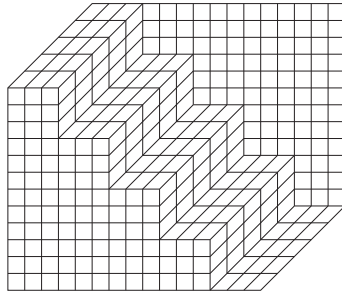


Technical Annex 8A Transport Assessment



Buro Happold

022961 Hayle Harbour Development

Transport Assessment

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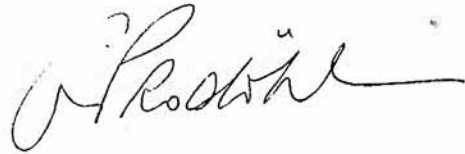
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date **21/11/07**

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1 Executive Summary

The proposal is to undertake comprehensive mixed-use development of land at Hayle Harbour, in the District of Penwith. This Transport Assessment updates and supersedes the draft document submitted in March 2006. Its scope has been the subject of discussion with the highway authorities.

The proposal is for a mix of employment, retail, leisure and residential development as an extension of the existing town. The development will be secured in four construction phases over a period of some 9 years.

The development site benefits from an allocation in the Local Plan for mixed-use development, subject to certain criteria including linkage with the existing town. A review of policy guidance indicates that accessibility is a key issue. The town itself benefits from a high level of public transport accessibility, reflecting its role as one of the District's main towns, and further improvement in the form of Park & Ride at St Erth is planned by the highway authority. Development as proposed will support further investment in public transport through increased demand for travel and the associated fare revenue. Opportunities to improve pedestrian links within and through the town are also included within the scheme.

The proposed development will offer living, working and shopping opportunities in one location, creating a sustainable integrated community. In parallel, additional services and facilities will be available to existing residents and visitors. Furthermore, new residents and visitors will enhance the viability of existing enterprise. In this way, the proposed development integrates well with the town. In physical terms, proposals for new crossings of the B3301 and new bridges between the quays will enhance the pedestrian environment within the town as a whole.

Whilst the development will generate not insignificant volumes of vehicle traffic, the form and location of the site are such that levels of traffic generation are relatively low for a development of this scale.

Impact assessment has been carried out of the critical junctions on the local road network, including those on the trunk road at either end of Hayle Bypass. At the request of the highway authority, the assessment considers the seasonal tourist peak and represents a worst-case but rare scenario – an overlapping of peak tourist traffic with peak development traffic. The assessment concludes that new proposed junctions will operate safely and without congestion even in the most onerous assessment scenario.

Development will increase the traffic flow through existing junctions with a consequent increase in peak hour congestion in places. Mitigation has been identified where feasible but parts of the network will be the subject of increased queuing under the worst-case traffic flow scenario tested.

Options for highway improvements to generate additional capacity to accommodate development traffic would not be appropriate in the context of current transport policy guidance. Whilst improvement can be implemented at the Loggans Moor junction with minimal environmental impact, mitigation for the effect of development traffic at other junctions will focus on demand-management – initiatives to reduce car traffic generation both from the development and from the town as a whole.

Demand Management is an accepted tool for achieving such a reduction in car use from the development. This strategy will be supported by the upgrading of transport infrastructure as part of the development.

In broader terms, the demand for travel associated with the new development will enhance the sustainability of existing rail and bus services; indeed investment in service improvements will be enabled by the increased demand for travel that the proposals will bring.

The proposed development is specifically designed to offer shopping and employment opportunities in proximity to and for existing residents of Hayle. Thus the development is designed to and will increase the 'containment' of the town and lead to a consequent reduction in existing car trips to other regional destinations.

Car Parking is provided within the development at a level broadly in accordance with the prevailing parking standards and accords with policy guidance. The demand for development-specific operational parking is difficult to assess in isolation, as operational parking needs of the site itself cannot be differentiated from the needs of the town as a whole. The development represents an extension to the town, with shops, restaurants and tourist facilities designed to enhance the existing offer to visitors.

The proposal provides for the parking needs of employment and residents on the site, with shared public parking facilities providing for the needs of all visitors. In this way, the development will not only support its own direct parking requirement but has the capacity to play a strategic role in a parking strategy for the town as a whole.

Travel Planning is promoted by the Government as a means of reducing car dependence of new development. The proposed development offers significant opportunities for Travel Planning and an appropriate Planning Condition to secure Travel Plans would be reasonable. Travel planning can be expected to secure tangible if modest reduction in the car mode share of the development. In parallel with other travel initiatives and parallel reduction in the car dependence of the town as a whole, scope exists to reduce car travel to a level that would enable development without any material effect on the highway network.

An assessment of the impacts of construction activities has indicated that the road network can safely accommodate the vehicle activities associated with the construction of the development.

It is concluded that the development proposals accord in all respect with transport policy guidance. In operational terms, subject to certain highway improvements the existing road network will adequately accommodate the requirements of the development without the likelihood of risk to other road users.

2 Introduction

2.1 Introduction

Buro Happold has been appointed by ING RED UK (Hayle Harbour) to provide highways and transportation services in respect of its proposals to redevelop land at Hayle in the District of Perwith, Cornwall. The Consultant is appointed amongst other things to prepare this Transport Assessment in support of an outline application for a mixed-use development.

The development has evolved over a period of time in response to consultation with the planning authority and other statutory bodies. A Draft Transport Assessment was completed in March 2006 and issued to Cornwall County Council as highway authority and to the Highways Agency, authority for the trunk road network. Both authorities have made comments on that document. Meetings have also been held with Officers of the County Council, the District Council and the Highways Agency. This new Transport Assessment incorporates the feedback received from all of the relevant authorities over that extended period of time.

In the period since the preparation of the original document, changes to the development profile have necessitated an updated impact assessment, which forms part of this new document. In all other respects too, this assessment represents an updated position; this document therefore supersedes entirely the Draft Transport Assessment of March 2006.

An indicative Masterplan has been prepared for the purpose of enabling detailed assessment of the impact of the proposals. The Masterplan, reproduced at Appendix A, forms the basis of this Transport Assessment.

2.1.1 Report Content and Format

The Transport Assessment follows a structure and scope arising broadly from discussions with the highway authorities over a period of many months. The structure is further guided by advice contained in the Department for Transport publication "Guidance on Transport Assessment" (March 2007).

Section 3 of the document describes the location and extent of the proposed development and its context in the existing highway network (the site context in relation to public transport and cycle route networks are considered in detail in subsequent chapters). Section 3 also sets out baseline data forming the basis of the assessment of the impact of generated vehicle traffic, which is dealt with in later sections.

Section 4 of the document reviews transport policy guidance of relevance to the planning application. Whilst the development site is already allocated for development, the policy review identifies a range of transport policies against which the proposals are expected to be assessed by the transport and planning authorities.

The proposals the subject of the outline application are described in Section 5, the focus being on issues relevant to transport, such as access and parking proposals.

In view of the importance of public transport for the accessibility of the proposed development, the role of bus and rail services is considered in detail in Section 6. Section 7 addresses the pedestrian and cycle accessibility of the development site. In both cases, the ability of existing services and infrastructure to accommodate travel demand is assessed and where appropriate, requirements for improvement are highlighted.

Section 8 supplements the work presented in Sections 6 and 7 and addresses the accessibility of the development by all modes of transport at a more local level. In doing so, the focus is on the interface between the development site and the surrounding public transport, walking, cycling and highway networks.

The allocation of the development site for mixed-use redevelopment indicates that in the view of the planning authority, highway impact can be appropriately mitigated. It is incumbent on the applicant however to identify the extent of any mitigation measures necessary to deal with the potential impact of additional vehicle trips arising from the proposals. Section 9 therefore sets out calculations of the likely traffic generation and its distribution onto the road network. The assessment of the impact of these new trips and options for mitigation are set out at Section 10. The impact assessment considers a number of scenarios as a means of identifying a range of impacts depending on the time of year, the time of day and the ability to 'contain' travel out of Hayle by achieving the correct balance of land uses within the development.

The role of car parking is important both in policy terms and in functional terms. In respect of policy, car parking provision strongly influences vehicle traffic generation and also impacts on the vitality and viability of town centres. In functional terms, the volume and form of parking influences issues such as highway safety and visual amenity. An assessment of car parking proposals is therefore included at Section 11.

Travel Planning as a way of managing the demand for travel by car will be set out as part of a mitigation strategy and the options for travel planning as part of the proposed development are discussed at Section 12.

The implications of construction activities are considered at Section 13; the assessment is summarised and conclusions drawn at Section 14.

3 Site Location and Baseline Transport Data

3.1 Site Location and Description

The location of the planning application site is shown on Figure 3.1.

The application proposals relate to an area within the centre of the town of Hayle. The town is situated to the north of the A30(T), the route forming the strategic highway spine through the County of Cornwall. The A30(T) bypasses the town of Hayle, which lies on the parallel B3301. The B3301 links to the A30(T) both to the east and to the west of the town.

The extent of the application site is shown on Figure 3.2. The site covers broadly four areas, referred to as South Quay, North Quay, 'Hilltop' and Riviere Fields. The Masterplan and land use schedule at Appendix A identifies the general layout of the site.

South Quay is the flat area of land occupying the western promontary. It fronts the B3301 and includes a small parcel of land now utilised as public car parking on the opposite side of the B3301.

The North Quay site covers the north-western portion of the site and includes the 'headland' extending into the harbour.

The site referred to as Hilltop lies at a higher level and on the slopes overlooking North Quay. The Riviere Fields site is that to the northeast. It is relatively flat and lies at a level above the quays.

3.2 Baseline Traffic Data

Public transport, walking and cycling networks are described later in the document. This section focuses on the highway network and the traffic data that will be used in the assessment of highway impact.

At a strategic level, it can be seen from Figure 3.1 that Hayle is well placed close to the County's primary road network, with the A30(T) connecting Hayle with Penzance in the south. To the north, the trunk route provides access to the Camborne/Pool/Redruth conurbation as well as to Truro and Bodmin. Further east, it links with the M5 at Exeter, with access from here to the national motorway network.

At a local level, the B3301 provides a continuous route through Hayle parallel to the trunk road. Between its junction with the A30(T) in the east – the Loggans Moor roundabout – and its junction with the A30(T) in the west – the St Erth gyratory – the B3301 is a single carriageway of width varying between approximately 6m and 9m. Through the built up area of Hayle, the route is subject to a 30mph speed limit.

The B3301 provides frontage access to a range of shops, services and facilities, concentrated in the Copperhouse and Foundry Square areas of Hayle. On-street car parking is provided in parallel lay-bys in these areas. There is also direct access from the B3301 to residential properties fronting the route.

The B3301 forms a roundabout junction with the B3302 at Foundry Square adjacent to Hayle railway station. The B3302 heads southward from its junction with the B3301, providing access to residential areas on the southern outskirts of the town. The B3302 crosses the A30(T) but does not form a junction with it.

East of the development land and to the north of the B3301 and the Copperhouse Pool inlet is the settlement of Phillack. The settlement is linked to the B3301 by Lethlean Lane, a Class 3 classified route. The route extends through Phillack to the cluster of holiday cottages located on the beachside clifftop. Lethlean Lane connects the area to the north of Copperhouse Pool with the B3301 at a priority junction.

The Lane is a single carriageway generally of width 6.5-7.5m. It narrows slightly as it passes the centre of the settlement and is subject to a 30mph speed limit.

Running parallel to the B3301 but to the north of the 'Copperhouse Pool' inlet is George V Memorial Walk, a traffic calmed shared-surface road approximately 4m wide, with frequent traffic humps along its length from the North Quay eastwards to Black Road Bridge. The through route to Lethlean Lane and the B3301 is stopped up and as a consequence, the route caters only for access to residential properties fronting it.

For the purpose of the earlier Transport Assessment, a series of classified manual traffic counts were undertaken in April 2005, traditionally a neutral month and a suitable basis for impact assessment. The counts covered the traditional AM (07.00-10.00) and PM (16.00-19.00) commuter peak periods and show highest levels of flow on the section of the B3301 east of Foundry Square. The busiest hours were shown to be 08.00-09.00 and 17.00-18.00, the traditional commuter peak periods.

The data is contained in full at Appendix B and summarised graphically on Figure 3.3 and Figure 3.4 for the AM and PM peak hour respectively.

Evening peak hour flows exceed those in the morning peak hour. In the PM peak hour (17.00-18.00), two-way flows of between 1,000 and 1,100 were recorded on the B3301. These levels of flow fall within the theoretical capacity of the route and observation on site today indicates generally free-flowing conditions along the corridor, with the only obstruction caused by the high number of turning movements to and from side-roads and parking lay-bys.

Flow levels on the B3302 – linking the centre of Hayle (Foundry Square) with settlements to the south - are of the order of 800 vehicles per hour (two-way) in the PM peak hour, again well within the theoretical carrying capacity of the corridor. Lethlean Lane, which links the B3301 with the settlement of Phillack, experiences peak hour flows of some 220 vehicles in the busiest hour.

The County Council has requested that impact assessment should consider the August tourist peak period and sensitivity testing for the August traffic situation was included in the earlier Transport Assessment. The County Council has made available data from a traffic count undertaken at Foundry Square in August 2006. That data is attached at Appendix C.

