as a result of changes to timetable assumptions precipitated by deferral of electrification and bi-mode operation of IEP trains. However, funding for the enhancement of Bristol East Junction has not yet been secured in CP5 (which ends in March 2019), and electrification will also probably follow its remodelling. Filton Bank 4-tracking is programmed for completion in December 2018 (Enhancements Delivery Plan Update report), though it will now be electrified after its completion	

TABLE 2.2
Assessment of the TA against the NPS

NPS Ref	Topic	Key issues	The focus of the TA
2.2	Addresses congestion and crowding to provide safe, expeditious, resilient networks supporting social and economic activity, capable of stimulating and supporting economic growth	The benefits of the Project are as follows: • reducing the rate of congestion growth; • improving economic activity; and • reducing journey times.	The purpose of the scheme to promote modal shift which would improve access to employment and economic opportunities such as the Temple Quarter Enterprise Zone around Bristol Temple Meads station
2.9	Enhance accessibility for non-motorised users	• Demonstrate and improve linkage between Portishead and Bristol. • Provide a safe link by means of a footbridge between Trinity Primary School and the residential land to the south of the line. • Reduce impact on PROWs between Pill and Portishead.	Metro West Phase 1 is primarily a public transport scheme and there will be a need to ensure the stations are readily accessible to pedestrians and cyclists.
2.29	Driver of economic growth and social development	• Safe and reliable route to work; • Increase business and leisure travel; • Support reasonable and local public transport to connect communities and public services with workplaces and with each other; • Provide for transport of freight.	MetroWest Phase 1 has a clear business strategy and is closely aligned with the strategic aims and responsibilities of the four West of England authorities, the Local Enterprise Partnership (LEP) and Network Rail and provides a tangibly integrated approach to the travelling public by providing the basis for a truly 'Metro' level of service for West of England local rail network, alongside the substantial investment in the long distance rail routes to and from the West of England. The MetroWest Phase 1 principal business objectives are: • To support economic growth, through enhancing the transport links to the Temple Quay Enterprise Zone (TQEZ) and into and across Bristol city centre, from the Portishead, Bath and Avonmouth and Severn Beach arterial corridors. • To deliver a more resilient transport offer, providing more attractive and guaranteed (future-proofed) journey times for commuters, business and residents into and across Bristol, through better utilisation of strategic heavy rail corridors from Portishead, Bath and Avonmouth, and Severn Beach. • To improve accessibility to the rail network with new and reopened rail stations and reduce the cost (generalised cost) of travel for commuters, business and residents. • To make a positive contribution to social well-being, life opportunities and improving quality of life, across the three arterial corridors

TABLE 2.2
Assessment of the TA against the NPS

NPS Ref	Topic	Key issues	The focus of the TA
2.35	Reducing pollution and congestion	Demonstrate the air quality and travel time improvements resulting from the scheme	The scheme is likely to reduce the overall impact of traffic growth on the highway network and as such the overall impact on air quality is likely to be negligible. There may be some localised impacts around the stations and the railway line alignment
5.201-5.218	Impacts on transport networks	Assess local plan policies on demand management and other relevant policies; consult with the highway authority and local planning authority	MetroWest Phase 1 has been assessed against national and local transport and planning policies and this is outlined in section 2 of this TA. Consultation with highway authorities has been undertaken to inform this TA with the elements and this is outlined in section 1

TABLE 2.3
Local Policies

Policy	Description	Objective/Relevance to TA	Ref. to EIA
Joint Local Transport Plan 3 2011 to 2026 (March 2011)	The plan, published by the West of England authorities outlines the transport strategy for the period up to 2026. It focuses on five goals: reducing carbon emissions, supporting economic growth, improving accessibility, providing for a safe, healthy and secure population, and enhancing quality of life.	The plan outlines the West of England as one of the fastest growing economies in the UK and a critical hub for the South-West's economy. It also highlights major transport improvements as a key priority for businesses. The plan aims to synchronise transport investment with major development and regeneration areas, such as Bristol's TQEZ. The plan indicates that residents in North Somerset would be beneficiaries of any investment in transport infrastructure. Currently, residents in the district have the worst accessibility to major employment sites of any residents across the West of England. Only 21% of residents can access major employment sites by public transport within 20 minutes, compared to a regional average of 31%. At the same time, only 55% of residents have access within 40 minutes, compared to 73% for the West of England. MetroWest Phase 1 will provide both a new link and alternative mode to and from the centre of Bristol with improved connections to North Bristol, Avonmouth and Bath. The key strategy of the plan is to support economic growth by providing an affordable, low carbon, accessible, integrated, healthy, safe and reliable transport network. Provision of reliable public transport infrastructure is considered to be a vital mechanism for achieving this strategy. In particular, the plan acknowledges a range of major transport schemes that were prioritised through the DfT's Regional Funding Allocation. These major schemes include significant investment in rail infrastructure such as MetroWest Phase 1. The scheme aims to reinstate rail connections between Portishead and Bristol, to provide enhanced accessibility.	Sections 6.6.1 to 6.6.4
West of England LEP Strategic Economic Plan 2015 to 2030 (March 2014)	The Strategic Economic Plan (SEP) prepared by West of England LEP outlines how the region will achieve sustainable economic growth over the plan period. Specifically, the SEP was prepared to support the West of England's attempts to secure government funding to assist economic development in the region between 2015 and 2021, via the Local Growth Deals initiative.	Within this context, the SEP aims to facilitate the creation of more than 25,000 jobs and develop an economy worth around £25bn per year (which also contributes some £10bn to the Treasury annually). The LEP vision is to encourage sustainable economic growth and the creation of substantial numbers of new private sector jobs by: • Supporting growth of key sectors; • Driving innovation and creativity and the development of new technologies, products and services; • Skilling the workforce to meet needs of our businesses now and in the future. Retaining existing talent, raising aspirations and marketing talent to inward investors;	Sections 6.6.12 to 6.6.14

TABLE 2.3
Local Policies

Policy	Description	Objective/Relevance to TA	Ref. to EIA
		• Assisting business start-up and growth; and • Making the West of England highly attractive to inward investors and existing companies by securing improved transport, environmental and broadband infrastructure that business needs; providing access to a range of employment land and premises; facilitate new housing and community structure; maintaining an outstanding physical environment and high quality of life to retain and attract highly skilled workers and graduates. The SEP positions the West of England as 'the city region of choice for a sustainable future', based on the region's legacy of innovation, world class university and research facilities, strong visitor economy and high quality of life. This positioning is supported by a focus on five priority sectors: creative and digital media, low carbon, high tech industries, advanced engineering and aerospace and professional services. The SEP highlights that expansion of these sectors will be driven by a number of 'levers of growth', including investment and promotion and places and infrastructure. In particular, infrastructure is presented as a key enabler of growth in the region, with MetroWest rail improvements Phase 1 and Phase 2 emphasised as key cross-boundary infrastructure interventions in the SEP. The SEP makes reference to the contribution to the region's economy and jobs as a result of MetroWest Phase 1. These economic outputs will be achieved by increasing the connectivity between Temple Quarter Enterprise Zone and the West of England's various Enterprise Areas, meaning major employment sites are brought closer to the skilled workforce residing in the region.	
North Somerset Local Plan (March 2014)	The Local Plan for North Somerset guides future development within the DCO Application Area and comprises the following formal documents: • North Somerset Council Core Strategy (April 2012) (see below) • Sites and Policies Plan Part 1: Development Management Policies (July 2016) • Saved policies from the Replacement Local Plan (March 2007) • Long Ashton Neighbourhood Development Plan 2013 – 2033 (May 2015) • West of England Joint Waste Core Strategy (2011)	Of these plans, the policies within the Core Strategy, the saved policies of the Replacement Local Plan and the policies within the Sites and Policies Plan Part 1: Development Management Policies are considered to be of particular relevance to the application.	Sections 6.5.3 to 6.5.9

TABLE 2.3
Local Policies

Policy	Description	Objective/Relevance to TA	Ref. to EIA
North Somerset Council Core Strategy (April 2012)	The Core Strategy sets out the broad long-term vision, objectives and strategic planning policies for North Somerset up to 2026. It was the subject of a legal challenge in 2012 in respect of housing supply Figures and was remitted to the Planning Inspectorate and was the subject of independent hearings in March 2014.	The policies of particular relevance to the DCO Scheme are shown in Table 6.1 of the EIA. An assessment of the DCO Scheme's compliance with these policies is provided in Appendix 1 of the Planning Statement.	Sections 6.5.10 to 6.5.11

Safeguarding in Local Plans (February 2015) (Incorporating Main Modifications, January 2016)	The development management policies are generic policies that are used when assessing a range of planning applications and development proposals. It does not contain site allocations, but instead focuses on a broad range of development issues such as the Green Belt, major transport schemes, development in the countryside and retailing.	The area in which the proposed scheme will be located comes under the safeguarding policy in "Sites and policies plan part 1 development management" (Publication Version) (February 2015) which complements the strategic context set out in the Core Strategy, and it states existing and proposed railway lines have a policy aim to:
		• To protect existing and proposed railway lines from inappropriate development.
		Policy DM22 goes on to say:
		• A corridor extending 10 metres either side of the existing tracks of the Taunton-Bristol railway line as shown on the Proposals Map is safeguarded for the provision of additional tracks. Development within this corridor will be permitted if it would not prejudice future capacity enhancements.
		• Land shown on the Proposals Map is safeguarded for the following alignments. Development will only be permitted if it would not prejudice the use of these alignments for rail traffic:
		  • Weston Railway Loop southern chord; and
		  • Portishead – Pill (for the Portishead to Bristol railway line including railway stations and associated car parking and highway works).
		Those policies of particular relevance to the DCO Scheme are shown in Table 6.3 of the EIA while an assessment of the DCO Scheme's compliance with these policies is provided in Appendix 1 of the Planning Statement.
			Sections 6.5.15 to 6.5.16

North Somerset Parking Standards (November 2013)	The North Somerset Parking Standards Supplementary Planning Document (SPD) defines and outlines the authority's approach to parking for new schemes/developments	The document explains that at non-residential locations, it is essential to manage the demand for car use by ensuring that the availability of car parking spaces does not discourage the use of alternative transport modes whilst ensuring that commuter car parking does not adversely impact on the surrounding local area. Refer to Section 7.5.1 of the TA for further details.	Section 6.5.5
North Somerset Highways Design Guide (October 2015)	The North Somerset Highways Design Guide sets out the standards and approach to design in connection with highways, footways, accesses and a range of other aspects of highway design.	The guidance applies to all highways schemes relating to new development within North Somerset including alterations or works to the existing highway and other transport infrastructure and associated works. Refer to Section 7.6.1 of the TA for further details.	N/A

TABLE 2.3
Local Policies

Policy	Description	Objective/Relevance to TA	Ref. to EIA
Bristol Local Plan – Core Strategy (June 2011)	The Bristol Core Strategy is part of the Local Plan (formerly the Local Development Framework), which sets out the overall approach and spatial strategy for future development in Bristol and provides the overarching strategic policy and guidance to deliver sustainable communities and economic growth across the City.	The policies within the Bristol City Council Core Strategy of particular relevance to the DCO Scheme are shown in Table 6.4 of the EIA. An assessment of the DCO Scheme's compliance with these policies are provided in Appendix 1 of the Planning Statement.	Sections 6.5.20 to 6.5.23
Site Allocation and Development Management policies (SADMP) Local Plan (July 2014) (Published by BCC)	This document supports the Core Strategy and outlines the development management policies, site designations and allocations.	Those policies within the Site Allocations and Development Management Policies of particular relevance to the DCO Scheme are shown in Table 6.5 of the EIA. An assessment of the DCO Scheme's compliance with these policies is provided in Appendix 1 of the Planning Statement.	Sections 6.5.24 to 6.5.26
Bristol Central Area plan (March 2015)	This document, which is part of the Bristol Local Plan, explores how Bristol City Centre will develop to the period up to 2026. It supports policy BCS2 of the Core Strategy that seeks to provide around 150,000 sq. m of net additional office space, 7,400 new dwellings and improved connectivity by transport.	The scope of the DCO works do not extend into the boundary of the Central Area Plan and therefore the policies of the Plan have not been considered further.	Sections 6.5.27 to 6.5.28

TABLE 2.4
Emerging Policies

Policy	Description	Objective/Relevance to TA	Ref. to EIA
WoE Joint Spatial Plan	This proposed statutory document will establish the housing requirement to be accommodated across the four West of England local authorities for the period from 2016 to 2036. The plan itself will provide a robust evidence base to inform each of the local authorities' Local Plan reviews.	The scope of the plan is limited to the following spatial matters: • The overall housing requirement to be accommodated in the WoE; • The broad strategic distribution of housing and employment land including strategic locations and key sites; and • Identification of strategic infrastructure proposals including transport required to deliver the scale of the development envisaged.	N/A
WoE Joint Transport Study	B&NES, BCC, NSC and SGC are preparing a joint study in parallel with the WoE Joint Spatial Plan, which is looking at how to meet the need for housing and employment space up to 2036.	The Joint Transport Study provided people with an opportunity to voice their opinion on how transport should be provided in the West of England over the next 20 years One of the concepts up for discussion and consultation was to undertake further improvements to the MetroWest rail concept which could improve the Henbury line, new rail line re-openings, and provide more capacity between Bristol and Bath and to South Wales.	N/A
North Somerset Guidance on Transport Assessments	In December 2015, North Somerset Council issued a new guidance document on preparation of Transport Assessments. Whilst this guidance largely seeks to replicate the previous GTA, it has been tailored to the policies and priorities of North Somerset.	Refer to sections 1.7 and 1.8 of the TA	N/A

Section 3

Scheme Proposals

3.1 Introduction

This section of the TA summaries the main elements of the proposal. The focus here is on the transport related aspects of the development such as the proposed service level, access and parking arrangements around the stations.

3.2 Scheme description

MetroWest Phase 1 will introduce new / enhanced rail passenger services across Bristol with a service pattern between Portishead, Bath Spa and Severn Beach, with intermediate stops. This will entail upgrading the existing freight only line between Parson Street junction and Portbury Dock junction (Pill), reinstatement of the current disused line between Portbury Dock junction and Portishead, and various minor works to facilitate the operation of the Phase 1 train services. A new station will be required at Portishead and the former station at Pill will be re-opened.

The following engineering works have been proposed, in order to deliver MetroWest Phase 1 and shown in Table 3.1. Elements A to AL, AN to AT, and AX are within the North Somerset Council local government boundary. Works Nos. AU to AY are within the Bristol City Council local government boundary. Work No. AM straddles both local government boundaries.

Note that the assessments presented in this draft TA report are based the more intensive half-hourly rail service pattern than the hourly patterns that is currently proposed. The final Environmental Statement and associated documents will report updated transport assessments.

TABLE 3.1
MetroWest Phase 1 Proposed Engineering Works

Proposed DCO Scheme Element	Description of DCO Scheme Element	Permanent or Temporary	Current land use
The Nationally Significant Infrastructure Project			
A	The NSIP comprises a new permanent railway approximately 5450 metres long from the junction of Quays Avenue and Harbour Road in Portishead to meet the existing Portbury Dock railway to the east of the M5 Motorway, then running parallel to the existing freight line to a new junction with the existing operational railway line between Pill Viaduct and the western portal of Pill Tunnel. The works include railway engineering works to: • replace the track formation, • repair or replace culverts, • repair or replace bridges and other structural assets, • minor earthworks and alterations to cuttings, install signalling, electrical and communication systems, and works to Pill Viaduct, installation of a new railway junction (Pill Junction), • noise barriers, and • fencing.	Permanent	Disused railway line between Portishead and Portbury Junction. Through Pill the new railway will be laid on operational railway land next to the existing freight line.
Associated Development			
B	The construction of a car park to the south of Harbour Road, Portishead and to the west of Quays Avenue (car park B) and pedestrian / cycling path.	Permanent	Disused railway corridor and undeveloped land.
C	Realignment of Quays Avenue and construction of new roundabout which also includes controlled parallel crossings on the Harbour Road and Pheonix Way arms.	Permanent	Highway land (Phoenix Way, Harbour Road and Quays Avenue) and undeveloped land.
D	A new railway station comprising platform, shelter, ticket office and waiting area, public toilet, lighting columns and railway communications mast, to the east of the realigned Quays Avenue, Portishead.	Permanent	Highway land (Quays Avenue) and undeveloped land.
E	Provision of a Toucan crossing on Quays Avenue west of the station site (entrance).	Permanent	Highway land (Quays Avenue)

TABLE 3.1
MetroWest Phase 1 Proposed Engineering Works

Proposed DCO Scheme Element	Description of DCO Scheme Element	Permanent or Temporary	Current land use
F	Provision of two bus stops (east bound and west bound) closer to the railway station.	Permanent	Highway land (Quays Avenue)
G	Car park (car park A) taxi and bus facilities on the eastern side of the realigned Quays Avenue and south of Phoenix Way Portishead.	Permanent	Highway land (Quays Avenue)
H	New pedestrian and cycle paths to the north and south of the new railway to connect Quays Avenue with the new pedestrian and cycle bridge west of Trinity Primary School.	Permanent	Disused railway and open space.
I	A new pedestrian and cycle bridge west of Trinity Primary School, Portishead over the Portishead Branch Line.	Permanent	Disused railway and open space.
J	A path south of the Portishead Branch Line Railway to connect the new pedestrian and cycle bridge to Galingale Way, Portishead.	Permanent	Permissive Footpath and open space.
K	A path north of the Portishead Branch Line Railway to connect the new pedestrian and cycle bridge north to Tansy Lane, Portishead.	Permanent	Permissive Footpath and open space – amenity grass with occasional shrubs and trees.
L	Construction haul road on south side of, and parallel to, Portishead Branch Line Railway, south of Fennel Road to the highway known as Sheepway.	Temporary	Agricultural land
M	A new maintenance compound and road rail access point to the Portishead Branch Line Railway from the north side of the highway known as Sheepway and on the northern side of the railway, close to the overbridge carrying the highway known as Sheepway over the railway, opposite Sheepway Gate Farm, Sheepway.	Permanent	Scrubland and agricultural land
N	Construction compound and access from the highway from Sheepway, on the north side of Sheepway and northern side of the Portishead Branch Line Railway opposite Sheepway Gate Farm, Sheepway.	Temporary	Agricultural land
O	Construction haul road on south side of, and parallel to, the Portishead Branch Line Railway, west from the highway of Sheepway to the proposed construction compound north of the Portbury Hundred highway.	Temporary (with permanent works to improve the access to Sheepway)	Agricultural land

TABLE 3.1
MetroWest Phase 1 Proposed Engineering Works

Proposed DCO Scheme Element	Description of DCO Scheme Element	Permanent or Temporary	Current land use
P	Construction compound between north of The Portbury Hundred highway and the Portishead Branch Line Railway and west of the junction of Station Road with Portbury Hundred, Portbury.	Temporary	Agricultural land
Q	Permanent improvements to the access from The Portbury Hundred highway to the field to the south of Portishead Branch Line and west of Station Road, Portbury	Permanent	Highway and agricultural land
R	Turning circle east of The Drove on the South side of the Portishead Branch Line	Temporary	Agricultural land.
S	Car parking spaces for Network Rail for use during maintenance and improvement of car parking spaces for Wessex Water.	Permanent	Informal parking areas.
T	Alteration to existing bridleway crossing at Royal Portbury Dock Road and alterations to National Cycle Route 26 at the Portishead Branch Line underbridge.	Permanent	Bridleway and disused railway
U	Alterations to permissive path comprising National Cycle Route 26 at Marsh Lane underbridge, Portbury.	Permanent	Cyclepath and disused railway
V	Haul road on the North side of railway from Marsh Lane to Cattle Creep Bridge and on to the proposed construction compound under the M5.	Temporary	Cyclepath and bridleway along the disused railway
W	Vehicular Access (on south side of disused railway) from Marsh Lane east to the accommodation underbridge on the Portishead Branch Line Railway to the West of the M5 Motorway	Temporary vehicular construction access and permanent access on foot.	Agricultural
X	Alterations to permissive path comprising part of National Cycle Route 26 at the Portishead Branch Line Railway underbridge beneath the M5 Motorway	Permanent	Disused railway and cyclepath
Y	New bridleway under the M5 Motorway Avonmouth Bridge east to the existing National Cycle Route 41 from Pill to Avonmouth	Permanent	Cyclepath, scrub and wasteland

TABLE 3.1
MetroWest Phase 1 Proposed Engineering Works

Proposed DCO Scheme Element	Description of DCO Scheme Element	Permanent or Temporary	Current land use
Z	Construction compound at Lodway Farm with highway access from Marsh Lane east via the Portishead Branch Line Railway bridge under the M5 Motorway and also access via The Breaches (Pill)	Temporary	Agricultural land
AA	Avon Road embankment strengthening works and temporary access to the south of the Portishead Branch Line through back gardens off Lodway Close.	Temporary	Agricultural and residential gardens
AB	Demolition and construction of the Avon Road Underbridge in Pill.	Permanent	Existing underbridge and footpath between Avon Road and Lodway Close.
AC	Temporary diversion of NCN 41 on North side of the Portishead Branch Line and temporary construction compound alongside the railway.	Temporary	NCN 41 and pedestrian access and Jenny's Meadow.
AD	Demolition of existing garages, temporary construction compound and re-construction of replacement garages on the north side of the Portishead Branch Line Railway to the South of Avon Road, Pill	Temporary compound and permanent replacement garages	Highway, yard and residential garages
AE	Demolition of wall fronting residential property known as Victoria House, Marine Parade, Pill to facilitate access for crane to construct the underbridge to the south of Avon Road, Pill	Temporary demolition and reinstatement	Residential
AF	Car park to serve Pill Station, to the south of Severn Road and Monmouth Court, Pill. Site for a new Power Supply Point ("PSP") for the railway.	Permanent	Former railway goods yard
AG	Temporary construction compound at Pill Yard, the proposed site of Pill station car park.	Temporary	Former railway goods yard
AH	New station on the site of the southern platform of the former station at Pill and new station forecourt on the site of 7 Station Road Pill (to be demolished), together with re-profiling and associated strengthening works to cutting slope to the rear of properties fronting Sambourne Lane and Hardwick Road, new access from the station forecourt to the platform, new platform with shelter and lighting, and fire refuge area down track of the platform.	Permanent	Disused Pill station and residential / commercial property.

TABLE 3.1
MetroWest Phase 1 Proposed Engineering Works

Proposed DCO Scheme Element	Description of DCO Scheme Element	Permanent or Temporary	Current land use
AI	Temporary construction compound in area proposed for the new Pill station forecourt.	Temporary	House and commercial property
AJ	Temporary construction compound at Pill Library car park and access onto the highway known as Underbanks.	Temporary	Pill library car park and highway
AK	Embankment strengthening works on the east side of Pill Viaduct to the rear of property off Mount Pleasant.	Permanent	Existing embankment on the operational railway.
AL	New Pill Junction between Pill Viaduct and the western portal of Pill tunnel where the existing and new railway tracks combine to the single track.	Permanent	Existing operational railway
AM	Railway engineering works from Pill Junction, to the west of the western portal of Pill Tunnel, to Ashton Junction. These works include: • 6 micro-compounds along the Avon Gorge with basic welfare facilities; • alterations to the track, including vertical and horizontal alignment, • replacing sleepers, ballast cleaning, and geotechnical works, • repairing and replacing culverts, • minor works to tunnels, • repairing or replacing bridges and other structural assets, minor earthworks and alterations to cuttings and embankments, • loose rock picking of cliff faces, • installing an intermediate signal, • replacing the signalling and electrical systems, • installing a train driver communication system, • replacing fencing along the railway alignment and • new maintenance access points from the existing River Avon Tow Path to the Portishead Branch Line Railway.	Permanent	Operational railway land
AN	Provision of a ghost island at Ham Green/Macrea Road	Permanent	Highway
AO	Site for the new PSP building, compound, road rail access point and associated access road from the highway of Chapel Pill Lane, Ham Green North of the eastern portal of Pill Tunnel.	Permanent	Pasture land.

TABLE 3.1
MetroWest Phase 1 Proposed Engineering Works

Proposed DCO Scheme Element	Description of DCO Scheme Element	Permanent or Temporary	Current land use
AP	Construction compound and rail access off Chapel Pill Lane.	Temporary	Pasture land.
AQ	Route for new electricity cables to connect the existing Distribution Network Operator's cables at Chapel Pill Lane overbridge, Ham Green, to the Portishead Branch Line Railway at the site for the PSP off Chapel Pill Lane.	Permanent	Private means of access.
AR	Permanent access to the South of the operational railway from Chapel Pill Lane to the Portishead Branch Line near Miles Underbridge.	Permanent	Agricultural land
AS	Works to Quarry underbridge No. 2.	Permanent	Underbridge and access
AT	Construction compound on West side of the operational railway adjacent to Quarry underbridge No. 2.	Temporary	Underbridge and access
AU	A new vehicular maintenance road rail access point from the highway of Clanage Road, Bower Ashton to the Portishead Branch Line Railway.	Permanent	Private sports field.
AV	Construction compound at Clanage Road in Bower Ashton.	Temporary	Private sports field
AW	Provision of a ramp to the west of the Portishead Branch Line Railway and north of the Ashton Vale Level Crossing to connect pedestrians and cyclists between Ashton Vale Road and Ashton Road (A370).	Permanent	Operational railway land
AX	Ashton Vale Level Crossing to be modified, but remain operational. Extension of left turn flare lane on Winterstoke Road onto Ashton Vale Road and optimisation of the Ashton Vale Road signals and upgrade of signals to “MOVA”.	Permanent	Local highway
AY	Permanent closure of Barons Close pedestrian level crossing (currently closed temporarily during the construction of AVTM MetroBus). Alternative pedestrian access along pedestrian and cycle path under construction by MetroBus scheme linking to the Ashton Vale Road level crossing and the proposed MetroWest Phase 1 pedestrian / cycle ramp.	Permanent	Railway and highway
Associated Development at Royal Portbury Dock			

TABLE 3.1
MetroWest Phase 1 Proposed Engineering Works

Proposed DCO Scheme Element	Description of DCO Scheme Element	Permanent or Temporary	Current land use
AZ	Replacement of the signalling equipment of the half kilometre section of railway from Portbury Dock to Portbury Dock Junction, within the land of the Bristol Port Company.	Permanent	Port operational land.

3.3 Portishead station

Portishead station will be the terminus of the new service and will be located to the southeast of the Quays Avenue, Harbour Road and Phoenix Way roundabout. It will have a single platform and will be staffed. In order to accommodate the new station, Quays Avenue will be modified to re-align the northern part of Quays Avenue to the west, undertake alterations to Phoenix Way and relocate the existing roundabout approximately 100 metres to the west. The highway alterations will also include various formal and informal pedestrian crossings and cycling route enhancements. Figures 3.1 to 3.3 show the location of the station with the corresponding highway improvements.

The scheme will provide two car parks – one to the immediate north of the station which will be accessed directly off Phoenix Way. This car park will comprise 71 spaces of which 13 will be designated for disabled users, 3 allocated to the train company and 3 for taxis. The car park will also include a covered bicycle parking area to accommodate approx. 50 bicycles as well as a small area for drop off movements and for taxis. The second car park is proposed to the south-west of the station site and will be accessed from Harbour Road. This car park which is linear in shape will comprise 215 standard parking spaces.

To support movement and circulation around the station, there are a number of enhancements to the pedestrian and cycling environment. A toucan crossing across Quays Avenue is proposed which will link the new bus stops that are planned to the south west of the station site. The crossing is also aligned with a new shared use path that will run parallel with Harbour Road and will provide the principal pedestrian and cyclist access from the station towards the town centre. The station will also link with proposed footpaths connecting with the Trinity Primary School crossing (proposed overbridge, refer to section 3.6.1) along both the north and south side of the railway.

FIGURE 3.1
Indicative Portishead station preferred option – Drawing 1

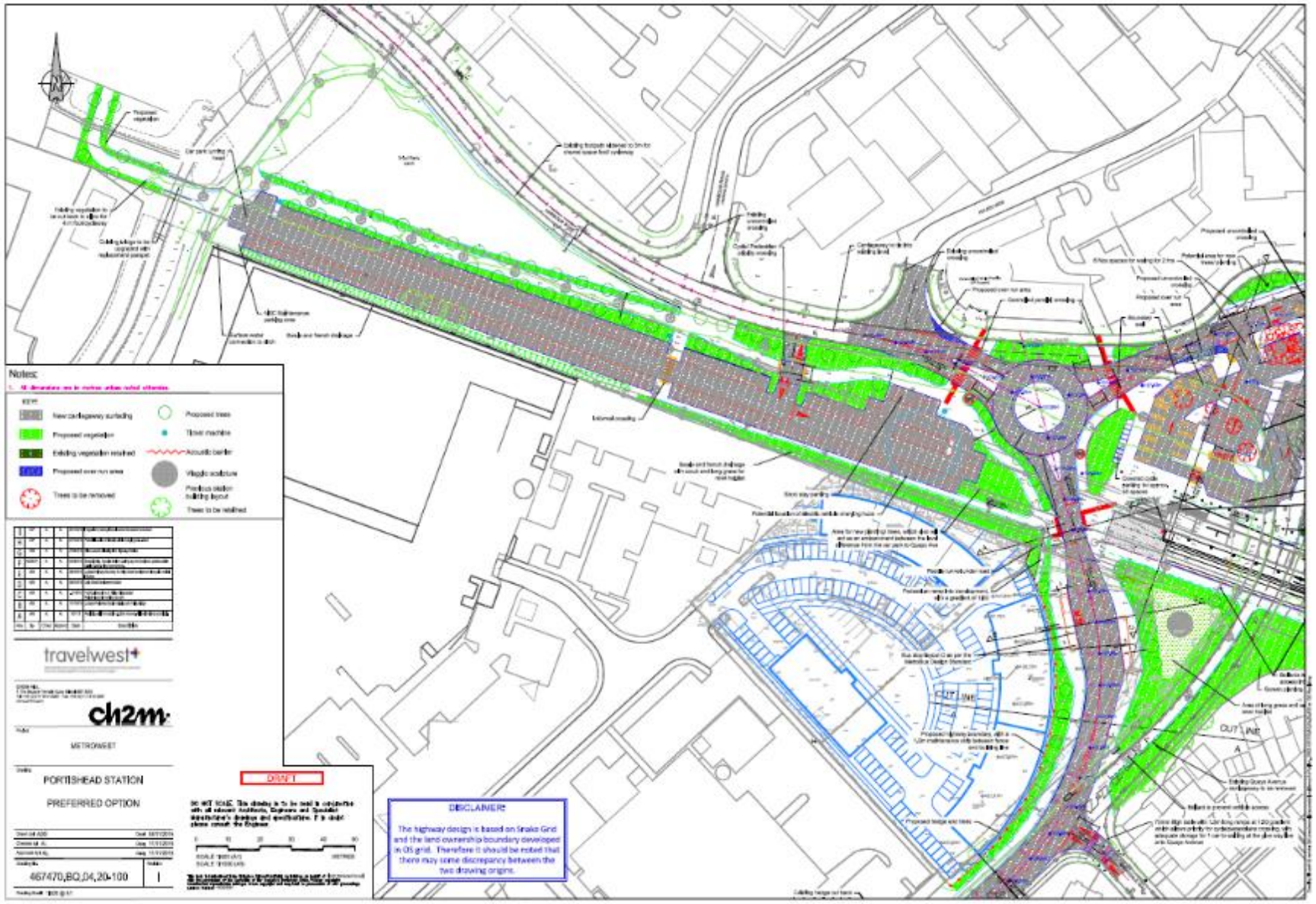


FIGURE 3.2

Indicative Portishead station preferred option - Drawing 2

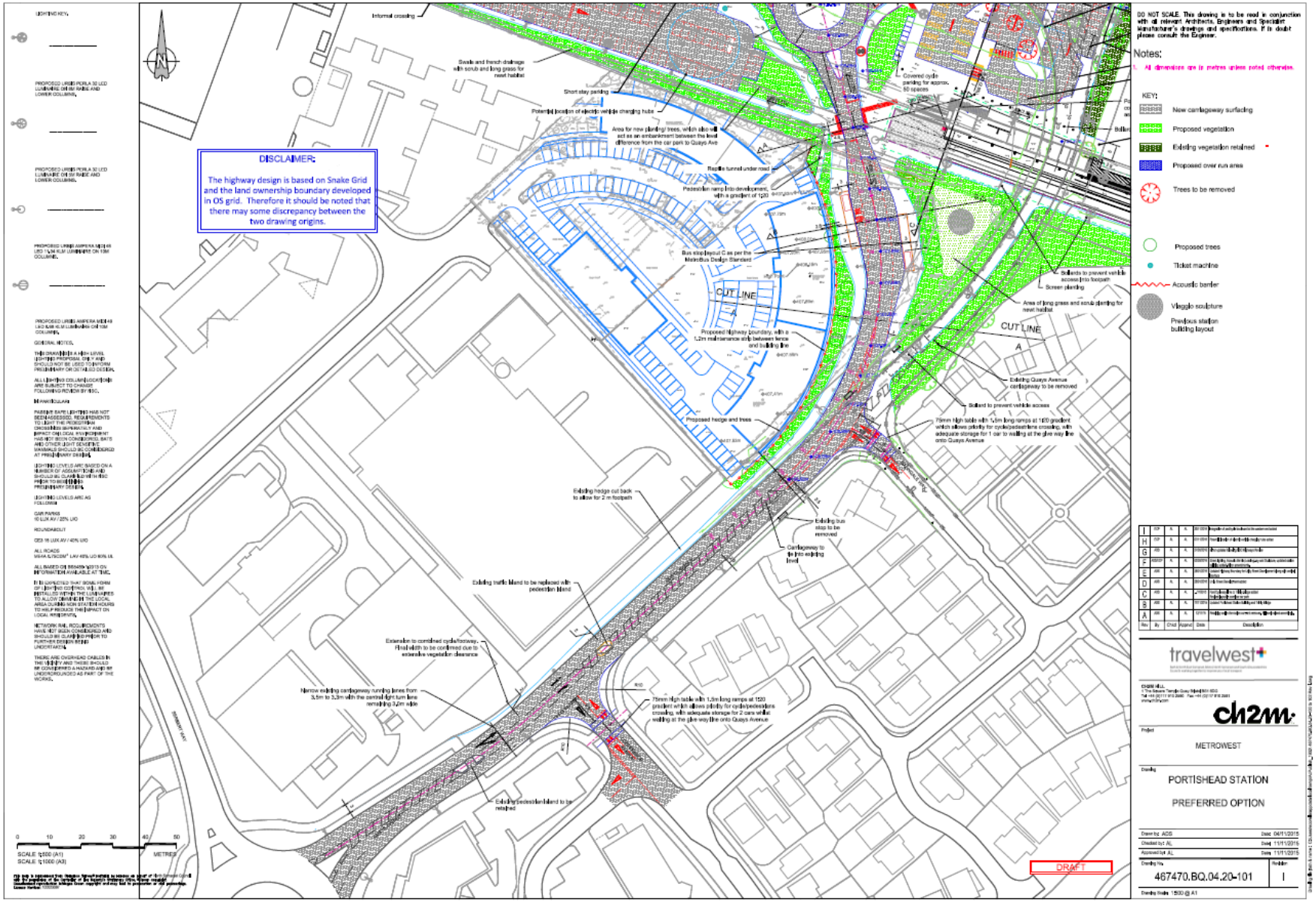
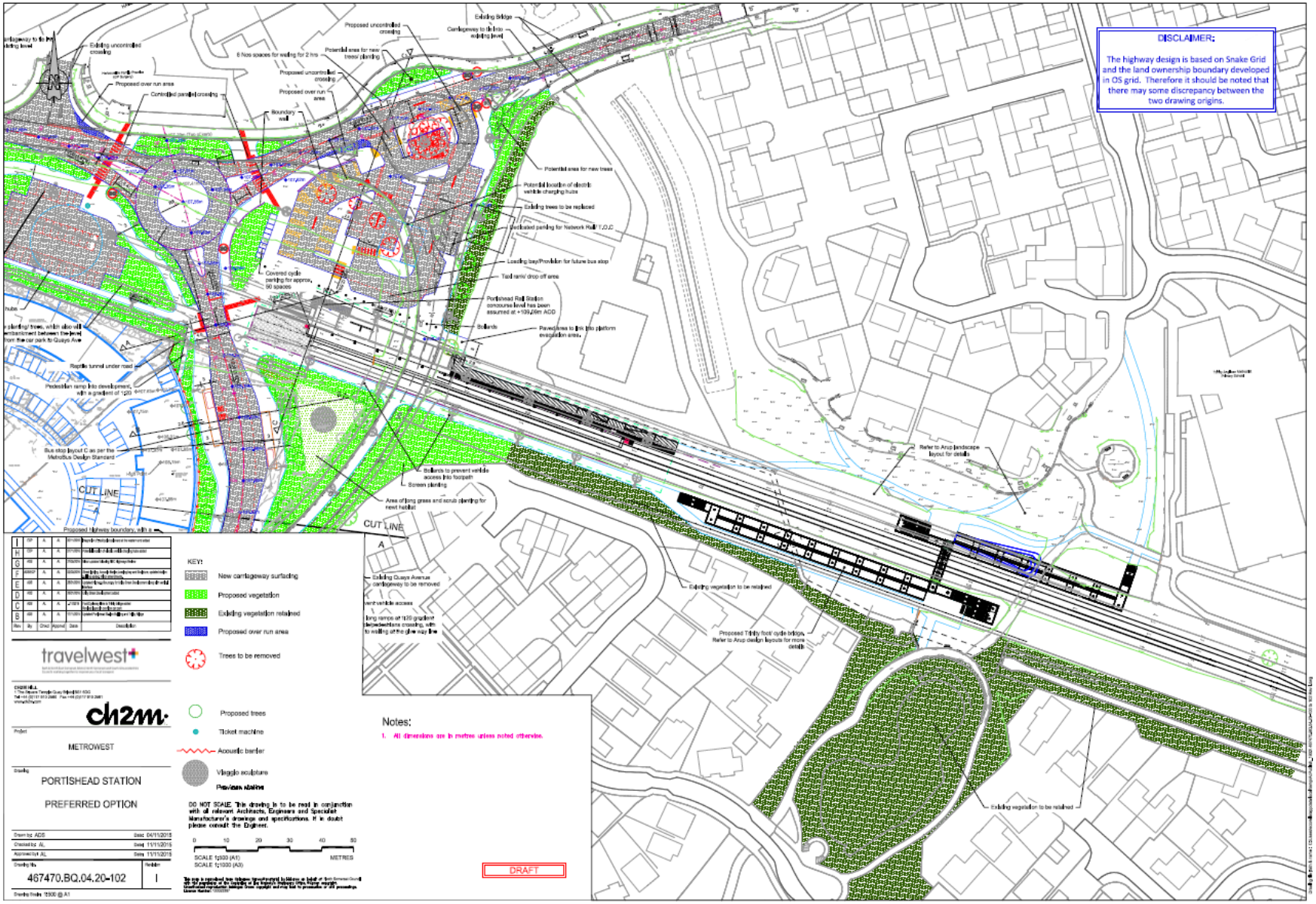


FIGURE 3.3

Indicative Portishead station preferred option - Drawing 3



3.4 Pill station

The proposed Pill station will be a one platform unstaffed facility with a car park. Passenger access to the station will be from the former station forecourt building on Station Road.

The main car park for the station will be located further to the northwest along Monmouth Road and will be accessed directly from Monmouth Road. The main car park will comprise of 62 spaces while a further 3 spaces designated for disabled users will be provided at the station forecourt and will be accessed from Station Road. Having mobility impaired parking facilities close to the platform will greatly benefit the utility of the station for those who might find parking at the proposed car park at Monmouth Road too challenging a distance. There will also be drop-off / pick-up provision at the station forecourt for 3 vehicles. A shelter by the entrance will house a ticket machine, waiting area, seating and cycle parking for about 20 bicycles. Vehicular access into and out of the new station forecourt will be one-way, with the entrance off Sambourne Lane and the exit onto Station Road.

The station proposal will also see minor enhancements to the pedestrian environment surrounding the station with informal crossing points added along Monmouth Road. These will be reinforced by parking controls in specific locations such as Monmouth Road, Chapel Row, Myrtle Hill, Chapel Row and Station Road that will improve visibility for pedestrians.

Figures 3.4 to 3.6 show the location of the station with the corresponding highway improvements while Figure 3.7 shows the locations of proposed parking controls in the immediate vicinity of the station.

FIGURE 3.4
Indicative Pill station preferred option - Drawing 1

FIGURE 3.5

Indicative Pill station preferred parking option - Drawing 2

FIGURE 3.6

Indicative Pill station preferred parking option- Drawing 3

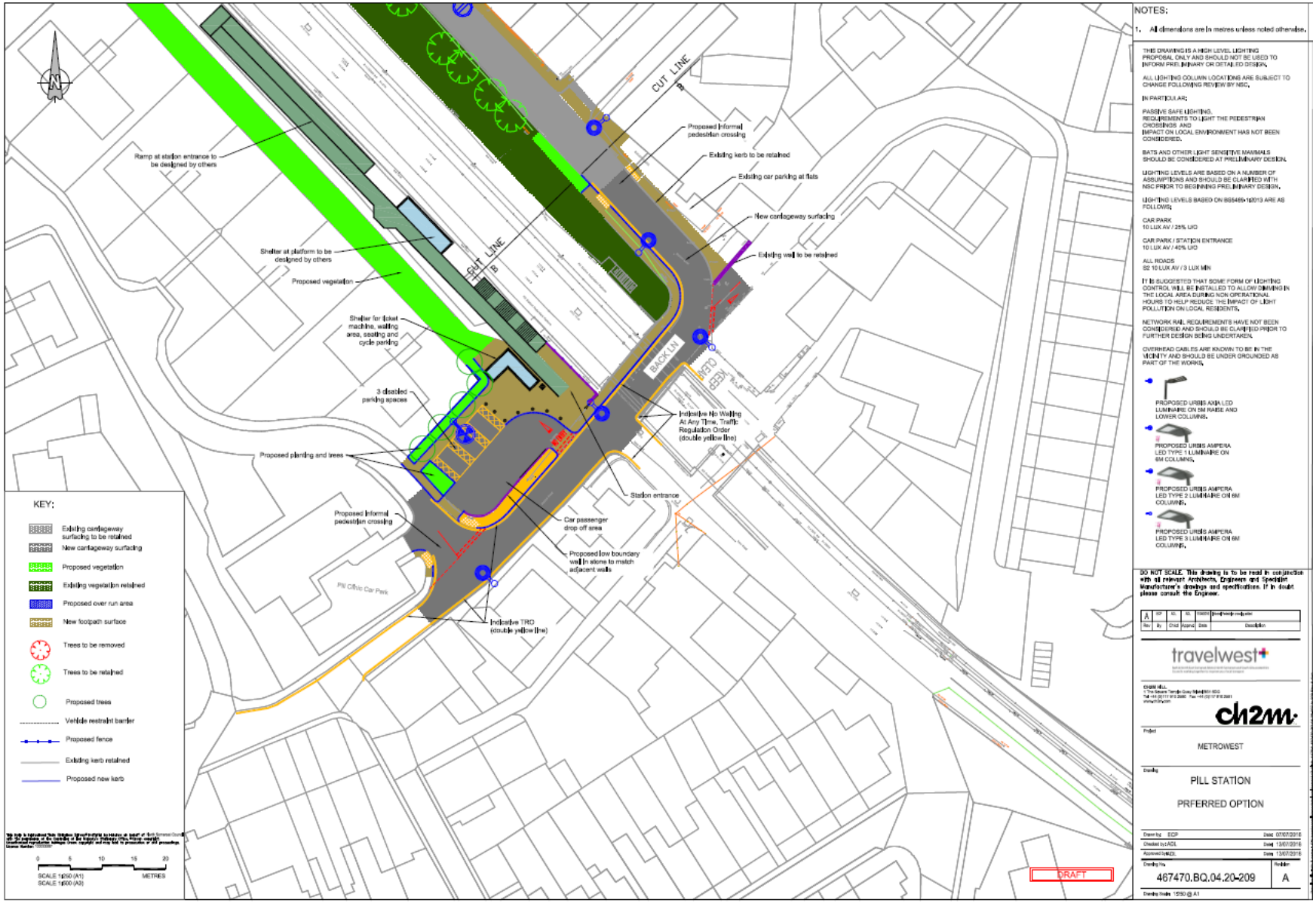
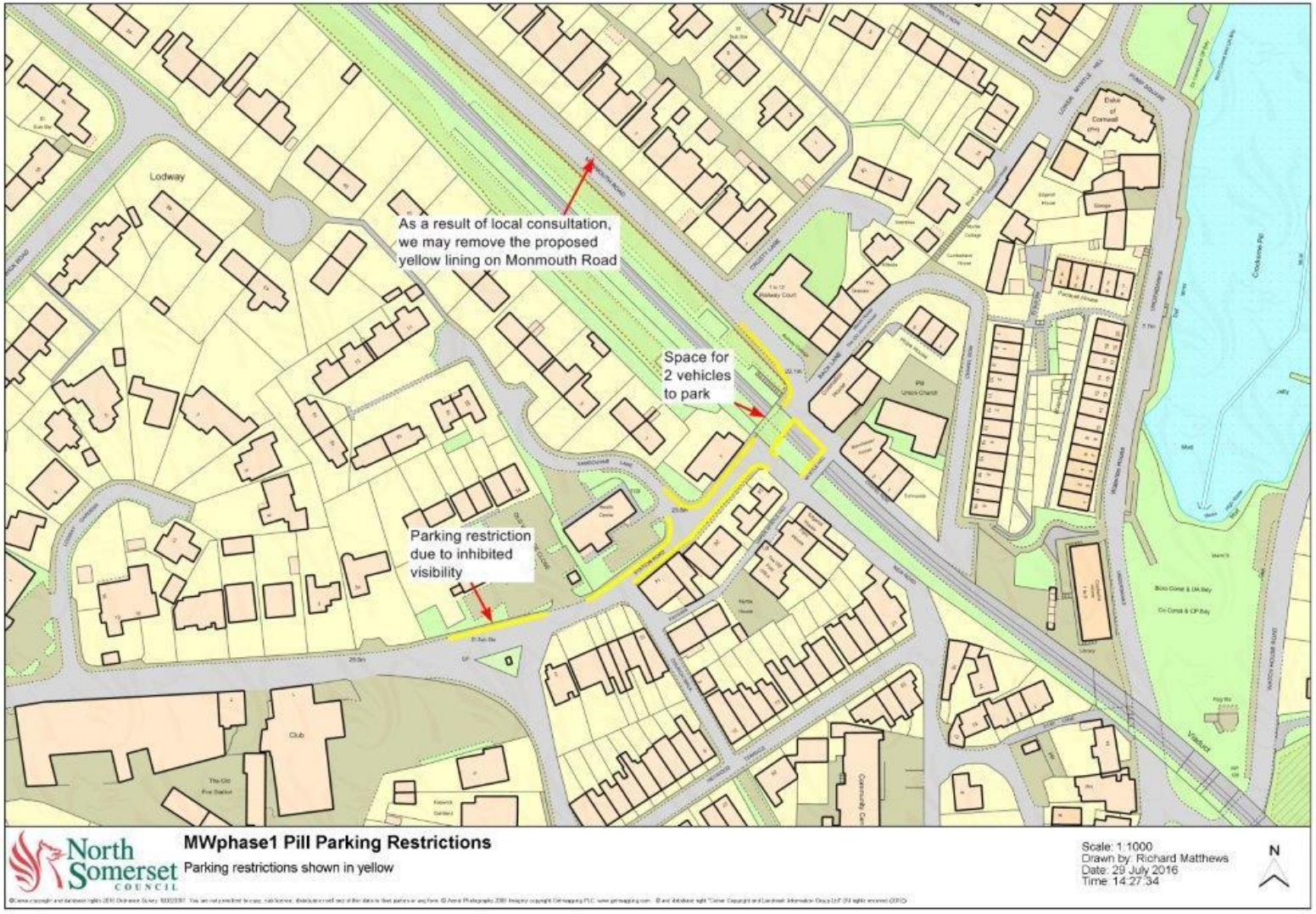


FIGURE 3.7
Indicative proposed parking restrictions in Pill



3.5 Ashton Vale Road

The MetroWest Phase hourly train service of up to 18 passenger trains per day (up to 10 on a Sunday) in each direction in addition to the existing freight movements will result in traffic impacts on Ashton Vale Road and on Winterstoke Road, in respect of longer traffic queue lengths. As a result, the level crossing barriers would need to operate more often than they do currently. As Ashton Vale Road is the only road access to the industrial estate this could lead to significant access restrictions to the businesses located there and cause traffic queues on both sides of the level crossing.

To demonstrate the level of impact as a result of the additional trains, a VISSIM based model of the Winterstoke Road/Ashton Vale Road junction and Ashton Vale level crossing has been developed (refer to Section 7.5 and **Appendix P**). The model demonstrates that queuing and delays are expected to increase significantly on Winterstoke Road northbound and on Ashton Vale Road. However, by implementing measures of mitigation in the form of extending the left-turn lane on the northbound side of Winterstoke Road and upgrading the mode of control of the signals to 'Microprocessor Optimised Vehicle Actuation' (MOVA), queues and delays are expected to deteriorate on Winterstoke Road as well as on Ashton Vale Road. The extended left-turn flare on Winterstoke Road will contain queuing traffic without blocking the adjacent ahead movement while queuing traffic on Ashton Vale Road will be well managed following the re-opening of the level crossing with the additional green phase (two to three minutes).

In light of this assessment, it will not be necessary to provide alternative highway access to Ashton Vale Industrial Estate for Stage 1 of the scheme. Ashton Vale Road level crossing will therefore remain operational.

In the medium term after the delivery of Stage 1 of the scheme, it is likely that an alternative highway access will be required should funding for Stage 2 (when additional passenger trains will be added to the network i.e. 2 tph) be identified. The options previously brought forward for discussion for the Ashton Vale Alternative Access Road (AVAAR) are described in **Appendix Q** of the TA.

3.6 Other elements of the scheme

The scheme will include a number of other enhancements as follows:

3.6.1 Portishead Trinity Footbridge

To the east of the new station at Portishead is a permissive footpath across the line that provides one of the main access routes to the Trinity Anglican Methodist Primary School from the residential areas on the south side of the railway. The re-opened railway line will sever this footpath and as a result, a new pedestrian and cycle bridge will be constructed to the southwest of the primary school over the Portishead Branch Line Railway as shown in Figure 3.8. This bridge will be designed to comply with the Equalities Act 2010 (superseded the DDA) so it is suitable for disabled users as well as cyclists and will connect Tansy Lane on the north side of the line to Galingale Way on the south side.

While the bridge will be accessible for cyclists, its proposed width at 3m means cyclists will be expected to dismount when using it. The existing permissive at grade crossing over the dis-used railway will be stopped up.

3.6.2 Other Pedestrian, Cyclist and Equestrian Measures

Other pedestrian, cyclist and equestrian improvements in addition to those outlined above in the immediate vicinity of the station include:

In Portishead

- A toucan crossing on Harbour Road immediately east of the bridge over the Portbury Ditch;
- Extension of the shared footway and cycleway along the west side of Quays Avenue opposite the junction with Galingale Way to the existing crossing point west of the junction with Conference Avenue; and
- Replacement of the existing traffic island on Quays Avenue with a pedestrian island west of the junction with Conference Avenue.

Between Portishead and Pill

- Diversion of the permissive path that forms part of National Cycle Route No. 26 to accommodate the construction of the new maintenance compound and access road on the northern side of the railway off Sheepway. The existing route is to be relocated to run along the outer, planted edge of the new compound as shown in Figure 8.5. An entry point off Sheepway will be provided to the north of the bus stop to minimise conflicts between cyclists and vehicles. The cyclepath will be 3m wide, surfaced with gravel, and separated from the new compound by a security fence.
- Existing cycling infrastructure (forming part of National Cycle Network 26) under the Royal Portbury Dock Road Bridge, Marsh Lane Bridge and the M5 Bridge to be realigned and rebuilt to allow both the permissive route and railway to pass under Portbury Dock Road. Cycleways to be segregated from the line by appropriate fencing.
- On Royal Portbury Dock Road, an uncontrolled bridleway (LA8/66/10) crossing will be provided over the road, comprising a “holding area” on both sides of the carriageway connecting to the bridleway and fenced along their outer boundaries (see Figure 8.6 and Figure 4.2 of the PEIR). The equestrian can wait safely back from the road until there is a suitable gap in the traffic before crossing.
- Works to National Cycle Route 26 are also proposed in the vicinity of the M5 underbridge (see Figure 4.2 of the PEIR). In this location NRIL has granted a licence for National Cycle Route 26 to pass under the M5 alongside the railway and join National Cycle Route 41 between Pill and Avonmouth. The licenced route connects to a bridleway (LA8/67/10) on the north side of the railway and M5, which does not cross under the M5, but terminates beneath the Avonmouth Viaduct of the M5. Although no licence or PRoW exists, equestrians currently use the cyclepath to pass under the M5.
- Consent is proposed to be sought for works to allow for the extension of bridleway LA8/67/10 north of the M5 underbridge to connect with NCN 41 to the east of the M5 that connects with Pill (see Figure 4.2 of the PEIR). The extension will provide a safe route for horses and other bridleway users away from the railway. This extension will be provided if the Port of Bristol agrees to dedicate the proposed route of the extended Bridleway as a PRoW and powers for land acquisition and PROW designation are not being proposed for this enhancement work. An alternative loop would then be provided to the north east of the existing crossing of the M5 overbridge. The bridleway, if constructed, would be 3m wide with a maximum gradient of 1 in 12. On the south-eastern side of the M5, the new bridleway would be raised above existing ground levels due to the marshy conditions. The existing licensed route under the M5 is intended to be re-provided for and will (subject to NRIL granting a new licence for its use) be available for pedestrians and cyclists, separated from the railway by security fencing.

- There are ten historic crossings along the disused line between Pill and Portishead. The DCO will be drafted to include powers to ensure that each is extinguished prior to construction of the DCO Scheme without replacement. The following crossings will be closed under the DCO Scheme:
  - Crossing serving former oil depot
  - Informal Trinity Primary School crossing between Galingale Way and Tansy Lane
  - Moor Lane
  - Sheepway 1 (enhancements to existing access south of the disused railway via the Sheepway overbridge)
  - Sheepway 2
  - Elm Tree Farm (alternative access provided via the A369 road)
  - Portbury Station
  - Drove Crossing
  - Portbury no. 3
  - Manor Farm no. 2
  - Manor Farm no. 1
  - Lodway Farm

Ashton Vale Road area

The Barons Close pedestrian crossing is located approximately 200 metres south of the Ashton Vale Road level crossing as shown in Figure 3.10. As of summer 2015, the pedestrian crossing has been temporarily closed as part of the AVTM MetroBus scheme. NR and BCC may bring forward separate proposals to permanently close this pedestrian crossing before MetroWest Phase 1 opens and passenger trains recommence service. In light of the possibility that such a proposal does not come forward, MetroWest Phase 1 is proposing to close this crossing as part of the DCO Scheme on safety grounds, due to the speed of approaching passenger trains, and the constrained visibility due to the track radius.

Alternative pedestrian access will be provided via a new pedestrian and cycle link currently under construction by the AVTM Rapid Bus Transit project, north from the existing level crossing to the carriageway of Ashton Vale Road next to the existing Ashton Vale Road level crossing (see Figure 3.9). The route will then be extended north by the construction of a pedestrian and cycle ramp parallel to the railway to link Ashton Vale Road to Ashton Road. The ramp forms part of the DCO Scheme which also includes designating part of the Rapid Transit pedestrian and cycle link as a public right of way.

FIGURE 3.8
Trinity Pedestrian Footbridge General Arrangement

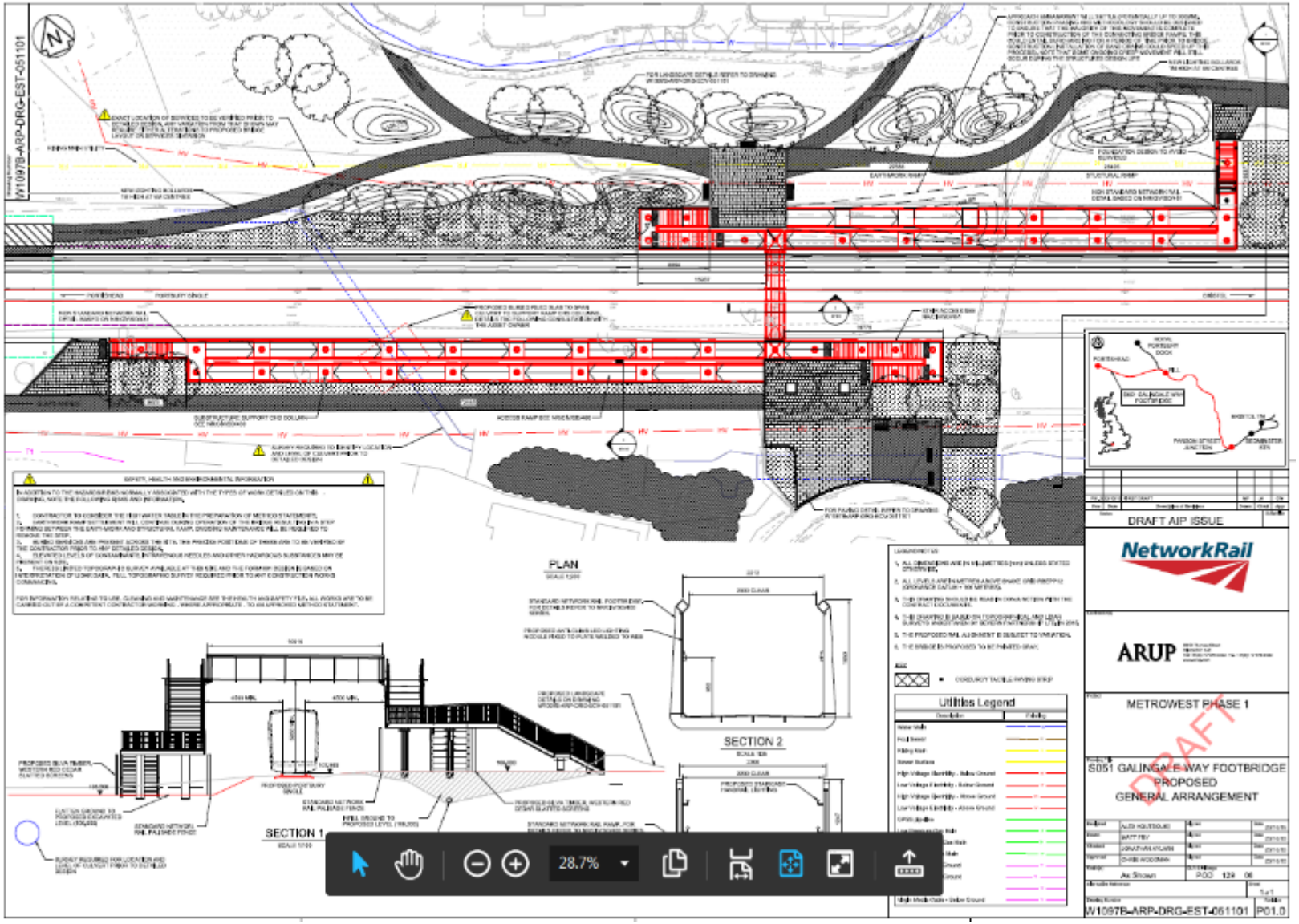


FIGURE 3.9
Proposed pedestrian/cycle footbridge at Ashton Vale

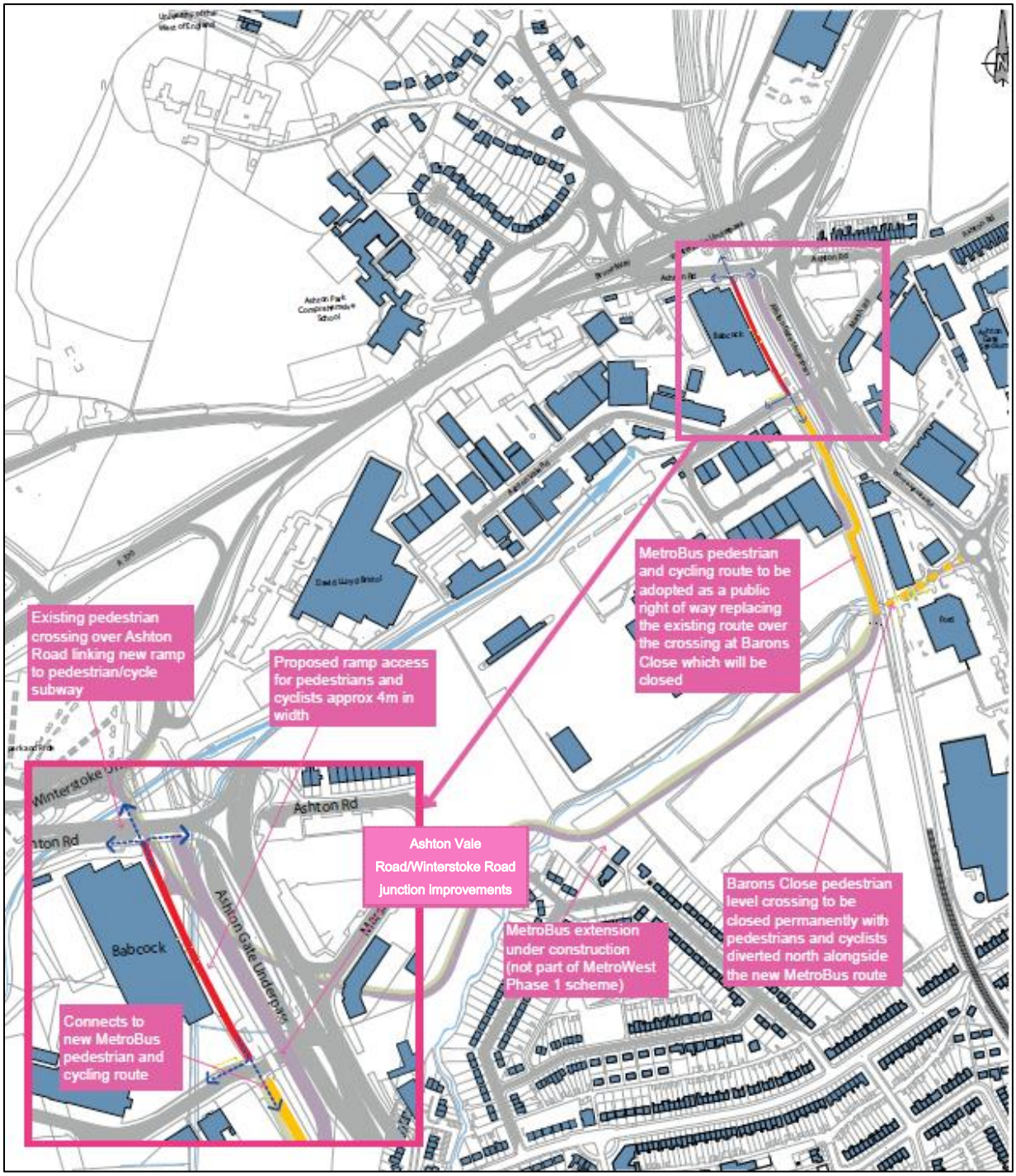


FIGURE 3.10

Barons Close Pedestrian Crossing Point (currently closed)

3.6.3 Signals and track

Elements of MetroWest Phase 1 which are proposed:

- Works on the Portbury Freight Line include:
  - Replacement of signalling equipment of the half kilometre section of railway from Portbury Dock to Portbury Dock Junction, within the land of the Bristol Port Company.
  - Upgrade work from Pill Junction to the western portal of Pill Tunnel where the existing and new railway tracks combine to the single track. This will include the installation of an intermediate signal in the Avon Gorge, minor track and access improvements for maintenance purposes.
- The partial reinstatement of the "down relief line" at Bedminster;
- An additional signal near Severn Beach / Avonmouth station to allow for additional trains to reverse there; and
- A track crossover and signalling at Bathampton to allow trains to turn around at Bath off the main line

3.6.4 Maintenance and Emergency Access

A number of permanent maintenance and emergency access points have been identified and these are detailed in Table 3.2. Figures 3.11 to 3.13 show the location of these access points.

