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Dublin Transportation  
Office

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**PT Interchange  
Preliminary Designs**

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PT Interchange Design  
Report: Blackrock

Report

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Dublin Transportation  
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PT Interchange Design  
Report: Blackrock

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## EXECUTIVE SUMMARY

This Public Transport Interchange Improvement Project was commissioned by the Dublin Transportation Office on behalf of GDA Local Authorities and public transport service providers to develop preliminary Public Transport (PT) Interchange designs at four locations in the Greater Dublin Area (GDA). Arup Consulting Engineers together with Darmody Architects were appointed to undertake this study, which has been undertaken in consultation with the stakeholders' representatives from Dun Laoghaire Rathdown County Council, Irish Rail, Bus Éireann, Dun Laoghaire Harbour Company, Stena Lines and Coach Tourism and Transport Council, depending on the location.

This report presents the background information in support of the Draft Preliminary Design Drawings for Blackrock PT Interchange. The information for Dun Laoghaire, Wicklow and Arklow are presented on separate reports.

The project included:

- Station visits
- Existing passenger surveys
- Forecasting future passenger and mode splits
- Determining PT Interchange facility requirements
- Development of alternative PT Interchange concepts
- Selection of preferred PT Interchange concepts

### Blackrock Public Transport Interchange

Blackrock Dart Station is a major transport interchange node on the Southeastern Suburban and DART corridors. The interchange accommodates a number of Dublin Bus and shuttle coach services, linking DART to residential, university and employment centres to the west. There is therefore significant interchange between rail and bus at the station. Blackrock Interchange currently handles approximately 1,300 and 900 rail passengers and 19 and 14 trains per hour in the AM and PM peak hours respectively. The existing pattern of rail passenger activities at the interchange is predominantly alighting in the AM peak and the reverse in the PM peak. Walk is the predominant access/ egress mode.

Facilities at Blackrock DART station are in need of improvement to cope with existing demand and forecast growth in demand into the future. There are severe width constraints within and around the station building, in particular at the station entrance. The existing lack of permeability between the neighbouring commercial areas and the interchange combined with significant width constraints along the main pedestrian access routes need to be addressed. The bus stops for Dublin Bus and coach services are remotely located from the station building and are inadequate from a user perspective. Significant improvements to bus, cycle and pedestrian access to the interchange are required.

Blackrock PT Interchange will shortly become the terminus point for proposed new and upgraded bus services using the Dundrum to Blackrock Orbital QBC. This will require significantly enhanced bus operating facilities to cope with increased bus frequency and increased bus passenger activity at this location.

AM and PM peak ridership is expected to grow in excess of 30% by 2009 and almost double by 2016. This forecast increased use of public transport will arise from significant improvements to bus and rail services and planned developments within the catchment of the interchange. It is therefore timely to review the current interchange facilities and prepare a preliminary design to meet future requirements.

It is considered that a well designed interchange will result in increased use of public transport by achieving:

- Seamless and efficient transfer between transport modes;

- More attractive and easier to use public transport;
- Better integration with the local urban context.
- High quality passenger information relating to all public transport modes serving the interchange and to the interchange surrounds through adequate signage;
- Safer passenger interchange;
- Higher levels of passenger satisfaction; and
- Better value for money of available funds.

By achieving all of the above, a well designed public transport interchange will benefit both public transport users and the operational environment around Blackrock interchange for all vehicular traffic. In addition, certain elements of the interchange improvements can provide direct benefits to third parties, for example developers within the catchment of the interchange. By identifying these elements at an early stage it may be possible to recoup the cost of these elements of the design through developer contributions levied on future development within the interchange catchment.

Figures ES 1 to ES 3 show the proposed layout surrounding Blackrock DART station. Key features include:

- Station building capacity enhancements, signage, ticketing and passenger information improvements;
- Provision of a bus area that would cater for enhanced bus services whilst minimising existing conflicts with vehicles and pedestrians;
- Provision of designated car and taxi pick-up and drop-off areas;
- Pedestrian access strategy for the PT Interchange, with new proposed routes and improved directional signage. Improvements to existing pedestrian environment in the PT Interchange;
- Cycle access strategy for the PT Interchange, with new proposed routes and improved directional signage. Improvements to existing cycle facilities in the vicinity of the PT Interchange; and
- A reduction in park and ride provision at Blackrock interchange from 70 spaces at present to 14 spaces following implementation of the above improvements.

This Preliminary Design Report presents the background information and describes in detail the improvements proposed for the PT Interchange at Blackrock DART Station.

Figure ES 1: Proposed Blackrock PT Interchange Layout

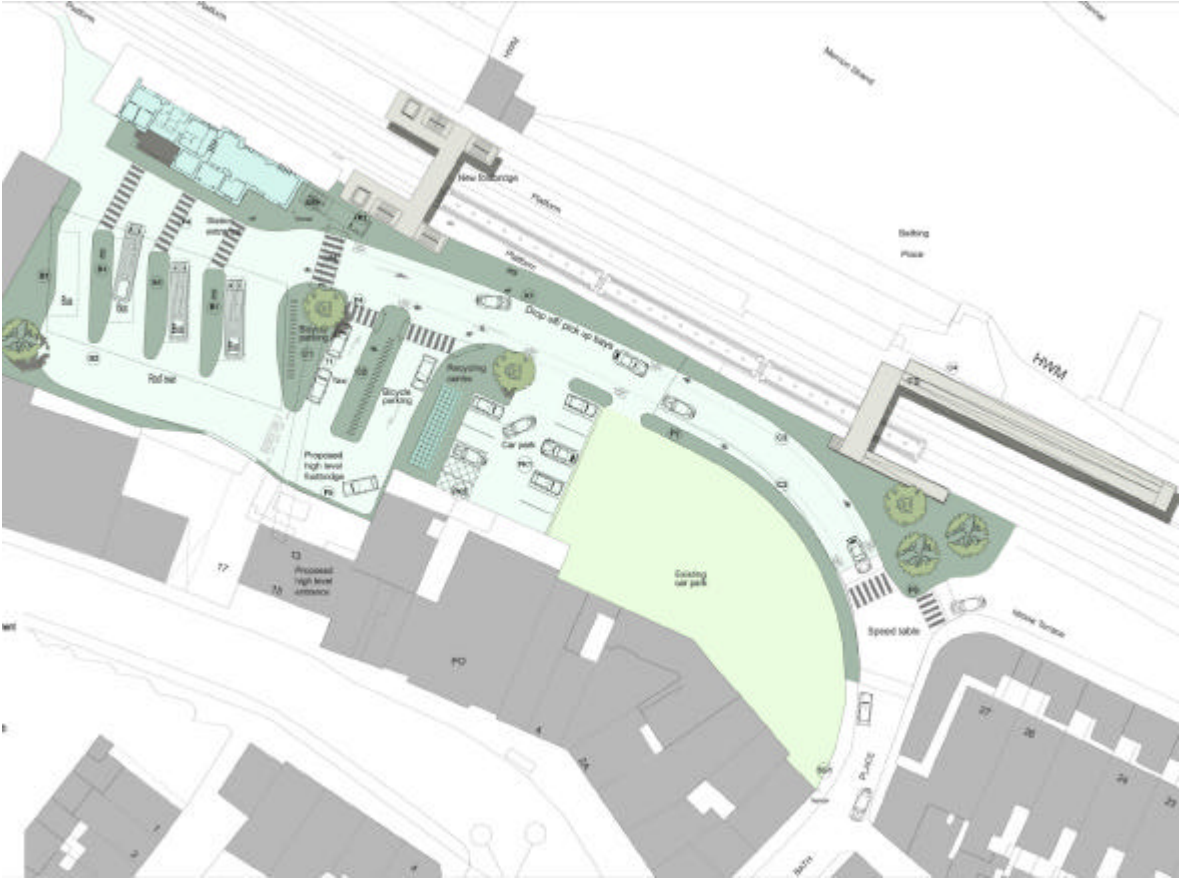
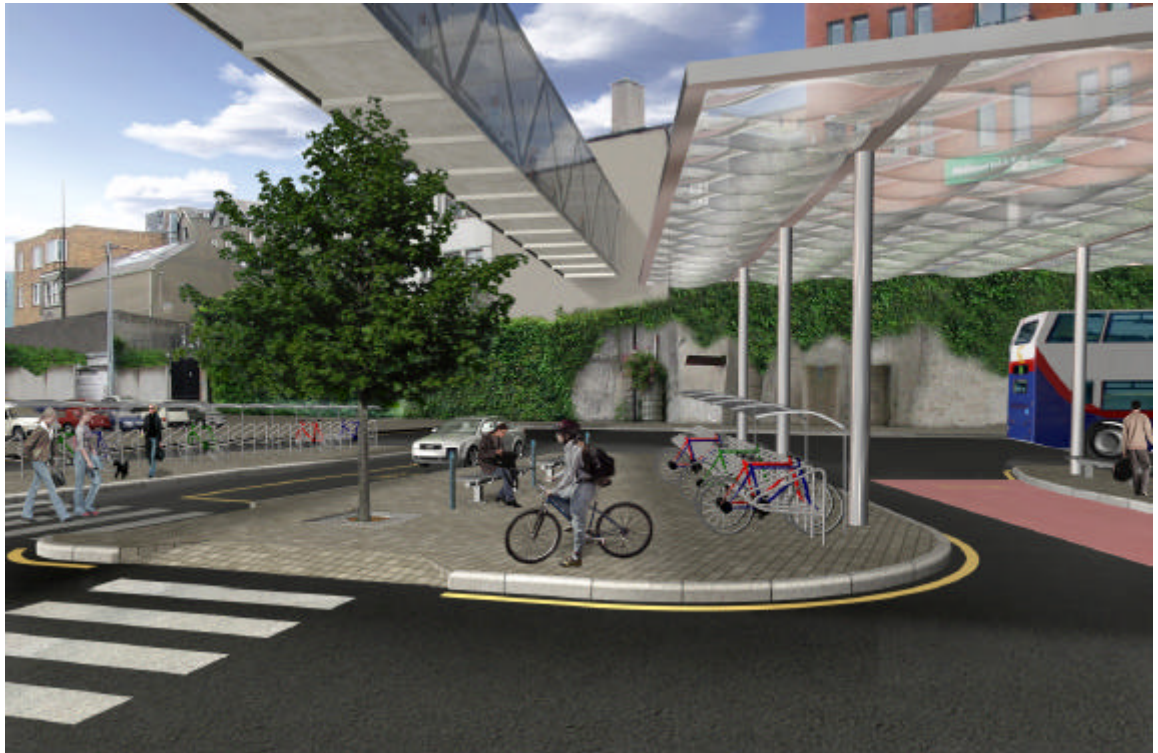


Figure ES 2: Station Forecourt



**Figure ES 3: Cycle & Taxi Area and Footbridge Link**



## 1. INTRODUCTION

### 1.1 Study Background

This study stems from the work of the Public Transport Interchange Working Group established by the Dublin Transportation Office (DTO) in cooperation with the local authorities in the Greater Dublin Area (GDA), transport operators and the Dublin Airport Authority. The brief of this group is to provide inter-agency co-ordination required to facilitate the programming and planning of upgrading and developing new public transport (PT) interchange and terminus facilities in the GDA.