The August data shows the busiest morning hour to be 11.00-12.00, indicative of reduced travel-to-work activity in that month and a corresponding increase in tourist activity. The afternoon busiest hour is shown again to be 17.00-18.00.

Of the assessed junctions on the B3301, there exists August survey data only for Foundry Square. Comparison of the surveyed flows at the Foundry Square junction for April 2005 and August 2006 shows that the August morning peak hour (11.00-12.00) is higher than the April morning peak hour (08.00-09.00) by some 30%. The August evening peak flows exceed the April evening peak flows similarly by some 30%. With the exception of the Foundry Square junction, these factors have been applied to all the base figures to determine the August base flows. At the request of Cornwall County Council, the Foundry Square junction capacity assessment fully uses the survey data to determine the flows on each arm in the opening and design years, as opposed to a 'blanket' factor applied across all arms of the other junctions.

Accident data for the five-year period to the end of March 2007 has been provided by the highway authority. The data indicates a total of 96 injury accidents in the five year period on the 4.3km section of the B3301 between the two trunk road junctions. Of most significance are those injuries classified as 'serious' and those classified as 'fatal', of which 11 were recorded.

Looking at the concentration of serious and fatal accidents, there is a wide distribution and no concentration of particular note. Taking all injury accidents into account, there is a concentration of accidents at the Loggans Moor junction (B3301/A30(T)), although the majority of these involve slight injury.

3.3 Committed Highway and Development Proposals

At the time that traffic data was collected in April 2005, an element of the new retail park adjacent to the Loggans Moor roundabout east of Hayle had not been occupied. An allowance for the traffic associated with that development is therefore included within the impact assessment that follows. Details of the traffic predicted in the associated Transport Assessment to be generated by the committed retail development is shown on Figure 3.5 and Figure 3.6 for the AM and PM peak hours respectively.

3.4 Car Parking

There are existing public car parks in Hayle, at Foundry Square and at Commercial Road, Copperhouse. The Foundry Square facility is a surface-level 'Pay & Display' car park, currently owned and managed by ING Ltd as a public facility. There is a further small car park to the south of the Square, behind the Lloyds Bank building.

These car parks prioritise short-stay parking and are intended primarily for motorists visiting the two main shopping areas. At Copperhouse there are also two supermarkets with their own parking areas. In addition to this off-street public parking provision, there is on-street parking along most of the length of the B3301, in particular at Penpol Terrace, Fore Street and other streets adjacent to the shopping areas.

4 Transport Policy Framework

4.1 Introduction

Transport policy guidance of relevance to the proposed development is contained in the statutory development plan, comprising the Penwith District Local Plan, the Cornwall County Structure Plan and Regional Planning Guidance for the southwest. In addition, Central Government guidance of relevance is contained in Planning Policy Guidance Note 13: Transport.

4.2 Penwith District Local Plan

The Penwith District Local Plan was adopted in 2004 and sets out the District Council's aspirations for development in the period to 2011. General guidance on new development is contained at Section 5 and includes relevant policies GD-2 and GD-5.

Policy GD-2 requires that the layout of development should:

(v) make provision for walking and cycling which is safe, convenient and attractive and include secure cycle parking facilities;

(viii) seek to maximise public transport opportunities.

Policy GD-5 advises that proposals for development will only be permitted where safe movement of traffic can be accommodated without the need for works that would have an adverse effect on the character and amenity of the surroundings.

In terms of transportation policies, those relating to car parking are of particular relevance. **Policy TP-12** states that the provision of car parking in any development must be related to the operational needs of the proposal and the availability of alternative means of transport to the private car. Where non-operational requirements would not be met in full, planning permission will not be granted unless the payment of a commuted sum for each space not provided on site is secured to fund provision of alternative car parking or other transport measures.

Policy TP-13 advises that new car parks will not be permitted unless they constitute the relocation of an existing facility in a manner that offers other community benefits.

Policy TV-D relates specifically to the allocation of land for development in Hayle and states:

South Quay/Foundry Yard, North Quay and East Quay are proposed for redevelopment for uses within classes A1, A2, A3, B1, B2, B8, C1, C3, D1 and D2 of the Town and Country Planning Order 1987. Proposals for development will be required to:

- (iii) Ensure that town centre uses are closely integrated with the adjacent town centre in terms of location, orientation and pedestrian movement; and*
- (viii) include provision for the improvement of the junction between Carnsew Road and Foundry Lane;*

4.3 Cornwall County Structure Plan

The County Structure Plan was adopted in September 2004 and sets out a strategy for development up to 2016. Transport policies and proposals are identified in Section 3 of the document.

Policy 27 sets out the transport approach to supporting the spatial strategy and includes:

- *Integrated strategies for the key towns where development will be focussed. There will be an emphasis on an enhanced role for public transport, walking and cycling, and network management including parking, park and ride and consistency of charges.*
- *An integrated public transport system, linking the main settlements based upon the SPTN [Strategic Public Transport Network] comprising the rail network, bus branch lines, core bus corridors (an hourly weekday service) and waterborne transport.*
- *Major scheme proposals to improve links between the County's main towns, along with maintenance of the highway infrastructure for safety and environmental reasons.*

The policy also identifies the reduction in car parking as a key part of the transport strategy. The policy contains the County Parking Guidelines referred to later in this document.

Policy 28 relates to accessibility and requires new development to ensure:

- *Opportunities to optimise walking, cycling and public transport are reflected in the scale, location and form of proposals;*
- *The effective management and safe movement of traffic;*

4.4 Regional Planning Guidance

The Regional Transport Strategy for the South West region is set out in Chapter 8 of the Regional Planning Guidance for the South West (RPG 10). This sets out a broad development strategy for the region until 2016 and beyond.

The main policy within the transport strategy affecting new development is **Policy TRAN1**, which requires that local authorities and developers should work towards reducing the need to travel by private motor vehicle through the appropriate location of new development. Development plans should:

- *Propose housing, employment and other uses in existing towns and propose a balanced mixture of uses in new developments;*
- *Propose major development on sites where there is a good choice of travel by sustainable transport, or where choices can be provided as part of the development, having regard to regional accessibility standards;*

Annex A to RPG10 includes 'Accessibility and Parking Standards'. This interim guidance seeks to quantify accessibility standards and enable a more quantitative evaluation of development proposals. The annex refers to accessibility criteria based on a number of factors, including walking distances to facilities and frequency of public transport services.

4.5 National Policy Guidance

Government policy relating to transport and new development is set out in Planning Policy Guidance Note (PPG) 13 – Transport (March 2001). The document sets out the government's guidance with respect to transport issues and new developments. The main objectives of this guidance are to:

- Promote more sustainable transport choices for both people and moving freight;
- Promote accessibility to jobs, shopping and services by public transport, walking and cycling;
- Reduce the need to travel, especially by car.

The key objectives of the policy guidance are to increase travel mode choice and in parallel, a reduction in the need to travel, especially by private car.

Travel planning is recognised by the Government as a mechanism for reducing the reliance of developments on travel by car and the implementation of Travel Plans is encouraged as a demand management tool.

4.6 Policy Summary

Transport policy guidance at all levels is consistent in seeking to secure improvements to accessibility by non-car modes of travel as a means to secure a shift away from the existing dependence on that mode of travel. In parallel, demand management measures such as Travel Planning will supplement spatial strategies designed to reduce the need for travel by car.

The degree to which the proposed development at Hayle accords with these guidelines will be assessed in later sections of this Transport Assessment.

5 Development Proposals

5.1 Built Development

The illustrative Masterplan and associated area schedule is attached at Appendix A to this report. The development comprises a mix of residential, employment, retail and leisure development, grouped broadly into four areas.

The 'South Quay' development area comprises the Quay to the north of the B3301 and includes the small parcel of land south of the B3301 currently a surface level car park. The South Quay site is planned to accommodate predominantly retail development at ground floor level, with apartments at higher levels. The site will also include employment development on both sides of the B3301.

North of the channel is the area referred to as 'North Quay'. This includes a range of new development north of the channel. Development on North Quay is made up of a mix of residential development, retail and employment development, including a fishing quay, together with water-related leisure uses such as a marina, hotel and restaurants.

Between North & South Quay lies East Quay, the site of a landmark building

Lying to the north and east, the areas referred to as 'Hilltop' and 'Riviere Fields' will be exclusively residential development, including both private market sale and affordable housing. The area schedule is summarised below:

Land Use	South Quay	North Quay	Hilltop	Riviere Fields
Houses (no)	-	44	94	233
Flats (no)	260	337	3	67
Retail (GFA)	10,585sqm	2,613sqm	-	-
Restaurant (GFA)	870sqm	835sqm	-	-
Industrial (GFA)	-	5,575sqm	-	-
Employment (GFA)	5,150sqm	7,355sqm	-	-
Hotel (beds)	-	60	-	-
Community Facilities (GFA)	2,090sqm	-	-	-

Table 5.1.1: Development Area Schedule

In total, the four development areas provide 1,039 new dwellings, some 13,200sqm of small-unit retail development and 18,000sqm of employment development. Other facilities include caf es and restaurants, a Gym and a tourist office.

5.2 Infrastructure

The proposed development will take its access from the B3301 at three locations.

The South Quay development will be accessed by a new priority junction onto the B3301 adjacent to its western edge. It is proposed to construct a staggered priority junction at this location as indicated on Drawing No. 00-TSK003 at Appendix D, which will also facilitate an improved access to the development site south of the B3301. The B3301 will be widened to facilitate segregated turning lanes and this will also enable the introduction of a new pedestrian refuge to ease movement across the road.

The North Quay development will be accessed from the B3301 further east, as shown on the Masterplan. To achieve an adequate access, a new bridge over the inlet will be provided at this location, immediately adjacent to the existing bridge. The new bridge will form a new signalised junction with the B3301, with the existing junction stopped up and the existing bridge given over to pedestrians. The proposed new bridge and junction are shown on Drawing No. 00-TSK002 at Appendix E.

Further east, the Lethlean Lane priority access junction onto the B3301 will provide a second access to the Riviere Fields housing development from Churchtown Road, to the west of the settlement of Phillack. This third vehicle access, intended as a simple priority junction of the form shown on Drawing No. 00-TSK001 at Appendix F, is intended to provide an alternative means of accessing the Riviere Fields housing site.

Within the development site, the South Quay element is effectively a dead-end, with a single access road extending to the end of the promontary and a branch leading to the triangular spit car park. Subject to the agreement of the highway authority, it is envisaged that with the exception of the main access spine, all roads within the site are laid out as a shared surface to optimise pedestrian convenience.

The larger North Quay site benefits from a spine road that runs through the development site, extending into the Hilltop zone and then into Riviere Fields, ultimately connecting to Churchtown Road and Lethlean Lane west of Phillack. The route effectively provides a through-route, although there will be negligible demand for movement from background traffic. The through-route provides the required second means of access to the housing development and an opportunity to limit the concentration of traffic on any part of the road network.

The spine road will be designed as a low speed street, with on-street parking adding to the traffic calming effect. Details of its design are a matter for detailed discussion with the highway authority.

In order to maximise the accessibility of the development and secure optimum linkage between the two quays, the proposals include the provision of three new footbridges as shown on the Masterplan. The bridges will

facilitate more convenient pedestrian linkage within the development site as a whole and link it by foot to existing development within the town centre and to the existing network of footways and cycle routes.

5.3 Car Parking

Details of car parking proposals are set out within the development schedule at Appendix A.

Operational car parking will be provided in the form of new on-street parking, some basement parking, new off-street public parking and undercroft parking associated with residential blocks. In general, each dwelling will be allocated one parking space, except for affordable housing where there will be a provision of 0.5 spaces per dwelling. Private houses will be provided with dedicated off-street parking.

The provision of parking for retail units, for employment and for leisure uses is treated more flexibly, with opportunities for sharing exploited where possible to reduce the overall provision, a strategy promoted by policy guidance. These elements of the proposed development are intended to increase the existing 'offer' to visitors to the town and associated parking can be considered to complement existing public parking provision.

South Quay

A total of 471 parking spaces will be provided either on-street or within basements within South Quay, intended for use by residents, businesses and visitors to other facilities within the site. In addition, a surface-level facility of 250 spaces is proposed on a small area of the triangular spit of land adjacent to South Quay and accessed through it. This latter facility is intended as a short-stay facility for the use of visitors to the development and to other town centre facilities with a small component for operational use by the Hayle fishing fleet.

North Quay

On North Quay, 1,171 car parking spaces will be provided for residents and visitors, again in a mix of on-street spaces and spaces included within residential blocks. The total includes a 450-space public car park (Plot NQ39) adjacent to Hilltop and 117 surface level spaces in the quarry.

The adequacy of the proposed car parking is addressed in Section 11 of this document.

5.4 Phasing of Development

For the purposes of assessment, the TA assumes full completion of the development for the 2011 and 2017 junction capacity modelling years.

The initial development phase sees the construction of the two new accesses onto the B3301 and with them, partial development of the South Quay, North Quay and Hilltop sites. The Riviere Fields housing development and the associated access to the east will be implemented in a second development phase. This phase also includes the construction of the 441-space public car park on North Quay.

Phase 3 sees the construction of the public car park on the triangular spit (subject to its requirement) and infilling of development on North Quay.

Phase 4 involves the completion of development on South Quay.

6 Public Transport Assessment

6.1 Introduction

The review of transport policy guidance set out at Section 4 above emphasises the importance of public transport in new development. In practical terms too, maximising opportunities to travel by public transport will serve to reduce the requirement for mitigation of highway impact.

