

8 Transport and access

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8 Transport

8.1 Introduction

The details of the application scheme have 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 and meetings have since been held with Officers of both highway authorities, together with Officers of the District Council. A new Transport Assessment incorporating those comments has been undertaken and forms part of the planning application.

This chapter describes the transportation impacts and proposed remedial measures of the proposed development, set in context of the existing situation. Relevant issues within this chapter have implications for the assessment of other sections of this Environmental Statement (ES), most notably noise and vibration and air quality.

8.2 Methodology and assessment criteria

In terms of transport, policy guidance at all levels requires development to be implemented in a manner that does not prejudice highway safety and in a manner that accords with the key objectives of securing maximum travel mode choice and minimum travel demand. These three criteria underlie the assessment of the transport effects of the application scheme.

The requirement to deliver a safe development relates primarily in this context to the ability of the local highway network to accommodate additional travel demand, in particular walking trips, cycle trips, public transport trips and trips by private car. Impact assessment has therefore addressed the availability of suitable infrastructure to accommodate the needs of pedestrians, cyclists and public transport users. In respect of travel by private car, impact assessment has focussed on those elements of the road network subject to a material increase in traffic flow arising from the proposed development.

The impact assessment is based on standard methodology and uses industry software to assess operational characteristics of individual junctions with and without development in place. Specifically, junction assessments have been undertaken using the PICADY, LINSIG and ARCADY analysis tools to establish queues and delays at junctions likely to be subject to a material increase in traffic flow. Analysis of congestion levels with and without development has allowed the impact of the development itself to be identified.

The amount of car parking proposed for the development has been assessed from a highway safety perspective to ensure there are no highway safety issues relating to overspill parking, and also compared to the policy guidance contained in the statutory development plan.

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

In transportation congestion terms, the significance of impact comes down to the increase in journey time queues and delays above the existing, and above background traffic growth without development. Remedial measures by way of junction design improvements can be used to mitigate any significant / perceptible increase arising from the proposed development.

Impacts from transport relating to noise and air quality are dealt with in chapters 6 and 11 respectively in this Environmental Statement.

In order to satisfy the requirements of the County Council, operational analysis has been undertaken for a design year equivalent to the year of 'substantial opening' of the development and for a future year. Analysis of a period of 10 years after the registration of the application has been undertaken of the trunk road junctions to satisfy the requirements of the Highways Agency and this 2017 scenario is taken to satisfy the future year' requirements of the County Council.

The program for the development is as yet unclear and is reliant on the grant of planning permission, the discharge of Conditions and the submission of reserved matters applications. As such, it is difficult to estimate a date of substantial completion but it is likely that a significant proportion of the first development phase will be secured by 2011. As such, operational analysis of junctions and links has been undertaken for design years 2011 and 2017.

Impact assessment of a development of the form proposed would normally consider the traditional commuter peak periods for a neutral period. The County Council has however asked that impact assessment consider the tourist season in Hayle and specifically, traffic patterns in August. The Council has provided limited data for August and this has enabled comparison of April and August traffic flows. The comparison has shown that the busiest hours, considering both months, are August 11.00-12.00 and August 17.00-18.00.

These two 'base' peak hours have been taken as the AM and PM peak hours for use in the impact assessment and have been combined with traditional AM and PM peak hour flows from the new development (in reality 08.00-09.00 and 17.00-18.00). As such, the combined flows are considered unrealistically high but provide the highway authority with the robustness of assessment that it has demanded.

Alternative scenarios have however been considered in the Transport Assessment in agreement with the authorities, in order that the effects of development can be assessed under more normal operational conditions. The Transport Assessment therefore presents analysis of four different scenarios, representing ranges of traffic generation and ranges of background traffic levels.

The following 'uplift' factors have therefore been applied to the April (neutral month) data to convert it to August (seasonal peak month) data for use in junction assessments:

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 database to ensure that interim traffic growth between 2005, (the date of the traffic survey), and the various design years is factored into the assessment.