The group has identified 29 locations (at present) where improvements in the PT interchanges are merited. The first four of these interchanges are addressed in this study: Blackrock, Dun Laoghaire, Wicklow and Arklow.

Arup Consulting Engineers were appointed by the DTO to determine appropriate interchange improvements and prepare preliminary designs for high quality multi-mode public transport (bus, train, pedestrian, cycle, park & ride, kiss & ride, taxi, ferry) interchanges at these locations.

This report presents the background information in support of the Draft Preliminary Design Drawings for Blackrock PT Interchange. The information for Wicklow, Arklow and Dun Laoghaire is presented on separate reports.

### 1.2 Scope

Data collection and patronage forecasting was undertaken to develop transport information needed to successfully design high quality public transport interchanges. This data is particular to this study and therefore should not be relied upon for any other transportation study where this project may be considered relevant.

The preliminary designs to date have been based on topographical information from Ordnance Survey maps and site visits. Further site investigation would be required to develop the detailed design of the proposed PT Interchange concepts.

### 1.3 Design Approach

A high quality intermodal transfer facility can be defined as follows:

- A place where networks meet. Consequently, it must integrate different scales and modes of transport;
- A busy hub as well as an original form of architecture, which must simultaneously resolve practical problems and offer an image of quality, possibly even prestige;
- A service-oriented space, where travellers can make the most of their journey with activities that complement the transport function itself;
- A focal point in an urban environment, playing a fundamental role in its local environment;
- A structure involving cooperation between several transport operators and service providers; and
- A facility requiring partnership at many levels, for example design and implementation stages, through the operational life of the facility, and crucially in financial terms.



### 1.3.1 Study Phases

The development of the preliminary designs was accomplished in four phases:

**Phase 1: Understanding study brief and context** - This stage consists of various activities to establish the design context and PT Interchange requirements. In addition to site visits and passenger and staff consultation, numerous surveys were undertaken to establish current interchange user volumes and characteristics. A review of 2016 forecast passenger volumes was also undertaken to establish long-term design requirements.

**Phase 2: Develop Initial PT Interchange Concepts for Preliminary Design** - The second stage takes into consideration the context and design requirements from the previous stage to develop initial design options. A number of options were developed and reviewed against key objectives and constraints. This resulted in a short list of options that were taken forward to the next stage.

**Phase 3: Develop Selected PT Interchange Options** - This stage developed the designs of the short listed concepts further. Based on formal comments from the various stakeholders, the concept designs were refined and the preferred concept was selected.

**Phase 4: Develop Preferred PT Interchange Option** - The final stage saw the development of CAD drawings to confirm the feasibility of the preferred design concept and illustrate the proposed design in greater detail. Specific proposals for the station building, PT Interchange and access were also finalised. The stage culminated with the development of preliminary cost estimates and a design and construction programme.

### 1.3.2 Consultation

Consultation was a key activity throughout the design process. A PT Interchange sub-group was established which consisted of representatives from all relevant stakeholders in the scheme, i.e. DTO, Dun Laoghaire Rathdown County Council (DLRCC) as the lead agency, Irish Rail, Dublin Bus, and the Coach Tourism and Transport Council (CTTC). A full list of the stakeholder representatives is provided in Appendix A. Workshops with the PT Interchange sub-group were conducted at each stage of the design development, and all major decisions regarding the design development were made at this level.

In addition, co-ordination meetings or consultations were also undertaken with various related offices of the DLRCC (including Roads and Traffic and Conservation Division), Irish Rail and the Quality Bus Network (QBN) Project Office.

## 1.4 Report Structure

The remainder of the report is structured as follows:

- Design Context;
- Existing Situation;
- Existing Ridership;
- Future Needs;
- Recommended Improvements;
- Cost Estimates; and
- Detailed Design Programme and Implementation.

## 2. DESIGN CONTEXT

### 2.1 Historical Context

Blackrock Station forms part of an important link in railways terms.

With the construction of the Kingstown Pier, and the growth of the local economy, a railway line linking Dublin and Kingstown was constructed. The Dublin and Kingstown Railway was the first to be constructed in Ireland and pushed Dublin to the forefront of rail progression with the opening of the first passenger railway station in the world. It was also one of the earliest dedicated commuter lines in the world.

The idea of the Dublin and Kingstown (D&K) Railway was promoted in 1825, and enabled by means of the Royal Assent in 1831. The construction was led by William Dargan and employed over 1,800 at the height of construction. Local stone was quarried for use and old Rock Road in Blackrock formed a key artery of supply in the transport of construction materials.

Blackrock Station was opened in 1834, in time to accept the first journey by Directors of the company in a horse drawn carriage. By October that year, the first trips were being made over the whole line by means of the steam locomotive 'Hibernia' across the whole line, from Pearse Street Station (formerly Westland Row) through Blackrock and onto Kingstown.

The expansion of the D&K section of the railway meant that Blackrock became a part of a larger lease to the Dublin and Wicklow Railway (D&WR), on the 4' 8.5" gauge and was then updated to form a key part of the DART (Dublin Area Rapid Transit) electrified commuter rail in the modern era.

### 2.2 Blackrock Development and Urban Context

The development plan for the area in recent years is based on a number of key documents and initiatives. The local PT Interchange area is illustrated in Figure 3.1.

The Local Coastal Plan as adopted by Council in 2002, highlights the key issues related to the coastal area at Blackrock. The objective of the plan, was for the 'County in consultation with other relevant bodies, undertakes a study of the Seafront area from Seapoint to Sandycove with a view to adopting an appropriate Development Plan for the area'.

In addition, the Specific Local Objective no. 5 on Map 2 of the DLRCC Development Plan 2004 – 2010 states as follows: 'To encourage the redevelopment of the area encompassing Blackrock Baths, Bath Place and Blackrock DART Station, including the provision of pedestrian/cycle access to Blackrock Park. Any redevelopment of the Blackrock Baths shall include a substantial swimming pool for public use.'

The resulting Plan, whilst non-statutory, covers the following issues:

- Land use, derelict and underused sites;
- Sustainable Development;
- Visual Appraisal and Urban Design;
- Environmental Enhancement;
- Roads, Parking, Public Transport and Accessibility;
- Conservation and Archaeology;
- Environmental Designations



- Maritime Tradition, Leisure and Tourism.

A number of other background documents were also consulted in the development of this plan, including:

- Dun Laoghaire Rathdown County Development Plan 1998;
- Dun Laoghaire Rathdown County Development Plan 2004 (adopted 20/04/2004);
- Dun Laoghaire Town Centre Integrated Plan 1999;
- Coastal Zone Management: A Draft Policy for Ireland;
- Strategic Planning Guidelines for Greater Dublin Area;
- Residential Density Guidelines for Planning Authorities;
- Architectural Heritage Protection – Guidelines for Planning Authorities; and
- The Dublin Transportation Office strategy – A Platform for Change 1999.

The DTO strategy, ‘A Platform For Change’ was key to understanding and exploring the opportunities of a sustainable, integrated transport network, in tandem with land use aspirations and guidelines in the Greater Dublin area.

## 2.3 Transportation Context

Blackrock rail station is situated approximately 6km to the southeast of Dublin city centre and 3km to the northwest of Dun Laoghaire Town Centre. The PT Interchange is accessed via Bath Place which links to Rock Hill Main Street, the main shopping street of Blackrock Village. Given its sea front location, it is slightly removed from main street activities. Interchange facilities include provision for terminating bus services, cycle and car parking. DART and South East Suburban rail services operate at about 6 minute headways during the peak hours.

Blackrock PT Interchange will shortly become the terminus point for proposed new and upgraded bus services using the Dundrum to Blackrock Orbital QBC. This will require significantly enhanced bus operating facilities to cope with increased bus frequency and increased bus passenger activity at this location.

The design principles for the PT Interchange will draw upon the DTO’s Advice Note on Public Transport Interchanges and aim to meet DTO objectives, as set out within ‘A Platform for Change’.

Key components of the improvements envisaged at Blackrock arising out of these include:

- Improvements to the passenger carrying capacity of the interchange;
- Providing additional/ new interchange facilities such as passenger pick up and drop of facilities, enhanced park & ride facilities, bus, taxi and cycle parking facilities etc; and
- Developing/ improving links between the interchange and its surrounds.

These need to be addressed specifically in relation to the station objectives set out in the Local Coastal Plan. The existing PT Interchange layout is presented in Arup Drawing No. T0001-08.

### 3. EXISTING SITUATION

#### 3.1 Site Visits and Surveys

The operation of the PT Interchange was observed on numerous visits during the course of the study. An initial site visit and facility audit was conducted in November 2004. Repeat visits were conducted in January and in various stages of design development, including a site meeting with the DLRCC conservation officer in March 2004.

In order to better understand the travel behaviour of commuters, various surveys were undertaken to collect relevant passenger information. The surveys were conducted during the morning (07:00 – 10:00hrs) and evening (16:00 – 19:00hrs) travel periods. The surveys carried out were aimed at collecting data on all potential users of the PT Interchange, which would include rail and bus passenger, and included the following:

- **PT Interchange passenger count** – The number of all bus and rail passengers in the immediate vicinity of the PT Interchange were counted to establish the existing passenger demand for the PT Interchange.
- **Passenger interview survey** – Interchange mode, origin/destination and supplementary information was collected via a combination of face-to-face interviews and self completed questionnaires. Only rail passengers were surveyed and this information was used to deduce bus passenger information.
- **Parking survey** – This survey recorded the build up of PT Interchange related parking during the three-hour morning peak and the exit pattern during the evening peak travel period. The data was used to support the mode split and parking information extracted from the passenger interviews. Maximum bicycle parking accumulation was also recorded at each PT Interchange.

The survey results are presented in detail in Appendix B.

#### 3.2 Existing Site Layout

The Blackrock PT interchange site and access via Bath Place gradually slope from 3 to 8 metres below the main access through the town (Rock Hill Main Street). Whilst this may have opportunities in exploiting the section in urban design terms across the site, the car-park and Station remain currently divorced from the town centre and further also suffer from low visual amenity in terms of layout, material finishes and composition.

Arup Drawing No. T0001-08 illustrates the existing Blackrock PT Interchange.

As Photograph 1 below shows, the PT Interchange bus area is currently situated at a more remote location from the station building than the 'Park and Ride' and drop-off/pick-up areas. Therefore, the existing arrangement does not reflect the correct hierarchy of modes at the interchange, as it gives priority to private car use over public transport users.