This section of the Transport Assessment therefore considers the accessibility of the proposed development by public transport. This is done firstly in a pragmatic way by establishing the quality of services and infrastructure of rail and bus networks. The accessibility of the development site can also be assessed in a more quantitative way and reference is made to the Accessibility Criteria of RPG10 for this purpose.

Policy 27 of the Structure Plan referred to a County-wide Strategic Public Transport Network. One such strategic corridor is the route linking Penzance, Hayle and Camborne. From the outset therefore, existing public transport provision can be assumed to be appropriate to a strategic public transport corridor.

6.2 Bus Services and Infrastructure

The most significant scheduled bus services of relevance to the application proposals are those operated by First Group between St Ives and Truro (Service 14), between Penzance and Truro (Service 18) and between St Ives and Penzance (Service 301). There are other less frequent services supplementing these key routes.

Operating details of the three key services are summarised in Table 6.2.1 below.

Service	Route Summary	Weekday Frequency	Saturday Frequency	Sunday Frequency	Weekday Operating Hours
14	St Ives-Truro via Hayle, Camborne and Redruth	Hourly	Hourly	One every 2 hours	07.06 until 23.42
18	Penzance- Truro via Hayle, Camborne and Redruth	Hourly	Hourly	One every 2 hours	07.08 until 23.13
301	St Ives- Penzance via Hayle & St Ives Holiday Village	Hourly	Hourly	Hourly	08.28 until 18.38

Table 6.2.1: Scheduled Bus Services

It is evident that a high level of bus service exists to Hayle at present. The Service 14 runs 7 days a week between St Ives and Truro calling at Hayle, Camborne and Redruth. On weekdays, the first bus to Truro is at

07.06 and there are 2 buses during the peak hour. The last bus to Truro is at 18.01; later services at 19.01, 20.01 and 23.42 terminate at Camborne. It takes 24 minutes to travel from Hayle to Camborne, 40 minutes to Redruth and 1 hour and 21 minutes to travel to Truro. The first service to St Ives is at 07.28 on weekdays and there are 2 buses in the morning peak hour. In the evening peak hour there are 2 services. The last bus to St Ives is at 23.13. The bus takes 16 minutes to travel from Hayle to St Ives.

Service 18 operates between Penzance and Truro via Hayle, Camborne and Redruth. This service operates 7 days a week with a comparable service between Monday and Saturday and a reduced service on Sunday. The first service to Truro is at 07.28, the express services stopping at Royal Cornwall Hospital and Truro only, taking 1hr and 6 minutes. The first non-express service is at 07.41 and takes 19 minutes to reach Camborne, 35 minutes to reach Redruth and 1 hour and 16 minutes to reach Truro. There is 1 service during the morning peak hour and 2 services during the evening peak. The last service is at 22.59 but terminates at Redruth; the last bus to Truro is at 19.04. The first bus to Penzance is at 07.03 - there are 2 services in the morning and in the evening peak hour. The last bus from Hayle to Penzance is at 22.13. It takes 23 minutes to travel to Penzance.

The Service 301 runs between St Ives and Penzance via Marazion, Hayle & St Ives Holiday Village, 7 days a week. The level of service is comparable on all days. The journey from Hayle to Penzance takes 30 minutes and it takes 22 minutes from Hayle to St Ives. The first bus from Hayle to Penzance is at 09.43 and the last bus is at 18.13. The first bus to St Ives is at 08.28 and the last bus is at 18.38. Between these times the service runs hourly.

In terms of infrastructure, there are bus stops located at regular intervals along the B3301. At their closest, bus stops lie immediately adjacent to the development site and all parts of the development will benefit from convenient walking routes to them. The quality of bus stops is variable but improvement is assumed to be programmed by the highway authority in recognition of the strategic nature of the bus route.

6.3 Rail Services and Infrastructure

Hayle railway station is located in an elevated position in the centre of the town and on the main national rail network in Cornwall. Services are operated by four train operating companies: First Great Western, Virgin Trains, Wessex Trains and Arriva Trains Wales.

The Monday to Friday peak hour daily services to and from Hayle are listed in the table below.

Service Route	First Stop in Hayle	Last Stop in Hayle	Frequency of Stops
From Plymouth/Exeter to Hayle	07.56	23.51	Hourly
From Hayle to Plymouth/Exeter	06.32	18.46	Hourly
From London and Reading To Hayle	07.56	19.13	Hourly
From Hayle to London and Reading	17.45	17.45	Hourly
From Penzance/St Erths to Hayle	05.23	22.00	2 Hourly
From Hayle to Penzance/St Erths	07.40	00.13	Hourly

Table 6.3.1: Rail Services to Hayle Station

In general terms there are hourly trains from Hayle to main destinations such as Penzance and Plymouth with connections to Exeter, Bristol and London. From Hayle you can also travel to more local destinations such as St Ives, Penzance, Redruth, Truro and St Austell. The journey to Penzance takes 20 minutes. To travel to St Ives by train you need to change trains at St Erth: the total journey time is 31 minutes. It takes 10 minutes by train to get to Camborne, 16 minutes to get to Redruth, 30 minutes to get to Truro and 47 minutes to get to St Austell.

The railway station offers limited car parking and facilities for passengers are also limited. The station is unstaffed and has no ticketing machines. There is no CCTV coverage of the station, no seating areas or waiting rooms. Additionally there are no toilet facilities or baby changing facilities. There is a payphone located at the end of the car park next to the main road. There is also a passenger information service available at the station and the whole of the station is accessible, although a surface crossing of the tracks is required to move between the platforms.

Access to the railway station is limited at present to a narrow road and footpath leading to it from the B3301 near Foundry Square. The access road is lightly trafficked and suitable for pedestrian use. Its location however requires that pedestrians from the Copperhouse direction need to walk further than would otherwise be necessary.

6.4 Park and Ride

The County Local Transport Plan indicates that a Park & Ride facility is planned for implementation at St Erth station, west of Hayle, in the period to 2011. The facility will have a capacity initially for some 600 cars and is intended to offer alternative access to St Ives. The station at St Erth serves Hayle too and the proposed facility could be used to access Hayle town centre, although the relatively short distance to Hayle and the frequency of trains suggest that the Park & Ride facility in the form now proposed will not play any role in accessing Hayle.

The P&R facility will however include facilities for buses and there is scope to expand the car park such that capacity could be provided to cater for demand for travel to Hayle using buses. The County Council has advised that it has considered the economic viability of a bus-based scheme of this form for Hayle and concluded that at present, a business case cannot be made even in the seasonal peak months. The County Council has however indicated that it would wish to re-evaluate the economic case for a link to Hayle should planning permission be granted for development at the harbour. The altered travel patterns arising from the application proposals may increase demand to a level that provides the necessary economic justification for such a scheme.

There is therefore a realistic possibility that the proposed development at Hayle could become the catalyst for a viable bus-based P&R link into Hayle town centre, an issue that should be further explored should planning permission be granted for the development.

6.5 Assessment of Public Transport

Whilst there are other less frequent services, the combination of scheduled bus routes alone provides Hayle with in excess of a half-hourly service to the important destinations of Truro, Camborne, Redruth and Penzance, as would be expected of a County strategic network. In its existing form therefore, the scheduled bus network provides adequately for a range of travel needs associated with the proposed development (as measured by the RPG10 accessibility criteria).

The proposals include a number of new crossing points of the B3301 and a network of pedestrian routes linking into and through the development site. These measures will support convenient access to bus services from the development site and from established development located north of Copperhouse Pool.

Rail services too offer opportunities to travel from Hayle (and therefore the development) to the major regional destinations. The benefits of the rail link are more relevant to longer-distance travel but even within the County, the existing rail services can be considered to supplement scheduled bus services and cater for work-based travel and other travel needs arising from the application proposals. As detailed in section 8 below, services are at least hourly and therefore offer potential for a range of journey types to services and facilities that are not available within Hayle, such as certain types of employment, larger retailing outlets, third-level education and other services including hospitals at Penzance and Camborne.

There is an informal footpath leading to the station platforms from the B3301 at the proposed North Quay access junction and this appears to offer scope for a major improvement in the accessibility of the station. The land is owned by ING, however the ability to secure a public route on this alignment is subject to the approval of the station operator, as there is no segregated link between the two platforms. It is recommended that the provision of a public route in this location is explored in the future, as its provision would significantly increase the demand for rail services and contribute to lower car dependence of the development site and the town as a whole.

In summary, it can be seen that the settlement of Hayle is well accessed by public transport, as would be expected of one of the County's main towns. Accessibility criteria defined by regional planning guidance are comfortably met.

Additional travel demand associated with new development will enhance the economic robustness of scheduled bus and rail services linking the town with other strategic destinations within the region. In this way, development at Hayle will contribute to a sustainable public transport system for the wider region. More critically, demand arising from the proposals is likely to strengthen the case for implementing a bus-based P&R service from the new facility at St Erth.

Measures associated with development, specifically the enhancement of pedestrian links between the B3301 and existing residential development north of Copperhouse Pool, will enhance the public transport accessibility of existing residents of the town. Scope also exists to significantly increase the accessibility of the railway station and this is a matter worth exploring whether or not development takes place.

Accessibility is enhanced by the provision from the development of a whole range of public facilities which are not currently available locally.

Section 8 of this report looks in more detail at the accessibility of the development site itself at the local level and therefore supplements the work presented above.

7 Pedestrian and Cycle Assessment

7.1 Introduction

The review of transport policy guidance set out in Section 4 emphasised the need to ensure a high level of non-car accessibility. It has been shown that a high level of public transport accessibility exists and this will provide a viable choice for travel between the development site and the other major towns within the District and the County.

At the local level, travel on foot and by bicycle offer significant potential for reducing the car dependence of the proposed development. The following paragraphs consider cycle accessibility and pedestrian accessibility separately. In each case, accessibility is assessed by considering the availability of services and facilities within reasonable walking and cycling distance of the development and by the quality of the walking and cycling infrastructure available to cater for the demand for travel.

Policy TV-D of the adopted Local Plan supports the principle of development at Hayle, subject to certain criteria, among them a high level of pedestrian linkage. This section of the report will demonstrate how the policy criteria will be met.

7.2 Cycle Route Network

Guidance contained within 'Planning Policy Guidance Note 13: Transport' suggests that cycling represents a realistic alternative to travel by private car for journeys of up to 5km. Taking this 5km distance as the cycle catchment area of the proposed development, the accessibility of the proposed development can be assessed by considering the range of services and facilities located within this catchment area.

Figure 7.1 indicates a cycle catchment identified as a 5km isochrone around the approximate centre of the proposed development. The cycle catchment area identified in this way includes all of the existing town centre facilities and extends to the centre of St Ives in the west. It is evident from the sketch that there is a substantial range of employment, shopping and leisure destinations available within cycling distance of the application site. Equally, there is a substantial residential population within cycling distance of employment and leisure facilities proposed as part of the town centre development.

The alignment of National Cycle Network Route NCR3 can also be seen on the sketch. NCR3 is an established cycle route extending from Lands End, through Penzance and through Hayle to Truro and beyond. This route touches the boundary of the South Quay site and follows into the North Quay Development across the listed bridge and along King George V Memorial Walk before crossing the B3301 to head east towards Truro via country lanes.

The cycle route will provide both for leisure cycling to and from the town but also an opportunity for cycling within Hayle itself. Of particular relevance is the link between the application site and shopping opportunities at the eastern end of the town.

The town primary and secondary schools – located east of Foundry Square, also fall within a comfortable cycling distance of the proposed development. Additionally Figure 7.1 shows that railway stations at Hayle and St Erth on the main line, as well as St Ives, Lelant and the Park & Ride south of Lelant, are also well within this catchment area, meaning that more distant cyclists can use the train to reach the development.

The development will be designed to facilitate convenient movement of cyclists to and within it, through extensive use of traffic calming and shared-surface treatment. In addition, public cycle parking will be included at a number of key locations, as well as within individual developments. Details of site-specific cycle parking will be established as part of reserved matters applications for the various parts of the development. As well as providing for cycling demand arising from the development, elements of the application scheme will enhance the cycle accessibility of the town centre as a whole. New crossings of the B3301 and associated speed management will enhance the local environment for cyclists, as will the proposed new bridges linking the quays to the existing town centre.

7.3 Pedestrian Network

Guidance contained within 'Planning Policy Guidance Note 13: Transport' suggests that walking represents a realistic alternative to travel by private car for journeys of up to 2km. Taking this 2km distance as the walking catchment area of the proposed development, the accessibility of the proposed development can be assessed by considering the range of services and facilities located within this catchment area.

Figure 7.2 indicates a pedestrian catchment identified as a 2km isochrone around the approximate centre of the proposed development. The catchment area includes all of Hayle and the many services and facilities accessible within the town.

There is an established network of footways and footpaths that will serve the needs of the proposed development and enable walking to and within the existing town centre facilities. Notable attractions include local Schools, with primary and secondary schools located in St George's Road approximately 800m southeast of the development site. The Schools are accessible on foot using existing footways, with links to the site strengthened by the provision of new crossing opportunities on the B3301.

Other significant destinations include local shops and public transport services. It has been shown that bus routes pass close to the development site and that bus stops are conveniently located. The railway station too is well situated for the development and its accessibility will be enhanced by proposals to introduce new pedestrian crossings of the B3301. The scope for further improvement of pedestrian access to the station has been identified above.