The requirement to secure maximum travel mode choice requires an assessment of the availability of walking, cycling and public transport services and infrastructure. Assessment criteria in this case are more objective, with guidance provided by the RPG10 Accessibility Criteria.

The influence of construction traffic have also been assessed for the construction programme using estimates of construction traffic volumes together with likely routes to the various elements of the development site .

Construction activities on South Quay will be served by an 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.

Equally, 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.

8.3 Baseline conditions

8.3.1 Highway conditions

At a strategic level, 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/Poole/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. 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 northwards through Phillack to the cluster of holiday chalets located on the beachside cliff top.

Lethlean 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. The road forms a wide priority junction with the B3301 to the east of the Copperhouse Pool.

Running parallel to the B3301 but to the north of the Copperhouse Pool inlet is George V Memorial Walk, which is a traffic calmed road of approximately 4 metres wide from the North Quay eastwards to Black Road Bridge. Lethlean Lane connects the area to the north of the inlet with the B3301 at a priority junction.

8.3.2 Traffic patterns

A series of classified manual traffic counts have been undertaken in April 2005, traditionally a neutral month and a suitable basis for impact assessment. The counts indicate relatively balanced flows by direction on the B3301, with highest flow levels being on the stretch immediately east of Foundry Square. Traffic flow is heaviest in the evening peak hour, with two-way flow of 1,044 recorded on this stretch of the road.

Flow levels on the B3301 are therefore currently significantly within the theoretical carrying capacity of the corridor. Whilst August flow levels are known to be up to 30% higher than April flows at certain times of the day, the increase in flow is not of a level that approaches the theoretical capacity of the link, which in any event is constrained by turning movements to and from the many parking spaces and side-roads along its length.

Traffic flow on the B3302 is also within the capacity of the link, with two-way flow of 620 vehicles in the morning peak hour and 800 vehicles in the evening peak hour recorded in 2005.

Lethlean Lane similarly is relatively lightly trafficked, with two-way flow of 170 vehicles in the morning peak hour and 220 vehicles in the evening peak hour.

8.3.3 Car parking

There are two main public car parks in Hayle, at Foundry Square and at Commercial Road, Copperhouse. These 'Pay & Display' facilities are intended for short-term use and cater 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 the length of the B3301, in particular at Penpol Terrace, Fore Street and other streets adjacent to the shopping areas. On-street parking is generally free of charge.

8.3.4 Bus services and infrastructure

Hayle lies on the route of one of the County's strategic public transport networks as defined by Policy 27 of the County Structure Plan.

The most significant scheduled bus services are those operated by First Group on a corridor between St Ives, Penzance and Truro, via Hayle. Scheduled services 14, 18 and 301 operate along the B3301 and between them provide three services each hour from Hayle to the most significant local destinations. Services operate seven days of the week, with start and finish times that offer opportunities for both employment and evening leisure travel to and from Hayle.

These scheduled services are supplemented by a number of other, lower frequency, bus services.

In terms of infrastructure, there are bus stops located at regular intervals along the B3301. The quality of passenger facilities at these facilities varies greatly, with some offering basic shelter facilities and some offering none at all. Investment in improvements to this infrastructure – essential if opportunities for reducing the car dependence of the town are to be realised – is assumed to be programmed by the highway authority in recognition of the status of the route as a 'Policy 27' strategic route.

8.3.5 Rail services and infrastructure

Hayle railway station is located on the main national rail network. Rail services are operated by four train operating companies: First Great Western, Virgin Trains, Wessex Trains and Arriva Trains Wales.

Trains travel from Hayle to regional destinations such as Plymouth, Exeter and onward to London. Of particular relevance for the development are services linking Hayle town centre with Penzance, Redruth and Truro. The existing timetable provides for approximately hourly services from Hayle to Penzance and Truro.

The railway station offers limited car parking and facilities for passengers are also limited. The station is accessible both by car and on foot only from its southern side from the B3301 close to Foundry Square. A secondary link between the station platforms and Penpol Terrace (due north from the northern platform) exists, although this is not a public route and access to the platforms has been prevented through the erection of fencing, presumably by the station operator on safety grounds.