**Photograph 1: Existing Station Building and PT Interchange**

### 3.3 DART Station building

The DART station is the main component of the PT Interchange. It is located at the northern end of Bath Place, to the northeast of the site. Access to the station is via a single entrance door that leads to the ticket hall, with the ticket office to the left and two ticket vending machines situated opposite to the entrance. Three machines for ticket validation and a manually operated gate are located immediately to the right of the ticket hall. Beyond the ticket gates to the right a waiting area with seating for around 8 people and a coffee/sandwich shop is provided.

Two exits lead to the northbound platform, where there is a sheltered area for the whole length of the station building. Boarding passengers have to climb three steps to gain access to the trains. A ramp is also provided towards the platform to the left of the building.

Passengers mostly wait for northbound trains within the sheltered area, where seating spaces for around 15 people are provided. Non-sheltered areas of the northbound platform have significantly less boarding passengers.

Southbound passengers exit the indoor waiting area onto the northbound platform, where a footbridge linking to the southbound platform is provided to the right of the station building. The southbound platform has a single shelter with around five seating spaces.

The train station currently handles 17 trains between 08:00 and 09:00hrs in the morning and 13 trains between 17:00 and 18:00hrs in the evening. The station has both significant boarding and alighting passenger volumes although there are more alighting passengers during the morning peak. The reverse was observed during the PM peak.

The majority of AM peak arrivals at the PT Interchange are passengers alighting from southbound trains with most departing passengers boarding northbound trains. In the PM peak period, this pattern is also reversed with most departing passengers boarding northbound trains and the majority of arriving passengers alighting from southbound trains.

The Station whilst historic is in need of refurbishment, repair and maintenance. Supplementary uses with the use of sensitive design may well add to the offer at the Station and further the customer experience. The station would benefit from further retail / food offer.

A requirement for improved access of mobility impaired passengers to the Station and platform was observed during site visits to the interchange. This deficiency was also apparent in the immediate car parking areas.

#### Photograph 2: Width Constraint at Station Building Entrance



### 3.4 Pedestrian Access

Pedestrians to the Interchange currently arrive from 4 specific points.

The first and main route is from the Rock Hill / Bath Place junction (and bus stop locations along Rock Hill) walking down to the Interchange on concrete slab pavements. This walking route whilst known to commuters is not well enough marked to enable the occasional / tourist (leisure) user to easily locate this route. The Bath Place access arrangements also suffer from narrow pavements for pedestrian use with minimum width values of around 1 metre approaching Rock Hill Main Street.

The second route that is used is via Blackrock Park to the Station / Bath Place. This route is narrow, poorly surfaced and currently underlit. Directional signage and effective way finding measures are not in place. Cyclists currently use this path, making it even more constrained.

The route along from Idrone Terrace currently uses a pavement along the coast wall. Effective wayfinding means are in place due to the sightlines offered by views of the railway line, Blackrock Baths and the Station itself.

The fourth route to the Interchange is by means of the Station itself.

About 20% of passengers walking to/from the PT Interchange in the morning walk via Blackrock Park. The majority 80% walk via Bath Place/Idrone Terrace towards Rock Hill Main Street. The equivalent proportions for the evening travel period are 10% and 90%. The smaller proportion of park users could be influenced by safety concerns along the park route in the evening.

**Photograph 3: Rail Passengers on Bath Place towards Buses and Town Centre**



### 3.5 Cycle Facilities

There are no dedicated cycle lanes leading to/from the PT Interchange. 46 bicycle parking spaces are provided in three separate areas within the Park and Ride lot in front of the station building. A moderate amount of cycle activity was observed in front of the station building although the maximum cycle parking occupancy observed was only 16 out of the 46 provided. It is understood however that cycle use is greater during the summer months. Cycle parking facilities are not sheltered and poorly lit. This could explain, in part, the low level of cycle usage.



### 3.6 Bus Facilities

A bus area of approximately 400sqm and one passenger shelter are located adjacent to the park and ride site. Dublin Bus Routes No. 17, 114, 115 and 46E call at the PT Interchange and make use of these facilities. Although there is only one loading bay, no simultaneous loading of Dublin Bus services was observed. The site also accommodates up to four parked buses.

Coach activity is also significant during AM and PM peak periods due to the Executive Coach services that link the Blackrock PT Interchange with the Central Park Business Park and Microsoft office campus in Sandyford. Coaches load and unload passengers along Bath Place, on the same side as the station building, and use the adjacent Dublin Bus area for manoeuvring.

28 and 25 bus and coach movements were observed at the PT Interchange during the 3-hour AM and PM peak periods respectively.

In addition to the above terminating services, there is also a bus stop serving Dublin Bus routes No. 7, 7A, 7X and 45 along Rock Hill Main Street, a few metres from the Bath Place/Rock Hill Road junction.

Poor layout, distance passengers have to walk to reach the Station, lack of signage and poor facilities are elements that need to be addressed.

### 3.7 Taxi

There are currently no dedicated taxi facilities at the PT Interchange and no taxis were observed waiting for passengers. Taxi passengers alight or board at the general pick up/drop off area directly in front of the station building.

### 3.8 Kiss and Ride

Vehicular access to the PT Interchange is only via Bath Place. It is a two-way single carriageway road intersecting Rock Hill Main Street with a signal-controlled junction. The main roads linking the PT Interchange with the Dublin and Dun Laoghaire areas are the Rock Road (R118) to the north, Mount Merrion Avenue (N31) to the west, Carysfort Avenue to the south, and Frascati Road (N31) to the east.

Drop off facilities are inadequate. Passenger pick up and drop off generally takes place immediately in front of the station building. U-turn facilities for turning cars are not provided. In addition, there are no designated spaces for cars waiting to pick up passengers. The maximum number of cars observed to be waiting/dropping-off at any given time was four. In general, kiss and ride activity was not observed to be disruptive to the operation of the PT Interchange except in isolated instances when cars parked partly on footpaths or when they use the car park for manoeuvring.

### 3.9 Park and Ride

A 70-space long-stay car park (Park and Ride) located directly opposite the station building is provided. The current charge is €5 per day. This was observed to be fully occupied by 9:00am with noticeable unmet demand.

Further to the south of the bus area a 22-space short-stay (3-hour) car parking is provided. Commuters were not observed to use this facility. There is alternative full-day parking along Idrone Terrace, about 100 metres from the station. This was however only very lightly occupied. Car parking at this location is charged for at a rate of €10/day.

DART station signage is not clearly apparent on approach roads.

### **3.10 Urban Design Elements**

The car-park and Station remain currently divorced from the town centre and also suffer from low visual amenity in terms of layout, material finishes and composition.

The current arrangements whilst in place do not provide adequate lighting levels. The urban environment is devoid of a landscaping strategy and the current quality of materials ranges across a wide spectrum of finishes and finish types.

### **3.11 Signage and Passenger Information**

Current provision of signage does not address the needs of the occasional user / leisure traveller. This situation is common to all access modes.

## 4. EXISTING RIDERSHIP

### 4.1 Patronage Volume

Passenger counts were carried out during the peak AM and PM periods on Wednesday 2<sup>nd</sup> February 2005 at Blackrock PT Interchange. The counts comprised of rail and bus passengers and were undertaken at the following locations:

- Station Entrance – Directional counts in and out (to and from Blackrock park and to and from Rock Hill Main Street)
- Scheduled Dublin Bus routes at the PT Interchange (17, 46E, 114 and 115)
- Executive Express Coach Stop

The surveys indicated that most PT Interchange movements were railway related. There was very little dedicated passenger movement between bus stops at the interchange and the local area.

#### 4.1.1 Rail Passengers

The DART station handles over 2,300 passengers during the morning peak (07:00-10:00hrs) travel period with over 1,400 alighting and 850 boarding passengers. This predominantly alighting pattern contradicts the general view of Blackrock as an origin commute station. This would indicate both a predominance of employment/ education related land uses in the vicinity of the interchange, and also inadequate access/ interchange opportunities for those in residential areas further from the interchange. The morning peak hour (08:00-09:00hrs) is very pronounced with about 850 alighting and 450 boarding passengers.

The evening peak (16:00-19:00hrs) period ridership was just over 1,950 passengers with 750 alighting and 1,250 boarding passengers. Similar to the morning peak hour period, the evening peak hour (17:00 – 18:00hrs) is very pronounced with 300 alighting and 600 boarding passengers.

#### 4.1.2 Bus Passengers

Bus and coach passenger volumes were counted for the AM and PM peak travel periods at the PT Interchange. The counts involved four Dublin Bus routes (17, 114, 115 and 46E) and two Executive Coach shuttle services (Central Park and Microsoft). The routes are described in the following table.

**Table 5.1: Blackrock PT Interchange Bus Services**

Route No	Route Description	Service Frequency (Arrivals/Departures)		Operator/Comment
		AM (07:00 – 10:00)	PM (16:00 – 19:00)	
17	RIALTO, Belfield, Stillorgan Rd., Mount Merrion Ave., BLACKROCK STATION	10 / 8	8 / 8	Dublin Bus
114	KILCROSS, Sandyford Rd., Sandyford Ind. Est., BLACKROCK STATION	8 / 6	7 / 7	Dublin Bus
115	BALLYOGAN, Sandyford Road, Sandyford Industrial Estate, BLACKROCK STATION	1 / 1	1 / 1	Dublin Bus (1 AM and 1 PM peak service)
46E	CITY CENTRE (Parnell Sq. West.), Stillorgan Park, Carysfort Avenue, BLACKROCK STATION.	2 / 2	1 / 1	Dublin Bus (2 AM and 1 PM peak services)



Route No	Route Description	Service Frequency (Arrivals/Departures)		Operator/Comment
		AM (07:00 – 10:00)	PM (16:00 – 19:00)	
Executive Coach	Central Park and Microsoft Office Campus (Sandyford) to BLACKROCK Station	0 / 7	8 / 0	Executive Coach (AM peak boarding and PM peak alighting services)

Route 17 provides the most frequent service with 8 arriving and departing buses observed during both the AM and PM peak travel periods. Route 114 has a slightly lower frequency. There is significant coach activity at the PT Interchange, with 7 departing and 8 arriving coaches in the AM and PM peak travel periods respectively.

A total number of 207 and 61 boarding and alighting bus passengers were recorded in the AM peak survey period. A total of 124 and 140 boarding and alighting bus passengers were recorded during the PM peak surveys period.

Regarding route choice in the AM peak travel period, 53% and 11% of bus passengers boarded the No. 114 and 17 routes respectively, with 33% of passengers boarding the coach services. The remaining 3% boarding passengers took the 115 or the 46E. 88% of alighting passengers used the 114 to arrive at the PT Interchange with the remaining 12% alighting from the 17. No passengers alight from the Executive Coach services in the AM peak period.

In the PM peak travel period, 61% and 29% of bus passengers boarded the No. 114 and 17 routes respectively. The remaining 10% boarding passengers took the 115. No passengers board the executive coach services in the PM peak period. 40% and 6% of alighting passengers used routes 114 and 17 to arrive at the PT Interchange with the remaining 54% alighting from Executive Coach services.

## 4.2 Mode Split

The table below shows the existing modal split for Blackrock station for alighting and boarding rail passengers in the AM and PM peak travel periods.