The development will be designed in a manner that encourages movement to and within it on foot and it will contribute to the general quality of the town as a place to walk within. Proposals particularly at South Quay to develop on both sides of the B3301 will help alleviate the severance caused by the road through the town. Furthermore, the inclusion of new crossing facilities within the proposed access junctions to South and North Quays will add to the ease of movement between the new development and established parts of the town.

The development includes new footbridges, linking the Quays together and enhancing movement within the town as a whole. Connections between the now isolated Hilltop development north of Copperhouse Pool and the town centre will be strengthened through development, as will the accessibility of Hayle beach. The latter will offer increased opportunities to access the strand for the public and avoid the need to drive as far as the existing car park. The development would make a substantial contribution towards the delivery of the 'Waterside Walkway': a local initiative that integrates the town and connects it to its surroundings by means of a network of footpaths that follow the water's edge throughout Hayle, bringing with it educational, heritage, community health and economic benefits.

7.4 Conclusions

There is a range of existing services and facilities available within walking and cycling distance of the development site, as would be expected given the location of the development site in the heart of the town. The development itself will secure further services and facilities that will be 'on the doorstep' of new residents, while also offering additional services for existing residents of the town.

As such, the proposed development will minimise the demand for travel by car by new residents for many purposes, whilst also increasing the attractiveness (and therefore the travel containment) of the town as a whole.

The development will also secure improvements to pedestrian and cycle accessibility that will benefit existing residents and contribute to delivery of Penwith DC's 'Waterside Walkway' initiative. The provision of a high quality pedestrian environment within the development site, the treatment of existing roads and junctions on the periphery of the site and the enabling of convenient through-routes all contribute to an improved environment within the town.

The potential for travel planning is referred to later in this document. Initiatives to encourage reduced car use will exploit this very high potential for walking to shops, to work and for leisure.

Section 8 of this report looks in more detail at the accessibility on foot of the development site at a very local level and therefore supplements the work presented above.

8 Development Accessibility

8.1 Introduction

Sections 6 and 7 of this Transport Assessment identify the accessibility of Hayle and the development site by public transport, on foot and by bicycle. In seeking to follow the document format recommended in the new Government guidelines, this section of the Assessment extends the work presented there and considers at the macro level whether the available accessibility levels are adequate to cater for anticipated travel demand and whether at the micro level, the form of the development is such that opportunities to exploit non-car accessibility potential is maximised.

In parallel, the assessment also considers whether the development itself or any aspect of it prejudices accessibility by making movement within Hayle more difficult than it would otherwise be.

8.2 Accessibility Assessment

The assessment of public transport has shown that existing scheduled bus and rail services provide strong links between Hayle and other strategic destinations, both within Cornwall and within the wider region. There are seven-day bus services from the town to St Ives, Penzance, Truro and the Camborne/Pool/Redruth conurbation. Services are at least hourly and therefore offer potential for a range of journey types to services and facilities that are not available within Hayle, such as certain types of employment, larger retailing outlets, third-level education and other services including hospitals at Penzance and Camborne. Rail services offer an alternative means of access to these strategic destinations and supplement the services offered by scheduled buses. Rail services also play an important role in transporting longer-distance tourists to the town.

The location of the development site in the heart of Hayle means that access to bus and rail services is readily available and will be maximised through appropriate layout of the development.

The masterplan is based on an internal access strategy comprising linkages within the site and between the site and key attractors, such as the beach, the waterfront and the town centre. The objective has been to integrate the development into the existing urban structure to maximise the ease of movement of pedestrians, cycles and vehicles into and through the new development.

One of the key movement principles for the development is the creation of a pedestrian and cycle waterfront route linking the town with the beach. It can be accessed anywhere along its length and connects the Foundry with the beach via South Quay, East Quay, and North Quay with a link to the 'Waterside Walkway' around Copperhouse. The route includes the two proposed pedestrian/cycle bridges linking the development 'quays', creating a continuous waterfront promenade.

Within the development, the movement strategy aims to create a walkable place by reducing the impact of the car. In this way, the life and vitality of the site can be optimised.

The interface between the new development and the existing town is addressed by dealing with the severance effect of the B3301 through the provision of enhanced crossing opportunities. These are focused at the new vehicle access points but include where possible dedicated pedestrian and cycle facilities.

In terms of accessibility by car, the safety and convenience of access to the site is ensured through the appropriate design of access junctions and the layout of streets. As detailed in section 3 above, there are no accident blackspots either existing or predicted.

8.3 Conclusions

A high level of accessibility at a strategic level is ensured by exploiting the already high levels of accessibility of Hayle town centre. There is in place a cycle route network and public transport network that offer convenient access to major regional destinations, other large towns in West Cornwall and within Hayle itself, the many services and facilities are located within walking and cycling distance utilising high quality and attractive routes that will be enhanced through the development proposals.

In terms of interface between the development site and the existing transport networks, it is a fundamental principle of the Masterplan to provide the form and links to integrate the development site with established development surrounding it.

Within the extensive site itself, the layout of public space and the opportunities for movement within and through it are designed to encourage pedestrian and cycle travel.

The proposals therefore provide an opportunity not only to maximise the accessibility of this part of the town centre but go beyond that and provide improved linkage within the town centre as a whole.

9 Traffic Generation and Distribution

9.1 Trip Generation

The assessment of vehicle trip numbers is based on trip rates derived from the TRICS2007 database. The 24-hour profile of trip generation has been derived for each of the nine separate land-uses referred to in the development schedule. The resulting traffic generation shows three distinct peaks, corresponding to the traditional AM and PM commuter peaks and a lunchtime interpeak.

The two later peaks include a large proportion of retail traffic. The trip-rates derived for retailing reflect traditional small-unit shopping malls and are as such are not entirely representative of the trip-making characteristics of stand alone small-unit retailing, without malls in this town centre context. As such, it is likely that the trip numbers calculated in this way are an overestimate of what is to be expected, particularly in the interpeak period.

The analysis of traffic impact will focus on the traditional AM and PM peak hours, as these will represent the periods of maximum impact of development-related traffic, reflecting the role of home-to-work and work-to-home trips associated with residential and employment elements of the scheme.

In order to reflect the fact that the retail element of the proposed development will be a series of small independent units rather than a shopping mall, a 20% reduction in trips to retail land uses has been applied to establish car trips likely to be new to the road network for the worst case scenario. Similarly, a 10% reduction has been applied to traffic expected to be generated by employment land-uses to account for the fact that new jobs are both within the established town centre and within walking distance of 1,039 new homes.

In terms of deriving a robust travel profile as a basis for the following impact assessment, no reduction has been made to vehicle trips associated with residential development, although a proportion of trips can be expected to be contained within the development or within the town centre.

The TRICS2007 data is attached at Appendix G. The resulting peak hour traffic generation, taking the above containment factors into account and differentiated by the four development zones, is shown in Table 9.1.1 below.

Site Area	AM Peak (08.00-09.00)		PM Peak (17.00-18.00)	
	Arrivals	Departures	Arrivals	Departures
South Quay	249	174	347	406
North Quay	174	120	172	237
Hilltop	17	41	40	24
Riviera Fields	52	124	122	75
Total	492	458	681	742

Table 9.1.1: Vehicle Trip Generation ('Worst Case' Conditions)

With some robust assumptions regarding linked trips between residential and retail development, the proposed development has the potential to generate 950 new vehicle movements in the AM commuter peak hour (arrivals and departures combined) and 1,423 vehicle movements in the PM commuter peak hour.

These new trips will be predominantly by private car, with the exception of goods vehicle trips associated with employment development on North Quay.

9.2 Sensitivity Testing

The assumptions underlying the above prediction of vehicle trips are very robust and when used in the impact assessment represent a worst case of impact on the surrounding road network. It has therefore been agreed with the highway authorities that sensitivity testing can be carried out based on an alternative and more realistic scenario of traffic generation.

Taking into account the significant potential for the containment of trips both within the mixed-use development and then within Hayle as a whole, alternative reduction factors have been calculated. A reduction in retail trips of 40% has been assumed, together with a 10% reduction in residential trips and again a 10% reduction in trips to and from employment elements of the development.

The resulting traffic generation profile is that set out in table 9.2.1 below.

Site Area	AM Peak (08.00-09.00)		PM Peak (17.00-18.00)	
	Arrivals	Departures	Arrivals	Departures
South Quay	203	145	274	315
North Quay	134	102	14	179
Hilltop	15	37	36	22
Riviera Fields	47	111	110	67
Total	339	394	559	583

Table 9.2.1: Vehicle Trip Generation ('Normal' Conditions)

Based on the more realistic assumptions about trip containment, the proposed development is anticipated to generate 733 new vehicle movements in the AM commuter peak hour (arrivals and departures combined) and 1,142 vehicle movements in the PM commuter peak hour.

No allowance has been made for the possible reduction in existing trips that would be anticipated arising from new job and shopping opportunities in the town. Whilst difficult to quantify, there is potential for the development to lead to containment of existing trips. This adds to the validity and robustness of the 'normal conditions' trip generation figures.

9.3 Traffic Distribution

The directional distribution of generated traffic has been estimated based on a review of population distribution within the region and informed by traffic flow patterns on the trunk road (a coarse level gravity model).

It is estimated that 40% of traffic associated with the proposed development will be attracted from the south, accessing destinations such as St Ives and Penzance. It is similarly estimated that 55% of traffic associated with the development will travel to and from the north to access strategic destinations such as Truro and the Camborne/Pool/Redruth conurbation.

It is estimated that 5% of traffic will be attracted to and from the direction of Helston, accessing Hayle via the B3302. It is assumed that no vehicle trips are contained within the town and the wider area bounded by the A30(T) trunk road corridor.

The distribution is shown graphically on Figure 9.1. It is assumed that all of the Riviere Fields area traffic will use the Lethlean Lane priority access junction. It is also assumed that the Hilltop area traffic will use the North Quay signalised access via the new bridge. Applying this distribution gives development generation in each of the peak periods.

Applying the directional distribution to the predicted new traffic movements shown in Table 9.1.1 produces generated traffic flows on the surrounding network as shown on Figure 9.2 for the busiest morning hour (08.00-09.00) and Figure 9.3 for the busiest evening hour (17.00-18.00) of the development. The turning movements predicted using the lower traffic generation set out in Table 9.2.1 are shown graphically on Figures 9.4 and 9.5 for the two peak hours.

It should be noted that the busiest time periods of the development does not coincide with the busiest seasonal time periods on the surrounding road network (see 3.2 above). The method of deriving a combined morning and evening peak hour for impact assessment will be set out in the following chapter of this document.

10 Impact of Generated Traffic

10.1 Scope of Impact Assessment

The proposed development will include new highway infrastructure in the form of an entirely new junction onto the B3301 at South Quay, an improved junction onto the B3301 at North Quay and a new priority access junction onto Churchtown Road from Riviere Fields, west of Phillack. The impact assessment will need to consider whether the proposed junctions will operate safely with the combined loading of development-related traffic and background traffic.

In addition, existing junctions that are likely to be subject to a material increase in traffic flow will also need to be considered, to establish that they can safely accommodate additional traffic movements. The existing junctions requiring assessment have been identified through negotiation with the highway authorities.

Combining new, improved and existing junctions, the following is the list of junctions that have been assessed for their ability to safely accommodate traffic flow associated with the application proposals:

- New South Quay access onto the B3301;
- Improved access to North Quay from B3301;
- Riviere Fields Access to Churchtown Road/Lethlean Lane;
- Existing B3301/B3302 Foundry Square roundabout;
- Existing B3301/Lethlean Lane priority junction;
- Existing A30(T) 'St Erth' gyratory;
- Existing A30(T) 'Loggans Moor' roundabout;

The County Council has asked that in addition, the impact of generated traffic on the busiest sections of the B3301 is considered, together with the potential impact of traffic generated through the settlement of Phillack.

10.2 Assessment Methodology

The operational analysis of the seven junctions will be undertaken using industry-recognised analysis tools, specifically the PICADY, LINSIG and ARCADY junction modelling software.

In order to satisfy the requirements of the County Council, operational analysis will be undertaken for design years equivalent to the 'year of opening' of the development and for a future year scenario. The requirement of the Highways Agency is that development impact is assessed for a horizon of ten years after the registration of a planning application, in this case 2017. The 2017 scenario has been agreed with the County Council as a suitable future-year assessment horizon.

Defining a 'year of opening' for a development with a long and phased build program is difficult. At this stage it is anticipated that the first phase of development will be substantially complete by 2011 and this is therefore suggested as a suitable 'year of opening' scenario. On that basis, impact assessment has been undertaken for the design years 2011 and 2017. Both the assessment years assume the site is fully completed in terms of generated traffic.

Impact assessment of development of the form proposed would normally consider the traditional commuter peak periods for a neutral month, i.e. one excluding summer holiday troughs and Christmas shopping peaks. The County Council has however asked that impact assessment consider the tourist season in Hayle and specifically that impact assessment address traffic patterns in August.

It has been shown in section 3.2 above that the August morning and evening peak hours are 11.00-12.00 and 17.00-18.00 respectively, with flow levels up to some 30% higher than those in the April commuter peak hours. In order to model the seasonal peak situation as requested by the highway authority, a series of 'uplift' factors have been applied to the April 2005 surveyed base flows to derive design year base flows for the two peak hours.