TABLE 3.2
Description of proposed maintenance and emergency access points

Ref	Access point	Description
MEA-1	Portishead, Station car park	Dedicated vehicle space for Network Rail Staff and emergency access point
MEA-2	Portishead, Trinity Footbridge	Pedestrian emergency access point
MEA-3	Sheepway (Figure 4.9 of the PEIR)	HGV emergency access point
MEA-4	Portbury Hundred (Figure 4.10 of the PEIR)	LGV maintenance access point
MEA-5	Marsh Lane Overbridge	LGV maintenance and emergency access point
MEA-6A	Pill, Station forecourt	Emergency access point (*to be confirmed)
MEA-6B	Pill, Station car park	LGV maintenance and emergency access point
MEA-7	Ham Green via Chapel Pill Lane (see Figure 4.15 of the PEIR)	HGV maintenance and emergency access point
MEA-8	Avon Gorge, near Leigh Court	Pedestrian maintenance access point (via 2.4m wide access steps to railway)
MEA-9	Avon Gorge, near Leigh Woods	Pedestrian maintenance access point (via 2.4m wide access steps to railway)
MEA-10	Avon Gorge, near Suspension Bridge	Pedestrian maintenance access point (via 2.4m wide access steps to railway)
MEA-11	Clanage Road (Figure 4.9 of the PEIR)	HGV maintenance and emergency access point
MEA-12	Ashton Vale level crossing	LGV maintenance and emergency access point

FIGURE 3.11

Proposed Portishead and Sheepway Maintenance and Emergency Accesses

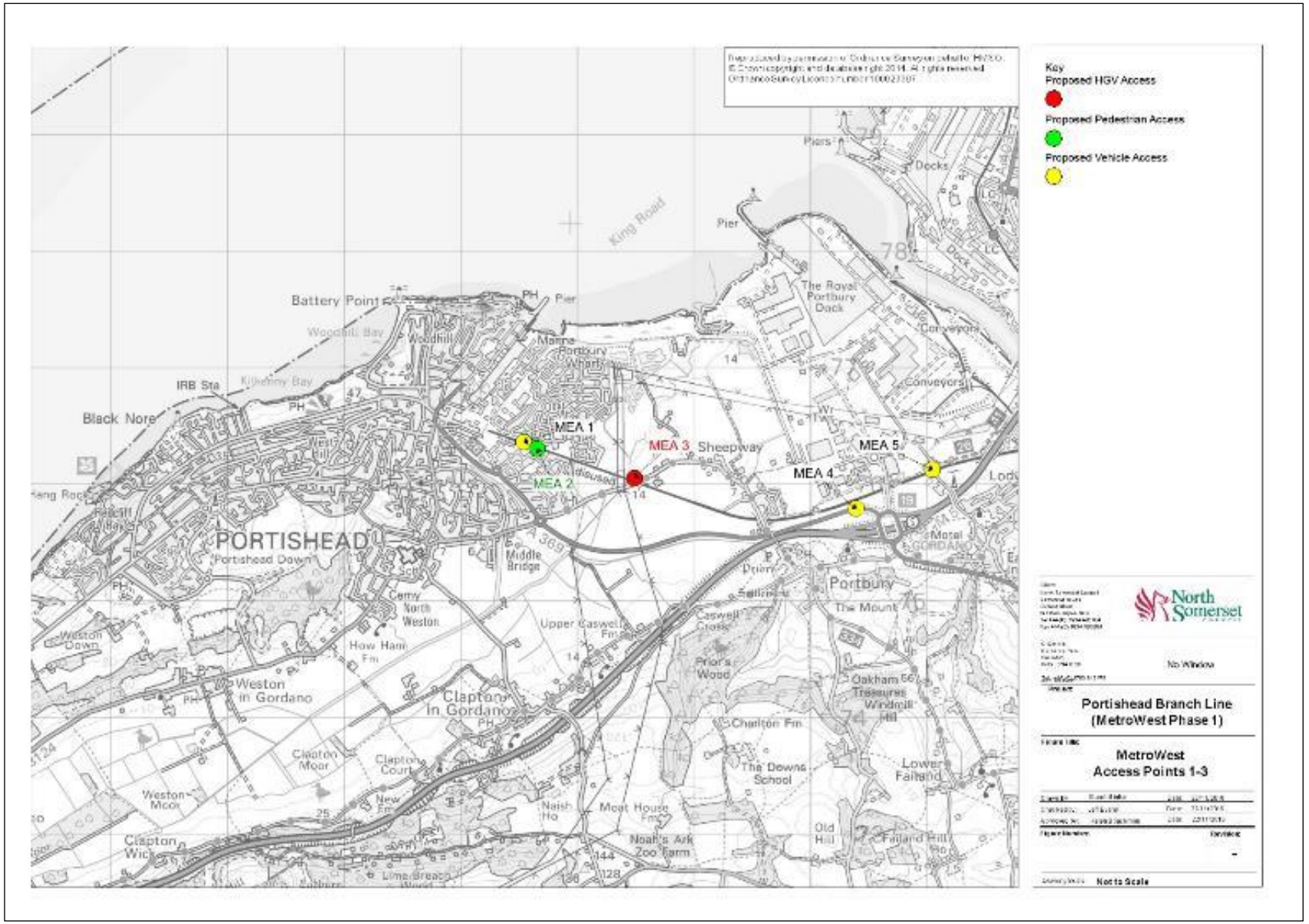


FIGURE 3.12

Proposed Pill and Avon Gorge Maintenance and Emergency Accesses

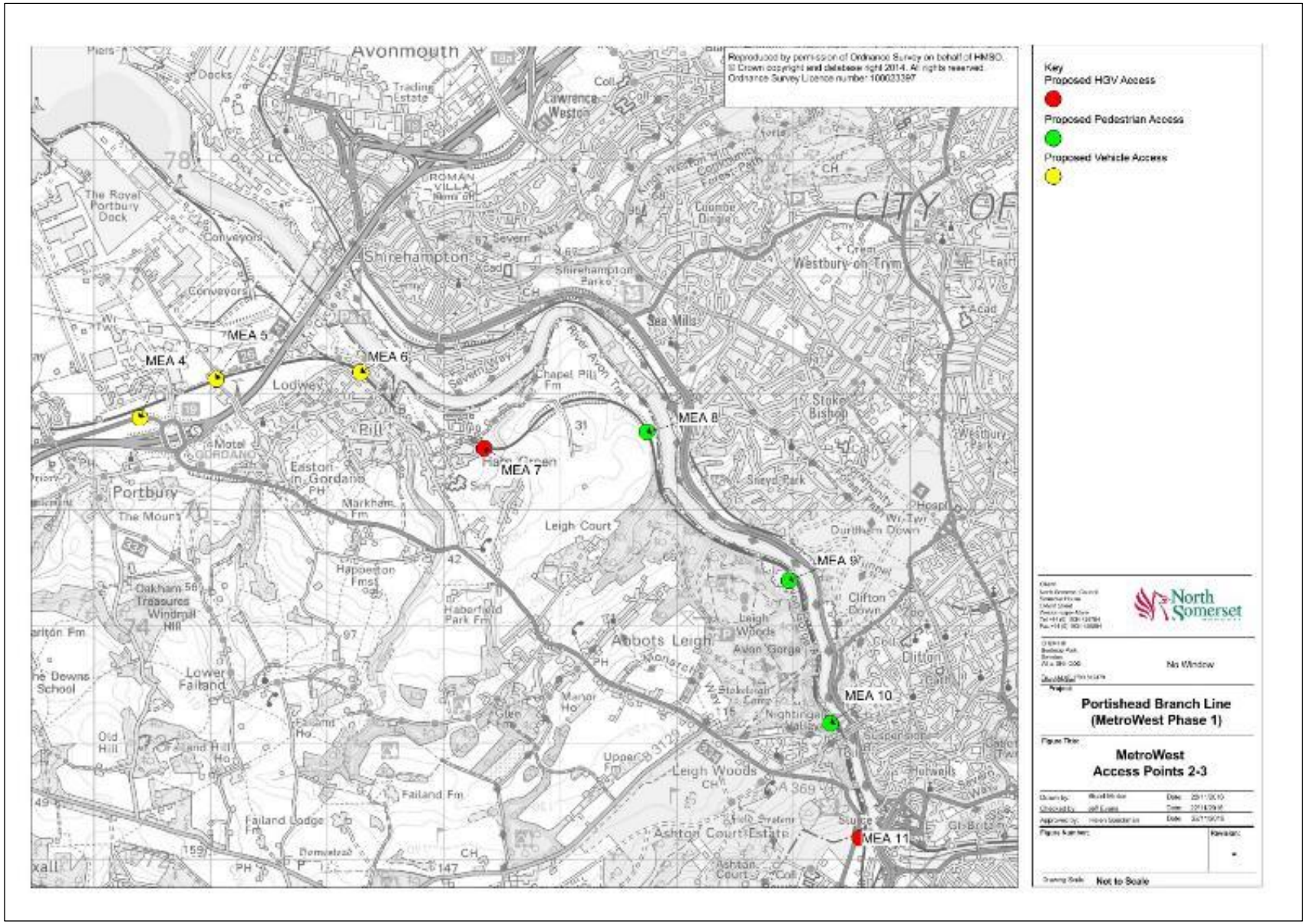
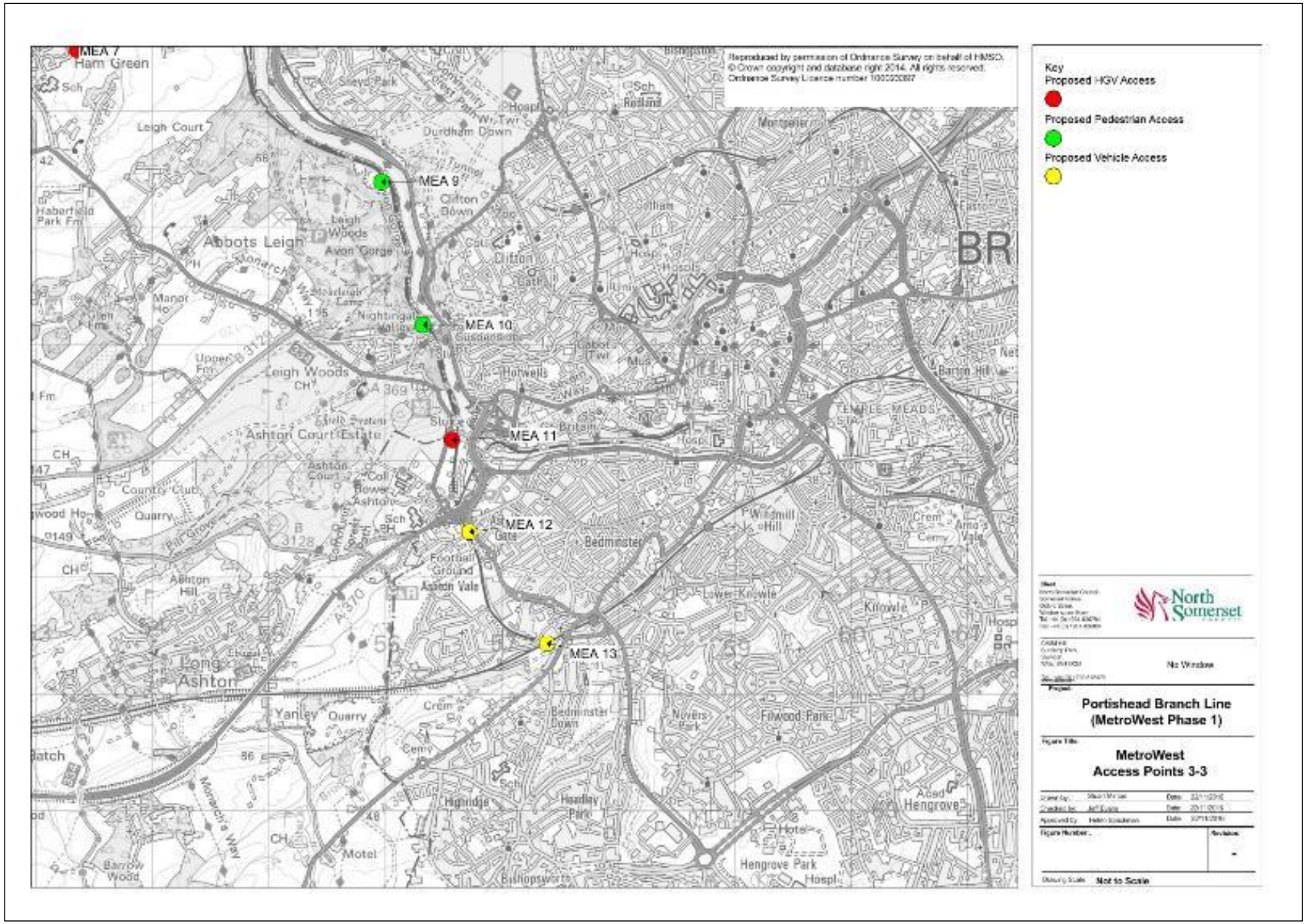


FIGURE 3.13

Proposed Ashton Vale Maintenance and Emergency Accesses



3.7 MetroWest Phase 1 passenger rail service pattern

MetroWest Phase 1 comprises the delivery of infrastructure and passenger train operations to provide:

- Half-hourly service for the Severn Beach line (hourly for St. Andrews Road station and Severn Beach station);
- Half-hourly service for Keynsham and Oldfield Park stations on the Bath Spa to Bristol line; and
- Reopened Portishead Branch Line with stations at Portishead and Pill, initially an hourly service, but ultimately providing 2 trains per hour.

The assessments presented in this report are based on a different, and more intensive half-hourly rail service pattern than the hourly patterns that is currently proposed. The Environmental Statement and associated documents will report updated transport assessments. The assessment presented in this Transport Assessment is based on the following rail service pattern

- Portishead to Avonmouth: 1 train per hour all day;
- Portishead to Bath Spa: 1 train per hour all day; and
- Severn Beach to Bristol Temple Meads: 1 train per hour all day.

Stopping at: Pill, Parson Street, Bedminster, Bristol Temple Meads, Keynsham, Oldfield Park, St. Andrews Road, Avonmouth, Portway, Shirehampton, Sea Mills, Clifton Down, Redland, Montpelier, Stapleton Road, Lawrence Hill and route terminus stations.

3.8 Summary of key issues

This section has outlined the proposals for the scheme, the scheme station infrastructure, signalling and service changes, plus other modal shift inducing infrastructure. Key issues for consideration in this TA are:

- New station at Portishead and the reopening of the station at Pill;
- Road alignment on Quays Avenue (Portishead) to accommodate the new station;
- New car parks and cycle parking for both stations;
- Pedestrian and cycling facilities to encourage walking to and from the stations and centres;
- Changes to pedestrian and cycling infrastructure especially to existing crossing points of the railway alignment;
- Junction improvements at Ashton Vale Road/Winterstoke Road;
- Changes to the signals on certain parts of the line; and
- Changes to the service patterns.

It is recognised that the scheme is being planned with a number of measures to mitigate transport impacts. These components of the schemes are summarised in sections 9 and 10.

Section 4

Existing Conditions

4.1 Introduction

The aim of this section is to outline the existing baseline conditions and understand the implications for the scheme. This should include an understanding of the existing transport networks and their operation but also other factors such as land uses and committed developments.

4.2 Existing land uses

In order to provide a context for the potential trip generation at the proposed Portishead and Pill stations and also the potential impacts arising from changes to crossing points and increased level crossing closures, a review of existing land uses is required. The focus here is not to provide an exhaustive list, but rather to get an overview of some of the land use considerations that need to be factored into this TA.

4.2.1 Portishead

Located approximately 12km to the west of Bristol City Centre, Portishead is a growing town with a population of approximately 27,000 people (based on Portishead wards in the 2011 Census). The town has undergone considerable redevelopment and expansion over the last decade with several new major developments at Portishead Vale, the Village Quarter and Port Marine (which is currently in its final phase of build).

Figure 4.1 shows the indicative land uses in the vicinity of the proposed Portishead station.

The Figure shows the new developments that have emerged in recent years in the vicinity of the station. To the north, east and south are the new residential developments whereas to the immediate west there are some new retail and mixed used developments.

The town centre continues to be largely focussed on a narrow strip along High Street although the new retail developments have been built towards Harbour Road, Old Mill Road and Wyndham Way. A number of industrial and warehousing units remain and these are clustered in Old Mill Road and off Harbour Road.

4.2.2 Portishead to Pill

The section of the line east of Portishead towards Easton-in-Gordano and Pill is semi-rural around the village of Sheepway until it passes the extensive commercial Portbury Port site to the north. There is some agricultural land to the south which this is bound by the M5 and the A369.

4.2.3 Pill

Pill is an historic village, located some 7.5kms west of Bristol City Centre with a population of approximately 3,500 (based on Pill wards in the 2011 Census). Together with the neighbouring villages of Easton-in-Gordano to the south west and Ham Green to the east, it is a continuous urban area.

Figure 4.2 shows Pill is largely residential throughout with local services and shops to support the community. A business park is located in Ham Green to the east (the Eden Office park) together with more recent housing.

4.2.4 Ashton Vale Road Level Crossing

Ashton Vale is a largely commercial and industrial area to the south west of Bristol City Centre. It is bounded by a residential area east of the A3029 Winterstoke Road and another residential area just south of some playing fields. Immediately west of the area is the Bristol and North Somerset boundary where planning restrictions exist on development as shown in Figure 4.3.

Ashton Vale Industrial Estate has a single access (Ashton Vale Road) from Winterstoke Road which crosses the existing freight line adjacent to the Winterstoke Road/Ashton Vale Road signal controlled junction. A number of businesses are served by the access including Babcock Integrated Technology, Manheim Bristol, Avonline, Bristol City Timber, Kenny Group and ETM Contractors. Dedicated left and right-turning lanes on Winterstoke Road accommodate vehicular access onto Ashton Vale Road where traffic is required to wait while freight trains pass.

FIGURE 4.1

Indicative land uses in the vicinity of Portishead Station

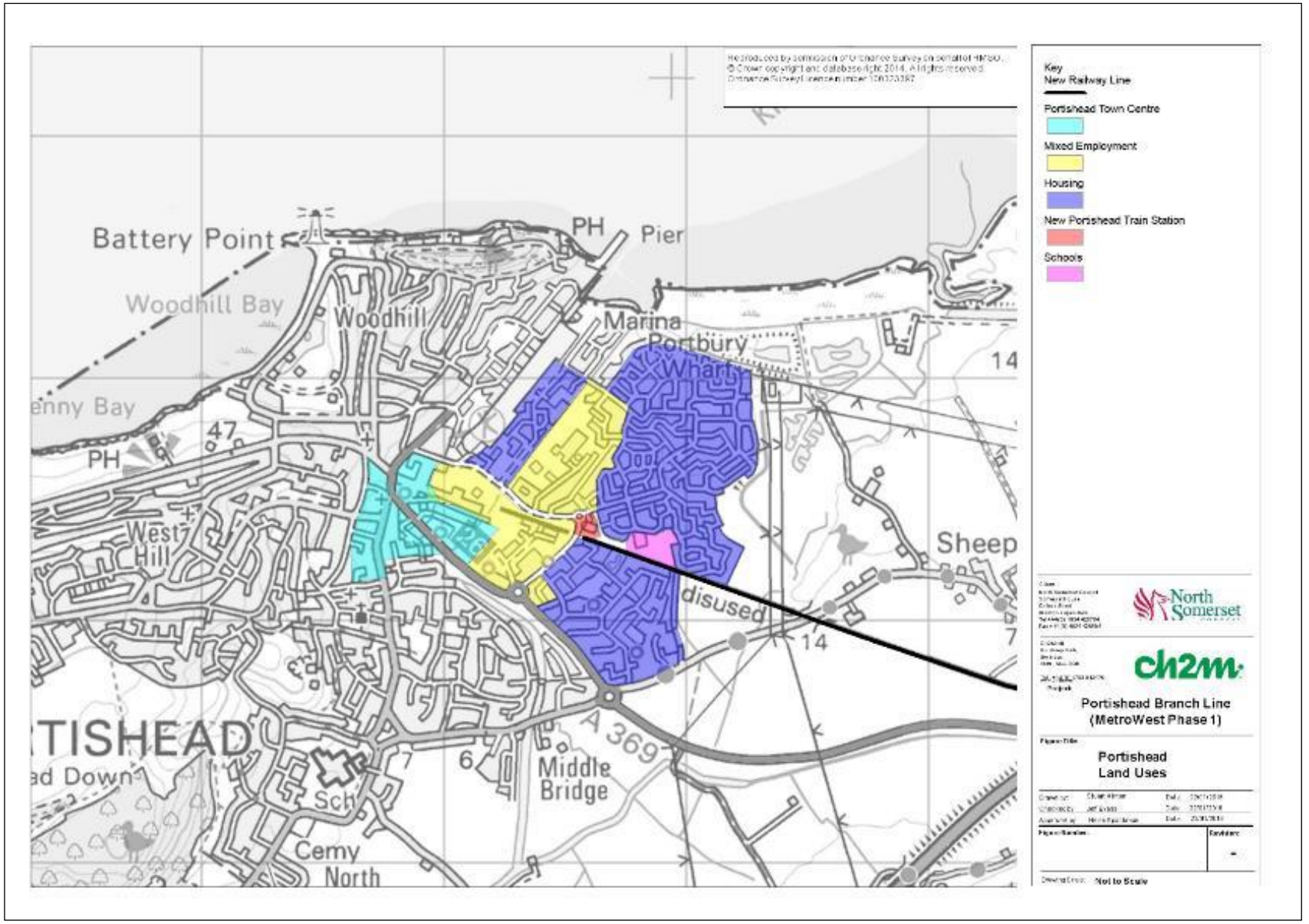


FIGURE 4.2
Indicative land uses in the vicinity of Pill Station

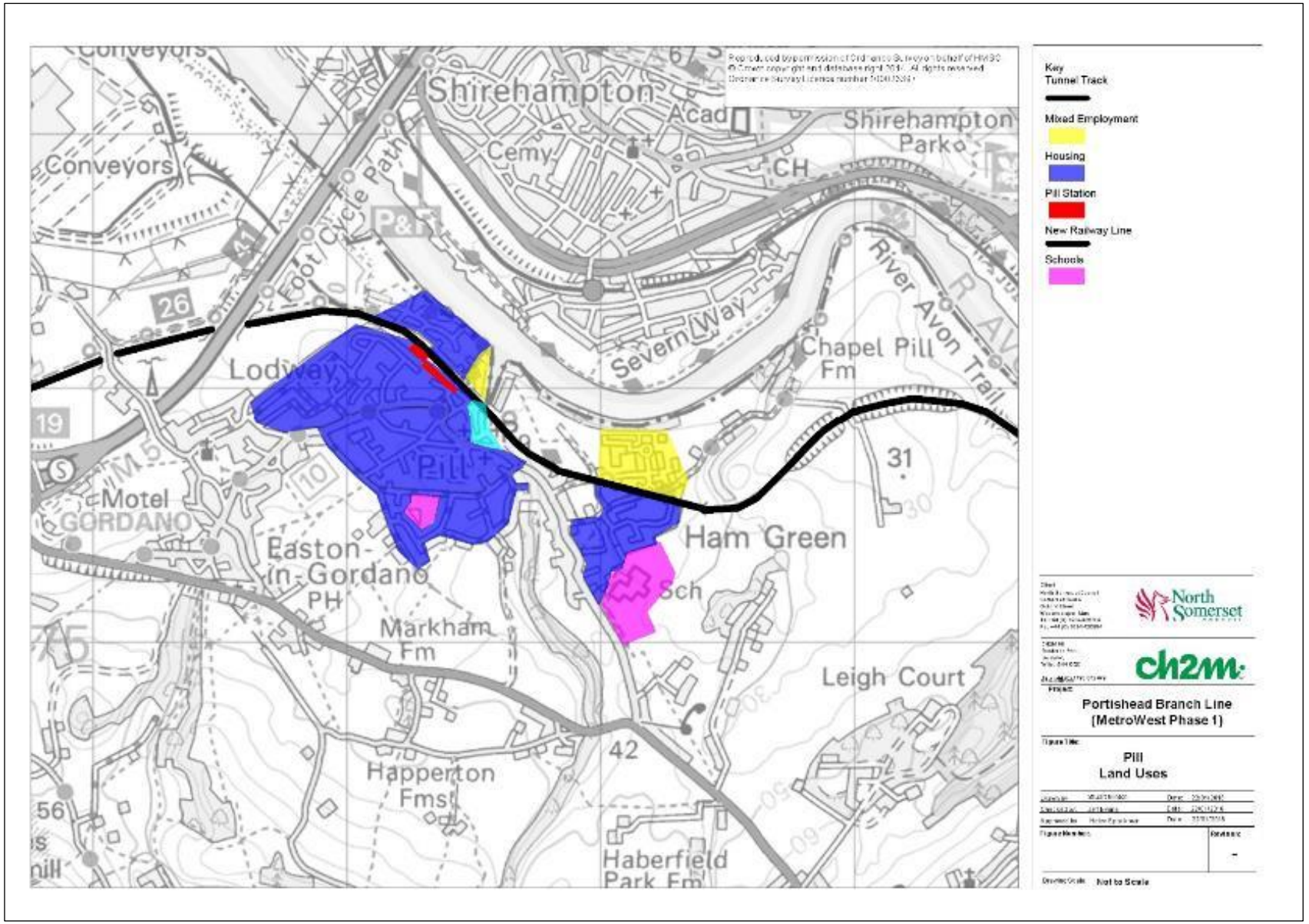
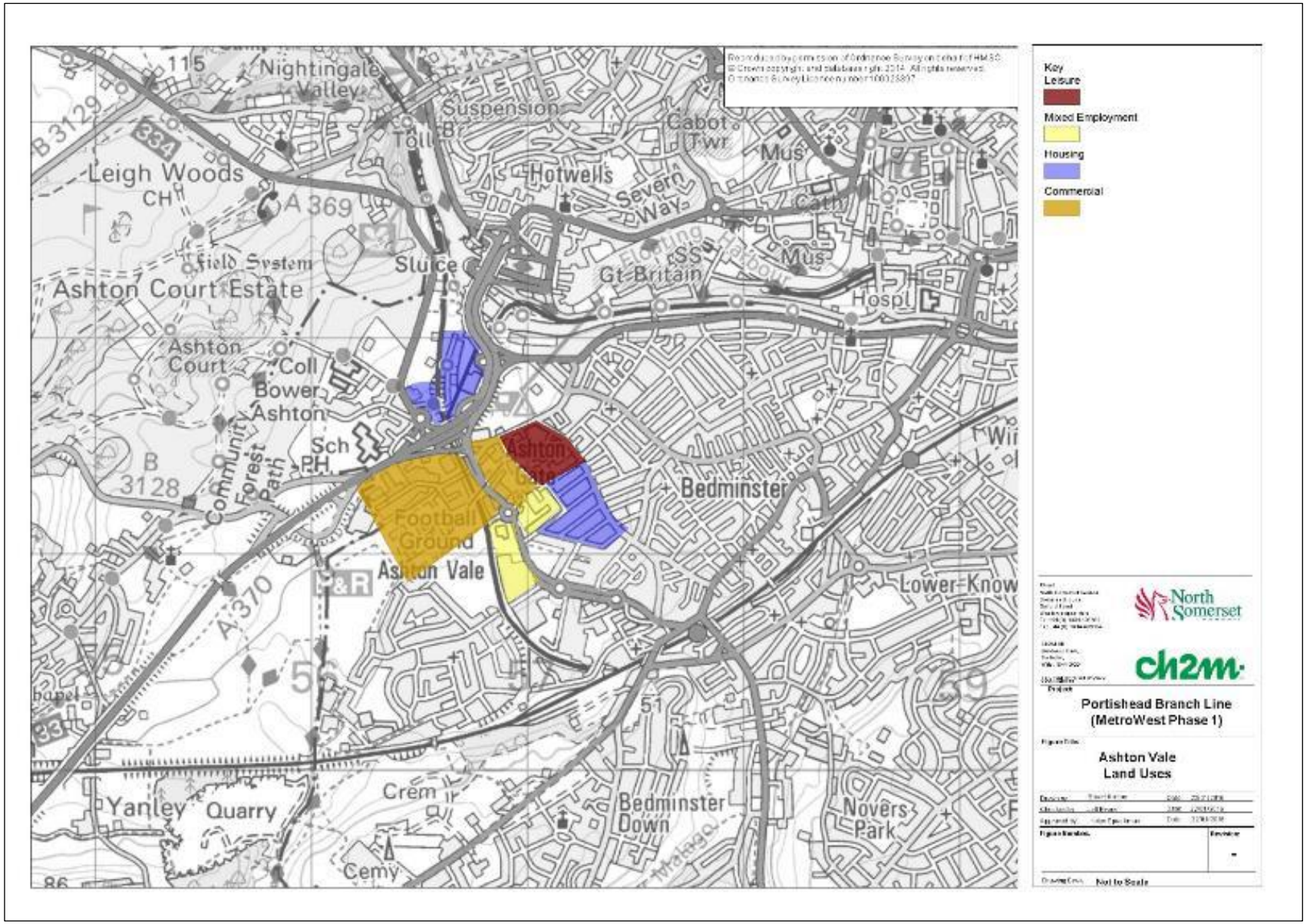


FIGURE 4.3
Indicative land uses in the vicinity of Ashton Vale Road



4.3 Committed development

Within the vicinity of the scheme, there are a number of developments that are likely to emerge over the next few years. The Greater Bristol Area Transport Model (GBATS4)[1] strategic modelling underpinning this TA takes account of a large listing of both employment and residential developments. **Appendix B** provides a listing of these developments – which are broken down by Near Certain (NC) and Reasonably Foreseeable (RF) – following discussion with local authority planning officers.

These new developments, which are eventually expected to increase the population of Portishead to over 30,000 people by 2019, are largely on former brownfield industrial sites. There are no NC and RF developments along the Avon Gorge.

Figures 4.4 to 4.6 show the extent of committed developments along the DCO redline in the vicinity of the DCO application area together with Table 4.1.

TABLE 4.1
Committed Developments

Portishead – North Somerset Council	
Application Number – NSC	**Description**
00/P/1846/O	Residential development of 110 dwellings
00/P/1864/O	Residential development of 94 dwellings
03/P/1991/F	4 no. 2 storey office buildings with associated car parking and landscaping.
07/P/1052/RM	Residential development of 140 dwellings
11/P/0955/F	Food store
11/P/1099/F	Residential development of 58 dwellings
11/P/2294/F	Residential development of 13 dwellings
12/P/1255/O	Furniture store, petrol filling station/kiosk and associated car parking
12/P/2033/F4	Employment development comprising office use.
14/P/2570/F	Erection of an assisted living development comprising 118 apartments and integrated care support and well-being facilities
15/P/2111/F	Second floor extension to provide 9 no. residential units
16/P/1608/F	Residential development of 70 dwellings and office building (application pending)
16/P/2066/F	Residential development of 93 dwellings and offices (application pending)

[1] GBATS (Greater Bristol Area Transport Study model) is a strategic transport demand model of the greater Bristol area and includes both highways and public transport. This model has been developed to be compliant with, and has been used to assess, a number of schemes in the area that have been given funding approval by the DfT. GBATS produces matrices of trips and journey data (time, cost and distance) for three time periods (AM peak, inter-peak and PM peak hours) and several modes (car, bus, rail and bus rapid transit) also subdivided by user class (commuting, other home based trips and business journeys) and income level of travellers

TABLE 4.1
Committed Developments

Pill & East-in-Gordano– North Somerset Council

Application Number – NSC	Description
11/P/0053/F	Change of use from Public House to 12 dwellings (flats)
14/P/1196/O	4 no. B1 Office Units
16/P/1938/F	Construction of access between cargo storage areas Plot 25 and 26 in Royal Portbury Docks across the public highway at Marsh Lane together with the installation of a traffic signal control system and associated works, including the widening of the Marsh Lane carriageway
16/P/1987/F	Development of site for port related use

Bristol – Bristol City Council

Application Number – BCC	Description
08/03578/F	Mixed use commercial and residential development
09/02242/P	Residential development of 137 dwellings
10/00813/P	Mixed use comprising around 145 residential units, 5000sqm of employment floor space and around 600sqm of retail floor space.
10/04691/R	Demolition of vacant building and construction of new building comprising 10 no. 1-bed units and 4 no. 2- bed units, 1 no. commercial unit and under-croft parking.
10/05279/F	Demolition of existing factory buildings (Use Classes B1 and B2) and erection of new office building (Use Class B1)
11/01851/F	Residential development of 78 dwellings
12/03180/F	Change of use of part of the building to a nursery and construction of an all-weather sports pitch
13/01483/F	Erection of bridge link
13/03517/F	Demolition of the existing Williams Stand, Wedlock Stand, former Hire-Rite building and 65 Ashton Road; erection of new Williams and Wedlock Stands with accommodation including community facilities, conferencing and hospitality, public house, club museum and club shop; and remodelled Dolman Stand, to include modifications to concourse, alterations to the front seating deck and alterations to front roof canopy; internal alterations to the Aty Stand and concourse; new sports pitch, car parking, landscaping (including fencing and paving); and associated infrastructure and engineering works. Stadium capacity to increase to 27, 000.
13/05786/F	New service centre on former industrial site
15/00291/P	Outline planning application for the erection of new buildings for academic, administration and support purposes (6,500m use class d1) and associated infrastructure including provision of a new public transport facility, amendments to car park layout, revised access arrangements and landscaping; and the demolition of 4,198m existing buildings, with all matters reserved except for siting, massing and access.
15/00545/F	Residential development of 14 dwellings
15/01988/F	Residential development of 110 dwellings
16/01699/P	Development of existing manufacturing site
16/01991/SCR	Residential development of 50 dwellings
16/04957/F	Extension to workshops and office space

TABLE 4.1
Committed Developments

17/01789/F	Erection of a self-storage unit, use class B8, with ancillary uses, on site car parking provision and landscaping (application pending)
17/01878/F	Demolition of existing buildings and erection of replacement building for indoor recreation use (Class D2) with associated car parking (application pending)
Identified in WoE Joint Spatial Plan and Transport Study – Draft Strategy	Residential development of 400 dwellings (Adjacent to South Bristol Link Road, Ashton Vale)

In addition to committed developments, Table 4.2 outlines the main infrastructure and improvement schemes to future year networks. The MetroWest schemes are specifically excluded from the model, as the model reported here is the MetroWest Phase 1 Do Minimum. The MetroWest schemes were included in the GBATS4 for scheme testing purposes.

TABLE 4.2
Additional Infrastructure included in MetroWest Future Year Do Minimum Scenario

Scheme	Description
20mph speed limits	Roll out of 20mph speed limits across Bristol
CPNN Off-site Works Package	A38 Filton roundabout. Capacity and safety improvements on 3-arms. Widening of M5 J16 motorway off-slips, A38 North and circulatory carriageway. Signing & lining changes on M5 J17 southbound off-slip. Widening of Merlin Road exit from roundabout and Highwood Lane entry to Merlin Road junction. Widening of southbound approach at A38 Aztec West Roundabout. A4018 Bus Corridor. Crow Lane, Charlton Road, Greystoke Avenue junction improvements. Local bus service enhancements. Capacity and safety improvements on Gipsy Patch Lane.
MetroBus	Rapid transit from Ashton Vale to Temple Meads via Bristol city centre. North Fringe to Hengrove Package. New highway link and bus route between A370 and Hengrove Park
Temple Circus Project	Redesign of Temple Circus roundabout. Related changes to the end of Victoria Street, The Friary, Temple Way, Temple Gate, connection with Redcliffe Way, Bath Bridge Roundabout
Managed Motorway Scheme	M4 Junctions 19-20 & M5 Junctions 15-17
Cribb's BRT Extension	Extending the NFHP BRT route from The Mall back to Parkway; bus priority on Gipsy Patch Lane and Hatchet Road.
M5 Junction 19	Replacement of left turn off the south bound exit slip, with a two lanes
London Paddington – South Wales Rail Electrification	Extra services between Bristol Temple Meads and London Paddington via Bristol Parkway included
Residents Parking	Roll out of residents parking permit scheme across central Bristol
Portway P&R Rail Station	Opening of rail station at Portway Park and Ride Site

FIGURE 4.4

Committed developments in the vicinity of the DCO application area – Portishead

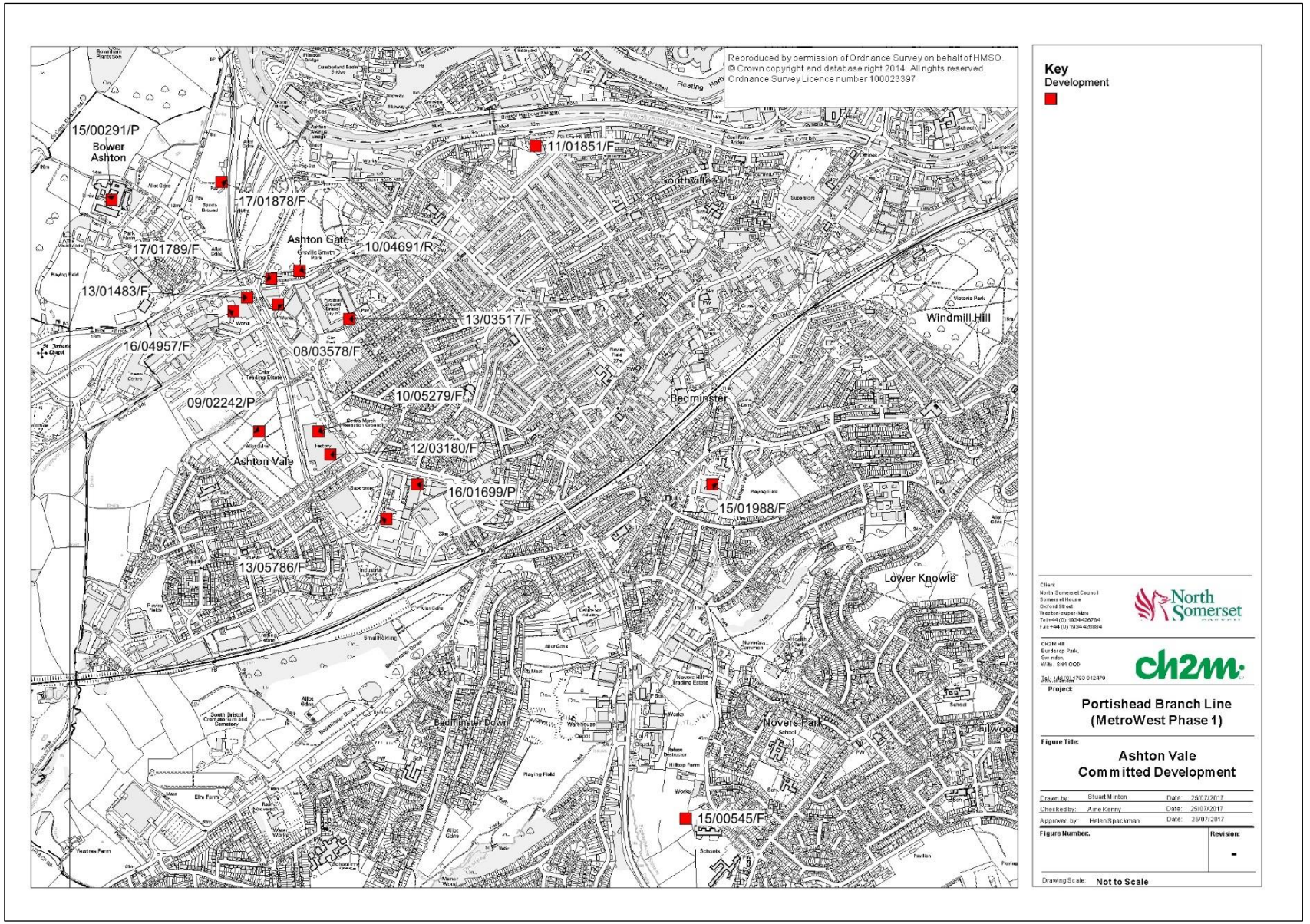


FIGURE 4.5

Committed developments in the vicinity of the DCO application – Pill and East-in-Gordano area

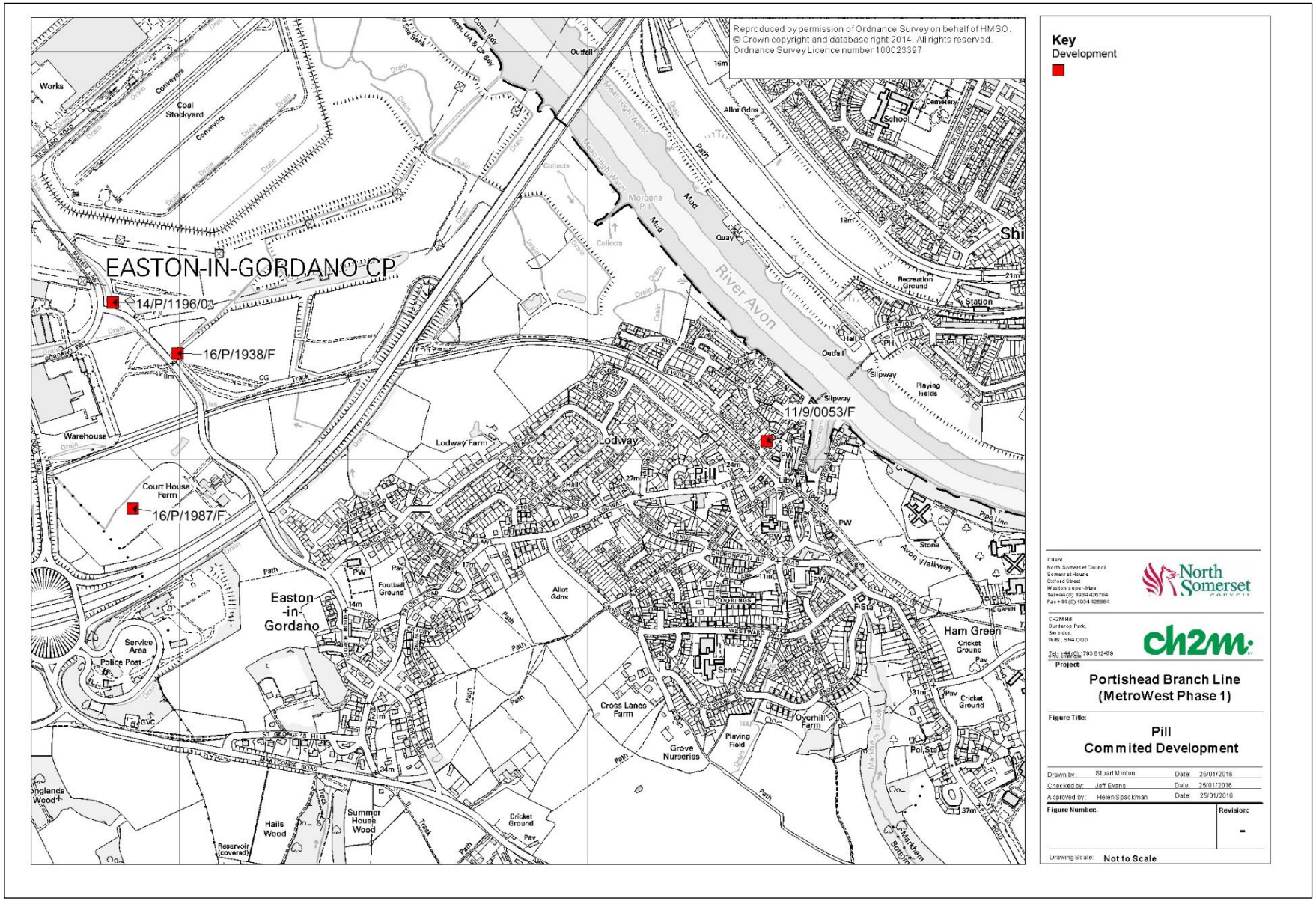
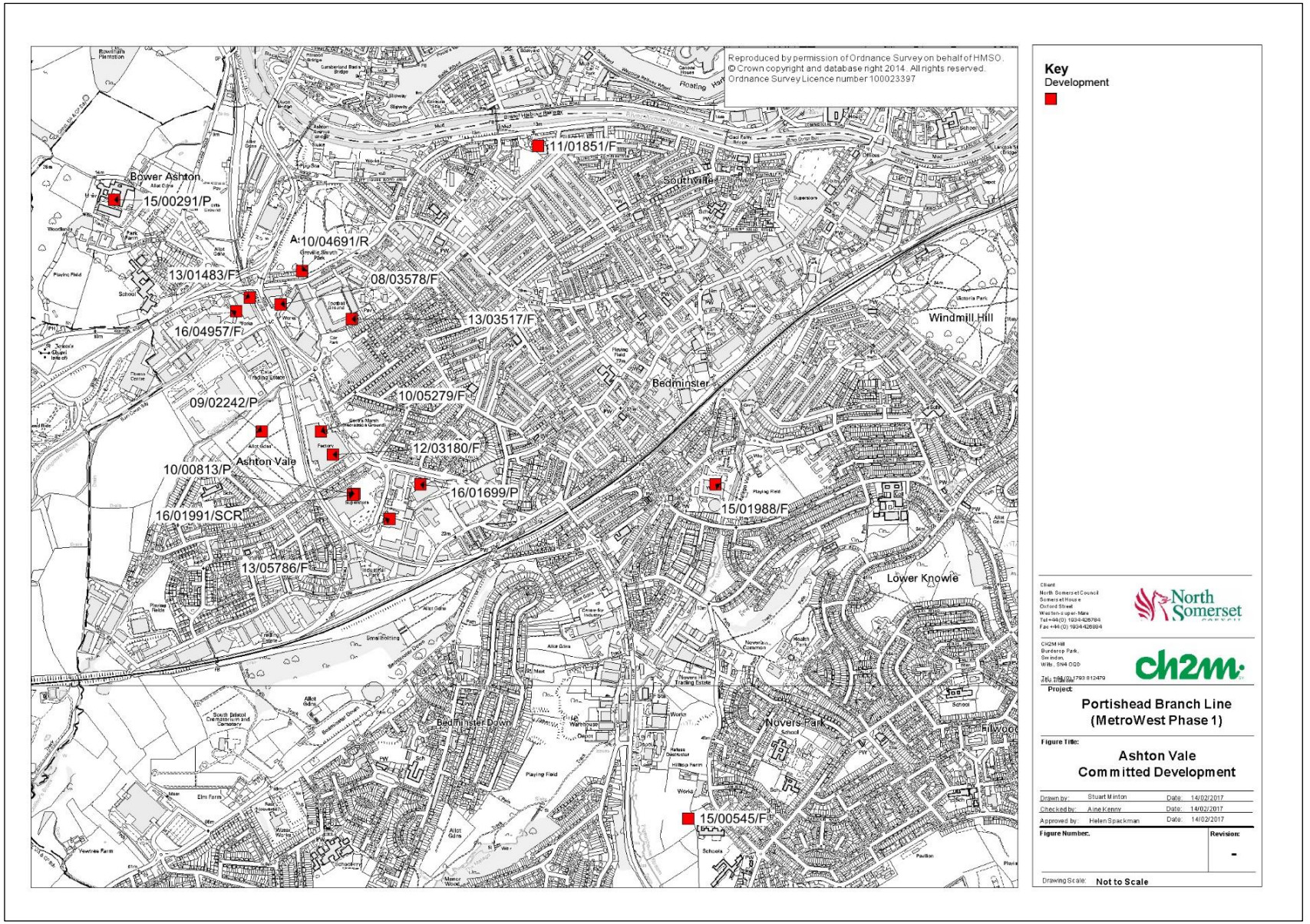


FIGURE 4.6

Committed developments in the vicinity of the DCO application – Ashton Vale area



4.4 Existing highway network

4.4.1 Principal links and junctions

4.4.1.1 Portishead

The town of Portishead is connected to the wider strategic and local highway networks by the links as shown in Figure 4.7.

The main roads in the town are:

- A369 Wyndham Way – which connects the eastern part of Portishead, the marina and the town centre with the principal link to the M5 at junction 19;
- B3214 Bristol Road – which connects to the town centre, the western part of Portishead and the various settlements south of Portishead;
- Cabstand and Nore Road – which links the town centre and western parts of Portishead particularly along the coastline;
- West Hill and Down Road – which is the main access route between the western parts of Portishead and the town centre; and
- Harbour Road/Quays Avenue - which links Wyndham Way with the marina area and the new areas in eastern Portishead.

4.4.1.2 Pill

The A369 is the principal access route to and from Pill with two main junctions at St Georges Hill in Easton-in-Gordano and Pill Road. Heywood Road and Lodway forms part of a 'spine' road that serves the larger settlement as shown in Figure 4.8.

4.4.1.3 Ashton Vale

Ashton Vale has three strategic routes towards the centre of Bristol:

- A369 which links Portishead and Pill with the City;
- A370 which is a major route in North Somerset and is one of the principal links between Weston-Super-Mare and Bristol; and,
- A3029 which is a major access route to south Bristol and the A38 to the Airport.

Just north of the level crossing site is the Ashton Vale underpass which connects with Brunel Way and enters the City at Hotwells. Figure 4.9 illustrates these principal routes.

FIGURE 4.7
Principal and main roads in Portishead

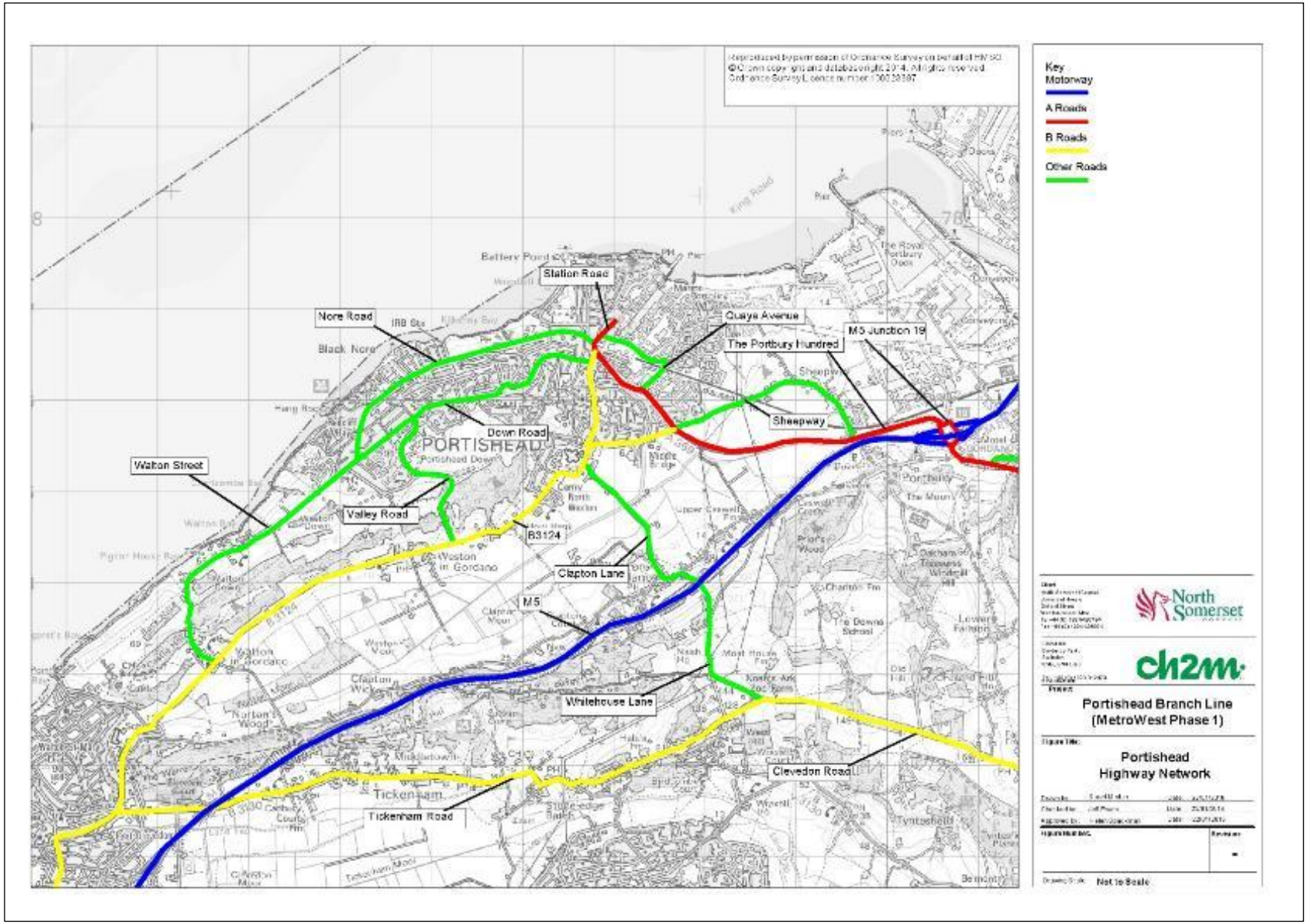


FIGURE 4.8
Principal and Main Roads in Pill

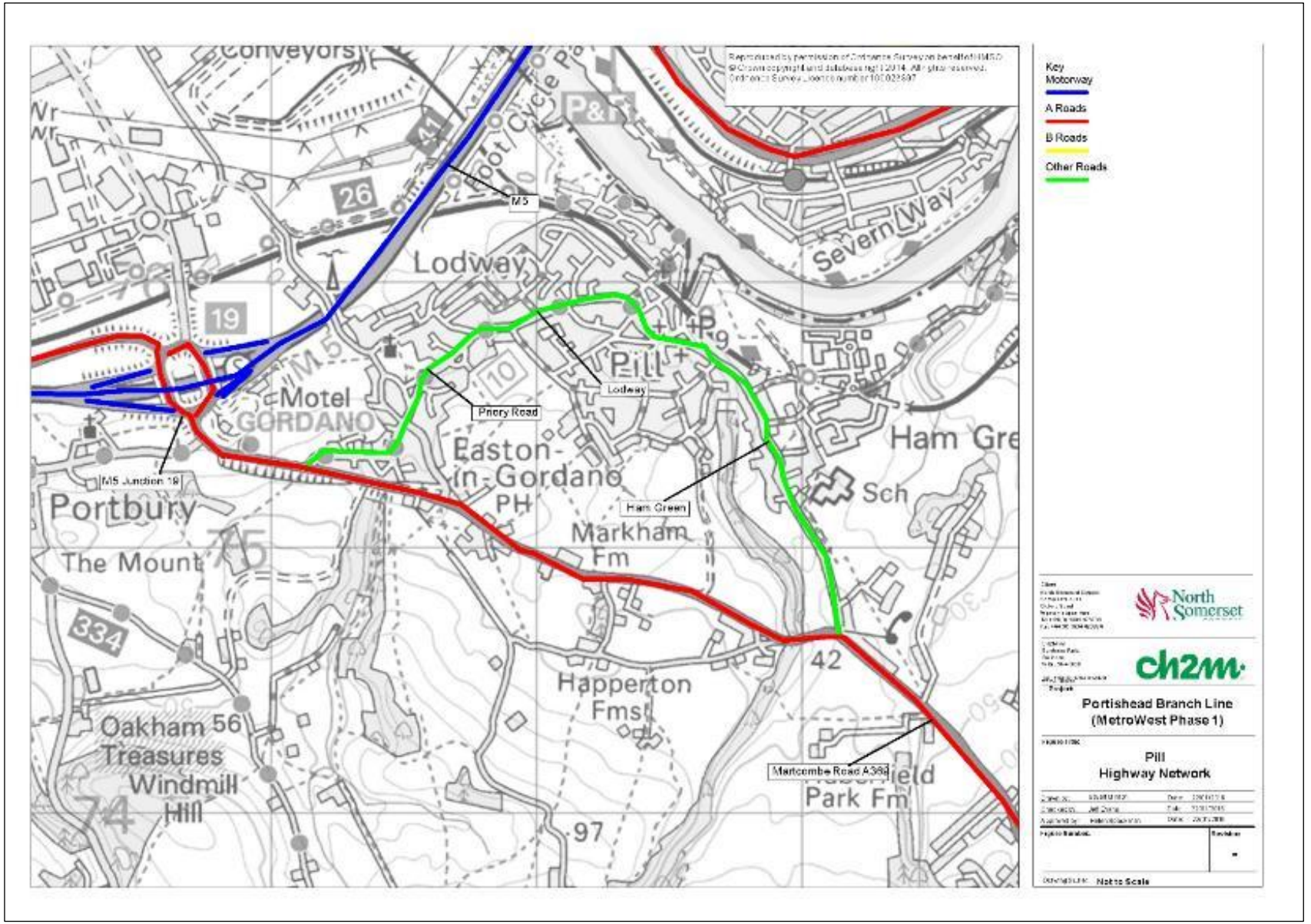
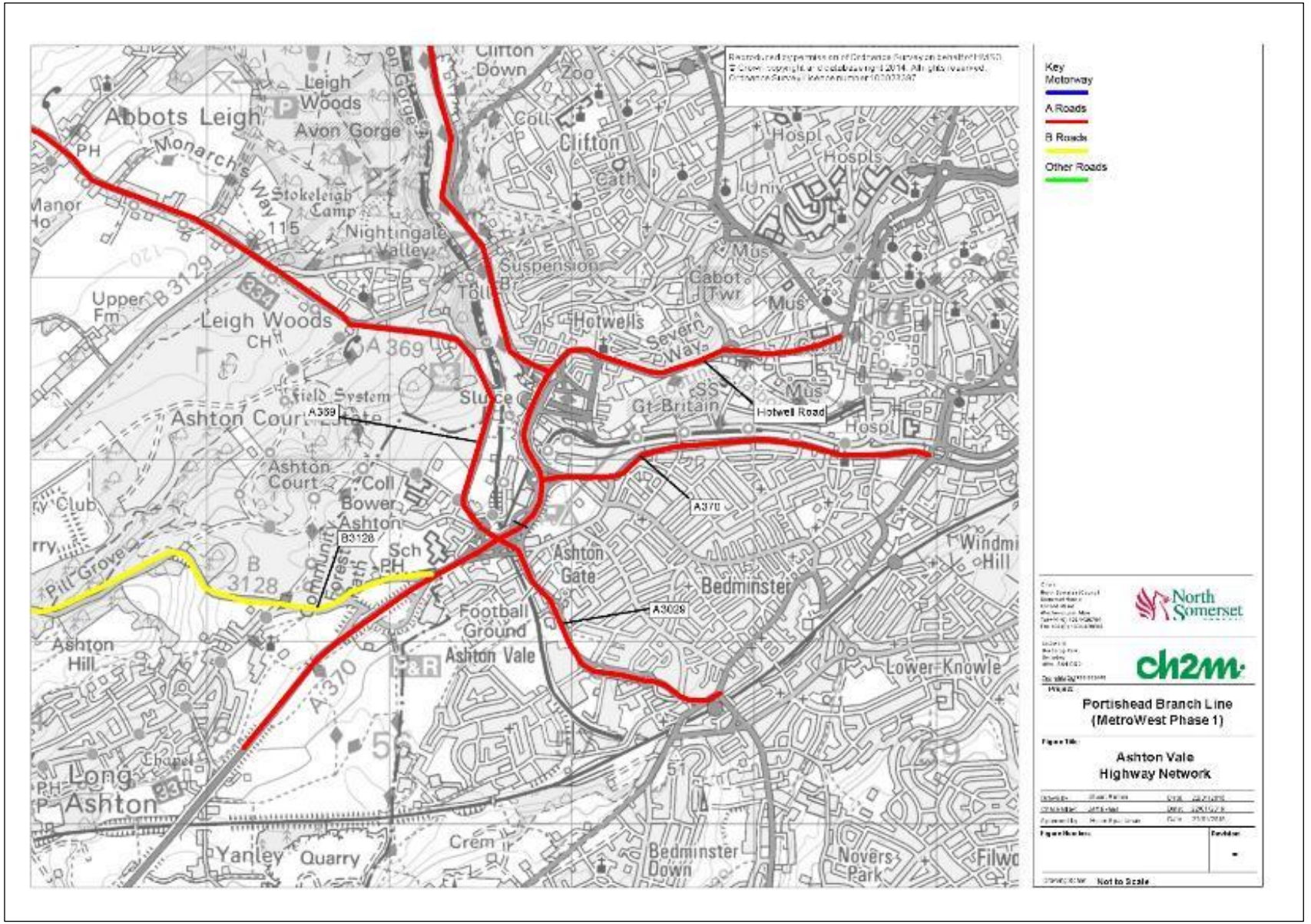


FIGURE 4.9
Principal and main roads in Ashton Vale



4.4.2 Local links and junctions

4.4.2.1 Portishead

Below is a short review of the local highways that surround the proposed station site in Portishead. These are based on observations undertaken in autumn 2014 and spring 2015.

Port Marine - Phoenix Way

Phoenix Way is part of the main circular road that serves the new developments at the Portishead Vale, the Village Quarter and Port Marine. Port Marine which has been built in the last decade has been built to a layout that attempts to curtail car use through limiting the number of both on-street and off-street car parking available. This is evidenced in Figure 4.10 which shows the more restricted width of Phoenix Way with a limited number of parking bays. This has the effect of reducing the level of parking but also reduces traffic speeds as there is insufficient space for oncoming vehicles to pass each other.

FIGURE 4.10
Port Marine – Phoenix Way

Port Marine - Malin Parade

Malin Parade is a short residential street that is located northwest of Phoenix Way and approximately 200m from the proposed Portishead Station. The unadopted road is relatively narrow which results in a limited level of on-street parking. Most of the properties have access to private communal parking areas which are located behind the houses.

Port Marine – Marjoram Way

Marjoram Way is an adopted street that runs from Phoenix Way to a junction with Tarragon Place. The road is the principal access point to Trinity Primary School and as a result parking controls are in place in the vicinity of the school. This includes double yellow lines and parking restrictions during school hours. Given the layout of Marjoram Way which is less than 6m wide in certain places, the double yellow lines help facilitate the flow of traffic along the road as shown in Figure 4.11.

Designed to the same layout and standards as neighbouring streets, Marjoram Way has a limited number of small parking bays that can accommodate up to three cars each. These are supplemented by off-street communal parking bays that are located to the rear of the properties.

FIGURE 4.11
Port Marine – Marjoram Way in the vicinity of Trinity Primary School

Port Marine – Camomile Walk

Camomile Walk which is located approximately 250m from the station is a private road which is accessed directly off Marjoram Walk. The road is relatively narrow which constrains the level of on-street parking. As with neighbouring streets, there are off-road parking bays available for local residents.

Port Marine – Finisterre Parade

Finisterre Parade forms part of the principal access routes around the Port Marine area. The road layout and alignment is designed to facilitate slower journeys and reduce car use through the limited availability of on-road parking spaces. The road has been adopted by the local authority.

Harbour Road

Harbour Road is the main link that connects the eastern part of Portishead with the town centre and the wider local highway network. Harbour Road can be broadly broken down into three sections which reflect the immediate land use.

The first stretch is from Station Road to the Marina. This area effectively forms part of the Town Centre and is characterised by recent commercial and residential development. The developments include two supermarkets, a hotel and a large car park. Harbour Road itself has been reconfigured with the development and has a raised table in the vicinity of the main pedestrian crossing point to the Marina. The width of the road is reduced and on-street parking is restricted to one side of the highway. Also within the same location, a footway is present only on the east side of the road.

The second stretch of Harbour Road is from the Marina towards the Portbury Ditch as shown in Figure 4.12. This stretch is characterised by new developments coming on stream. The alignment of the highway is generally straighter with footways on both side. Given the developments are located away from the highway edge, forward visibility is good. There are no parking controls in place.

FIGURE 4.12
Harbour Road – in the vicinity of the Portbury Ditch

The final stretch of Harbour Road is from the Portbury Ditch to the junction with Phoenix Way and Quays Avenue as shown in Figure 4.13. This stretch provides access points to two industrial estate areas as well as more recent office development, the Marina Health Centre and a sheltered housing complex. On the west side of the highway, the land between the former railway line and Harbour Road is not developed and will form part of the parking proposals as part of the scheme.

One aspect of these land uses is that generally off-street parking provision is more limited (particularly in the case of the Health Centre) which results in a significant demand for on-street parking. This is evidenced in this TA under parking conditions. The width of the highway means that parking on both sides of the road could potentially impede the two-way flow of traffic along Harbour Way.

FIGURE 4.13
Harbour Road – in the vicinity of the Marina Health Centre

Haven Way

Haven Way is a short private road that provides access from Harbour Way to a small industrial area, the Marina Health Centre and a sheltered housing complex. The road is relatively narrow which means parking is largely confined to one side, otherwise vehicles would have difficulty in passing opposing traffic as shown in Figure 4.14.

One feature of Haven Way are abnormal sized HGV movements. It is noted that parking levels on Haven View and Harbour Road result in problems for HGV turning movements.

FIGURE 4.14
Haven Way

Gordano Gate Business Park – Serbert Close

Serbert Close is one of the roads that make up the Gordano Gate Business Park. A small cul-de-sac off Serbert Road, this private highway provides access to several office buildings. Each of the properties has a communal private parking area.

Gordano Gate Business Park – Serbert Road

Another of the roads that makes up the business park is Serbert Road. Principal land uses along this road are office and light industrial/warehousing units with ancillary activities. Most of the premises have off-street parking provision available which reduces the demand for on-street parking.

Gordano Gate Business Park – Serbert Way

Serbert Way is the principal access route to the Gordano Business Park and retail park. The dominant land use on Serbert Way is the Sainsbury's Supermarket which opened in October 2014. Located along Serbert Way also are a hotel and a chain restaurant/pub. On-street parking was observed – principally to do with the surrounding offices and ancillary services.

FIGURE 4.15
Serbert Way

Galingale Estate

Galingale Estate – Conference Avenue

Conference Avenue is located approximately 300m South West from the proposed station location. Conference Avenue has two distinct land uses – residential on the east side and an office park on the west side. Both land uses have off-street parking available which reduce the level of on-street parking.

Conference Avenue itself has some traffic calming features such as raised tables and build outs which have a beneficial impacts on controlling traffic speeds.

Galingale Estate – Galingale Way

Galingale Way is an adopted residential street located approximately 150 metres from the station. Galingale is the principal means of access to the estate with a number of junctions with neighbouring streets. Generally, most of the estate has off-street parking provided which results in a low number of vehicles parked on the public highway.

Galingale Way itself has two sections. The section that has a junction with Quays Avenue includes a small communal garden and has both vertical and horizontal traffic calming features. The road itself forms part of the National Cycle Network Route 26.

A second section which routes through a small parkland area links up to Tydeman Road. The adopted road also has some traffic calming features such as bricked surface treatments as shown in Figure 4.16.

FIGURE 4.16
Galingale Way

Galingale Estate – Mulberry Avenue

Mulberry Avenue is a short link that weaves between Conference Avenue and Galingale Way. The road has a bricked raised table in a central section. The road width is relatively narrow which has the added impact of reducing vehicle speeds further.

Galingale Estate – Mulberry Close

Mulberry Close is a residential cul-de-sac that arcs from Mulberry Avenue towards Conference Avenue. The road is similar to neighbouring streets with off-street parking available to residents.

Galingale Estate – Peartree Field

Peartree Field is an adopted residential cul-de-sac that is located directly South West of the station location. The street, which is screened off from the railway line alignment by vegetation, can only be accessed directly from Galingale Way by both vehicles and pedestrians. As with other neighbouring residential streets, the layout and traffic calming features are similar.

Galingale Estate – Tydeman Road

Tydeman Road is a residential street to the South East of the station location and provides access to a number of side streets. The housing is generally more recent thus the layout conforms to patterns as laid out in publications such as Manual for Streets 2. Most of the housing has off-street parking available although the narrow width of the street restricts on-street parking.

4.4.2.2 Pill

Below is a short review of the local highways that surround the proposed station site in Pill. These are based on observations undertaken in autumn 2014 and spring 2015.

Station Road

Station Road links Lodway and Heywood Way with the eastern part of Pill and will be the principal route for vehicle accessing the station from the west. The highway is located in the older part of the village and as a result the highway width is narrow in many parts that requires parking controls to facilitate the flow of

traffic. Apart from residential land uses, Pill Clinic is also located here and has a specific amount of off-street parking available.

FIGURE 4.17
Station Road Pill

Avon Road

Avon Road provides a link to the residential area in North East Pill. This area is characterised by post war housing located closer to the river. Many of the properties have off-street parking available compared to older parts of the town.

FIGURE 4.18
Avon Road, Pill

Back Lane and Chapel Row

Back Lane and Chapel Row forms a circular road in the older part of the town and has the same characteristics of a narrow highway width with properties located close to the highway edge. In many places, footways are lacking although traffic flows are very low.

Back Lane together with Chapel Row form a highway loop to the immediate north of the station entrance. Mainly residential, it is characterised by older and more densely concentrated housing types with limited off street parking. Back Lane is narrow in parts so much so that a footway is not present

Church Walk and Heywood Terrace

Church Walk and Heywood Terrace is a small area of largely terraced streets that is located to the South West of the station site. The area has the same characteristics of limited levels of off-street parking space being available. In certain places, road markings have been added to improve the operation of the highway.

Crusty Lane

Located opposite to the proposed entrance to the station, Crusty Lane is a short cul-de-sac comprising a few houses. All the dwellings have off-street parking which means there is available on-street parking space close to the junction with Monmouth Road.

Hardwick Road and Lodway Close

Hardwick Road and Lodway Close are located to the north west of the station although it has no direct vehicle access to the site. Hardwick Road and Lodway Close forms part of a small post-war housing estate that has a lower density with a number of properties of having off-street parking provision.

FIGURE 4.19
Hardwick Road

Mariners Way

Located to the North East of the proposed station site and close to the river, Mariners Way forms part of a small post-war housing estate. The road provides an alternative route to Station Road to reach this part of Pill. Some of the properties have off-street parking and so have similar conditions to other parts of the town.

Monmouth Court

Monmouth Court and Monmouth Road form a road that runs parallel to the proposed station site and will be the principal vehicle access to the station. A feature of Monmouth Court is the presence of a footway on one side only and a road width that only permits parking on the one side which makes it difficult for vehicles to pass each other. However, most of the dwellings have off-street parking available.

FIGURE 4.20
Monmouth Court

Monmouth Road

Monmouth Road will be the main vehicle access point to the car park and will provide the pedestrian link to the proposed station entrance on Station Road. The road mainly consists of housing that do not have off-street parking although a private lane (and garages) exist along of the rear of the street.

The highway width is constrained as shown in Figure 4.21 with the presence of a footway on the one side only. The carriageway width does create difficulties for vehicles to pass each other especially with the volume of parked vehicles on the highway. However, there are spaces between parked cars allowing for cars to pass provided by residential driveways. The low vehicle speeds and the segregation between traffic and the footway caused by on street parking supports the safe movement of pedestrians along this link.

FIGURE 4.21
Monmouth Road

Sambourne Lane

Located to the west of the station site, Sambourne Lane is a small cul-de-sac comprising retirement bungalows with limited parking provision. The road also provides access to the Pill Clinic car park as shown in Figure 4.22.

FIGURE 4.22
Samborne Lane

Severn Road

Severn Road extends from Monmouth Court and runs parallel to the railway line before a short lane to Avon Road. The road width is narrower than Monmouth Court with no footway present but a number of properties have private parking.

4.4.2.3 Access to Pill Tunnel

The tunnel is accessed from Ham Green via Macrae Road and Chapel Pill Lane. These roads mainly serve residential properties as well as a number of commercial units and a hospice located on Chapel Pill Lane. There are footways located along Macrae Road from Ham Green while pedestrian facilities are absent on Chapel Pill Road.

4.4.2.4 A369 Clanage Road

Clanage Road (A369) provides a link between the A370 to the south and Rownham Hill to the north which leads into Leigh Woods. The road primarily serves residential properties as well as Avon and Somerset Constabulary and Bedminster Cricket Club. There are pedestrian facilities present along one side of the highway to a point where its leads onto Rownham Hill.

4.4.2.5 Ashton Vale

Ashton Vale is a mixed industrial and residential area of South West Bristol. The area has generally good links to central Bristol as a result of the dual carriageway A370 Brunel Way to Hotwells. Currently, the existing Parson Street to Portbury freight line cuts through the industrial, commercial area and residential areas of Ashton Vale.

The scheme proposals will directly impact on the existing Ashton Vale road level crossing which provides access to an industrial estate. The existing Ashton Vale Road is accessed directly from Winterstoke Road through a signalised junction. This junction permits northbound left turns (in the direction of Bristol City Centre) only with southbound right turns not permitted by the layout of the junction. Exiting traffic from Ashton Vale Road have the option to either turn left northbound or right southbound.

4.4.2.6 Other elements of the Scheme

In addition to the above, the other elements of the scheme will involve signal and track layout changes in Ashton Vale, Avonmouth and Bathampton. Existing Network Rail access points to the operational railway line will be utilised for these works.

4.4.3 Weight restrictions

Figure 4.23 provides the weight restrictions along the scheme alignment. This generally shows the weight restrictions are located away from the scheme and largely apply to unclassified minor roads. On this basis, there are no restrictions to consider.

4.4.4 Speed limits

Along the principal roads in Portishead, a 30mph speed limit generally applies with a few exceptions such as in the residential areas of Port Marine where a 20mph zone applies. Higher speed limits apply on the A369 Portbury Hundred south of Portishead.

In Pill, the main Lodway/Heywood Road/Ham Green road through the area is 30 mph with higher speed limits applying outside Pill.

4.4.5 Existing Traffic Regulation Orders

Figures 4.24 and 4.25 show the extent of existing traffic orders in Portishead and Pill respectively.

Within Portishead, the main orders are in and around the town centre. These largely relate to prohibiting or restricting waiting as not to impede the flow of traffic through the centre. Outside the centre, other controls are in place near Schools such as Marjoram Way near Trinity Primary School. There are also other controls near the location of the proposed station – namely in and around the Health Centre on Harbour Road and Old Mill Road where double yellow line road markings prohibit parking.

In Pill, there are fewer restrictions but essentially there is prohibition of waiting along one side of Station Road and parts of Heywood Road near the centre. These controls are geared towards ensuring that the flow of traffic is not impeded given the relatively narrow carriageway width.

Figure 4.26 shows the extent of existing TROs within Ashton Vale Industrial Estate. Parking is mainly unrestricted with only the section from the Winterstoke Road junction to the access to Manheim having restrictions in place in the form of double yellow line road markings along both sides.