**Table 5.2: Blackrock Rail Passenger Modal Split**

		Walk	Bus	Car (driver)	Car(pass )	Bicycle	Taxi	Total Passengers
Alighting	AM	84%	15%	0%	1%	0%	0%	1423
	PM	73%	10%	7%	9%	1%	0%	734
Boarding	AM	73%	7%	8%	10%	2%	0%	863
	PM	81%	11%	3%	4%	1%	0%	1231

The table above shows the modal split for alighting and boarding rail passengers at Blackrock station in the 3-hour AM and PM peak hour survey periods. There is currently no non-rail related passenger activity at the PT Interchange. It can be clearly seen below that the vast majority of rail passengers (about 75%) walk to and from the PT Interchange. Of the passengers who walked to or from the PT Interchange, the majority of these walked to locations in the vicinity of the interchange.

Further detailed existing ridership information is presented in Appendix B.

## 5. FUTURE NEEDS

### 5.1 Forecast Patronage

While this study does not include the development of detailed patronage forecasts, figures extracted from the DTO transport model and initial estimates were reviewed against planned railway capacity enhancements, local studies, and information on major development proposals that could influence PT Interchange usage.

The table below provides the patronage for this PT Interchange in 2005, 2009 and 2016. It is assumed, based on the January 2005 survey results, that close to 100% of passengers at the PT Interchange are rail related and this is used to derive the PT Interchange requirements for all the modes involved in 2009 and 2016.

**Table 6.1: Blackrock PT Interchange Passenger Forecast (passengers/hour)**

Year	Morning Peak AM (8 – 9)		Evening Peak (17 – 18)	
	Board	Alight	Board	Alight
2005	467	855	622	311
2009	623	1140	829	415
2016	904	1656	1204	602

The 2005 patronage numbers for the Blackrock PT Interchange are based on the January 2005 surveys. The forecast 2009 patronage numbers are based on a 33% increase in capacity due to the a combination of the imminent introduction of longer 8-car trains, developments within the catchment of the interchange improved interchanging bus services and interchange facilities. Details of developments within the catchment of the interchange were provided by Dun Laoghaire Rathdown Co. Co. at the outset of this study.

The 2016 AM peak hour patronage numbers are based on the DTO's multimodal model and assume significant public transport improvements in the GDA generally and developments within the catchment area of the PT Interchange.

The 2016 PM peak numbers have been estimated from the AM peak volumes by applying the existing pattern at the PT Interchange activity. The existing splits between boarding and alighting passengers have been assumed to remain unchanged.

### 5.2 Mode Splits

The projected mode split is presented in the table below.

It is assumed that the existing profile of access/ egress to Blackrock interchange will remain largely unchanged for 2009, with most rail passengers walking or using the bus to get to / from the interchange. Because of the intensive improvements planned for bus services and better bus-rail integration it is assumed that car driver mode share would fall for 2016. The forecast demand however has not been capped but actual figures would be influenced by the provision of Park and Ride at the location. The estimated mode split for year 2016 is tabulated below.

**Table 6.2: Blackrock Rail Passenger Mode Split: 2009 and 2016**

		Walk	Bus	Car <sup>1</sup> (driver)	Car (pass)	Bicycle <sup>2</sup>	Taxi <sup>3</sup>
<b>Alighting</b>	<b>AM</b>	84%	15%	0%	1%	0%	0%
	<b>PM</b>	75%	10%	5%	9%	1%	0%
<b>Boarding</b>	<b>AM</b>	75%	7%	6%	10%	2%	0%
	<b>PM</b>	82%	11%	2%	4%	1%	0%

Note: <sup>1</sup> Actual demand would be influenced by available spaces. The number of actual drivers could be significantly less if existing park and ride provision is reduced significantly.

<sup>2</sup> Provision for bicycles taken as 2.5% of AM peak departures

<sup>3</sup> Provision for taxis taken as 2.0% of AM peak arrivals

The resulting Blackrock PT Interchange peak hour patronage volumes have been sorted by mode and included in the tables below. The forecast passenger flows by mode and location are shown in Figures 2 and 3.

**Table 6.3: 2009 and 2016 AM Peak Patronage at Blackrock PT Interchange (passengers/hr)**

Movement	Year	Walk	Bus	Car (passenger)	Car (driver) <sup>1</sup>	Bicycle
<b>Boarding</b>	<b>2009</b>	455	44	62	50	12
	<b>2016</b>	678	65	93	50	19
<b>Alighting</b>	<b>2009</b>	958	171	11	0	0
	<b>2016</b>	1391	248	17	0	0

Note: <sup>1</sup> Actual demand would be influenced by available spaces. Actual drivers could be significantly less if existing park and ride provision is reduced significantly.

**Table 6.4: 2009 and 2016 PM Peak Patronage at Blackrock PT Interchange (passengers/hour)**

Movement	Year	Walk	Bus	Car (passenger)	Car (driver) <sup>1</sup>	Bicycle
<b>Boarding</b>	<b>2009</b>	671	91	33	25	8
	<b>2016</b>	985	134	49	25	12
<b>Alighting</b>	<b>2009</b>	303	42	37	29	4
	<b>2016</b>	450	62	55	29	6

Note: <sup>1</sup> Actual demand would be influenced by available spaces. Actual drivers could be significantly less if existing park and ride provision is reduced significantly.

### 5.3 Vehicle Requirement

The associated vehicle accommodation to serve the above ridership and mode split is enumerated in the following tables.

**Table 6.5: Park and Ride**

Scenario	Provision	Comments
Existing	70 spaces	2 disabled spaces provided at P&R.
2009 Requirement	Requirement dependent on available space	No additional spaces are to be provided to avoid further traffic congestion in the area. Further reduction necessary due to reallocation of space for bus station.
2016 Requirement	As for 2009	No additional spaces.

**Table 6.6: Bus Station**

Scenario	Provision	Comments
Existing	Dublin Bus: 1 loading bay and 20m x 20m stacking and loading area.  Coach: There is no provision for coaches	Dublin Bus Routes No. 17, 114 and 115 board and alight here.  Passengers wait for the coach on the footpath to the side of the station. Coaches use the Dublin Bus area to manoeuvre
2009 Requirement	4 bays, with 1 double length Circulation for out of service buses	Blackrock PT Interchange will become a terminus point for new and upgraded bus services using the Dundrum to Blackrock Orbital QBC. Dublin Bus: Frequency for No.17 to be increased from 2-3 per hour to around 10 per hour once the Dundrum to Blackrock Orbital QBC is in place. One double length bay provided for increased bus frequency.  Coach: some services observed to have long dwell times (15 to 30 minutes)
2016 Requirement	As for 2009	No long-term plans available. It was agreed with Dublin Bus that 2 bays would be sufficient to handle increased service.  Coach bay utilisation could be improved to accommodate increased frequency.

**Table 6.7: Taxi Provision**

Scenario	Provision	Comments
Existing	There is no provision for taxis.	No current demand for taxi interchange.
2009 Requirement	2 bay taxi rank to be provided	Provision subject to additional space available. Could serve about 2.0% of average 2016 morning alighting load.
2016 Requirement	As for 2009	As for 2009

**Table 6.8: Drop off and Pick up Provision**

Scenario	Provision	Comments
Existing	Current access road does not have designated area for dropping and picking up passengers and car manoeuvring	Bath Place provides access to the station and Park and Ride. Cars use this road to drop and pick up passengers by the station entrance. Currently there is no convenient space for turning.
2009 Requirement	Provide kerb length for five cars.	Based on observed evening peak requirement of three spaces.
2016 Requirement	As for 2009	Increased demand to be minimised by improved bus services.

**Table 6.9: Bike Parking Provision at Blackrock PT Interchange**

Scenario	Provision	Comments
Existing	46 spaces provided.	10 to 15 spaces currently used in the AM peak January 2005 site visits
2009 Requirement	Two parking areas with about 30 spaces each.	Improve facilities by providing shelter and lighting. The number of spaces provided could serve over 2.5% of projected 7 – 10am boarding passenger. Increased from 2% to allow for increased bike use following improved local cycle infrastructure including the proposed Sutton to Sandycove (S2S) bike route project.
2016 Requirement	As for 2009.	Could accommodate 2.5% of projected 7 – 10am boarding passenger.

## 6. RECOMMENDED IMPROVEMENTS

There are a number of measures that, when employed in tandem will revitalise the PT Interchange and its immediate environs. These include:

- Improved pedestrians access arrangements to the DART Station;
- Improved cycle access arrangements and cycle parking facilities;
- Bus interchange facilities;
- Taxi facilities;
- Car parking / drop off and pick up areas;
- Improved connectivity to the Town Centre;
- Lighting strategies;
- Landscaping strategies;
- High quality of materials;
- Provision of improved signage and passenger information; and
- Enhancing capacity and facilities in the station building.

The execution of the above strategies in tandem will result in a significantly enhanced environment thus facilitating interchange between modes. In doing so, the effective catchment of the station will be significantly widened.

Improvements are grouped into three general categories:

- Local Access;
- PT Interchange Layout; and
- Station Building.

These improvements are designed to meet current facility deficiencies and ridership increase up to 2016. It is anticipated that the majority of improvements for Blackrock PT Interchange would be implemented in a single phase. A second (long-term) phase is proposed for the high-level pedestrian link bridge as this would be dependent on the availability of development opportunities along Rock Hill Main Street. The individual improvements for each phase are presented in the following sections.

### 6.1 Local Area Access Improvements (Phase 1)

A local area access strategy has been developed to facilitate movements to and from the PT Interchange. This includes the upgrading of existing pedestrian links and the provision of a new cycle route.

Requirements for supporting local area traffic management around the Blackrock PT Interchange are shown in Figure 6. Proposed improvements are shown in more detail in Drawing No. T0001-07.

### 6.1.1 Pedestrian Access

Bath Place is currently the main pedestrian link to and from the PT Interchange, as it accommodates in excess of 90% of AM and PM peak PT Interchange pedestrian volumes. Footpaths are provided along both sides of the road, but these have constrained width in the proximity of the Rock Hill/Bath Place junction.

The proposed local area access pedestrian improvements are presented below:

- Signalised pedestrian crossing across Newton Avenue – This route would serve passengers with origin or destination in south-eastern areas of Blackrock. The proposed route will help alleviate existing footpath width constraints along Bath Place in the short term (see Item P1 in Drawing No. T0001-07); and
- The existing pedestrian bridge over the railway line would be improved as part of the proposed Sutton to Sandycove Cycle Route Project. (see Item P2 in Drawing No. T0001-07).

### 6.1.2 Cycle

Cycle routes are proposed in Dun Laoghaire-Rathdown's County Development Plan along the following roads as illustrated in Figure 6.

- Mount Merrion Avenue;
- Carysfort Avenue;
- Blackrock Park, Idrone Terrace, Newtown Avenue and Seapoint Avenue; and
- The proposed Sutton to Sandycove (S2S) cycle path.