With the exception of the Foundry Square roundabout, the following 'uplift' factors have therefore been applied to the April 2005 (neutral month) data to convert it to August (seasonal peak month) data for use in junction assessments. These factors have been derived from counts on the A30 (T) for trunk road traffic and from the most suitable counts on the B3301 in Hayle, for Hayle traffic:

AM (Trunk Road)	1.21
AM (B3301)	1.35
PM (Trunk Road)	1.16
PM (B3301)	1.31

In addition, traffic growth factors have been derived from the TEMPRO and NRTF database to ensure that interim traffic growth between 2005 and the various design years is factored into the assessment. Traffic flows for the Foundry Square junction have been derived directly from the August 2006 survey for the August scenario and factored up using the same method as for the other flows.

As agreed with the highway authorities, four scenarios have been tested in this way:

- Development assuming 'worst-case' trip generation in peak month (August);
- Development assuming 'normal' trip generation in peak month;
- Development assuming 'worst-case' trip generation in neutral month (April);
- Development assuming 'normal' trip generation in neutral month;

10.3 Peak Month Impact Assessment (Worst-Case Trip Generation)

Design traffic flows for the purpose of impact assessment are generated by adding worst-case generated peak hour flow (Table 9.1.1) to the derived base flow for the August peak hours. In reality, the time periods do not coincide; for the purpose of assessment however the development peak flows (08.00-09.00 and 17.00-18.00) have been added to the seasonal background peak flows (11.00-12.00 and 17.00-18.00) to generate the assessment scenario. This methodology ensures a robust assessment.

10.3.1 South Quay Access

As this is a new junction, the task is to demonstrate that it can operate safely in future design years, with assessment of the 'with development' scenario only necessary.

The operation of the proposed priority junction has been assessed using PICADY software for the 2011 and 2017 design years – the results are contained in full at Appendix H and summarised in the table below.

2011	AM Peak Hour		PM Peak Hour	
	Maximum RFC	Maximum Q	Maximum RFC	Maximum Q
Right turn to South Quay	0.337	1	0.459	1
Left turn from South Quay	0.227	1	0.937	6
Right turn from South Quay	0.373	1	0.904	5
2017				
Right turn to South Quay	0.342	1	0.468	1
Left turn from South Quay	0.238	1	0.997	10
Right turn from South Quay	0.416	1	0.967	7

Table 10.3.1: Operation of South Quay Access under full development scenario

The junction is shown to operate within its capacity in the two busiest hours in both design years. Queuing is minimal and there would be no obstruction to the movement of traffic on the B3301.

10.3.2 North Quay Access

The proposed design for the North Quay access junction includes building a new bridge and a signalised junction. The operation of the junction has therefore been assessed using LINSIG software for the 2011 and 2017 design years. The modelling output is reproduced in full at Appendix J and is summarised in Table 10.3.2 below.

2011	AM Peak (08.00-09.00)		PM Peak (17.00-18.00)	
	Maximum RFC	Maximum Q	Maximum RFC	Maximum Q
Hayle Terrace Ahead	78%	18	76%	22
Hayle Terrace Right Turn	29%	2	55.1%	3
North Quay left/right	79.1%	8	86.3%	14
Penpole Terrace left/ahead	69.4%	16	85.8%	33
2017				
Hayle Terrace Ahead	83.3%	21	81.1%	26
Hayle Terrace Right Turn	32.3%	2	60.9%	3
North Quay left/right	81.4%	8	87.9%	14
Penpole Terrace left/ahead	74%	18	90.8%	38

Table 10.3.2: Operation of North Quay traffic signals under full development scenario

The LINSIG analysis shows that in both design years, the junction would operate within its capacity.

10.3.3 Foundry Square Roundabout

The Foundry Square roundabout, the intersection of the B3301 and B3302, has recently been improved by the highway authority. The improved junction layout, shown in the drawing at Appendix K, has formed the basis of the impact assessment, which is contained at Appendix L and summarised in Table 10.3.3 below.

2011	AM Peak		PM Peak	
	Maximum RFC	Maximum Q	Maximum RFC	Maximum Q
Penpol Terrace	0.919	9	1.227	112
B3302	0.673	2	1.073	33
Carnsew Road	0.689	3	1.707	380
2017				
Penpol Terrace	1.029	27	1.874	527
B3302	0.785	4	1.064	34
Carnsew Road	0.782	4	2.023	574

Table 10.3.3: Operation of Foundry Square roundabout under full development scenario

The analysis indicates that the existing mini-roundabout will not have the capacity necessary to accommodate the predicted traffic flow comprising the development, background traffic and growth in background traffic.

The consequence is queuing on all arms in the busiest hours.

The degree to which traffic associated with the development contributes to this situation has been established by analysing the junction under the scenario of no development. Analysis of the junction, taking background traffic growth into account but assuming no development, is included at Appendix L and summarised in Table 10.3.4 below.

2011	AM Peak		PM Peak	
	Maximum RFC	Maximum Q	Maximum RFC	Maximum Q
Penpol Terrace	0.593	2	0.863	6
B3302	0.483	1	0.821	4
Carnsew Road	0.421	1	1.070	33
2017				
Penpol Terrace	0.697	3	0.997	20
B3302	0.581	2	0.986	17
Carnsew Road	0.503	1	1.320	115

Table 10.3.4: Operation of Foundry Square roundabout in absence of development

The analysis shows that the roundabout will be subject to queuing and delay in the peak periods in 2017 even if development does not take place, although traffic associated with the application scheme adds to the anticipated congestion levels.

The conclusion of the Draft Transport Assessment (March 2006) was that this junction operated over capacity in its earlier form. The current layout improvements are designed to minimise the scale of the roundabout, with the consequence that its capacity is reduced. It is likely therefore that the junction has been amended for the purpose of environmental benefits in the knowledge that a consequence will be capacity constraint. It is worth emphasising at this stage that the impact assessment focuses on a seasonal peak scenario that is unlikely to materialise and if it does, will do so very irregularly.

10.3.4 B3301/Lethlean Lane Priority Junction

The location and form of the existing junction, which is proposed to be retained in its existing form, can be seen from the Masterplan drawing. The operation of the junction has been tested using the PICADY analysis software, with the results of the full development scenario for the two design years summarised below. The full model output is reproduced at Appendix M.

2011	AM Peak		PM Peak	
	Maximum RFC	Maximum Q	Maximum RFC	Maximum Q
Lethlean Lane Left Turn	1.191	10	3.212	23
Lethlean Lane Right Turn	1.163	16	3.120	42
B3301 Right Turn	0.302	1	0.571	2
2017				
Lethlean Lane Left Turn	1.567	18	4.462	26
Lethlean Lane Right Turn	1.515	31	4.363	49
B3301 Right Turn	0.332	1	0.589	2

Table 10.3.5: Operation of the B3301/Lethlean Lane priority junction under full development scenario

It is evident from the analysis that the priority junction will be operating above its capacity in both peak hours in the design years, with the development completed. Queuing in the side-road will be extensive in the evening busiest hour, although traffic flow on the major road will remain unobstructed by turning traffic.

In order to identify and isolate the impact of development traffic, a similar analysis of the operation of the junction without development in place has been undertaken. The results are summarised in Table 10.3.6 below.

2017	AM Peak		PM Peak	
	Maximum RFC	Maximum Q	Maximum RFC	Maximum Q
Lethlean Lane Left Turn	0.080	1	0.098	1
Lethlean Lane Right Turn	0.537	2	0.636	2
B3301 Right Turn	0.185	1	0.339	1

Table 10.3.6: Operation of the B3301/Lethlean Lane priority junction under 'Without Development' scenario

The analysis indicates that the priority junction would operate within its capacity in the design years without the inclusion of development traffic. It is therefore primarily the effect of the development that leads to queuing and delay at the junction in the busiest hours.

It is not proposed to implement highway works at this junction to secure additional capacity and reduce side-road queuing, as such works are likely to encourage greater use of the Lethlean Lane route to access the development. In practise, the use of the Lethlean Lane access to the site will be regulated by queuing at this junction (and in parallel by the lack of queuing at the alternative North Quay access to the development) and the anticipated queuing is not expected to materialise. Here too it is important to emphasise the degree to which impact modelling represents an abnormally pessimistic scenario of traffic flow.

10.3.5 Churchtown Road at Riviere Fields

Analysis of the proposed priority junction using the PICADY modelling technique provides results as shown in Table 10.3.7 below and reproduced in full at Appendix N. In the absence of accurate data, a nominal passing flow on Churchtown Road has been assumed for the purpose of the modelling.

2011	AM Peak Hour		PM Peak Hour	
	Maximum RFC	Maximum Q	Maximum RFC	Maximum Q
Egress from Development	0.301	1	0.190	1
Right turn to Development	0.055	1	0.039	1
2017				
Egress from Development	0.306	1	0.193	1
Right turn to Development	0.043	1	0.045	1

Table 10.3.7: Operation of Churchtown Road Access under full development scenario

The modelling confirms that the proposed new junction would operate with capacity in reserve in the assessment years with development completed. For the purpose of this assessment it has been assumed that the trips generated by the whole of the Riviere Fields area of the development will use the Lethlean Lane junction via Churchtown Road to access the wider network. In reality, some of these trips will access the B3301 via the proposed North Quay access to avoid capacity constraints at the Lethlean Lane junction onto the B3301.

10.3.6 A30(T) St Erth Roundabout

The existing gyratory has been modelled using the ARCADY software for both peak hours, the results being shown in Table 10.3.8 below. In accordance with Highways Agency requirements, analysis has considered only the design year 10 years after registration of the development proposals.

2017	AM Peak		PM Peak	
	Maximum RFC	Maximum Q	Maximum RFC	Maximum Q
A30 (T) East	0.941	12	0.991	24
A30 (T) West	1.463	391	1.182	115
Nut Lane	0.671	2	0.501	1
Griggs Hill	0.504	1	0.253	1

Table 10.3.8: St Erth Roundabout – 2017 Full Development

The analysis indicates that in the 2017 design year, with the development completed the junction will accommodate traffic flows in excess of its operating capacity. The effect will be long queuing in the peak hours on the eastbound A30(T).

Here too, in order to identify and isolate the impact of development traffic, a similar analysis of the operation of the junction without development in place has been undertaken. The results for the design year 2017 are summarised in Table 10.3.9 below.

2017	AM Peak		PM Peak	
	Maximum RFC	Maximum Q	Maximum RFC	Maximum Q
A30 (T) East	0.887	7	0.911	9
A30 (T) West	1.323	241	0.961	15
Nut Lane	0.659	2	0.472	1
Griggs Hill	0.397	1	0.083	1

Table 10.3.9: St Erth Roundabout – 2017 No Development

The analysis of the 'Without development' scenario indicates that the junction is anticipated to operate beyond its capacity even in the absence of development in Hayle. Operational problems at the junction are therefore a factor of interim traffic growth as much as they are a consequence of new development.

10.3.7 A30(T) Loggans Moor Roundabout

The five-arm trunk road roundabout has been analysed for the 2017 design year – the results are set out below.

2017	AM Peak		PM Peak	
	Maximum RFC	Maximum Q	Maximum RFC	Maximum Q
Marsh Lane	0.435	1	0.414	1
A30 (T) South	1.246	172	0.917	10
Carwin Rise west	1.150	98	0.971	17
A30 (T) North	1.237	189	1.598	583
Carwin Rise east	0.573	2	0.539	2

Table 10.3.10: Operational Analysis under full development scenario

The operational analysis indicates that the roundabout will be subject to queuing and delays in the peak hours in the design year, assuming full build-out of the development at Hayle. To establish the degree to which this is a function of background traffic growth, the operation of the junction has been analysed under the scenario of no development for the year 2017, as shown in Table 10.3.11.

2017	AM Peak		PM Peak	
	Maximum RFC	Maximum Q	Maximum RFC	Maximum Q
Marsh Lane	0.400	1	0.392	1
A30 (T) South	1.169	124	0.868	6
Carwin Rise west	1.041	38	0.731	3
A30 (T) North	1.131	102	1.429	389
Carwin Rise east	0.514	1	0.481	1

Table 10.3.11: Operational Analysis under 'Do Nothing' Scenario

The analysis of the 'No Development' scenario indicates that the junction will in any event be operating above its capacity owing to the effects of traffic growth and the new retail development. Comparison of Table 10.3.11 and 10.3.10 indicates that the effect of development traffic is to increase queue lengths on the trunk road. In both scenarios, i.e. with and without the development, three arms are saturated and two are not.

An improvement scheme involving widening of the southbound A30(T) approach to the junction is shown on Figure 9.6 and comprises a widening of the approach to provide three approach lanes. This improvement could be secured within highway land. The effect of the improvement can be identified by analysing this improved layout and the ARCADY model results are shown in Table 10.3.12 below.

2017	AM Peak		PM Peak	
	Maximum RFC	Maximum Q	Maximum RFC	Maximum Q
Marsh Lane	0.555	2	0.609	2
A30 (T) South	1.310	203	0.994	22
Carwin Rise west	1.123	85	0.964	15
A30 (T) North	0.897	8	1.146	143
Carwin Rise east	0.685	2	0.716	3

Table 10.3.12: With Development and Improvement

It can be seen that the proposed improvement to the roundabout will significantly reduce southbound queuing on the A30(T) and bring it to a level below that to be expected if development were not to take place. As such, this improvement scheme, whilst not itself resolving background capacity issues, can be considered to mitigate the impact of development traffic.