FIGURE 4.23
Weight restrictions

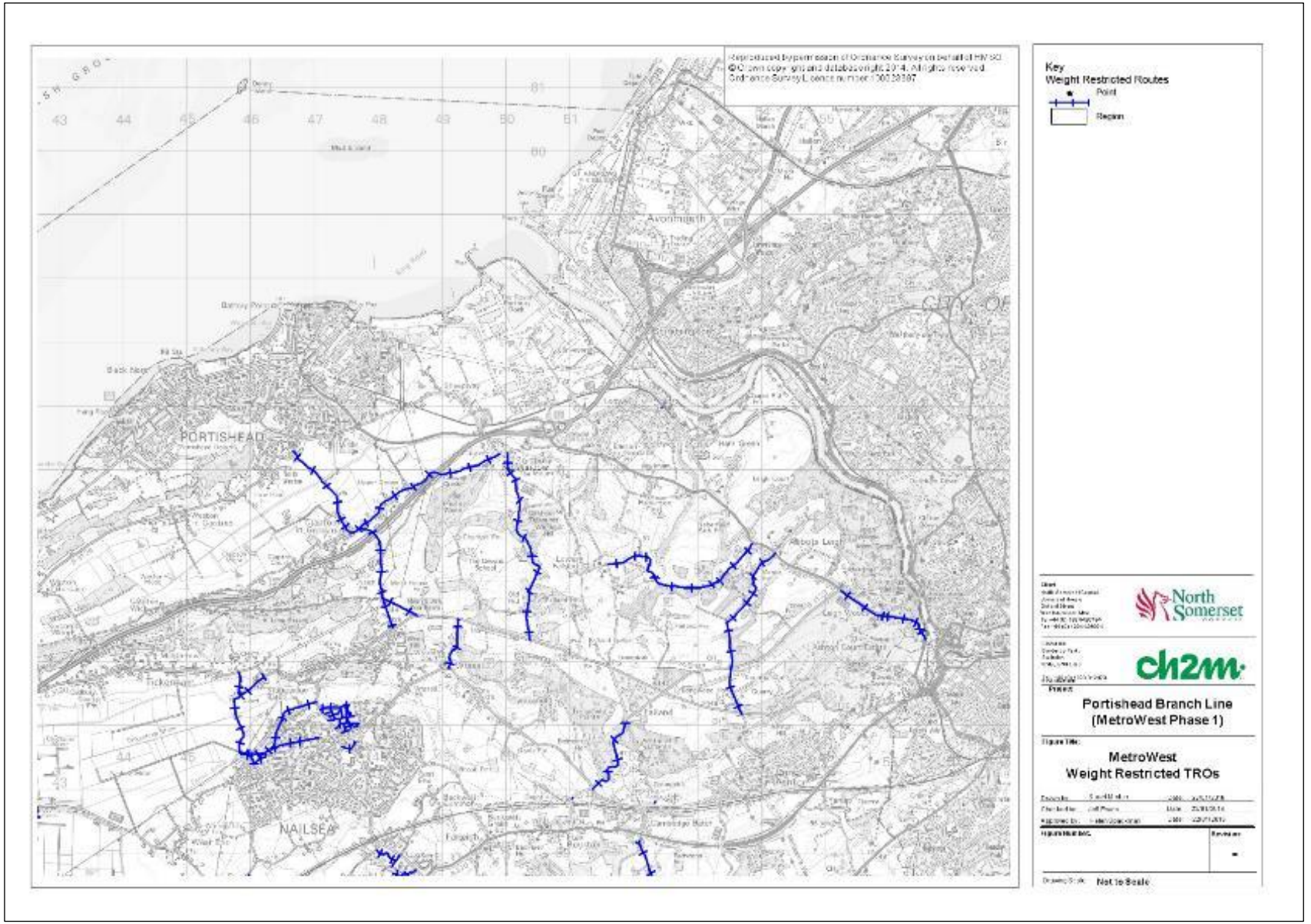


FIGURE 4.24
Parking restrictions in Portishead

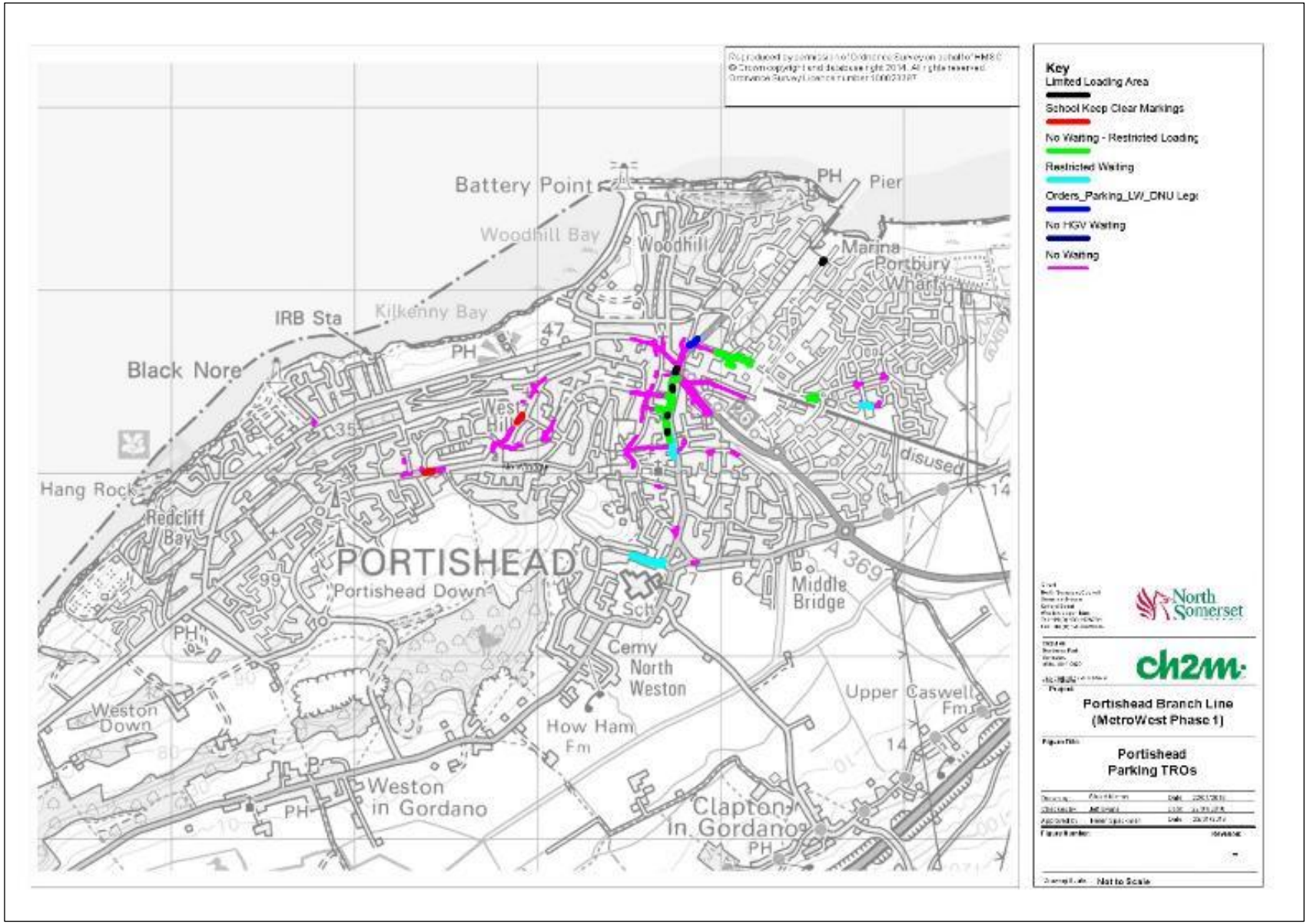


FIGURE 4.25
Parking restrictions in Pill

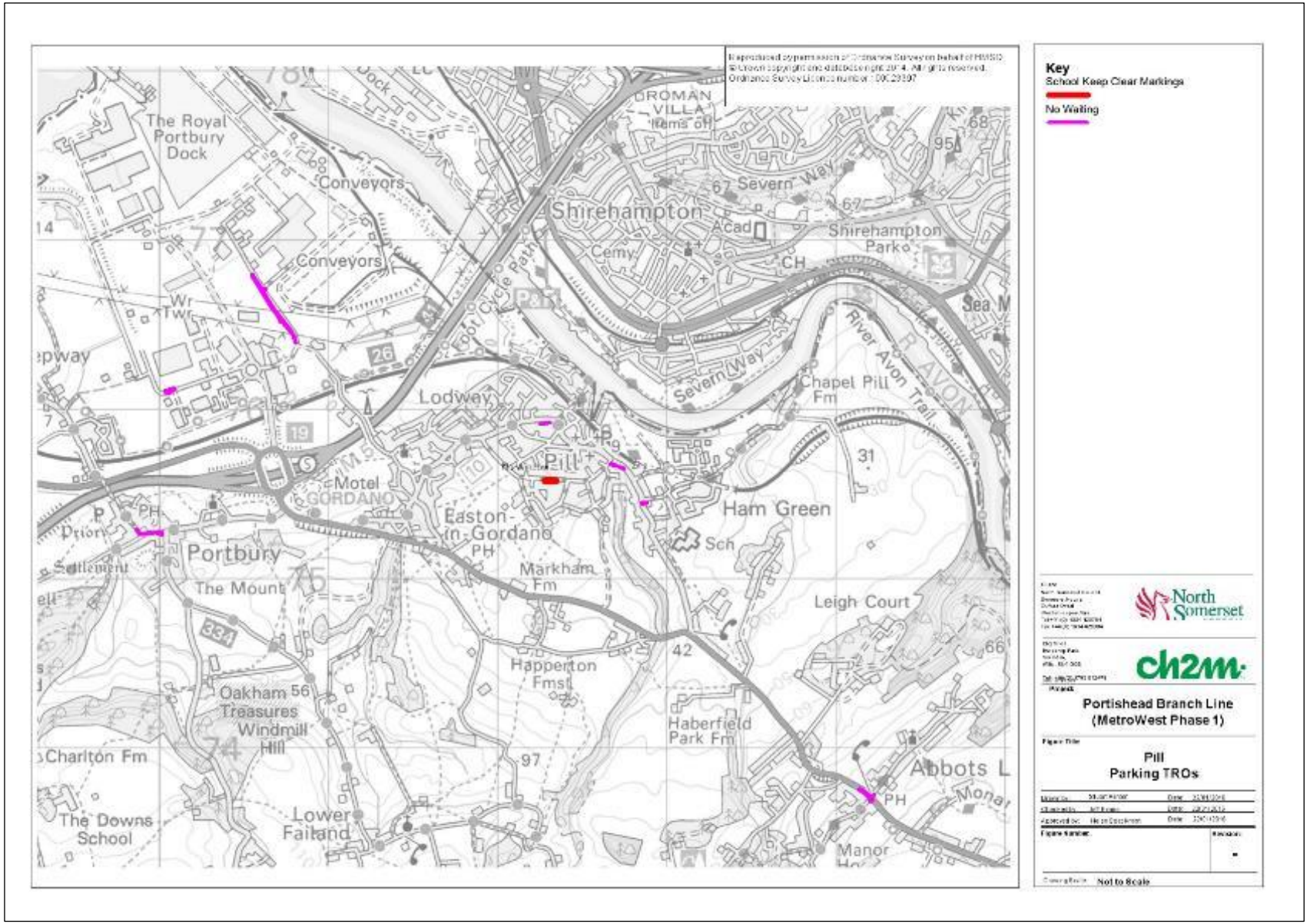
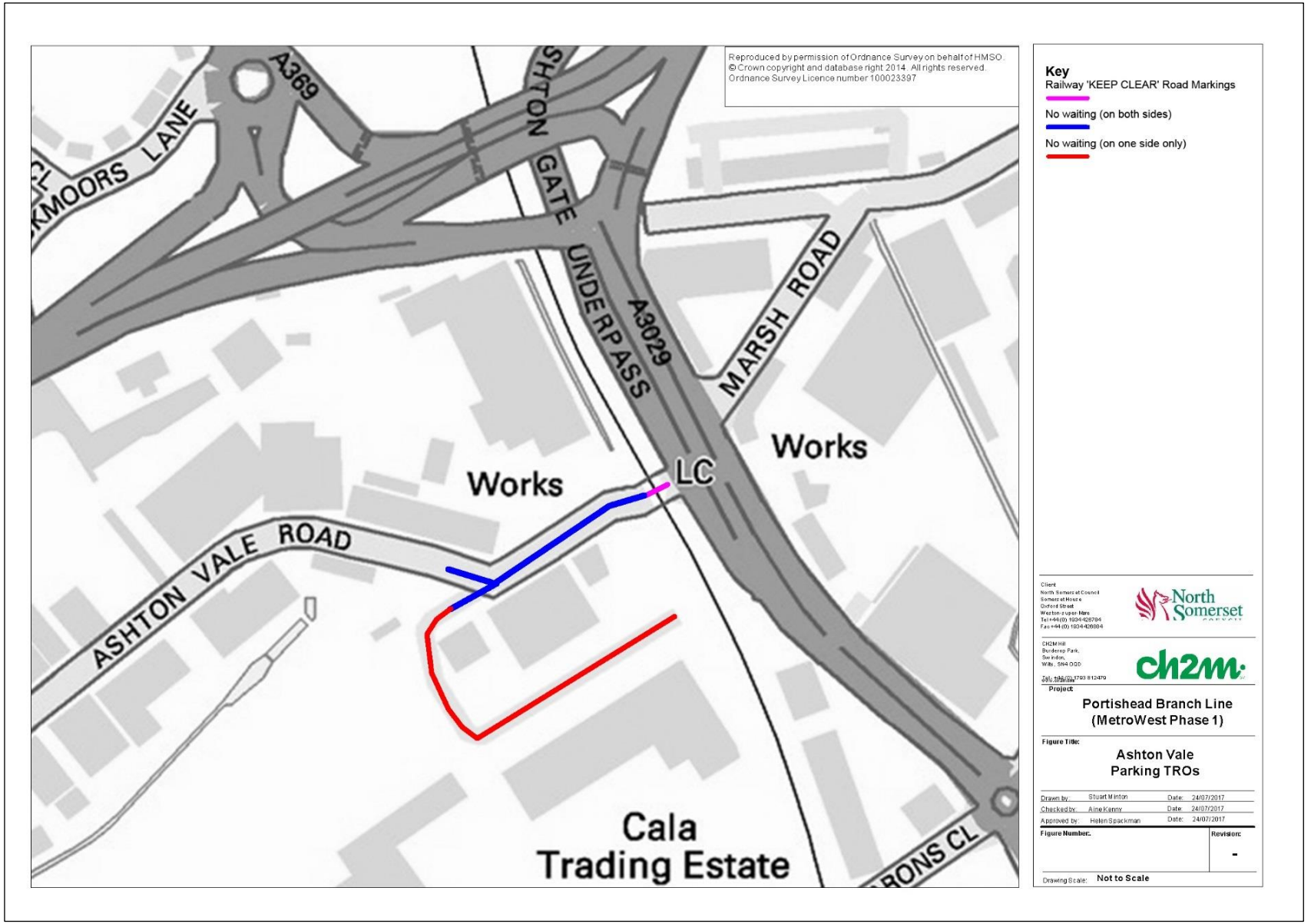


FIGURE 4.26
Parking restrictions in Ashton Vale



4.5 Existing highway flows

4.5.1 Overview

To understand the traffic flows and conditions on the highway network, manual turning counts were undertaken in February 2014 with automatic traffic count (ATC) data recorded in February 2015. The count was undertaken in accordance with Design Manual for Road and Bridges (DMRB) Volume 12: Traffic Appraisal of Road Schemes – Chapter 6, Section 6.2 and had the following criteria:

- Undertaken for 14 consecutive calendar days excluding school holidays for a two-week period;
- Hour flows recorded;
- Undertaken in both directions;
- AM and PM peak hours to be identified;
- Vehicles to be classified by length: and
- Summary for each week to give 12, 16, 18 and 24 hour totals as well as 5 and 7 day averages.

In addition to the traffic counts collected for this traffic assessment, a large data collection exercise was undertaken in 2014 to inform the GBATS4 revalidation.

Turning count surveys were also undertaken in 2016 at the Ashton Vale Road area.

4.5.2 Portishead

Traffic counts were undertaken at locations as shown in Figure 4.27. A report of surveys in **Appendix C** details the scope and methodology of the counts undertaken.

Figure 4.29 provides a summary of the peak AM (08-00 to 09-00) and PM (17-00 to 18-00) flows. The Figure reveals a number of trends about existing flows as follows:

- The highest flows both in the morning and afternoon peaks were observed along the A369 Wyndham Way and Portbury Hundred corridor;
- The two way flow along Quays Avenue is fairly consistent between the morning and evening peaks. This reflects the outflow from the residential area of Port Marine in the morning peak but the inflow towards the commercial and industrial areas around the marina. This trend is effectively reversed in the evening peak;
- The evening flows into the Gordano Business Park are higher than the morning peak indicating the impact of Sainsbury's Supermarket is more pronounced later in the day; and
- The Portbury Hundred junction as the principal vehicle access route into and out of Portishead is the most heavily trafficked although the Sheepway arm has much lower flows.

4.5.3 Pill

Figure 4.28 shows the ATC locations in Pill. The Report of Surveys in **Appendix C** provides information on the scope and the methodology of the count.

As a result of TA scoping discussion, a request was made to assess traffic flows at the junction of the A369/St Georges Hill. This data has been recorded by NSC at a different period and is outlined in **Appendix C**.

Figure 4.30 provides a summary of the peak AM (08-00 to 09-00) and PM (17-00 to 18-00) flows. The Figure reveals a number of trends about existing flows as follows:

- The main flows within Pill are along Heywood Road and Lodway. There is a larger north-south directional flow towards Bristol in the AM peak and this reversed in the PM peak;
- The traffic volumes along Station Road and Monmouth Road reflect the largely residential area of Pill. There is a directional variation which again reflects the morning and evening peaks.

4.5.4 Ashton Vale

NSC undertook a MCC (turning count survey) at the Winterstoke Road/Ashton Vale Road signalised junction in March 2016. Counts were also undertaken at the Park and Ride entrance. The Report of Surveys in **Appendix C** provides information on the scope and the methodology of the counts. Further counts were undertaken in May 2017 and these are reported in **Appendix P**.

FIGURE 4.27
ATC Locations in Portishead

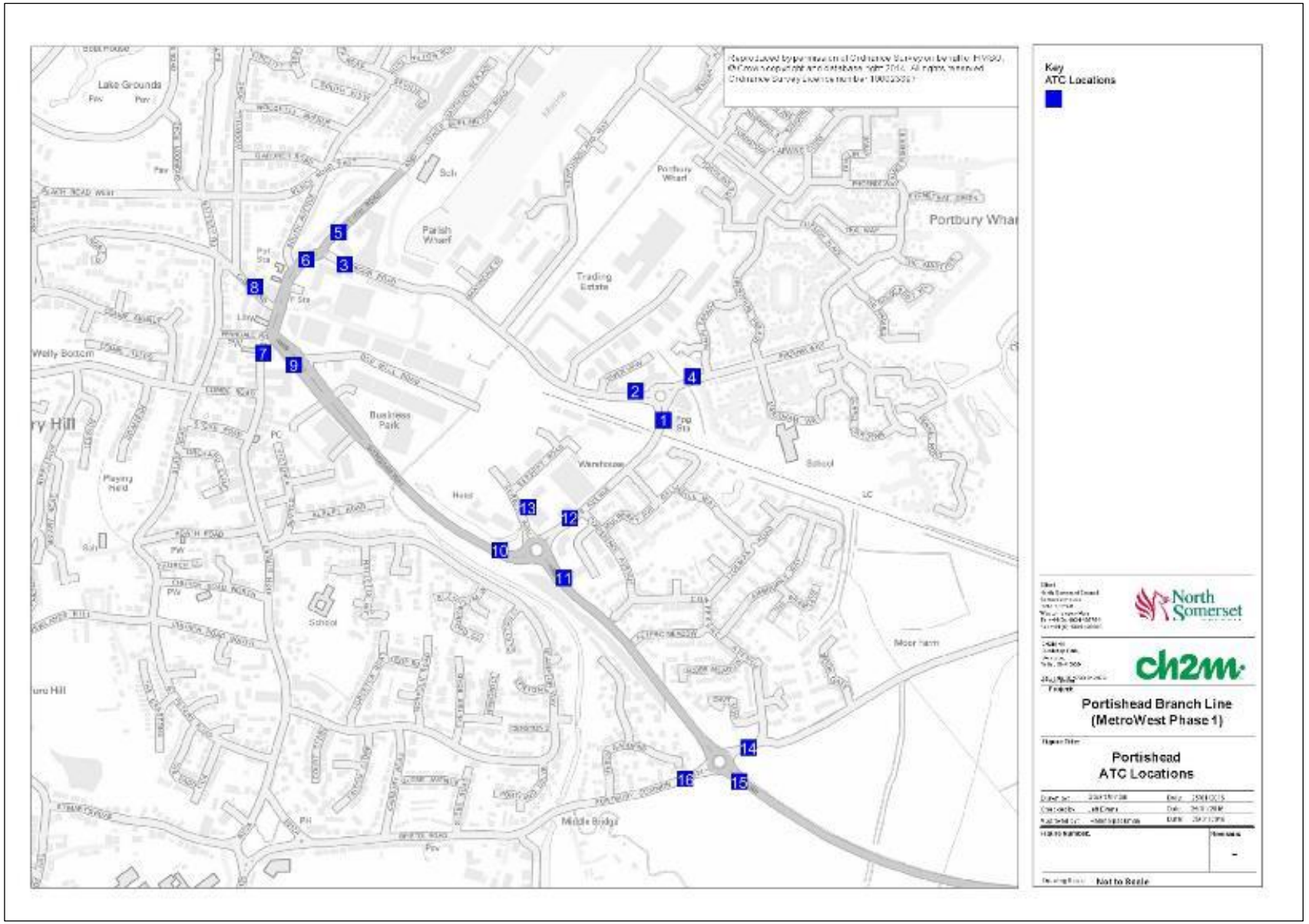


FIGURE 4.28
ATC Locations in Pill

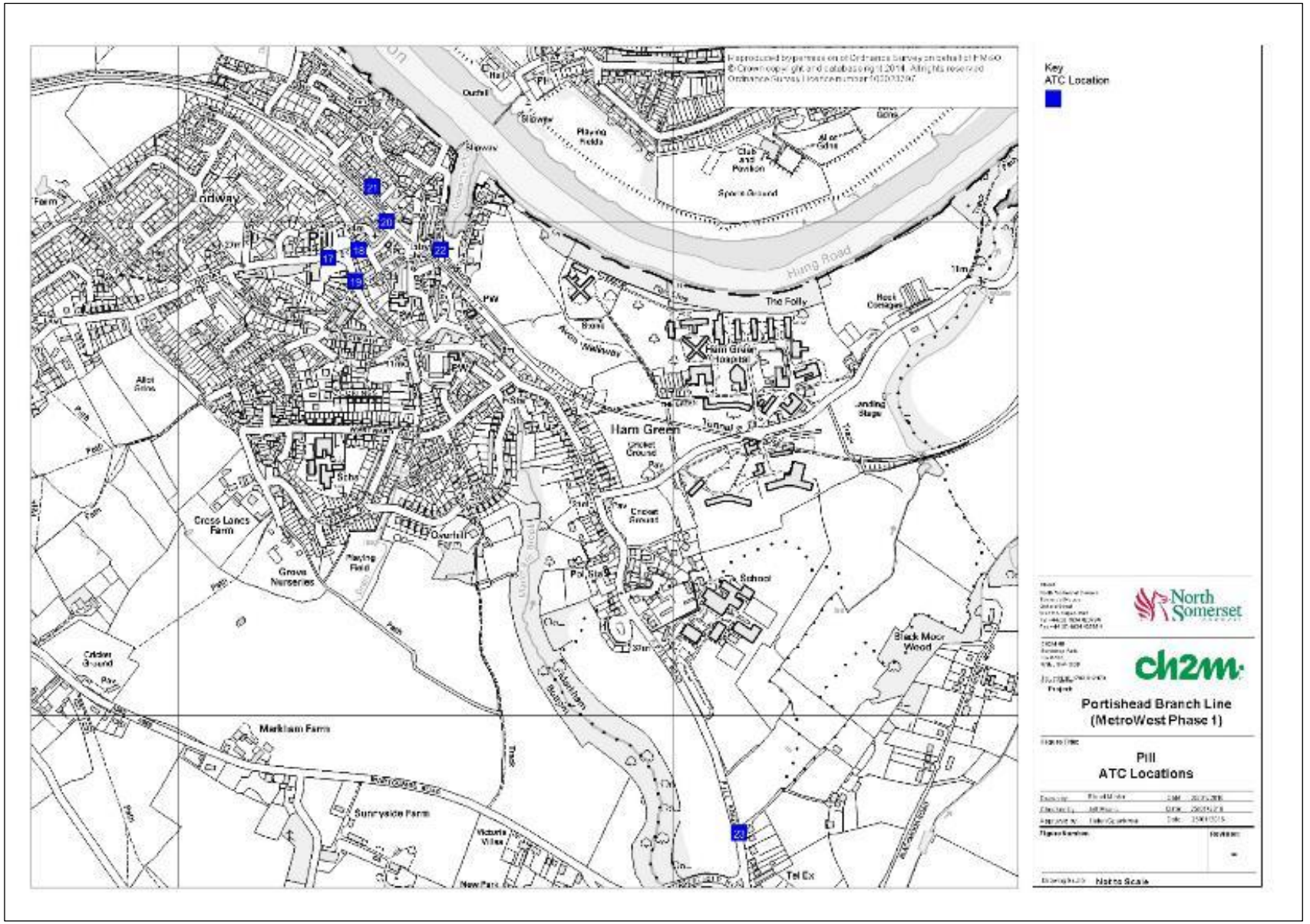


FIGURE 4.29

Baseline AM and PM traffic flows in Portishead (Passenger Car Unit (PCUs))

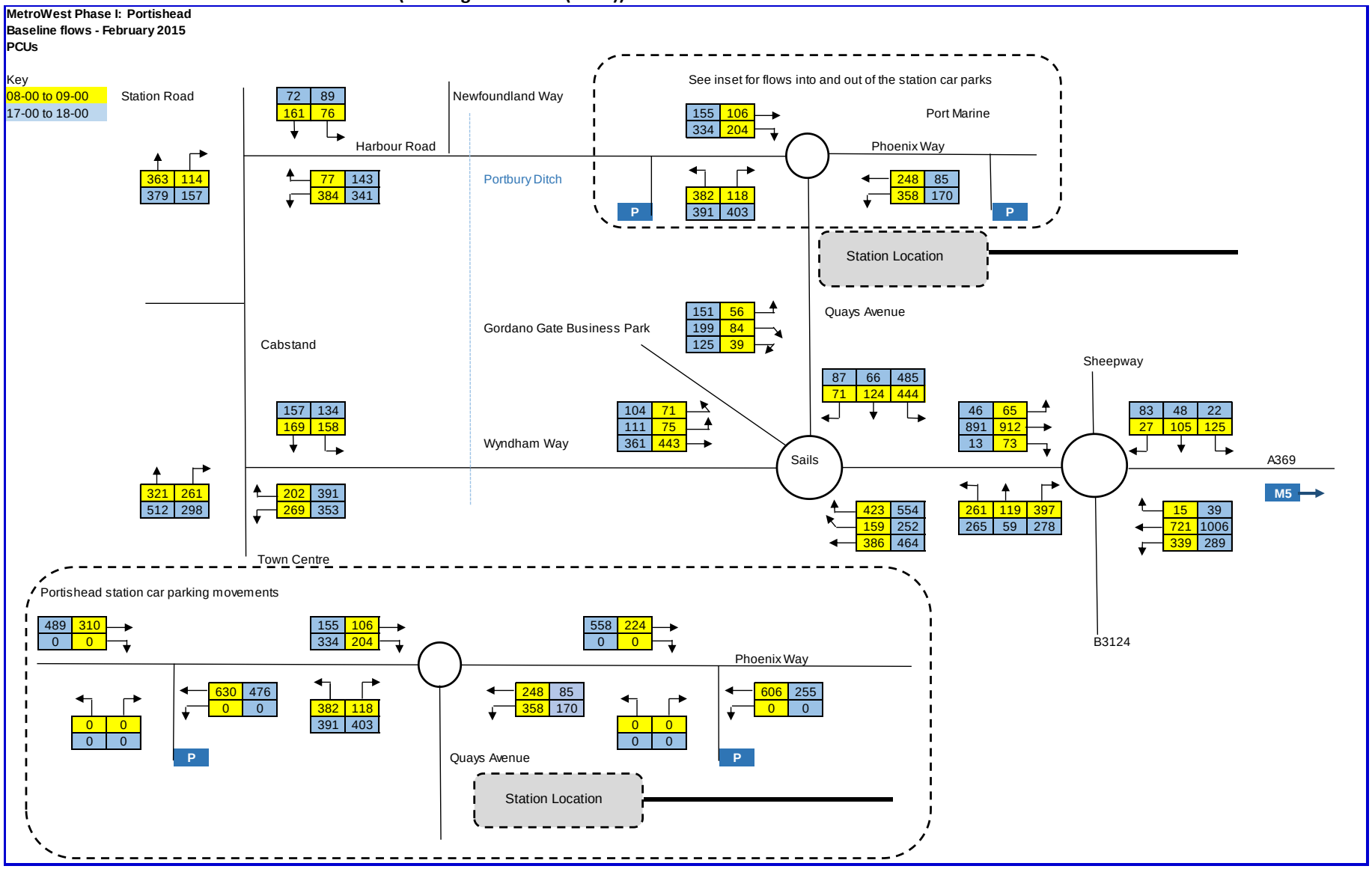
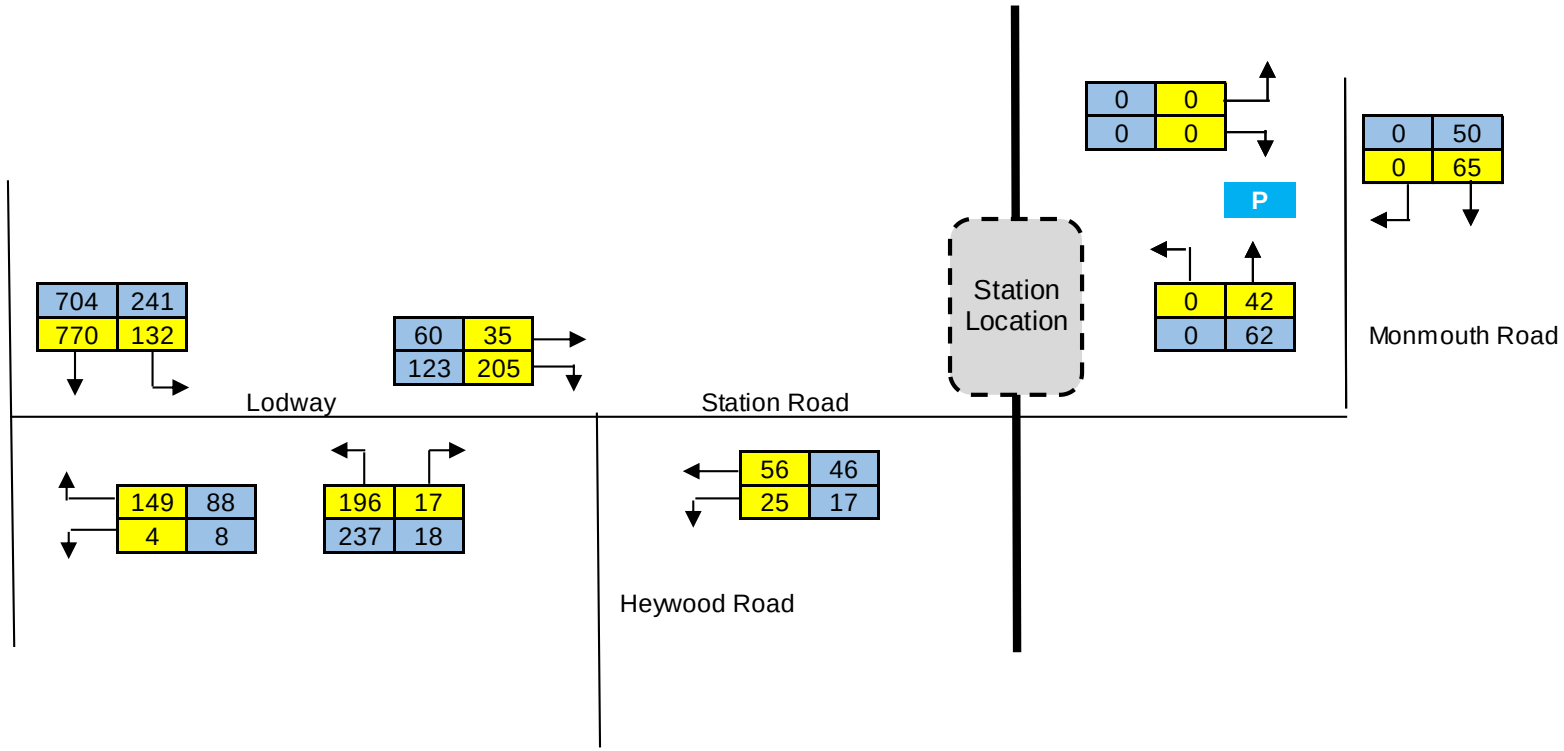


FIGURE 4.30
Baseline AM and PM traffic flows in Pill (PCUs)



4.5.5 Level Crossings

4.5.5.1 Ashton Vale

Figure 4.31 shows the location of the ATCs in the vicinity of the Ashton Vale level crossing.

Table 4.3 shows a breakdown of the traffic for the two counts that were undertaken in 2014 and 2015 respectively. The Report of Surveys in **Appendix C** details the differences in methodology and scope.

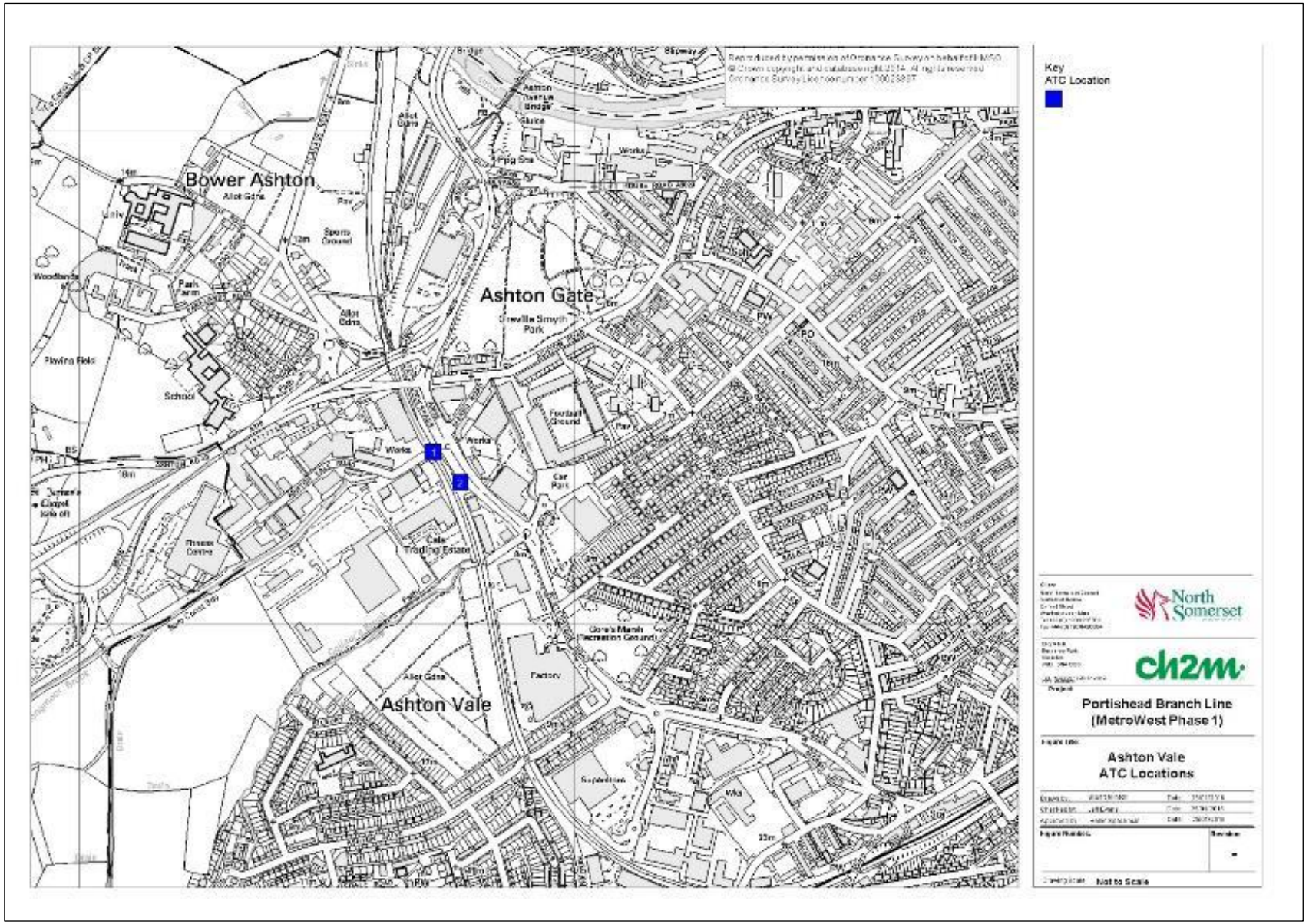
TABLE 4.3
Recorded traffic flows at Ashton Vale

Survey Date	Traffic flows AM peak two way flow	Traffic flows PM peak two way flow	Recorded max queue lengths
2014	232	250	19 vehicles
2015 Ashton Vale Road	284	228	Not recorded
2015 Winterstoke Road NB	994	880	Not recorded

An analysis of the count data shows some differences in the AM and PM flows in and out of the Ashton Vale Road industrial estate but consistent flows along Winterstoke Road. This reflects the peripheral distributor role from the M5 and South Bristol/A38 that Winterstoke Road plays.

Additional turning count data was also obtained in May 2017. These data were collected at 15 minute periods between 07-00 and 19-00 and were classified into the following vehicle types: cars, LGV, HGV, bus, pedestrians, pedal cycle and motor cycle. This information was used in the calibration of the VISSIM model as described in chapter 7.5 and attached in **Appendix P** of the TA.

FIGURE 4.31
ATC Locations in Ashton Vale



4.6 Existing parking conditions

4.6.1 Overview

To understand fully the existing parking conditions, parking surveys were undertaken in the vicinity of the proposed stations and also along Ashton Vale Road near the existing level crossing. Further information on these surveys is provided in **Appendix I** of the TA. For each location, a separate approach was undertaken as follows:

- In Portishead, a bespoke survey of observed parking levels was undertaken in February 2015 and September 2015 given the extent of different land uses and the number of highways involved;
- In Pill, a qualitative assessment was undertaken in February 2015. The approach reflects the limited level of on-street parking that is generally available close to the proposed station; and
- In Ashton Vale Road, a bespoke survey was undertaken over two days in March 2016. The survey reflects the immediate commercial and industrial land uses along this road with an earlier observation start time in the day.

4.6.2 Portishead

4.6.2.1 Existing parking supply

In order to provide a context to parking demand in the vicinity of the proposed new Portishead railway station, an assessment was undertaken to ascertain the level of available parking space. Table 4.4 provides an overview of the indicative number of spaces and Figure 4.32 shows the geographical extent of the assessment.

TABLE 4.4
Indicative numbers of on-street parking spaces near Portishead Station

Survey Zone Reference	Road	Indicative Number of Vehicles
Zone A	Marjoram Way	22
	Camomile Walk	15
	Rosemary Crescent	15
	Tansy Lane	3
	Biscay Drive	5
	Malin Parade	17
	Finisterre Parade	14
	Wight Row	8
	Phoenix Way	20
Zone B	Harbour Road	24
	Harbour Industrial Estate	20
	Haven View	13*
Zone C	Serbert Way	8
	Serbert Road	20
	Serbert Close	6

TABLE 4.4
Indicative numbers of on-street parking spaces near Portishead Station

Survey Zone Reference	Road	Indicative Number of Vehicles
Zone D	Quays Avenue	15
	Mulberry Avenue	13
	Conference Avenue	16
	Tydeman Road	6
	Peartree Field	9
	Galingale Way	12
	Mulberry Close	9
	Holmlee	4
Zone E	Car Park 1	92*
	Car Park 2	44
Zone F	Old Mill Road	21*
Zone G	Newfoundland Way	40
	The Anchorage	20
	Martingale Way	15

*Please note that some sites have varying indicative parking scenarios e.g. residential streets have homeowners vehicles included in the count.

This assessment is based on the following assumptions:

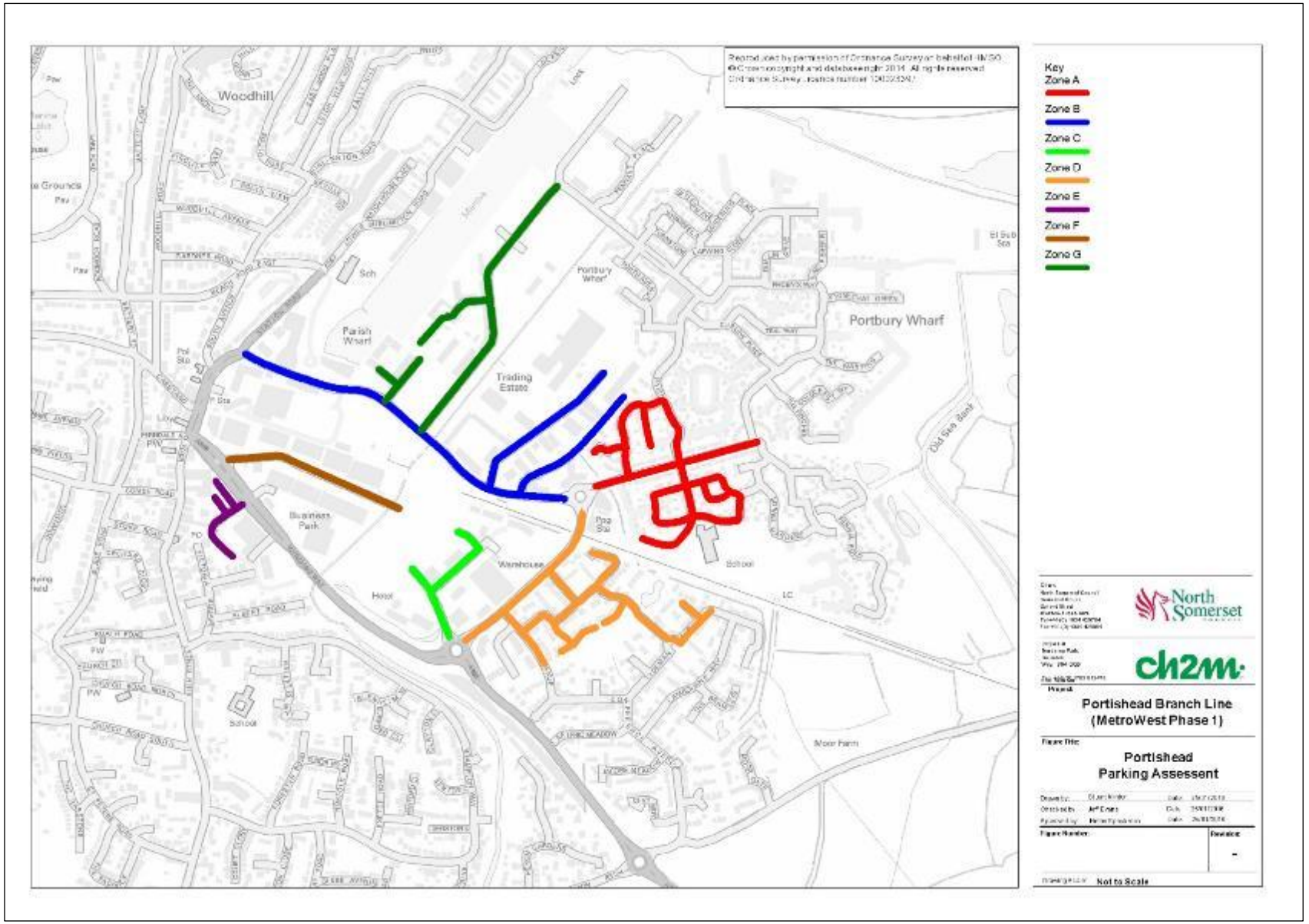
- Where carriageway width would impede the flow of vehicles, spaces have been counted on the one side of the highway only (E.G. Harbour Road);
- A standard vehicle length of 6m was assumed and this was taken from NSC's Parking Standards Policy;
- Excluded private off-street parking but takes account of private access space from the public highway; and
- Where roads are known not to have been adopted by NSC, the highways have not been included in the above calculation. This includes some minor roads within Port Marine and the Serbert Road estate.

Overall, the parking assessment suggests most of the spaces are located within residential areas. The number of parking spaces in the predominately commercial areas are limited by the number of private access points.

4.6.2.2 Parking count

To assess the baseline parking demand situation in Portishead, surveys were undertaken across seven distinct zones as shown in Figure 4.32 in February and September 2015. The surveys were undertaken between 07-00 and 19-00 and the counts were carried out in 15-minute time segments. To understand the results, the following analysis is based on the maximum number of vehicles observed for each hour during the day. The full survey data and analysis can be found in **Appendix C.**

FIGURE 4.32
Portishead Station Parking Assessment



4.6.2.3 Analysis of the Portishead Parking Survey

An analysis of the survey has revealed distinct parking trends in each of the surveyed areas as follows:

- **In Port Marine (Zone A)** parking demand is fairly consistent throughout the day. The exception is Rosemary Crescent which saw a spike in parking levels around 15-00. The main explanation is the close proximity to Trinity Primary School where parking restrictions exist on Marjoram Way outside the school entrance. Phoenix Parade and Marjoram Way also experience some spikes throughout the day also but remain at a constant level through the rest of the survey period.
- **Around Harbour Road (Zone B),** parking fluctuated during the day time particularly in the vicinity of the health centre. There was a peak in demand between 12-00 and 13-00 along Harbour Road.
- **Within Gordano Gate Business Park (Zone C),** a very low level of on-street parking along Serbert Way and Serbert Close was observed. The main difference is Serbert Road which saw some parking which appears to be associated with the surrounding employment land use.
- **Around Galingale Way (Zone D),** the survey showed reduced demand for parking space during the off-peak period. There was one main exception being Galingale Way where the close of the proximity of the road to the school produces a localised spike in demand. The other roads experience some peaks and dips but these are relatively minor.
- **Within the Town Centre (Zone E)** both car parks are well-used throughout the day and are often full to capacity.
- **Along Old Mill Road (Zone F)** parking demand reflects the surrounding employment land use with high demand throughout the day.
- **Towards Portishead Marina (Zone G)** , the survey showed parking demand to be relatively consistent during the day along Newfoundland Way and Martingale Way. The Anchorage had a peak and off-peak fluctuation reflecting surrounding residential land use.

These results have been presented in graphical format in **Appendix I** of the TA.

4.6.3 Pill

In assessing and reviewing existing car parking demand in Pill, surrounding streets within a 200m parallel strip were assessed. This is shown in Figure 4.33. Table 4.5 provides a summary of existing parking provision and the outcome of observed parking levels.

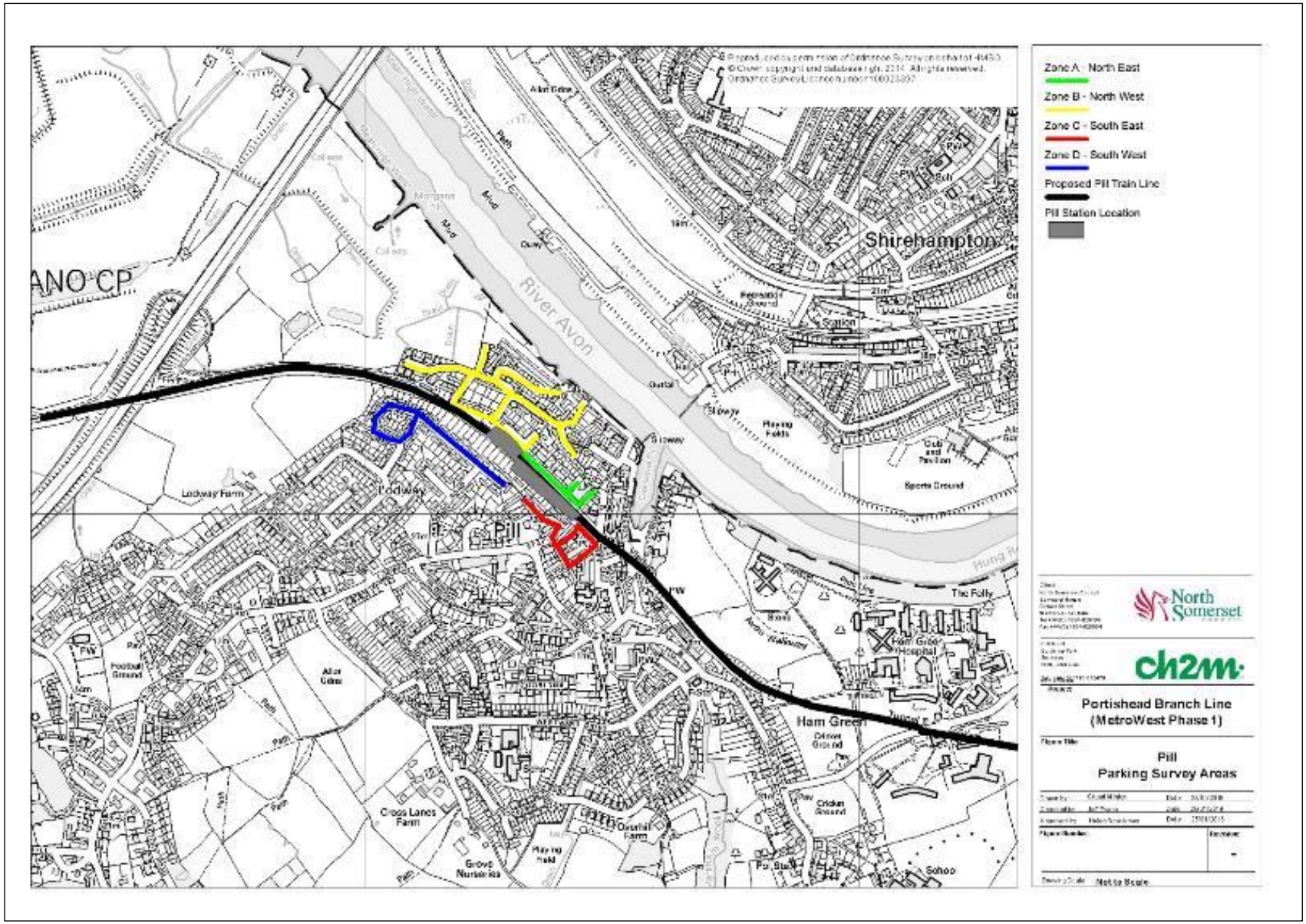
TABLE 4.5
Summary of observed parking provision and conditions in Pill

Road	Land Use	Highway Layout	Likely walking route to station	On street parking	Off street parking	Parking controls	Observed parking levels
Avon Road	Residential	Wide with footway on either side	Yes	Yes	Yes	None	None
Back Lane	Mainly residential	Narrow with limited footway	Yes	None	Yes	None	None
Chapel Row	Residential	Narrow with limited footway	No	Yes	Yes	None	Low
Church Walk	Residential	Narrow with limited footway	Yes	None	None	None	Medium
Crusty Lane	Residential	Narrow with footway on either side	No	Yes	Yes	None	Low

TABLE 4.5
Summary of observed parking provision and conditions in Pill

Road	Land Use	Highway Layout	Likely walking route to station	On street parking	Off street parking	Parking controls	Observed parking levels
Hardwick Road	Residential	Standard with footway on either side	Yes	Yes	Yes	None	Medium
Heywood Terrace	Residential	Narrow with footway on either side	Yes	Yes	None	None	Medium
Lodway Close	Residential	Standard with footway on either side	Yes	Yes	Yes	None	Low
Mariners Way	Residential	Standard with footway on either side	Yes	Yes	Yes	None	Medium
Monmouth Court	Residential on one side	Narrow with footway on one side	Yes	Yes	Yes	None	High
Monmouth Road	Residential on one site	Narrow with footway on one side	Yes	Yes	Yes	None	High
Newport Road	Residential	Standard with footway on one side	No	Yes	Yes	None	Medium
Sambourne Lane	Mixed	Standard with footway on either side	Yes	Yes	Yes	None	High
Severn Road	Residential on one side	Narrow with no footway	Yes	Yes	Yes	None	Low
Station Road	Mixed	Narrow with limited footway	Yes	Yes	Yes	Yes	High
Upper Myrtle Way	Residential	Narrow with no footway	Yes	No	Yes	None	Low

FIGURE 4.33
Pill Station Parking Assessment



4.6.4 Ashton Vale

A parking survey was conducted along Ashton Vale Road for two weekdays in March 2016.. To understand more fully the impact of the immediate land uses on demand for on-street parking, Ashton Vale Road was split into five small zones. Table 4.6 provides an overview of the indicative number of spaces and Figure 4.34 shows the geographical extent of the assessment.

Table 4.6
Indicative numbers of on-street parking spaces on Ashton Vale Road

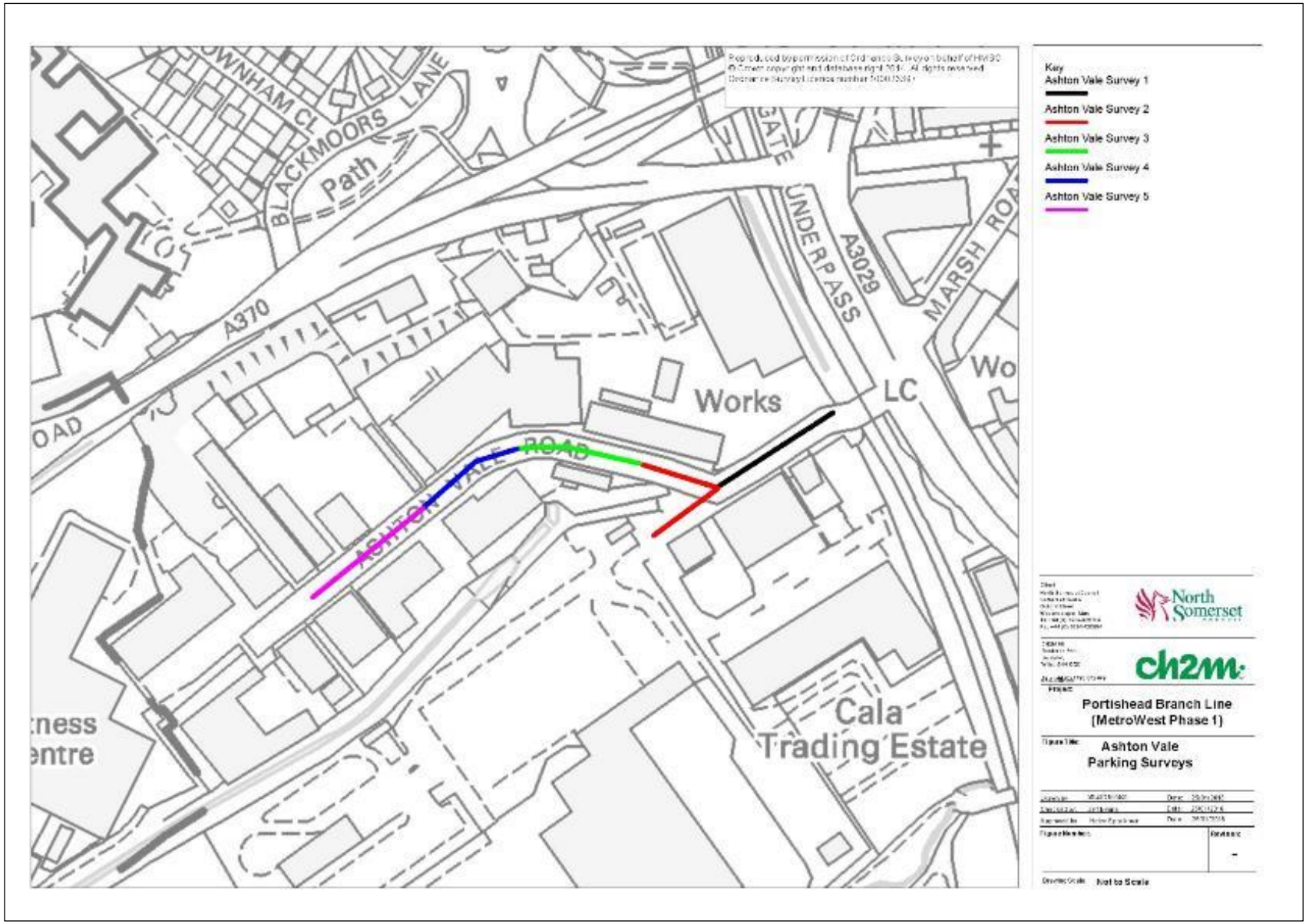
Survey Zone Reference	Road	Indicative Number of Vehicles
Zone 1	All zones on Ashton Vale Road	1
Zone 2		12
Zone 3		9
Zone 4		9
Zone 5		15

The survey identified different levels of parking demand along the highway as follows:

- **In Zone 1,** located close to the existing level crossing, there was a variation between the two days – the first day saw the total number of parked vehicles exceeding the number of spaces whereas on the second day, apart from a small spike in the morning, no vehicles were observed.
- **In Zone 2,** the number of vehicles apart from one time segment did not exceed the total number of spaces available on the road.
- **In Zone 3,** there was some fluctuation during both days – the morning period saw more vehicles parked than available spaces but there were spare places in the afternoon period;
- **In Zone 4,** apart from one small spike on one of the surveyed days, there were available spaces along this stretch of the road.
- **In Zone 5,** demand exceeded the number of on-street parking spaces available.

These results have been presented in graphical format in **Appendix I** of the TA.

FIGURE 4.34
Ashton Vale Road Parking Assessment



4.7 Existing collision data

4.7.1 Portishead

In Portishead, for the period between 1st January 2011 and 30th June 2016, there was a total of 46 collisions resulting in 51 casualties. Further details of each collisions are presented in **Appendix D** of the TA. The data and mapping does not indicate any particular collision cluster with the junction of Harbour Road and Newfoundland Way having the largest number of collisions at three over the assessment period. It is also noted that four collisions occurred along the B3124 High Street between its junctions with Roath Road and Church Road North. Table 4.6 summarises the total collisions and casualties in Portishead during the period being assessed.

Three serious collisions occurred during the period being assessed. The first of these occurred in March 2011 on the High Street where a vehicle collided with an elderly pedestrian on a zebra crossing. The second serious collision occurred in April 2012 at the roundabout junction between Portbury Hundred and Sheepway which involved a cyclist and a vehicle. The latest serious collision occurred along Wyndham Way in June 2013 and involved the collision of a vehicle with a child after they failed to look properly before crossing at a point without a specified pedestrian crossing.

TABLE 4.6
Summary of collision data in Portishead

	Collisions				Casualties			
Link	**Fatal**	**Serious**	**Slight**	**Total**	**Fatal**	**Serious**	**Slight**	**Total**
B3124 High Street	0	1	5	6	0	1	6	7
Harbour Road	0	0	3	3	0	0	4	4
A369 Wyndham Way	0	1	4	5	0	1	4	5
Bristol Road	0	0	1	1	0	0	1	1
Nore Road	0	0	2	2	0	0	2	2
Brampton Way	0	0	1	1	0	0	1	1
St. Marys Road	0	0	1	1	0	0	1	1
Station Road	0	0	1	1	0	0	1	1
The Portbury Hundred	0	0	1	1	0	0	2	2

	Collisions				Casualties			
Junction	**Fatal**	**Serious**	**Slight**	**Total**	**Fatal**	**Serious**	**Total**	**Slight**
Nore Road /Battery Road	0	0	2	2	0	0	2	2
Harbour Road /Martingale Way	0	0	1	1	0	0	1	1
B3124 High Street/Albert Rd	0	0	1	1	0	0	1	1
Slade Road/Avon Way	0	0	1	1	0	0	2	2
A369 Wyndham Way/COOP Carpark	0	0	2	2	0	0	2	2
A369 Wyndham Way/B3124 High Street	0	0	1	1	0	0	1	1

A369 Portbury Hundred/Sheepway Roundabout	0	1	3	4	0	1	4	3
Slade Road/Coombe Road	0	0	1	1	0	0	1	1
Brompton Road/Cadbury Rd	0	0	1	1	0	0	1	1
Phoenix Way/Redpoll Drive	0	0	1	1	0	0	1	1
B3124/Bristol Road Roundabout	0	0	1	1	0	0	1	1
Harbour Road /Newfoundland Way	0	0	3	3	0	0	4	4
Bristol Road /Clevedon Road Roundabout	0	0	1	1	0	0	1	1
B3124 High St /St.Peters Rd	0	0	2	2	0	0	2	2
B3124 Portbury Common/Heron Gardens	0	0	1	1	0	0	1	1
B3124 High Street/Stoke Rd	0	0	1	1	0	0	1	1
Bristol Road /Cadbury Road	0	0	1	1	0	0	1	1

One feature that has to be noted is the number of collisions involving pedestrians or cyclists. Out of the 46 collisions assessed, 20 involved vulnerable users with three of these being classified as serious (as described above). Table 4.7 provides a summary of the contributory factors which shows no common trend apparent.

TABLE 4.7
Contributory factors for all collisions in Portishead

	Contributory factors for all collisions including those involving vulnerable users						
Link	**Involving pedestrian or cyclist**	**Loss of Control**	**Failed to look properly/mis -judgement**	**Travelling too fast**	**Reckless Driving**	**Weather**	**Other**
B3124 High Street	4	0	0	0	0	0	2
Harbour Road	2	0	0	0	0	0	1
A369 Wyndham Way	3	0	1	0	0	1	0
Bristol Road	0	0	0	1	0	0	0
Nore Road	0	0	0	0	0	0	2
Brompton Way	0	1	0	0	0	0	0
St. Marys Road	1	0	0	0	0	0	0
Station Road	1	0	0	0	0	0	0
The Portbury Hundred	0	0	0	0	0	0	1
Junction	**Involving pedestrian or cyclist**	**Loss of Control**	**Failed to look properly/mis -judgement**	**Travelling too fast**	**Reckless Driving**	**Weather**	**Other**
Nore Road/Battery Road	1	0	1	0	0	0	0
Harbour Road/Martingale Way	0	0	1	0	0	0	0

B3124 High Street/Albert Road	1	0	0	0	0	0	0
Slade Road/Avon Way	0	0	0	1	0	0	0
A369 Wyndham Way/COOP Carpark	0	0	2	0	0	0	0
A369 Wyndham Way/B3124 High Street	1	0	0	0	0	0	0
A369 Portbury Hundred/Sheepway Roundabout	2	0	2	0	0	0	0
Slade Road/Coombe Road	0	0	0	0	1	0	0
Brampton Road/Cadbury Road	1	0	0	0	0	0	0
Phoenix Way/Redpoll Drive	1	0	0	0	0	0	0
B3124/Bristol Road Roundabout	0	0	1	0	0	0	0
Harbour Road/Newfoundland Way	0	0	3	0	0	0	0
Bristol Road/Clevedon Road Roundabout	0	0	1	0	0	0	0
B3124 High Street/St. Peters Road	1	0	1	0	0	0	0
B3124 Portbury Common/Heron Gardens	0	0	1	0	0	0	0
B3124 High Street/Stoke Road	1	0	0	0	0	0	0
Bristol Road/Cadbury Road	0	0	0	0	0	0	1

4.7.2 Pill

In Pill, a total of 27 collisions took place over the period being assessed (1st January 2011 to 30th June 2016). A further 40 collisions occurred at J19 of the M5 during this period. Further details of each collisions are presented in **Appendix D** of the TA. Table 4.8 summarises the total collisions and casualties by street in Pill and Table 4.10 summarises the total collisions and casualties surrounding M5 Junction 19.

In Pill, there have been 9 collisions along the A369 Martcombe Road, with further 8 collisions occurring at the various junctions along its length between M5 Junction 19 and its junction with Happerton Lane. There have been further collisions on Ham Green leading north to Heywood Road during the period being assessed.

There have been no fatal collisions during this period but a total of two serious collisions have been recorded; one along Martcombe Road and another on Westward Drive. The first collision occurred in October 2011 when a vehicle collided with a pedestrian who ran out onto Westwood Drive between two parked cars. A second collision occurred in May 2012 where a vehicle and motorcycle collided along the A369 Martcombe Road. This collision occurred as a result of reckless overtaking by the motorcyclist.

Table 4.9 is a review of all the contributory factors for collisions in Pill Village which shows that there is a mixture of reasons with failure to look properly/misjudgement being the most common cause.

TABLE 4.8
Summary of collision data in Pill Village

	Collisions				Casualties			
Link	**Fatal**	**Serious**	**Slight**	**Total**	**Fatal**	**Serious**	**Slight**	**Total**

A369 Martcombe Road	0	1	8	9	0	1	14	15
A369 Haberfield Road	0	0	1	1	0	0	2	2
Pill Road	0	0	1	1	0	0	1	1
Macrae Road	0	0	1	1	0	0	1	1
Ham Green	0	0	3	3	0	0	3	3
Heywood Road	0	0	1	1	0	0	1	1
Westward Drive	0	1	0	1	0	1	0	1
Junction	**Fatal**	**Serious**	**Slight**	**Total**	**Fatal**	**Serious**	**Slight**	**Total**
A369 Martcombe Road/St Georges Hill	0	0	2	2	0	0	3	3
A369 Martcombe Road/Rectory Road	0	0	2	2	0	0	2	2
A369 Martcombe Road/Happerton Lane	0	0	2	2	0	0	2	2
A369 Martcombe Road/Pill Road	0	0	2	2	0	0	2	2
Rudgeleigh Road/Cross Lanes	0	0	1	1	0	0	1	1
Priory Road/Court Hay	0	0	1	1	0	0	1	1

TABLE 4.9
Contributory factors for collisions in Pill Village

Link	**Involving pedestrian or cyclist**	**Loss of Control**	**Failed to look properly/ misjudgement**	**Travelling too fast**	**Reckless Driving**	**Weather**
A369 Martcombe Road	0	1	5	0	3	0
A369 Haberfield Road	0	0	0	1	0	0
Pill Road	1	0	0	0	0	0
Macrae Road	1	0	0	0	0	0
Ham Green	2	0	1	0	0	0
Heywood Road	0	0	1	0	0	0
Westward Drive	1	0	0	0	0	0
Junction	**Involving pedestrian or cyclist**	**Loss of Control**	**Failed to look properly/ misjudgement**	**Travelling too fast**	**Reckless Driving**	**Weather**
A369 Martcombe Road/St Georges Hill	0	0	1	1	0	0
A369 Martcombe Road/Rectory Road	1	0	1	0	0	0
A369 Martcombe Road/Happerton Lane	0	1	1	0	0	0
A369 Martcombe Road/Pill Road	0	0	1	0	0	1
Rudgeleigh Road/Cross Lanes	0	0	1	0	0	0
Priory Road/Court Hay	1	0	0	0	0	0

The data and mapping provided for the highways surrounding Junction 19 of the M5 indicates that there have been more collisions on the southbound carriageway than the northbound carriageway on the approach to the junction. Furthermore a greater number of collisions have occurred on the M5 southbound off-slip than on the northbound off-slip.

There are a number of collision clusters on the roundabout itself particularly at the exits onto The Portbury Hundred A369, Martcombe Road A369 and M5 southbound on- and off-slip roads.

In August 2014, there was a serious collision at the A369 Martcombe/J19 roundabout traffic lights which involved the collision of two vehicles as a result of a lane crossing at the junction. Table 4.11 is a review of all the contributory factors for collisions surrounding J19 and shows that there is a variety of reasons with the majority of collisions having been caused by a driver failing to look properly/misjudgement.

TABLE 4.10
Summary of collisions surrounding J19 of the M5

	Collisions				Casualties			
Link	**Fatal**	**Serious**	**Slight**	**Total**	**Fatal**	**Serious**	**Slight**	**Total**
Royal Portbury Dock Road	0	0	1	1	0	0	1	1
A369 The Portbury Hundred	0	0	3	3	0	0	4	4
M5 Northbound	0	0	2	2	0	0	4	4
M5 Southbound	0	0	8	8	0	0	12	12
Gordano Way	0	0	1	1	0	0	1	1
Junction	**Fatal**	**Serious**	**Slight**	**Total**	**Fatal**	**Serious**	**Slight**	**Total**
Royal Portbury Dock Roundabout	0	0	2	2	0	0	2	2
Junction 19 Roundabout	0	1	24	25	0	1	30	31

TABLE 4.11
Contributory factors for all collisions around J19 of the M5

	Contributory factors for all collisions including those involving vulnerable users						
Link	**Involving pedestrian or cyclist**	**Loss of Control**	**Failed to look properly/ misjudgement**	**Travelling too fast**	**Reckless Driving**	**Weather**	**Other**
Royal Portbury Dock Road	0	0	1	0	0	0	0
A369 The Portbury Hundred	1	0	1	0	0	1	0
M5 Northbound	0	1	1	0	0	0	0
M5 Southbound	0	2	5	0	0	0	1
Gordano Way	0	1	0	0	0	0	0
Junction	**Involving pedestrian or cyclist**	**Loss of Control**	**Failed to look properly/ misjudgement**	**Travelling too fast**	**Reckless Driving**	**Weather**	**Other**
Royal Portbury Dock Roundabout	0	0	2	0	0	0	0
Junction 19 Roundabout	1	3	16	0	5	0	0

4.7.3 Ashton Vale

In the Ashton Vale area, a total of 33 collisions with 40 casualties took place over the period between 1st January 2011 and 30th November 2016. Further details of each collision are presented in **Appendix D** of the

TA. Table 4.12 provides a summary of the collisions whereas Table 4.13 provides a breakdown of the contributory factors.