Cycle linkage from neighbouring areas to the PT Interchange will improve with the completion of the above routes.

The proposed Sutton to Sandycove cycle path will run to the eastern side of the tracks in the vicinity of the PT Interchange. Linkage to the PT Interchange will be provided via a bridge that will span over the railway line and then land on the footpath at the Bath Place/Idrone Terrace junction (see Item C4 in Drawing No. T0001-07).

To complement the above strategy and ensure adequate bicycle linkage to the PT Interchange, the following improvements are recommended:

- Cycle lanes along Bath Place linking the PT Interchange to the proposed cycle network along Blackrock Park and Idrone Terrace (see Item C3 in Drawing No. T0001-07); and
- Adequate directional signage at major cyclist decision points in the study area.

### 6.1.3 Bus

The Blackrock PT Interchange will be the terminus of the Dundrum to Blackrock Orbital QBC. The bus provision for the PT Interchange takes into account the increase in bus frequencies as a result of the implementation of the Orbital QBC. No other local bus access improvement is proposed as part of the PT Interchange study.

Dublin Bus routes operating in the vicinity of the PT Interchange mainly along Rock Hill Main Street, should be provided adequate signposting and passenger information to facilitate passenger interchange. In the long-term, the provision of a high level footbridge between the PT Interchange and Rock Hill Main Street will further facilitate passenger interchange (see Section 7.4.1).



#### **6.1.4 Taxi**

A two-bay taxi rank is proposed as part of the PT Interchange improvements. No dedicated taxi access improvement is proposed as part of the PT Interchange study.

#### **6.1.5 Private Vehicles**

Bath Place will remain as the main vehicular link between the PT Interchange and the neighbouring road network. The proposed PT Interchange layout would facilitate car manoeuvring in the vicinity of the station building.

Due to lack of available space there is no scope for major vehicular or pedestrian improvements at the Rock Hill Main Street/Bath Place signal-controlled junction.

#### **6.1.6 Signage**

The zones to the south of Rock Hill Main Street and Newton Avenue in Blackrock are mature urban areas with sufficient pedestrian linkage for existing and potential PT Interchange users. However, a lack of adequate directional signage is likely to result in difficulties for unfamiliar PT Interchange users. To address this issue, it is proposed to provide directional signage at major junctions and pedestrian decision points in the area.

Directional signage indicating the route to the PT Interchange should be provided at the following locations:

- Blackrock Park (see Item SG1 in Drawing No. T0001-07);
- Both of the proposed Sutton to Sandycove footbridge landings (see Item SG2 in Drawing No. T0001-07);
- Rock Hill Main Street/Bath Place junction (see Item SG3 in Drawing No. T0001-07);
- Idrone Terrace/Newton Avenue Junction (see Item SG4 in Drawing No. T0001-07);
- Rock Hill Main Street / Newton Avenue/Temple Road junction (see Item SG5 in Drawing No. T0001-07);
- Mount Merrion/ Rock Road junction (see Item SG6 in Drawing No. T0001-07);
- Frascati Road/Rock Hill Main Street junction (see Item SG7 in Drawing No. T0001-07);
- Frascati Road/George's Avenue junction (see Item SG8 in Drawing No. T0001-07); and
- Frascati Road/Carysfort Avenue junction (see Item SG9 in Drawing No. T0001-07).

## **6.2 PT Interchange Layout Improvements (Phase 1)**

The proposed improvements for the Blackrock PT Interchange are described in this section. Arup Drawings No. T0001-A1 and 06 illustrate the proposed PT Interchange layout in urban design/architectural and engineering terms respectively.

#### **6.2.1 Pedestrian Access**

Pedestrian circulation within the PT Interchange will be improved by providing a better streetscape design, direct routes between the various PT Interchange elements and raised pedestrian crossings. All pedestrian facilities provided will meet the requirements for mobility-impaired users.

Pedestrian-vehicle and pedestrian-bus conflict would be minimised by removing the station car park from the station forecourt and by providing separate areas for bus boarding and

alighting and car and taxi passenger drop-off and pick-up. Pedestrian routes leading to the car parks and beyond would be clearly marked and designated for pedestrian priority.

The measures to improve the quality of the pedestrian access include:

- The provision of new pedestrian pavements to both sides of Bath Place;
- Widening of the existing footpath along the station side of Bath Place is also proposed to facilitate 'Kiss and Ride', pedestrian movements and to accommodate the new station footbridge landing, which is expected to be in place by the end of 2005;
- The widening, to two metres, of the pavement adjacent to the existing car park along Bath Place;
- The use of signage and wayfinding elements on all access routes;
- The upgrading of the surface treatment and lighting along the Blackrock Park access route between the PT Interchange and park;
- The improvements to the public realm on the junction of Bath Place and Idrone Terrace, which includes a speed table at the junction as a traffic calming measure and to improve the pedestrian environment (see Item P3 in Drawing No. T0001-A1);
- The provision of pedestrian crossings that will provide linkage from the station building to the bus station, taxi and cycle parking areas and from there towards the proposed footpath along the western side of Bath Place; and
- The Station upgrade works (to be described later) in addressing the Station access.

### 6.2.2 Cycle

The provision of cycling facilities within the PT Interchange would be improved. The overall provision of cycle parking spaces would be increased to about 60 spaces to accommodate 2.5% of projected 2016, 07:00 – 10:00am boarding passengers.

The PT Interchange proposals allow for:

- Two large, and clearly designated cycle parking areas with about 30 spaces each, as indicated on the plans (see Item C1 and C2 in Drawing No. T0001-A1);
- The first (Item C1) is located in the covered hardstanding area between the Bus Station and the Taxi area, with the second (Item C2) located between the Taxi and the vehicle access area. Lighting and shelter would be provided at both areas;
- Cycle racks are arranged in single file series to aid visual overseeing and thus security;
- Cycle racks are in stainless steel and lockable; and
- Advisory cycle lanes on both sides of Bath Place (Item C3). These lanes will link the wider cycle network to the PT Interchange via a footbridge linkage (Item C4) to the proposed Sutton to Sandycove cycle path provided at the Idrone Terrace/Bath Place Junction. These advisory cycle lanes will extend up to the proposed cycle parking locations at the PT Interchange.

### 6.2.3 Bus

Blackrock Station is designated as a suburban rail to Quality Bus Network Interchange, and the proposals need to address these aspirations.

The station forecourt and current park and ride site will be combined to provide a bus station. Bus and coach services from Bath Place will gain access to their designated area via a shared access road running along the eastern boundary of the current park and ride site.

The new arrangement provides for 4 no. bus stands (see Item B1 in Drawing No. T0001-A1), that include design proposals for:

- Wide and generous pavement areas for alighting and set down for passengers;
- Well positioned hardwearing seating benches as indicated on the plan in the bus stand area;
- A single bus canopy covering all of the stands and also the passenger waiting areas below. The canopy needs to be of a simple and modern design so as not to compete with the historic nature of the Station (see Items B2 in Drawing No. T0001-A1);
- The canopy is provided with natural light slots above the passenger waiting areas so as to demarcate the passenger waiting areas;
- The sightlines to the Station and way finding are reinforced by the location of the Bus provision to the Rail Station;
- Boards giving service and local area information and allowing for provision of real time passenger information to aid and encourage passengers;
- Provision for pre-boarding ticketing and fare validation; and
- The bus area would include an internal circulation facility for out of service buses.
- One double length bay for high frequency service.

### 6.2.4 Taxi

The proposed PT Interchange improvements include a new taxi area in the vicinity of the station building, which would consist of the following:

- A new dedicated taxi stand with 2 bays next to the bus station (see Item T1 in Drawing No. T0001-A1); and
- The taxi lane would provide a u-turn facility for taxis and cars turning round to drop or pick up passengers without interfering with bus operation.

The proposed taxi bay provision could serve 2.0% average AM 2016 alighting load.

### 6.2.5 Kiss and Ride

Bath Place would remain, as the only vehicular access to the PT Interchange, although widening of the existing carriageway to accommodate wider footpaths, cycle lanes and kiss and ride bays is required. A designated drop-off and pick-up area is proposed on the station side of Bath Place approximately 30 metres from the station building.

The PT Interchange proposals allow for:

- Providing clearly designated drop-off and pick-up areas as designed and indicated on the site layout (see Item K1 in Drawing No. T0001-A1);
- Providing clarity of signage;

- Providing 5 drop off / pick up bays alongside the station, thereby negating the need for users to cross a lane of vehicular movement;
- Providing ample circulation space and pavement areas for passengers to offload / load luggage / shopping as necessary; and
- Providing clearly demarcated drop-off and pick-up bays.

### **6.2.6 Park and Ride**

The park and ride site will be relocated to the existing bus area. The park and ride proposals would allow for:

- Providing a clearly designated car parking area with 14 no. car parking spaces, 2 of which will be designated for use of the recycling centre (see Items PK1 and 2 in Drawing No. T0001-A1);
- Providing clarity of signage; and
- Providing clearly demarcated parking bays.

The adopted strategy results in a loss of 58 park and ride spaces but optimises the use of available space for public transport, giving priority to bicycle and bus users over private vehicles.

The designation of dedicated station park and ride spaces should be reviewed together with the overall parking strategy for Blackrock Village. In particular the strategy for the adjacent short-term car park and available on-street long-term parking along Idrone Terrace needs to be reviewed.

The above proposals for the PT Interchange will meet the anticipated 2016 bus, 'Kiss and Ride' and bicycle requirements. The proposed improvements would result in a safe and efficient PT Interchange operation.

### **6.2.7 Lighting**

The following lighting strategy is proposed for the PT Interchange area and illustrated in Drawing No. T0001-A1.

- Street lighting is provided along the access road and within the car parking areas. These visual elements will provide functional and clear lighting to meet the safety requirements in the area;
- Footpath lighting along the pedestrian link between the PT Interchange and the Blackrock Park would be enhanced to provide functional and clear lighting to meet the safety requirements in the area;
- The second aspect of the lighting strategy will be associated with high-level bollards along the pavement, lighting and denoting the means of access to the Station. This in effect will form a part of the way finding elements to the Station, along all the 4 main and key access routes; and
- The third element of the Lighting strategy will be feature lighting. This will be placed on or near the Station to light the Station and Bus Canopy. Uplighters will also be employed discreetly to light selected trees as part of the landscaping approach.

### **6.2.8 Landscaping**

The landscaping improvements are illustrated in Drawing No. T0001-A1.

The PT Interchange proposals include:

- The use of trees as orientation devices;
- Shrubs / low level planting / seeded and grass areas are not proposed due to their maintenance implications;
- A group of three semi- mature (root balled trees) are proposed at the junction of Idrone Terrace / Bath Place;
- Further single trees are to be placed; at the junction to the taxi circulation area, on the bicycle parking island and to the rear of the bus canopy area; and
- Seating is further placed in strategic locations in the PT Interchange to provide a welcoming and inviting area for rest.