8.3.6 Park and ride

The County Council proposes to implement rail-based P&R services from St Erth railway station in the period to 2011. The objective is to increase the accessibility primarily of St Ives and in its planned form, the facility will offer little benefit to Hayle.

Assessment by the County Council of the viability of operating bus-based services from the facility into Hayle has indicated that a business case cannot be made for such a new service. The proposals for new development at Hayle would however alter the outcome of this economic assessment and Officers have indicated that they would wish to review the feasibility analysis once planning permission is granted.

8.3.7 Committed development

At the time that traffic counts were undertaken in April 2005, new retail and residential developments adjacent and close to the Loggans Moor junction on the A30(T) had the benefit of planning permission but had not begun construction.

Details of these developments, which include the new 'Boots' outlet, have been supplied by the County Council and the associated traffic movements have been included within the 'baseline' traffic flows utilised in the traffic impact assessment.

There are no committed highway improvements, other than those at Foundry Square detailed below.

8.4 Planning policy guidance

Transport policy guidance of relevance to the application scheme 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 (RPG 10). In addition, Central Government guidance of relevance is contained in "Planning Policy Guidance Note 13: Transport" (PPG 13).

8.4.1 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, of most relevance being **Policy GD-2** and **Policy GD-5**.

These policies require that the layout of development should make provision for safe, convenient and attractive walking and cycling and that new proposals should seek to maximise public transport opportunities.

Furthermore, 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.

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, with the need for development to ensure that town centre uses are closely integrated with the adjacent town centre in terms of location, orientation and pedestrian movement.

8.4.2 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.

The policy also identifies a reduction in car parking as a key part of the transport strategy. The policy contains the County Parking Guidelines, which should be applied to all new development.

Policy 28 relates to accessibility and requires new development to ensure that opportunities to optimise walking, cycling and public transport are reflected in the scale, location and form of proposals. In addition, new development should include the effective management and safe movement of traffic.

8.4.3 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.

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 and Local Transport 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;

RPG10 includes at Annex A a set of Accessibility Criteria, which while 'interim' in status, provide guidance as to the practical assessment of transport accessibility.

8.4.4 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, leisure facilities and services by public transport, walking and cycling;

Reduce the need to travel, especially by car.

The objective of the guidance is therefore twofold: to maximise travel mode choice and to minimise the need for travel. This parallel approach to demand management is intended to secure minimum car dependence from new development and thereby reduce emissions associated with private car travel.

8.5 Assessment of potential impacts

8.5.1 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.

Construction activities on South Quay will be served by an 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.

Equally, 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.

In terms of volumes it is understood that during peak construction activity (Phase 1), 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.

Later 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.

8.5.2 Highway impact

8.5.2.1 Development traffic

The volume of vehicle traffic generated by the proposed mixed-use development has been estimated using the TRICS trip-rate database to establish traffic volumes associated with each individual land-use element of the application scheme.

The redevelopment will significantly enhance the attractiveness of Hayle as a visitor destination and new retail opportunities will supplement existing retail outlets in the town. It is likely therefore that some demand for new shops within the development will be linked with demand for existing shops. In practice therefore, a proportion of traffic associated with new retail outlets will not be new to the town. In addition, a proportion of visitors to the new shops will be existing residents and residents of the new development. To reflect this fact, it has been assumed that 20% of car trips to the new retail outlets will not be new trips on the road network.

Similarly, the employment opportunities associated with the proposed development will appeal to existing and new residents as well as people living elsewhere in the region. To reflect this fact, a reduction of 10% in the calculated employment trips has been applied to reflect this 'containment' effect of the mixed-use development. No reduction has however been made for traffic originating from residential development, a proportion of which will in reality be contained within the development or within the town centre.

Taking these 'containment' factors into account, a more realistic assessment of generated traffic is derived by reducing both the retail and employment trip rates. Applying the reduction in retail flows of 20% and the reduction in employment trip numbers of 10% gives the following 'aggregated' trip numbers for the commuter peak hours, which have formed the basis of the traffic impact assessment:

AM Peak (08.00-09.00)		PM Peak (17.00-18.00)	
Arrivals	Departures	Arrivals	Departures
480	431	656	727

Table 8– 1: Estimated development traffic flow (aggregated) – worst case scenario

The proposed development will give rise to 911 new vehicle movements in the AM commuter peak hour (arrivals and departures combined) and 1,383 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.