10.4 Peak Month Impact Assessment (Normal Trip Generation)

10.4.1 South Quay Access

The operation of the proposed priority junction has been assessed for the scenario of the busiest month but assuming the lower trip rates. The results are contained in full at Appendix H and summarised below.

2011	AM Peak Hour		PM Peak Hour	
	Maximum RFC	Maximum Q	Maximum RFC	Maximum Q
Right turn to South Quay	0.268	1	0.351	1
Left turn from South Quay	0.182	1	0.429	1
Right turn from South Quay	0.283	1	0.543	1
2017				
Right turn to South Quay	0.275	1	0.358	1
Left turn from South Quay	0.188	1	0.449	1
Right turn from South Quay	0.312	1	0.578	2

Table 10.4.1: Operation of South Quay Access under full development scenario

As would be expected, the junction is shown to operate within its capacity in the two busiest hours in both design years. Queuing is minimal and there would be no obstruction to the movement of traffic on the B3301.

10.4.2 North Quay Access

The operation of the junction under this traffic flow scenario has been assessed using LINSIG software. The modelling output is reproduced in full at Appendix J and is summarised in Table 10.4.2 below.

2011	AM Peak (08.00-09.00)		PM Peak (17.00-18.00)	
	Maximum RFC	Maximum Q	Maximum RFC	Maximum Q
Hayle Terrace Ahead	75.9%	17	77.1%	18
Hayle Terrace Right Turn	23%	2	35.2%	2
North Quay left/right	71.6%	7	80.6%	9
Penpole Terrace left/ahead	66.7%	15	84%	24
2017				
Hayle Terrace Ahead	79.7%	19	81%	20
Hayle Terrace Right Turn	25%	2	38.2%	2
North Quay left/right	79.6%	8	88.3%	10
Penpole Terrace left/ahead	70.1%	16	87.6%	27

Table 10.4.2: Operation of North Quay traffic signals under full development scenario

The LINSIG analysis shows that in both design years, the junction would operate within its capacity.

10.4.3 Foundry Square Roundabout

Analysis of the small roundabout under this flow scenario is summarised in the following table.

2011	AM Peak		PM Peak	
	Maximum RFC	Maximum Q	Maximum RFC	Maximum Q
Penpol Terrace	0.869	6	1.149	73
B3302	0.637	2	1.035	24
Carnsew Road	0.638	2	1.593	285
2017				
Penpol Terrace	0.869	6	1.285	151
B3302	0.637	2	1.777	66
Carnsew Road	0.638	2	1.793	456

Table 10.4.3: Operation of Foundry Square roundabout under full development scenario

The analysis indicates that even with lower levels of generated traffic, the mini-roundabout will not have the capacity necessary to accommodate the predicted traffic flow comprising the development, background traffic and growth in background traffic. The consequence remains queuing on all arms in the busiest hours.

10.4.4 B3301/Lethlean Lane Priority Junction

The operation of the junction has again been tested using the PICADY analysis software, with the results of the full development scenario for the two design years summarised below. The full model output is reproduced at Appendix M.

2011	AM Peak		PM Peak	
	Maximum RFC	Maximum Q	Maximum RFC	Maximum Q
Lethlean Lane Left Turn	1.703	19	1.955	16
Lethlean Lane Right Turn	1.649	33	1.907	29
B3301 Right Turn	0.330	1	0.528	2
2017				
Lethlean Lane Left Turn	0.248	1	4.484	25
Lethlean Lane Right Turn	0.647	2	4.363	49
B3301 Right Turn	0.232	1	0.589	2

Table 10.4.4: Operation of the B3301/Lethlean Lane priority junction under full development scenario

Under the scenario of lower traffic generation, the priority junction continues to operate above its capacity in both peak hours in the design years, with the development completed.

10.4.5 Churchtown Road at Riviere Fields

As the proposed junction has been shown to operate satisfactorily under the most robust scenario, no further modelling has been considered necessary.

10.4.6 A30(T) St Erth Roundabout

The gyratory has been modelled using the ARCADY software for both peak hours under the scenario of lower traffic generation. The results are shown in Table 10.4.5 below.

2017	AM Peak		PM Peak	
	Maximum RFC	Maximum Q	Maximum RFC	Maximum Q
A30 (T) East	0.933	11	0.972	19
A30 (T) West	1.436	360	1.149	93
Nut Lane	0.668	2	0.497	1
Griggs Hill	0.490	1	0.216	1

Table 10.4.5: St Erth Roundabout – 2017 Full Development

Whilst the analysis indicates that the impact of development is reduced under this scenario, the junction will operate in excess of its capacity with extensive queuing on the eastbound A30(T).

10.4.7 A30(T) Loggans Moor Roundabout

The five-arm trunk road roundabout has been analysed for the 2017 design year with lower traffic generation – the results are set out below.

2017	AM Peak		PM Peak	
	Maximum RFC	Maximum Q	Maximum RFC	Maximum Q
Marsh Lane	0.430	1	0.410	1
A30 (T) South	1.234	164	0.910	9
Carwin Rise west	1.136	89	0.925	10
A30 (T) North	1.221	172	1.571	469
Carwin Rise east	0.565	2	0.532	2

Table 10.4.6: Operational Analysis under full development scenario

Even with lower traffic generation arising from the development, the operational analysis confirms that the roundabout will be subject to queuing and delays in the peak hours.

The effect of the proposed improvement can be identified by analysing the improved layout with lower development flow and the ARCADY model results are shown in Table 10.4.7 below.

2017	AM Peak		PM Peak	
	Maximum RFC	Maximum Q	Maximum RFC	Maximum Q
Marsh Lane	0.536	2	0.603	2
A30 (T) South	1.291	194	0.985	20
Carwin Rise west	1.111	77	0.919	10
A30 (T) North	0.885	8	1.127	163
Carwin Rise east	0.666	2	0.707	3

Table 10.4.7: With Development and Improvement

It is confirmed that the improvement scheme secures operational characteristics consistent with those under the 'Do Nothing' scenario and mitigates the impact of the development.

10.5 Neutral Month Assessment (Worst-Case Trip Generation)

The following analysis sets out the results of the assessment of the neutral month with higher traffic generation prediction.

10.5.1 Foundry Square Roundabout

The improved junction layout, shown in the drawing at Appendix K, has formed the basis of the impact assessment, which is contained at Appendix L and summarised in Table 10.5.3 below.

2011	AM Peak		PM Peak	
	Maximum RFC	Maximum Q	Maximum RFC	Maximum Q
Penpol Terrace	1.177	75	1.231	112
B3302	0.651	2	0.871	6
Carnsew Road	0.876	6	1.306	128
2017				
Penpol Terrace	1.259	116	1.303	160
B3302	0.688	2	0.929	9
Carnsew Road	0.941	11	1.397	178

Table 10.5.1: Operation of Foundry Square roundabout under full development scenario

Again, the analysis indicates that the mini-roundabout will not have the capacity necessary to accommodate the predicted traffic flow comprising the development, background traffic and growth in background traffic.

The consequence is queuing on all arms in the busiest hours.

10.5.2 B3301/Lethlean Lane Priority Junction

The location and form of the existing junction, which is proposed to be retained in its existing form, can be seen from the Masterplan drawing. The operation of the junction has been tested using the PICADY analysis software, with the results of the full development scenario for the two design years summarised below. The full model output is reproduced at Appendix M.

2011	AM Peak		PM Peak	
	Maximum RFC	Maximum Q	Maximum RFC	Maximum Q
Lethlean Lane Left Turn	0.255	1	0.417	1
Lethlean Lane Right Turn	0.627	2	0.820	4
B3301 Right Turn	0.230	1	0.426	1
2017				
Lethlean Lane Left Turn	0.315	1	1.094	6
Lethlean Lane Right Turn	0.720	3	1.070	9
B3301 Right Turn	0.247	1	0.463	1

Table 10.5.2 Operation of the B3301/Lethlean Lane priority junction under full development scenario

The analysis demonstrates that with this assessment scenario, the junction operates close to its operating capacity in the evening peak hour and within its capacity in the morning peak hour.

Comparison of this scenario with the others already tested demonstrates that it is the chosen month that has the most significant effect on the operation of the junction, with changes in the traffic generation having only small effects on the modelling results.

10.5.3 A30(T) St Erth Roundabout

The existing gyratory has been modelled using the ARCADY software for both peak hours, the results being shown in Table 10.5.3 below. In accordance with Highways Agency requirements, analysis has considered a design year of 2017 - 10 years after registration of the proposed development.

2017	AM Peak		PM Peak	
	Maximum RFC	Maximum Q	Maximum RFC	Maximum Q
A30 (T) East	0.714	3	0.808	4
A30 (T) West	1.153	105	0.984	20
Nut Lane	0.511	1	0.394	1
Griggs Hill	0.380	1	0.225	1

Table 10.5.3 St Erth Roundabout – 2017 Full Development

The analysis indicates that in all design years, with the development completed the junction will accommodate traffic flows in excess of its operating capacity. The effect will be long queuing in the peak hours on the eastbound A30(T).

10.5.4 A30(T) Loggans Moor Roundabout

The five-arm trunk road roundabout has been analysed for the 2017 Highways Agency design year – the results are set out below.

2017	AM Peak		PM Peak	
	Maximum RFC	Maximum Q	Maximum RFC	Maximum Q
Marsh Lane	0.356	1	0.349	1
A30 (T) South	0.990	23	0.752	3
Carwin Rise west	0.894	8	0.761	3
A30 (T) North	1.220	170	1.280	217
Carwin Rise east	0.448	1	0.435	1

Table 10.5.4: Operational Analysis under full development scenario

The operational analysis indicates that the roundabout will be subject to queuing and delays in the peak hours in all future design years, assuming full build-out of the development at Hayle and completion of development on the adjacent retail park.

The effect of the improvement scheme is shown in Table 10.5.5 below.

2017	AM Peak		PM Peak	
	Maximum RFC	Maximum Q	Maximum RFC	Maximum Q
Marsh Lane	0.438	1	0.452	1
A30 (T) South	1.037	39	0.794	4
Carwin Rise west	0.882	7	0.761	3
A30 (T) North	0.884	7	0.926	11
Carwin Rise east	0.529	2	0.534	2

Table 10.5.5: With Development and Improvement

It can be seen that the proposed improvement to the roundabout will significantly reduce southbound queuing on the A30(T) and bring it to a level below that to be expected if development were not to take place. As such, this improvement scheme, whilst not itself resolving background capacity issues, can be considered to mitigate the impact of development traffic.

10.6 Neutral Month Assessment (Normal Trip Generation)

The impact assessment presented in the following tables represents the assessment of the more realistic traffic generation during a neutral month. As the three access junctions have been demonstrated to operate satisfactorily under the most robust assessment scenarios, they have not been considered for this scenario.

10.6.1 Foundry Square Roundabout

The Foundry Square roundabout, the intersection of the B3301 and B3302, has recently been improved by the highway authority. The improved junction layout, shown in the drawing at Appendix K, has formed the basis of the impact assessment, which is contained at Appendix L and summarised in Table 10.6.1 below.

2011	AM Peak		PM Peak	
	Maximum RFC	Maximum Q	Maximum RFC	Maximum Q
Penpol Terrace	1.177	75	1.231	112
B3302	0.651	2	0.871	6
Carnsew Road	0.876	6	1.306	128
2017				
Penpol Terrace	1.259	116	1.303	160
B3302	0.688	2	0.929	9
Carnsew Road	0.941	11	1.397	178

Table 10.6.1: Operation of Foundry Square roundabout under full development scenario

The analysis indicates that even under this scenario, the mini-roundabout will not have the capacity necessary to accommodate the predicted traffic flow comprising the development, background traffic and growth in background traffic.

10.6.2 B3301/Lethlean Lane Priority Junction

The operation of the junction has been tested using the PICADY analysis software and is summarised below. The full model output is reproduced at Appendix M.

2011	AM Peak		PM Peak	
	Maximum RFC	Maximum Q	Maximum RFC	Maximum Q
Lethlean Lane Left Turn	0.215	1	0.200	1
Lethlean Lane Right Turn	0.566	2	0.663	2
B3301 Right Turn	0.216	1	0.394	1
2017				
Lethlean Lane Left Turn	0.248	1	0.495	1
Lethlean Lane Right Turn	0.647	2	0.843	4
B3301 Right Turn	0.232	1	0.428	1

Table 10.6.2: Operation of the B3301/Lethlean Lane priority junction under full development scenario

It is evident from the analysis that the priority junction will be operating within its capacity in both peak hours in the design years, with the development completed.

10.6.3 A30(T) St Erth Roundabout

The existing gyratory has been modelled using the ARCADY software for both peak hours, the results being shown in Table 10.6.3 below.

2017	AM Peak		PM Peak	
	Maximum RFC	Maximum Q	Maximum RFC	Maximum Q
A30 (T) East	0.708	3	0.792	4
A30 (T) West	1.126	89	0.946	13
Nut Lane	0.508	1	0.386	1
Griggs Hill	0.366	1	0.189	1

Table 10.6.3: St Erth Roundabout – 2017 Full Development

The analysis indicates that in all design years, with the development completed the junction will accommodate traffic flows in excess of its operating capacity. The effect will be long queuing in the peak hours on the eastbound A30(T).