All of the collisions that took place around Ashton Vale received a classification of being 'slight'. Of these 33 collisions, 16 of these took place on A3029 Winterstoke Road with the most common cause (almost 50%) being 'Rear Shunt/side swipe'.

TABLE 4.12
Summary of collisions for Ashton Vale

	Collisions				Casualties			
Link	**Fatal**	**Serious**	**Slight**	**Total**	**Fatal**	**Serious**	**Slight**	**Total**
A3029 Winterstoke Road	0	0	16	**15**	0	0	19	**19**
A369 Clanage Road	0	0	5	**4**	0	0	5	**5**
A3029 Ashton Vale Underpass	0	0	1	**1**	0	0	2	**2**
A3029 Brunel Way	0	0	7	**6**	0	0	10	**10**
Blackmoors Lane	0	0	2	**1**	0	0	2	**2**
A3029 Ashton Road	0	0	1	**2**	0	0	1	**1**
Wedlock Way	0	0	1	**1**	0	0	1	**1**

TABLE 4.13
Contributory factors for all collisions around Ashton Vale

Link	**Involving pedestrian or cyclist**	**Loss of Control**	**Failed to look properly/ misjudgement/ give way**	**Travelling too fast**	**Reckless Driving**	**Weather**	**Rear shunt/ side swipe**	**Total**
A3029 Winterstoke Road	3	0	2	2	0	0	9	16
A369 Clanage Road	4	0	0	0	0	0	1	5
A3029 Ashton Vale Underpass	0	0	0	0	0	0	1	1
A3029 Brunel Way	1	0	1	0	0	0	4	6
Blackmoors Lane	3	0	0	0	0	0	0	3
A3029 Ashton Road	1	0	0	0	0	0	0	1
Wedlock Way	0	0	0	0	0	0	1	1
Total	**12**	**0**	**3**	**2**	**0**	**0**	**16**	**33**

4.8 Existing public transport provision

4.8.1 Portishead bus services

Portishead is currently well served by a mix of commercially operated and local authority financially supported bus services. The services link the town with Bristol and the main towns nearby as well the main employment, education, retail and leisure centres in North Bristol. Figure 4.35 shows the extent of the current services.

Table 4.14 summarises these services and their frequency. The table reveals that on the main Portishead to Bristol corridor through Pill is served by the frequent X3/X4 services with both early start and late finish times including at the weekend. It should be noted that that the X4 service replaced the X2 service from 4th September 2016 plus there have been a number of minor changes to the X3 route in order to improve

reliability and punctuality (www.firstgroup.com). In addition, single-decker buses have been replaced by double-deckers on all X3/X4 journeys. This will increase capacity by providing an additional 40 seats per journey (www.firstgroup.com).

This commercial service, until recently, was partially supported by funding from NSC's Local Sustainable Transport Fund (LSTF) for a set period.

TABLE 4.14
Portishead Bus Services

Number	Route	Monday to Friday daytime frequency First service Last service (from Portishead, Combe Road)	Saturday daytime frequency First service Last service (from Portishead, Combe Road)	Sunday & Bank Holiday daytime frequency First service Last service (from Portishead, Combe Road)
X3	Bristol to Portishead	Every 30 mins 05-45 23-38	Every 30 mins 05-37 23-38	Every hour 08-56 18-52
X4	Bristol to Portishead Via Pill	Every 30 mins 05-31 01-15	Every 30 mins 06-17 01-15	Every hour 08-27 00-08
X5	Weston-Super-Mare to Bristol Parkway via Nailsea, Clevedon, Portishead, Cribb's Causeway and UWE Frenchay	Every hour 06-37 to Portbury Docks 08-45 to Parkway 18-32 to Cribbs Causeway 17-00 to Parkway	Every hour 07-57 17-49	Every 2 hours 09-57 15-51
88a	Nailsea-Portishead (White Lion-Stop C)-Clevedon-Nailsea	Every 2 hours 08-19 16-49	Every 2 hours 08-19 16-49	No service
88c	Nailsea-Portishead (White Lion-Stop D)-Clevedon-Nailsea	Every 2 hours 08-32 17-07	Every 2 hours 08-32 17-07	No service
C5 to C8 Kings Ferry	Portishead to Abbey Wood MOD via Cribb's Causeway	Portishead, Waitrose 06-50 09-05 16:32 (Return) 19:05 (Return)	No service	No service
C1-C2 Crossville Flyer	Weston to Abbeywood MOD via Clevedon, Portishead and Aztec West	Portishead, Waitrose 06-47 C1 07-08 C2 16:53 C1 (Return) 17:53 C2 (Return)	No service	No service

The route taken by the X5 service has also changed since early September 2016. Firstly, buses no longer serve UWE's Frenchay Campus and now start and terminate at Bristol Parkway railway station. Further adjustments include changes to the route in Clevedon and additional journeys to and from Portbury Docks at times better suited to working patterns.

The above table confirms there are relatively good links from Portishead to Clevedon, Nailsea and Weston-Super-Mare as well as Cribb's Causeway, Aztec West, MoD Abbey Wood and UWE Frenchay although it should be noted that services considerably diminish in the evening and at weekend periods.

Table 4.15 shows the typical off-peak journey times to a range of destinations from Portishead.

TABLE 4.15
Indicative off-peak bus journey times from Portishead

Destination	Indicative off peak journey time by direct bus routes
Bristol City Centre	42 mins
Pill	19 mins
Clevedon	24 mins
Weston-Super-Mare	1 hr
Nailsea	34 mins
Cribb's Causeway	24 mins
Aztec West	20 mins
MoD Abbey Wood	35 mins
UWE Frenchay Campus	42 mins

4.8.2 Existing bus service access to the proposed Portishead station site

A review of the existing bus services within Portishead show only two routes serving existing stops in the immediate vicinity of Harbour Road – these being the C5 to C8 Kings Ferry service and the C1-C2 Crossville Flyer service in the morning and evening peak.

Although the X3 operates half hourly and starts and terminates in the western part of Portishead, the route also serves the Port Marine area before reaching the stops on Quays Avenue. As a result, this means journey times within Portishead itself can be prolonged for the distances covered as shown in Table 4.16.

TABLE 4.16
Indicative off-peak bus journey times within Portishead

Destination	Indicative journey times from Quays Avenue to other areas of Portishead
Nightingale Rise	32 mins
Town Centre (Combe Road)	10 mins

4.8.3 Pill bus services

Pill is currently served by bus services on the Bristol to Portishead corridor. There are two main services, the X3 and X4 as shown in Figure 4.36 below.

FIGURE 4.35
Portishead Bus Services

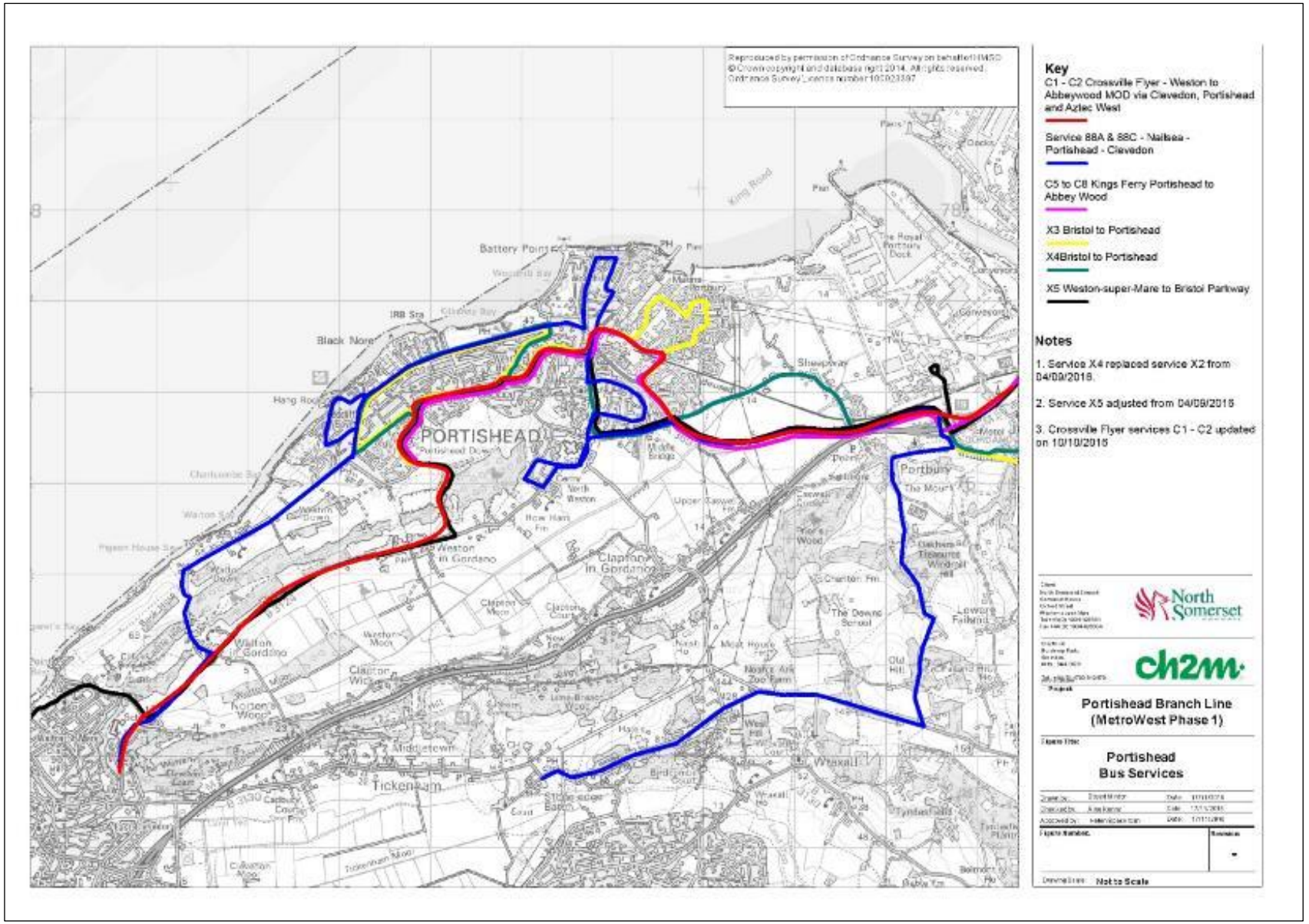
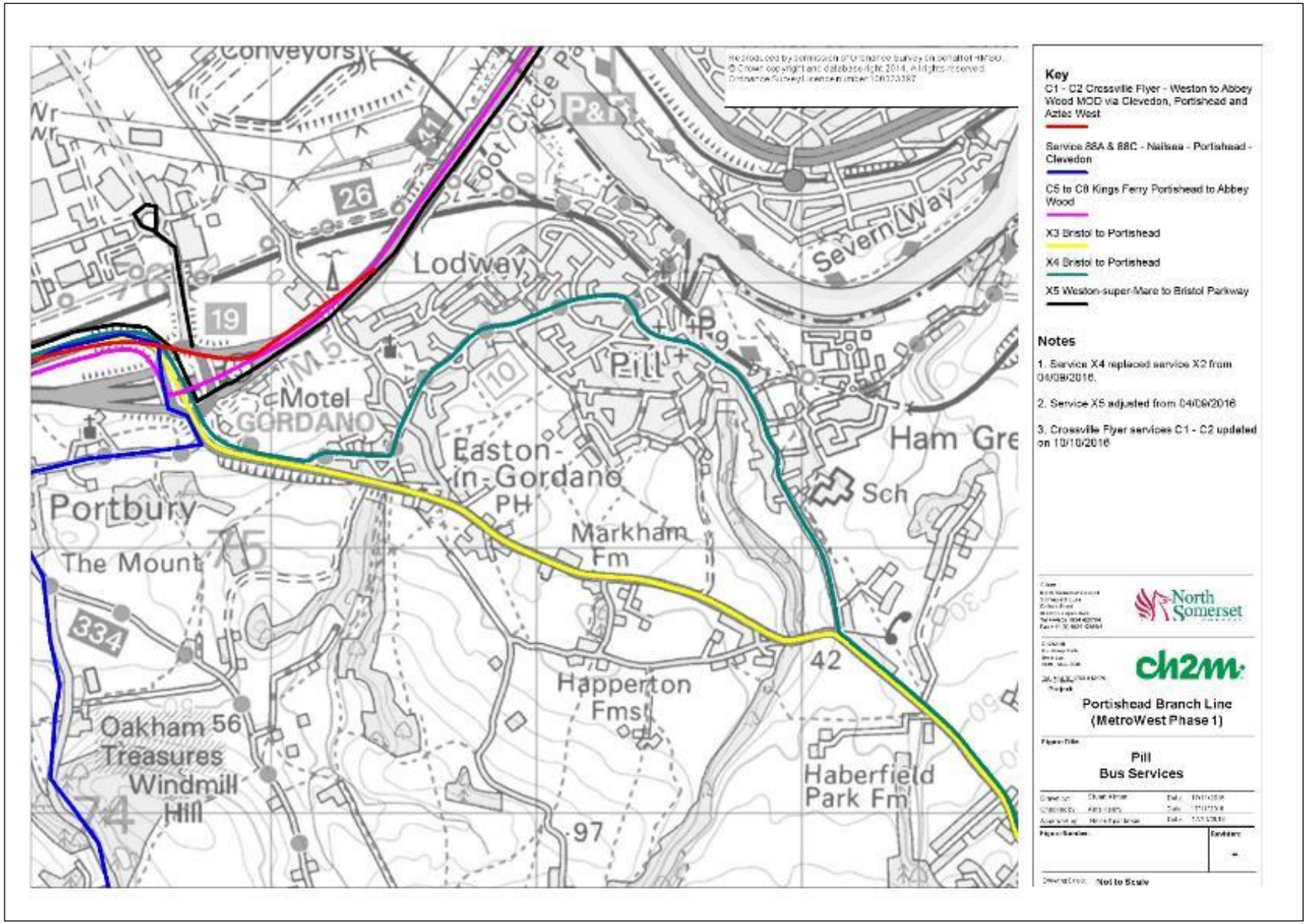


FIGURE 4.36
Pill Bus Services



The X4 service provides the principal link through the heart of Pill. This service generally has a 30 minute frequency Monday to Saturdays, with an hourly service on Sunday. The earliest eastbound (Portishead to Bristol) service departs Pill Station Road stop at 06:09 while the earliest westbound service departs at 06:20. The latest eastbound X4 service departs Pill Station Road stop at 00:59 while the last westbound service departs at 23:40.

Typical off-peak bus journey times from Pill to Portishead are 20 minutes whereas off-peak journeys to Bristol are around 23 minutes. The nearest bus stops to the proposed Pill station are around 110 metres away but given the general walking distances within Pill, the number of bus and rail related journeys in Pill are expected to be very low.

4.8.4 Bus services in the vicinity of the level crossings

No timetabled bus services currently operate across the level crossings that will be impacted by the scheme. However, Long Ashton P&R site is served by buses 505 and 903 with service 505 providing a service from the P&R site to Bristol City centre every 10-15 mins while service 903 serves Clifton, Bristol Zoo and Southmead Hospital. The site opens at 6am every day barring Sundays and closes at 9:30pm on week days and at 9pm on Saturdays.

4.8.5 Survey of bus passengers

NSC conducted a questionnaire of a limited number of bus passengers on services X2 (now the X4)/X3 in March 2016. The survey asked the passengers a number of questions such as journey purpose, origin/destination, ticket type, access to a car and views on the quality of existing bus services. The survey also sought responses on the likely impact of the rail service on future use.

The main findings of the survey were:

- The main origin and destination flows were between Portishead and Bristol which were in the region of 87% and 88% of those surveyed while flows between Pill and Bristol accounted for less than 10%;
- Employment was the main journey purpose at 57% of all trips followed by education just under 20% and shopping at 12%;
- The majority of bus passengers were regular users – with three quarters saying they used the bus 3 to 5 times a week;
- Approximately 48% said they had access to a car; and
- A total of 61% indicated they could use the rail service.

4.8.6 Local rail network

Figure 4.37 shows the current local rail network within the West of England.

Whilst the scheme seeks to reintroduce rail passenger services to Portishead and Pill and enhance frequencies to Avonmouth and Bath, the current base pattern services is generally hourly but this is not uniform throughout as follows:

- Stations to Weston-Super-Mare and on the Severn Beach line as far as Avonmouth see one/two trains-per-hour;
- Severn Beach has a less than hourly service to Bristol;
- Stations between Bristol and Bath Spa have one train per hour (with the exception of Keynsham that may have an additional service every few hours);
- Filton Abbey Wood has four trains-per-hour to Bristol;
- Stapleton Road and Lawrence Hill have two to three trains-per-hour; and

- Patchway and Yate have one train-per-hour.

The nearest stations serving the wider North Somerset area around Portishead and Pill are Nailsea and Backwell (approximately 11km from the centre of Portishead) and Yatton (approximately 16km from the centre of Portishead). Whilst the majority of services from both stations are local West of England 'stopping' services, there are a number of direct 'intercity' routes to London in the morning and evening peak. The availability of these long distance services will continue unchanged under the scheme proposals, and it is likely a number of those living within the catchments of Portishead and Pill will continue to use Nailsea and Backwell.

4.9 Existing rail freight movements

4.9.1 Portbury

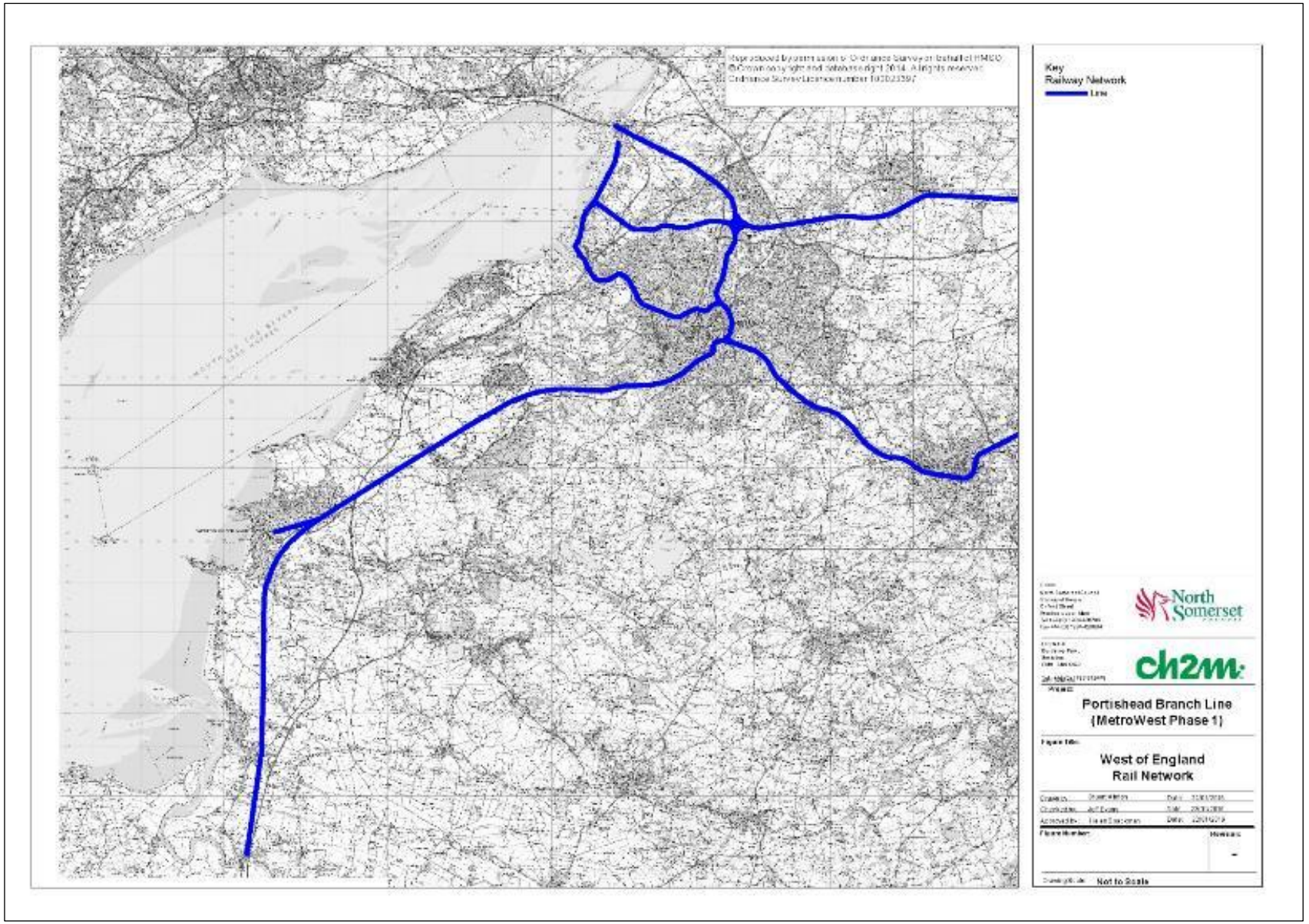
The Royal Portbury Dock opened in 1977 to cater for bigger vessels than could then be accommodated at Avonmouth Docks. Never originally rail served, the freight spur from the Portishead railway line was opened in 2002. As part of the original planning permission for the new rail link into the Portbury dock area, a limit of 10 trains per day was included as a condition. This was subsequently adjusted to 3650 trains per annum, to reflect that the bulk nature of imports could mean a daily limit would be restrictive, but retaining the same number of trains overall. Within this limit, specific access rights are held by train operators to cover flows between the port and various destinations.

The working timetable for the Portbury branch currently has as many as 26 trains indicated (2-way), but in practice these include paths that are alternatives for each other between the same origin-destination at relatively close timings (partly to take into account variation in shipping access), so would never all be used.

Freight train data for a one month period between February and March 2016 revealed:

- Up to four freight trains ran during weekdays with up to two on weekends;
- Out of the 30 days, there were only freight train movements on 15; and
- Rail freight movements that took place coincided with the off-peak and peak periods on the local highway network with resulting barrier down times at Ashton Vale Road.

FIGURE 4.37
West of England Local Rail Network



4.10 Non-Motorised User Provision

Within this section, the provision for non-motorised users is outlined. The focus is on networks used by the public rather than provision used exclusively for private use such as private farm crossings. It also includes a short description of the current provision for equestrians.

4.10.1 Portishead

In assessing the extent of the existing walking and cycling networks, thresholds from the Manual for Streets (MfS) have been used. This suggests that a walkable neighbourhood will have a range of services within an 800m or a 10 minute walk. Within Portishead, this includes part of the town centre, Portbury Wharf, Port Marine and the residential areas around Brampton Way as shown in Figure 4.38. The Walking and Cycling Plan in **Appendix J** provides further detail about the pedestrian and cycling links in Portishead.

Figure 4.38 shows the principal pedestrian links in the 800m vicinity of the station. A review of the links indicates that the main route and desire line from the station to the town centre is not direct with a number of potential routes all requiring a modest detour. The main pedestrian and routes being:

- Along Harbour Road and past the Waitrose supermarket;
- Along the unadopted path near Sainsbury's and then towards Old Mill Road; and
- Along Quays Avenue towards Wyndham Way.

The plan in **Appendix J** identifies a number of other key pedestrian routes that either link with the station or will be impacted directly by the scheme. These being:

- To the residential areas around Brampton Way;
- To the residential area of Port Marine;
- Towards Portishead marina;
- Towards the residential areas south of the station; and
- From Trinity Primary School towards Brampton Way.

With cycling, MfS indicates a 5km threshold. Figure 4.39 suggests that the whole of Portishead would be accessible by bicycle to and from the station. Given this, the plan focuses upon the adequacy of the links within the smaller 800m threshold with particular emphasis on the cycling routes in and around the station area.

The main cycling routes that have been identified are:

- Towards Portishead town centre along Harbour Road (with onward links towards the Marine Lake area and northern Portishead);
- To Portishead town centre along Wyndham Way (with onward links to western Portishead);
- To Brampton Avenue (with links to southern Portishead);
- To Sheepway via National Cycle Network 26; and
- To Port Marine.

The Walking and Cycling Plan provides an audit of the adequacy of these links which form part of the mitigation measures that will be required.

4.10.2 Pill

In Pill, the 800m pedestrian threshold covers most of the village with Easton-in-Gordano and Ham Green just outside this threshold as shown in Figure 4.40. A 5km cycling threshold for Pill shows the whole of Pill including Easton-in-Gordano and Ham Green would be accessible as shown in Figure 4.41.

It is important to note that the standard of the walking and cycling network in Pill varies quite widely. This reflects both the development of the area over a number of years and the local topography. As a result, the immediate area surrounding the station which is characterised by older and higher density housing means pedestrian provision generally does not meet current standards and cycling infrastructure is even more limited. However, the relative narrow highway widths generally has a conducive effect on reducing traffic speeds which benefits non-motorised users. The area has a number of footpaths between streets which results in a good level of pedestrian permeability.

The walking and cycling network layout is different in other parts of Pill and reflects the period of development. Generally, the pedestrian network is more comprehensive and it is less discontinuous. Conditions, particularly on the quieter roads, are generally more favourable for different types of cyclists.

The Walking and Cycling Plan in **Appendix J** identifies a number of pedestrian routes in Pill. These being:

- From the station towards Pill Wharf;
- Towards Avon Road;
- To Crosslanes through Station Road;
- To Brookside via Station Road and Heywood Road;
- To Ham Green via Underbanks;
- To Easton-in-Gordano via Stoneyfields; and
- To Lodway via Station Road.

As with Portishead, the geographical focus is the area surrounding the station. As stated, the immediate highway layout constrains the number of measures that can be implemented. Nevertheless, the Plan has identified the following cycling routes:

- From the Station towards Royal Portbury Dock and Sheepway through NCN Route 26;
- To Easton-in-Gordano and Portbury via Lodway; and
- To Ham Green via Heywood Road.

4.10.3 Portishead to Pill

The walking and cycling network between Portishead and Pill, as expected, is limited but provides important links between the two settlements and also Royal Portbury Dock. Figure 4.42 shows the extent of PRoWs. The most significant link is LA 15/21/20 which is not only a bridleway in parts but also forms part of NCN route 26.

The Figure shows a number of PRoWs directly to the north of the scheme alignment but it is important to note that the M5 generally severs the area and the number of segregated crossing areas is limited.

FIGURE 4.38
800m Walking threshold for Portishead

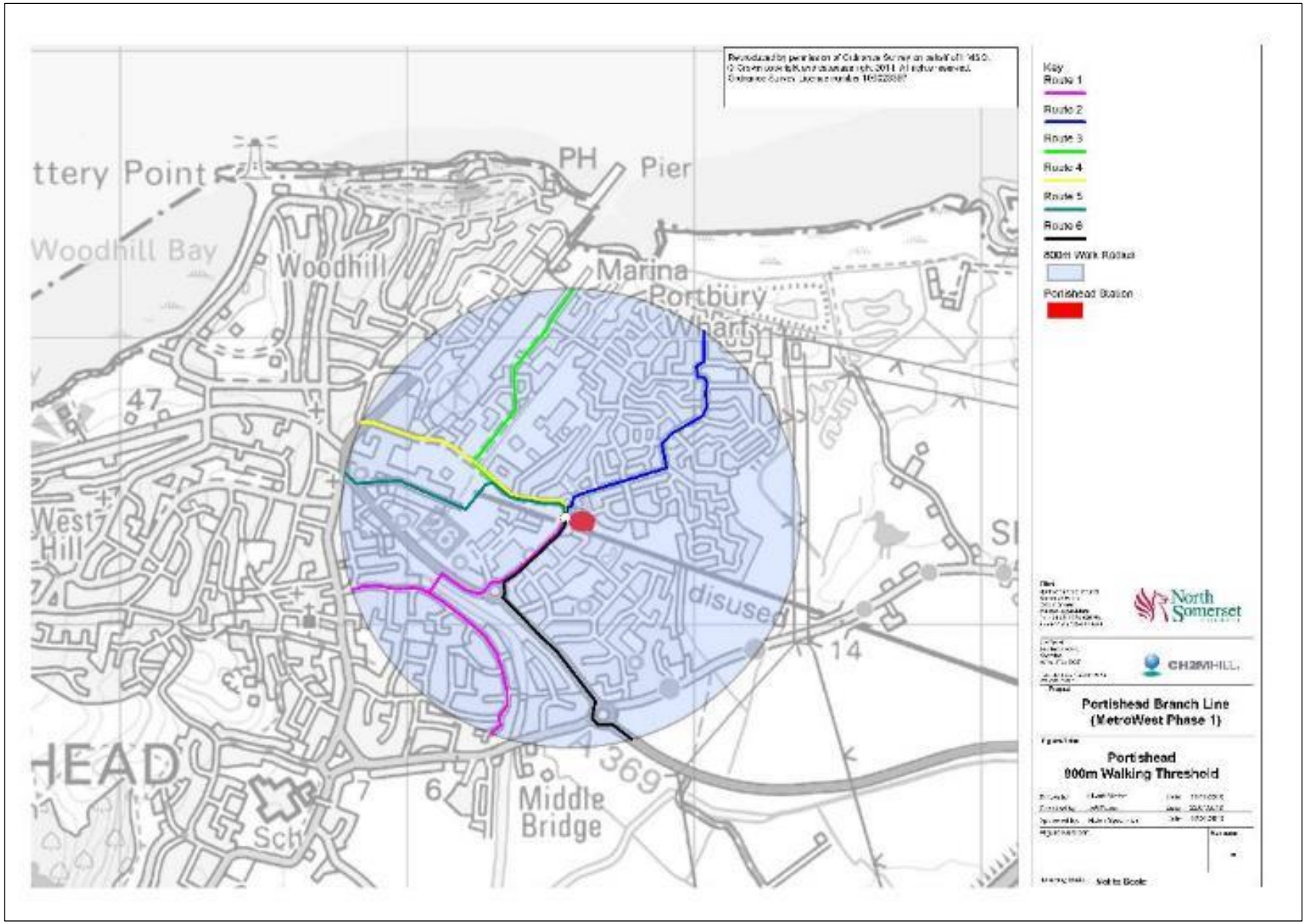


FIGURE 4.39
5km Cycling threshold for Portishead

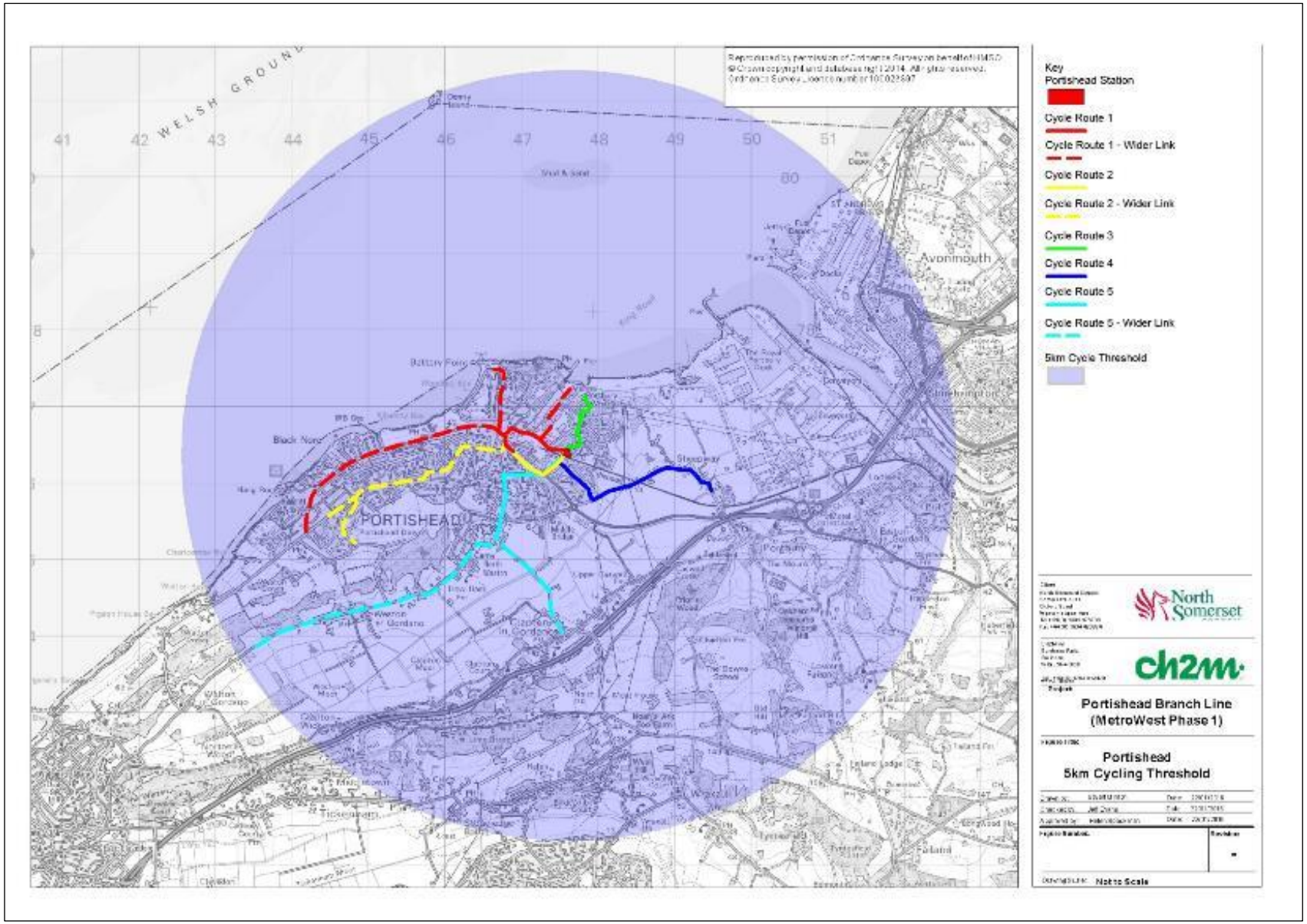


FIGURE 4.40
800m Walking threshold for Pill

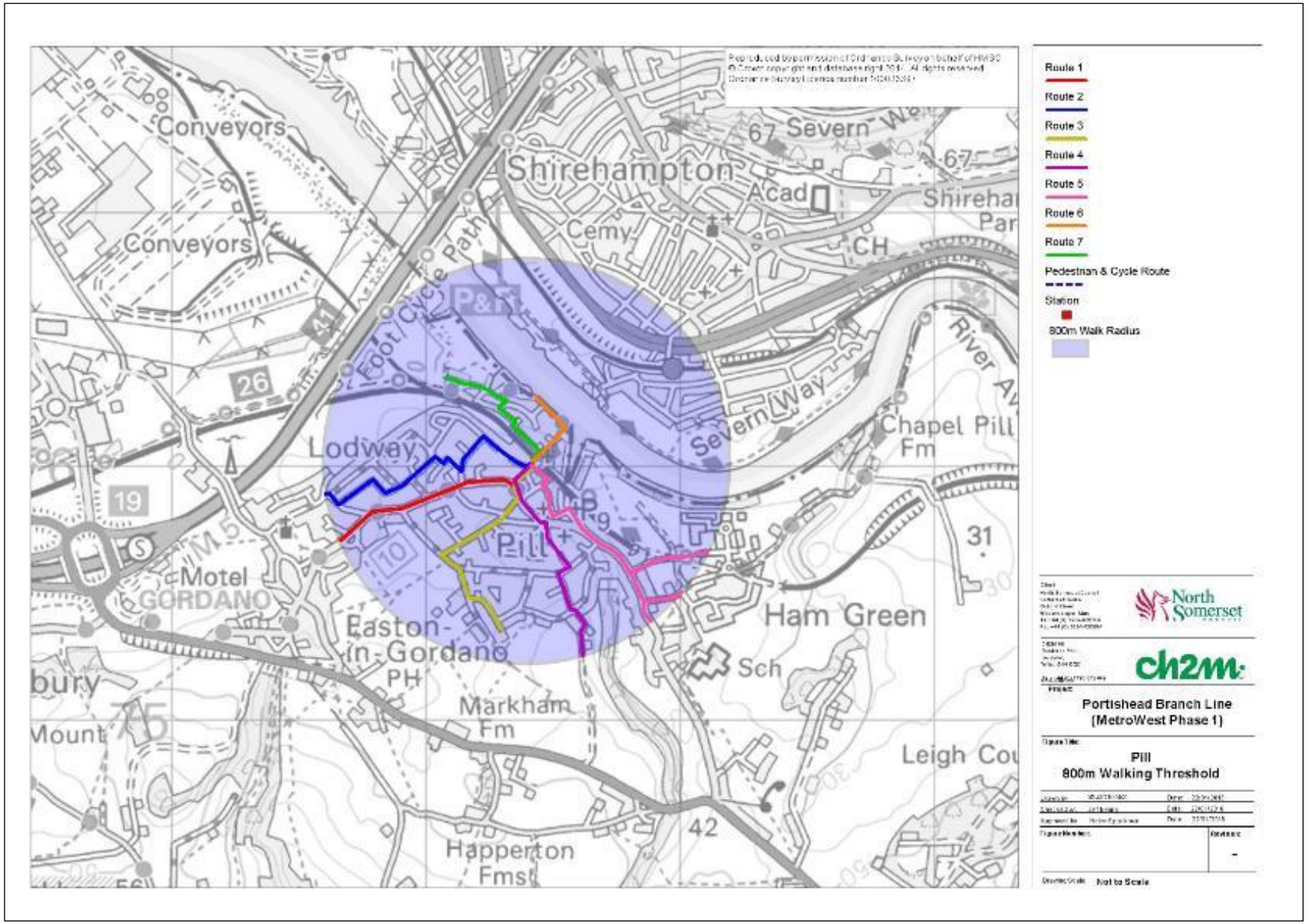


FIGURE 4.41

5km Cycling threshold for Pill (excludes routes north of the River Avon where there is existing access from existing railway stations)

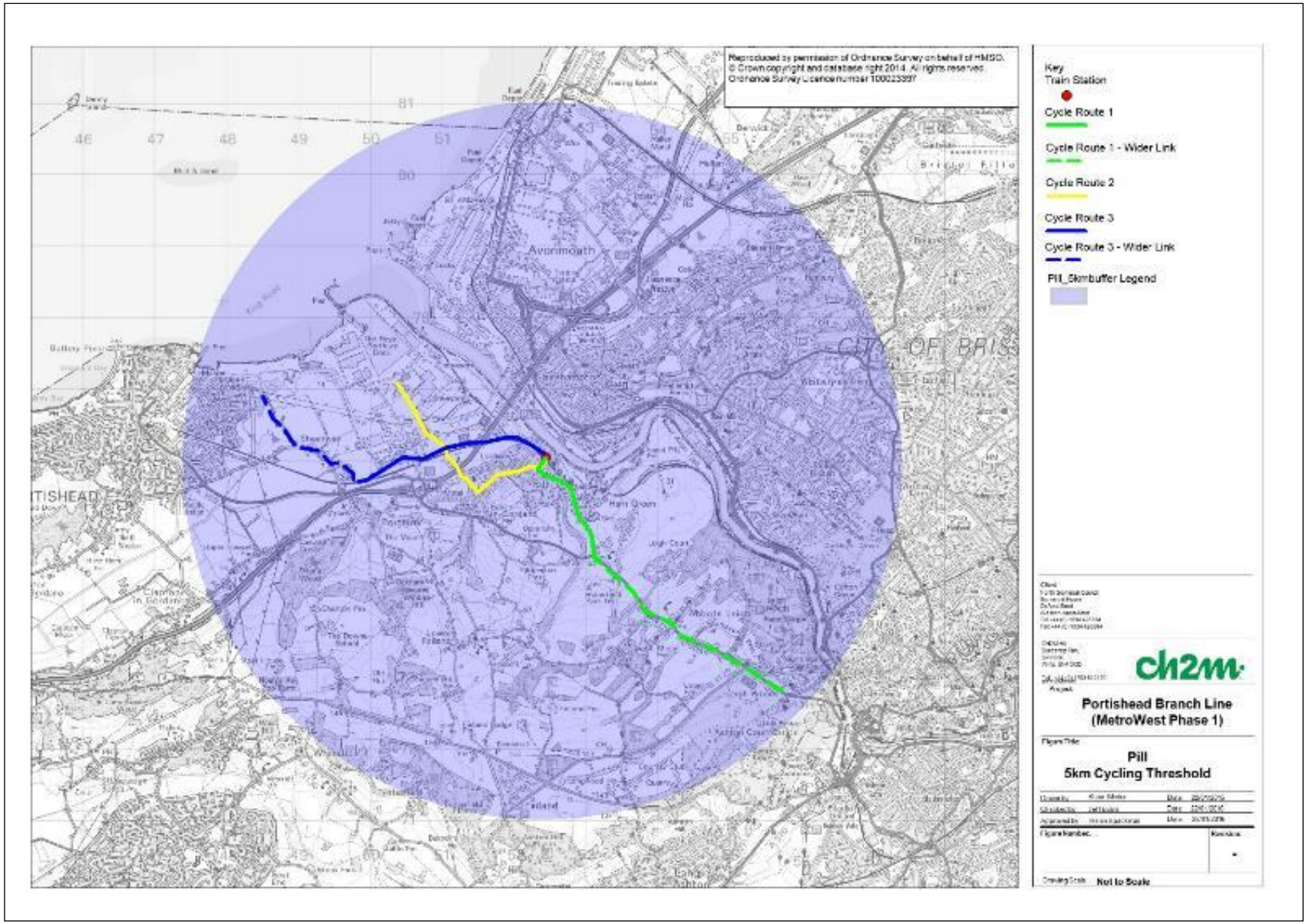
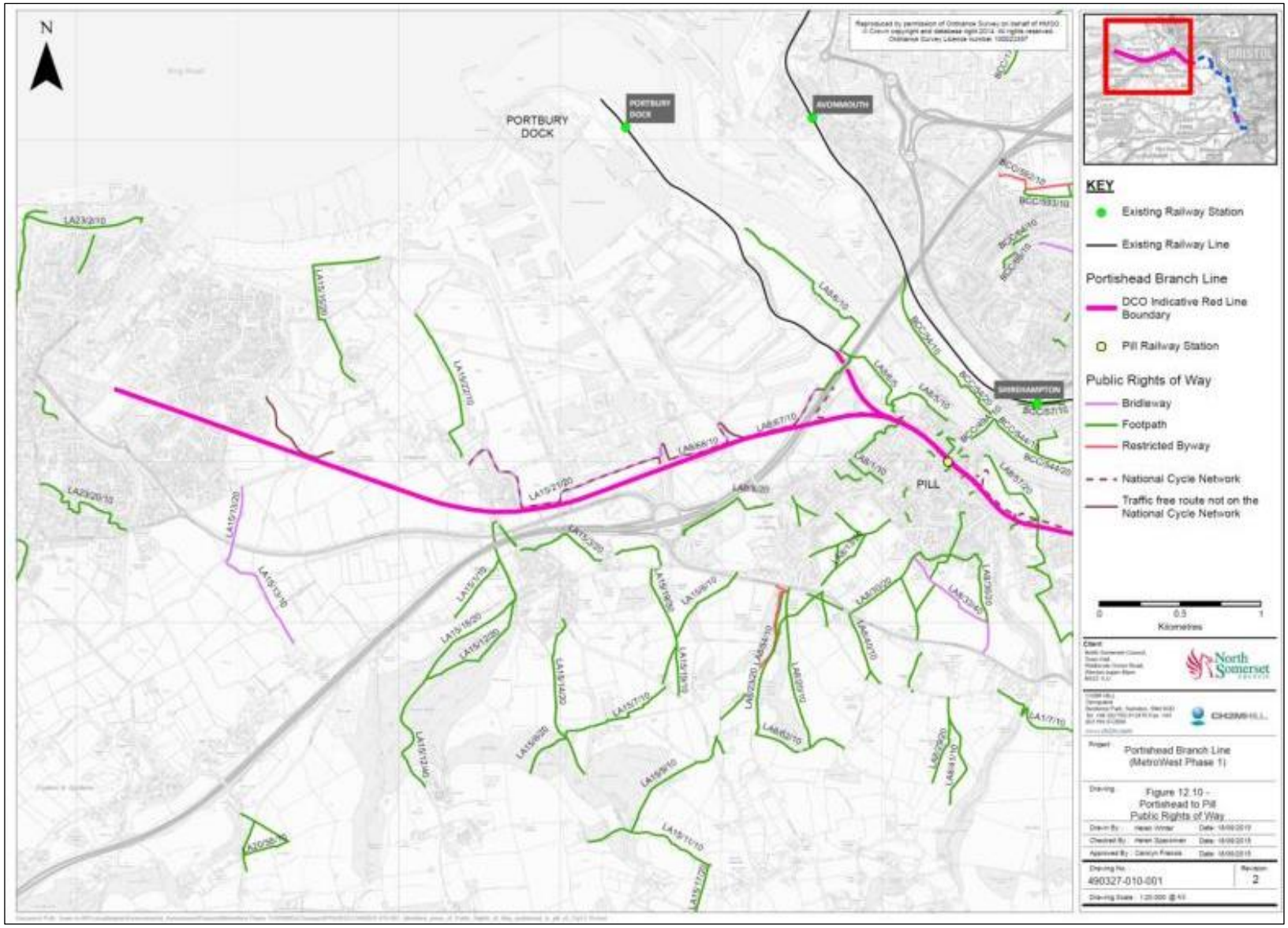


FIGURE 4.42
PROWs between Portishead and Pill



4.10.4 Ashton Vale

Given the predominately commercial and industrial land use together with heavily trafficked roads, the pedestrian and cycling network is limited in the Ashton Vale Road area. The scheme will intersect the network at two particular locations i.e. Ashton Vale Road level crossing and the pedestrian crossing at Barons Close. The operation of Ashton Vale Road level crossing equally applies to all pedestrians and cyclists with no immediate alternative route other than the Barons Close crossing.

The Barons Close pedestrian crossing is located approximately 200 metres south of the Ashton Vale Road level crossing as shown in Figure 3.10. As of summer 2015, this crossing has been temporarily closed as part of the Ashton Vale Temple Meads (AVTM) bus link. This link will run parallel to the railway line at this location and will cross over on a viaduct (see Figure 3.9).

The nearest other crossing points over the railway line are along the A370 Ashton Road 140m north but there is no direct access to the industrial estate. An indirect pedestrian route is available off the B3128 around 1km further west.

The other crossing point is around 630m south of Barons Close. A pedestrian route through Ashton Drive is available although an indirect access through a recreation field is not advisable on personal safety grounds.

One of the main concerns is the impact of the scheme on pedestrians during match days and other events at the Ashton Gate Stadium. This is assessed in further detail in **Appendix L**.

4.10.5 NMU counts

NMU counts have been undertaken at three specific locations at different periods along the Scheme alignment as follows:

- Within Portishead;
- On NCN Route 26 to and from Pill; and
- Ashton Vale Road.

Further detail about the surveys and the data collected are given in **Appendix C Report of Surveys**.

Portishead

Table 4.17 summaries the flows captured in Portishead. The data captured confirms the importance of the permissive route across the disused line between Trinity Primary School to the north and the residential area (Galingale Way) to the south with over 150 NMU two-way movements recorded in the school morning peak and over 200 two-way movements during school afternoon/evening peaks. The scheme would result in pedestrians having to make a 700m diversion during the construction phase, via Tansey Lane and Quays Avenue (refer to Figure 8.4). An alternative means of access has therefore been proposed as part of the overall scheme in the form of a pedestrian footbridge over the railway linking Trinity Primary School and Galingale Way.

The high volume of NMUs recorded crossing the line at Trinity Primary School contrasts with the lower number of pedestrians and cyclists recorded along Quays Avenue itself.

The table also shows the importance of NCN route 26 between Portishead and Pill with in the region of 89 to 126 cyclists recorded during the survey period.

TABLE 4.17
Summary of NMU count data in and around Portishead

Date	Location	Direction	Time period	Pedestrians	Cyclists	Equestrians
02/05/2014	Towards Galingale Way	Towards Trinity School	7:00 am – 10:00 am	109	13	0
02/05/2014	Towards Galingale Way	Towards Trinity School	14:00 pm – 18:00 pm	106	17	0
02/05/2014	Trinity School, Portishead	Towards Galingale Way	7:00 am – 10:00 am	52	3	0
02/05/2014	Trinity School, Portishead	Towards Galingale Way	14:00 pm – 18:00 pm	128	16	0
09/2014	Trinity School, Portishead	Two way	7:00 am – 10:00 am	220	45	0
09/2014	Trinity School, Portishead	Two way	14:00 pm – 18:00 pm	249	36	0
02/05/2014	Quays Avenue, Portishead	Towards Quays Avenue	12:00pm – 13:00pm	10	0	0
02/05/2014	Quays Avenue, Portishead	Towards Phoenix Way/Harbour Road Roundabout	12:00pm – 13:00pm	14	3	0
09/2014	Quays Avenue, Portishead	Two way	12:00pm – 13:00pm	26	8	0
04/05/2014	NCN Route 26, Portbury	Towards Marsh Lane	10:00 am – 15:00 pm	12	89	4
04/05/2014	NCN Route 26, Portbury	Towards M5 Cycle Underpass	10:00 am – 15:00 pm	14	126	0
04/05/2014	Sheepway, Route 26, Portbury	Towards Sheepway Gate Farm	15:30 pm – 16:30 pm	12	19	1
04/05/2014	Sheepway, Route 26, Portbury	Towards Portbury Hundred Roundabout	15:30 pm – 16:30 pm	16	26	0

Pill

In the Pill area, data has been collected over a five year period of the cycle flows on NCN route 26. Figures 4.43 and 4.44 show the extent of flows over a typical day for each year from 2010 to 2014.

FIGURE 4.43
Pill to Portishead Cycle Path Users

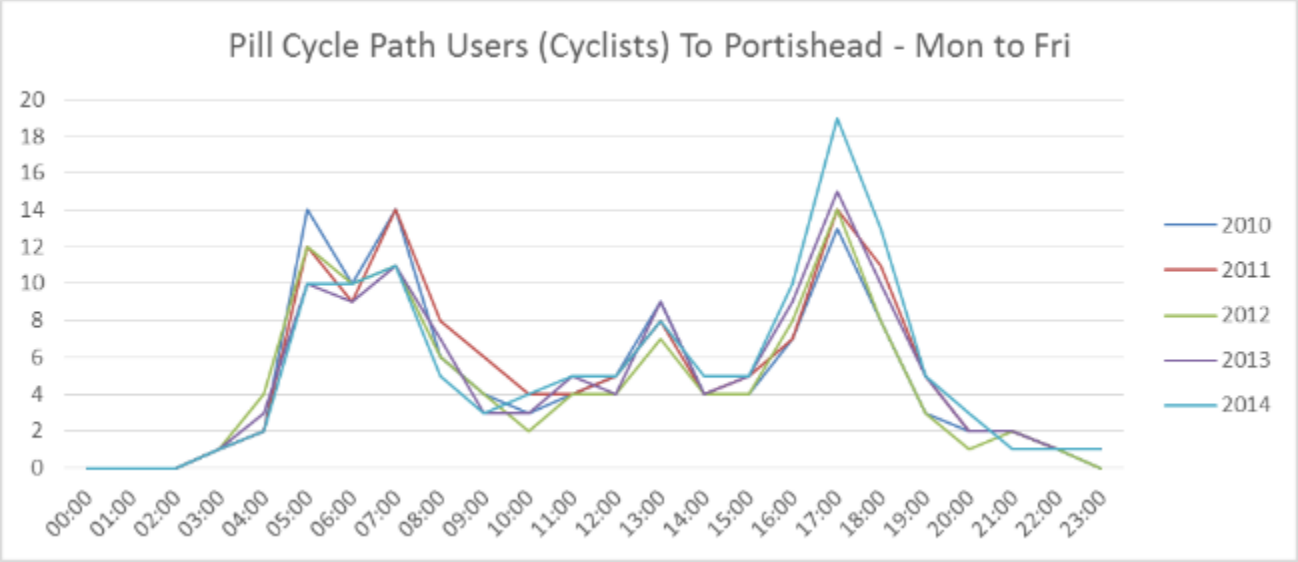
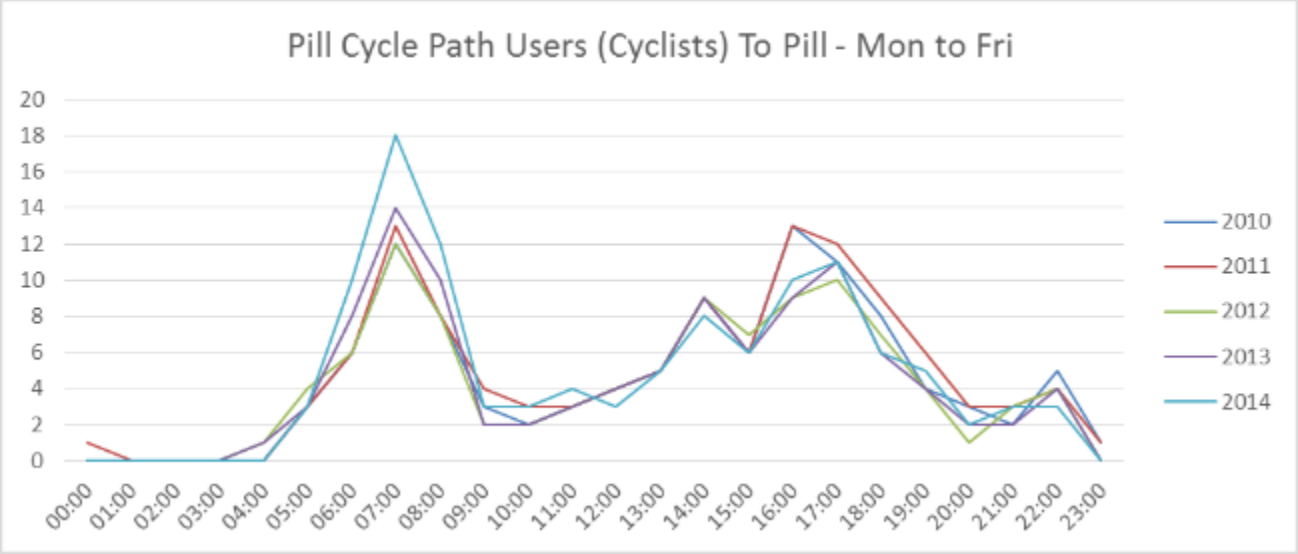


FIGURE 4.44
Portishead to Pill Cycle Path Users



This shows that between 2010 and 2014, cyclists using the Pill cycle path to Pill remain at a relatively consistent level throughout the day with trends sticking to the AM and PM peak periods. The only year that does break this trend is 2014 where the number of users on the path are lower in the AM peak period.

Ashton Vale Road

Pedestrian and cyclist flows have also been recorded at Ashton Vale Road in the vicinity of the level crossing. Figures 4.45 and 4.46 show the peak flows into Ashton Vale Estate occur at 09-00 and 12-00 whereas flows out of the area occur at 12-00 and 16-00.

FIGURE 4.45
Ashton Vale Road Level Crossing – To Ashton Vale Estate

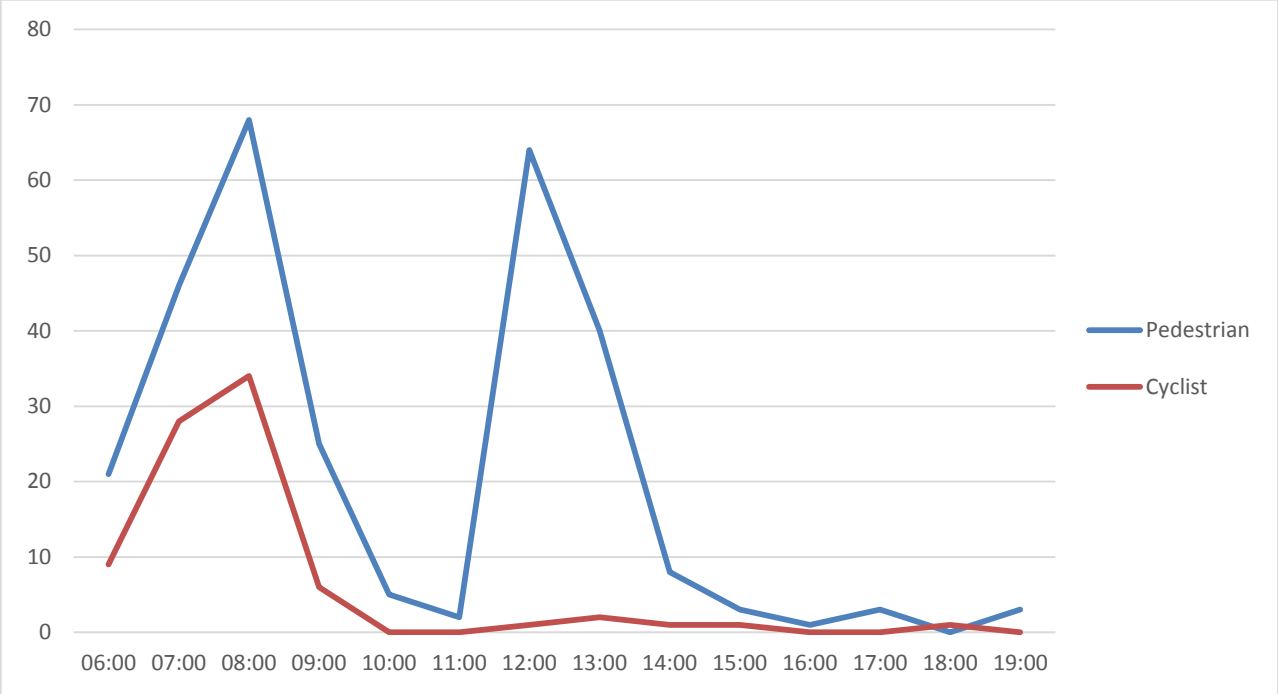
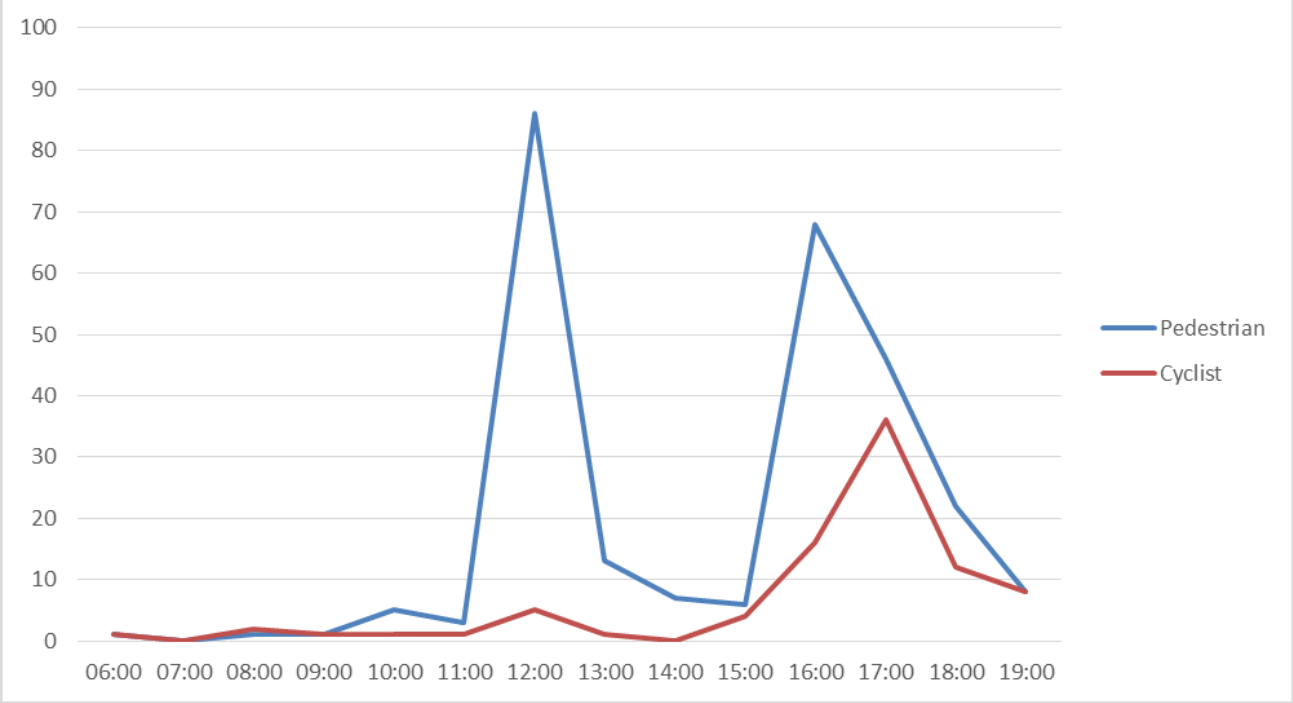


FIGURE 4.46
Ashton Vale Road Level Crossing – From Ashton Vale Estate



4.11 Existing level crossings

There are a number of existing level crossings that will be impacted by the introduction of the scheme. These are:

- Ashton Vale Road within the City of Bristol and on the current Parson Street to Portbury freight line;
- West Town Gate level crossing near Portway within the City of Bristol and on the current Severn Beach line;
- Avonmouth Station level crossing within the City of Bristol and on the current Severn Beach line; and
- King Road Avenue level crossing within the City of Bristol and on the current Severn Beach line.

The Ashton Vale Road level crossing is a Manned Crossing Barrier, supervised by CCTV from TVSC (Thames Valley Signalling Centre) "A Desk". The level crossing is interlocked with road traffic lights controlling the adjacent road junction at Ashton Vale Road.

Assessments of these level crossings have been undertaken and attached in **Appendix H** of the TA.

4.12 Summary of the key issues

This section of the TA aimed to present a comprehensive overview of the baseline conditions. Whilst there are many considerations, the pertinent issues are:

- Portishead and Pill have distinctive land uses – the former has seen considerable recent development particularly in the vicinity of the station and the latter comprising older and mature development;
- This is reflected in the function and layout of principal and local links. Much of the highways around Portishead station have been designed to recent standards whereas Pill is characterised by older and limited highways;
- An analysis of flows show the role and function of each highway. The A369 provides a principal and strategic link between Portishead, Pill and Bristol. Despite this, the flows in each direction are similar in the morning and evening peaks in Portishead;
- Parking surveys reflect demand from immediate land uses and as a result, variations emerge in different areas;
- Accident data generally does not show any accident clusters or any major causal reasons. The greatest number have occurred in the vicinity of J19 of the M5 – but this has to be seen in the context of the large traffic volumes and relative higher speeds;
- Portishead and Pill currently have a good network of bus services which are largely provided on a commercial basis although some public funding has been made available;
- Both settlements have a comprehensive footway network with a more limited cycling network. Pedestrian and cycling links to Portishead town centre are not direct whilst the use of a permissive path to Trinity Primary School plays an important role; and
- A total of four level crossings will be impacted by the scheme. The Ashton Vale Road crossing currently has around one freight train movement in both directions each day although the number of permitted freight trains is greater than this. The other three level crossings generally involve passenger rail freights.

Section 5

Impact Methodology and Assumptions

5.1 Introduction

This part of the TA outlines the methodology that has been used to determine the likely demand for the scheme. Due to the complexity of the scheme, the modelling process applied is over and beyond what is typically undertaken for a TA where analytical tools have been developed to understand rail timetabling, strategic transport impacts and economic performance.

This chapter provides a description of the modelling tools used to inform trip generation, assignment and distribution as well as the tools used to replicate future scenarios on the transport network. A number of assumptions have been applied to the models and these are outlined here together with their rationale.

Note that the assessments presented in this report are based on a different, and more intensive half-hourly rail service pattern than the hourly patterns that is currently proposed. The Environmental Statement and associated documents will report updated transport assessments.

5.2 Trip generation – Rail Demand Model

To inform the trip generation, assignment and distribution, outputs from the Rail Demand Model (RDM) have been used and applied to the traffic count data.

The RDM is a combination of bespoke spreadsheet models and MOIRA (timetable based demand modelling software) to assess rail enhancements offered by MetroWest Phase 1. There are three main elements to the RDM:

- Trips at new stations (on existing and re-opened lines);
- Diversion of existing trips to new stations; and
- Changes in demand at existing stations from new or amended services (including suppression of demand by extra station calls).

The Business Case documentation specifies the methodology and sensitivity testing within the RDM. The methodology makes use of rail industry data and derived techniques to forecast demand at new stations broadly based on relationships at existing stations elsewhere. As no data has been specifically collected, forecasts have therefore employed existing data sources. These include:

- The National Rail Travel Survey (NRTS);
- Office of the Rail Regulator (ORR) Statistics;
- West of England annual station survey;
- MOIRA; and
- The Passenger Demand Forecasting Handbook (PDFH).

5.2.1 New station total demand

This employs a basic regression technique, which takes into account the relationship between journeys and catchments at a number of similar stations. Information used in the regression is drawn from MOIRA extracts (trips and generalised journey times, GJT) and 2011 Census (population and employment). MOIRA information used is for trips between all stations in the MetroWest area and the rest of the national rail network. The new stations model is calibrated to existing stations in the locality.

For a new station, the models estimate total demand using the catchment at the new station in conjunction with catchments at potential destination stations and journey times between the two. Potential destination stations are based on those observed for nearby existing stations, with journey times calculated for the new station. This generates demand for each movement and ticket type, for which a simple gravity model is used to distribute trips.

The new stations demand model is applied to Portishead and Pill for MetroWest Phase 1.

5.2.2 Diversions of existing trips to new station

An estimate of how many trips are new to the railway or transferring from other stations has been made using a station access logit model, with generalised costs calculated for journeys from the 'true' origin of a trip (e.g. home) to existing stations, compared with a similar trip using a new station. This is based on true origin to station trips in National Rail Travel Survey (NRTS) data for stations in the MetroWest area. The NRTS identifies true origin and destination of rail users, as well as the time taken and distance to the station.

The model calculates propensity to change stations based on proximity. NRTS figures for time and distance between origins and stations are adjusted for the new stations using factors derived from comparison of straight-line distances from true origin to the existing station used versus the distance from true origin to new station. A forecast 'station share' is calculated based on the new station versus existing station.

The station shift has been calibrated using behaviour at existing stations, the main principle being that unrealistic transfers are eliminated. For example, care has been taken to consider longer distance railhead movements that use major stations such as Bristol Parkway or Bristol Temple Meads.

5.2.3 Demand at existing stations

MOIRA is a model based on the full network timetable, with demand drawn from real ticket sales. It is used by the rail industry to forecast the impact of service related changes on passenger revenue, including analysing the effect of changes such as stopping patterns, infrastructure and rolling stock on the passenger numbers carried and the revenue impact. Impacts are calculated using a series of elasticity relationships, set out in the PDFH. MOIRA has been used to assess the impacts of MetroWest Phase on existing stations in the WoE as well as the wider rail network. In addition, generalised journey time, demand and revenue figures have been extracted from MOIRA for stations in the MetroWest area to use in the forecasts of the new stations.

5.3 Variable Demand Model

A Variable Demand Model has been developed utilising EMME (public transport) and SATURN (highway) transportation software. The 'variable demand model' (VDM) seeks to replicate likely actual future situations on the transport network. The methodology was developed as a result of concerns that traditional fixed trip matrix models did not replicate actual behaviour in congested network environments. In such environments, people decide to change mode, decide to travel to alternative destinations or as a last resort not travel at all. The VDM allows all these choices. For this reason the analysis of impacts of schemes using the GBATS4 model must consider the following:

- Changes in the amount of travel;
- Changes in the travel patterns (O-D);
- Changes in highway use; and
- Changes in bus use.

These impacts are considered in turn.

5.3.1 Model adjustments

A key feature of the type of model represented by GBATS4 is that they are mostly driven by demographic changes such as population and employment. However, when forecasting rail demand, it is acknowledged that these sorts of models can struggle to reflect changes in such a 'minority modes'; that is, a mode that has a comparatively small proportion of total demand, and/or geographical coverage in a modelled area. As intimated in WebTAG (Units M1.1 and M4), rail demand is more commonly assessed using trip rate and elasticity approaches; these approaches form the basis of the RDM that has been used to develop rail demand forecasts for MetroWest Phase 1. Hence it has always been anticipated that a degree of adjustment would have to be made to GBATS4 outputs to align GBATS4 forecasts with RDM forecasts.

The principal reason that GBATS4 has been employed in assessing MetroWest Phase 1 is to consider potential highway benefits that the rail scheme could generate, to feed into the cost benefit analysis. As such, highway trip matrices from GBATS4 models have been adjusted. This has been done by first amending the rail demand trip matrices in GBATS4 so that their assignment to the network results in station-by-station demand that is close to that generated by the RDM. The proportion of the resulting (adjusted) rail demand that are former car trips has been identified, and removed from highway matrices. Overall modal changes, and hence car transfers, have been derived from GBATS4 results.

5.4 Assumptions

In addition to the calculation of demand, a number of assumptions have been applied. In the first instance, as a result of scheme scope revisions, the assessments presented in this report are based on the more intensive half-hourly rail service pattern than the hourly patterns that is currently proposed. The Environmental Statement and associated documents will report updated transport assessments.

5.4.1 Opening year and horizon year assessment

Following scoping discussion, it was agreed that the opening year of 2019 and the ten year period of 2029 would be assessed. However, it is now likely the scheme opening will be in 2021. The difference between 2019 and 2021 in terms of traffic growth is marginal and as a result, 2019 figures are presented in the interim as the de facto opening year assessment. Likewise, 2029 is retained as the horizon year.

Traffic growth rates have been calculated using TEMPRO (Trip End Model Presentation Program) version 6.2. Whilst the intention was to use the outputs from the GBATS4, the model does not provide sufficient flows and detail for the immediate roads surrounding the station.