The main contributor to the traffic flow to and from the proposed development is the retail element of the development, despite the 20% reduction in the trip rates. Shops accounts for approximately 60% of traffic attracted to the development in the evening peak hour and 40% of traffic in the morning peak hour.

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 8-2 below.

AM Peak (08.00-09.00)		PM Peak (17.00-18.00)	
Arrivals	Departures	Arrivals	Departures
339	394	559	583

Table 8– 2 Estimated development traffic flow (Aggregated) – normal scenario

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 1,182 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.

The pattern of distribution of traffic onto the road network has been estimated based on the relative attraction of local destinations and having regard to existing traffic patterns derived from traffic surveys in April 2005. It is predicted that 55% of generated traffic will depart the site in an easterly direction and access the strategic road network at the Loggans Moor roundabout. 40% of traffic will travel westbound in the direction of Penzance and St Ives, accessing the strategic road network at the St Erth gyratory. 5% of generated traffic is predicted to travel to and from the direction of Helston via the B3302.

The Churchtown Road access in Phillack is likely to cater only for the residential development proposed at Riviere Fields, effectively 12-15% of development traffic.

No allowance has been made for the fact that some car trips might be contained within Hayle itself.

8.5.2.2 Scope of impact assessment

The proposed development is to be accessed by vehicle traffic via one new junction onto the B3301 (South Quay), an improved junction onto the B3301 (North Quay) and a new junction onto Churchtown Road in Phillack. The impact assessment has considered whether these proposed new junctions will operate satisfactorily with the combined loading of development-related and background traffic.

In addition, existing junctions that are likely to be subject to a material increase in traffic flow have also been assessed for the impact of generated traffic. These junctions have been identified as part of ongoing negotiations with the highway authorities and are as follows:

- Existing B3301/B3302 Foundry Square roundabout;
- Existing B3301/Lethlean Lane priority junction;
- Existing A30(T) 'St Erth' gyratory;
- Existing A30(T) 'Loggans Moor' roundabout;

Figure 8.5.1 shows the locations of the junctions

Design flows have been calculated by combining background traffic in the August peak hours with traffic arising from the proposed development in the traditional commuter peak hours.

8.5.2.3 Assessment methodology

Operational assessment of the seven junctions has considered 4 scenarios based on ranges of trip generation and the intensity of background traffic (to reflect seasonal variation). In each case, assessment of the two peak time periods is assessed, giving eight operational scenarios for each of the seven junctions tested. The results of the worst-case assumption have been used in the environmental assessment of traffic impacts and are reported below.

(a) South Quay Access

The operation of the proposed new staggered crossroads has been assessed using the PICADY analysis software for the two design years 2011 and 2016. The result of the analysis of the two peak time periods is shown in Table 8–3 below.

2011	AM Peak (08.00-09.00)		PM Peak (17.00-18.00)	
	Maximum RFC ¹	Maximum Q*	Maximum RFC	Maximum Q
Egress from Development	0.373	1	0.937	6
Right turn to Development	0.337	1	0.459	1
2017				
Egress from Development	0.416	1	0.997	10
Right turn to Development	0.342	1	0.468	1

Table 8–3 Operation of South Quay access under full development scenario

The analysis shows that the proposed new junction would operate within its capacity and without undue delay to through-traffic on the B3301, as indicated by the relatively low queuing levels: traffic on the B3301 has priority meaning the only non priority traffic that could cause queuing to the main road traffic would be the right turn into the development – the queues are minimal for this movement meaning no delay to passing traffic. Queuing in the side-road is also low and there is no evidence of congestion in the side-road that might lead to a safety hazard.