Here too, in order to identify and isolate the impact of development traffic, a similar analysis of the operation of the junction without development in place has been undertaken. The results for the design year 2017 are summarised in Table 10.6.4 below.

2017	AM Peak		PM Peak	
	Maximum RFC	Maximum Q	Maximum RFC	Maximum Q
A30 (T) East	0.674	2	0.743	3
A30 (T) West	1.019	32	0.768	3
Nut Lane	0.496	1	0.352	1
Griggs Hill	0.277	1	0.061	1

Table 10.6.4: St Erth Roundabout – 2017 No Development

The analysis of the 'Without development' scenario indicates that the junction is anticipated to operate beyond its capacity even in the absence of development in Hayle. Operational problems at the junction are therefore a factor of interim traffic growth as much as they are a consequence of new development.

10.6.4 A30(T) Loggans Moor Roundabout

The five-arm trunk road roundabout has been analysed for the 2017 Highways Agency design year – the results are set out below.

2017	AM Peak		PM Peak	
	Maximum RFC	Maximum Q	Maximum RFC	Maximum Q
Marsh Lane	0.351	1	0.346	1
A30 (T) South	0.981	20	0.746	3
Carwin Rise west	0.876	6	0.718	3
A30 (T) North	1.201	155	1.256	194
Carwin Rise east	0.440	1	0.427	1

Table 10.6.5: Operational Analysis under full development scenario

The operational analysis indicates that the roundabout will be subject to queuing and delays in the peak hours in all future design years, assuming full build-out of the development at Hayle and completion of development on the adjacent retail park. To establish the degree to which this is a function of background traffic growth, the operation of the junction has been analysed under the scenario of no development for the year 2017, as shown in Table 10.6.6.

2017	AM Peak		PM Peak	
	Maximum RFC	Maximum Q	Maximum RFC	Maximum Q
Marsh Lane	0.328	1	0.326	1
A30 (T) South	0.930	11	0.706	3
Carwin Rise west	0.758	3	0.535	1
A30 (T) North	1.097	81	1.130	104
Carwin Rise east	0.389	1	0.374	1

Table 10.6.6: Operational Analysis under 'Do Nothing' Scenario

The analysis of the 'No Development' scenario indicates that the junction will in any event be operating above its capacity owing to the effects of traffic growth and the new retail development. Comparison of Table 10.6.5 and 10.6.6 indicates that the effect of development traffic is to increase queue lengths on the trunk road. In both scenarios, i.e. with and without the development, three arms are saturated and two are not.

2017	AM Peak		PM Peak	
	Maximum RFC	Maximum Q	Maximum RFC	Maximum Q
Marsh Lane	0.423	1	0.437	1
A30 (T) South	1.021	33	0.782	4
Carwin Rise west	0.867	6	0.718	3
A30 (T) North	0.871	7	0.908	9
Carwin Rise east	0.511	1	0.515	1

Table 10.6.8: With Development and Improvement

It can be seen that the proposed improvement to the roundabout will significantly reduce southbound queuing on the A30(T) and bring it to a level below that to be expected if development were not to take place. As such, this improvement scheme, whilst not itself resolving background capacity issues, can be considered to mitigate the impact of development traffic.

10.7 Safety Impacts

The B3301 functions as an access route for Hayle and the adjoining settlements. Given the strategic role of the A30(T), the B3301 provides no strategic role beyond this and flow levels reflect that. The description of existing highway conditions at Section 3 identified existing peak flow levels on the route of the order of 1,000 vehicles per hour. This level of flow falls within the theoretical carrying capacity of the corridor, although the effects of turning movements to and from the route are such that its practical capacity is reduced.

The proposed development is shown to generate flow levels of 1,423 vehicles per hour in the busiest period (worst case scenario) and reduced flow at all other times. In absolute terms, the additional flow equates to

approximately 25%. Whilst this represents a material increase in flow, the combination of background and development flow will not exceed the theoretical carrying capacity of the B3301.

Aside from considerations of carrying capacity, more critical is the issue of highway safety. There are environmental effects associated with traffic flows on the B3301, particularly in areas where pedestrian activity is particularly high.

The Lethlean Lane route to and through Phillack is likely to accommodate two-way flow levels of 317 vehicles in the 2011 design year without development. The proposed development will add 160 trips to this flow, an increase of some 50%. In absolute terms, this is a significant increase. The combined flow remains however significantly within the capacity of the corridor. The development flow – at 160 trips per hour – is a level that in itself will be difficult to perceive, as it equates to one vehicle every 22 seconds.

It has been shown as part of the impact assessment that the use of Lethlean Lane for access to the proposed development is likely to be constrained by capacity limitations at the junction onto the B3301. In reality therefore, the use of this route is likely to be less than anticipated.

10.8 Impact Assessment Conclusions

The junction impact assessment concludes that the three proposed access junctions can accommodate the traffic flow generated by the proposed development in the future designs, even under particularly onerous assumptions regarding the combination of development and background flow.

Analysis of the two existing junctions at Foundry Square and Lethlean Lane has indicated levels of over-saturation in the busiest hour, in the former case whether or not development takes place. In both cases, highway improvements to provide additional network capacity is not proposed. The sensitivity testing indicates that conditions at Foundry Square can be expected to be problematic under any scenario, it is evident however that operational difficulties at the Lethlean Lane junction are a function only of the more robust analyses.

In respect of the two trunk road junctions, the St Erth gyratory will experience additional congestion in the busiest hour as a result of development, although predicted operational difficulties are not attributable to development alone. Mitigation in the form of physical improvement is not possible at the junction. The level of impact associated with development traffic varies considerably depending on the scenario, such that in the least robust scenario, the impact of the proposed development is very small.

The Loggan's Moor junction too will experience additional congestion, although an improvement scheme is identified that would offer mitigation for this.

Opportunities to directly mitigate the impact of development traffic through additional network capacity are limited to the Loggans Moor trunk road junction. At other junctions, direct mitigation through increased network capacity is either not feasible or not appropriate. As such, opportunities to mitigate the effects of the

proposed development must focus on demand management as a means of reducing the total flow of traffic on the road network. Congestion and junction capacity in the Penwith District area is an issue that is being considered by the Highways Agency and Cornwall County Council at a strategic level.

A recognised demand-management measure is Travel Planning, discussed in greater detail in Section 12 of this document. Travel Planning as a technique lends itself particularly to employment and residential development, where opportunities to encourage and enable reduced car use are most feasible.

The role of public transport for the travel demands of the proposed development is outlined at Section 6. Travel Planning will ensure maximum take-up by residents and employees of the development of existing public transport, therefore leading to reduced private car use. It is however the potential for achieving a shift towards public transport by existing residents, employees and visitors of/to Hayle that offers the greatest scope to effect mitigation for the effects of development traffic. The proposed development will support such a reduction in background traffic by:

- Supporting greater investment by others in rail and bus services to the town;
- Supporting greater investment by others in improved public transport infrastructure in the town;
- Enabling increased walking and cycling within the town, thereby increasing the attractiveness of bus and rail services;
- Investigating the potential for enhanced access to the railway station;

In addition to measures associated specifically with the development, other committed initiatives such as the St Erth Park & Ride facility will play a central role in the strategy of reducing the car dependence of visitors to the town. This particular initiative, planned for implementation in the short term, will almost certainly effect a reduction in car traffic attracted both to the development and to the town.

11 Car Parking

11.1 Introduction

The proposed car parking provision has been assessed to establish whether (a) adequate parking is accommodated to avoid highway safety issues relating to overspill parking and whether (b) the level of provision accords with policy guidance contained in the statutory development plan.

The proposed development comprises a range of complementary land-uses, with scope for shared use; issues of operational need and interpretation of policy guidance are therefore complex.

11.2 Car Parking Review

The Riviere Fields and 'Hilltop' sites accommodate residential development only, with proposals that off-street parking is provided to accommodate the demand arising from new flats and houses. Both sites are far enough from existing and new services and facilities that they are unlikely to be attractive to visitors for parking. On the basis that adequate parking for residents and visitors can be accommodated 'on-plot', no further assessment is therefore required of these parts of the development.

In respect of South Quay, the following table sets out the proposed parking provision and compares it with the provision required of the prevailing parking standards, assuming that each element of the mixed-use development is treated as a free-standing and independent proposal.

Proposed Development	Parking Standard (Maximum)	Standard Provision	Actual Provision
Residential 260 flats	1-2 per dwelling	260-520	260
5,150m ² Employment	1/35-50m ² GFA	103-147	111
10,585m ² Retail (Non food)	1/25m ² GFA	423	60
435m ² Leisure (Café/Restaurant)	1/5m ² public area	40	40
Total		826-1,130	471

Table 11.1: Proposed Parking Supply – South Quay

The 'Community' element of the proposed development will comprise a modest Health Centre and Tourist Information Centre, for which a parking standard is not quoted. These elements of the development site can be assumed not to be trip attractors in their own right and are not expected to generate an additional demand for car parking.

It is evident that the total provision of 471 spaces falls significantly within the maximum parking level defined by the County Council's standards, as required by policy guidance.

In operational terms, treating South Quay in isolation (it will be argued later that this is not appropriate) would appear to indicate that parking provision falls significantly below the maximum standards and whilst this is acceptable in theory, there is the potential for a highway safety hazard. The calculations should however be taken as a significant overestimate of actual parking demand, as the retail parking need in particular will not be at the level suggested by the Council's standards, as the proposal is for a range of smaller units rather than a shopping centre of the form anticipated by the standards.

The above calculation also ignores the car park on the triangular spit, which will offer a further 250 spaces. These are not intended to cater for the operational needs of the development; rather they are intended to accommodate new visitors to the Town Centre as a whole. These visitors will be the same visitors that will frequent the shops and restaurants within the development and in this way, this facility can be considered to contribute towards the operational parking need of the development.

The provision on North Quay can be assessed in a similar way, with the following table setting out standard maximum requirements and actual proposed provision.

Proposed Development	Parking Standard (Maximum)	Maximum Provision	Actual Provision
Residential 382 flats/houses	1-2 per dwelling	382-764	382
7,355m ² Employment (includes 450 space public car park)	1/35-50m ² GFA N/A	147-210 450	562
2,613m ² Retail (Non food)	1/25m ² GFA	105	105
5,575m ² Industrial	1/50-200m ² GFA	28-112	112
1,455m ² Leisure (Café/Restaurant)	1/5m ² public area	145	0
60-bed hotel	1/bedroom	60	10
Total		675-1,012	1,171

Table 11.2: Proposed Parking Supply – North Quay

In the case of North Quay, the proposed level of provision of 1,171 spaces exceeds the recommended maximum derived from the policy guidance. This is partly due to the fact that the 450-space public car park is intended to accommodate visitor demand arising from the town centre as a whole, a fact that cannot be adequately reflected in the parking standards. As such, it can be concluded that North Quay in isolation offers sufficient operational parking, without in practise exceeding the maximum level recommended in policy guidance.

The provisions on South and North Quays can realistically be looked at in combination, as new pedestrian bridges proposed as part of the development will create linkages that will support easy access to parking across the wider site. Looking at the development as a whole therefore, the parking provision – at 1,691

spaces – falls in the range of maximum provision as defined by the standards, calculated to be 1,501-2142 spaces.

11.3 Conclusions

In terms of policy guidance, it is evident that the proposals accord with the development plan, with parking levels below the maximum identified in the County Council parking standards.

Regarding operational considerations and effects on highway safety, it is difficult to accurately predict the level of peak car parking demand. Taking the maximum parking standards as a guide, demand for 1,500 spaces appears to be a reasonable assumption and this is catered for.

Many of the trips generated by the proposed development will be linked to existing trips to the town and much parking demand will be a replacement for parking demand now accommodated elsewhere in the town. The proposals to implement pedestrian linkages that will optimally connect the development will ensure that existing town centre parking can be considered to be available to accommodate demand for parking that is not enabled directly within the development site. As such, the proposed provision might represent an oversupply in the context of the development alone. The development needs however to be seen as a catalyst for increased attractiveness of the town and parking within the site will simply add to the public parking stock of the town as a whole.

The proposals for public parking both at North Quay and on the triangular spit reflect the need to support the vitality and viability of the town centre and management of these spaces for short-term use will ensure that they fulfil this strategic function as well as supporting the development.

12 Travel Planning

12.1 Introduction

A Travel Plan is a package of measures, including physical measures, management and promotional initiatives, which manage access to a site in a manner that encourages travel by modes other than the private car. A Travel Plan is a permanent and evolving set of actions designed to reduce the environmental effects of travel by private car.

Government guidance has been shown in Section 4 to encourage the implementation of Travel Plans as a mechanism for achieving development that minimises car dependence and maximises transport sustainability. It has also been concluded that demand management is important as a mechanism for mitigating the effects of vehicle traffic associated with redevelopment.

Whilst Government guidance suggests that Travel Plans should be submitted with planning applications, this is not always practical. In this particular case, end-users of the various developments are not known and it is suggested that an appropriate Planning Condition will be sufficient to secure Plans, subject to agreement by the authorities that a Plan could indeed secure the desired objectives in this instance.

With that in mind, this section of the Transport Assessment seeks to demonstrate that Plans could indeed feasibly be implemented at Hayle Harbour and in a manner that would achieve the desired results. The format and likely content of Plans is also proposed to support the implementation by the planning authority of a Planning Condition.