TEMPRO is a DfT software package that is used for transport planning purposes. It includes forecast data on population, employment, households by car ownership, trip ends and traffic growth factors. Traffic growth factors have been extracted from the software for North Somerset and Bristol for the assessment year periods.

Table 5.1 shows the respective growth rates that have been applied in this TA.

TABLE 5.1
TEMPRO growth rates

Area	2015 to 2019* Origin	2015 to 2019* Destination	2015 to 2029 Origin	2015 to 2029 Destination
00HC8 Portishead AM	1.0301	1.0441	1.1221	1.1487
00HC8 Portishead PM	1.0428	1.0342	1.1498	1.1335
00HA1 Bristol (Part) AM	1.0351	1.0385	1.1053	1.129
00HA1 Bristol (Part) PM	1.0383	1.0358	1.1266	1.1103
00HB1 Bristol (Main) AM	1.0409	1.0479	1.1429	1.166
00HB1 Bristol (Main) PM	1.0449	1.0397	1.158	1.1406
00HB2 Avonmouth AM	1.0397	1.0464	1.1364	1.1487
00HB2 Avonmouth PM	1.0447	1.0387	1.1544	1.1349

* 2019 used as a proxy for an opening year of 2021

5.4.2 Peak period assessment

Throughout the focus has been on the morning daytime peak period of 08-00 to 09-00 and the evening peak period of 17-00 to 18-00 where the greatest demand on transport networks can be expected.

5.4.3 Timetabled services

The following services have been assumed for each station as follows as shown in Table 5.2.

TABLE 5.2
Assumed rail services

Station	Mon-Fri daytime	Mon-Fri eve	Sat & Public Holidays	Sun
Portishead	½ hourly all day	Hourly	½ hourly all day, hourly eve	Hourly daytime only
Pill	½ hourly all day	Hourly	½ hourly all day, hourly eve	Hourly daytime only

This is a higher level of service provision than is included in the scheme proposal, therefore provides a robust assessment of impacts. The Environmental Statement and associated documents will report updated transport assessments.

5.4.4 Level crossing closures

The scheme will also result in changes to existing timetabled passenger services. The following changes in Table 5.3 have been assumed.

TABLE 5.3
Assumed passenger rail services at level crossings

Station	Mon-Fri daytime	Mon-Fri eve	Sat & Public Holidays	Sun
East Town Road	2tph to Avonmouth 2 tph to Shirehampton	1tph to Avonmouth 1 tph to Shirehampton	2tph to Avonmouth day 2 tph to Shirehampton day 1tph to Avonmouth eve 1 tph to Shirehampton eve	1tph to Avonmouth 1 tph to Shirehampton
Avonmouth Gloucester Road	1 tph to Severn Beach 1 tph to Avonmouth	1 tph to Severn Beach 1 tph to Avonmouth	1 tph to Severn Beach 1 tph to Avonmouth	1 tph to Severn Beach 1 tph to Avonmouth
King Road	1 tph to Severn Beach 1 tph to Avonmouth	1 tph to Severn Beach 1 tph to Avonmouth	1 tph to Severn Beach 1 tph to Avonmouth	1 tph to Severn Beach 1 tph to Avonmouth

Hourly and 45 minute frequency passenger service provision has been assessed at the Ashton Vale Road level crossing. Details of the assessments are shown in **Appendix P**.

5.4.5 Parking assumptions

The calculation of parking spaces has been based on the requirements in the North Somerset Parking Standards. For on-street parking, a 6m long parallel space has been assumed. Where parking controls are in place, these have been taken into account. For certain sections where parking would impede the flow of traffic and the operation of the highway, additional assumptions about parking spaces being constrained to one side of the street have been made. These are documented at the appropriate point.

In order to calculate a typical week day accumulation at the car parks at Portishead and Pill station, a number of assumptions have been made. It was recognised that applying MOIRA factors from annual figures the demand profile in the peaks are not modelled. In order to achieve a more tidal peak profile, figures from the West of England Rail Survey which has counts of boarding and alighting at other stations have been applied and weighted to the peak.

A split of 'origin' and 'destination' trips by time of day, drawn from NRTS data has also been undertaken. This splits the station entries into trips that are departing at the origin end of their trip in Portishead/Pill (potentially parking their car) or returning to another origin with the destination end of their trip at Portishead/Pill (unlikely to be parking). Vice versa for station exits (arriving destination trips and returning origin trips).

The parking accumulation also assumes differences in the vehicle occupancy passenger rates. Between 05-00 and 10-00 and 16-00 to 23-00, 1 passenger is assumed for each car whereas this rises to 1.6 between 10-00 and 16-00 during the day. This has the effect of increasing the level of demand for car parking particularly during the peak period.

One final assumption underpinning the accumulation is the extent of overnight car parking. For this exercise, it has been assumed that 10 vehicles will be left in Portishead and 5 vehicles left in Pill overnight.

5.4.6 Passenger car unit (PCU)

In this TA, a value of 2.5 has been applied to flows relating to HGVs (all sizes) and buses. This value is taken from GBATS4 modelling assumptions for the West of England area.

5.5 Distribution and assignment of traffic

The distribution and assignment of traffic to and from the stations has been informed by the outputs from the Rail Demand Model and the GBATS4 strategic model for the West of England area. Output Areas (OAs) from GBATS4 have been used as shown in Figure 5.1.

Appendix G Trip Generation, Distribution and Assignment of Traffic provides the breakdown of distribution and assignment from each OA to and from the stations. However, the following assumptions have been made:

- All vehicle trips are regarded as additional to the network. No allowance has been made to reassign existing journeys on the network;
- The most direct route to and from the stations has been assumed where possible. For example, OA area 32,705 covering effectively Portishead marina, traffic is assumed to use Harbour Road with 50% turning into Newfoundland Way and 50% into Station Road;
- For Portishead station, 78% of all vehicle traffic will turn into Harbour Road to access the larger of the two car parks with 22% of traffic entering Phoenix Way (the percentages reflect the respective capacities of the two car parks of the overall number of spaces);
- With drop off and pick up trips, in Portishead 50% are assumed to return to the origin of the journey with 25% towards Portishead town centre via Harbour Road and Cabstand with the remaining 25% towards J19 of the M5. There is limited published information on linked trips such as these – most research relates to retail related trips and so has limited applicability. On this basis, given the volume of drop-off and pick-up trips are likely to be more limited, the percentages are based on an assessment of likely routes to and from each station;
- Sensitivity test undertaken on these percentages to show the extent of potential variation on different routes; and
- In Pill, a similar 50% are assumed to return to the origin with 25% heading towards J19 of the M5 and 25% along the A369 towards Bristol.

Figures 5.2 to 5.5 show the respective distribution of traffic to and from Portishead and Pill stations respectively. Note that the assessments presented in this report are based on a different, and more intensive half-hourly rail service pattern than the hourly patterns that is currently proposed. The Environmental Statement and associated documents will report updated transport assessments.

FIGURE 5.1
Output areas

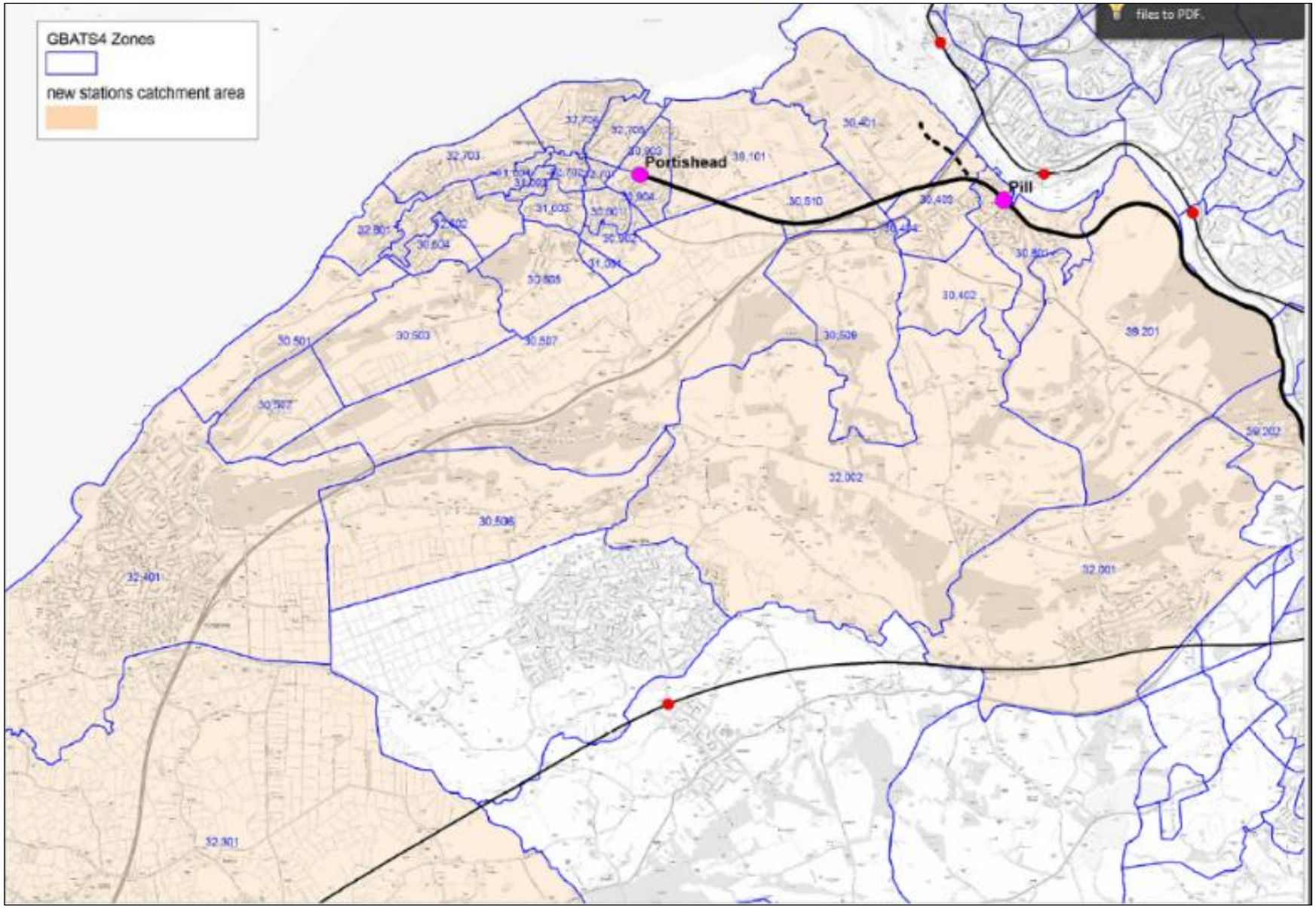


FIGURE 5.2

Distribution of one way trips to Portishead Station

MetroWest Phase I: Portishead
Development Distribution - Drivers Only

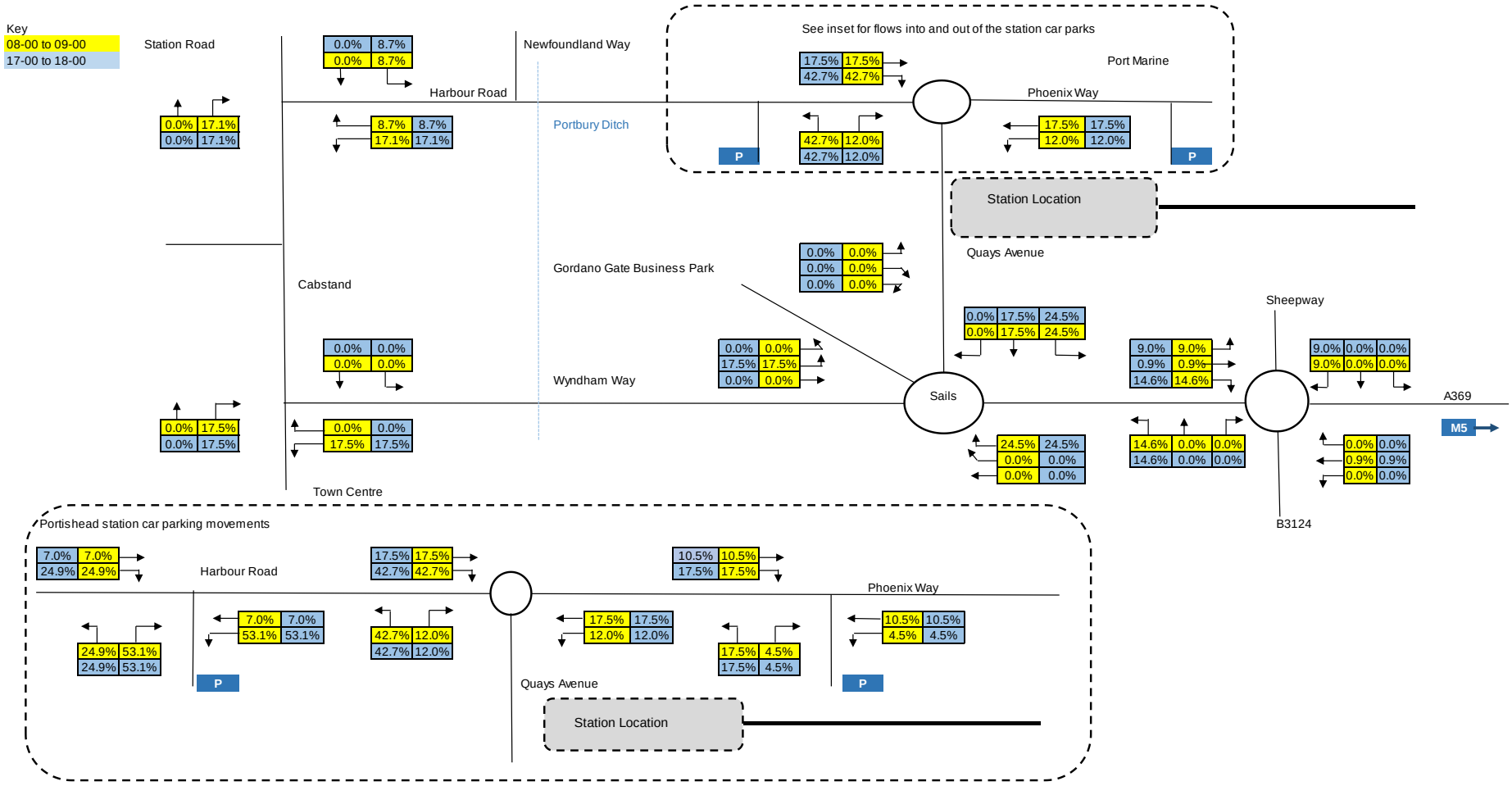


FIGURE 5.3

Distribution of drop off and pick up trips to Portishead Station

MetroWest Phase I: Portishead
Development Distribution - Drop Off and Pick Up

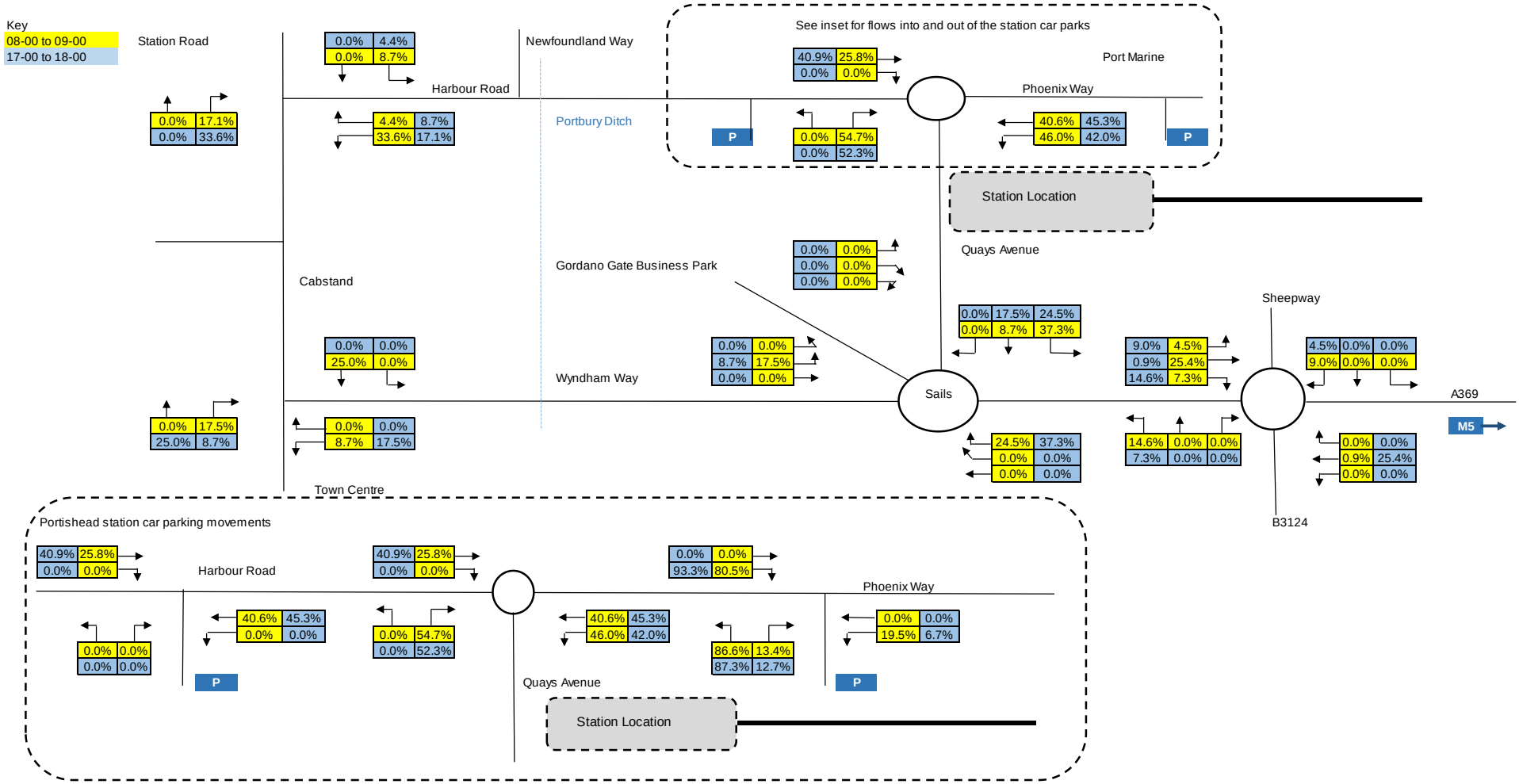


FIGURE 5.4
Distribution of one way trips to Pill Station

MetroWest Phase I: Pill
Drivers to and from the station assignment

Key
08-00 to 09-00
17-00 to 18-00

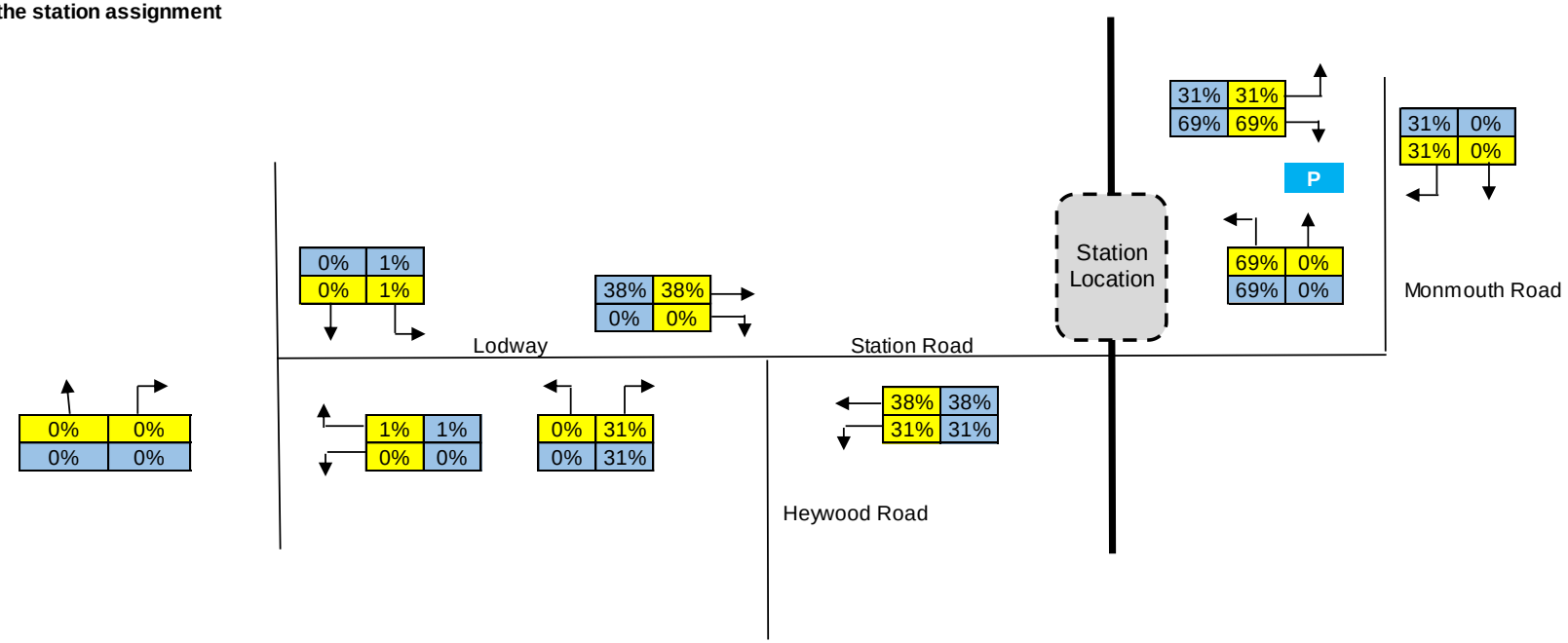
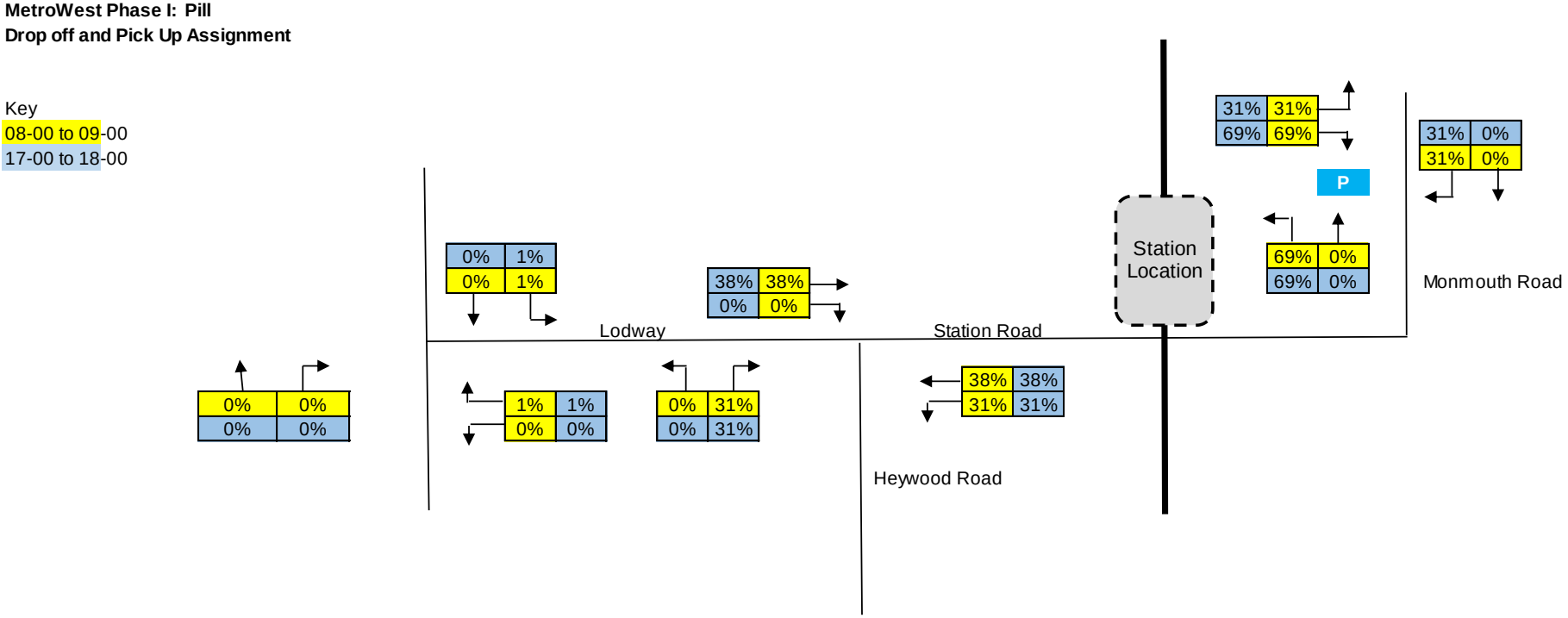


FIGURE 5.5
Distribution of drop off and pick up trips to Pill Station



Section 6

Strategic Operational Impact Assessment

6.1 Introduction

This section sets out the strategic operational impacts of the scheme. The impacts reported in this section include:

- Strategic case for the scheme;
- Passenger rail demand;
- Strategic highway and bus impacts; and
- Rail freight.

6.2 Strategic Case

6.2.1 Overview

This section sets the strategic benefits of the scheme.

The aspects of change associated with the scheme are:

- Economic growth
- Congestion and transport resilience
- Accessibility
- Environment and social wellbeing

6.2.2 Economic growth

The West of England has a substantial economic growth agenda which is being driven through the Local Economic Partnership's Strategic Economic Plan (SEP). However, without improvement to the transport network, including rail infrastructure, it is likely that economic prosperity will be constrained by the capacity of the existing transport networks. The LEP's overall vision is to build on previous economic growth through a range of interventions including improving access to major employment sites for the skilled workforce catchment. The population is expected to exceed 1.1 million by 2026.

The 2012 Atkins report 'GVA Impacts of Major Transport Schemes – Final Report: West of England Authorities' concludes that in the West of England, congestion is a barrier to economic growth. It notes that the West of England operates within a complex economic geography in which it is critical to ensure that businesses are able to draw on a suitably skilled labour market to address their growth aspirations. Conversely, it is critical to ensure effective options for travel to work, particularly in terms of connecting areas of employment need with suitable job opportunities.

The GVA study included consultation with a range of stakeholders. Their findings highlight that stakeholders feel that:

- Poor perceptions of connectivity and traffic congestion on the road network are a negative influence on business and business reputations in the sub-region. One property agent believed the transport network is '*one of the biggest drawbacks of Bristol City*' and that it is continuing to **depress demand** and property values in the city-region.
- Transport and connectivity is not only key in enabling people and goods to be moved but also contributes to a **positive image** of an area that is 'open to business'. The importance of transport was noted by one business representative organisation as '*top of the pile for most businesses*'.
- Poor access to the south of Bristol is **deterring investment**. One agent commented that, in their search for properties, some businesses rule out particular areas from the outset due to poor access and connectivity. In particular, access to the South Bristol area was highlighted as the

most prominent issue. One business representative believes that '*businesses in the south of Bristol are at a real disadvantage compared with the north of the City due to poor transport connections'*.

- In future, business growth and location decisions will be more strongly related to transport infrastructure. For example, **businesses may decide to move out** of Bristol City centre, because of congestion issues, if it is not essential to stay on operational grounds.
- Growth and future prospects could be constrained without suitable investment in infrastructure. One business representative stated that '*if the schemes do not go ahead there will be real limitations on businesses' ability to grow, as poor transport infrastructure is a* ***significant restraint on growth****'.* A public sector representative commented that *'the West of England is seen as economically successful and has the right ingredients to be even more successful, but poor transport infrastructure could prevent the rapid growth the West of England is capable of*'.

The target growth in jobs and GVA will be delivered both through higher productivity and increased numbers of people working and living in the area. The GVA report recognises that this will lead to substantial increases in travel demand: without action being taken, it is likely that most of the increased travel demand will be by car, leading to large increases in traffic congestion.

Whilst some demand could be accommodated through public transport, it is likely that more local rail services would reach capacity and would not be able to accommodate further growth in demand. The study concludes that, "If improvements are not made, the rail network in its current form will continue to play only a minor role in catering for future travel demand in the West of England." Overall the report recognises that, "The limited catchment of the local rail network and increasingly long journey times by bus within the urban areas will reduce the overall depth of labour markets and limit the potential for clustering benefits."

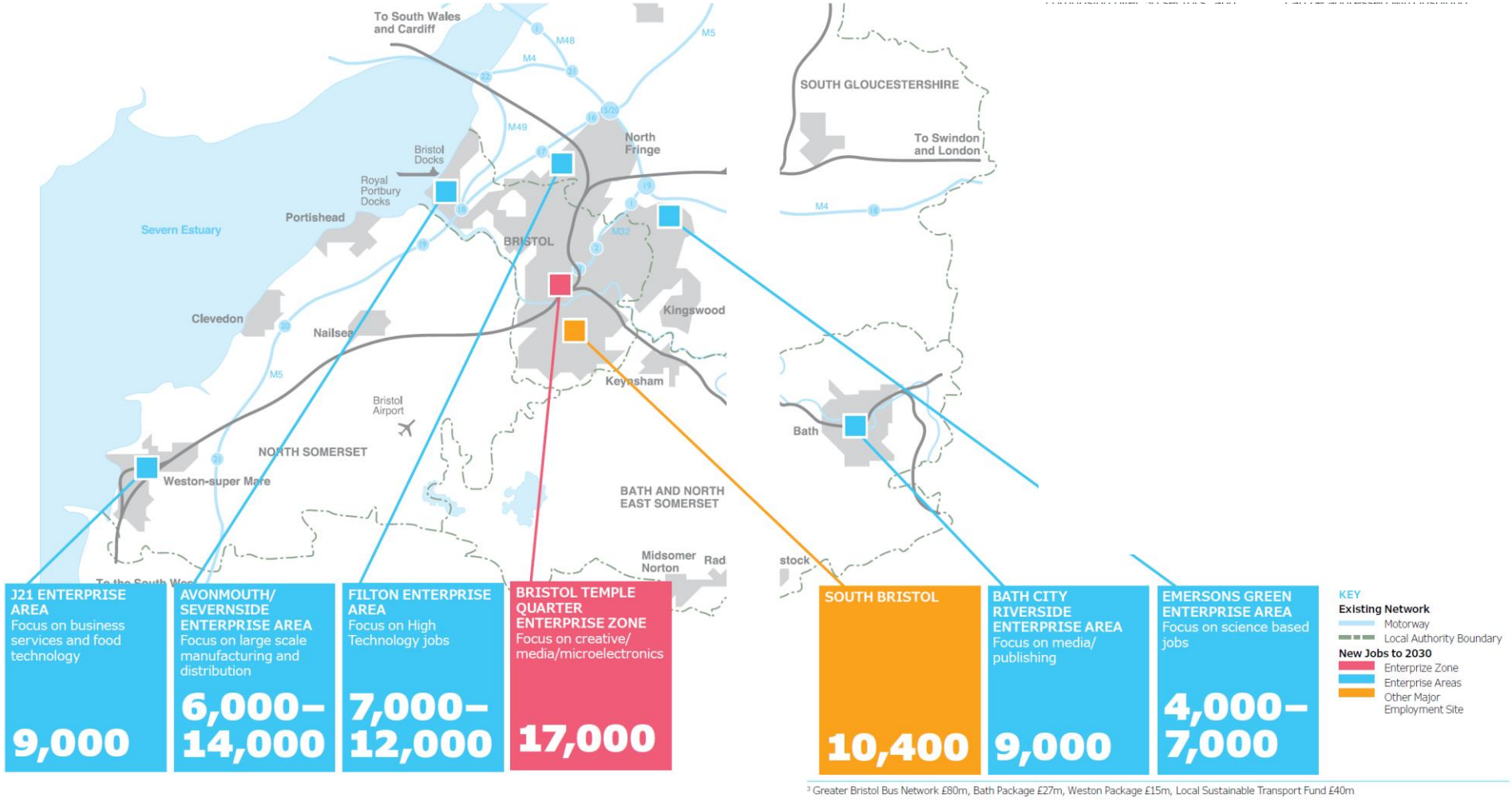
These problems and challenges identify a need for strategic and targeted investment to enhance the local rail network as a part of the West of England's approach **to supporting economic growth**. This has a direct correlation with the SEP objective:

"Create places where people want to live and work, through delivery of cultural infrastructure and essential infrastructure, including broadband, transport and housing to unlock suitable locations for economic growth."

Figure 6.1 shows the relationship between employment development areas and the MetroWest scheme.

FIGURE 6.1

Employment development areas in the MetroWest area *(source SEP)*



[3] Greater Bristol Bus Network £80m, Bath Package £27m, Weston Package £15m, Local Sustainable Transport Fund £40m

Planning for this growth means the city region needs to make sure its transport infrastructure is not only fit-for-purpose, but has the ability to respond to increasing demand and, therefore, maximise potential for continued economic growth. The modal share for journey to work within the Temple Quay Enterprise Zone (TQEZ) is increasing rapidly; the recent TQEZ Transport Report (June 2012, Halcrow/CH2M Hill) forecasts that 15 per cent of trips to/from the Enterprise Zone will be by rail).

Enterprise areas are now becoming established and are expected to be major trip generators. Rail will play a significant part in meeting this demand (see Table 6.1).

TABLE 6.1
Enterprise zone and enterprise areas

Enterprise Zone/Area	Jobs	Rail Schemes
Bristol Temple Quarter Enterprise Zone and new arena	17,000	MetroWest Phase 1 and 2 New stations package Portway platform
Bath City Riverside Enterprise Area	9,000	MetroWest Phase 1 New stations package
J21 Enterprise Area (Weston-Super-Mare)	9,000	MetroWest Phase 1 and 2
Emersons Green/Science Park Enterprise Area via Bristol Parkway	4,000 to 7,000	MetroWest Phase 2
Filton Enterprise Area	7,000 to 12,000	MetroWest Phase 2
Avonmouth Severnside Enterprise Area	6,000 to 12,000	MetroWest Phase 1 and 2
South Bristol Priority Growth Location	10,400	MetroWest Phase 1

Source: WoE Response to the GW Franchise, updated using information from the SEP

Table 6.2 shows a considerable number of new homes and jobs are planned in the West of England area to 2029 while Table 6.3 underlines this with major housing areas directly served by rail or with potential for rail access.

TABLE 6.2
Planned housing and employment growth in the West of England

Council	Homes	Jobs	Core Strategy Period
Bath & North East Somerset*	13,000	10,300	2011- 2029
Bristol City	32,800	21,900	2011- 2026
North Somerset*	17,130	14,000**	2006- 2026
South Gloucestershire	28,355	18,600-21,870	2006 - 2027
All	91,285	68,070	

Source: Taken from the WoE Response to the GW Franchise, based on Core Strategies and supporting evidence documents.

*Proposed figures subject to local plan examinations, ongoing 2014.

** Homes updated February 2014 but job figures to be revised.

TABLE 6.3
Major new housing areas served by rail schemes

Housing Area	Homes	Rail Schemes
Cribbs Patchway New Neighbourhood	5,700 50 ha employment land	MetroWest Phase 2 (Henbury Line)
North Yate	3,000	MetroWest Phase 2
Somerdale (former Cadbury site at Keynsham)	700	MetroWest Phase 1
Weston-super-Mare	11,000	MetroWest Phase 1 and 2

Source: Core Strategies. Housing area figures are included in the Core Strategies.

The Atkins report 'Unlocking Our Potential: The Economic Benefits of Transport Investment in the West of England,' November 2012, found that MetroWest delivers some 2,500 jobs, which based upon on the level of self-containment equates to unlocking some 2,900 homes. MetroWest, therefore, has significant benefits in bringing forward private sector investment.

Table 6.4 sets out the strategic considerations associated with economic growth.

TABLE 6.4
MetroWest Phase 1 economic growth summary

Strategic consideration	MetroWest Phase 1
Problem	• Congestion and poor accessibility constrain economic growth and will increasingly
Consequence (impact of not changing)	• Negative perceptions of transport have an adverse impact on business location decisions and deter investment • Depressed demand and property values in some areas • Transport could prevent the area from fulfilling its full potential • Labour market is constrained • Travel time/cost for employees is high
MetroWest Phase 1 objective	• Business objective – To support economic growth • Supporting objective – To enhance transport links to the TQEZ and into and across Bristol city centre, from the Portishead, Bath and Avonmouth/Severn Beach arterial corridors
Outcome	• Jobs unlocked • Increased depth and skills base of accessible labour market • Increased agglomeration of business activity • Reduced cost of business travel • Support growth at TQEZ • Improved perceptions of competitiveness • Reduced congestion on road network when compared to a 'do minimum' scenario

6.2.3 Tackling congestion and improving transport network resilience

The West of England transport networks are reaching capacity and congestion is particularly notable at:

- Bristol city centre and approaches to Bristol Temple Meads;
- The M5 Junction 19;
- The A369 between the M5 and Portishead ;
- The A4 between Bath and Bristol; and,
- Corridors into Bristol city.

In the strengths/weakness/opportunities/threats (SWOT) analysis, set out in the LEP's SEP, there is a recognition that there is a key weakness of "*Rising congestion within the West of England and on key routes to other regions, and the potential for harm to the environment exacerbated by high levels of growth."*

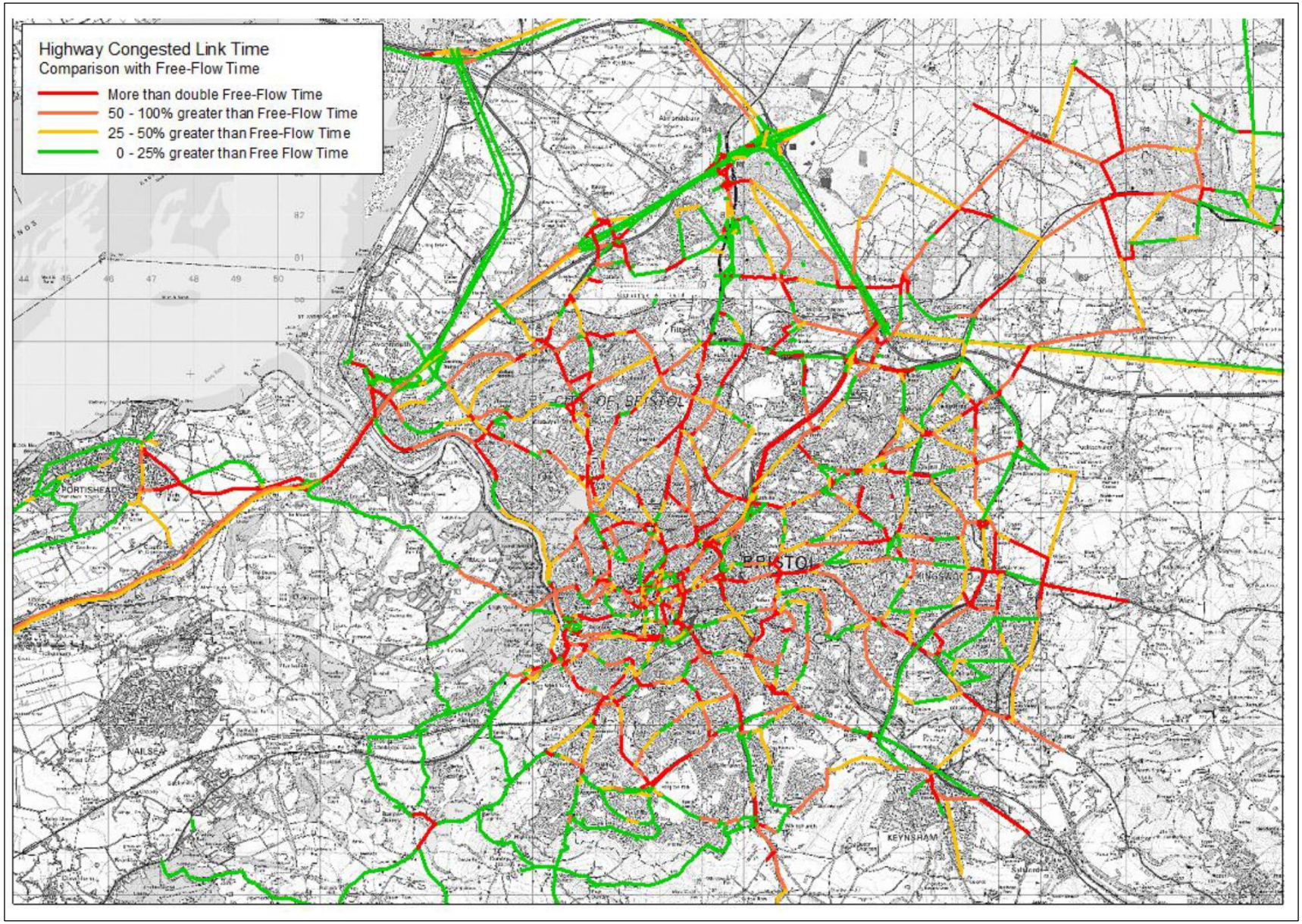
The West of England Congestion Delivery Plan (2009 update) which is a daughter document of the Joint Local Transport Plan (JLTP), states that *"Peak hour traffic speeds in the Greater Bristol area, at an average of 15 mph, are the slowest of the English `core' cities. At peak periods, 21% of travelling time is spent stationary and DfT data indicate that there has been until recently a steady decline in average speeds."*

The vision identified in the Bristol Core Strategy is for a city of sustainable communities that combine housing, employment, retail, education, training and leisure functions, all linked by a strong public transport network. At present, however, traffic congestion and journey time unreliability make Bristol one of the most congested cities in Britain. In order to tackle congestion and air pollution, the Core Strategy's vision is for a less car-dependent city and an emphasis on walking, cycling, bus, rapid transit and rail.

The JLTP estimates the cost of congestion will be £600 million by 2016.

Figure 6.2 (source: Atkins 2012 GVA Study) highlights the extent of the likely future congestion problem in 2031. It shows the A369 from the M5 to Portishead and parts of the A4 between Bath and Bristol as having more than double the free flow time.

Figure 6.2: Map showing future congestion in 2031 *(source Atkins GVA study)*



Data from surveys for GBATS4 modelling, shown in Table 6.5, also illustrates the significant difference between free flow and peak time journey times.

TABLE 6.5
Free flow vs AM Peak journey times on key routes

Route	Observed AM Peak (Oct 2013)		Observed AM Peak (May 2013)	
	Free Flow JT (mins)	Net Peak hour JT (mins)	Free Flow JT (mins)	Net Peak hour JT (mins)
A4 (Keynsham to Bath Bridge)	11.4	29.5	10.2	22.5
A4 Portway (Avonmouth to Hotwells)	10.6	21.4	9.5	17.0
A369 (Portishead to Ashton Gate)	11.8	22.7	11.5	17.6

Free Flow JT = minimum journey time recorded in the period 06:00-10:00

Observed = Strategic data

In the JLTP3, there is a congestion indicator, which uses information from the DfT and figures for 2011/12 (usually a year in arrears). This shows that average traffic speeds have increased over the previous year at a faster rate than nationally, see Table 6.6.

TABLE 6.6
Average vehicle speeds (flow-weighted) during the weekday morning peak on locally managed 'A' roads by local authority in England, annually from 2006/7

	2006/7	2007/8	2008/9	2009/10	2010/11	2011/12	Change 2010/11 to 2011/12
Bath & North East Somerset UA	21.9	21.5	22.6	22.4	22.4	22.8	1.5%
Bristol, City of UA	14.7	15.1	15.9	15.6	15.5	15.7	1.1%
North Somerset UA	28.9	29.0	29.5	29.4	29.8	30.1	0.8%
South Gloucestershire UA	25.3	25.1	25.3	24.9	24.6	25.1	2.0%
ENGLAND	24.6	24.7	25.1	25.0	25.1	25.3	0.8%

The Portishead to Bristol corridor (A369) suffers congestion and journey time reliability problems. This not only causes delays and lost productivity for car drivers and goods vehicle operators but also presents a major hurdle for an attractive public transport mode along the corridor. The problems and context of the A369 corridor are summarised as:

- The A369 is the only transport corridor directly linking Portishead with Bristol which is just 10 miles to the east.
- The capacity constraints on the A369 are exacerbated by the fact that it crosses junction 19 of the M5. This is one of the busiest parts of the M5 with the Avonmouth Bridge immediately to the north.
- The A369 continually suffers from the knock-on effects of incidents on the M5 with high volumes of traffic using a constrained local road corridor with few alternative route options.

The West of England trend for high rates of private car ownership is magnified in Portishead where only 12% of households (2011 Census) do not have access to a private vehicle. This emphasises the town's over-reliance on private car ownership. These patterns are reflected in the high proportion of residents who travel to work using private vehicles (as car/motorcycle drivers or passengers). At 81 per cent, the proportion of commuters travelling by private vehicle is considerably above both the West of England (69 per cent) and nationwide averages (66 per cent). Less than 1 per cent of commuters locally use rail services (2011 Census), see Table 6.7.

TABLE 6.7
Mode of Travel to Work (2011 Census)

Mode of Travel to Work	Pill	Portishead	West of England	England
Train	0.5%	0.8%	2.3%	5.6%
Motor Vehicle	72.6%	80.8%	69.2%	66.4%

There is also strong evidence from the Office of the Rail Regulator (ORR) of increasing demand on the rail network, as shown in the data in Table 6.8. This will lead to capacity issues if not addressed.

TABLE 6.8
ORR historic patronage growth in West of England area
2004-2012 figures

Station groupings	2004/05 to 2012/13 TOTAL	2004/05 to 2012/13 per annum
Bristol main (Temple Meads and Parkway)	60%	6.7%
Severn Beach line*	190%	21.1%
Other Bristol urban**	172%	19.1%
B&NES (including Keynsham)	58%	6.4%
South Gloucestershire (excluding Parkway)	153%	17.0%
North Somerset	54%	6.0%
OVERALL	67%	7.4%

*Assume excl. Lawrence Hill and Stapleton Road

**Assume incl. Lawrence Hill, Stapleton Road, Bedminster, Parson Street

However, the growth in patronage does not wholly relate to the geographical nature of travel demand in the area. West of England is largely self-contained with 89 per cent (Census 2001) of its workforce living and working within the area. The provision of services that focus on areas of demand would further increase rail patronage in the region.

Table 6.9 sets out the strategic considerations associated with congestion and transport resilience.

TABLE 6.9
MetroWest Phase 1 congestion and transport network resilience summary

Strategic consideration	MetroWest Phase 1
Problem	• Congestion on the road and rail networks
Consequence (impact of not changing)	• Slow and unreliable journey times (particularly on the A4, A369/M5 and routes into and within Bristol city) • Traffic congestion is delaying buses • Impact on perception/attractiveness of the region for investment/business location • Reduced size of accessible labour pool • Cost of congestion (expected to reach £600 million by 2016) • Environmental impact of traffic and congestion (air quality management area in Bristol)
MetroWest Phase 1 objective	• Business objective - to deliver a more resilient transport offer • Supporting objective – to contribute to reducing traffic congestion and providing more attractive and guaranteed (future-proofed) journey times on the Portishead, Bath and Avonmouth/Severn Beach arterial corridors. • Supporting objective – to contribute towards enhancing the capacity of the local rail network, in terms of seats per hour in the AM and PM peak.
Outcome	• Reduced road congestion when compared to a 'do minimum' scenario • Reduced journey times • More reliable journey times • Improved air quality • Increased rail capacity • Improved transport choice on the Portishead, Bath Spa and Severn Beach line corridors

6.2.4 Accessibility

'Making the Connections' (Social Exclusion Unit, 2003) identified five key barriers impacting on accessibility:

- *The **availability** and physical accessibility of transport: For some people in isolated urban and rural areas there are limited or no public transport services or the services are unreliable, or do not go to the right places or at the right times.*
- ***Cost** of transport: Some people find the costs of personal or public transport very high or unaffordable.*
- *Services and activities located in **inaccessible places**: Developments including housing, hospitals, business and retail are often located in areas not easily accessible to people without a car.*
- ***Safety and security**: Some people will not use public transport or walk to key services because of the fear of crime or anti-social behaviour.*
- ***Travel horizons**: Some people are unwilling to travel long journey times or distances, or may not know about or trust transport services.*

Commuting from Portishead to Bristol city centre under typical morning peak hour traffic conditions takes approximately of 50 minutes, as congestion can make the journey both longer and unreliable. Given distance is just 10 miles, the resulting average vehicle speed is very low, with peak hour trips taking considerably longer than the same journey in the off-peak. Reducing the travel times will reduce the overall cost of travel.

The lack of a rail link between Bristol and Portishead also means that people without access to a car face additional difficulties. Bus journeys can take over an hour in peak periods, and are susceptible to delay due to the overall levels of congestion on this corridor. This length of journey may, in some cases, mean that residents of Portishead are unable to (or discouraged from) seeking employment or education opportunities in the Bristol area.

The Severn Beach line stations have different levels of service, from every 40 minutes between Temple Meads and Avonmouth, to every 1 or 2 hours at St Andrew's Road and Severn Beach stations. This results in the following accessibility issues:

- Poor access to the employment opportunities in the Avonmouth area
- Poor access from the residential areas around the Severn Beach line

The residential areas around the Severn Beach line have a higher proportion of residents claiming Job Seekers Allowance and with no car compared to other parts of the West of England.

Accessibility into Bath suffers from the low level of train services for Keynsham and Oldfield Park.

The provision of the new stations at Portishead and Pill will increase the accessibility of the rail network to residents in North Somerset. In particular, this will benefit the 16,000[2] people who live within a mile of Portishead station and around 2,000 people who live within a mile of Pill station.

Table 6.10 sets out the strategic considerations associated with accessibility.

TABLE 6.10
MetroWest Phase 1 Accessibility Summary

Strategic consideration	MetroWest Phase 1
Problem	• Congestion on the roads and the limited existing rail services mean that travel times into Bristol or to key employment centres by bus or car are currently lengthy and costly.
Consequence (impact of not changing)	• Missed work and educational opportunities • Likely growing social inequalities • Increasing reliance on the car • Attractiveness of the bus will decline (will suffer from general congestion and journey time delay)
MetroWest Phase 1 objective	• Business objective – improve accessibility • Supporting objective – ensure that more people have easy access to the rail network • Supporting objective – to reduce the overall generalised cost of travel for commuters, businesses and residents
Outcome	• More people within easy access of a rail station • Increased mode choice

[2]The catchment of Portishead station is related to the location of the station site, the catchment of people living within a mile could range from less than 10,000 to 16,000.

TABLE 6.10
MetroWest Phase 1 Accessibility Summary

Strategic consideration	MetroWest Phase 1
	• Rail will be a genuinely attractive alternative to the car • Increased range of employment and educational opportunities available

6.2.5 Environment and social well-being

Mapping in the DfT "Carbon Pathway Analysis" 2008 Report shows that the largest CO_2 emissions from transport in the West of England are, not unexpectedly, where traffic levels are greatest. This includes the major urban areas, along the sub-region's motorways and other busy roads.

Whilst reducing congestion and managing traffic flow will deliver some carbon benefits, it is recognised that achieving a 40% target for transport will require a reduction in car-based trips within the urban area.

Transport is estimated to account for over 20% of CO_2 emissions nationally and 36% at the local level. Motorway and trunk road traffic is the major source of emissions, accounting for about 55% of total CO_2 emissions in the West of England, with urban roads responsible for around 30%. Within Bristol's central Air Quality Management Area (AQMA), 97% of NO_2 emissions are from road traffic. CO_2 emissions are expected to rise 19% by 2011, compared to 2004 levels.

BCC has declared a single AQMA which covers Bristol city centre and parts of the main radial roads including the M32. This AQMA extends approximately 1 km east of the Portbury Freight Line and includes part of the local railway network within the centre of Bristol. The AQMA has been declared for NO_2 (1-hour mean and annual mean objectives) and PM10 (24-hour mean objective).

BANES Council has also declared one AQMA in the centre of Bath, which extends along the main roads including Warminster Road and London Road. The Bath AQMA is located approximately 500m from the proposed Bathampton turn-back and has been declared for NO_2 (1-hour mean and annual mean objectives).

Further information about air quality issues are set out in Table 6.11.

TABLE 6.11: EMISSIONS INFORMATION

BCC, NSC and B&NES CO_2 emissions for 2011 for different economic sectors

Economic Sector	CO_2 (Kt)		
	BCC	NSC	B&NES
Road Transport (A roads)	149	102	131
Road Transport (motorways)	77	247	0
Road Transport (minor roads)	290	172	108
Diesel railways	6	7	7
Transport other	3	13	1
Land Use, Land-Use Change, and Forestry (LULUCF) Net Emissions	4	27	10
Total for all sectors (non-transport sectors not shown here)	2,036	1,351	897

On average, the carbon emissions for all three local authorities were estimated at 7Kt for diesel railways (0.003% of total CO_2 emissions), with road transport accounting for about 516Kt (25% of total CO_2 emissions) for BCC and NSC.

The West of England office is committed to promoting healthy lifestyles, and transport has an important part to play in this work. The local transport plan provides information about health and transport including the following statements:

- *67% of adults in Bristol are at an increasing risk of ill health due to low levels of physical activity; physically active people reduce their risk of developing chronic diseases- such as coronary heart disease, stroke and type 2 diabetes—by up to 50%, and the risk of premature death by about 20-30 per cent (National Active Travel Strategy 2010).*
- *Walking and cycling are the easiest ways that most people can increase their physical activity levels.*
- *Each additional kilometre walked per day is associated with a 4.8% reduction in the likelihood of obesity. Each additional hour spent in a car per day is associated with a 6% increase.*
- *Increased public transport use contributes to increased physical activity.*

Table 6.12 sets out the strategic considerations associated with the environment and social wellbeing.

TABLE 6.12
MetroWest Phase 1 environment and social wellbeing summary

Strategic consideration	MetroWest Phase 1
Problem	• Worsening air quality, particularly in the Bristol urban area • Health issues – obesity, inactivity which may, in part, be linked to high reliance on the private car
Consequence (impact of not changing)	• Traffic will increasingly be a major contributor to high levels of CO_2 and poor air quality • Deteriorating health of the local population
MetroWest Phase 1 objective	• Business objective – to make a positive contribution to the environment and social wellbeing • Supporting objective – to contribute towards achieving a reduction in CO_2 levels • Supporting objective – to contribute towards improved life opportunities, health and quality of life
Outcome	• Reduced use of the car, leading to lower levels of CO_2 ,when compared to a 'do minimum' scenario • Increased levels of physical activity (as rail journeys are more likely to include a walking component)

6.3 Passenger rail demand

The calculation of the trips to and from Pill and Portishead stations have been informed by the outputs of the RDM model. Whilst the periods represent the opening year and 10 years after opening year, it is important to note that the GBATS4 strategic multi modal model is based on forecast years of 2021 and 2036. These years being aligned with the dates of the land use planning underpinning the Local Plan Core Strategy. Note that the assessments presented in this report are based on a different, and more intensive half-hourly

rail service pattern than the hourly patterns that is currently proposed. The Environmental Statement and associated documents will report updated transport assessments.

The access to and from station modal split has been calculated from:

- Survey data from existing West of England railway stations – although it has to be noted the survey numbers are relatively small and there is a marked variation between individual stations;
- Use of generalised costs from origin and destination points by walking, cycling, car and bus; and
- Use of assumptions about the maximum and minimum distances of each mode.

Table 6.13 summarises the demand by mode and distance for the assessment periods of 2019 (used as a proxy for the opening year of 2021) and 2029 (horizon year) for Portishead station.

TABLE 6.13
Demand by mode and distance to Portishead Station for 2019 and 2029 (rounded)

2019	Walk	Bus	Car	Car drop off	Bicycle	Taxi	Total
Less than 1 km	359	9	122	54	15	1	561
from 1 to 2 km	27	6	72	32	18	1	155
from 2 to 3 km	1	9	26	12	3	0	51
from 3 to 4 km	-	1	17	8	1	0	27
from 4 to 5 km	-	0	10	4	-	0	14
from 5 to 10 km	-	-	6	3	-	0	8
More than 10 km	-	-	20	9	-	0	29
Totals	387	26	273	121	37	3	846
2029	**Walk**	**Bus**	**Car**	**Car drop off**	**Bicycle**	**Taxi**	**Total**
Less than 1 km	508	13	173	77	21	2	794
from 1 to 2 km	39	8	101	45	26	1	220
from 2 to 3 km	2	13	37	17	4	0	73
from 3 to 4 km	-	2	24	11	2	0	39
from 4 to 5 km	-	1	14	6	-	0	20
from 5 to 10 km	-	-	9	4	-	0	13
More than 10 km	-	-	23	12	-	0	41
Totals	549	36	385	171	53	4	1198

Note: rail demand based on half-hourly train service

These tables give the likely weekday demand at the station. It shows in the ten year period that demand at the station will ramp up across all modes. It shows the importance of sustainable modes particularly for the shorter distance trips to and from the station with cars for longer distance trips. The number of bus related trips to and from the station remain comparatively low.

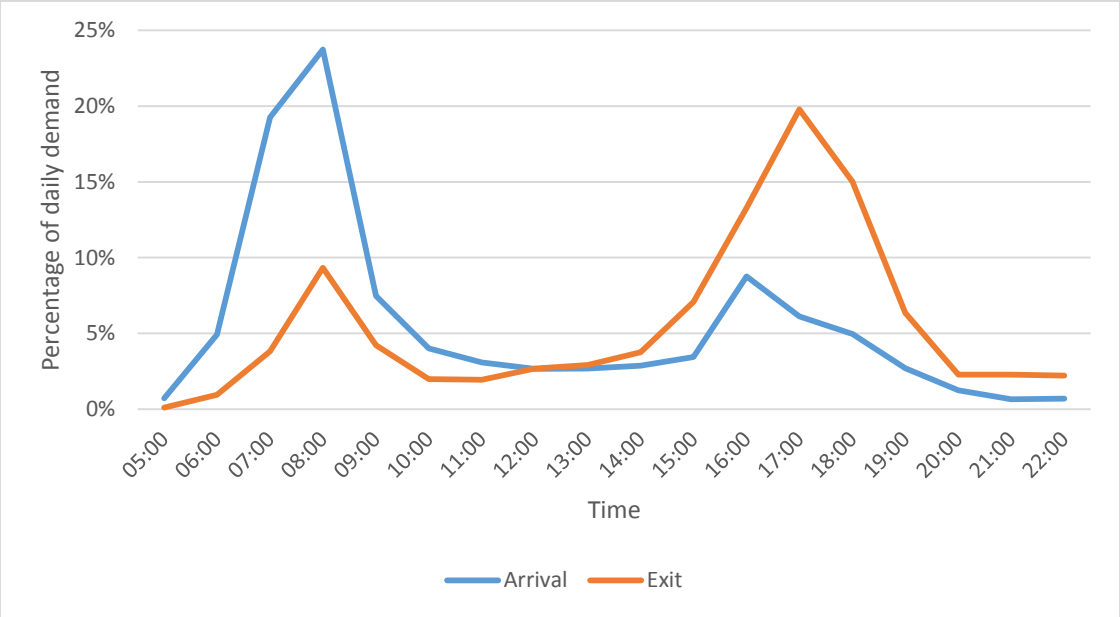
Table 6.14 shows the same type of data for Pill station. Again, demand at the station will ramp up over the assessment period.

TABLE 6.14
Demand by mode and distance to Pill Station for 2019 and 2029 (rounded)

2019	Walk	Bus	Car	Car drop off	Bicycle	Taxi	Total
Less than 1 km	74	1	-	-	4	-	79
from 1 to 2 km	1	0	31	14	1	0	48
from 2 to 3 km	-	-	2	1	0	0	2
from 3 to 4 km	-	-	4	2	0	0	6
from 4 to 5 km	-	-	1	1	-	0	2
from 5 to 10 km	-	-	6	3	-	0	8
More than 10 km	-	-	-	-	-	-	-
Totals	75	1	44	20	5	0	145
2029	**Walk**	**Bus**	**Car**	**Car drop off**	**Bicycle**	**Taxi**	**Total**
Less than 1 km	105	1	-	-	6	-	112
from 1 to 2 km	1	0	45	20	1	0	67
from 2 to 3 km	-	-	2	1	0	0	4
from 3 to 4 km	-	-	6	3	0	0	8
from 4 to 5 km	-	-	2	1	-	0	2
from 5 to 10 km	-	-	8	4	-	0	12
More than 10 km	-	-	-	-	-	-	-
Totals	106	2	62	28	7	1	206

Note: rail demand based on half-hourly train service

FIGURE 6.3
Percentage of all day demand arriving and exiting Portishead and Pill stations



6.4 Strategic highway and bus impacts

6.4.1 Variable demand modelling of the scheme

The overall approach of the modelling work is set out in section 5. In summary, the rail demand for the scheme has been undertaken using a rail demand model that considers both new station demand and demand at existing stations (the latter using MOIRA).

The MetroWest Phase 1 scheme has been coded in GBATS4 and the model has been used to assess the possible wider area effects of MetroWest Phase 1, and in doing so to, as much as possible, replicate the level of demand calculated in the rail demand modelling work.

Results in the remainder of this section reflect model results presented are taken directly from GBATS4. This includes changes in the amount of travel and travel patterns. Changes in highway use are based on the amended highway trip matrices.

Note that the assessments presented in this report are based on a different, and more intensive half-hourly rail service pattern than the hourly patterns that is currently proposed. The Environmental Statement and associated documents will report updated transport assessments.

6.4.2 Changes in the amount of travel

Table 6.15 shows the changes in the modelled number of trips between Do Minimum and Do Something scenarios. These figures are taken directly from GBATS4 outputs.

TABLE 6.15
Modelled number of trips in Base, Do Minimum and Do Something scenarios

	2013	2021		2036	
	Base	Do Minimum	Scheme	Do Minimum	Scheme
	AM Peak				
Rail, car, bus	119700	131250	131400	144240	144670
Rail	9140	10570	10840	12090	12720
Car	98050	103620	103560	114460	114200
Bus	12510	17060	17000	17690	17760
	Inter Peak				
Rail, car, bus	89030	97210	97250	110180	110140
Rail	3220	3790	3870	4700	4880
Car	76220	80760	80750	91950	91780
Bus	9590	12650	12630	13530	13480
	PM Peak				
Rail, car, bus	127930	139460	139440	153250	153430
Rail	10360	12110	12290	13830	14230
Car	105720	111050	111010	122680	122440
Bus	11850	16300	16140	16740	16760

Note: based on rail demand from half-hourly train service

The tables shows:

- An aggregate total of rail and bus person trips and car PCUs suggests overall trip increases from base to 2021 Do Minimum (around 9%) and Base to 2036 Do Minimum (around 20%);
- Public transport modes see more significant increases in trip numbers from Base to Do Minimum than car – whereas overall trips increase by around 9% from 2013 Base to 2021 Do Minimum (all time periods), bus trips increase by around a third and rail trips by around 16%;
- Rail demand rises from Do Minimum to Do Something scenarios (all years and time periods);
- Car demand falls from Do Minimum to Do Something (all years and time periods), but reductions are small;
- Bus demand falls from Do Minimum to scheme in the 2021 AM and PM peaks, but increases from Do Minimum to Do Something in 2036 – inter peak bus demand falls from Do Minimum to Do Something in both years; and
- The scheme increases trip making overall from the Do Minimum in the AM peak in 2021 and 2036, the inter peak in 2021 and PM peak in 2036 – other years and time periods see small decreases.

6.4.3 Changes in the travel patterns (O-D)

As the GBATS4 model allows trips to change destination it is important understand the location of these changes, to understand the impacts to highway, and public transport usage. Table 6.16 shows the model changes to/from the Portishead area as a result of the scheme.

TABLE 6.16
Changes in the amount of travel to/from Portishead

	2013	2021		2036	
	Base	Do Minimum	Scheme	Do Minimum	Scheme
AM	3330	3720	3750	4000	4050
Inter Peak (IP)	2150	2440	2450	2690	2720
PM	2910	3280	3310	3440	3490

Note: based on rail demand from half-hourly train service

Table 6.16 shows that the scheme increases the amount of travel to and from Portishead above the Do Minimum in both 2021 and 2036. However the scale of increase is lower than the de facto additional transport supply. Increases in trips from Base to Do Minimum to/from Portishead are proportionally slightly higher than overall across the GBATS4 model in 2021, in all time periods, but similar to overall values in 2036.

The 2011 Journey to Work (JTW) Census data shows that 11% of Portishead residents travel to work in Bristol City Centre.

6.4.4 Changes in highway use

6.4.4.1 Network wide statistics

The changes in highway demand result in network wide changes set out in Table 6.17. The analysis indicates modest highway benefits from the scheme.

TABLE 6.17

Highway Network Wide Statistics [3]

		2013 Base			2021 Do Minimum			2021 Scheme		
Network Statistics	Units	AM	IP	PM	AM	IP	PM	AM	IP	PM
Over-capacity Queues	pcu. hrs/hr	1283	25	1125	1710	28	1607	1,529	27	1,228
Total Delay	pcu. hrs/hr	704	347	535	652	360	606	643	359	593
Total Travel Time	pcu. hrs/hr	26992	18877	26894	30059	20640	29909	29650	20620	29262
Travel Distance	pcu. kms/hr	1140962	917543	1171511	1243034	992675	1259609	1236619	991669	1252419
Total Trips Loaded	pcus/hr	125630	106561	124898	134898	115269	133139	134664	115203	132898
Overall Average Travel Time	mins	12.9	10.6	12.9	13.4	10.7	13.5	13.0	11.0	13.0
Overall Average Distance	kms	9.1	8.6	9.4	9.2	8.6	9.5	9.0	9.0	9.0
Overall Average Speed	kph	42.3	48.6	43.6	41.4	48.1	42.1	42.0	48.0	43.0

		2036 Do Minimum			2036 Scheme		
Network Statistics	Units	AM	IP	PM	AM	IP	PM
Over-capacity Queues	pcu. hrs/hr	4528	160	4597	2,249	150	2,115
Total Delay	pcu. hrs/hr	925	582	948	861	577	845
Total Travel Time	pcu. hrs/hr	37599	24710	37576	33550	24616	33648
Travel Distance	pcu. kms/hr	1393517	1154403	1418295	1356868	1151555	1381648
Total Trips Loaded	pcus/hr	152665	134251	150188	152170	134073	149542
Overall Average Travel Time	mins	14.8	11.0	15.0	13.2	11.0	13.5
Overall Average Distance	kms	9.1	8.6	9.4	8.9	8.6	9.2
Overall Average Speed	kph	37.1	46.7	37.7	40.4	46.8	41.1

Note: based on rail demand from half-hourly train service

[3] Figures in this table are aggregated across the whole of the modelled road network in GBATS4. This network covers the WoE area, as well as some links beyond. Network wide statistics are used to demonstrate overall changes in traffic characteristics, such as total travel time and total delay.

6.4.4.2 Changes in link flows

The resultant changes in highway demand between future year Do Something, with MetroWest Phase 1, and Do Minimum scenarios are shown in Figures 1 to 27 in **Appendix E**.

In the plots from the GBATS4 SATURN model a green line represents an increase in traffic flow, a blue line represents a reduction in traffic flow and the width of the line is proportional to the size of the change.

The plots showing differences in traffic flow show:

- General increases in traffic from 2013 to 2021, and then further increases to 2036;
- Some local reductions in traffic in future year Do Minimum scenarios associated with changes in highway network, or the effects of developments such as in the St James Barton area and at Temple Circus;
- Comparatively small changes in highway demand resulting from the scheme, albeit widely observed as MetroWest Phase 1 services cover several rail lines across the WoE area. Overall, it is unsurprising that the quantum of highway change is relatively small. Rail demand changes by a few hundred trips in modelled (1 hour) periods, of which a proportion (between 30% and 75%) are former car trips, which is then distributed across the modelled area according to origin and destination;
- Some more notable reductions to assigned highway trips, such as the M5 Avonmouth Bridge as a result of changes in trip patterns from to/from Portishead;
- Some localised increases in highway trips as a result of re-routeing in a congested network. For example, the Portbury Hundred in the AM peak has increased traffic movement. This is caused by reductions in car trips from Portishead heading towards the M5 (transferring to rail) resulting in the Portbury Hundred becoming a more attractive route than it was. This in turn draws trips back onto the Portbury Hundred that were using alternative (less suitable) routes in the Do Minimum. As such, traffic flows reduce markedly on Clapton Lane and Naish Hill.
- Some other reductions in demand associated with sensitivity of network to changes in demand that are not specifically linked to the scheme, such as St Phillips Causeway and Long Ashton Bypass.

6.4.4.3 Congestion in future years

All the future year transport modelling considers forecast planned development. This development will change the way the transport behaves. Figures 1 to 27 in **Appendix E** show plans of the congestion hotspots on the network from base, 2020 and 2036 scenarios, for AM, IP and PM models.

The plots showing differences in congestion show increases in the congestion associated with development growth in future years, but little change associated with the scheme.

6.4.4.4 Overview of highway impacts

In summary the transport modelling work shows:

- Rail demand rises from the Base to Do Minimum and from Do Minimum to Do Something scenarios (all years and time periods) – biggest increases from base to Do Minimum scenarios. These changes have an impact on highway use.
- General increases in highway traffic from 2013 to 2021, and then further increases to 2036 associated with development growth.
- Some local reductions in traffic in future year Do Minimum scenarios associated with changes in highway network, or the effects of developments such as in the St James Barton area and at Temple Circus;

- Reductions in highway demand resulting from the scheme commensurate with increases in rail demand;
- Some specific increases or reductions in traffic as a result of the sensitivity of a congested network to changes in demand, both local to, and slightly away, from the scheme.
- Increases in highway congestion associated with development growth in future years, but little change associated with the scheme.