### **6.2.9 Quality of Materials**

The proposals are as illustrated in the attached sample board in Appendix C. Consideration has been given to materials that:

- Have a high level of durability;
- Is in essence maintenance free; and
- Provide a level of quality that adds to the urban realm.

### **6.2.10 Signage and Passenger Information**

The proposals at the PT Interchange encompass:

- Way finding signage as beacons announcing the PT Interchange, located along Bath Place and further at the Station itself (see Items SG1 and SG 2 in drawing No. T0001-A1);
- Specific mode signage located at the junction to uses;
- Provision of passenger systems, which could include Real Time Passenger Information boards for bus and rail services; and
- Services serving the interchange and the local area, directions to the principal activity centres and reference to sources of further information.

### **6.2.11 Safety and Security**

Personal safety and security PT Interchange design elements that would address safety and security concerns include:

- Maximised clear lines of visibility for station staff positions (e.g. ticket office);
- Strategically located CCTV and help points both at the platform and immediate interchange environment;
- Enhanced lighting at the passenger waiting areas, car park, cycle parking and pedestrian access routes (e.g., footpath between station and Blackrock Park);and
- Passenger drop-off zones within easy access of the station building.

## 6.3 Station Building Improvements (Phase 1)

### 6.3.1 Capacity Enhancement

In terms of the Station building, a number of strategic interventions are proposed. The proposed improvements are presented below and illustrated in Arup Drawing No. T0001-A2:

- The mobility impaired access issues between platforms are being addressed by the DART upgrade project (see Item S1 in Drawing No. T0001-A2);
- The Station arrangements were discussed at various workshops and also at two meetings with the Conservation Officer of the Council, on site at Blackrock Station on the 20<sup>th</sup> April 2005;
- The existing Station Entrance is narrow, and it is proposed that the more contemporary front door is removed, including the frame to maximise the structural opening to aid passenger movement into the Station. Consideration has been given to make this door opening larger by small structural alterations around its opening (see Item S2 in Drawing No. T0001-A2);
- As the existing station entrance can only be marginally widened, an additional entrance of 2.5metres width is proposed (see Item S3 in Drawing No. T0001-A2). The new entrance will serve the expanded ticket hall;
- A contemporary entrance intervention is proposed;
- Due to the narrow widths of the existing platforms, and the passenger congestion issues that arise, it would be recommended to provide additional openings onto the platform, this is proposed to be achieved by removing the poorly built connection between the northern building and the main building. A contemporary structure in its place would allow additional connections to the platform to be made (see Item S4 in Drawing No. T0001-A2);
- The access of the platforms is by means of the proposed circulation system;
- Placement of signage will be at key decision making areas, for example at the head or base of staircases, and where a key change of direction is required. Adequate decision making space will be provided to aid the smooth and unimpeded flow of passengers (see Sample Board Sheet in Appendix C for specific examples);
- Help points shall be provided on strategic locations at the platforms; and
- Finally, a refurbishment of the Station, along with a retail offer (see Item S5 in Drawing No. T0001-A2) is proposed, which will add to and enhance the quality of the environment.

The 2016 AM and PM flows are illustrated on the PT Interchange preliminary layouts (Figures 4 and 5). For the ticket hall and concourse, a combined area of 45m<sup>2</sup> is required to achieve a level of service C in the peak 5 minutes. Over 51m<sup>2</sup> is already provided.

A comparison between existing and proposed Blackrock station building and PT Interchange is provided in Photographs 4 and 5.

**Photograph 4: Existing Blackrock Station Building and PT Interchange**



**Photograph 5: Proposed Blackrock Station Building and PT Interchange**



### **6.3.2 Signage and Passenger Information**

Signage for passengers is provided at the station itself in the form of:

- Local information signage;
- Direct platform way finding; and
- Timetable information.

Passenger information is provided by means of Real Time Passenger Information (RTPI) on both platform and further within the ticket hall / concourse.

'Best in field' examples of the above are provided in Appendix C.

### **6.3.3 Revenue Collection Strategies**

The ticket office is planned as the main manual vending opportunity for ticket retail sales. This will be supplemented by ticket vending machines in the location of the ticket office.

Fare protection will be by means of the ticketing control barrier line at the Station. Further supervision of this control barrier line will be afforded by the visual overseeing of staff from the ticket office to the ticketing control barrier line. The proposed improvements include:

- Relocated ticket office with adequate queuing area (see Item S6 in Drawing No. T0001-A2);
- The number of ticket gates would be increased from two to seven to offer a higher level of service and accommodate forecasted increase in ridership. While two barriers in the arriving and departing direction will more than cope with the smooth operation of the Station, for prudence an additional barrier has been added in each direction, to cope with electronic failures / maintenance. Four barriers are provided at the platform gate array to minimise the chances of long queues blocking the platform. (See Item S7 in Drawing No. T0001-A2); and
- Ticket Vending Machines (TVMs) will supplement the ticket office function and will be retained at their current location. Provision will be made for additional ticketing equipment as necessary.

Ticketing integration is planned to ensure that systems are in place in the future to deal with rail / bus transfers and other modal use shares.

### **6.3.4 Commercial Opportunities**

Whilst the footfall at Blackrock is small, generally 500 passengers per hour will sustain 30 minutes of retail trading activity for a small retailer. Thus a small retail unit operating at least in the AM and PM peaks hours may well constitute a viable commercial offer and add to the amenity offer at the station itself.

## **6.4 Local Area Access Improvements (Phase 2)**

### **6.4.1 Rockhill Main Street Pedestrian Link Bridge**

Bath Place is, at present the only direct pedestrian link between the PT Interchange and Rock Hill Main Street. This results in a lack of permeability between the PT Interchange and the commercial and residential areas situated immediately to the west of Rock Hill Main Street and Frascati Road. The problem is exacerbated by the narrow footpaths along Bath Place.



There is potential to provide a high level bridge that would link the PT Interchange directly to Rock Hill Main Street. With approximately 30 – 40% of PT Interchange pedestrian movements along Bath Place having either origin or destination within these areas, the provision of this additional pedestrian link is highly desirable.

This possibility will be dependent on development opportunities along Rock Hill Main Street and impact on the possible future airspace redevelopment of the station forecourt area. The footbridge is considered a long-term objective, as it would provide a direct link between the main Blackrock Village Street and the PT Interchange bypassing the narrow footpaths along Bath Place.

The footbridge would considerably improve pedestrian access to/from the PT Interchange as well as result in a significant decrease in pedestrian movements along Bath Place.

The requirements and objectives of this connection are:

- To provide a high level, passenger friendly connection via means of a link bridge from Rock Hill (see Item P5 Drawing No. T0001-A1 and see Item P3 Drawing No. T0001-07);
- The footbridge would require a high level entrance to be located in an acquired retail / commercial property off Rock Hill;
- Traversing across the vehicle arrangements it would land at a position close to the Station;
- These future bridge proposals are indicated on the plans in a dotted outline;
- In order for the footbridge to be deliverable and integrated into the urban environment, two areas would need to be further developed and considered in accordance with the 2004 County Development Plan objectives, being;
  - The future use and development of the Blackrock Baths, either as a leisure or residential / commercial mix and thereby providing a potential anchor to passenger demand and throughput; and the consideration and development of an air rights building of 2 / 3 storeys above the Interchange in the proposed Bus / Taxi and car parking areas.
  - The integration of this footbridge with the recently constructed over-track footbridge. This would provide for easier access to/ from the southbound platform and Rock Hill Main Street. The implications for this in terms of revenue control would also have to be investigated.

The following two items are subject to the implementation of the above high level link bridge.

- A new pedestrian crossing on Rock Hill Main Street in front of the remote station entrance (see Item P4 in Drawing No. T0001-07); and
- Improved pedestrian streetscape along St George's Avenue, as this route will provide a more direct link to the PT Interchange to/from the commercial and residential areas south of Frascati Road (see Item P5 in Drawing No. T0001-07).

## 7. COST ESTIMATES

A preliminary high level cost estimate of the physical infrastructure recommended is presented in this section.

The costings below exclude:

- Costs associated with Rail Possessions and Engineering working hours which will be dependent on procurement strategies.
- Preliminaries at 25%.
- Profit at 7.5%.
- Contingency at 10%.

The further significant elements that shall affect cost will be the construction phasing strategy and funding availability; either delivering the project in one full and continuous phase or delivering the project in incremental portions with time delays between each phase as funding is made available.

While construction in one continuous phase will be the most economic way forward, it has been estimated that a multi-phase approach with site establishment costs at each phase could add in the order of 25 – 35% to overall costs. The presented cost estimates in this report assume independent delivery of Phase 1 and 2 works.

The costs per principal phase of the PT Interchange improvements are enumerated below.

### 7.1 Phase 1

#### **Clearance**

Re-configure road / hardscaping

**Euro 85,000.00**

#### **Bus Canopy**

New Bus Station Canopy / works

**Euro 450,000.00**

#### **Access Road**

Civil works / drainage / new retaining wall / access road and road works

**Euro 211,500.00**

#### **Station**

Stations Refurbishment and re-configuration minor works

**Euro 85,000.00**

- Make openings in existing walls 500mm thick and making good including lintel  
Euro 20,000.00
- Demolish existing walls 250mm thick  
Euro 5,500.00
- Demolish existing walls 500mm thick  
Euro 6,000.00

- Internal painting to existing walls  
Euro 8,800
- Remove existing floor and lay terrazzo floor  
Euro 16,000
- Paint existing ceiling  
Euro 2,900
- New one brick walls including finishes  
Euro 5,300
- New doors including finishes and ironmongery  
Euro 3,000
- New build (new WC's and new extension)  
Euro 17,500.00

#### **Local Access Improvement**

Provision of pedestrian crossings on Newton Avenue.

**Euro 15,000.00**

## **7.2 Phase 2**

#### **Footbridge**

Footbridge from High Street / Lift / Stair / Clearance works

**Euro 1,400,000.00**

- Enclosed Lift  
Euro 362,500.00
- Semi -enclosed Stair  
Euro 200,000.00
- Enclosed Bridge (35m)  
Euro 764,400.00

#### **Local Area Access Improvements**

Footpath Improvement along George's Avenue

**Euro 12,500.00**

- Kerb  
Euro 3,800.00
- Concrete Footpath  
Euro 8,700.00

Pedestrian crossings on Rock Hill Main Street

**Euro 15,000.00**

### **7.3 Cost Summary**

The total estimated cost for each phase is summarised below.

Phase 1     € 846,500.00

Phase 2     €1,427,000.00

**Total       €2,274,000.00**

## 8. DETAILED DESIGN PROGRAMME AND IMPLEMENTATION

### 8.1 Phase 1 Programme

The Detailed Design will be undertaken in a manner that ensures compliance with statutory planning requirements, notwithstanding the sequence or selection of the Construction phasing Stages.

In terms of the design Programme for site clearance, bus canopy and Station.