The County Council is in the process of adopting Travel Plan guidance and has provided a draft copy of its 'Advice to Developers in Cornwall' document. This provides guidance to developers on the form and content of Travel Plans and has been used to inform the following proposals. The document will be 'adopted' as a standard against which the individual Travel Plans will be assessed.

Travel Plans will be addressed at a later stage as part of the planning conditions and section 106 agreement.

12.2 Travel Plan Objectives

The proposed development comprises retail, residential, leisure and employment development. At this stage, the likely end-users of the development are unknown but this should not preclude consideration of the form and content of Plans that will be implemented at individual developments.

The Government has produced guidance relating to residential travel planning, which itself points to the potential for such initiatives to be effective ('Making Residential Travel Plans Work' DfT, June 2007). New residential development at Hayle, particularly that implemented in 'estates' or in blocks, lends itself well to

travel planning. A number of significant employment units are envisaged as part of the proposals and these too will readily lend themselves to the successful implementation of Plans targeted at staff and visitors.

Leisure and retail provision is widely dispersed throughout the proposed site and parking associated with it is in many cases shared with other public provision. These elements of the development are less well suited to travel planning, though initiatives to manage parking supply could be considered in liaison with the planning and highway authorities independent of specific Travel Plans.

The overarching objective of Travel Plans Guidance contained in PPG13 (Transport) is intended to:

- i. promote more sustainable transport choice;
- ii. promote accessibility by public transport, walking and cycling;
- iii. reduce the need to travel by car;

These overarching objectives will inform the specific objectives of individual Travel Plans.

Travel Planning is likely to be successful in delivering reductions in private car trips at this location for a number of reasons:

- the nature of the mixed use development is such that significant scope for pedestrian travel to shops, jobs and other services exists;
- scope exists for encouraging cycle travel between the development and services and facilities in Copperhouse;
- bus public transport exists in a form that supports travel to a number of strategic destinations;
- rail public transport exists, offering services to a range of strategic destinations;
- scope exists to increase the accessibility of both bus and rail services for existing and new residents and workers in the town;

12.3 Travel Plan Content

Guidance in respect of the structure and content of Travel Plans is contained in the County Council's 'Advice for Developers' document. In accordance with those guidelines, Travel Plans for the phases of the proposed development will be structured broadly as follows:

Context

The development site transport context will be presented as a basis for identifying opportunities for alternative transport solutions.

Baseline Travel Data

The data presented earlier in this Transport Assessment focuses on traffic flow patterns. In addition to updating this information, Travel Plans implemented as part of the development will include Travel Surveys to identify a baseline mode-split measure, which will form the basis of an agreed target reduction.

Scope and Objectives

With the overarching objectives of PPG13 in mind, the individual Travel Plans will be expected to include as their stated objectives:

- (a) to promote awareness of travel opportunities and encourage use of non-car modes;
- (b) increase ease of access to public transport and to walking and cycling;
- (c) to reduce the proportion of single-occupancy car journeys made by residents/visitors/employees;

Plan Measures

The Travel Plans will include:

- Measures to promote walking;
- Measures to promote the use of public transport;
- Measures to promote car sharing;
- Measures to manage the supply of and demand for car parking;
- Consideration of any other measures which may be relevant to achieve the objectives.

Targets and Outcomes

Specific and achievable targets will be identified in the Travel Plan documents.

Guidance provided by the Department for Transport ('Guidance on the Assessment of Travel Plans', Dec 2005) suggests that reductions in car mode share of between 5% and 10% are achievable over a 3-5 year horizon. For the purpose of the Hayle Plans, a 5% target reduction over three years appears achievable.

Action Plan

Each Plan will include an Action Plan, setting out objectives for implementing the specific measures chosen to secure the target mode split.

Implementation Strategy

The success of any Plan relies on its maintenance and management. Proposals to monitor this will be included in the Travel Plans.

12.4 Conclusion

The mitigating effect of travel planning is difficult to predict and monitoring and review will be an essential part of the travel planning strategy. It would not be unreasonable however to prepare initial Plans with targets to achieve a 5% reduction in the car mode share within a three-year period. Further reduction would be planned after that initial period, although at a reduced rate.

Plans would be secured by Planning Condition, with reference made to the Council's guidance document and to the *Travel Plan Framework* referred to above. With a defined structure and mechanism for delivery, there is no reason to believe that Travel Plans could not secure the target level of car travel reduction and thereby contribute to mitigating the impacts of the proposed development.

13 Construction Traffic Effects

13.1 Construction Program

Construction is an inevitable consequence of development and specific Planning Conditions ensure that construction activities are managed in a way that minimises its impact. It would not be unreasonable for the Planning Authority to impose a Condition requiring the submission of a Construction Traffic Management Plan, which would form the basis of the authorities' approval of matters such as:

- The routes used to access the development site;
- Arrangements for operatives car parking on site;
- The requirements for traffic regulation orders to support construction activities;
- Hours of operation;

It is also typically the case that impacts associated with construction traffic are less than the permanent impacts associated with development when it is completed.

Notwithstanding this, the following section sets out sufficient information to enable the planning and highway authorities and other interested parties to assess the likely impacts of construction activities on highway safety.

13.2 Construction Traffic Impacts

Estimates of construction traffic volumes have been provided by others, together with details of the likely routes to the various elements of the development site.

For the purposes of the TA it is assumed that construction will commence with the development of North Quay. Traffic accessing North Quay for the purpose of construction will access the site from the east on the B3301, with a prohibition in travel through Foundry Square. Access to the North Quay site for construction traffic will necessitate early construction of the proposed new bridge, although signalling of its junction with the B3301 is unlikely to be required to cater for construction traffic alone.

For the purpose of constructing the Riviere Fields housing development and as a secondary means of accessing North Quay on occasions where the internal roads will not accommodate an alternative, construction traffic will access the development site from Churchtown Road via Lethlean Lane.

Whilst the route passes through the settlement of Phillack, it is part of the classified road network and there are no existing regulatory constraints on the use of the route by heavy vehicles. Notwithstanding this, the use of this route will be limited as far as possible, to minimise the impacts on the settlement.

Construction activities on South Quay will be served by a nominated and enforced access route utilising the B3301 from the A30(T) west of Foundry Square. Access to Hayle for works at South Quay will be prohibited from the east, so that construction traffic does not pass through the town. The site access will be located at the location of the proposed permanent access, which will be partly constructed at the outset for that purpose.

In terms of volumes, we are advised that during peak construction activity, an average of 35 construction vehicles per day will serve the development site, all of these from the trunk road in the west. This development phase is anticipated to last for some thirty-six months. Peak activity is anticipated to see 80 lorries per day accessing the site via the B3301.

Other phases, which will see construction traffic travelling on the B3301 through Copperhouse, will see a maximum of 37 vehicles per day (average of 16) accessing the development site. Of these, only a proportion will travel through Phillack and then only for a proportion of the time.

13.3 Conclusions

The location of the development site adjacent to the B3301 means that construction traffic can largely be limited to this Class 2 highway, which is an appropriate route for construction traffic. Whilst numbers will peak at 80 per day, this will be on the least sensitive part of the route. At all other times, levels of activity will be substantially below this.

Where construction traffic will travel on the B3301 through Copperhouse, levels will be low when compared to background traffic flow.

Occasional use of Lethlean Lane for access to Riviera Fields is unavoidable. The Class 3 route is however not considered unsuitable in highway geometry terms for this purpose on a temporary basis.

14 Summary and Conclusions

14.1 Summary

The proposal is to develop a mix of residential, employment, retail and complementary uses in the centre of Hayle. Development will front the Class 2 B3301, which links the town with the A30(T) trunk road at either end.

Existing traffic flow on the B3301 is relatively light and well within the capacity of the link. Traffic flow levels in the town reach a seasonal peak in August, reflecting the role of the town and the sub-region as a tourist destination.

There are currently limited off-street parking opportunities in the town, with parking demand catered for primarily in the form of on-street parking.

The development site is allocated for mixed-use development and the principle of development in Hayle is therefore established. Notwithstanding this, transport policy guidance has been reviewed to establish those key policies that need to be reflected in the proposals. A review of policies contained in the statutory development plan has been undertaken, identifying the major objective of securing development that is accessible by a range of travel modes.

The proposal is for development in four discrete areas. The South Quay and North Quay sites will accommodate primarily residential and retail development, the former as flats. There will be complementary facilities such as a tourist office, café's and restaurants. The 'Hilltop' and Riviere Fields sites, slightly further from the town centre, will accommodate exclusively residential development.

The development will be accessed from the existing public highway in three places – two new accesses onto the B3301 and a new access onto Churchtown Road in Phillack. The South Quay site will have a single access. The North Quay, 'Hilltop' and Riviere Fields sites will benefit from two accesses, with a spine road between them.

The development will include two public car parks – one on North Quay and one on the triangular spit of land adjacent to South Quay. Operational parking will additionally be provided within residential plots and on-street.

The town of Hayle is well served by bus and rail public transport, reflecting its location on one of the County's strategic public transport networks (Structure Plan Policy 27). The development site is well located to exploit these services. Indeed the demand for travel arising from the development will increase the economic sustainability of those commercial services, ensuring a 'critical mass' necessary to support investment in services by the operators in the longer term.

The development is well placed to exploit links on foot and by bicycle to a range of existing services and facilities, including public transport, schools and shops. The existing established highway network will adequately cater for the demand for walking to existing destinations.

The development site will include a mix of shopping, living and working and will generate a high level of internal pedestrian movement, which will be catered for through appropriate design of streets and public spaces. The development will attract existing residents to its shops and employment opportunities and in turn generate demand for existing services and facilities. The site's central location will enable a high level of pedestrian linkage between the site and the rest of the town.

The provision of new bridges linking parts of the development and the redevelopment of land on both sides of the B3301 will help to knit the new development into the fabric of the existing town.

The mix of complementary land uses on the development site will ensure 'containment' of trips within the site and minimise out-commuting from the town. The integration of the development into the wider town also offers potential to link trips in a form that reduces the number of new cars on the road network. Making a modest allowance for the effects of containment within the development and linkage between the development site and the town centre, it is anticipated that the development will generate some 950 vehicle movements (arrivals and departures combined) in the busiest morning hour and some 1,400 vehicle movements in the busiest evening hour. All of these trips are assumed to depart Hayle via the B3301 and B3302, with 55% anticipated to travel to the northeastbound A30(T), 40% anticipated to travel to the southwestbound A30(T) and 5% expected to depart the town on the B3302 in the direction of Helston.

Assessment of more reasonable traffic generation assumptions have shown that making certain assumptions about trip containment, the proposed development is more likely to generate lower levels of vehicle traffic, with forecasts showing 750 movements in the AM peak hour and 1,200 in the evening.

The assessment of the impact of generated traffic has been based on a combination of the busiest background traffic flows in August and the busiest commuter peak traffic flow associated with the development. In view of the non-overlapping times, this form of assessment represents very much a worst-case and a scenario that is likely to occur only very occasionally. The analysis also takes standard levels of traffic growth into account in deriving background traffic flow levels for the design years 2011 and 2017.

The assessment of the operation of the seven critical junctions indicates that the three proposed new access junctions would operate within capacity and without impact on the operation of the B3301 even in the most onerous assessment scenario. The Foundry Square and B3301/Lethlean Lane junctions would be subject to increased congestion, which is partly associated with development and partly with general traffic growth. The two trunk road junctions would also be the subject of increased queuing and delay arising from traffic associated with the proposed development. In all cases, the effects of the development are aggravated in the summer months, with reduced levels of impact in the 'normal' assessment periods.

An improvement scheme for the Loggans Moor trunk road junction has been identified that will offer mitigation for the congestion effects of the proposed development. The other junctions are not proposed for improvement owing to the difficulty in achieving appropriate solutions.

Mitigation for the effect of development traffic focuses on travel planning and demand management as a means of reducing both generated traffic and background traffic. Through the implementation of Travel Plans, and the provision of high quality links within the development and within the town as a whole, reductions in traffic generation can be achieved that would offset the impacts identified as being attributable to the proposals.

Indirectly, the strengthening of the vitality and viability of Hayle as a self-contained settlement will support initiatives by others to increase public transport accessibility and further reduce travel into and out of the town by car.

Levels of car parking are shown to accord with prevailing parking standards. In operational terms too, levels of car parking are considered adequate. The development will secure additional public car parking in the town, with an associated benefit to the vitality and viability of Hayle.

The potential to implement Travel Plans has been discussed and Planning Conditions will reasonably require Plans to be implemented at many of the developments, primarily residential and employment sites. There is evidence within the industry to support the view that Plans implemented in this way can affect reduced car travel. Published guidance provided by the County Council provides a suitable framework for new Plans and a Framework document will be agreed.

Construction traffic activities have been briefly outlined, concluding that traffic flow levels will be comparatively low and concentrated on access routes appropriate for that purpose.

14.2 Conclusions

It is concluded that development of the form proposed accords with adopted transport policies of the District and County Council's.

Subject to detailed design, new highway infrastructure associated with the proposed development would not prejudice highway safety and would enhance the wider accessibility of the town.

In technical terms, whilst impacts associated with development traffic are unavoidable, no impact on the safety of new or existing residents, employees or visitors is anticipated.