6.4.5 Changes in bus use

The impacts of the scheme on bus patronage, are associated with:

- Abstraction from current bus services to the new rail services; and,
- Use of local bus services to access the stations.

These are discussed in turn.

6.4.5.1 Abstraction from bus current services to the new rail service

Analysis has been undertaken about the volume of passengers who currently use the X3/X4 buses who would transfer to the new rail services. Refer to **Appendix C** where the results of a detailed survey undertaken in March 2016 have been presented.

Data collected for the GBATS model update provided information about the number of existing bus passengers and their origins-destinations. The nearest bus stops and stations to each origin and destination were identified and the generalised costs by rail and bus were calculated. This was used to estimate the percentage of bus passengers who could transfer to rail, which would be between 25% and 40%. Note that this assumes a half-hourly train service, and will be reviewed in light of scheme service changes prior to submission of the DCO.

6.4.5.2 Use of local bus services to access the stations

The analysis presented in Tables 6.13 and 6.14 shows that by 2029 the demand to access Portishead station by bus could be up to 35 passengers per day, and 2 passengers per day for Pill.

6.5 Impacts to rail freight

6.5.1 Portbury Dock

The scheme will result in freight trains sharing the line with passenger trains between Parson Street Junction and the proposed new Pill Junction. The scheme has been designed such that there will be no adverse impacts on rail freight operation. Timetabling analysis has been undertaken which illustrates that rail freight paths can be accommodated alongside the proposed scheme, providing as many freight paths as are available (albeit not all used) at present.

Section 7

Local Operational Impact Assessment

7.1 Introduction

The section will discuss the impact of the scheme on a local level. This includes highway impacts at a variety of junctions in the vicinity of the scheme, impacts at levels crossings in Ashton Vale and Avonmouth, impacts on on-street parking in the vicinity of Portishead and Pill stations, and impacts on pedestrians and cyclists. Note that the assessments presented in this report are based on a different, and more intensive half-hourly rail service pattern than the hourly patterns that is currently proposed. The Environmental Statement and associated documents will report updated transport assessments.

7.2 Traffic Counts

Based upon discussions with the Planning Inspectorate and relevant Officers from NSC with regards to the scoping report, traffic counts have been undertaken at 9 junctions and one level crossing on the local highway network. The junctions identified are listed below.

- Phoenix Way/Quays Avenue/Harbour Road (Portishead) (refer to section 7.3.1);
- Station Road/Harbour Road (Portishead) (refer to section 7.3.2);
- Quays Avenue/Wyndham Way/Serbert Way (Sails roundabout) (Portishead) (refer to section 7.3.3);
- Cabstand/Wyndham Way/High Street (Portishead) (refer to section 7.3.4);
- Wyndham Way/Sheepway/Portbury Hundred (Portishead) (refer to section 7.3.5);
- M5 Junction 19 (Pill) (refer to section 7.3.6);
- Station Road/Heywood Road/Lodway (Pill) (refer to section 7.3.7);
- A369/St Georges Hill (Pill) (refer to section 7.3.8);
- A369/Pill Road (Pill) (refer to section 7.3.9); and
- Ashton Vale Road/Winterstoke Road – (Ashton Vale Level Crossing) (refer to section 7.4.1).

To determine the baseline traffic situation traffic counts have been undertaken. Details of these counts are identified in **section 4 of the TA**. The traffic counts provide details of vehicular movements during the AM and PM peak periods used for the assessments. For each of the junctions a number of scenarios have been tested, these scenarios being:

- Baseline ‘2015’ – Existing Traffic and Transport Conditions;
- ‘2019’ (as a proxy for opening year 2021) – without the scheme;
- ‘2019’ (as a proxy for opening year 2021) – with the scheme;
- The horizon year ‘2029’ – without scheme; and
- The horizon year ‘2029’ – with the scheme.

7.3 Highways Impacts

7.3.1 Phoenix Way/Quays Avenue/Harbour Road

Phoenix Way/Quays Avenue/Harbour Road is a three-arm roundabout and has been assessed using ARCADY junction assessment software for both the AM and PM peak periods. Figure 7.1 illustrates the total PCU flow generated by this scheme for 2015 assessment periods.

Figure 7.2 and Figure 7.3 shows the total PCU flows generated by this scheme for both the 2019 and 2029 assessment periods in the AM and PM peak periods, without the proposed scheme. Figure 7.4 and Figure 7.5 shows the total PCU flows generated by this scheme for both the 2019 and 2029 assessment periods in the AM and PM peak periods, with the proposed scheme.

Tables 7.1 and 7.2 identifies the maximum Ratio of Flow to Capacity (RFC) for each arm during both peak periods without the scheme in place. It is estimated that the junction would operate, with adequate spare capacity during both the morning and evening peaks in all scenarios with maximum RFC's of 0.45 on Phoenix Way in the AM and 0.52 RFC on Quays Avenue in 2029 without the proposed scheme.

FIGURE 7.1
2015 Baseline traffic at Phoenix Way/Quays Avenue/Harbour Road

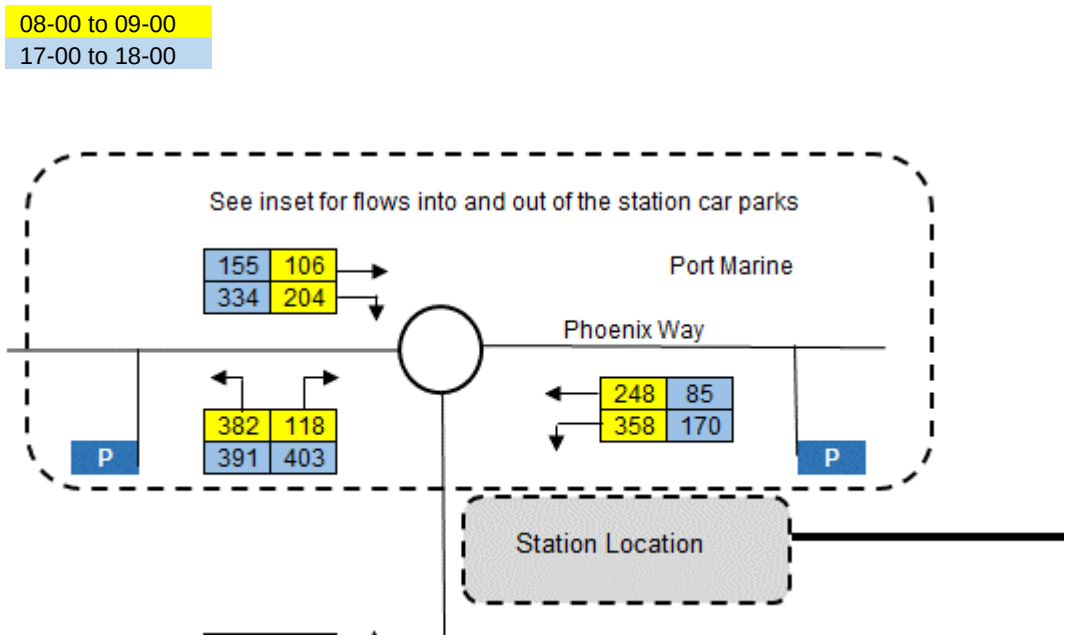


FIGURE 7.2
Future 2019 traffic flows at Phoenix Way/Quays Avenue/Harbour Road without scheme

08-00 to 09-00
17-00 to 18-00

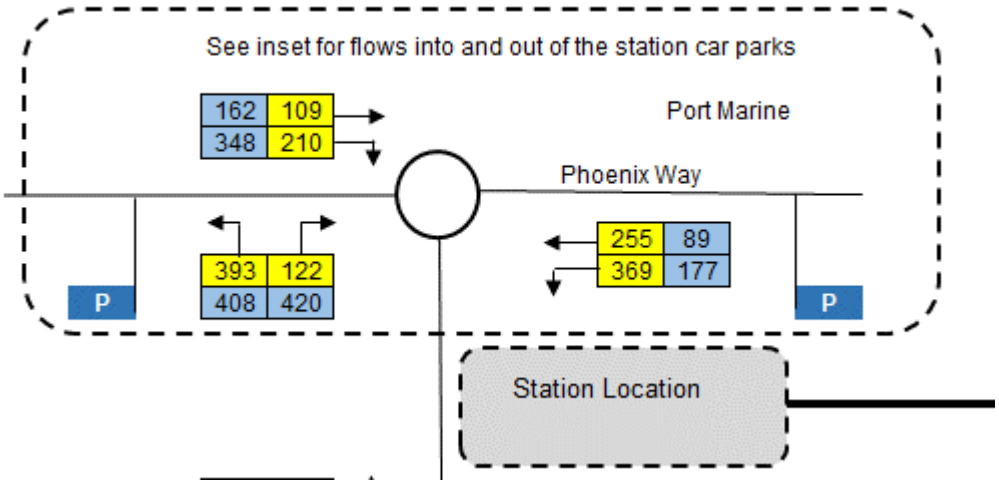


FIGURE 7.3
Future 2029 traffic flows at Phoenix Way/Quays Avenue/Harbour Road without scheme

08-00 to 09-00
17-00 to 18-00

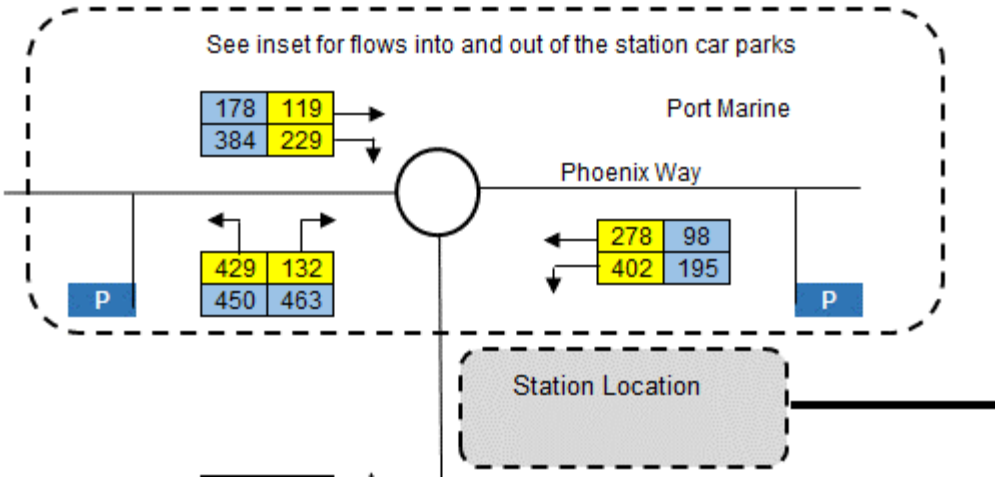


FIGURE 7.4
Future 2019 traffic flows at Phoenix Way/Quays Avenue/Harbour Road with scheme

08-00 to 09-00
17-00 to 18-00

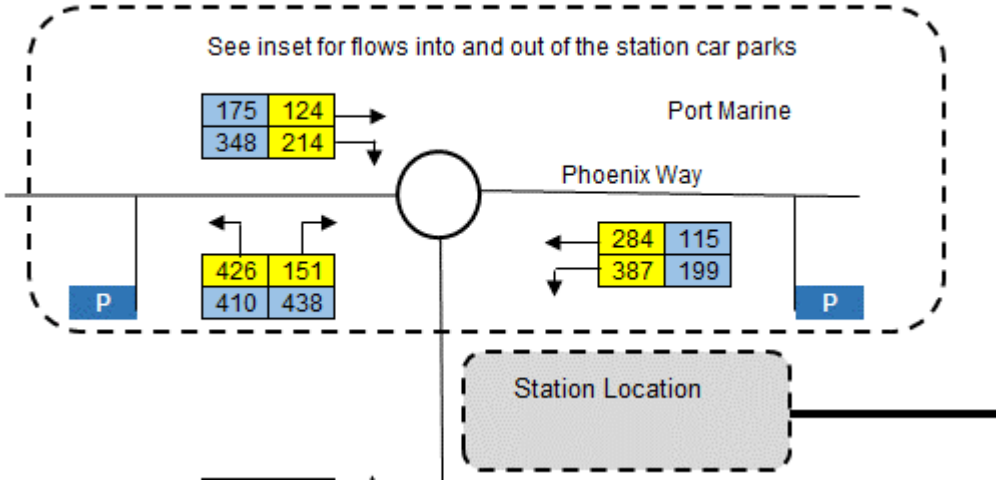


FIGURE 7.5
Future 2029 traffic flows at Phoenix Way/Quays Avenue/Harbour Road with scheme

08-00 to 09-00
17-00 to 18-00

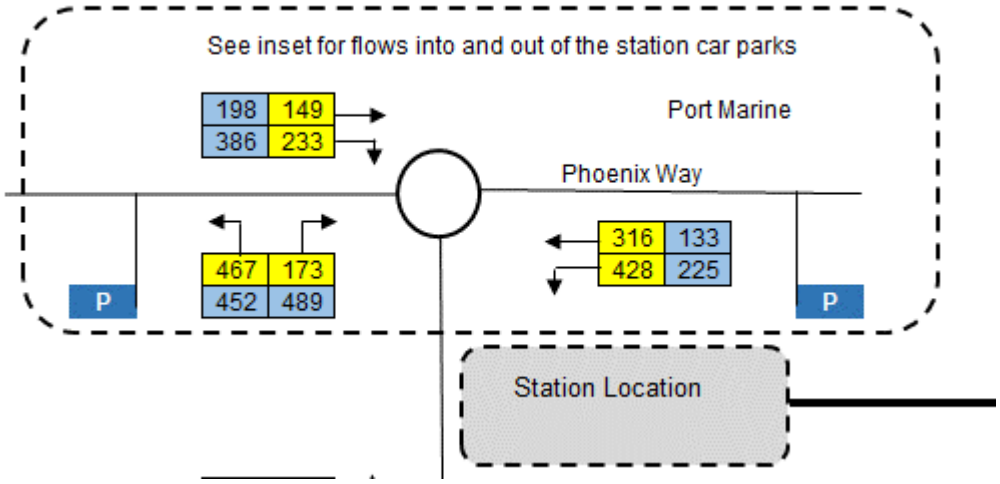


TABLE 7.1
Junction Performance at Phoenix Way/Quays Avenue/Harbour Road without scheme 2015

	2015					
	AM			PM		
	Queue (PCU)	Delay Sec	RFC	Queue (PCU)	Delay Sec	RFC
Phoenix Way	0.67	3.61	0.4	0.22	2.8	0.18
Quays Avenue	0.43	2.81	0.3	0.81	3.33	0.45
Harbour Road	0.31	3.29	0.24	0.75	5.01	0.43

TABLE 7.2
Junction Performance at Phoenix Way/Quays Avenue/Harbour Road without scheme for 2019 and 2029

	2019						2029					
	AM			PM			AM			PM		
	Queue (PCU)	Delay Sec	RFC	Queue (PCU)	Delay Sec	RFC	Queue (PCU)	Delay Sec	RFC	Queue (PCU)	Delay Sec	RFC
Phoenix Way	0.7	3.7	0.41	0.23	2.85	0.19	0.83	4.01	0.45	0.26	2.91	0.21
Quays Avenue	0.45	2.86	0.31	0.87	3.46	0.47	0.52	3.02	0.34	1.07	3.83	0.52
Harbour Road	0.32	3.33	0.25	0.82	5.26	0.45	0.37	3.45	0.27	0.9	5.63	0.48

The reconfigured Phoenix Way/Quays Avenue/Harbour Road junction as proposed by the scheme has been modelled with the 2019, 2019 with scheme, and 2029 and 2029 with scheme flows. The output of this modelling is provided in **Appendix O Mitigation Assessments**.

The new junction has a number of fundamental differences. The proposed layout consists of a roundabout smaller in diameter and a single lane entry approach on each arm. This means the existing roundabout notionally has more capacity but the presence of controlled crossings on each arm mean the operation of the junction will be fundamentally more different.

When the scheme has been included for testing, based on the assumptions mentioned previously, the results below in table 7.3 illustrate that the junction performance in both years 2019 and 2029 work within capacity and do not have congestion issues, both within the AM and PM peaks.

TABLE 7.3
Junction Performance at Phoenix Way/Quays Avenue/Harbour Road with scheme for 2019 and 2029

	2019						2029					
	AM			PM			AM			PM		
	Queue (PCU)	Delay Sec	RFC	Queue (PCU)	Delay Sec	RFC	Queue (PCU)	Delay Sec	RFC	Queue (PCU)	Delay Sec	RFC
Phoenix Way	1	6	0.54	1	5	0.29	2	9	67	1	5	35
Quays Avenue	1	8	0.58	3	12	0.75	2	9	65	5	17	83
Harbour Road	1	5	0.35	2	11	0.64	1	6	39	3	15	73

The assessment suggests that:

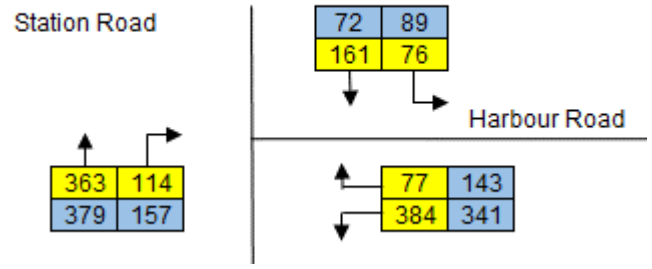
- The greatest impacts are likely to occur in 2029 evening peak with the largest queues (5 vehicles) and delay (17 seconds) occurring on the Quays Avenue arm;
- Overall, the roundabout performs within capacity as all arms are performing 85% of demand flow to capacity; and
- That the new reconfigured junction with the scheme in place will not have a detrimental impact on the operation of the local highway network.

7.3.2 Station Road/Harbour Road/Cabstand

The junction of station Road/Harbour Road/Cabstand is currently a priority junction. The result of the PICADY junction assessment analysis is shown in Figure 7.6 which illustrates the total PCU flow generated by this scheme for 2015 assessment periods.

FIGURE 7.6
2015 Surveyed traffic at Station Road/Harbour Road/Cabstand

08-00 to 09-00
17-00 to 18-00

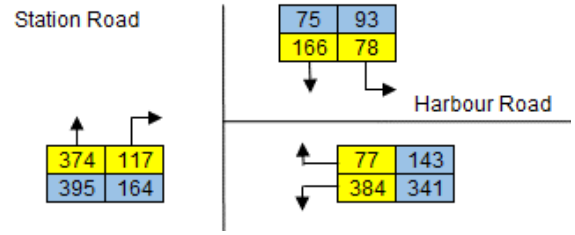


Figures 7.7 and 7.8 below shows the total PCU flows generated by this scheme for both the 2019 and 2029 assessment periods in the AM and PM peak periods, with and without the proposed scheme respectively.

FIGURE 7.7
Future 2019 & 2029 traffic at Station Road/Harbour Road/Cabstand without Scheme

08-00 to 09-00
17-00 to 18-00

2019



2029

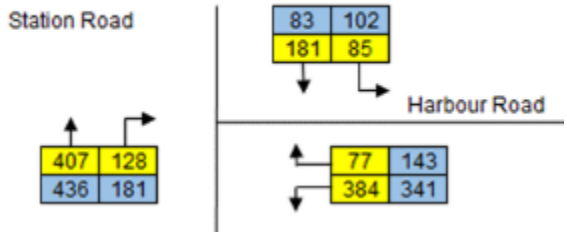


FIGURE 7.8
Future 2019 & 2029 traffic at Station Road/Harbour Road/Cabstand with Scheme

08-00 to 09-00
17-00 to 18-00

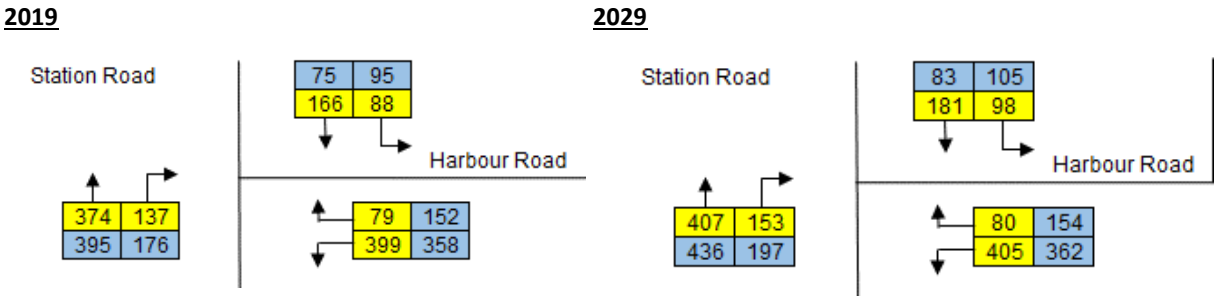


Table 7.4 and 7.5 provides an overview of the capacity of the junction for the 2015 baseline, 2019 opening years and 2029 horizon year periods. The results based upon the existing traffic volumes indicate that there would be minimal queueing increases on all arms. With the highest queue increase (from 2029 without Scheme compared against 2029 with proposed scheme), (+0.05 pcu) resulting on arm Harbour Road within the PM and a decrease in queue on Station Road (Right turn) also within the PM (-0.69 pcu).

TABLE 7.4
Junction Performance at Station Road/Harbour Road/Cabstand without scheme for 2015

	2015					
	AM			PM		
	Queue (PCU)	Delay Sec	RFC	Queue (PCU)	Delay Sec	RFC
Station Road (left turn)	0.18	7.81	0.15	0.18	6.77	0.16
Station Road (Right turn)	0.66	13.5	0.4	0.24	11	0.2
Harbour Road	0.19	8.21	0.16	0.45	10.2	0.31

TABLE 7.5
Junction Performance at Station Road/Harbour Road/Cabstand without scheme for 2019 and 2029

	2019						2029					
	AM			PM			AM			PM		
	Queue (PCU)	Delay Sec	RFC	Queue (PCU)	Delay Sec	RFC	Queue (PCU)	Delay Sec	RFC	Queue (PCU)	Delay Sec	RFC
Station Road (left turn)	0.19	7.99	0.16	0.2	6.91	0.16	0.22	8.63	0.18	0.24	9.48	0.2
Station Road (Right turn)	0.7	13.9	0.41	0.26	11.2	0.21	0.84	15.4	0.46	1	18.5	0.51
Harbour Road	0.19	8.28	0.16	0.45	10.4	0.31	0.2	8.51	0.17	0.48	11	0.32

Table 7.6 shows the junction performance when the proposed scheme has been included in the modelling scenario anticipates that there would be minimal queueing with the highest RFC of 0.45 on Station Road (Right Turn), during the AM peak.

TABLE 7.6
Junction Performance at Station Road/Harbour Road/Cabstand with scheme for 2019 and 2029

	2019						2029					
	AM			PM			AM			PM		
	Queue (PCU)	Delay Sec	RFC	Queue (PCU)	Delay Sec	RFC	Queue (PCU)	Delay Sec	RFC	Queue (PCU)	Delay Sec	RFC
Station Road (left turn)	0.21	8.06	0.17	0.2	6.96	0.17	0.26	8.84	0.21	0.24	7.4	0.19
Station Road (Right turn)	0.67	13.3	0.4	0.26	11.53	0.21	0.82	14.99	0.45	0.31	12.47	0.24
Harbour Road	0.2	8.38	0.17	0.49	10.74	0.33	0.21	8.67	0.17	0.53	11.42	0.35

The PICADY results indicate that **the proposed scheme does not have a significant impact on the junction and works well within capacity.**

7.3.3 Quays Avenue/Wyndham Way/Serbert Way (Sails roundabout)

Quays Avenue/Wyndham Way/Serbert Way junction is a four-arm roundabout and has been modelled using ARCADY software. The fourth arm is an access to a development situated on the North-West direction from the junction. The development is occupied by a franchise hotel accommodation and multiples of two storey height office building blocks.

The result of the ARCADY analysis presented in Figure 7.9 illustrates the total PCU flow generated by this scheme for 2015 assessment periods.

FIGURE 7.9
2015 Surveyed traffic at Quays Avenue/Wyndham Way/Serbert Way

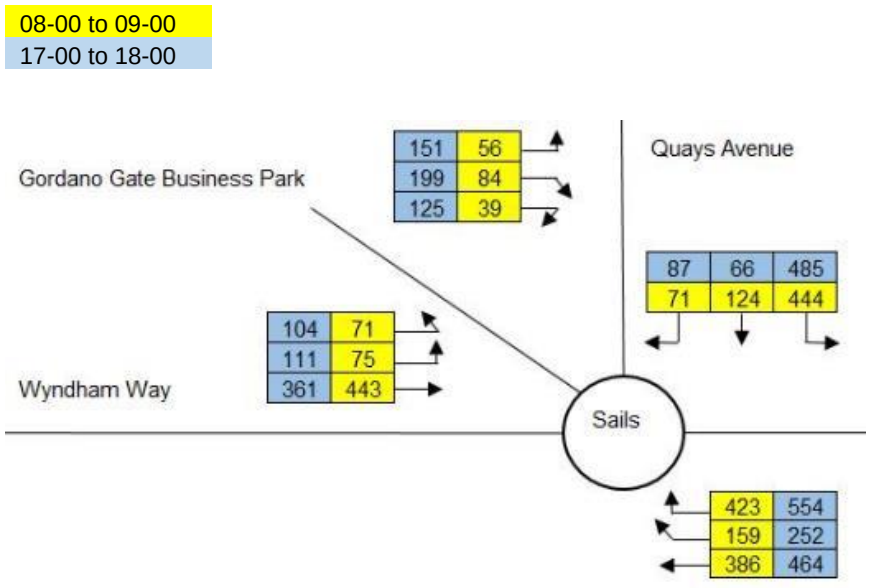


Figure 7.10 and Figure 7.11 show the total PCU flows generated "without" the proposed scheme for both the 2019 and 2029 assessment periods.

FIGURE 7.10
Future 2019 traffic at Quays Avenue/Wyndham Way/Serbert Way "Without" Scheme

08-00 to 09-00
17-00 to 18-00

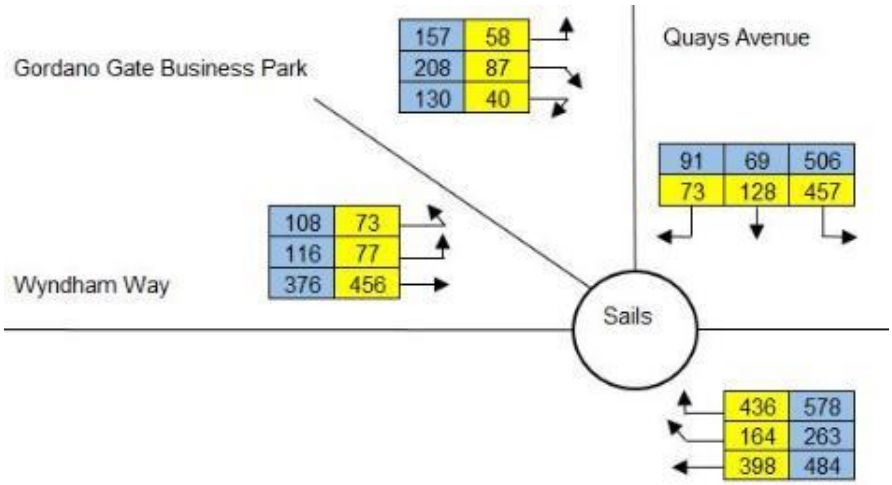


FIGURE 7.11
Future 2029 traffic at Quays Avenue/Wyndham Way/Serbert Way "Without" Scheme

08-00 to 09-00
17-00 to 18-00

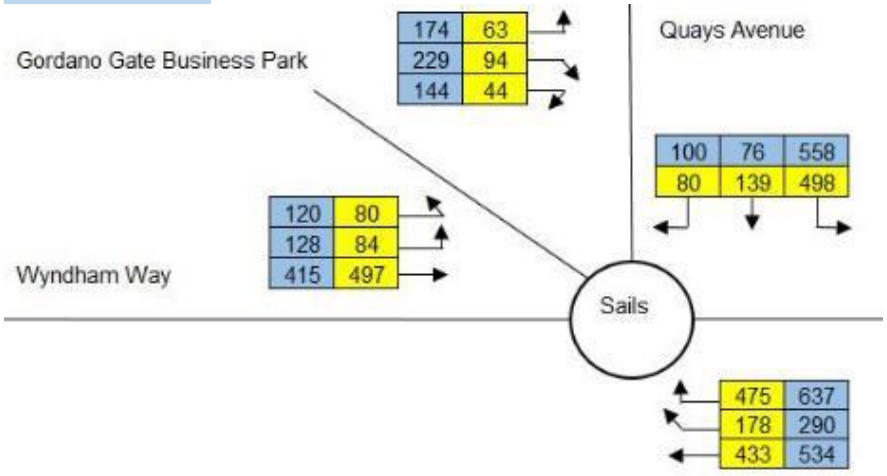


Figure 7.12 and Figure 7.13 show the total PCU flows generated with the proposed scheme for both the 2019 and 2029 assessment periods.

FIGURE 7.12
Future 2019 traffic at Quays Avenue/Wyndham Way/Serbert Way "With" Scheme

08-00 to 09-00
17-00 to 18-00

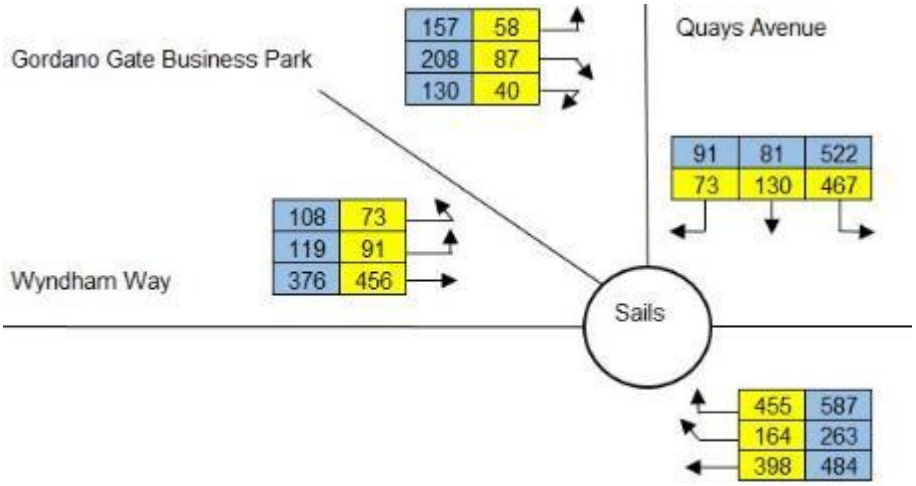
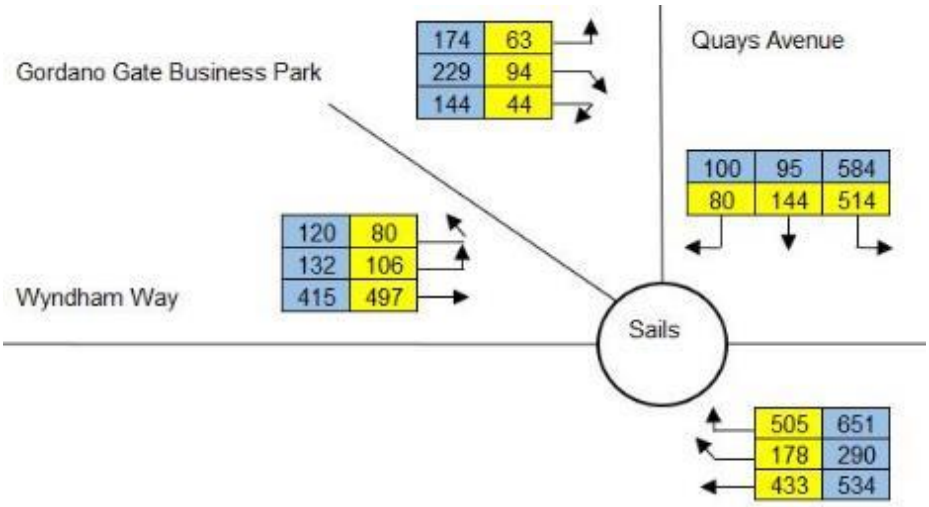


FIGURE 7.13
Future 2029 traffic at Quays Avenue/Wyndham Way/Serbert Way "With" Scheme

08-00 to 09-00
17-00 to 18-00



The following tables summarises the results of the operational assessment of the existing roundabout junction in 2015, 2019 and 2029 without the proposed scheme. As would be expected, both the RFC values and queues increase with the addition of traffic growth. The PM shows to have the highest RFC of 0.76 on Wyndham Way South and Serbert Way arms in 2029, with minimal queuing recorded on all arms.

TABLE 7.7
Junction Performance at Quays Avenue/Wyndham Way/Serbert Way for 2015 without scheme

	2015					
	AM			PM		
	Queue (PCU)	Delay Sec	RFC	Queue (PCU)	Delay Sec	RFC
Quays Avenue	0.79	4.06	0.44	0.87	4.88	0.47
Wyndham Way (South)	0.94	3.2	0.49	1.83	4.75	0.65
Wyndham Way (West)	0.87	4.88	0.47	1.07	6.14	0.52
Serbert Way	0.27	4.86	0.21	1.42	9.9	0.59

TABLE 7.8
Junction Performance at Quays Avenue/Wyndham Way/Serbert Way for 2019 & 2029 without scheme

	2019						2029					
	AM			PM			AM			PM		
	Queue (PCU)	Delay Sec	RFC	Queue (PCU)	Delay Sec	RFC	Queue (PCU)	Delay Sec	RFC	Queue (PCU)	Delay Sec	RFC
Quays Avenue	0.84	4.21	0.46	0.97	4.79	0.49	1.04	4.79	0.51	1.29	5.78	0.56
Wyndham Way (South)	1.01	3.31	0.5	2.1	5.23	0.68	1.22	3.7	0.55	3.08	6.99	0.76
Wyndham Way (West)	0.94	5.1	0.49	1.23	6.76	0.55	1.2	5.97	0.55	1.81	9.06	0.65
Serbert Way	0.28	5.02	0.22	1.7	11.4	0.63	0.34	5.56	0.25	3.01	18.6	0.76

With the addition of traffic associated with the proposed scheme for 2029 it can be seen that the highest increased queue length is on Wyndham Way during the AM peak period with an increase of 0.14 pcu (less than 1 pcu). Other RFC values and queues lengths during both peak periods are not significantly affected.

TABLE 7.9
Junction Performance at Quays Avenue/Wyndham Way/Serbert Way with scheme for 2019 and 2029

	2019						2029					
	AM			PM			AM			PM		
	Queue (PCU)	Delay Sec	RFC	Queue (PCU)	Delay Sec	RFC	Queue (PCU)	Delay Sec	RFC	Queue (PCU)	Delay Sec	RFC
Quays Avenue	0.87	4.28	0.47	1.05	5.00	0.51	1.11	4.94	0.53	1.48	6.27	0.6
Wyndham Way (South)	1.05	3.38	0.51	2.18	5.38	0.69	1.31	3.85	0.57	3.3	7.43	0.77
Wyndham Way (West)	1.00	5.32	0.5	1.26	6.89	0.56	1.34	6.45	0.57	1.89	9.39	0.66
Serbert Way	0.29	5.16	0.23	1.74	11.68	0.64	0.36	5.85	0.26	3.17	19.64	0.77

With the addition of the proposed scheme the junction illustrates **that there is no significant impact on the junction and the junction will have spare capacity in future years.**

7.3.4 Cabstand/Wyndham Way/High Street

Cabstand/Wyndham Way/High Street junction is currently operating as a three-arm mini roundabout. Cabstand and Wyndham Way have multiple traffic lane approaches to the mini roundabout while High Street has a single lane approach. This roundabout was recently modified with the removal of traffic signals from all three approaches to the junction.

Cabstand/Wyndham Way/High Street mini roundabout has been modelled using ARCADY software. The following Figure 7.14 illustrates the total PCU flow generated by this scheme for 2015 assessment periods.

FIGURE 7.14
2015 Baseline traffic at Cabstand/Wyndham Way/High Street

08-00 to 09-00
17-00 to 18-00

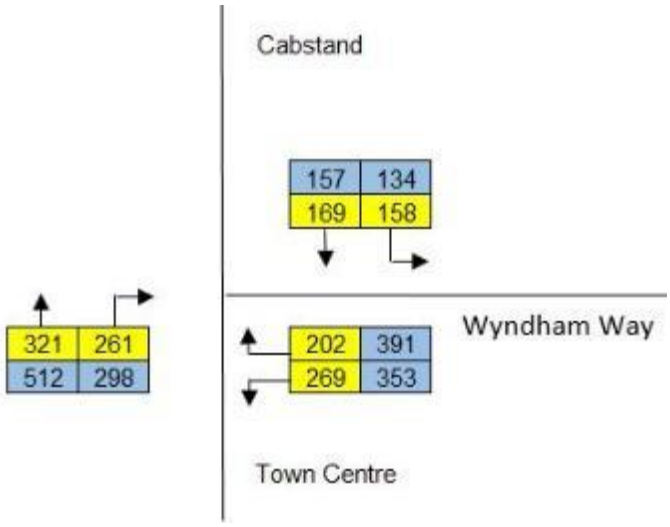
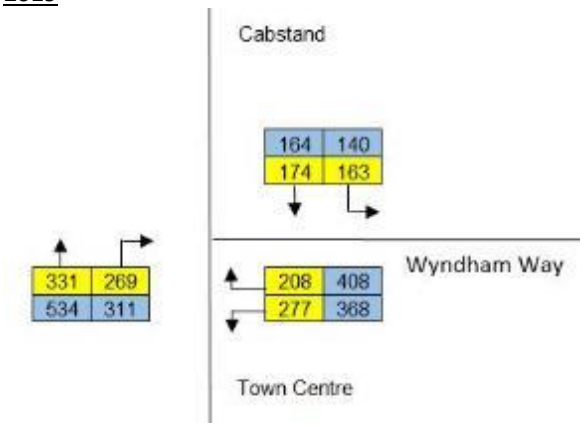


Figure 7.15 shows the total PCUs generated by this scheme for both the 2019 and 2029 assessment periods without the scheme, and Figure 7.16 shows the total PCUs generated by this scheme for both the 2019 and 2029 with the scheme.

FIGURE 7.15
Future 2019 & 2029 traffic at Cabstand/Wyndham Way/High Street "Without" Scheme

08-00 to 09-00
17-00 to 18-00

2019



2029

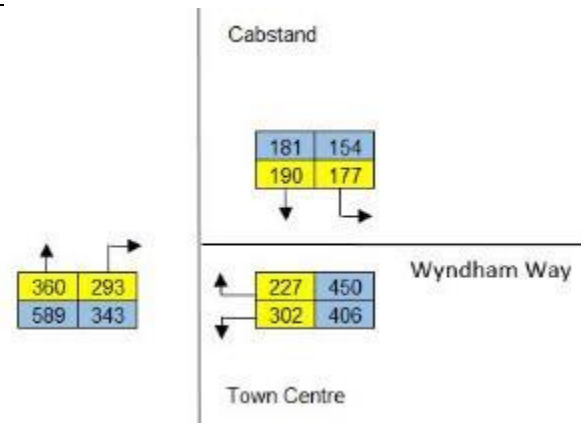
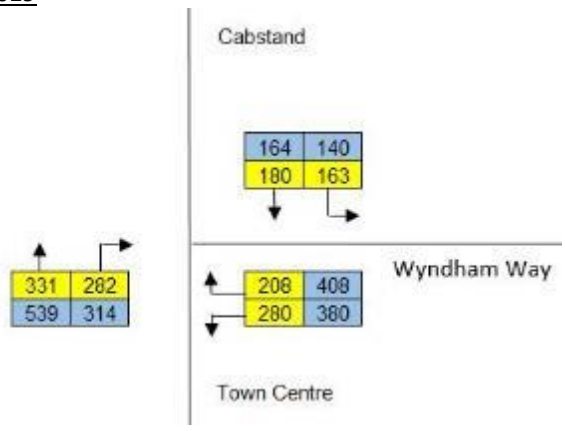


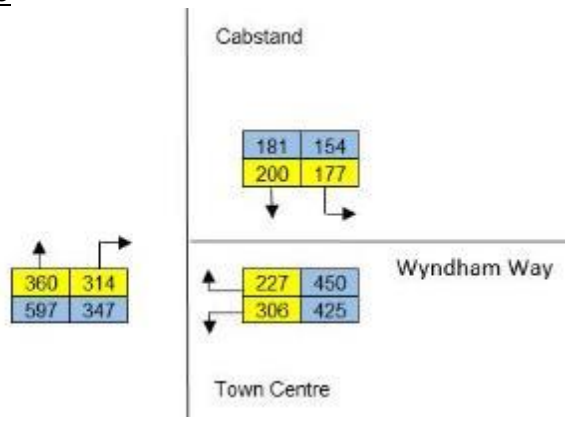
FIGURE 7.16
Future 2019 & 2029 traffic at Cabstand/Wyndham Way/High Street "With" Scheme

08-00 to 09-00
17-00 to 18-00

2019



2029



The results of the operational assessment of Cabstand/Wyndham Way/High Street priority junction for the existing base year 2015 traffic scenario show that the junction is operating at capacity in the PM peak period with some spare capacity in the AM peak period.

The model output from the existing base year 2015 traffic scenario has already identified traffic queues on the High Street both in the AM and PM peaks. The traffic demand on High Street is 42% and 44% of the total morning and evening demand. It should be noted that the high volume of traffic is filtered through High Street in a single traffic lane arrangement.

Table 7.10 & 7.11 provides an overview of the capacity of the junction for the 2015 baseline, 2019 opening years and 2029 horizon year periods. The junction is currently operating at capacity in the 2015 existing scenarios both in the AM and PM peak periods especially for the High Street arm in the evening peak period. It is noted that the period of congestion during the AM peak is less than an hour and is followed by relatively light traffic flows and little or no queuing during the off-peak periods.

TABLE 7.10
Junction Performance at Cabstand/Wyndham Way/High Street for 2015 without scheme

	2015					
	AM			PM		
	Queue (PCU)	Delay Sec	RFC	Queue (PCU)	Delay Sec	RFC
Wyndham Way (Left turn)	0.88	10.84	0.47	1.55	14.63	0.61
Wyndham Way (Right turn)	0.23	3.77	0.19	0.56	4.73	0.36
High Street	14.84	86.51	0.98	257	1507	1.64
Cabstand	0.47	4.75	0.32	0.37	4.22	0.27

TABLE 7.11
Junction Performance at Cabstand/Wyndham Way/High Street for 2019 and 2029

	2019						2029					
	AM			PM			AM			PM		
	Queue (PCU)	Delay Sec	RFC	Queue (PCU)	Delay Sec	RFC	Queue (PCU)	Delay Sec	RFC	Queue (PCU)	Delay Sec	RFC
Wyndham Way (Left turn)	0.94	11.21	0.49	1.75	15.87	0.61	1.14	12.5	0.54	2.42	20.1	0.72
Wyndham Way (Right turn)	0.24	3.82	0.2	0.61	4.9	0.38	0.28	3.99	0.22	0.74	5.39	0.43
High Street	20.98	114	1.02	312	1832	1.74	49.3	232	1.13	475	2703	2.01
Cabstand	0.5	4.84	0.33	0.4	4.28	0.28	0.57	5.07	0.36	0.45	4.42	0.31

Table 7.12 shows the impact of the proposed scheme on the junction for 2019 and 2029. Given that the junction is at capacity in the 2015 base year, any increase in growth and/or further committed development, the proposed scheme will have an impact on the junction. When comparing the 2029 without scheme with the 2029 with scheme it can be seen that the proposed scheme has a minimal impact on the junction, with an increase in queues of 12 PCUs in the AM on High Street and a reduction in queues within the PM on the same arm. The rest of the arms are relatively unchanged or have an insignificant queue impact.

TABLE 7.12
Junction Performance at Cabstand/Wyndham Way/High Street with scheme for 2019 and 2029

	2019						2029					
	AM			PM			AM			PM		
	Queue (PCU)	Delay Sec	RFC	Queue (PCU)	Delay Sec	RFC	Queue (PCU)	Delay Sec	RFC	Queue (PCU)	Delay Sec	RFC
Wyndham Way (Left turn)	0.96	11.39	0.49	1.91	16.84	0.66	1.14	12.85	0.55	2.42	22.68	0.75
Wyndham Way (Right turn)	0.24	3.85	0.2	0.61	4.9	0.38	0.28	4.04	0.22	0.74	5.39	0.43
High Street	25.7	134	1.04	322	1889.5	1.76	60.9	304.4	1.16	473	2795	2.04
Cabstand	0.51	4.93	0.34	0.4	4.28	0.28	0.6	5.21	0.38	0.45	4.42	0.31

Even though this junction is at capacity even before future growth has been added, **the proposed scheme has no significant impact on the junction** which is reflected in the increase, and the occasional decrease, in queues on certain arms and the level of change in the RFCs presented.

7.3.5 Wyndham Way/Sheepway/Portbury Hundred

Wyndham Way/Sheepway/Portbury Hundred is a four-arm roundabout and has been modelled using ARCADY software. Figure 7.17 illustrates the total PCUs generated for 2015 assessment periods.

FIGURE 7.17
2015 Surveyed traffic at Wyndham Way/Sheepway/Portbury Hundred

08-00 to 09-00
17-00 to 18-00

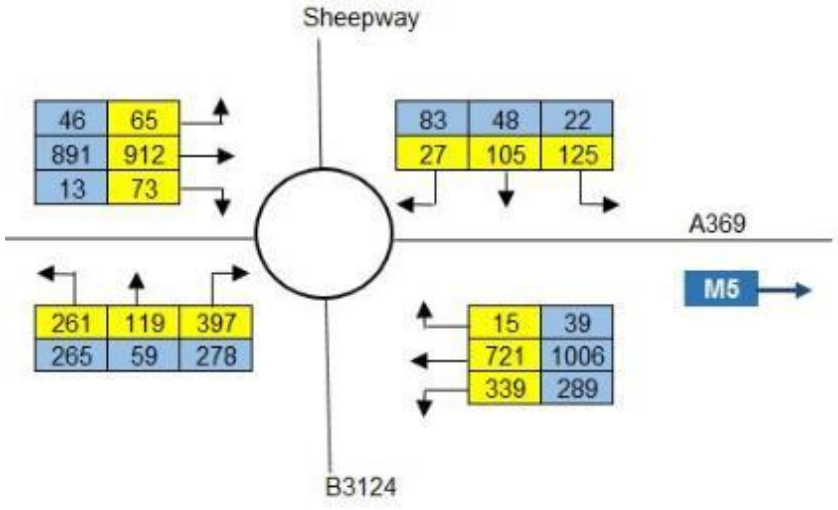


Figure 7.18 and Figure 7.19 shows the total PCUs generated, for both the 2019 and 2029 assessment periods without the proposed scheme and Figure 7.20 and Figure 7.21 show the proposed scheme flows.

FIGURE 7.18
Future 2019 traffic at Wyndham Way/Sheepway/Portbury Hundred "Without" Scheme

08-00 to 09-00
17-00 to 18-00

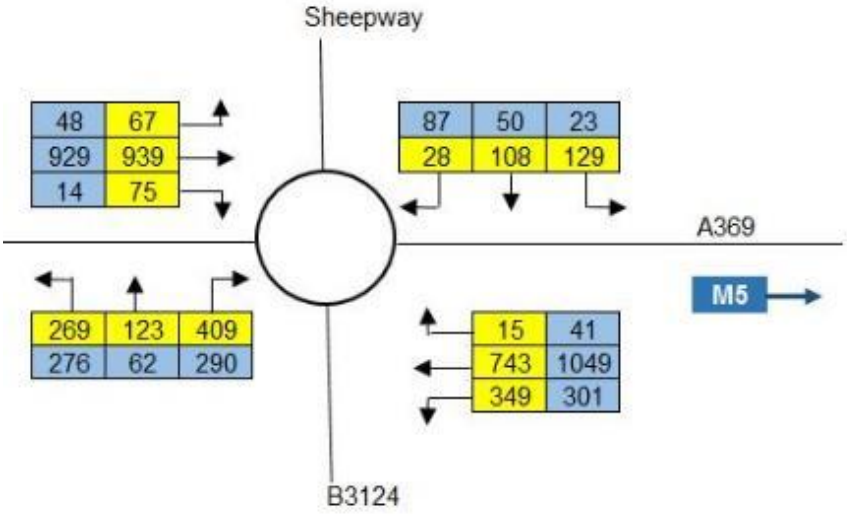


FIGURE 7.19
Future 2029 traffic at Wyndham Way/Sheepway/Portbury Hundred "Without" Scheme

08-00 to 09-00
17-00 to 18-00

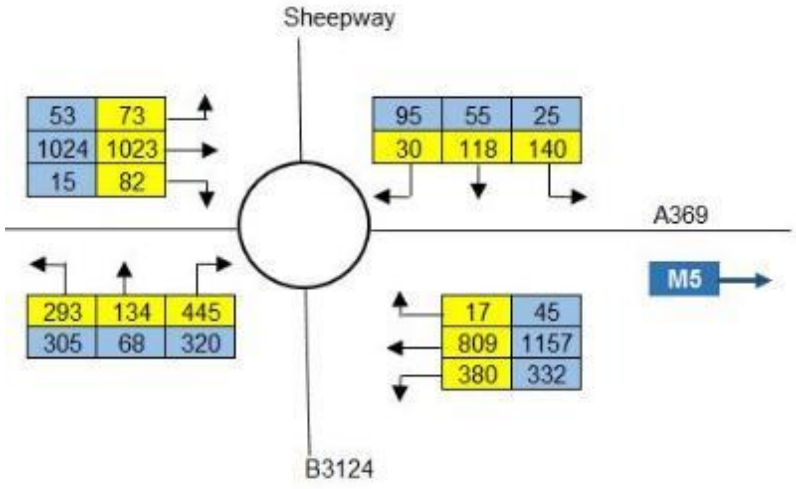


FIGURE 7.20
2019 traffic at Wyndham Way/Sheepway/Portbury Hundred "With" Scheme

08-00 to 09-00
17-00 to 18-00

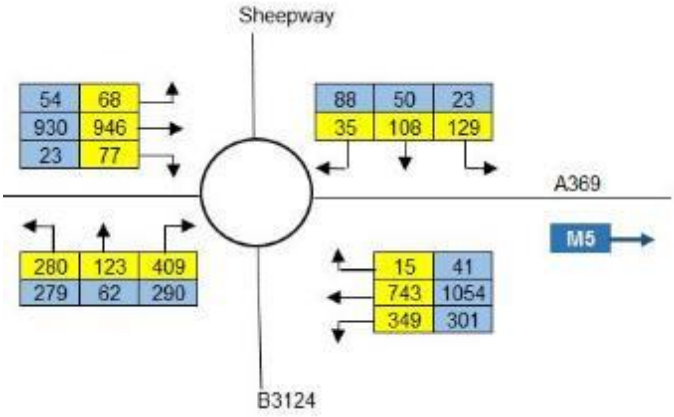


FIGURE 7.21
2029 traffic at Wyndham Way/Sheepway/Portbury Hundred "With" Scheme

08-00 to 09-00
17-00 to 18-00

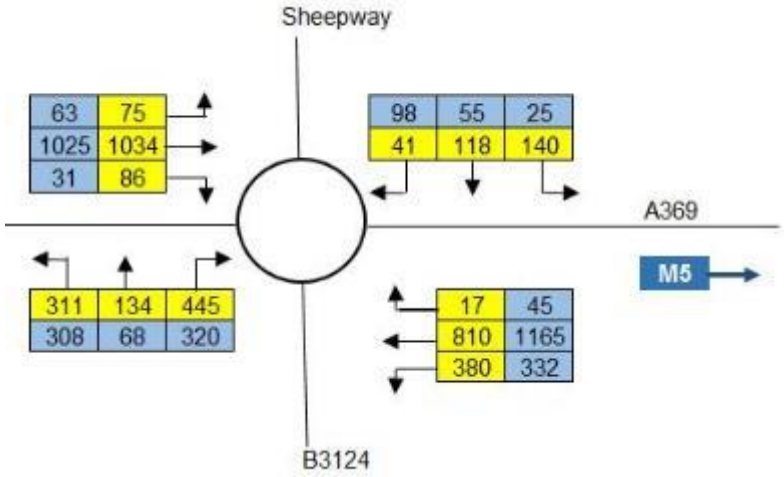


Table 7.13 & 7.14 provides an overview of the capacity of the junction for the 2015 baseline, 2019 opening years and 2029 horizon year periods. The RFC value on all arms operate within capacity in both the AM and PM peak hours. With the highest RFC of 0.83 on Wyndham Way in the AM 2029 with an associated maximum queue length of 5 PCUs.

TABLE 7.13
Junction Performance at Wyndham Way/Sheepway/Portbury Hundred for 2015 without scheme

	2015					
	AM			PM		
	Queue (PCU)	Delay Sec	RFC	Queue (PCU)	Delay Sec	RFC
Sheepway	0.78	9.99	0.44	0.28	6.03	0.22
Portbury Hundred	1.08	3.3	0.52	1.7	4.2	0.63
Portbury Common	1.61	6.83	0.62	1.41	7.76	0.59
Wyndham Way	2.54	8.04	0.72	1.55	5.37	0.61

TABLE 7.14
Junction Performance at Wyndham Way/Sheepway/Portbury Hundred for 2019 and 2029 without scheme

	2019						2029					
	AM			PM			AM			PM		
	Queue (PCU)	Delay Sec	RFC	Queue (PCU)	Delay Sec	RFC	Queue (PCU)	Delay Sec	RFC	Queue (PCU)	Delay Sec	RFC
Sheepway	0.88	11	0.47	0.31	6.45	0.24	1.38	16	0.59	0.41	7.75	0.29
Portbury Hundred	1.15	3.42	0.54	1.93	4.57	0.66	1.43	3.89	0.59	2.7	5.81	0.73
Portbury Common	1.8	7.43	0.65	1.7	8.98	0.63	2.63	10	0.73	3.01	14.6	0.76
Cabstand	0.5	4.84	0.33	0.4	4.28	0.28	0.57	5.07	0.36	0.45	4.42	0.31

Table 7.15 shows the impact of the proposed scheme on the junction for 2019 and 2029. Given the assumptions used, the scheme is unlikely to have a detrimental impact on the operation of the junction with the largest queues occurring on the Wyndham Way arm of 5 PCUs in the 2029 morning peak period and a RFC of 0.85.

TABLE 7.15
Junction Performance at Wyndham Way/Sheepway/Portbury Hundred with scheme for 2019 and 2029

	2019						2029					
	AM			PM			AM			PM		
	Queue (PCU)	Delay Sec	RFC	Queue (PCU)	Delay Sec	RFC	Queue (PCU)	Delay Sec	RFC	Queue (PCU)	Delay Sec	RFC
Sheepway	0.4	6.95	0.29	0.94	11.48	0.49	1.57	17.68	0.62	0.43	7.98	0.3
Portbury Hundred	2.03	4.8	0.67	1.16	3.45	0.54	1.45	3.95	0.59	2.82	6.05	0.74
Portbury Common	1.74	9.15	0.64	1.89	7.69	0.66	2.91	10.91	0.75	3.16	15.3	0.77
Cabstand	1.84	6.04	0.65	3.01	9.2	0.75	5.2	14.79	0.85	2.73	8.12	0.74

With the addition of the proposed scheme the junction illustrates that **there is no significant impact on the junction and has spare capacity in future years.**

7.3.6 M5 Junction 19

Section 6 of the Strategic Operational Impact Assessment examines the impact of the scheme on the strategic highway network. This includes the impact on Junction 19 of the M5. The modelling predicts increases in congestion at this junction associated with development growth in future years, but little change associated with the scheme.

7.3.7 Station Road/Heywood Road/Lodway

The existing junction is a priority junction and has been modelled using PICADY software. The following Figure 7.22 illustrates the total PCUs generated for the 2015 assessment periods taken from the surveys conducted.

FIGURE 7.22
2015 Surveyed traffic at Station Road/Heywood Road/Lodway

08-00 to 09-00
17-00 to 18-00

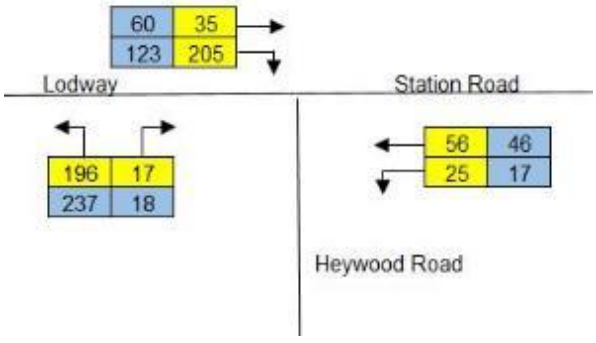
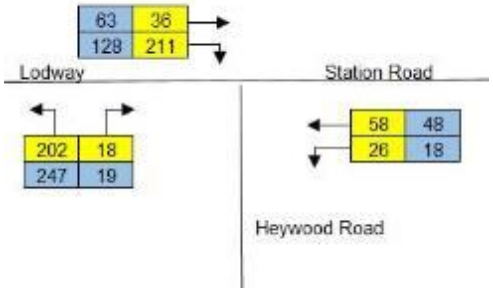


Figure 7.23 shows the total PCUs generated by this scheme for both the 2019 and 2029 assessment periods without the scheme. Figure 7.24 shows the total PCUs generated for both the 2019 and 2029 with scheme assessment periods.

FIGURE 7.23
Future 2019 & 2029 traffic at Station Road/Heywood Road/Lodway "Without" Scheme

08-00 to 09-00
17-00 to 18-00

2019



2029

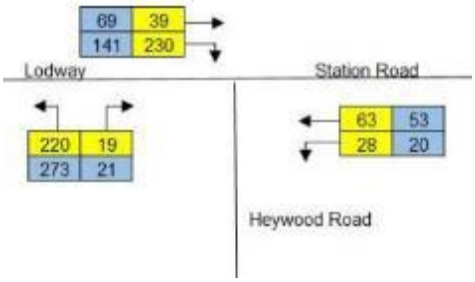
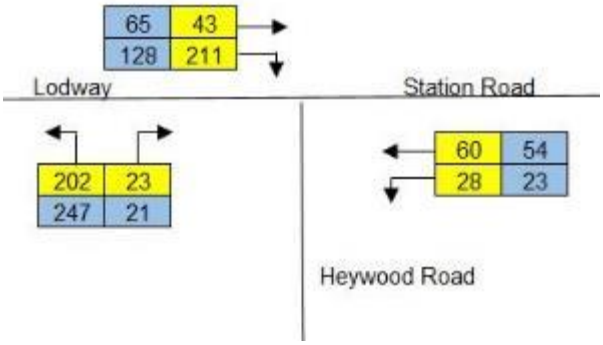


FIGURE 7.24
Future 2019 & 2029 traffic at Station Road/Heywood Road/Lodway "With" Scheme

08-00 to 09-00
17-00 to 18-00

2019



2029

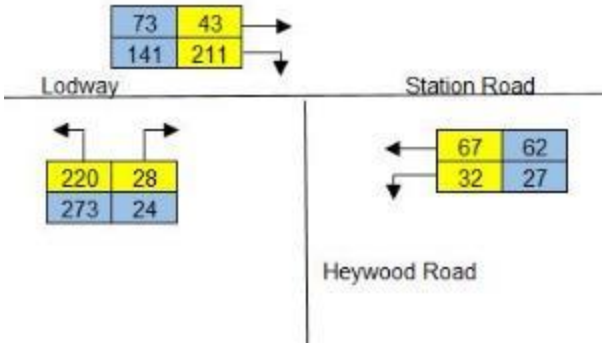


Table 7.16 & 7.17 provides an overview of the capacity of the junction for the 2015 baseline, 2019 opening years and 2029 horizon year periods. The results presented below show the junction to be within capacity in 2019 and 2029 without the scheme with the highest RFC of 0.15 in the AM peak on the Station Road North arm in 2029.

TABLE 7.16
Junction Performance at Station Road/Heywood Road/Lodway for 2015

	2015					
	AM			PM		
	Queue (PCU)	Delay Sec	RFC	Queue (PCU)	Delay Sec	RFC
Station Road (South)	0.05	5.99	0.04	0.03	5.67	0.03
Station Road (North)	0.14	8.45	0.13	0.11	7.99	0.10
Heywood Road	0.04	7.06	0.04	0.04	6.89	0.04

TABLE 7.17
Junction Performance at Station Road/Heywood Road/Lodway for 2019 and 2029 without scheme

	2019						2029					
	AM			PM			AM			PM		
	Queue (PCU)	Delay Sec	RFC	Queue (PCU)	Delay Sec	RFC	Queue (PCU)	Delay Sec	RFC	Queue (PCU)	Delay Sec	RFC
Station Road (South)	0.05	6.03	0.05	0.03	5.7	0.03	0.05	6.14	0.05	0.04	5.78	0.03
Station Road (North)	0.15	8.57	0.13	0.12	8.11	0.11	0.17	8.9	0.15	0.14	8.41	0.12
Heywood Road	0.04	7.1	0.04	0.04	6.93	0.04	0.04	7.2	0.04	0.04	7.02	0.04

When the additional flow is added to include the proposed scheme, as shown in Table 7.18, the impact of the scheme on the junction for both 2019 and 2029 are insignificant.

TABLE 7.18
Junction Performance at Station Road/Heywood Road/Lodway with scheme for 2019 and 2029

	2019						2029					
	AM			PM			AM			PM		
	Queue (PCU)	Delay Sec	RFC	Queue (PCU)	Delay Sec	RFC	Queue (PCU)	Delay Sec	RFC	Queue (PCU)	Delay Sec	RFC
Station Road (South)	0.05	6.07	0.05	0.04	5.77	0.04	0.06	6.15	0.06	0.05	5.9	0.05
Station Road (North)	0.16	8.68	0.14	0.14	8.25	0.12	0.18	8.96	0.16	0.16	8.65	0.14
Heywood Road	0.05	7.21	0.05	0.04	6.96	0.04	0.06	7.29	0.06	0.05	7.08	0.05

Table 7.18 shows that the **proposed scheme has no significant impact on the junction**.

7.3.8 A369/St Georges Hill

A369/Georges Hill is at present a priority junction and has been modelled using PICADY software. The following Figure 7.25 illustrates the total PCUs generated by the surveys undertaken for 2015 assessment periods.

FIGURE 7.25
2015 Surveyed traffic at A369/St Georges Hill

08-00 to 09-00
17-00 to 18-00

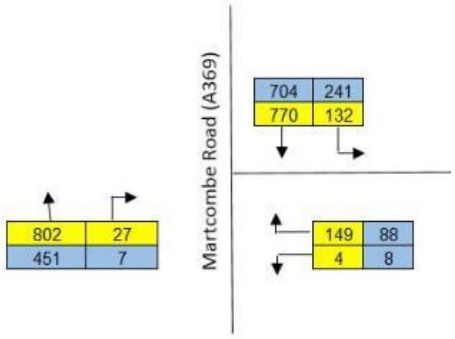
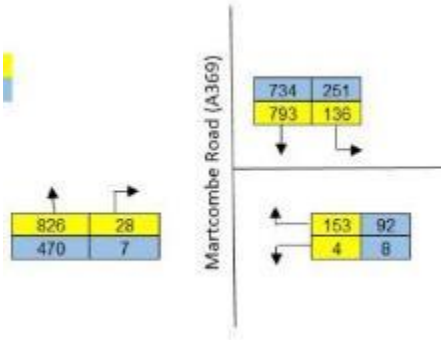


Figure 7.26 shows the total PCUs generated for both the 2019 and 2029 assessment periods without the proposed scheme.

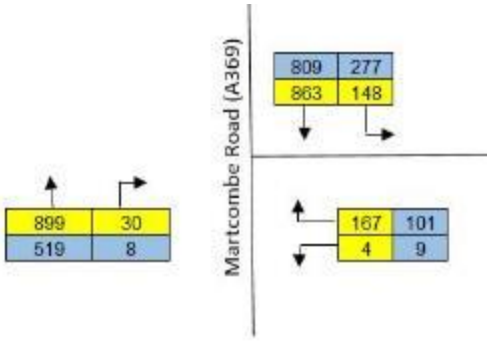
FIGURE 7.26
Future 2019 & 2029 traffic at A369/St Georges Hill "Without" Scheme

08-00 to 09-00
17-00 to 18-00

2019



2029

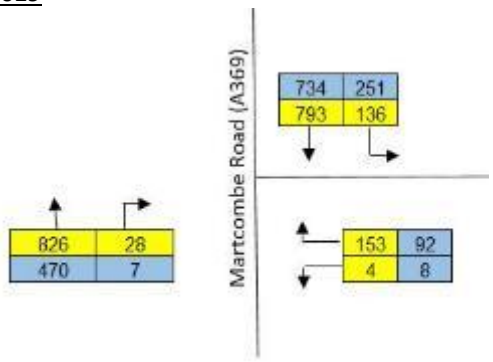


The assignment and distribution of vehicle traffic at this particular location indicates that this junction is likely to experience a minimal change in vehicle flows. Figure 7.27 shows the traffic flows for 2019 and 2029 with scheme where it indicates no change in traffic flow arising from the scheme. Given that there is no fluctuation in the flows, no further junction modelling has been undertaken for the 2019 and 2029 with scheme scenarios.

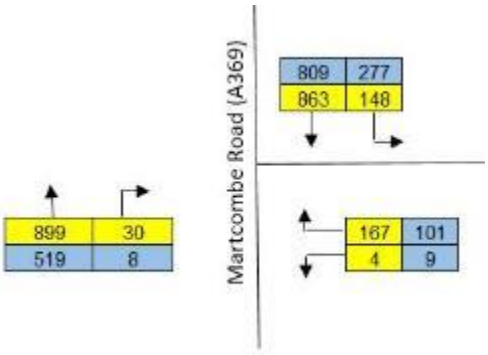
FIGURE 7.27
Future 2019 & 2029 traffic at A369/St Georges Hill "With" Scheme

08-00 to 09-00
17-00 to 18-00

2019



2029



The results in table 7.19 & 7.20 provides an overview of the capacity of the junction for the 2015 baseline, 2019 opening years and 2029 horizon year periods. It shows that the existing and future scenarios are within capacity and the proposed scheme **will not have a significant impact on the junction**.

TABLE 7.19
Junction Performance at A369/St Georges Hill for 2015 without scheme

	2015					
	AM			PM		
	Queue (PCU)	Delay Sec	RFC	Queue (PCU)	Delay Sec	RFC
St George Hill (Left turn)	0.01	10.1	0.01	0.02	8.93	0.02
St George Hill (Right turn)	1.05	23.7	0.52	0.33	12.5	0.25
A369	0.06	7.1	0.06	0.01	6.95	0.01

TABLE 7.20
Junction Performance at A369/St Georges Hill for 2019 and 2029 without scheme

	2019						2029					
	AM			PM			AM			PM		
	Queue (PCU)	Delay Sec	RFC	Queue (PCU)	Delay Sec	RFC	Queue (PCU)	Delay Sec	RFC	Queue (PCU)	Delay Sec	RFC
St George Hill (Left turn)	0.01	10.6	0.01	0.02	9.14	0.02	0.02	13	0.02	0.03	9.74	0.03
St George Hill (Right turn)	1.2	26.3	0.55	0.37	13.2	0.27	1.96	40.1	0.68	0.48	15.6	0.33
A369	0.06	7.22	0.06	0.02	7.1	0.01	0.07	7.59	0.07	0.02	7.53	0.02

7.3.9 A369/Pill Road

The assignment and distribution of vehicle traffic to and from Pill Station indicates that this junction is likely to experience a minimal change in vehicle flows. In the opening year of 2019 and horizon year of 2029 shows just under one vehicle (rounding) arising from the scheme. **This reflects the 4% assignment of total traffic to and from the station at this junction**. Given the low level of the flows, no further junction modelling has been undertaken.

7.4 Level crossing impacts

7.4.1 Modelling Approach

The impact of the scheme on the operation of the Winterstoke Road/Ashton Vale Road junction and the adjacent level crossing has been assessed using a calibrated and validated VISSIM micro-simulation traffic model (refer to **Appendix P** for the Winterstoke Road/Ashton Vale Road VISSIM Model Development Assessment). A range of rail service scenarios has been considered which vary in terms of the number of passenger and freight rail movements as well as the time between successive level crossing closures. A standard closure time of four minutes has been assumed in all scenarios representing a worst case based on rail service information supplied by Network Rail. The rail scenarios tested are as follows:

- 1 Unit B: 1 passenger train and 1 freight train in each direction in each hour;
- 1 Unit CU: 1 passenger train in each direction and 1 freight train in one direction only (up from Portbury) in each hour; and
- 1 Unit CD: 1 passenger train in each direction and 1 freight train in one direction only (down to Portbury) in each hour.

These three different rail service scenarios were tested with a number of different networks reflecting the existing layout and operation of the Winterstoke Road/Ashton Vale Road signalled junction and a range of mitigation measures, as follows:

- 'Do-Nothing' Scenario, which consists of the existing junction layout and traffic signal operation;
- 'Ext Lt Lane' Scenario, which includes the extension of the Winterstoke Road northbound left turn lane into Ashton Vale Road to 150 metres; and
- 'Microprocessor Optimised Vehicle Actuation (MOVA) Ext Lt Lane' Scenario, which includes the extension of the Winterstoke Road northbound left turn flare with the VISVAP file modified to provide extra green time to movements affected by the level crossing thereby emulating longer green times which would be provided under MOVA control.

These scenarios were tested with base year (2017) traffic flows and no forecasting of future volumes has been carried out. MetroWest Phase 1 is expected to operational by 2021 and traffic flows are not expected to materially grow over the intervening period.