¹ The above assessments simulate traffic conditions for the highest trafficked hours in future years. The Maximum RFC is the maximum ratio of flow to capacity within this hour as traffic builds and ebbs. Theoretically the Maximum RFC could reach 1 before significant queuing occurs, although in practise 0.85 is used for design purposes. The Maximum Q is the maximum queue within the hour in passenger car units i.e. cars – an HGV is 2 passenger car units.

The existing access to the development site opposite South Quay is to be retained, as it provides a means of access to third-party properties. Whilst this junction is currently sub-standard in its geometry, the proposals will lead to a reduction in its use and therefore a net safety benefit.

(b) North Quay Access

The location and form of the proposed signalled three-arm junction is shown on the Masterplan. The operation of the junction has been assessed using the LINSIG analysis software, with the results for the design years 2011 and 2017 summarised in the following table.

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 Ahead/Left	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 Ahead/Left	74%	18	90.8%	38

Table 8— 4 Operation of North Quay traffic signals under full development scenario

The analysis shows that the proposed signalled junction will operate within its available capacity in both the AM and the PM peak hours, under the scenario of full development and interim traffic growth in both the design years. The junction will retain sufficient capacity for traffic growth far beyond 2016.

(c) Priority access to Churchtown Road

Analysis of the proposed priority junction using the PICADY modelling technique provides results as shown in Table 8—5 below.

2011	AM Peak (08.00-09.00)		PM Peak (17.00-18.00)	
	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	AM Peak		PM Peak	
Egress from Development	0.264	1	0.152	1
Right turn to Development	0.090	1	0.102	1

Table 8– 5 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.

(d) 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 has formed the basis of the impact assessment, which is summarised in Table 8–6 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 8– 6 Operation of Foundry Square roundabout under full development scenario

The analysis indicates that the mini-roundabout will not have the capacity necessary to accommodate the predicted traffic flow comprising the development flow, 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 summarised in Table 8–7 below.

2017	AM Peak		PM Peak	
	Maximum RFC	Maximum Q	Maximum RFC	Maximum Q
Penpol Terrace	0.697	3	0.997	20
B3302	0.581	2	0.986	17
Carnsew Road	0.503	1	1.320	115

Table 8– 7 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 2011 and 2017 even if development does not place, although traffic associated with the application scheme adds to the anticipated congestion levels.

(e) 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.

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 8— 8 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 peak periods, 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 8—9 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 8— 9 Operation of the B3301/Lethlean Lane 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 the effect of the development that leads to queuing and delay at the junction in the busiest hours.

(f) St Erth Gyrotory

The existing gyrotory has been modelled using the ARCADY software for both peak hours, the results being shown in Table 8–10 below. In accordance with Highways Agency requirements, analysis has considered a design year 10 years after registration of the planning application.

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 8– 10 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 Highways Agency required design year of 2017 are summarised in Table 8– 11 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 8– 11 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.

(g) Loggans Moor Roundabout

The five-arm trunk road roundabout has been analysed for the 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	0.435	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 8– 12 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 future design year, assuming the proposed development at Hayle and the now completed retail development park at Loggan's Moor. All consented development schemes including the retail park at Loggan's Moor have been included within the future background traffic growth levels: background traffic is a term used to distinguish all other traffic from the proposed development's traffic.

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 8– 13.

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 8– 13 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 8-12 and 8-13 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.

8.5.3 Car parking impact

The amount of car parking provided within the site has been based on envisaged need, twinned with policy guidance and the desire to encourage walking, cycling and public transport.

The policy guidance suggests that overall, the North and South Quay developments require a maximum parking level between 1,501 and 2,142 parking spaces, with 1,622 parking spaces proposed.

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	400
5,150m ² Employment	1/35-50m ² GFA	103-147	51
10,585m ² Retail (Non food)	1/25m ² GFA	423	0
435m ² Leisure (Café/Restaurant)	1/5m ² public area	40	0
Total		826-1,130	451

Table 8– 14 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.