The following key design date timescales are envisaged:

- *Scheme Design – 4.5 months*
- *Detailed Design – 4.5 months*
- *Planning Permission – 6 to 9 months*

Planning Permission could commence after Scheme Design, however Detailed Design would progress at risk if this were run in tandem with the Planning application.

In terms of construction periods; the following construction periods are envisaged:

- *Site Clearance – 2 months*
- *Road Arrangements – 5 months*
- *Bus Canopy – 3 months*
- *Station works – 4 months*
- *Pedestrian Crossing - 1 month*

### 8.2 Phase 2 Programme

In terms of the design Programme for the footbridge, the following key design date timescales are envisaged:

- *Scheme Design – 4.5 months*
- *Detailed Design – 4.5 months*
- *Planning Permission – 6 months*

Planning Permission could commence after Scheme Design, however Detailed Design would progress at risk if this were run in tandem with the Planning application

In terms of construction periods; the following construction period is envisaged:

- *Footbridge – 6 months*
- *Pedestrian Crossing and footpaths - 1.5 months*

### 8.3 Implementation: Next Steps

Following the development of the preliminary designs, it will be the responsibility of the Dun Laoghaire Rathdown County Council, as lead agency to bring them forward to detailed design and implementation.

While most of the key design issues have been addressed in the study, a number of issues primarily relating to implementation need further consideration. These include:

- Potential loss of parking revenue – The reallocation of existing parking space in the vicinity of the station for bus activities and the consequential reduction in parking supply requires further investigation by Dun Laoghaire Rathdown Co. Co. to determine its impact in terms of lost parking income. This review could include:
  - Policy review on offering short-stay vs. park and ride spaces;
  - Redesignation of adjacent short-stay car park; and
  - Redesignation of on-street parking spaces along Idrone Terrace.
- Redevelopment proposals for Blackrock Baths – It is a specific goal in the DLRCC Development Plan 2004-2010 to encourage the redevelopment of the area encompassing Blackrock Baths, Bath Place and the PT Interchange site. The preliminary design would need to be reviewed against redevelopment schemes that might be drawn up prior to PT Interchange works commencing.

The preliminary designs have been endorsed by the PT Interchange sub-working group and presented to the DTO PT Interchange working group in July 2005.

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**FIGURES**

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**Figure 1 Study Area**

**Figure 2 2009 PTI Movements**

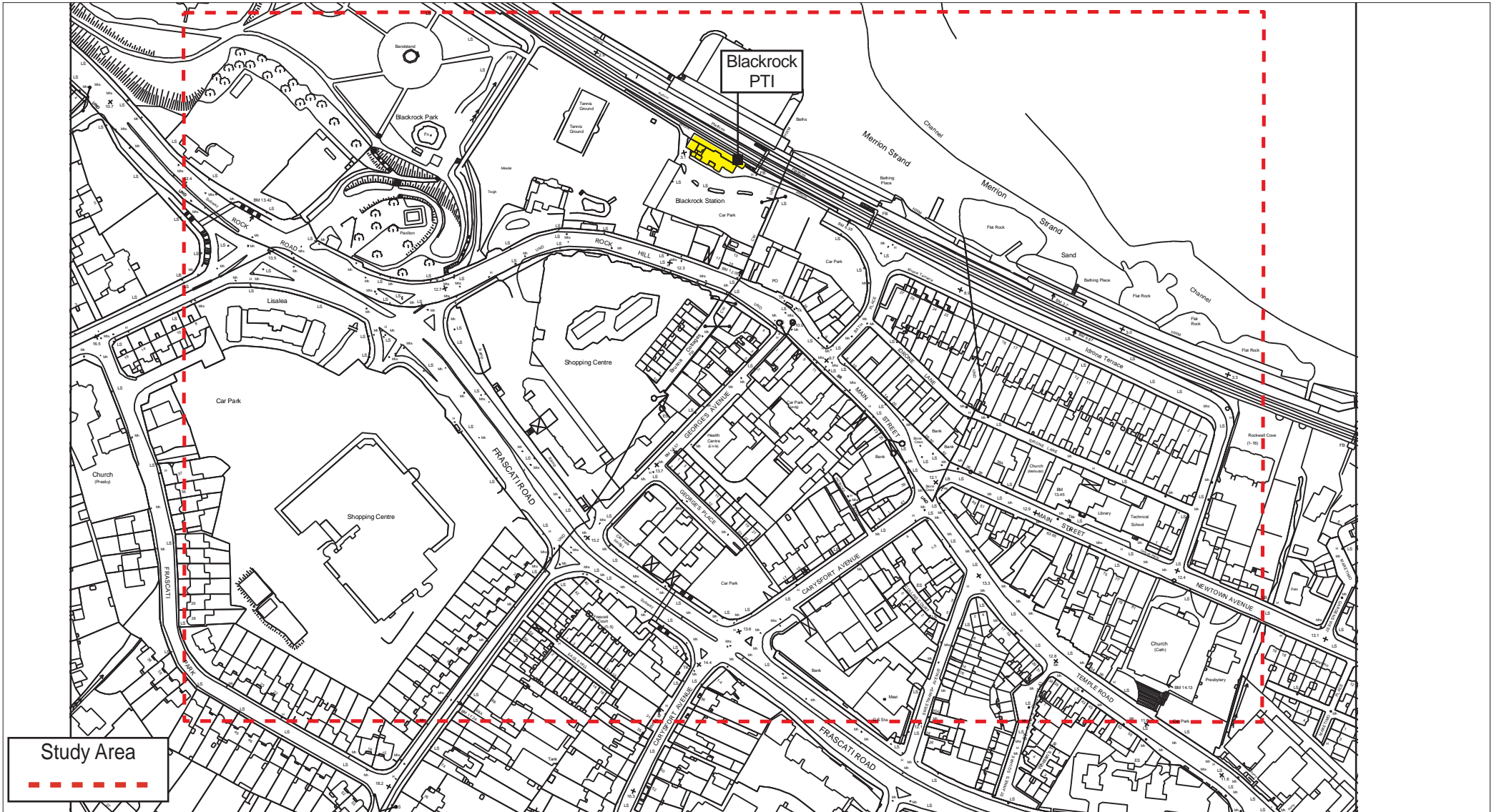
**Figure 3 2016 PTI Movements**

**Figure 4 2016 Station Passenger Movements – AM Peak**

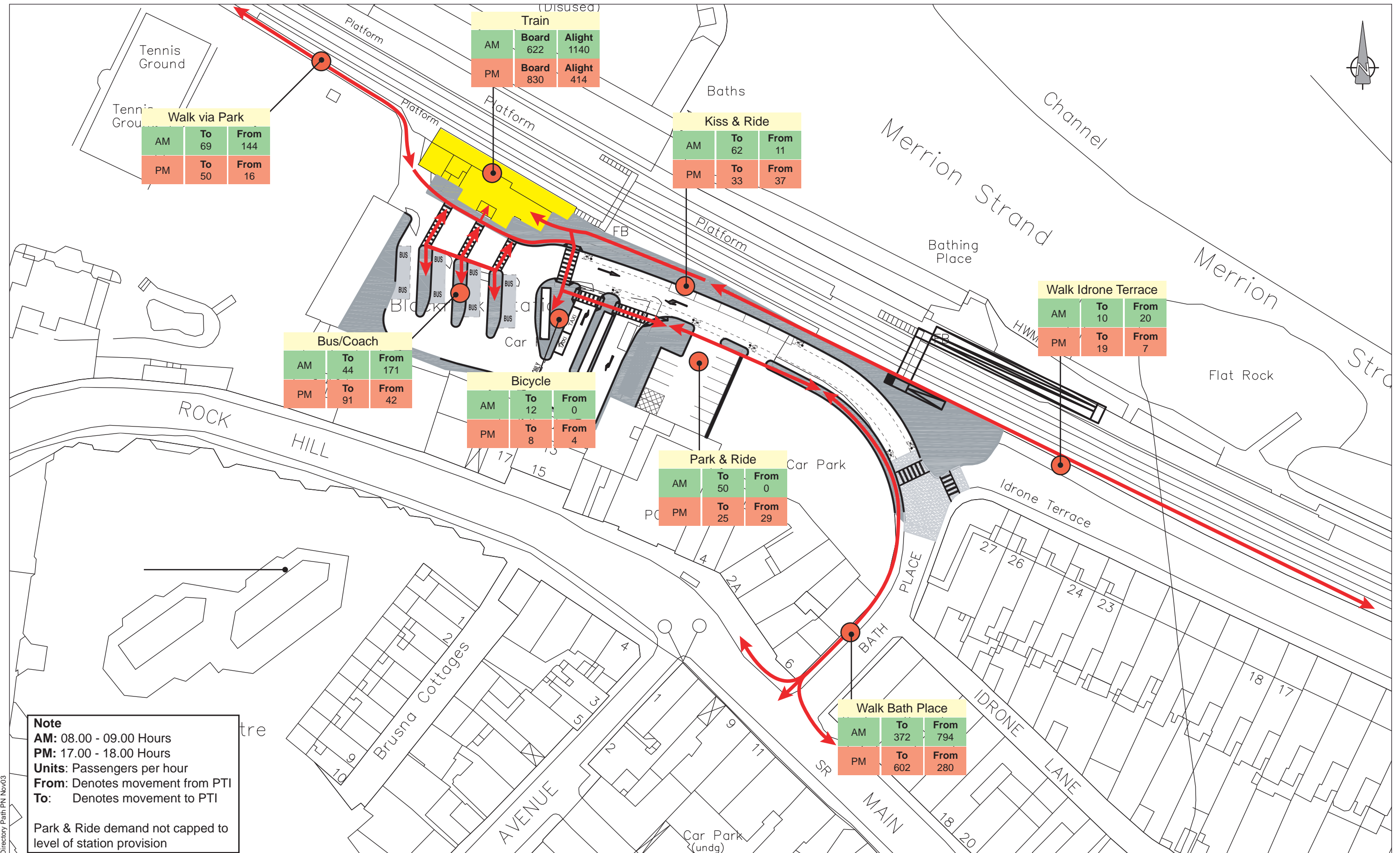
**Figure 5 2016 Station Passenger Movements – PM Peak**