For reference, the Options Report for the Ashton Vale Alternative Access Road has also been attached in **Appendix Q**.

7.4.2 Modelling Observations

Do Nothing

It was observed that queueing traffic on the left-turn lane on Winterstoke Road leading to Ashton Vale Road blocks trips wanting to go northbound to the A370 underpass and the A3029, even when there is green time for these movements. Additionally, heavy queueing traffic was observed on Ashton Vale Road when the level crossing barrier is down, particularly during the evening peak period when traffic volumes on this arm are more dominant.

With Extended Left-Turn Lane

Under this scenario, the left-turn lane on Winterstoke Road leading to Ashton Vale Road has been extended to circa 150m (from 60m) in length in order to store additional traffic queuing to the level crossing and prevent it from impeding the main through movement.

It was observed that the signalised junction operated largely within capacity in all three rail scenarios during the AM peak period where queues on the Winterstoke Road northbound left turn into Ashton Vale Road rarely impeded other movements through the network. However, notable queuing on Ashton Vale Road was still noted particularly during the PM peak period following a level crossing closure.

With Extended Left-Turn Lane and MOVA

The scenario tested included the extension of the left turn flare as above along with changes to the signals to simulate MOVA control providing more green time to the Winterstoke Road left turn and the Ashton Vale Road phases.

These scenarios consist of an extended left turn lane on Winterstoke Road northbound and adjustments to the signal operation within the model in order to simulate MOVA control. These changes were tested under the three rail scenarios within the AM and PM peak periods. The extended left turn lane on Winterstoke Road northbound was effective in containing queuing without blocking the adjacent ahead movement during the AM peak period. During the PM, whilst queue lengths built to high levels on Ashton Vale Road during level crossing closures, they were well managed following the re-opening of the level crossing and with the additional green cleared relatively quickly (two to three minutes) following a level crossing closure.

7.4.3 Conclusion of Assessment

The modelling assessment demonstrates that, with the combined improvements of the extension of left-turn lane and MOVA, there will be no overall detrimental impact on the operation of the highway at this location. The assessment has shown that, even with the level crossing barrier down for a period of up to 4 minutes and assuming a Worst-Case scenario '1 Unit B', traffic queuing in the left-turn lane on Winterstoke Road will not block straight through northbound traffic during the AM peak when left-turn flow into Ashton Vale industrial estate is dominant.

The model also demonstrates that with the same level crossing barrier down times and the Worst-Case rail scenario, traffic queues show only a modest increase compared to baseline levels, but return to these levels within two to three minutes during the critical PM peak period when large volumes are exiting the industrial estate.

7.5 Parking impacts

7.5.1 Context of North Somerset Parking Standards

The North Somerset Parking Standards Supplementary Planning Document (SPD) defines and outlines the authority's approach to parking for new schemes/developments. The document is used to provide further detail to existing development plan policies, but it cannot create new policy. In this case, the Parking Standards SPD provides further clarification of the Core Strategy Policy CS11 on parking which states:

> *'Adequate parking must be provided and managed to meet the needs of anticipated users (residents, workers and visitors) in usable spaces. Overall parking provision must ensure a balance between good urban design, highway safety, residential amenity and promoting town centre attractiveness and vitality.*
>
> *New developments must seek to maximise off street provision, assess where on-street provision may be appropriate, demonstrate that buses, service and emergency vehicles are not restricted, and ensure that the road network is safe for all users.'*

The document explains that at non-residential locations, it is essential to manage the demand for car use by ensuring that the availability of car parking spaces does not discourage the use of alternative transport modes whilst ensuring that commuter car parking does not adversely impact on the surrounding local area.

The scheme proposals currently sit outside the non-residential standards for both vehicle and cycle parking. However the document does state that other uses such as this scheme will take account of Policy CS11 above. However, the schedule does outline the requirements of disabled parking and motorcycles.

In terms of disabled parking, non-residential development should provide a minimum of 5% of their total parking space for people with disabilities. With motorcycle parking, this should be at a minimum of 3% of the relevant required parking.

7.5.2 Portishead Station

Figures 7.30 and 7.31 show the predicted demand for parking at Portishead Station in 2019 (as a proxy for the opening year of 2021) and 2029 together with the number of parking spaces that will be provided by the Scheme. The Scheme proposes that 20 of the spaces are earmarked for users of the nearby Harbourside Health Centre.

The analysis indicates that in the opening year and 10 years after commencements of operation, the number of parking spaces will be more than sufficient to meet demand even assuming 10 vehicles are parked overnight. Note that these assessments are based on a different, and more intensive half-hourly rail service pattern than the hourly patterns that is currently proposed.

7.5.3 Pill Station

Figures 7.32 and 7.33 show the projected parking demand at Pill Station in 2019 (as a proxy for the opening year of 2021) and 2029.

The analysis suggests that the car park will be more than sufficient to meet demand at the station for both periods even assuming 5 vehicles are parked overnight. Note that these assessments are based on a different, and more intensive half-hourly rail service pattern than the hourly patterns that is currently proposed.

FIGURE 7.30
Portishead Station Parking Demand 2019

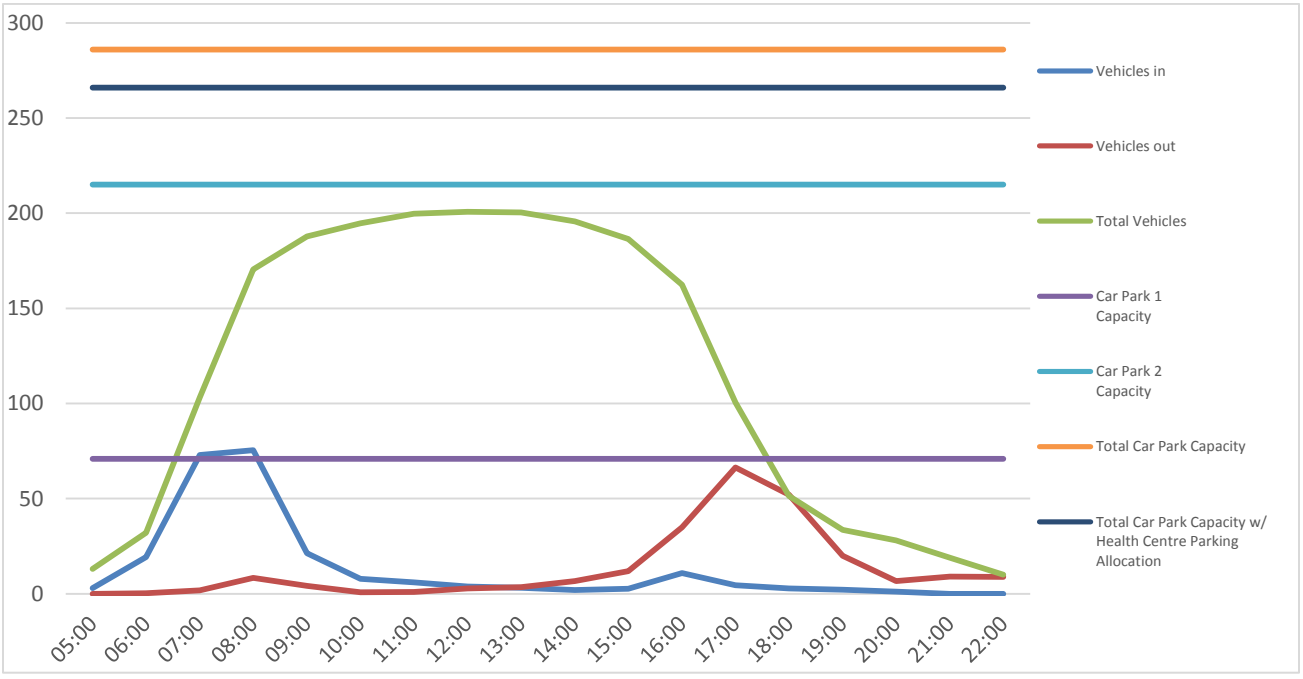


FIGURE 7.31
Portishead Station Parking Demand 2029

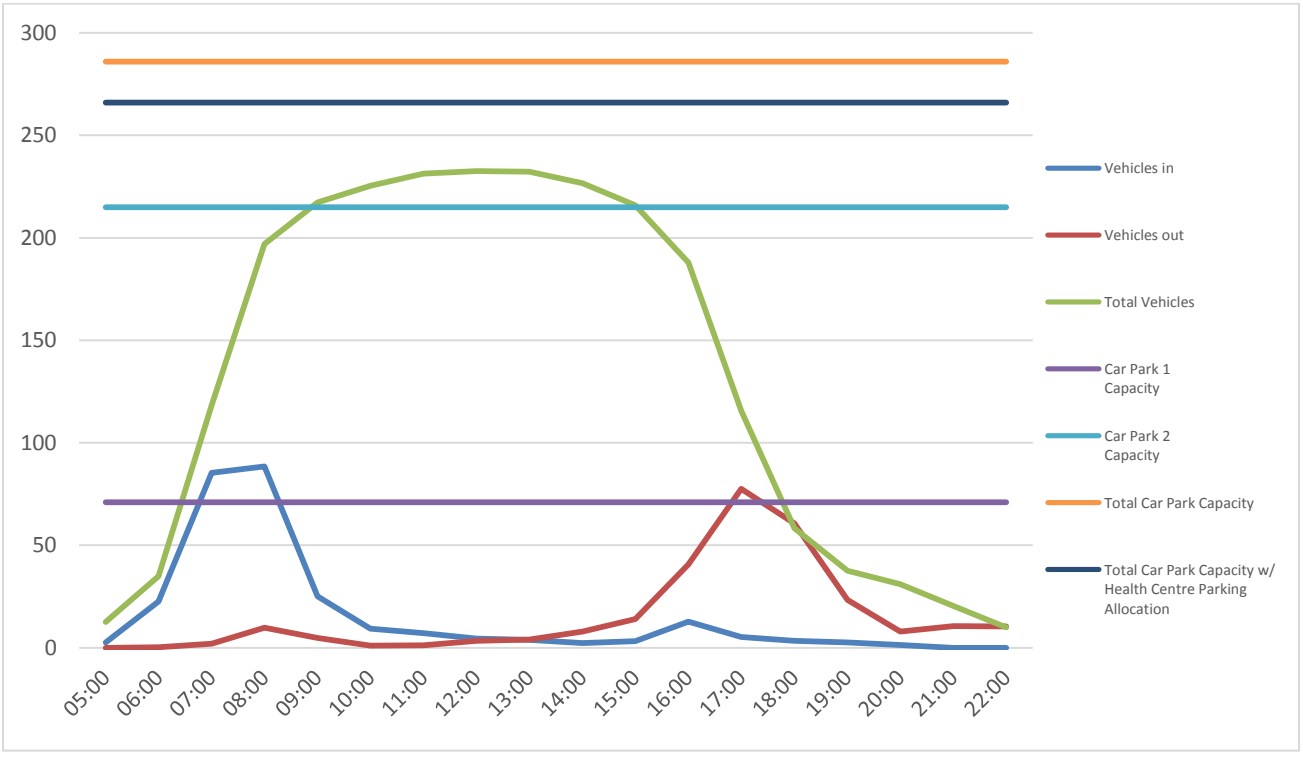


FIGURE 7.32
Pill Station Parking Demand 2019

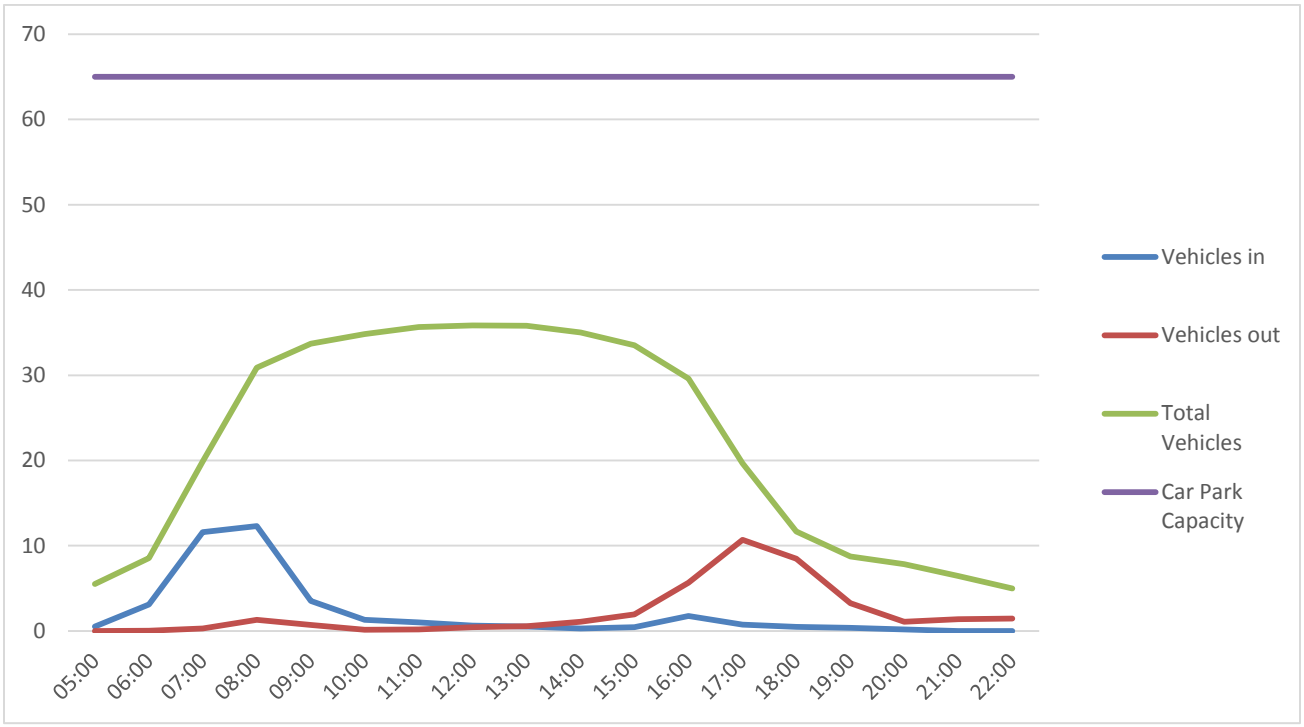
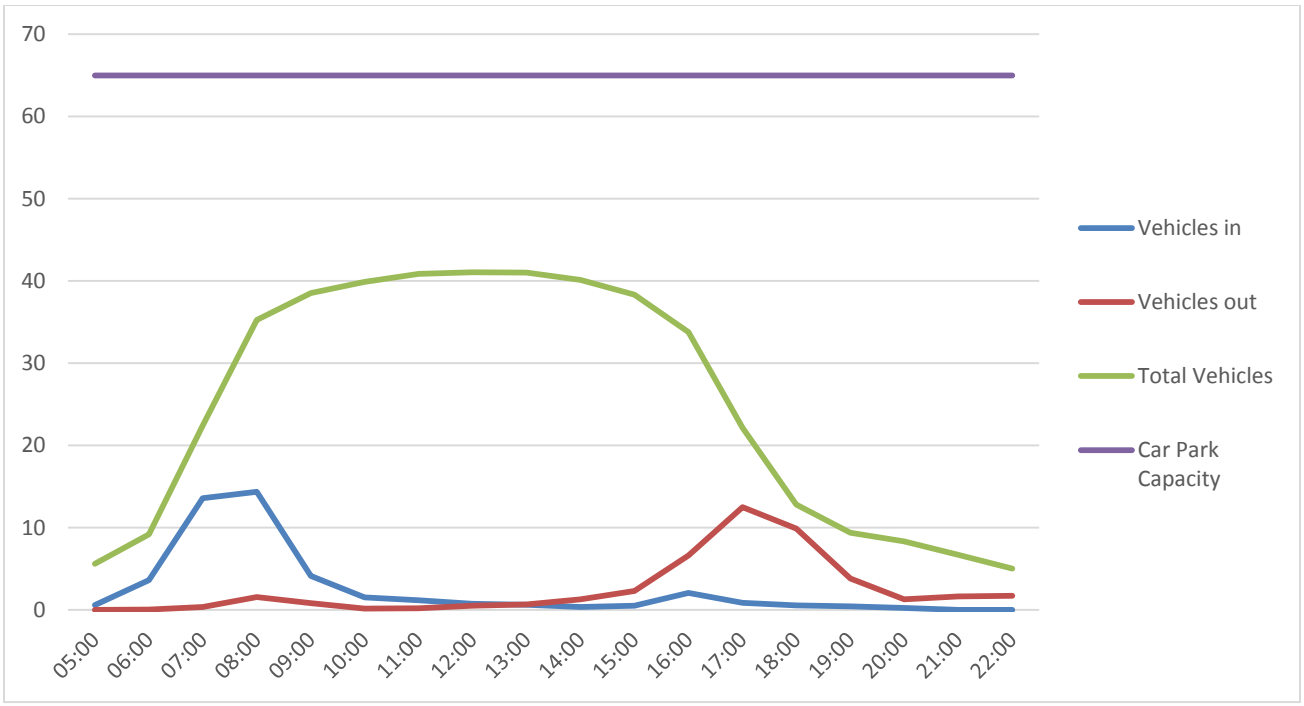


FIGURE 7.33
Pill Station Parking Demand 2029



7.5.4 Car parking impacts on neighbouring streets

The assessment about car park usage suggests that the parking provision will be able to accommodate demand including the use of nearby and existing NSC parking. Nevertheless, on-street parking will remain attractive as:

- The demand may exceed forecasts and car parking provision may not be sufficient;
- There are more convenient on-street parking locations; and
- Free on street parking may be more attractive than the pay to stay car parks.

In considering the geographical extent of passengers using on-street parking, it is noted that in Portishead the furthest car park space is approximately 400m away from the station entrance whereas in Pill, the distance is around 200m.

7.6 Walking and cycling impacts

7.6.1 Context of North Somerset Highways Design Guide (October 2015)

The North Somerset Highways Design Guide was adopted by the local authority in October 2015. It sets out the standards and approach to design in connection with highways, footways, accesses and a range of other aspects of highway design. The guidance applies to all highways schemes relating to new development within North Somerset including alterations or works to the existing highway and other transport infrastructure and associated works.

The guide outlines a hierarchy system for highways within the area. The authority emphasises the importance of this hierarchy and the need to give it due consideration at the outset with any new development. This hierarchy outlines the function of each type of highway and the design standards required such as minimum carriageway width.

The guide also states as part of any new development, key pedestrian and cycling routes and destinations must be identified. Reference is made to Local Transport Note Policy LTN 1/04 'Planning and Design for Walking and Cycling' and LTN 2/08 'Cycle Infrastructure Design'. This sets out the common design principles for pedestrian and cycle provision. It notes the road network is the most basic and important cycling facility available, and the preferred way for providing for cyclists is to create conditions on the carriageway where cyclists are content to use it, particularly in urban areas.

The document also refers to PRoWs. The design, specification and construction required for the PRoW will be determined by the rating of the route in the network hierarchy. Where any PRoW shown on the Definitive Map and Statement is affected by proposals, provision should be made for the PRoW including suitable diversion or replacement where necessary.

As a result, the design of the scheme will need to give consideration and conform to these elements within North Somerset.

7.6.2 Audit of Routes

As part of the **Walking and Cycling Plan** in **Appendix J**, an audit of the walking and cycling routes was undertaken. A range of impacts have been identified and these have been ranked using a high, medium and low system. In terms of the scheme, these are broadly defined as:

- **High –** The impact of the scheme is likely to lead to significant highway safety concerns for pedestrians and cyclists and/or are critical for improving access to and from the stations;
- **Medium –** These are moderate highway related concerns and/or would be beneficial for improving access to and from the stations; and
- **Low –** These concerns would be beneficial in improving the conditions for walking and cycling trips.

Table 7.23 details the impacts that have been regarded as high.

TABLE 7.23
Identified Pedestrian and Cyclist Impacts

Route and Location		Impact
Portishead Route 1 – Quays Avenue towards Brampton Way Quays Avenue junction with Phoenix Way/Harbour Road		At the existing junction with Phoenix Way and Harbour Road, dropped kerbs and tactile paving are currently provided. The flow of traffic at the junction is relatively constant reducing the opportunities to cross. This is a particular issue for specific users (e.g. those with disabilities)
Portishead Route 1 – Quays Avenue towards Brampton Way Quays Avenue towards junction with Wyndham Way		Cyclists use the footway on the east side of Quays Avenue up to junction with Galingale Way where they are directed to cross the road and continue their route along segregated footpath of the west side of Quays Avenue. The footway on the west side of Quays Avenue is also discontinuous. However, dropped kerbs and tactile paving are provided at crossing points.
Portishead Route 3 – Harbour Road to town centre		Currently there are no designated crossing points along Harbour Road until you reach the town centre. Users wishing to cross towards the marina and businesses along Harbour Road currently have no formal crossing point.

Route and Location		Impact
Portishead Route 3 – Harbour Road to town centre		There is a lack of clarity of the recommended route from the station towards the town centre. One of the routes from Harbour Road and Old Mill Road is along an unadopted path which has poor levels of surveillance and surfacing.
Pill Route 1 – Station Road to Lodway		The roads surrounding the station have limited carriageway widths and sub-standard walking and cycling provision. However, this has the effect of reducing vehicle speed which is conducive for non-motorised users. However, as part of this there are a lack of crossing points particularly across Lodway/Heywood Avenue.
Pill Route 6 – from the station towards Pill Wharf via Back Lane.		Immediately opposite the station, there is no bespoke provision for pedestrians and cyclists. With increased traffic flows and pedestrian/cyclist movement, there is a risk of greater conflict. Whilst the opportunities are constrained by highway layout, there are opportunities to improve surfacing, signage, road markings and identifying recommended crossing points.

7.7 Summary of benefits and impacts

In general, the study of the above junctions indicate that the impact of the scheme has minimal adverse effect on the junction operation. The initial assessment provided an overview of junction performance using the proposed traffic scenario from base year 2015, opening year 2019 and horizon year 2029. A summary of the impacts has been presented in Table 7.24 below.

TABLE 7.24
Summary of Impacts

Location	Type of impact	Summary
Junctions		
Phoenix Way/Quays Avenue	Not significant	
Station Road/Harbour Road/Cabstand	Not significant	
Quays Avenue/Wyndham Way/Serbert Way	Not significant	
Cabstand/Wyndham Way/High Street	Not significant	Junction currently at capacity though the scheme will not have a significant impact on its current operation.
Wyndham Way/Sheepway/Portbury Hundred	Not significant	
M5 Junction 19	Not significant	Congestion predicted to increase as a result of future development growth as opposed to the scheme.
Station Road/Heywood/Road/Lodway	Not significant	
A369/St. Georges Hill	Not significant	
A369/Pill Road	Not significant	
Ashton Vale Road/Winterstoke Road junction (near level crossing)	Not significant	Scheme includes improvements at junction. Refer to Section 7.4 (VISSIM modelling)
Parking		
Portishead Station	Streets within 400m vulnerable to overspill parking or to vehicles refusing to pay the tariff to park at the station	No. of spaces at station to exceed the demand on year of opening and 10 years after year of opening.
Pill Station	Streets within 300m vulnerable to overspill parking or to vehicles refusing to pay the tariff to park at the station	No. of spaces at station to exceed the demand on year of opening and 10 years after year of opening.

Section 8

Construction Impact Assessment

8.1 Introduction

This section of the TA assesses the extent of the construction impacts on transport networks. As a linear development, the construction works will have an extensive effect across the area with specific locations having some greater impacts.

8.2 Construction Works

The Construction Strategy for the Scheme (refer to section 3.2 for scheme description) is being developed by Network Rail, but will not be fully detailed until the construction contractor is on board. The outline construction strategy (focuses upon the compounds and possible access points from the highway network that will be required. This report seeks to establish an *expected* construction approach with the information available at the time of writing.

The construction strategy, where possible, will seek to move as much of the construction materials and waste by rail. Where access by road is needed, deliveries and waste removals will avoid the peak traffic periods, where possible. However, the assessment presented in this section does not assume this to be the case, rather a realistic worst case for transport impacts has been considered.

8.3 Construction Access

A number of access points from the highway network will be required to undertake the works. Initial assessment indicates the access points as detailed in Table 8.1 and shown in Figures 8.1 to 8.3 will be required.

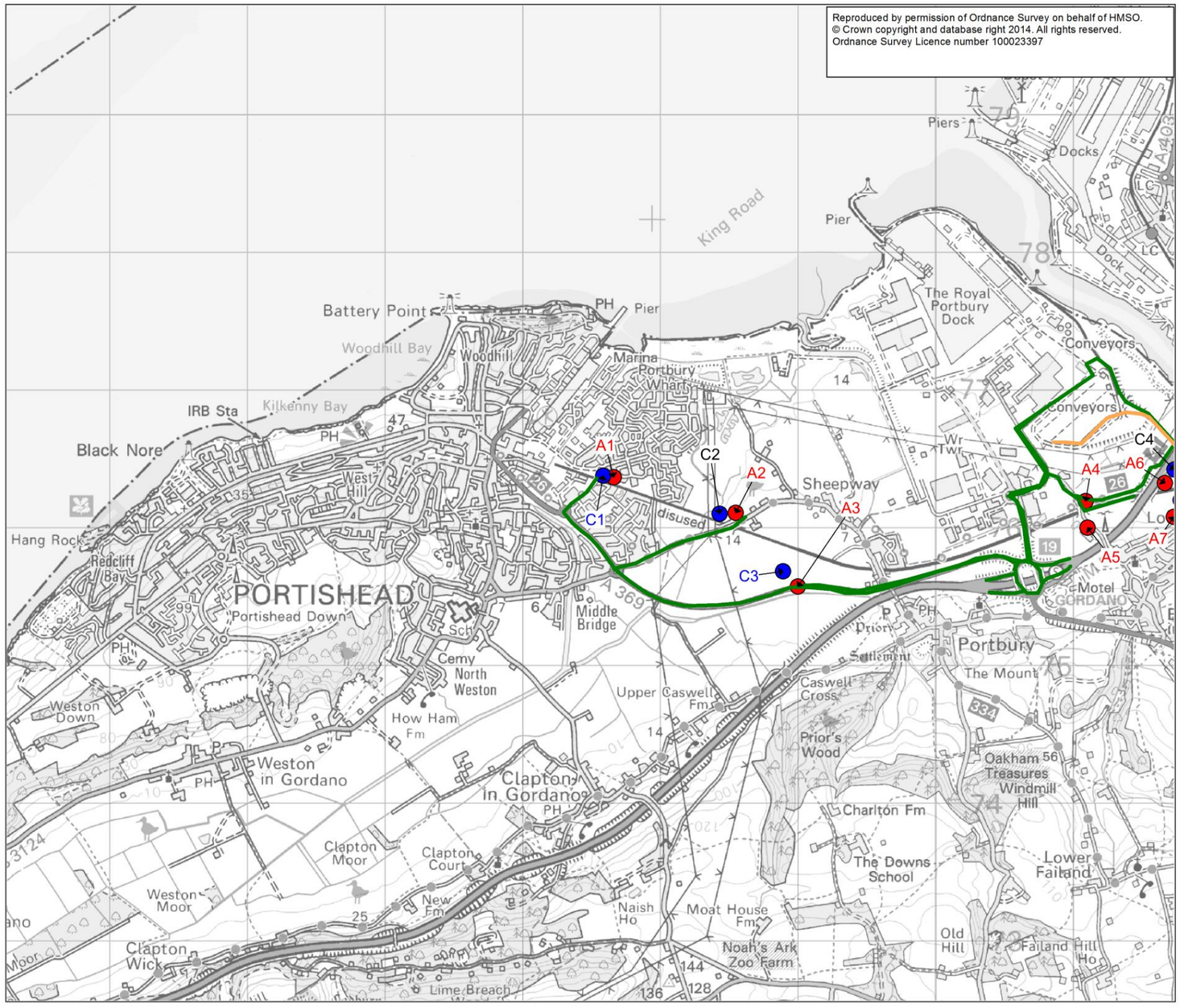
TABLE 8.1
Construction Access Points

Ref	Name	Purpose	Location
A-1	Portishead Station	To facilitate access to Portishead Station and Trinity Bridge sites.	Phoenix Way/Quays Avenue, Portishead
A-2	Sheepway (north of railway)	For construction vehicles and intermediate worker access. Option to use as part of haulage route.	Access from Sheepway on the north side of the Portishead Branch Line opposite Sheepway Gate Farm, Sheepway. Refer to Figure 4.9 of the PEIR for layout plan of access point.
A-3	Portbury Hundred	Access to main compound for all vehicles	Access off the A369 Portbury Hundred to the west of the junction with Station Road. Junction to be constructed with access restricted to left in/left out only. Refer to Figure 4.10 of the PEIR for layout plan of access point.
A-4	Marsh Lane 1	To facilitate access to Cattle Creep Underpass (to be infilled as part of the works) and fencing. For construction vehicles only.	Vehicular access from haul road on north side of railway
A-5	Marsh Lane 2	Access to the underbridge on the railway to the west of the M5. For construction vehicles only. Option to use as part of one way through system.	Vehicular access from Marsh Lane east to the underbridge on the railway to the west of the M5.

TABLE 8.1
Construction Access Points

Ref	Name	Purpose	Location
A-6	M5 Overbridge	Alterations to permissive path comprising part of NCR26 at the railway underbridge beneath the M5 Motorway.	To the west of the M5 Overbridge. Access permanently restricted to pedestrians.
A-7	Lodway Farm	Access to main compound for all vehicles	New junction and access road required from the Breeches (Pill). Option to use access from Marsh Lane via the Portishead Branch Line Railway Bridge under the M5 (i.e. A-4).
A-8	Avon Road	Access for construction vehicles only to construct Avon Road Underbridge to enable the double tracking to be facilitated	Access through Pill to Avon Road to construct Avon Road Underbridge (refer to Fig. 9.2 and Table 9.6 of the TA)
A-9	Pill Station car park	Access for construction vehicles only for the construction of Pill Station	Access from Monmouth Road, Pill
A-10	New Pill Station	Access for construction vehicles only to provide access to top of Pill Station ramp	Access from Station Road, Pill
A-11	Pill Viaduct	Access for pedestrians only to the west of Pill Tunnel. Access possible for light vans via cycle path if agreed.	For access west of Pill Tunnel
A-12	Chapel Pill Lane	Access for all vehicles only to the main compound for the north end of Avon gorge	Access off end of adopted section of Chapel Pill Lane (opposite Penny Brohn UK). Refer to Figure 4.15 of the PEIR for details of access to Pill tunnel from Chapel Pill Lane and Macrae Road.
A-13	Chapel Pill Farm Access	Pedestrian access only for intermediate welfare. Access by light vehicles subject to consent from landowner/hazard assessment.	Pedestrian access only. Vehicle access to be agreed and vehicle access restrictions over bridge to be confirmed.
A-14	Miles Dock	Pedestrian access only for intermediate welfare. Access by ATV subject to consent/hazard assessment.	Avon Gorge Chainage 124m 07
A-15	Quarry Underbridge 4	Pedestrian access only for intermediate welfare. Access by light vehicles subject to consent from landowner/hazard assessment.	Avon Gorge Chainage 123m 23
A-16	Valley Underbridge	Pedestrian access only for intermediate welfare. Access by light vehicles subject to consent from landowner/hazard assessment.	Avon Gorge – north of Clifton Suspension Bridge Chainage 122m 31
A-17	Clanage Road	Pedestrian access only for intermediate welfare.	Access from Clanage Road
A-18	Clanage Road	Access for all vehicles only to the main compound for the south end of Avon gorge	Access from Clanage Road. Refer to Figure 4.16 of the PEIR for layout plan of access point.
A-19	Ashton Vale Road	Access for all vehicles to undertake construction works at the level crossing and new track junction	Access from Winterstoke Road/Ashton Vale Road

FIGURE 8.1
Portishead Construction Compounds and Accesses



Legend
Access
Compound
MicroCompounds
Proposed Track Delivery (Existing Track)
Haulage Routes

Note:
Access to coal yard and exit point with secuity barrier, vehicle weight bridge and wash.

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Project:
Portishead Branch Line (MetroWest Phase 1)

Figure Title:
MetroWest Compounds, Accesses and Haulage Routes 1-3

Drawn by:	Stuart Minton	Date:	15/09/2017
Checked by:	Áine Kenny	Date:	15/09/2017
Approved by:	Helen Spackman	Date:	15/09/2017

Figure Number:. | **Revision:** -

Drawing Scale: **Not to Scale**

FIGURE 8.2
Pill and Avon Gorge Construction Compounds and Accesses

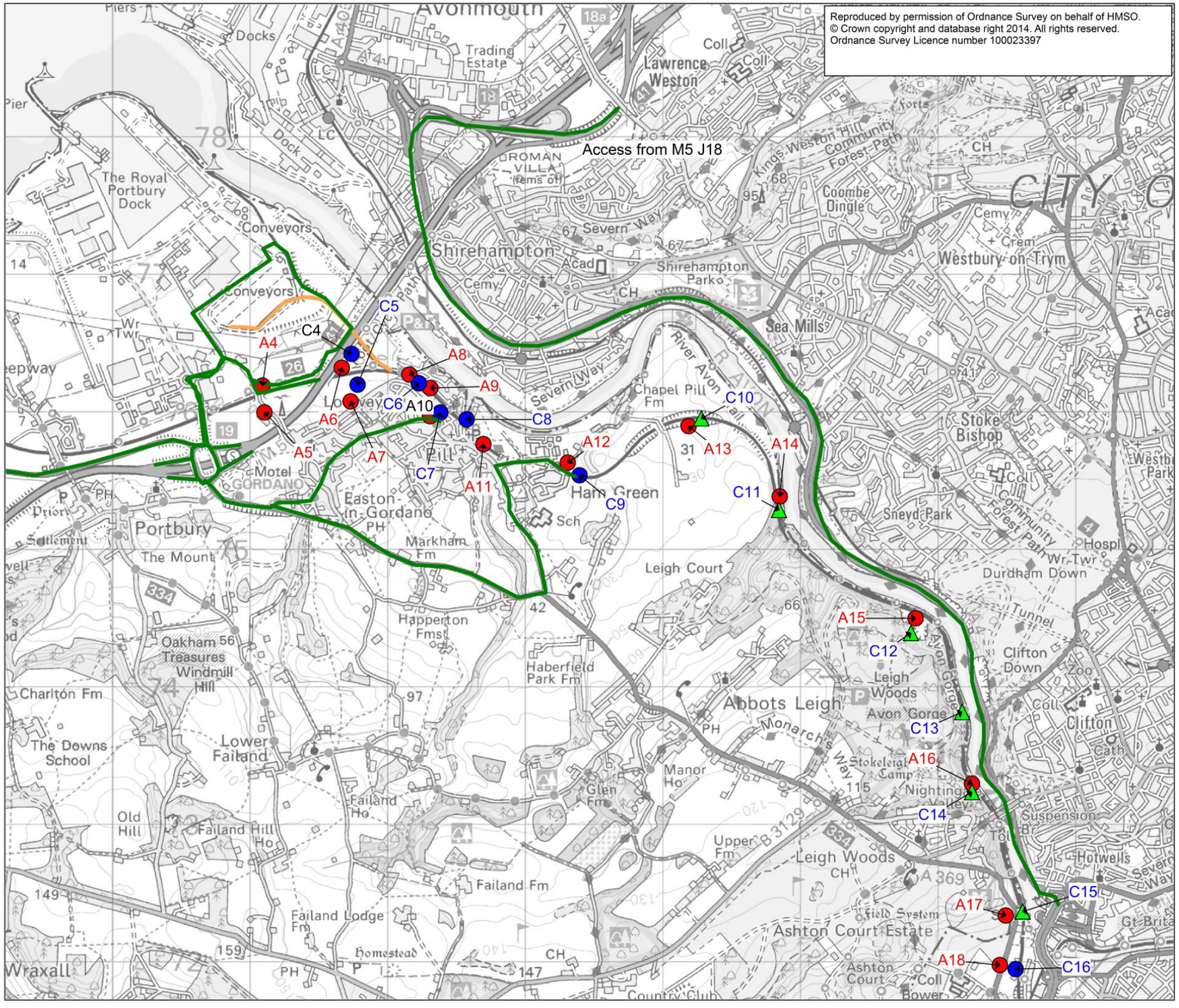
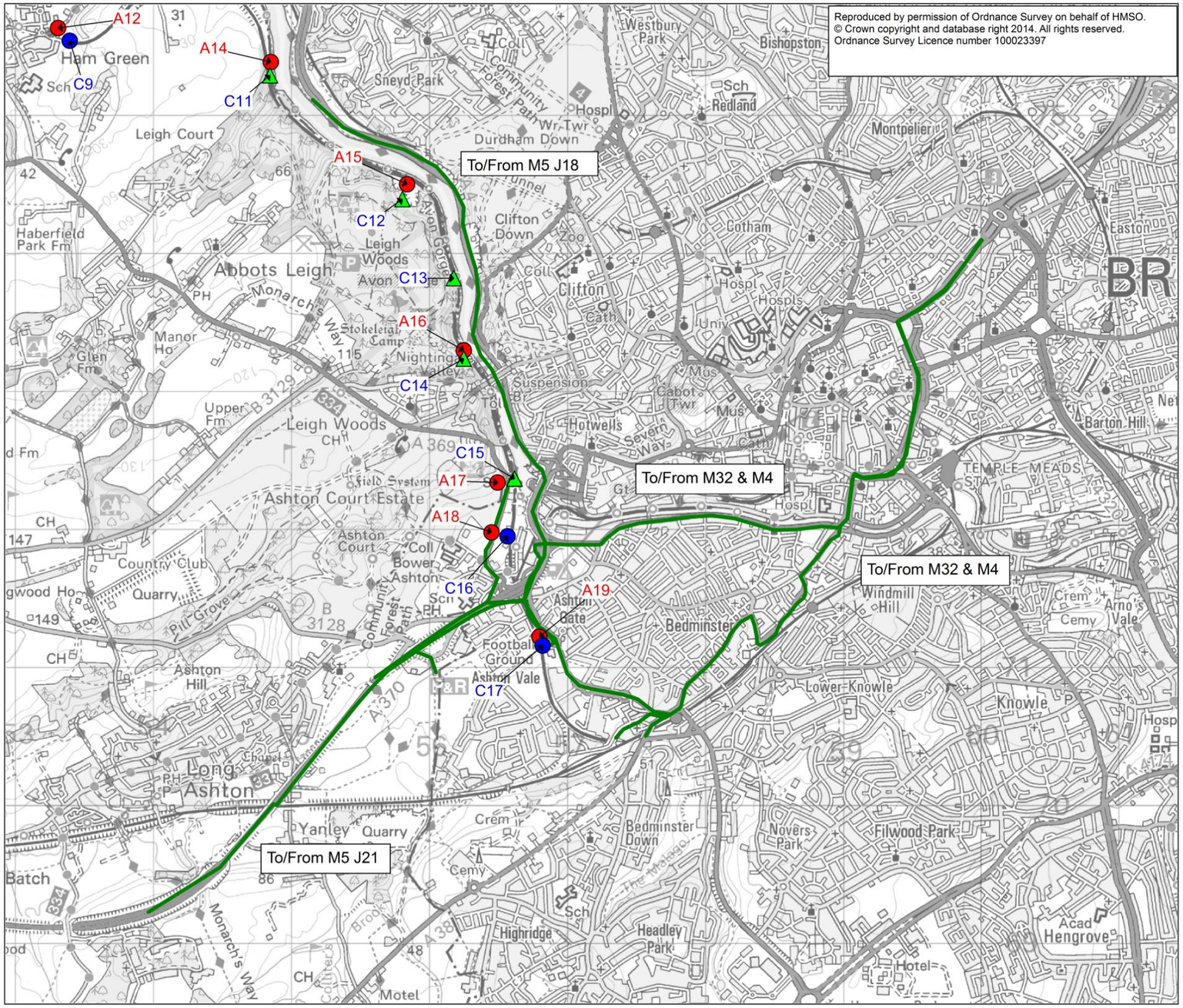


FIGURE 8.3
Avon Gorge and Ashton Vale Construction Compounds and Accesses



Legend
Access
Compound
MicroCompounds
Haulage Routes

Note:

Access to coal yard and exit point with secuity barrier, vehicle weight bridge and wash.

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Project:
Portishead Branch Line (MetroWest Phase 1)

Figure Title:
MetroWest Compounds, Accesses and Haulage Routes 3-3

Drawn by:	Stuart Minton	Date:	15/09/2017
Checked by:	Áine Kenny	Date:	15/09/2017
Approved by:	Helen Spackman	Date:	15/09/2017

Figure Number:. **Revision:** -

Drawing Scale: **Not to Scale**

8.4 Construction Compounds

A number of compounds will be required at intervals along the DCO Scheme and these are detailed in table 8.2 and shown in Figures 8.1 to 8.3. The table identifies the extent of HGV movements, on-site parking and the level of material storage for each compound.

TABLE 8.2
Description of Construction Compounds

No.	DCO Scheme Element	Place Name	Location	Existing Land Use	Proposed Construction Use
1	D	Portishead	Portishead on site of new station car park A on eastern side of the realigned Quays Avenue.	Urban	To facilitate construction of new station, realignment of Quays Avenue and Trinity Primary School crossing
2	N	Sheepway	Sheepway Overbridge	Pasture	Site office and welfare facilities
3	P	Portbury Hundred	Land between the disused railway and The Portbury Hundred	Pasture	Main construction compound for construction of track between Portishead and Pill..
4	W	Avonmouth Bridge	Land under M5 Avonmouth Bridge.	-	Construction compound for construction of track between Portishead and Pill
5	Z	Lodway Farm	Fields between the M5, the disused railway and The Breaches in Pill.	Pasture and small orchard	Storage compound and access for reconstruction of underbridge south of Avon Road, temporary storage of waste and materials, and access to the railway.
6	AG	Pill Yard	A former goods yard, off Monmouth Road, Pill	Open storage	Material storage / site offices and welfare for construction of Pill Station
7	AI	Pill Station	7 Station Road, Pill	Commercial units	Following demolition of the property, temporary use of the site as a construction compound before developing the site as the new entrance to Pill Station
8	AJ	Pill Viaduct	Pill Library carpark	Car Park	Storage area.
9	AP	Ham Green	Field off McCrae Road, Ham Green	Pasture	For work within Pill Tunnel, welfare, and for site of new permanent electrical building
10-15	AM	Micro-compounds	Avon Gorge	Existing clearings in woodland	6 No. micro compounds through the Avon Gorge containing basic welfare facilities
16	AV	Clanage Road,	Clanage Road, Bower Ashton	Playing fields (not open to the public)	Compound for welfare and access to Avon Gorge.
17	AX	Ashton Vale	Ashton Vale Level Crossing	Highway	Works next to Level Crossing

8.5 Traffic Generation and Impacts

The Construction Strategy does not indicate in detail the likely traffic generation arising from the construction works. However, it is possible to ascertain some of the likely impacts as shown in Table 8.3.

TABLE 8.3

Assessment of the MetroWest Phase 1 Construction Impacts

Ref	Location	Construction activity	Include HGVs?	Traffic Generation	Time of works	Is traffic expected in peak periods (7am-10am; 4pm-7pm)	Impact on existing users
PD/1	Portishead – Quays Avenue and Harbour Road junction	Relocation of existing services and utilities	Yes	Major HGV deliveries.	Weekday /day time	Yes	Temporary or partial closure of Quays Avenue required. Shared footway/cycleway relocation. Identification of crossing points. Impact on existing bus services.
PD/2	Portishead – Quays Avenue and Harbour Road junction	Construction of new Quays Avenue and Harbour Road junction	Yes	Major HGV deliveries. Medium level of construction worker car parking	Weekday /day time	Yes	Temporary or partial closure of Harbour Road. Footway relocation. Identification of crossing points. Impact on existing bus services.
PD/3	Portishead – Marjoram Way	Construction of new Trinity footbridge	Yes	Major HGV deliveries	Weekday /day time	Yes	Closure of existing permissive footpath between Marjoram Way and Galingale Way.
SY/1	Sheepway – Gate Farm	Access to compound	Yes	Limited HGV with lower level of worker car parking	Weekday /day time	No	HGVs may prevent impede the flow of traffic along Sheepway. Existing cycleway will need to be relocated to accommodate the compound (see Figure 8.5).
SY/2	A369 - The Portbury Hundred	Access to compound	Yes	Major HGV deliveries with large level of worker car parking	Weekday /day time	No	New access point from the A369 will need to be constructed.
PK/1	Portbury Dock Compound	Access to compound	Yes	Major HGV deliveries with large level of worker car parking.	Weekday /day time	No	Access to the compound will be through Royal Portbury Dock Road and onto Port land. A larger level of traffic movements from M5 J19 should be expected.
PI/1	Lodway farm	Access to compound	Yes	Major HGV deliveries	Weekday /day time	No	Access to site yet to be determined. Possibility of using the Port and transporting material along the railway alignment

TABLE 8.3

Assessment of the MetroWest Phase 1 Construction Impacts

Ref	Location	Construction activity	Include HGVs?	Traffic Generation	Time of works	Is traffic expected in peak periods (7am-10am; 4pm-7pm)	Impact on existing users
PI/2	Avon Road	Access to compound	Yes	Major HGV deliveries with no car parking	Weekday /day time	No	Difficulty to travel to and from Avon Road site due to narrow and constrained highway network
PI/3	Pill Station	Access to compound	Yes	Major HGV deliveries	Weekday /day time	No	Difficultly to travel to and from the station site due to narrow and constrained highway network
PI/4	Pill tunnel – Macrae Road and Chapel Pill Lane	Access to compound	Yes	Major HGV deliveries with medium level of worker car parking	Night work	No	Road layout is narrow in parts and on-street parking could impede HGV deliveries
PI/5	Pill tunnel – Chapel Pill Lane	Access to compound	Yes	Major HGV deliveries with medium level of worker car parking	Night work	No	Difficultly to travel to and from the site due to narrow road spaces and close proximity to housing.
AG/1-4	Avon Gorge Compounds	Access to Micro-compound	No	Access from railway line or from neighbouring land	Night work	No	Very marginal and localised to specific locations
AV/1	A369 Clanage Road	Access to compound	Yes	HGV deliveries with medium level of worker car parking	Night work	No	There are currently weight restrictions on the A369 north of the compound site and deliveries will need to be directed via the A370 further south
AV/3	Ashton Vale – Ashton Vale Road	Access to compound	Yes	HGV deliveries with no car parking	Night work	No	There may be localised impacts on the operation of the existing Ashton Vale Road and Winterstoke Road junction

8.6 Traffic routeing

Construction traffic will use the principal highway network wherever possible and designated routes to and from the compounds and access points will be identified in the final Construction Management Traffic Plan (CTMP). The routes to be used by construction traffic are presented in Figures 8.1 to 8.3. In order to mitigate against the impact of the construction works on the highway network, use of other routes will generally be prohibited.

Any possible issues encountered on the highway network as a result of construction traffic associated with the scheme have been outlined below.

8.6.1 Portishead

Major HGV deliveries to the compounds at Portishead Station will have an impact on the operation of the local highways network, namely Quays Avenue, Harbour Road and the roundabout junction between Quay Avenue, Harbour Road and Phoenix Way.

The presence of on-street parking on Phoenix Way, Marjoram Road and Tansy Way will likely impede construction traffic assessing the proposed Trinity footbridge. The presence of pedestrians, particularly children associated with the adjacent primary school, will need to be considered when the detailed construction plans are developed. Access to the site of the footbridge will be through a residential area from the Quays Avenue and Harbour Road roundabout. The increase in traffic volumes is likely to result in some level of inconvenience for residents.

8.6.2 Sheepway

While HGV movements will be limited to and from the Sheepway compound, there will be an increase in traffic volumes on Sheepway from its junction with The Portbury Hundred. This will have a slight impact to existing users of Sheepway.

8.6.3 Portbury Docks

The presence of HGVs associated with the scheme combined with the existing volume of HGVs associated with the port will have an impact on the operation of The Royal Portbury Dock Road, Gordano Way and Marsh Lane. The substandard width and condition of Marsh Lane is a concern which will need to be addressed to accommodate increased traffic levels.

8.6.4 Pill

8.6.4.1 Lodway Farm

The access to the compound at Lodway will be through a residential area via The Breaches. While the increase in traffic volumes is likely to result in some level of inconvenience for residents, this will be mainly accessed by workers vehicles as opposed to HGVs.

8.6.4.2 Pill Station and Avon Road

Access to the compounds at Pill Station and Avon Road, which is routed through residential areas, is also likely to be impeded by the narrow and constrained nature of the road network from Martcombe Road through East-in-Gordano and into Pill. It should be noted that the delivery route for the 100 tonne crane at the Avon Bridge site will require temporary parking controls on Marine Parade due to the limited space of the road. This is to avoid any conflict with parked cars on this route. It will also be necessary to demolish part of a garden wall at the corner of Myrtle Hill and Marine Parade in Pill. Powers are sought to demolish a row of garages at Avon Road in Pill to accommodate the crane. The garages will be replaced by new build garages at the completion of the relevant works. The delivery route for the crane is shown in Figure 9.2.

8.6.4.3 Chapel Pill Farm

HGVs and other construction vehicles may encounter difficulties while accessing the main compound at Pill Tunnel. The geometry of the highway leading to the site coupled with the presence of on-street parking, namely Macrae Road and Chapel Pill Lane, is likely to restrict the movement of traffic to and from the site. To accommodate the safe movement of HGV vehicles during construction, minor highway modifications need to be undertaken (refer to Figure 4.15 Sheets 2 to 5 of the PEIR) as follows:

- The existing traffic island at the T-junction on Ham Green/Macrae Road needs to be replaced with a flush island and removable reflective signs to allow HGVs to make a right-hand turn onto Macrae Road and double yellow lines are required on Macrae Road to prevent parking near the junction (see Figure 4.15 Sheet 5 of the PEIR).
- The existing footpath on the traffic island between Macrae Road and Chapel Pill Lane needs to be strengthened to allow potential run-over by heavy vehicles (refer to Figure 4.15 Sheet 3 of the PEIR).
- A new access is required off Chapel Pill Lane sufficient to accommodate turning movements of a HGVs onto the new access lane/track to the compound (refer to Figure 4.15 Sheet 2 of the PEIR).

8.6.5 Ashton Vale

The compound at Ashton Vale industrial estate is likely to impact on the operation of A3029 Winterstoke Road and its junction with Ashton Vale Road.

8.7 Walking and Cycling Impacts

The scheme will have an impact on a number of local and designated pedestrian and cycling paths in the vicinity of the scheme. This will result in a number of these routes requiring a temporary diversion for a period of time during the construction phase at the following locations:

- Trinity footbridge: The construction of the footbridge will result in pedestrians having to make a 700m diversion during the construction phase, via Tansy Lane, Quays Avenue and Galingale Lane as shown in Figure 8.4.
- Sheepway: Diversion of the permissive path that forms part of National Cycle Route No. 26 to accommodate the construction of the new maintenance compound and access road on the northern side of the railway. The existing route is to be diverted further north away from the railway as shown in Figure 8.5. Note that this diversion will be permanent (refer to section 3.6.2).
- Royal Portbury Dock Road: Diversion of NCN 26 onto Bridleway LA8/66/10 crossing Royal Portbury Dock Road further north away from the railway as shown in Figure 8.6.
- Marsh Lane: Temporary closure of NCN26 between the Marsh Lane underpass to a point south of the railway underpass to avoid conflict with construction traffic associated with the temporary construction compound at Lodway. The diverted route will continue south on Marsh Lane, under the M5 then turn left onto Church Road. The diversion will continue onto Debecca Lane and Lodway where it will link up with the Avon Cycleway. Further designated routes can be accessed from here including NCN41 (Avon Road/Marine Parade). This diversion is shown in Figures 8.7 to 8.8.
- Pill: Further diversions will be implemented with the temporary closures of part of Avon Road and Star Lane (footpath closure) as shown on Figures 8.7 and 8.8.
- Avon Gorge Tow Path: Temporary closures will be implemented along the length of Avon Gorge during the construction phase for a few hours' or days at a time.
- Clanage Road: With the temporary closure of the Avon Gorge tow path, traffic will be diverted onto Clanage Road as shown on Figure 8.9 and 8.10.

FIGURE 8.4
Diversion at Trinity Footbridge

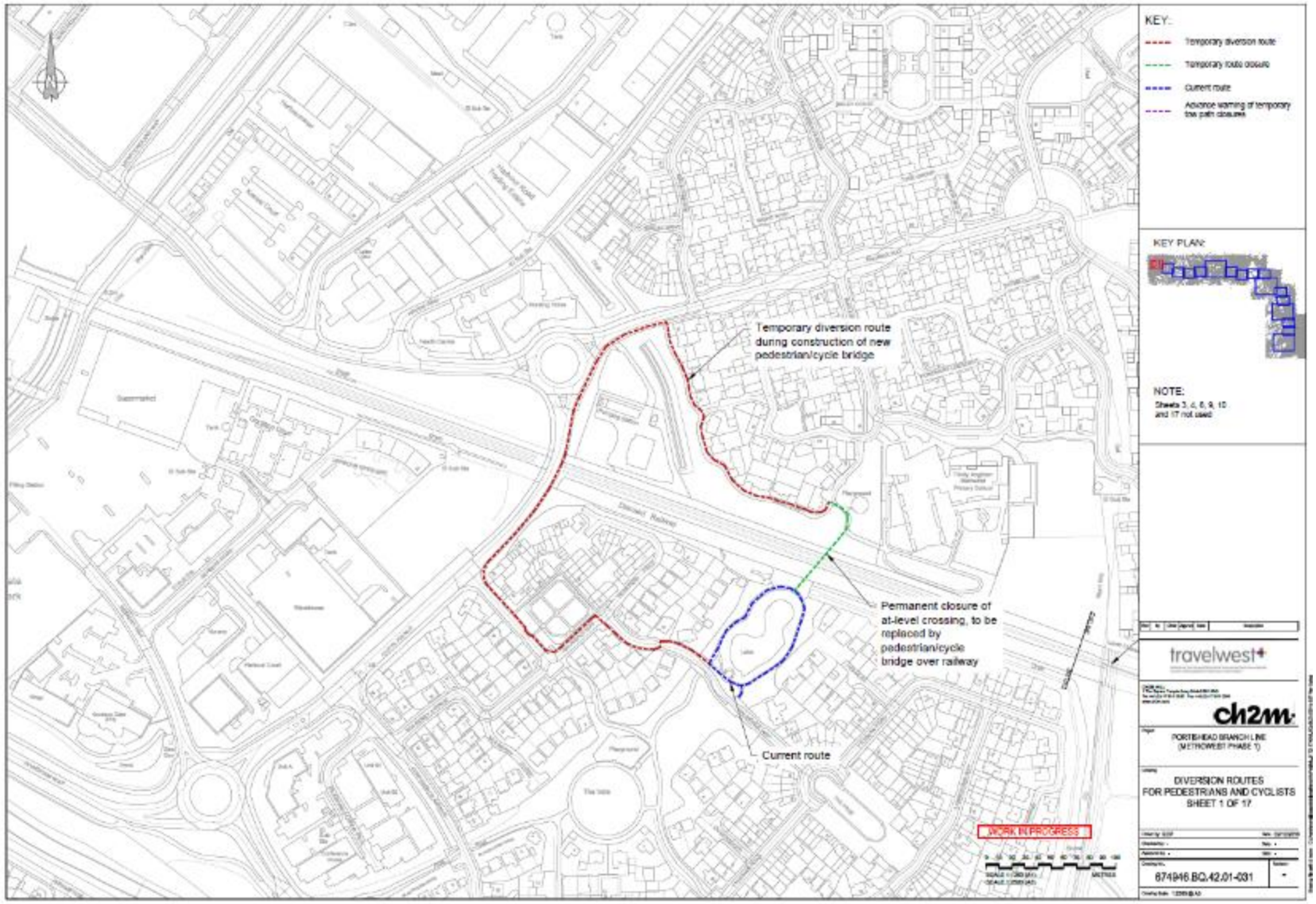


FIGURE 8.5
Diversion at Sheepway

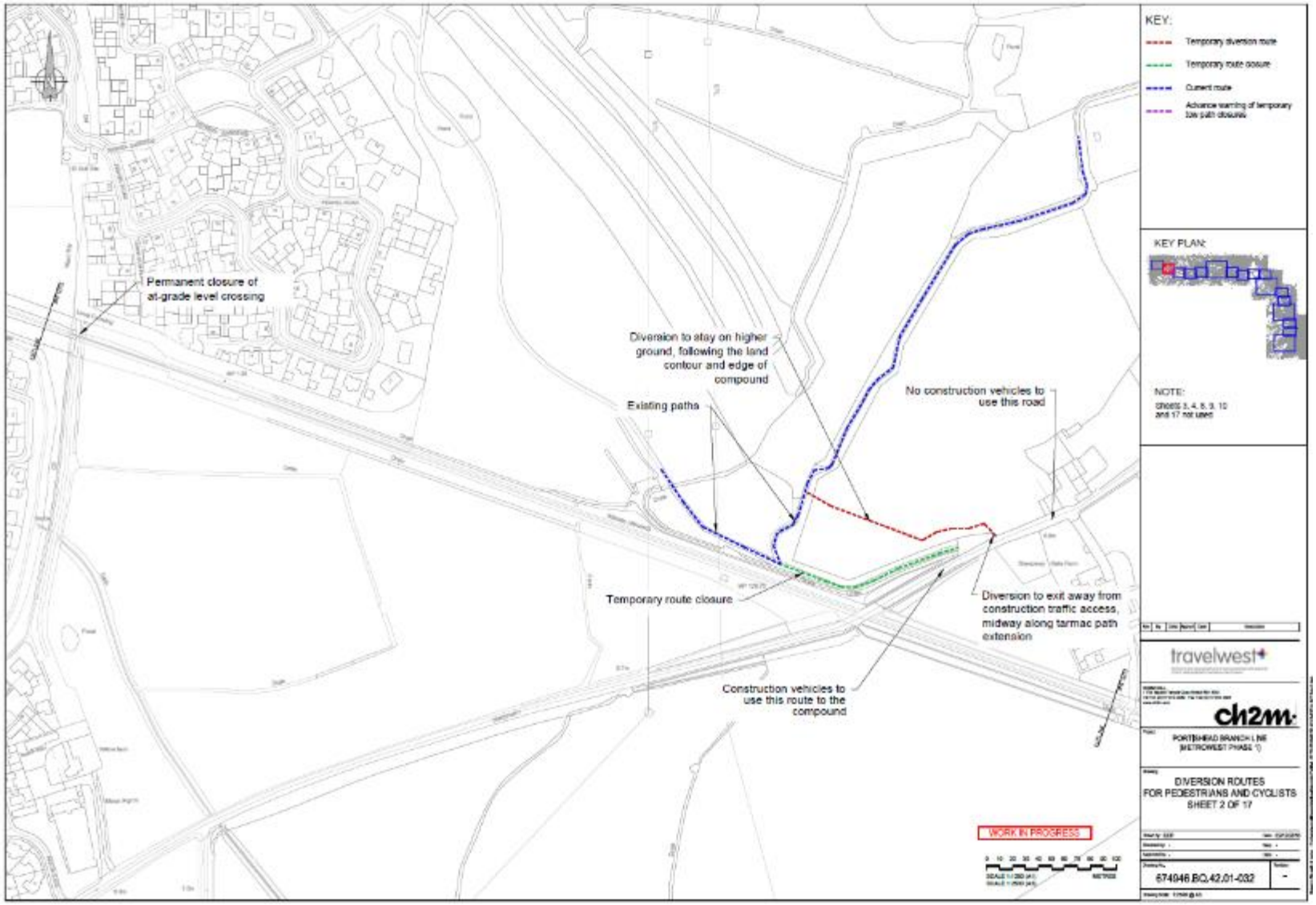


FIGURE 8.6
Diversion at Royal Portbury Dock Road

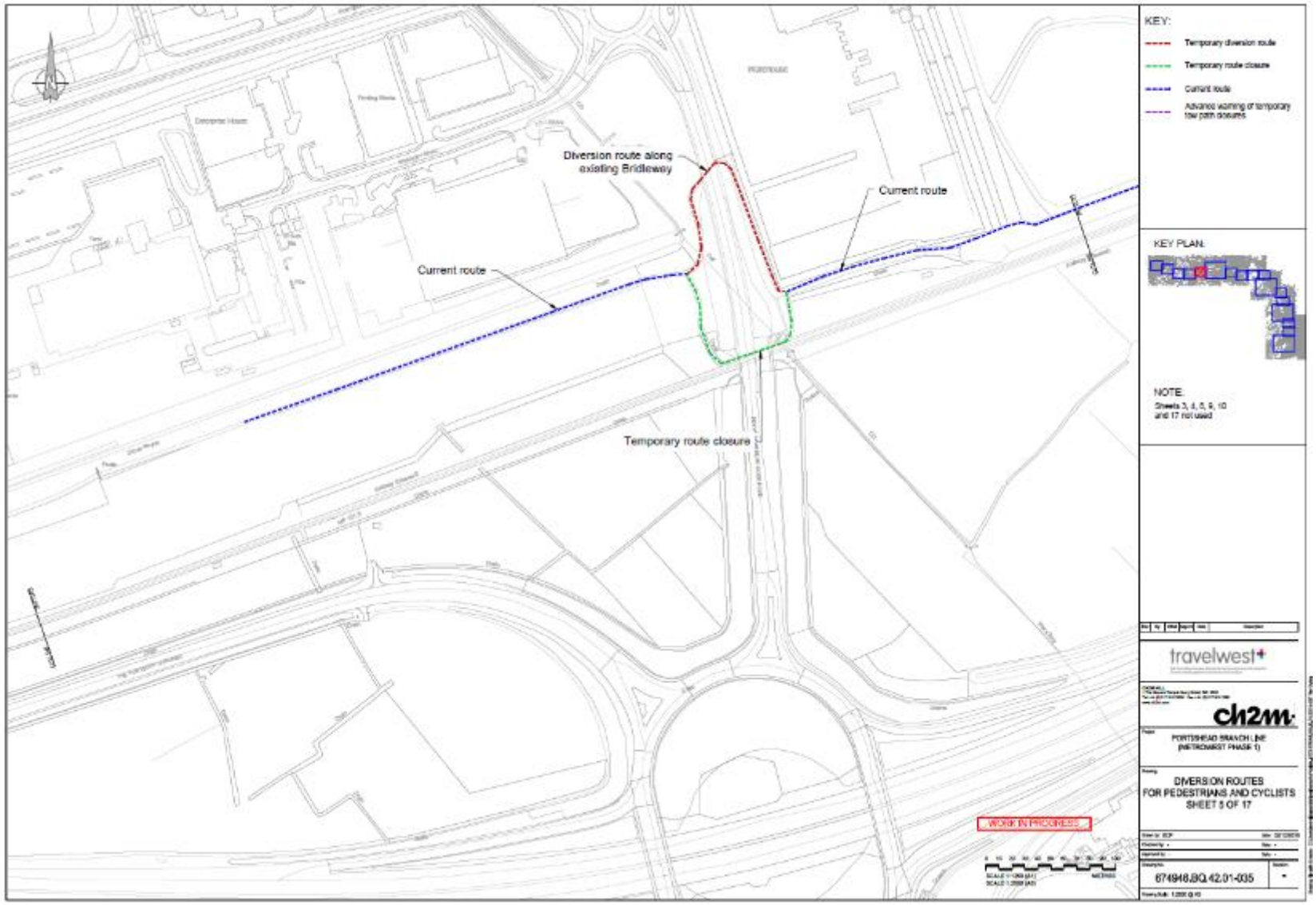


FIGURE 8.7
Diversion at Marsh Lane

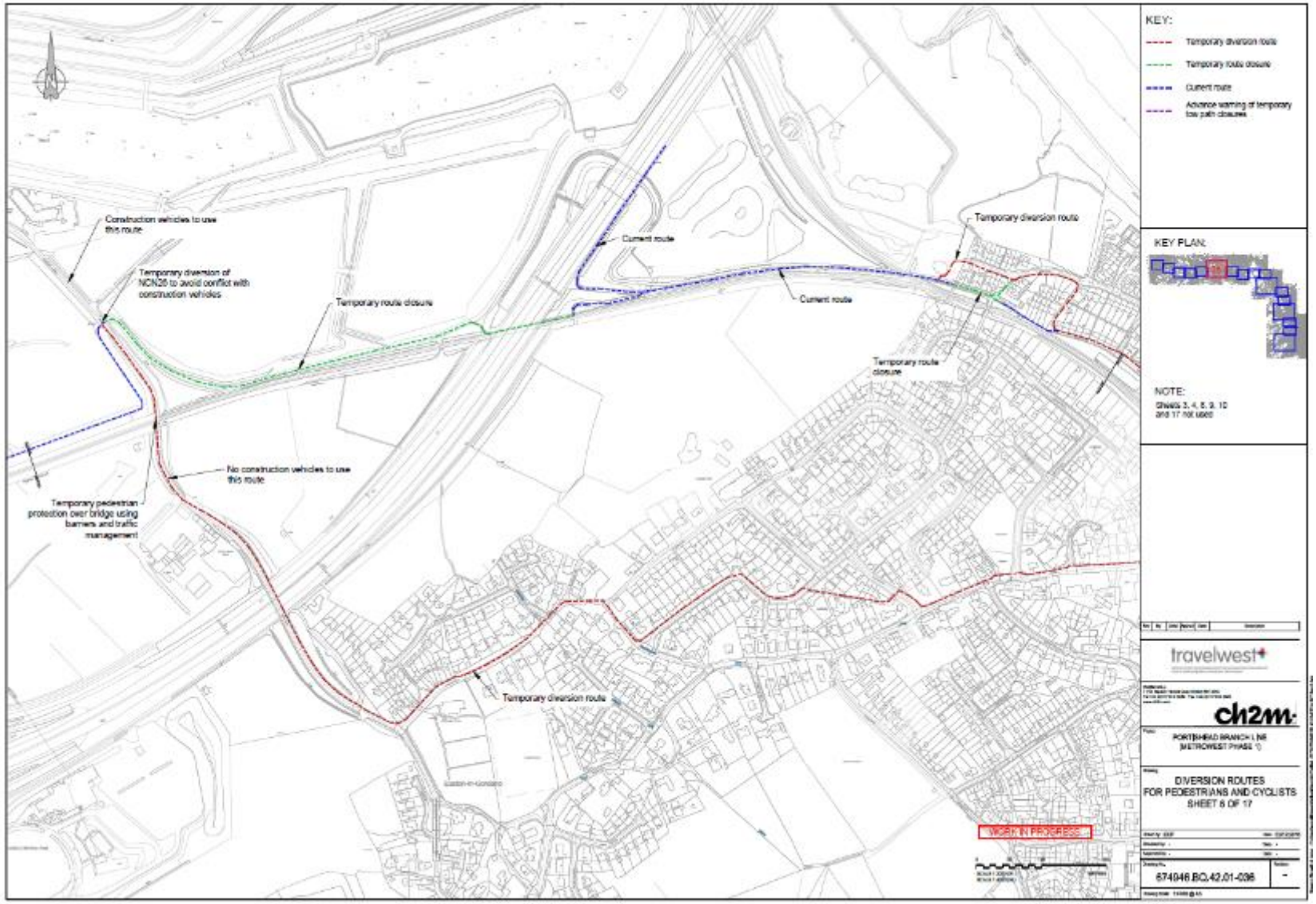


FIGURE 8.8
Diversions through Pill

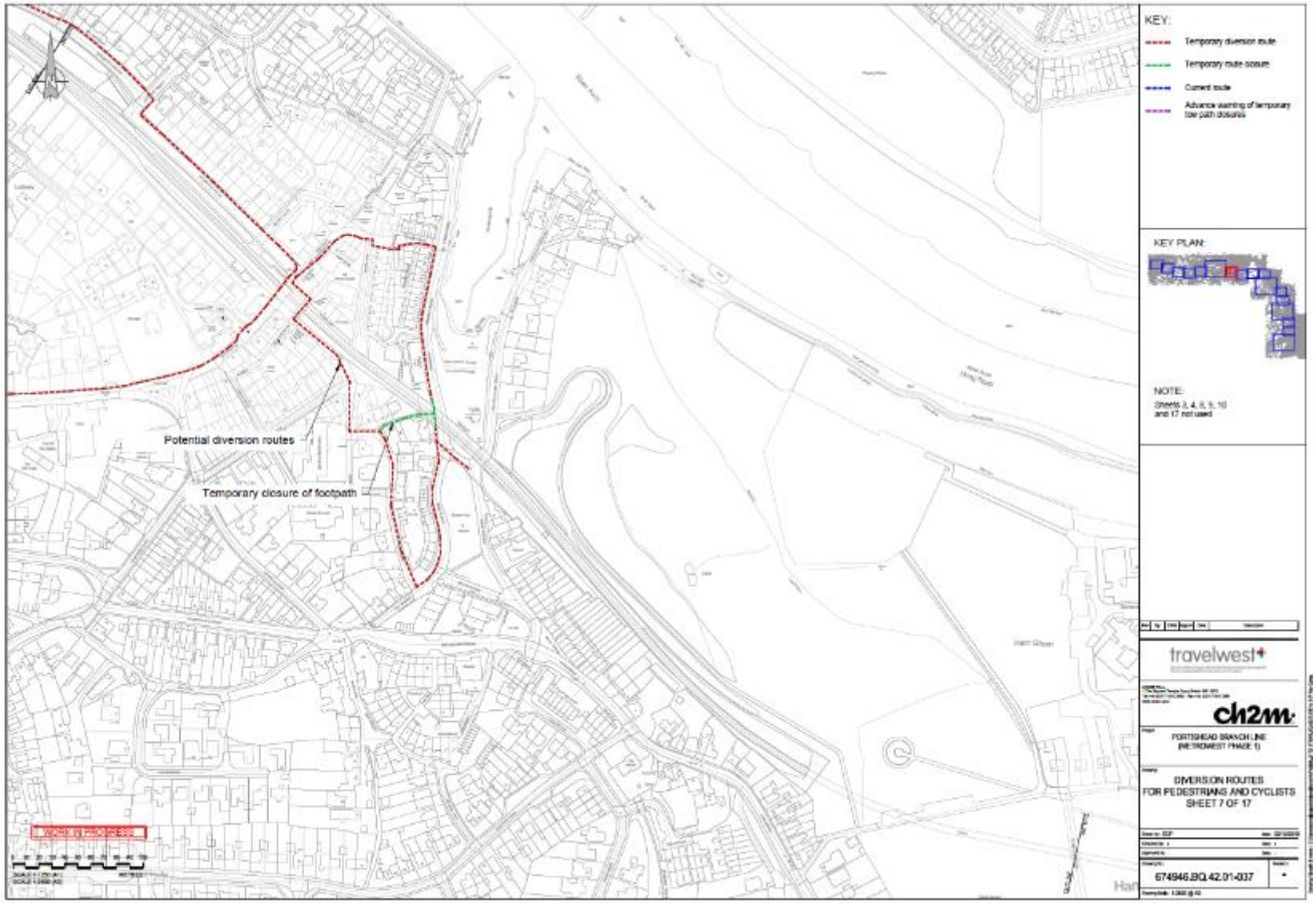


FIGURE 8.9

Diversion onto Clanage Road following temporary closure of Avon Gorge tow path (Drawing 1)

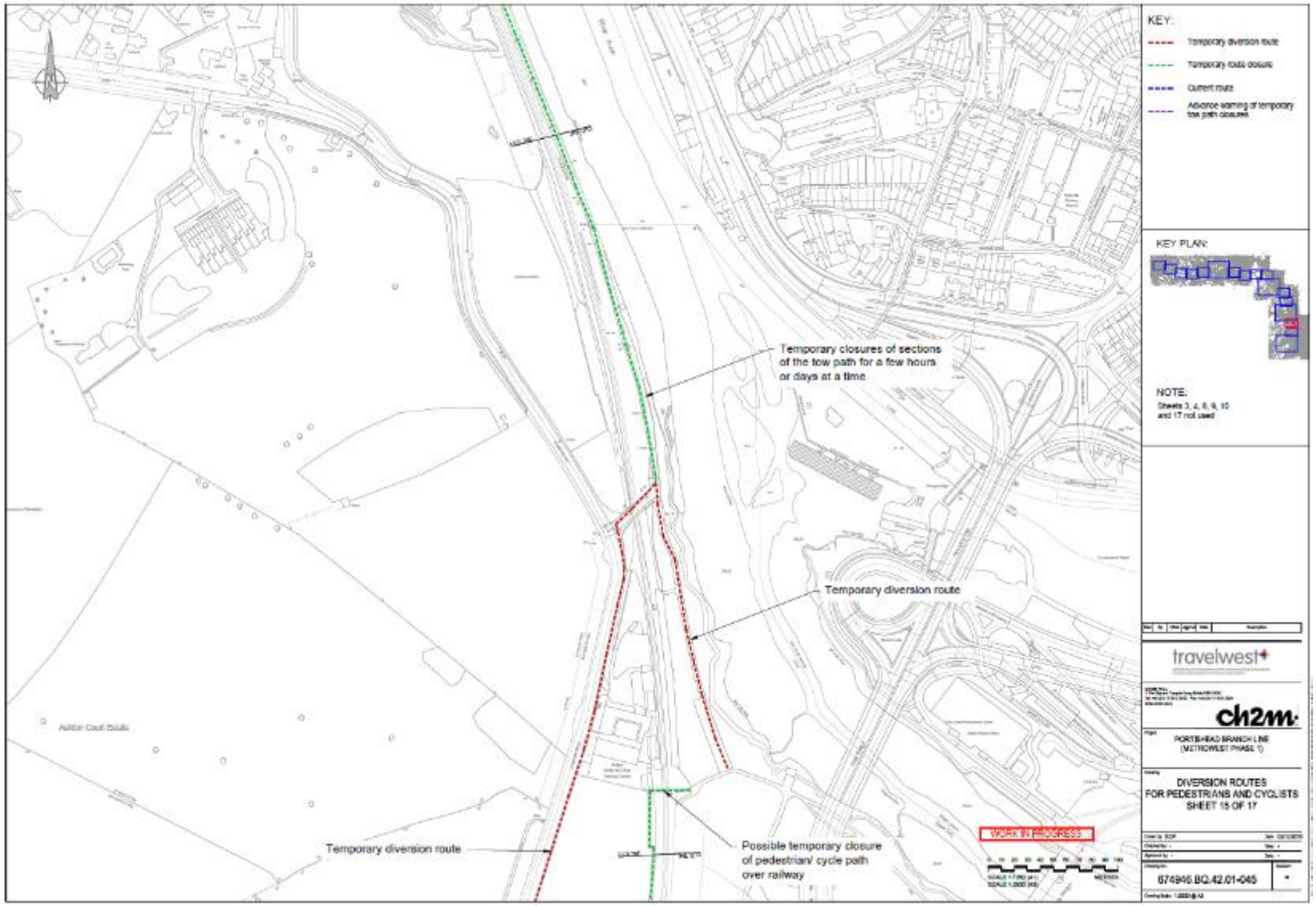
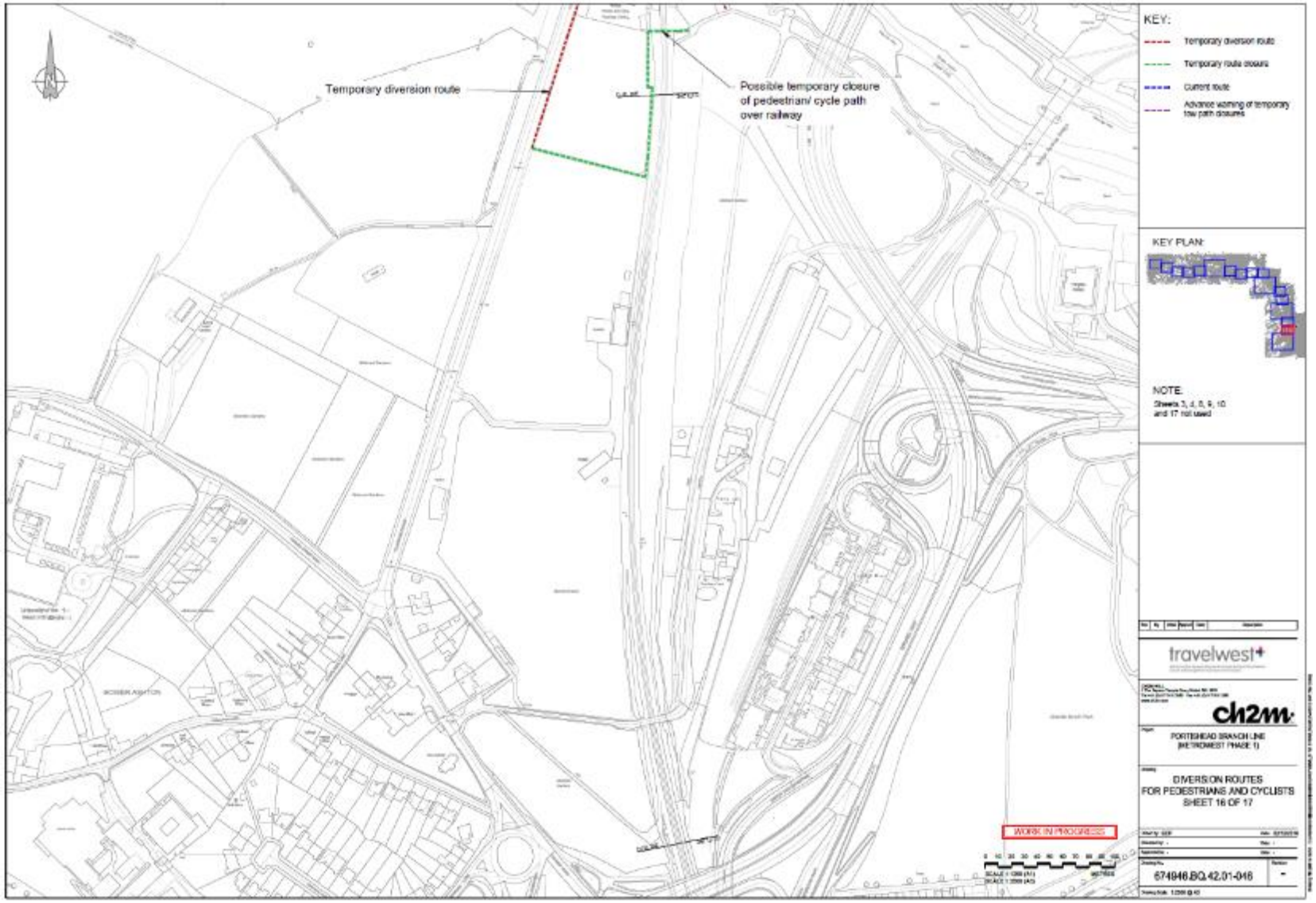


FIGURE 8.10

Diversion onto Clanage Road following temporary closure of Avon Gorge tow path (Drawing 2)



8.8 Summary of impacts

Whilst much of the detail relating to the construction works is still evolving and subject to further discussion, the works will involve the need for a number of compounds and different access points. Although it is difficult to ascertain the number of construction related trips and deliveries to these sites, it is possible to provide details of the locations to be effected. This analysis suggests that:

- The greatest impacts will be at the sites of the proposed stations in Portishead and Pill, construction of the new Trinity Primary footbridge, Lodway Farm, Avon Road, the works required at Pill Tunnel and Ashton Vale Road/Winterstoke Road junction.
- A medium level of impact is expected at Sheepway, the Portbury Hundred, Portbury Dock and Bower Ashton; and,
- The lowest level of impact is expected at the micro-compounds within Avon Gorge.