The provision of 451 spaces falls significantly below the maximum parking level range suggested by the local policy guidance, however in operational terms, treating South Quay in isolation is not appropriate

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 381 flats/houses	1-2 per dwelling	190-380	721
7,355m ² Employment	1/35-50m ² GFA	147-210	
2,613m ² Retail (Non food)	1/25m ² GFA	105	450
5,575m ² Industrial	1/50-200m ² GFA	28-112	
1,455m ² Leisure (Café/Restaurant)	1/5m ² public area	145	
60-bed hotel	1/bedroom	60	
Total		675-1,012	1,171

Table 8– 15 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 1,622 spaces – falls in the range of maximum provision as defined by the standards, calculated to be 1,501-1,805 spaces.

Much 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 to be seen as a catalyst for the 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 reduced provision for retail and employment draws on the close proximity of housing and potential employees as well as the closeness of the railway and encourages other forms of travel.

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.

8.5.4 Accessibility levels

In terms of non-car travel, the development has been assessed for the degree to which it achieves accessibility levels required of prevailing transport policy guidance. Taking the RPG10 Accessibility Criteria as a guide, the development can be considered accessible. In pragmatic terms too, the site is considered to have a high level of accessibility, as would be expected of its location within and adjacent to the town centre.

In terms of opportunities for non-car travel, regular bus and train services operate throughout the day and provide for connections to nearby urban area. At its closest, the bus corridor is directly adjacent to the South Quay development and some 200m from North Quay, with a large proportion of the site within a 400m walk.

The railway station is 200m from the development site and is also within a reasonable walking distance of a large proportion of the development site.

Demand for public transport services arising from the development is likely to enhance the attractiveness of further investment in those services by their operators, while at the same time increasing the sustainability of the existing services to the benefit of the town as a whole.

The proposals include a number of measures designed to enhance the non-car accessibility of the development and strengthen its pedestrian and cycle links with public transport and with local services and facilities. As set out in Chapter 3.3.2 the on-site provision would include a new cycle connection between Carnsew Road and Copperhouse Pool, two new pedestrian / cycle bridges over Penpol Creek, a new pedestrian / cycle bridge between East Quay and North Quay, and new pedestrian routes between North Quay and Hilltop. By enhancing linkage between the development site and complementary existing town centre facilities, opportunities exist to increase accessibility levels within the town as a whole.

Specifically, the application scheme includes new opportunities to cross the B3301 on foot, reducing the severance effect of the road and encouraging walking within the town. The scope exists too to re-establish a pedestrian link to the railway station, enabling not just the new development but existing residents north of Copperhouse Pool to walk and cycle to the station.

8.6 Mitigation

8.6.1 Highway impact

The assessment of the impact of vehicle traffic associated with the proposed development identifies that the highway works required to provide vehicle access to the site can be secured in a safe manner and that adequate network capacity will be retained at those junctions.

Analysis of the effects of development-generated traffic on existing key junctions has however identified potential for increases in peak hour congestion levels at a number of junctions, particularly those on the trunk road. The analysis also shows however that congestion at the two trunk road junctions will be attributable to background traffic growth and to the effects of other development as much as it is attributable to development at Hayle and the development itself cannot therefore be considered to be the cause of any potential highway safety risk.

Notwithstanding this, the scope for improvement to the two roundabout junctions has been assessed. It has been concluded that there is little scope for improvement to the St Erth roundabout within the land available for such works but that a scheme of capacity improvement could be delivered at the Loggans Moor junction.

An improvement scheme involving widening of the southbound A30(T) approach to the junction is presented in the Transport Assessment 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 8–16 below.

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

Table 8–16 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.

The Foundry Square junction will not accommodate predicted traffic levels in the future, whether or not development as proposed takes place. Whilst the development traffic adds to congestion levels in the peak hours, it is not the primary cause of congestion and will not therefore be the sole cause of impact at this location.

The recently improved junction offers less highway capacity than was originally the case and further improvement to increase the capacity of the junction would appear to be contrary to the authorities' objectives. It is assumed that some level of congestion at the junction has been anticipated and accepted as part of the scheme. Measures to mitigate the anticipated congestion should therefore focus on demand management, i.e. measures to reduce traffic generation within the town.