Section 9
Mitigation

9.1 Introduction

The previous section assessed the potential impact of the scheme on the local highway network and sustainable journeys and identified certain issues at specific locations. This part of the TA examines the effectiveness of the measures to mitigate the identified concerns. As in previous sections of this TA, 2019 has been used throughout as a proxy for the 2021 opening year.

9.2 Highway mitigation

9.2.1 Junctions

Previous sections in the TA identified that the impact of the scheme is unlikely to have a major detrimental impact on the capacity and operation of the assessed junctions. This is a reflection that most origin and destination journeys to and from the stations will be spread across the local highway network and will not be concentrated at specific locations. On this basis, mitigation is not proposed.

9.2.2 Links

The assessment also indicates that there will not be a detrimental impact to local highways other than the potential for increased levels of on-street parking. Section 9.4 outlines the recommended parking control mitigation which should ensure the operation of the highways surrounding the station sites will not be impeded by parking levels.

9.3 Parking control mitigation

Based upon the results of the parking survey and the analysis of likely parking demand, a certain level of parking control mitigation is required around the stations. These controls would need to be proportionate to balance existing demand from businesses and residents but also to prevent opportunistic parking particularly from users who are reluctant to pay the minimum level of parking changes.

9.3.1 Portishead car parking mitigation

Table 9.1 summarises the recommended level of parking control for Portishead station. The roads that have been identified are in close proximity to the station within 400 metres of the furthest station car parking space and could be impacted by users unwilling to pay the parking charges.

TABLE 9.1
Recommended Parking Mitigation for Portishead

Street	Likely Parking Demand	Mitigation
Harbour Road (from Quays Avenue to Newfoundland Way)	Existing significant demand for on-street parking from local businesses and health centre	Double yellow line
Haven View (from Harbour Road to Haven Lodge)	Existing significant demand for on-street parking from local businesses and health centre	Waiting restrictions to 2 hours.
Quays Avenue (from Harbour Road to Wyndham Way)	Close proximity to the station will result in a significant level of on-street parking	Double yellow line

TABLE 9.1
Recommended Parking Mitigation for Portishead

Street	Likely Parking Demand	Mitigation
Phoenix Way (from Quays Avenue to Marjoram Way)	Close proximity to the station will result in a significant level of on-street parking. It is noted that the number of parking bays along Phoenix Way provides a restraint on the level of on-street parking	Double yellow line (except designated parking bays)
Galingale Way (from Quays Avenue to Peartree field)	Close proximity to the station will result in a significant level of on-street car parking.	Single yellow line with limited application of waiting
Peartree field	Close proximity to the station will result in a significant level of on-street car parking.	Single yellow line with limited application of waiting
Tansy Lane	Close proximity to the station will result in a significant level of on-street car parking.	Requires adoption by the highway authority. Single yellow line with limited application of waiting
Camomile Way	Close proximity to the station will result in a significant level of on-street car parking.	Requires adoption by the highway authority. Single yellow line with limited application of waiting
Malin Parade	Close proximity to the station will result in a significant level of on-street car parking.	Requires adoption by the highway authority. Single yellow line with limited application of waiting
Biscay Drive	Close proximity to the station will result in a significant level of on-street car parking.	Requires adoption by the highway authority. Single yellow line with limited application of waiting

9.3.2 Pill car parking mitigation

Table 9.2 shows the recommended mitigation for Pill. The roads that have been identified for mitigation are located in close proximity to the station and are generally within 200 metres of the furthest available car parking space. In addition, the recommended roads reflect local topography where significant inclines on walking routes to and from the station will have an additional bearing.

TABLE 9.2
Recommended Parking Mitigation for Pill

Street	Likely Parking Demand	Mitigation
Monmouth Road (from Crusty Lane to Station Road)	Close proximity to the station will result in a significant level of on-street car parking.	Double yellow lines
Station Road (Monmouth Road to Sambourne Lane)	Close proximity to the station will result in a significant level of on-street car parking.	Double yellow lines
Station Road (Sambourne Lane to Heywood Road)	Retain visibility from development site on Station Road	Double yellow line
Station Road (New Road to Church Walk)	Close proximity to the station will result in a significant level of on-street car parking.	Double yellow lines
Sambourne Lane (from Station Road to the Health Centre front entrance)	Close proximity to the station will result in a significant level of on-street car parking.	Double yellow lines
Chapel Road/New Road/Myrtle Hill (gyratory)	Close proximity to the station will result in a significant level of on-street car parking.	Double yellow lines

9.3.3 Other mitigation

In addition to above, other mitigation is recommended. The provision of keep clear H bars should be provided for private access to properties and businesses where requested. A monitoring regime for a period of three years after the station openings should be undertaken. This would take the form of parking beats over a day at set intervals and should ascertain the extent of any on-street parking that may be associated with station users.

9.4 Public transport mitigation

There are currently no proposals in place to amend existing bus services outlined in section 3. It is the responsibility of NSC to liaise with the relevant bus operators to ensure that the various bus services meet the strategic needs of the authority.

9.5 Walking and cycling mitigation

The scheme proposes mitigation measures that would enhance the walking and cycling environment, particularly along desire lines, in the vicinity of the stations. These are summarised in Table 9.3.

TABLE 9.3
Recommended walking and cycling mitigation

Location	Mitigation	Rationale
Phoenix Way/Quays Avenue/Harbour Road	Realignment of Quays Avenue and construction of new roundabout which also includes controlled parallel crossings on the Harbour Road and Pheonix Way arms.	This would address the severance impact currently created by constant traffic flows at Phoenix Way/Quays Avenue/Harbour Road junction
Trinity Primary School	Provision of a footbridge compliant with the Equalities Act 2010	The current permissive path will be severed by the scheme. The construction of a disabled compliant footbridge would formalise this main pedestrian and cycling route to and from Trinity Primary School
Quays Avenue (between the station and Serbert Way)	Extension of the shared footway and cycleway on the west side of Quays Avenue	The audit identified the pedestrian and cycle route is discontinuous along Quays Avenue and would require users to use an informal crossing point closer to Wyndham Way. This measure would mean pedestrians and cyclists are 'funnelled' through the toucan crossing near the station.
Quays Avenue (between the station and Serbert Way)	Existing traffic island to be replaced with a pedestrian island	This measure represents an improvement in the crossing point across Quays Avenue and reflects the increase in NMU movements likely to take place.
Royal Portbury Dock Road	Improvements to existing bridleway uncontrolled crossing point	Improvements would have beneficial impacts for pedestrians and cyclists (as well as equestrians)

9.6 Construction Impact Mitigation

The **Construction Traffic Management Plan (CTMP**) in **Appendix K** identifies five areas of potential mitigation. These being:

- Delivery routes;
- Management of abnormal loads;

- Phasing of construction and operating periods;
- Traffic management measures within compounds including parking; and
- Local traffic management measures relating to temporary or partial local highway network closures.

9.6.1 Delivery routes

Table 9.4 and Figures 9.1 to 9.3 outline the recommended routes for the delivery of materials. These routes take account weight restrictions, the capacity of the local highway network to accommodate HGV movements where required and the need to minimise the impacts on residential neighbourhoods, local businesses, local schools and other services.

TABLE 9.4
Description of the main construction delivery routes

Delivery Route	Description
1	Exit Junction 19 of the M5 then follow the Portbury Hundred (A369), crossing over the B3124/Sheepway roundabout and then turning right at the A369/Quays Avenue roundabout. The route ends at a site just to the south of the Harbour Road/Phoenix Way roundabout.
2	Exit Junction 19 of the M5 then follow the Portbury Hundred (A369) until turning right onto Sheepway at the roundabout with the B3124/Sheepway. Follow Sheepway until the bridge heading over the railway line.
3	Exit Junction 19 of the M5 then travel northbound on the Royal Portbury Dock road. Then turn right onto Gordano Way at the roundabout, and then turn right onto Marsh Lane. The entrance of the site is then accessed at the second lane on the left.
4	Exit Junction 19 of the M5 then travel southbound on Martcombe Road (A369) and take the first left onto Priory Road. Travel on Priory Road which leads onto Lodway, and then follow until it turns onto Heywood Road. Continue along Heywood Road and turn left onto Mount Pleasant. Continue along Mt. Pleasant, followed by Underbanks (going under the railway underpass) and then onto Myrtle Hill and Marine Parade. Continue on Marine Parade until reaching the junction with Avon Road. At this junction turn right onto Avon Road and then left onto Severn Road. It should be noted that the roads in the latter half of this journey are narrow and thus may cause an issue for large vehicles.
5	Exit Junction 19 of the M5 then travel southbound on Martcombe Road (A369) until turning left at the junction with Pill Road. Travel northbound along Pill Road until it leads onto Ham Green. Turn right at the roundabout onto Macrae Road. Travel along Macrae Road until turning right onto Hart Close followed by a left onto Chapel Pill Lane. The site can then be accessed by taking the first right off Chapel Pill Lane onto a track.
6	Leave Junction 18 of the M5 and then proceed along the Portway (A4) until taking the A3029. Leave the A3029 and turn right to go underneath Ashton Road (A370) and turn right. Continue onto Clanage Road.
7	Leave Junction 18 of the M5 and then travel along the Portway (A4) until taking the A3029 (Brunel Way over the Cumberland Basin). Follow the A3029 southbound until turning right at the Barons Close roundabout onto the A369.
Avon Bridge Crane Route	Leave Junction 19 of the M5 and travel south east along Martcombe Road. Turn left onto Pill Road which leads onto Ham Green. Continue until turning left at Mt. Pleasant which leads onto Underbanks. Follow this around until it joins Marine Parade followed by Avon Road.

FIGURE 9.1

Recommended Construction Delivery Routes - Portishead

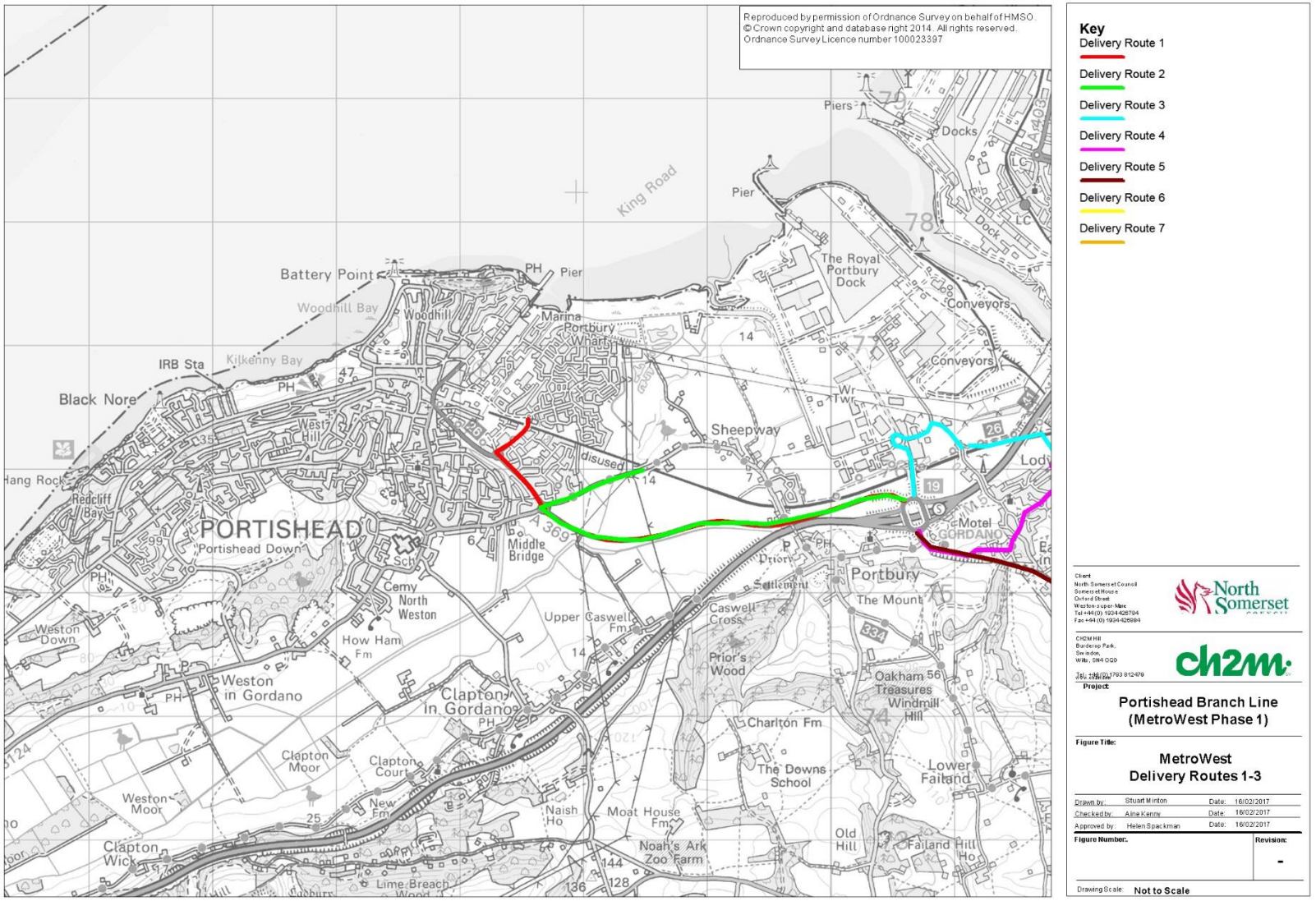


FIGURE 9.2

Recommended Construction Delivery Routes - Pill

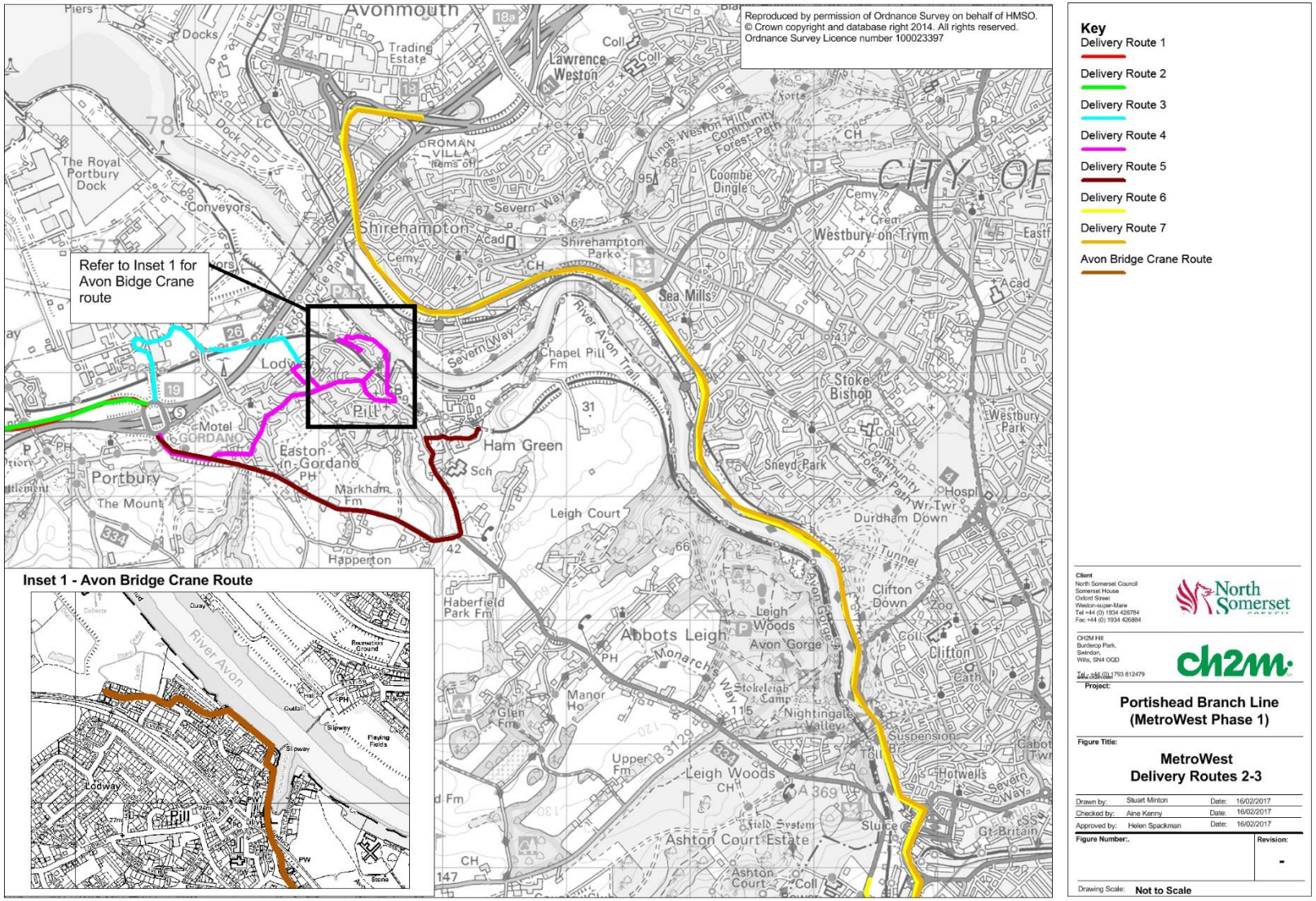
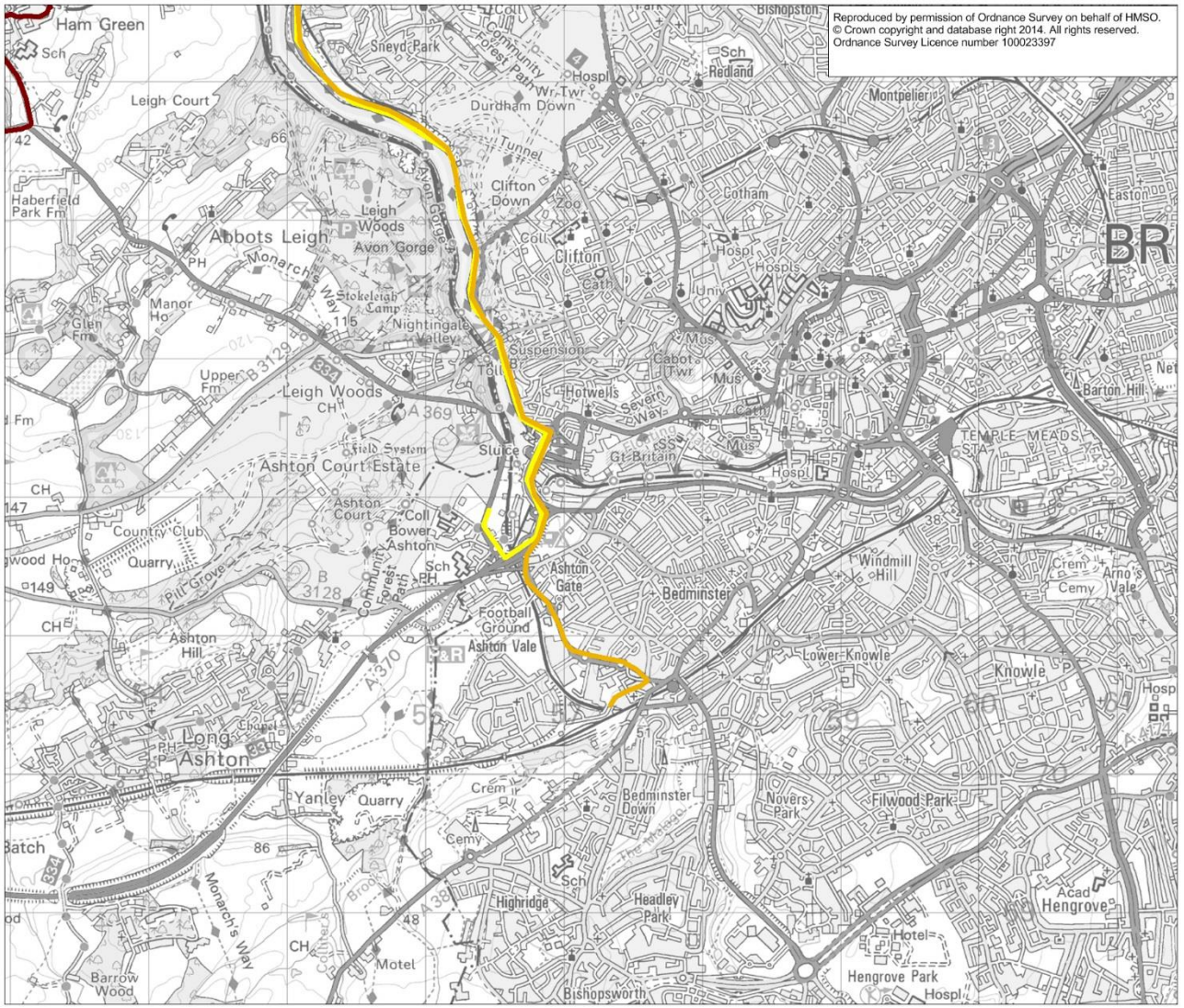


FIGURE 9.3

Recommended Construction Delivery Routes – Ashton Vale



9.6.2 Abnormal Loads

The construction works will involve the delivery of a number of abnormal loads and the movement of high volume materials. The extent and volume of these loads is currently not known but as the construction strategy is finalised, this information will become clearer.

Nevertheless, the following principles will apply to abnormal loads:

- To minimise disruption to traffic, abnormal loads will be grouped together and travel in convoy wherever possible;
- Careful consideration will be given to whether the highway network can accommodate abnormal loads. This may require, in some instances, loads being broken into smaller blocks to minimise impacts;
- Prior to transportation of the first abnormal load, an access route survey feasibility report will be undertaken;
- The transport of abnormal loads will be timed to be moved outside peak traffic hours to minimise disruption. These deliveries will be pre-arranged and will meet the requirements of the Police, the Local Highway Authority and Highways England; and
- Information will be provided to local residents, businesses and services about the delivery of abnormal loads. The most effective way of communicating this information will be agreed at the appropriate time.

9.6.3 Traffic Management Measures in Compounds

The following principles will apply:

- Preparation and submission of a construction compound transport plan. This will include a block plan, indication of access points and connections to the highway network, surrounding land uses, detail of security fencing and health and safety signage, and internal layout and parking;
- The construction site will be managed so that vehicles and pedestrians using site routes can move around safely. This will include separate entry and exit gateways and clearly marked crossings. Where access onto the highway is required, an assessment of a safe visibility splay will be undertaken;
- Vehicle movement on site will be controlled through designated parking areas and the location of storage areas so that delivery vehicles do not have to cross the site. Provision will be made for turning movement within each site so that, where possible, vehicles can leave and enter in forward gear; and,
- Additional control measures such as banksmen who will be responsible to control manoeuvres and gatekeepers will be in place. Internal speed limits will be restricted to 5mph.

9.6.4 Traffic Management Measures on the Highway Network

The final part of the mitigation will be a requirement to produce traffic management plans for the impacts on the highway network. The traffic management plans will provide an assessment of the following:

- Existing conditions. This includes all users of the highway including non-motorised users, key trip generators such as local schools and local services such as public transport;
- An assessment of the impacts. This may include a full temporary closure or a partial closure such as the use of temporary signals. Diverting pedestrian routes taking into account the importance of desire lines and the needs of those with physical or visual impairment;
- A review of the measures required. This should include any additional control measures that may be required such as manning of signals, notification and enforcement by local police; and
- The need for Travel Demand Management (TDM) measures. This includes the communication and dissemination of information to the public, businesses and local services. There may be a requirement to promote alternative routes or modes or recommendation not to travel at specific times.

Section 10

Transport Implementation Strategy

10.1 Introduction

This final part of the TA brings together possible measures that are being considered for implementation in support of the scheme. Some of the possible measures would be implemented prior to the opening of the scheme, whereas others would be undertaken post opening. Note though that the inclusion of individual measures, and their detailed implementation, is currently being reviewed and finalised.

10.2 Mitigation measures

Table 10.1 provides a summary of the possible infrastructure related measures that are being reviewed for their potential implementation, the results of which will be finalised in due course. For ease of reference, these have been described by geographical area.

TABLE 10.1
Mitigation measures to be implemented

Ref	Area	Location	Measure	Type of measure	Rationale	Timescale	Responsible
1	Portishead	Phoenix Way/Quays Avenue/Harbour Road	Realignment of Quays Avenue and construction of new roundabout which also includes controlled parallel crossings on the Harbour Road and Pheonix Way arms	Integral part of scheme	Level crossings not permitted by ORR	Prior to opening	Scheme Promoter
2	Portishead	Quays Avenue	Provision of a Toucan crossing on Quays Avenue west of the station site (entrance).	Integral part of scheme	To meet a pedestrian and cycle desire line from west of the station	Prior to opening	Scheme Promoter
3	Portishead	Quays Avenue	Provision of two bus stops (east bound and west bound) closer to the railway station	Integral part of scheme	To enable easier transfer between bus and rail services	Prior to opening	Scheme Promoter
4	Portishead	Quays Avenue (between the station and Serbert Way)	Extension of the shared footway and cycleway on the west side of Quays Avenue	Mitigation	To meet a pedestrian and cycle desire line from west of the station	Prior to opening	Scheme Promoter
5	Portishead	Quays Avenue (between the station and Serbert Way)	Existing traffic island to be replaced with a pedestrian island	Mitigation	To meet a pedestrian and cycle desire line from west of the station	Prior to opening	Scheme Promoter
6	Portishead	Trinity Primary School	Provision of a footbridge compliant with the Equalities Act 2010	Integral part of scheme	To formalise the crossing point across the railway and to provide access to and from the primary school	Prior to opening	Scheme Promoter
7	Portishead	Harbour Road (Between Quays Avenue and Newfoundland Road)	Double yellow lines	Mitigation	To reinforce use of the provided station car parks and minimise detrimental impacts on local businesses	Prior to opening	Scheme Promoter
8	Portishead	Haven View (From Harbour Road to Haven View)	Waiting restrictions to 2 hours	Mitigation	To reinforce use of the provided station car parks and minimise detrimental impacts on local businesses, residents and the health centre	Prior to opening	Scheme Promoter
9	Portishead	Quays Avenue	Double yellow line	Mitigation	To reinforce use of provided station car parks and minimise detrimental impacts on local residents	Prior to opening	Scheme Promoter

TABLE 10.1
Mitigation measures to be implemented

Ref	Area	Location	Measure	Type of measure	Rationale	Timescale	Responsible
10	Portishead	Phoenix Way (from Quays Avenue to Marjoram Way)	Double yellow lines (except existing parking bays)	Mitigation	To reinforce use of provided station car parks and minimise detrimental impacts on local residents	Prior to opening	Scheme Promoter
11	Portishead	Galingale Way (from Quays Avenue to Peartree Field)	Single yellow line with limited waiting period (e.g. between 12-00 to 13-00)	Mitigation	To reinforce use of provided station car parks and minimise detrimental impacts on local residents	Prior to opening	Scheme Promoter
12	Portishead	Peartree Field	Single yellow line with limited waiting period (e.g. between 12-00 to 13-00)	Mitigation	To reinforce use of provided station car parks and minimise detrimental impacts on local residents	Prior to opening	Scheme Promoter
13	Portishead	Tansy Lane	Adoption by the highway authority and single yellow line with limited waiting period (e.g. between 12-00 to 13-00)	Mitigation	To reinforce use of provided station car parks and minimise detrimental impacts on local residents	Prior to opening	Scheme Promoter
14	Portishead	Camomile Walk	Adoption by the highway authority and single yellow line with limited waiting period (e.g. between 12-00 to 13-00)	Mitigation	To reinforce use of provided station car parks and minimise detrimental impacts on local residents	Prior to opening	Scheme Promoter
15	Portishead	Malin Parade	Adoption by the highway authority and single yellow line with limited waiting period (e.g. between 12-00 to 13-00)	Mitigation	To reinforce use of provided station car parks and minimise detrimental impacts on local residents	Prior to opening	Scheme Promoter
16	Portishead	Biscay Drive	Adoption by the highway authority and single yellow line with limited waiting period (e.g. between 12-00 to 13-00)	Mitigation	To reinforce use of provided station car parks and minimise detrimental impacts on local residents	Prior to opening	Scheme Promoter
17	Sheepway to Pill	National Cycle Network 26	Realignment of existing of NCN 26 and ensure it is constructed to the latest standards	Integral part of scheme	To accommodate railway alignment	Prior to opening	Scheme Promoter
18	Portbury	Royal Portbury Dock Road	Improvements to the existing bridleway uncontrolled crossing point	Integral part of scheme	To improve safety conditions for pedestrians and cyclists	Prior to opening	Scheme Promoter

TABLE 10.1
Mitigation measures to be implemented

Ref	Area	Location	Measure	Type of measure	Rationale	Timescale	Responsible
19	Portbury to Pill	Under the M5 bridge	Closure of existing bridleway and replacement with a new bridleway under the M5	Embedded Mitigation	To ensure a safe and appropriate route for horse riders as the existing bridleway will be partially required for the new railway alignment	Prior to opening	Scheme Promoter
20	Pill	Monmouth Road (from Crusty Lane to Station Road)	Double yellow lines	Mitigation	To reinforce use of provided station car parks and minimise detrimental impacts on local residents and businesses	Prior to opening	Scheme Promoter
21	Pill	Station Road (Monmouth Road to Sambourne Lane)	Double yellow lines	Mitigation	To reinforce use of provided station car parks and minimise detrimental impacts on local residents, health centre and businesses	Prior to opening	Scheme Promoter
22	Pill	Sambourne Lane (from Station Road to the Health Centre front entrance)	Double yellow lines	Mitigation	To reinforce use of provided station car parks and minimise detrimental impacts on local residents, health centre and businesses	Prior to opening	Scheme Promoter
23	Pill	Station Road (Sambourne Lane to Heywood Road)	Double yellow lines	Mitigation	To reinforce use of provided station car parks and minimise detrimental impacts on local residents, health centre and businesses	Prior to opening	Scheme Promoter
24	Pill	Station Road (New Road to Church Walk)	Double yellow lines	Mitigation	To reinforce use of provided station car parks and minimise detrimental impacts on local residents, health centre and businesses	Prior to opening	Scheme Promoter
25	Pill	Chapel Row/New Road/Myrtle Hill Gyratory	Double yellow lines	Mitigation	To reinforce use of provided station car parks and minimise detrimental impacts on local residents, health centre and businesses	Prior to opening	Scheme Promoter

TABLE 10.1
Mitigation measures to be implemented

Ref	Area	Location	Measure	Type of measure	Rationale	Timescale	Responsible
26	Pill	Ham Green/Macrea Road	Provision of a ghost island	Integral part of scheme	To facilitate HGV movement towards the Pill Tunnel access route	Prior to construction works	Scheme Promoter
27	Ashton Vale	Ashton Vale Road/Winterstoke Road junction	Extension of left-turn lane on Winterstoke Road northbound and upgrade of the mode of control of traffic signals to MOVA. Installation of a replacement pedestrian/cycle ramp to the north of the level crossing to connect pedestrians and cyclists to Ashton Road and the existing network of at grade and subway footpaths and cycle paths.	Integral part of scheme	To improve access to Ashton Vale industrial estate	Prior to opening	Scheme Promoter
28	Ashton Vale	Barons Close Pedestrian Crossing	Closure of existing pedestrian crossing across the railway line with a replacement route.	Integral part of scheme	To improve safety for pedestrians	Prior to opening	Scheme Promoter
29	Parking (Generally)	In the vicinity of Portishead and Pill Railway Stations	Post implementation monitoring of parking	Mitigation	To measure effectiveness of parking provision	Post implementation for 2 years	Scheme Promoter

10.3 Outline Construction Traffic Management Plan (CTMP)

The Outline Construction Traffic Management Plan is attached in **Appendix K** of the TA. The aim of the CTMP is to outline the specific transport impacts arising from the construction works and to provide a framework for addressing these impacts. The document sets out the principles that will be followed to manage construction traffic during the works.

The Outline CTMP comprises the following:

- **Overview of the construction works** – This section provides a summary of the main construction activities;
- **Access points and compounds**– The various access points and compounds are detailed;
- **Traffic generation and transport impacts** – The scale of the impact has been assessed for each identified location; and
- **Mitigation**– Measures to be adopted to minimise the construction impacts on the highway, users and local residents and businesses.

10.4 Outline station travel plans

10.4.1 Overview

To encourage and reinforce sustainable journeys, outline station travel plans have been prepared and are presented in **Appendix N**. Travel plans are documents that are intended to manage travel to and from key trip generating places and as such are required by NPPF.

The travel plans presented in the appendix have outline status. This means they provide a basis for the detailed travel plans that can be drawn up when the stations open. Nevertheless, the documents provide a framework for managing the travel planning process and the scheduling of specific measures. Both the outline station travel plans for Portishead and Pill comprise:

- **Policy background** – Demonstrates the links between the travel plans and the policy context;
- **Station characteristics** - This outlines the station characteristics in terms of layout and the expected demand levels. It describes the facilities to be provided for the different methods of accessing the station;
- **Aims and objectives** – Provisional aims and objectives are set out for each station and the likely level of use;
- **Action plan**– Outlines the indicative actions required to meet the aims and objectives; and
- **Monitoring and review** – The final section provides an overview of how the travel plan should be monitored and updated.

10.4.2 Main elements of the Action Plan for Portishead Station

Table 10.2 summarises the main actions that have been identified for the outline station plan.

10.4.3 Main elements of the Action Plan for Pill Station

Table 10.3 summarises the main actions that have been identified for the outline station plan.

TABLE 10.2
Recommended actions in the Portishead Station Outline Travel Plan

Objective	Action Ref	Action	Timescale	Impact	Cost
48% people walking to the station	A1	Review walking routes to the station and identify infrastructure improvements which could encourage walking.	Before opening	High	High
4% people cycling to the station.	B1	Review cycle access routes in the vicinity of the station to identifying and implementing improvements to cycling infrastructure.	Before opening	High	High
	B2	Ensure as part of the station design, good surveillance and lighting for the cycling parking area	Before opening	Low	Medium
	B3	Generate awareness of secure cycle parking through promotion on the station (posters, signage on secure compound).	Station opening	Low	Low
	B4	Make local cycling maps available at the station and other key centres, including online.	Station opening	Low	Low
	B5	Establish a station-based Bicycle User Group (BUG) - possibly linked to an existing group..	Post opening	Medium	Low
Ensure that bus travel to the station is a realistic option for passengers	C1	Liaise with bus operators about the need to connect to with the station and improve services including existing frequency	Before and after opening	Medium	Medium
	C2	Ensure information about bus times is easily available at bus stops, the station and online. Include information on connections with trains	Before and after opening	Medium	Low
	C3	Ensure information about bus times is easily available at bus stops, the station and online. Include information on connections with trains	Before and after opening	Medium	Low
30% driving to and from the station	D1	Investigate the feasibility of providing car share priority spaces in a prominent area of the car park	Before and after opening	High	Low
	D2	Promotion of Travelwest car sharing scheme	After opening	Low	Low
Maximise awareness and options for using the new rail service	E1	Provide incentives for local residents to try the new rail service, for example discounted tickets in the opening week.	After opening	High	Medium
	E2	Provide information on new rail services to residents and businesses in Portishead	After opening	Medium	Low
	E3	Provide local residents and businesses with information on travel options to the station, including cycling, bus services and local car sharing schemes.	After opening	Medium	Low

TABLE 10.3
Recommended actions in the Pill Station Outline Travel Plan

Objective	Action Ref	Action	Timescale	Impact	Cost
46% people walking to the station	A1	Review walking routes to the station and identify infrastructure improvements which could encourage walking.	Before opening	High	High
3% people cycling to the station.	B1	Review cycle access routes in the vicinity of the station to identifying and implementing improvements to cycling infrastructure.	Before opening	High	High
	B2	Ensure as part of the station design, good surveillance and lighting for the cycling parking area	Before opening	Low	Medium
	B3	Generate awareness of secure cycle parking through promotion on the station (posters, signage on secure compound).	Station opening	Low	Low
	B4	Make local cycling maps available at the station and other key centres, including online.	Station opening	Low	Low
	B5	Establish a station-based Bicycle User Group (BUG) - possibly linked to an existing group.	Post opening	Medium	Low
Ensure the route to bus stops is attractive as possible	C1	Linked with A1 above, ensure the route to and from the nearest bus stops to the station is attractive and safe to use.	Before and after ppening	Medium	Medium
37% driving to and from the station	D1	Investigate the feasibility of providing car share priority spaces in a prominent area of the car par	Before and after opening	High	Low
	D2	Promotion of Travelwest car sharing scheme	After opening	Low	Low
Maximise awareness and options for using the new rail service	E1	Provide incentives for local residents to try the new rail service, for example discounted tickets in the opening week.	After opening	High	Medium
	E2	Provide information on new rail services to residents and businesses in Pill	After opening	Medium	Low
	E3	Provide local residents and businesses with information on travel options to the station, including cycling, bus services and local car sharing schemes.	After opening	Medium	Low

10.5 Summary of key issues

In this section, the various measures required to support the transport related impacts of the scheme have been brought together. These identify:

- The range of physical interventions that need to be put in place before the scheme opens. Some of these will facilitate sustainable trips to and from the station. Others will mitigate some of the operational impacts to the local highway network;
- There will be specific locations and routes along the scheme alignment which will have a greater level of impacts. The mitigation in the construction traffic management plan show how the impacts will be mitigated; and
- The outline travel plans provide a framework for promoting sustainable trips to and from the stations and ensured it is maintained.

Section 11

Conclusions and Recommendations

11.1 Summary

11.1.1 Application and TA Coverage

This TA has described the analyses undertaken to assess the transport effects of the MetroWest Phase 1 DCO scheme where it is proposed to reopen the Portishead Branch Line with stations at Portishead and Pill in North Somerset.

The MetroWest Phase 1 project comprises the delivery of infrastructure and passenger train operations to provide for a:

- half-hourly service on the Severn Beach line;
- half-hourly service at local stations on the Bath to Bristol line; and
- reopened Portishead Branch Line with stations at Portishead and Pill, initially with an hourly service.

This will entail upgrading the existing freight only line between Parson Street junction and Portbury Dock junction (Pill), reinstatement of the current disused line (Portishead Branch Line) between Portbury Dock junction and Portishead, and various minor works to facilitate the operation of the Phase 1 train services. A new station will be required at Portishead and the former station at Pill will be re-opened.

The Portishead Branch Line (MetroWest Phase 1) Project meets the definition of a nationally significant infrastructure project ("NSIP") for the purposes of the Planning Act 2008. Under the Act, planning permission for the Project will be sought by NSC as the applicant through a DCO. The DCO application covers a number of elements which have been outlined in section 11.1.4 below.

Other works required on the Portbury Freight Line will be undertaken by Network Rail under their permitted development rights and will not form part of the DCO application.

Note that the assessments presented in this report are based on a different, and more intensive half-hourly rail service pattern than the hourly patterns that is currently proposed. The Environmental Statement and associated documents will report updated transport assessments.

11.1.2 Objectives

The scheme, whilst of a local impact, will provide a key element in improving railway passenger capacity on the Great Western railway network with a re-established connection between Portishead and Bristol. The scheme will help to deliver a modal shift from the private car to a more sustainable mode, which should help to reduce congestion on both the local and strategic road networks and deliver associated benefits in terms of safety, reliability, CO_2 reduction, social inclusion and should help to contribute towards sustainable economic growth both locally and across the wider sub-region.

11.1.3 Existing Conditions

The TA provides an overview of some of the existing land use considerations that need to be considered across the scheme. This covered Portishead, Pill, Portishead to Pill and Ashton Vale Level Crossing.

11.1.3.1 Portishead

Portishead town has undergone considerable redevelopment and expansion over the last decade with several thousand new homes built at Portishead Vale, the Village Quarter and Port Marine (which is currently in its final phase of build). The whole area was formerly dominated by heavy industry, but this was all closed by the late 1980s. The development since has been typically high density with a modern urban

design layout and appearance. The population of Portishead is now over 27,000 (Census 2011) and is forecast to exceed 30,000 before the project opens in 2021. Portishead is a successful and vibrant town with an active high street and has strong socio-economic links with Bristol, which serves as the main centre of employment.

11.1.3.2 Portishead to Pill

The section of line between Pill and Portishead is currently disused. The terrain between the two locations is generally low-lying coastal plain crossed by a number of land drains and small rivers and at risk from tidal flooding. The existing disused line passes through Sheepway and Portbury Port to the north before passing under the M5 into Pill.

11.1.3.3 Pill

Pill is an historic village, with Easton-in-Gordano to the south west and Ham Green to the east. The three villages have little green space between them and therefore effectively form one urban settlement. The disused Pill station, which is to be re-opened, is located in the heart of the historic centre of the village. The population of Pill, Easton-in-Gordano and Ham Green is about 6,180 (Census, 2011).

11.1.3.4 Portbury Dock Junction (Pill) to Parson Street

The section of railway (Portbury Fright Line) from Portbury Dock junction (Pill) to Parson Street junction is used by freight trains only. The Portbury Freight Line extends from Portbury Dock and south of the River Avon, passing through the Avon Gorge to join the main line to the South West of England between Ashton Gate and Parson Street Junction to the south of Bristol. Freight train data for a one month period between February and March 2016 revealed:

- Up to four freight trains ran during weekdays with up to two on weekends;
- Out of the 30 days, there were only freight train movements on 15; and
- Rail freight movements took place coincided with the off-peak and peak periods on the local highway network with resulting barrier down times at Ashton Vale Road.

The scheme proposals will directly impact on the existing Ashton Vale Road level crossing which provides access to an industrial estate off Winterstoke Road. A number of businesses are served by the access including Babcock Integrated Technology, Manheim Bristol, Avonline and ETM Contractors. Dedicated left- and right-turning lanes on Winterstoke Road accommodate vehicular access onto Ashton Vale Road where traffic is required to wait while freight trains pass.

11.1.4 Proposed Scheme

The scheme will entail upgrading the existing freight only line between Parson Street junction and Portbury Dock junction (Pill) and reinstatement of the current disused line between Portbury Dock junction and Portishead.

The following details the elements of the Project that form the DCO Application:

- Rebuild the disused Portishead to Pill line (5.45km) which will run from the junction of Quays Avenue and Harbour Road in Portishead to meet the existing Portbury Dock railway to the east of the M5 Motorway. From here, the line will run parallel to the existing freight line to a new junction with the existing operational railway line between Pill Viaduct and the western portal of Pill Tunnel.
- New station at Portishead including car parks and pedestrian and cycle link to the town centre.
- Realignment of Quays Avenue and its junction with Harbour Road (Portishead).
- A new fully accessible pedestrian bridge linking Trinity Primary School to the north of the Portishead Branch Line Railway to Galingale Way to the south.

- Construction of a temporary haul road on south side of, and parallel to, the Portishead Branch Line Railway, south of Fennel Road to the highway known as Sheepway.
- A new maintenance compound and road rail access point to the line from Sheepway.
- Construction compound and access from from Sheepway.
- Construction haul road on south side of, and parallel to, the Portishead Branch Line Railway, west from the highway of Sheepway to the proposed construction compound north of the Portbury Hundred highway.
- Construction compound between the Portbury Hundred highway and the Portishead Branch Line Railway west of the junction of Station Road with Portbury Hundred, Portbury.
- Permanent access from the Portbury Hundred highway to the field to the south of Portishead Branch Line Railway and west of Station Road, Portbury.
- Alteration to existing bridleway crossing at Royal Portbury Dock Road and alterations to National Cycle Route 26 at the Portishead Branch Line underbridge.
- Temporary vehicular Access from Marsh Lane east to the accommodation underbridge on the Portishead Branch Line Railway to the West of the M5 Motorway.
- Alterations to permissive path comprising part of National Cycle Route 26 at the Portishead Branch Line Railway underbridge beneath the M5 Motorway.
- New bridleway under the M5 Motorway Avonmouth Bridge east to the existing National Cycle Route 41 from Pill to Avonmouth.
- Temporary construction compound at Lodway Farm with highway access from Marsh Lane east via the Portishead Branch Line Railway Bridge under the M5 Motorway and also access via The Breaches (Pill).
- Demolition and construction of the Avon Road Underbridge in Pill.
- Demolition of existing garages, temporary construction compound and re-construction of replacement garages on the north side of the Portishead Branch Line Railway to the South of Avon Road, Pill.
- Demolition of wall fronting residential property known as Victoria House, Marine Parade, Pill to facilitate access for crane to construct the underbridge to the south of Avon Road, Pill.
- Reopening of former station at Pill and new car park.
- New Pill Junction between Pill Viaduct and the western portal of Pill tunnel where the existing and new railway tracks combine to the single track.
- Railway engineering works from Pill Junction, to the western portal of Pill Junction.
- 6 no. micro- compounds along Avon Gorge only accessible by foot.
- A new permanent vehicular maintenance road rail access point from the highway of Clanage Road, Bower Ashton to the Portishead Branch Line Railway.
- Site for the new PSP building, compound, road rail access point and associated access road from the highway of Chapel Pill Lane, Ham Green North of the eastern portal of Pill Tunnel.
- Construction compound and rail access off Chapel Pill Lane.

- Route for new electricity cables to connect the existing Distribution Network Operator's cables at Chapel Pill Lane overbridge, Ham Green, to the Portishead Branch Line Railway at the site for the PSP off Chapel Pill Lane.
- A new vehicular maintenance road rail access point from the highway of Clanage Road to the Portishead Branch Line Railway.
- Temporary construction compound at Clanage Road in Bower Ashton.
- Temporary diversion of the public footpath from Clanage Road to River Avon Towpath.
- New pedestrian and cycle ramp to the west of the Portishead Branch Line Railway and linking Ashton Vale Road with Ashton Road (A370) providing a replacement pedestrian and cycling route following the closure of Barons Close (Container Crossing) pedestrian crossing.
- Improvement works at the Winterstoke Road/Ashton Road junction and Ashton Road level crossing which will include extension of the left-turn lane on the northbound carriageway of Winterstoke Road and upgrading of mode of control of the signals to MOVA
- Replacement of the signalling equipment of the half kilometre section of railway from Portbury Dock to Portbury Dock Junction within the land of the Bristol Port Company.

The works described below form part of the MetroWest Phase 1 but are not proposed to be included within the application for the DCO since they can be undertaken by Network Rail using permitted development rights under Part 18 of the GDPO.

- Improvements to highway access at Pill tunnel and other locations;
- Partial reinstatement of the Down Relief line at Bedminster;
- New signals for the entire line between Temple Meads and Portishead;
- Additional signal at Avonmouth;
- Bathampton turn-back (track crossover and signalling);
- Works to the Freightliner Yard; and
- Repair works to underbridges and overbridges.

11.2 Impacts of Scheme

Note that these assessments are based on a more intensive half-hourly rail service pattern than the hourly patterns that is currently proposed. The ethos of railway demand is the same for the hourly service pattern, though ultimate demand levels are slightly lower. The Environmental Statement and associated documents will report updated transport assessments

11.2.1 Strategic Operational Impacts

The distribution and assignment of traffic to and from Portishead and Pill stations has been informed by the outputs from the Rail Demand Model (RDM) and the GBATS4 Strategic model covering the study area.

11.2.1.1 Railway Impact

The calculation of the trips to and from Pill and Portishead stations have been informed by the output of the passenger Rail Demand Model (RDM). For Portishead station, the data shows that, in the 10 year period assessed (2019 to 2029), demand at the station will increase across all modes of transport i.e. walking, bus, car, car drop-off, bicycle and taxi. The data highlights the importance of sustainable modes particularly for

the shorter distance trips to and from the station with cars being used for longer trips. The number of bus-related trips remain comparatively low.

For Pill station, a similar trend is noted with demand at the station predicted to increase over the 10 year assessment period.

11.2.1.2 Strategic Highway and Bus Impacts

Changes in amount of travel

The number of trips associated with the scheme have been modelled for "Do Minimum" and "Do Something" scenarios for the years 2021 and 2036. The model suggests that the aggregate total of rail and bus trips and car PCUs will increase from the Base Year (2013) to 2021 Do minimum (~9%) and from the Base Year to 2036 Do minimum (~20%). The increase in the number of public transport modes (rail and bus) shows the greatest change from the Base Year to the 2021 Do Minimum and Do Something scenarios where bus trips increase by approximately 25% while train trips increase by approx. 15%. Trips by rail and bus show a further increase from the Base Year to the 2036 Do Minimum and Do Something scenarios with both rail and bus trips increasing by more than 25% for both scenarios, across all three peak periods assessed.

The analysis indicates that car demand will decrease, albeit slightly, from the Do Minimum to Do Something scenarios for both the 2021 and 2036 years and all time periods assessed. Bus trips also show a slight decrease from the 2021 Do Minimum to Do Something scenarios but show an increase from the 2036 Do Minimum to Do Something scenarios.

Changes in travel patterns (O-D)

The GBATS4 model has been used to predict trip changes to and from the Portishead area as a result of the scheme. The model suggests that the amount of travel to and from Portishead for both the 2021 and 2036 Do Minimum scenarios will increase for all time periods assessed by approx. 11% and 20% respectively. The modelling also predicts a slight increase from the Do Minimum to the Do Something scenarios for both assessment years for all three time periods.

Changes in Highway Use

The GBATS4 model predicts a general increase in traffic on the highway from 2013 to 2021 and further increases to 2036. Some notable reductions to assigned highway trips were observed at the M5 Avonmouth Bridge as a result of changes in trip patterns to and from Portishead. Some localised increases in highway trips as a result of re-routing in a congested network has also been predicted.

All future year modelling has considered forecast planning development which will have an impact on traffic volumes. The model suggests an increase in congestion levels associated with development growth in future years, but little change associated with the scheme.

Overall Highway Impacts

The increase in railway demand from the Base Year to Do Minimum and Do Something scenarios for both years and all time periods assessed are shown to have an impact on highway use. There will be a general increase in traffic levels from the Base Year to 2021 and further increases to 2036 associated with development growth. Some local reductions in traffic have been predicted for future years Do Minimum scenarios. There will be reductions in highway demand resulting from the scheme which correspond with an increase in rail demand. Overall, the model suggests an increase in highway congestion associated with development growth in future years but little change associated with the scheme.

11.2.1.3 Impact on Rail Freight

The scheme will result in freight trains sharing the line with passenger trains between Parson Street Junction and Pill Junction. The scheme has been designed so that there will be no adverse impact on rail freight operation.

11.2.2 Local Operational Impacts

11.2.2.1 Highway Impacts

Traffic counts have been undertaken at 10 junctions and 4 level crossings on the local highway network in order to obtain a baseline scenario (2015). For each junction and level crossing, a number of scenarios have been tested as follows:

- Baseline '2015' – Existing Traffic and Transport;
- The opening year '2019' – without the scheme [4]
- The opening year '2019' – with the scheme
- The horizon year '2029' – without the scheme
- The horizon year '2029' – with the scheme

The assessment of each junction indicates that the impact of the scheme has a minimal impact on the operation of the junctions for all scenarios tested. While it is observed that the Cabstand/Wyndham Way/High Street junction already operates beyond capacity, the model indicates that the scheme will not have a significant impact on its current operation.

The most notable impact is expected to occur at the Ashton Vale Road level crossing where an increase in the number of trains will result in an increase in the length of time the crossing will be closed for highway vehicles. This, in turn, will have an adverse impact on traffic flow on Winterstoke Road, Ashton Vale Road and on the operation of the signalised priority junction between Winterstoke Road and Ashton Vale Road.

For the 2015 Base Year AM peak model, the introduction of passenger trains is likely to result in the capacity of the left-turn lane on Winterstoke Road to be exceeded and the through route to the Ashton Vale underpass to be blocked. This situation is made worse with traffic growth in future years. For the 2015 Base Year PM peak model, there is predicted to be considerable queuing on Ashton Vale Road with traffic waiting to depart the Industrial Estate. This is likely to affect internal movement of vehicles within the estate.

11.2.2.2 Parking Impacts

Parking surveys were undertaken in the vicinity of Pill and Portishead stations. The demand at both locations has been predicted for 2019 (equivalent) and 2029. The assessment suggests that in 2019, the number of spaces proposed at Portishead station will be sufficient to meet the demand. However, in the 2029 scenario, the analysis suggests that parking demand will exceed the number of spaces provided by approx. 14 vehicles between 9am and 3pm during a typical weekday.

Analysis for Pill station indicates that the proposed carpark will be sufficient to meet the demand for both periods assessed.

The impact on on-street parking has also been assessed particularly as free on-street parking in close proximity to the stations may be more attractive than the pay-to-stay carparks. It is therefore likely that the streets within 400m of Portishead station and within 300m of Pill station will be particularly vulnerable to overspill parking or to users refusing to pay the parking tariff.

11.2.2.3 Impact on NMUs

An audit of the walking and cycling routes have been undertaken as part of the overall TA. A range of impacts have been identified which include impacts on NMUs at the Quays Avenue/Phoenix Way/ Harbour Road junction in Portishead, lack of a safe crossing point on Harbour Road, substandard access route

[4] Note that the scheme opening year is more likely to be 2021 than 2019. However, it is considered that the difference between 2019 and 2021 background traffic is likely to be minimal, so analysis using 2019 as the 'opening year' has been retained in this version of the TA

between Portishead station and the town centre, and substandard pedestrian and cycle facilities surrounding Pill Station.

There will also be significant impacts on the formal crossing point east of Portishead Station linking Trinity Primary School, on the northern side of the line, to the residential area to the south. Further east between Portishead and Pill, NCN 26 and Bridleway LA 15/21/10 will be impacted by the reopening of the line.

The closure Barons Close pedestrian crossing will have a significant impact on assess to the industrial estate for both pedestrians and cyclists.

11.2.2.4 Construction Impacts

The Construction Impact Assessment (CIA) has outlined the proposed location of all construction compounds, associated accesses and designated delivery routes to be used by construction traffic. The proposed scheme is likely to result in impacts, albeit on a temporary basis, on the operation of the highway network. The greatest impacts are expected at both stations, at the location of the proposed Trinity footbridge, and at the proposed construction compounds. The increase in HGVs is also likely to have an impact on the designated delivery routes particularly in the more urban locations (Pill, Portishead and Ashton Vale in particular) and along more rural narrow routes such as Sheepway and Chapel Pill Lane (access to compound at Pill Tunnel). The lowest level of impact is expected at the micro-compounds along the Avon Gorge which can only be accessed by foot.

11.2.3 Traffic Impacts

11.2.3.1 Highways

It has been identified that the impact of the scheme is unlikely to have a major detrimental impact on the capacity and operation of the assessed junctions.

11.2.3.2 Parking

A certain level of parking control mitigation is required in the vicinity of Portishead and Pill train stations. Mitigation in the form of double and single yellow line road markings have been considered on streets within 400m of Portishead station and 300m of Pill station. The provision of ‘Keep Clear’ H-bars at access points to private dwellings and businesses has also been considered where requested. A monitoring regime for a period of 3 years after the scheme opens has been suggested which will help ascertain the extent of any on-street parking that maybe associated with station users.

11.2.3.3 Public Transport

There are currently no proposals in place to amend existing bus services. It is the responsibility of NSC to liaise with the relevant bus operators to ensure that the various bus services meet the strategic needs of the authority.

11.2.3.4 NMUs

The scheme proposes a number of mitigation measures which will enhance the walking and cycling environment, particularly in the vicinity of the proposed stations.

The reconfiguration of the Phoenix Way/Quays Avenue/Harbour Road junction will incorporate tiger crossings on each arm. This will mitigate against the impact currently created by continuous traffic flows and will provide opportunities for NMUs to cross the road safely. A formal crossing point has also been proposed on Harbour Road which will meet the desire line to improve access to Portishead Marina and businesses along Harbour Road from the station.

One of the most significant impacts on NMUs resulting from the scheme occurs at a formal crossing point between Trinity Primary School and a residential area to the south of the line. Pedestrian counts have

demonstrated that this crossing point is heavily trafficked particularly during peak school hours with over 150 NMU two-way movements recorded in the school morning peak and over 200 two-way movements during school afternoon/evening peak. The introduction of passenger trains on the line will pose a significant risk to NMUs using this crossing. It is therefore proposed to construct a footbridge above the line in order to remove this risk.

Following the closure of Barons Close pedestrian crossing, a replacement pedestrian/cycle ramp to the north of the level crossing to connect pedestrians and cyclists to Ashton Road and the existing network of at grade and subway footpaths and cycle paths will be constructed.

11.2.3.5 Construction Impact

The scheme proposes a number of mitigation measures which will help reduce the impact on the highway network during the construction phase. The TA has accounted for the delivery of abnormal loads where a number of measures have been outlined in order to minimise the impact including the following: the division of larger loads to smaller, more manageable loads; undertaking route feasibility reports prior to delivery; delivery of abnormal loads outside peak hours; and the provision of information to local residents, local businesses and other services prior to delivery.

A construction compound transport plan should be prepared and submitted for each compound. This should indicate how the compounds will be managed i.e. management of vehicles and pedestrians, control of vehicle movement to and from the site, provision of parking and turning areas, and provision of areas for storage.

Furthermore, a Traffic Management Plan should be produced to help minimise the impact of construction traffic on the operation of the highway network.

In order to mitigate against impacts on designated PRoWs along the scheme during the construction phase, a number of temporary diversions will be implemented at various locations including Trinity footbridge, Sheepway, Royal Portbury Dock Road and Clanage Road.

11.3 Conclusions

The MetroWest Phase 1 principal business objectives are:

- To support economic growth, through enhancing the transport links to the Temple Quarter Enterprise Zone (TQEZ) and into and across Bristol city centre, from the Portishead, Bath and Avonmouth and Severn Beach arterial corridors;
- To deliver a more resilient transport offer, providing more attractive and guaranteed (future-proofed) journey times for commuters, business and residents into and across Bristol, through better utilisation of strategic heavy rail corridors from Portishead, Bath and Avonmouth, and Severn Beach;
- To improve accessibility to the rail network with new and reopened rail stations and reduce the cost (generalised cost) of travel for commuters, business and residents; and
- To make a positive contribution to social well-being, life opportunities and improving quality of life, across the three arterial corridors.

In addition, the MetroWest Phase 1 supporting objectives are:

- To contribute to reducing traffic congestion relative to a ‘Do Minimum’ scenario (as opposed to current levels of congestion) on the Portishead, Bath and Avonmouth, and Severn Beach arterial corridors;

- To contribute to enhancing the capacity of the local rail network, in terms of seats per hour in the AM and PM peak; and
- To contribute to reducing the overall environmental impact of the transport network.

The scheme supports these objectives, and where transport impacts have been identified for the Scheme, these should be considered against the objectives and need for the scheme that has been demonstrated. Three overriding factors summaries the effects of the scheme:

- The scheme complies with and is supported by the provisions of the NPS NN;
- The scheme will deliver a sustainable transport solution contributing towards the Government's aspirations for transport, society, the economy and environment; and
- The scheme is linear in nature, contained within the existing discontinued railway corridor, re-using previously developed land that has been safeguarded specifically for the Project in the applicable local development plans.

A strong level of national and local policy support and compliance, improvements to transport provision through increasing accessibility to the rail network and enhancing rail services across the sub-region, in combination with manageable and overall neutral transport impacts, provides strong support for granting consent for the scheme.

A number of possible measures that are being considered for implementation in support of the scheme. Note though that the inclusion of individual measures, and their detailed implementation, is currently being reviewed and finalised.

Note that the assessments in this Draft TA are based on a more intensive half-hourly rail service pattern than the hourly patterns that is currently proposed for the initial implementation of the scheme. The ethos of railway demand is the same for the hourly service pattern, though ultimate demand levels, and commensurate traffic impacts, are slightly lower. As such, the Draft RA as presented illustrates a worst-case situation that represents the potential future enhancement of the scheme to the full half-hourly service level on the Portishead branch line. The Environmental Statement and associated documents will report updated transport assessments prior to completion of the DCO process.