The proposed development will contribute to such a demand management strategy at a very broad level by increasing the 'offer' within the town, making it a more attractive place for local people to choose to shop and work. The implications are that out-commuting and travel for shopping could be reduced, thereby reducing traffic flow levels overall.

At a more detailed level, enhanced linkage within the town and increased attractiveness of public transport can be expected to lead to some reduction in car trips originating within the town itself.

Travel Planning is acknowledged by the Government as a means of reducing travel by car and the grant of planning permission for the application scheme will be conditional upon the preparation of Travel Plans for various elements of the development. Whilst the effects of travel planning are difficult to predict, there is significant scope for Travel Plans to secure reductions in car trips made by residents and employees of the development.

The Lethlean Lane junction too is shown to be the subject of an impact arising directly from the proposed development. Here too, highway capacity improvements are not considered appropriate in policy terms and demand management of the form identified above is expected to lead to reductions in background traffic flows that will offset the impact of development traffic.

It is a stated objective of the County Council's 5-year Transport Plan to deliver a Park & Ride site at St Erth. In its existing form, the facility is unlikely to materially affect traffic patterns in Hayle but the County Council has advised that the proposed development could be the catalyst for a bus-based system operating from the new P&R facility. If such a bus-based system were implemented, with new development at Hayle helping to make the necessary economic case, it would be expected to significantly reduce the amount of car traffic in the town. In isolation therefore, such a proposal would be likely to provide full mitigation for the effects of the proposed development.

8.7 Residual impacts

The effects of travel demand management are difficult to quantify, as is the timeframe over which the benefits will be realised. It is possible that the effects of demand management will not reduce traffic levels such that there is no material increase in queuing and delay at the Foundry Square and Lethlean Lane junctions.

Whilst there are likely therefore to be residual impacts, the scale of these is difficult to estimate. It must be emphasised that impact analysis has focussed on a particularly harsh scenario of tourist peak flows combined with development commuter peak flows and levels of impact indicated in the junction assessments can be expected to occur for very short periods of the year, if at all.

8.8 Cumulative impacts

The transport assessment has considered the cumulative impacts of consented development, and of measures to encourage more environmentally friendly forms of travel, including walking, cycling and public transport including the potential park and ride site at St Erths to gain access to the proposed development.

In cumulative terms the transport impact of the proposed development may be reduced through the park and ride scheme and may be increased or reduced through consented developments. Quantifying the level of reduction in impact is difficult and the more severe scenario has been reported on.

8.9 Monitoring

An integral part of the Travel Plans that will be implemented at many of the individual developments, provision will be made for the monitoring of travel patterns. The form and frequency of the monitoring processes will be a matter for discussion as part of the process of finalising the individual Travel Plans.

8.10 Conclusions

The assessment of the environmental impacts of the development in terms of transport has considered:

- a. whether the proposed development delivers accessibility levels appropriate to the aspirations of prevailing policy guidance
- b. whether the proposed development and associated transport infrastructure could be implemented in a manner that does not prejudice highway safety
- c. whether generated traffic would give rise to congestion of a level that would compromise highway safety

With regards to point (a), it is concluded that the accessibility levels appropriate to the aspirations of prevailing policy guidance will be achieved within the development. Indeed the scheme when implemented in full will prove to be a catalyst for wider more sustainable travel patterns to and within the town.

With reference to point (b), due consideration has been given to ensure that highway safety is not compromised and new roads and junctions will provide sufficient operational capacity so as not to compromise safety. Demand management measures will also help to ensure that car travel is minimised.

In respect of point (c), in general terms congestion levels are either insignificant or can be mitigated by highway improvements. Where this is not possible, demand management is anticipated to provide a level of mitigation.

The possible junction enhancements to be included as part of a Section 106/Section 278 agreement, Travel Plans to be secured through Planning Conditions and 'cost free' accessibility improvements associated with the development represent the developer's commitment to demand management. These measures provide the potential to mitigate the impacts of the proposed development.

8.11 References

Penwith District Local Plan

Cornwall County Structure Plan

Regional Planning Guidance for the Southwest

Planning Policy Guidance Note 13: Transport