**Figure 6 Local Area Access Strategy**



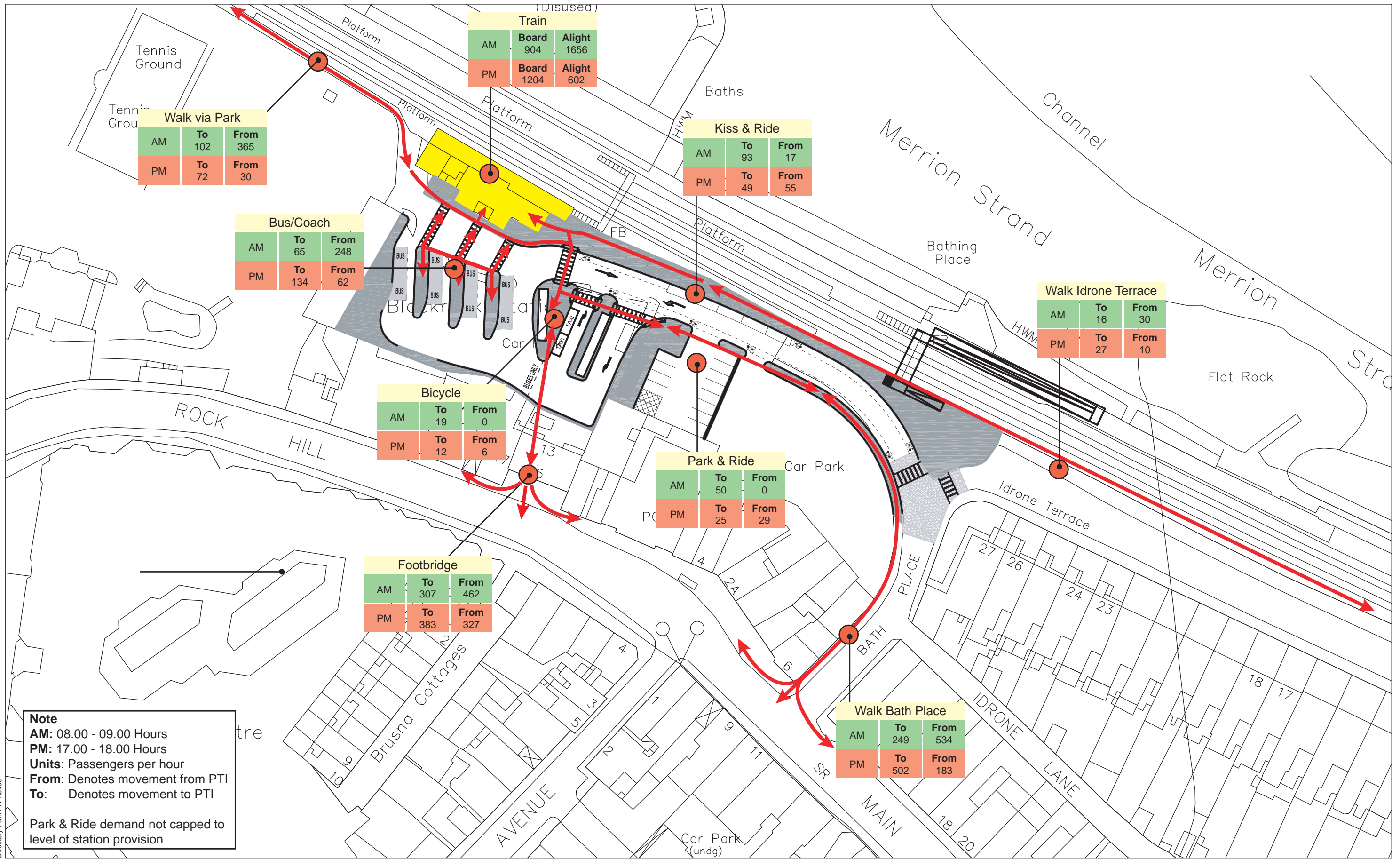


Study Area  
 - - - - -

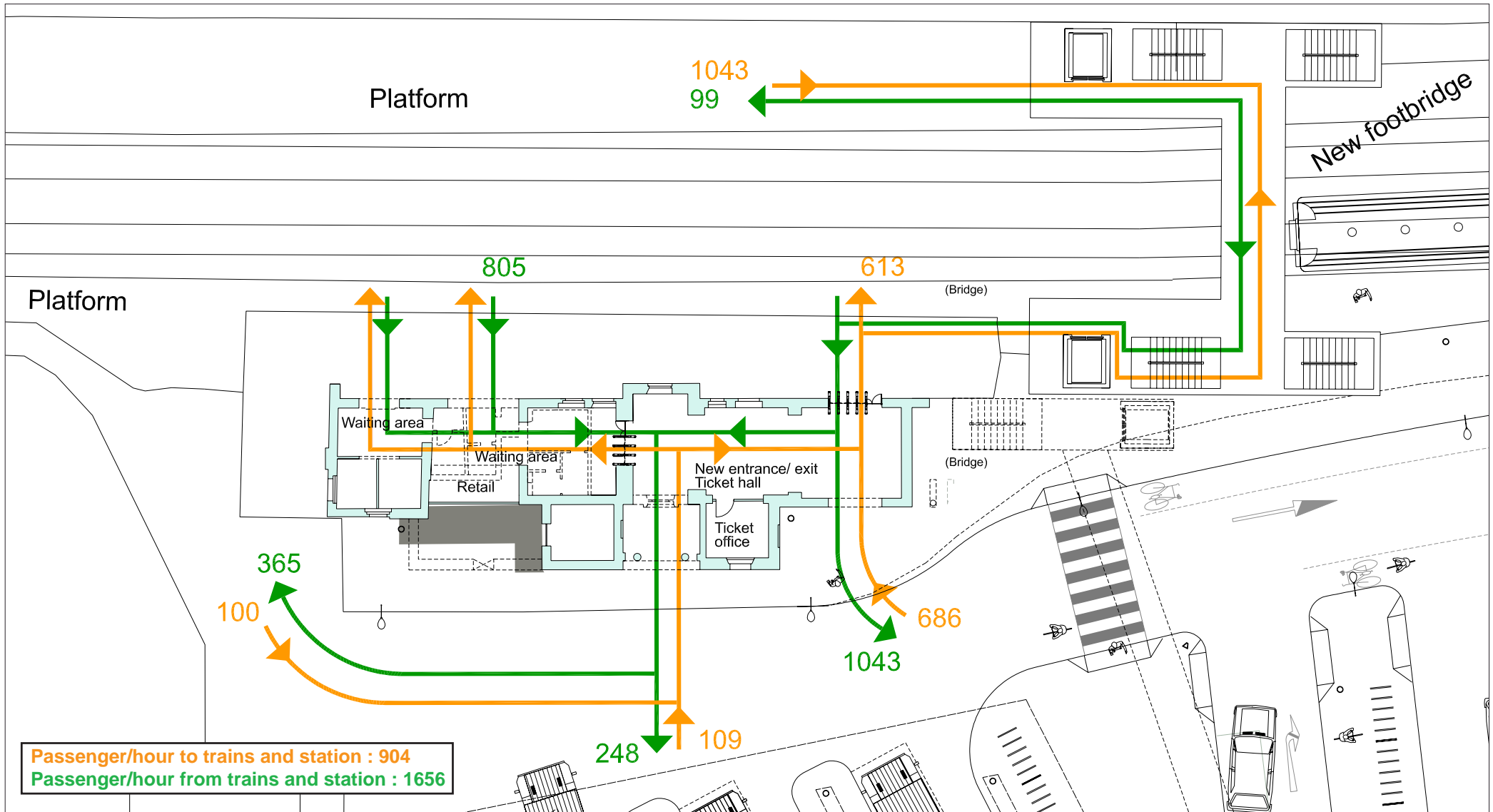


Directory Path PN Nov03





Directory Path PN Nov03



2016 Station Passenger Movements | AM Peak

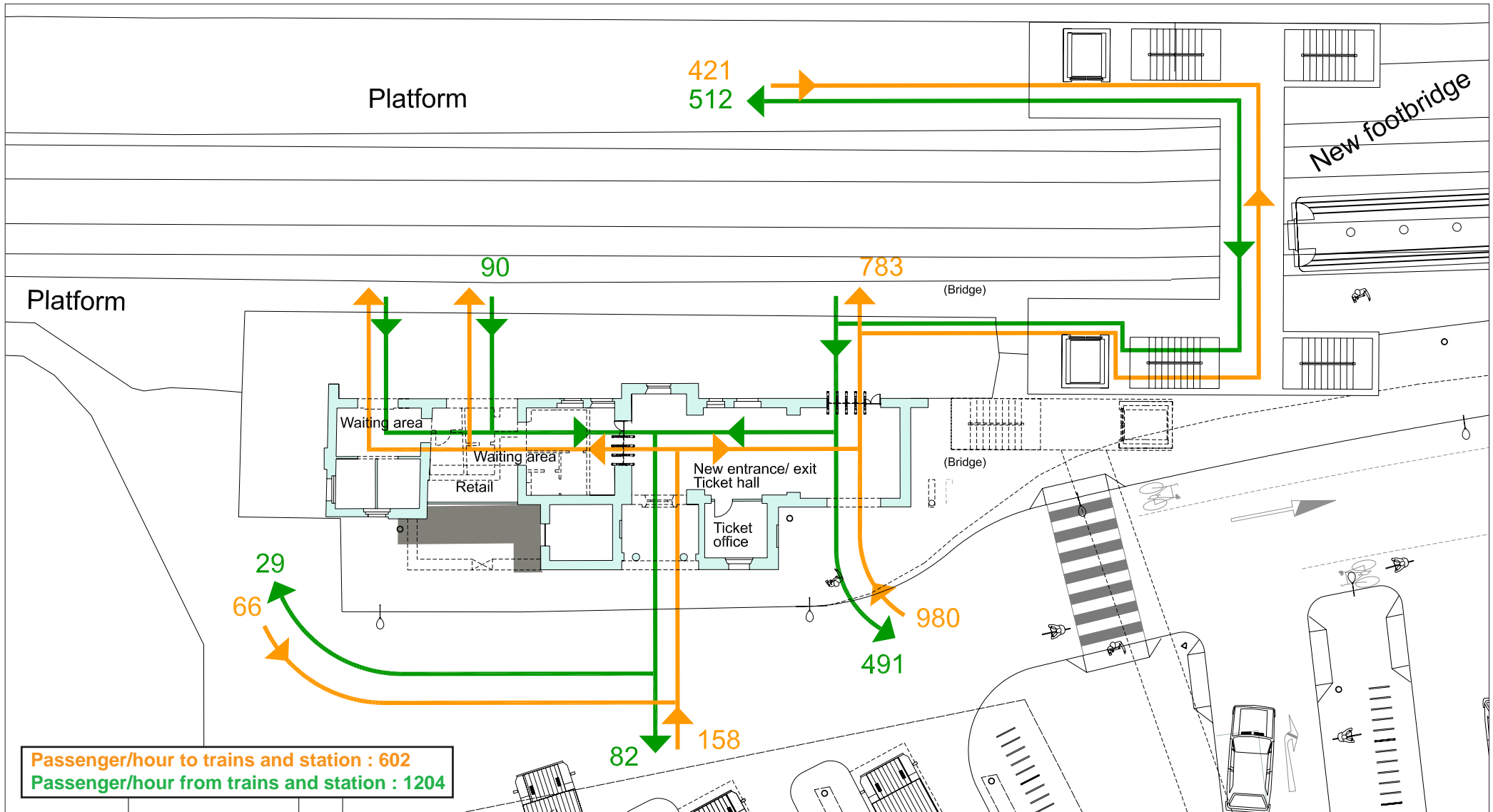
Preliminary PTI Design Report | Blackrock

D4659.20

January 2006

Figure 4.0

ARUP



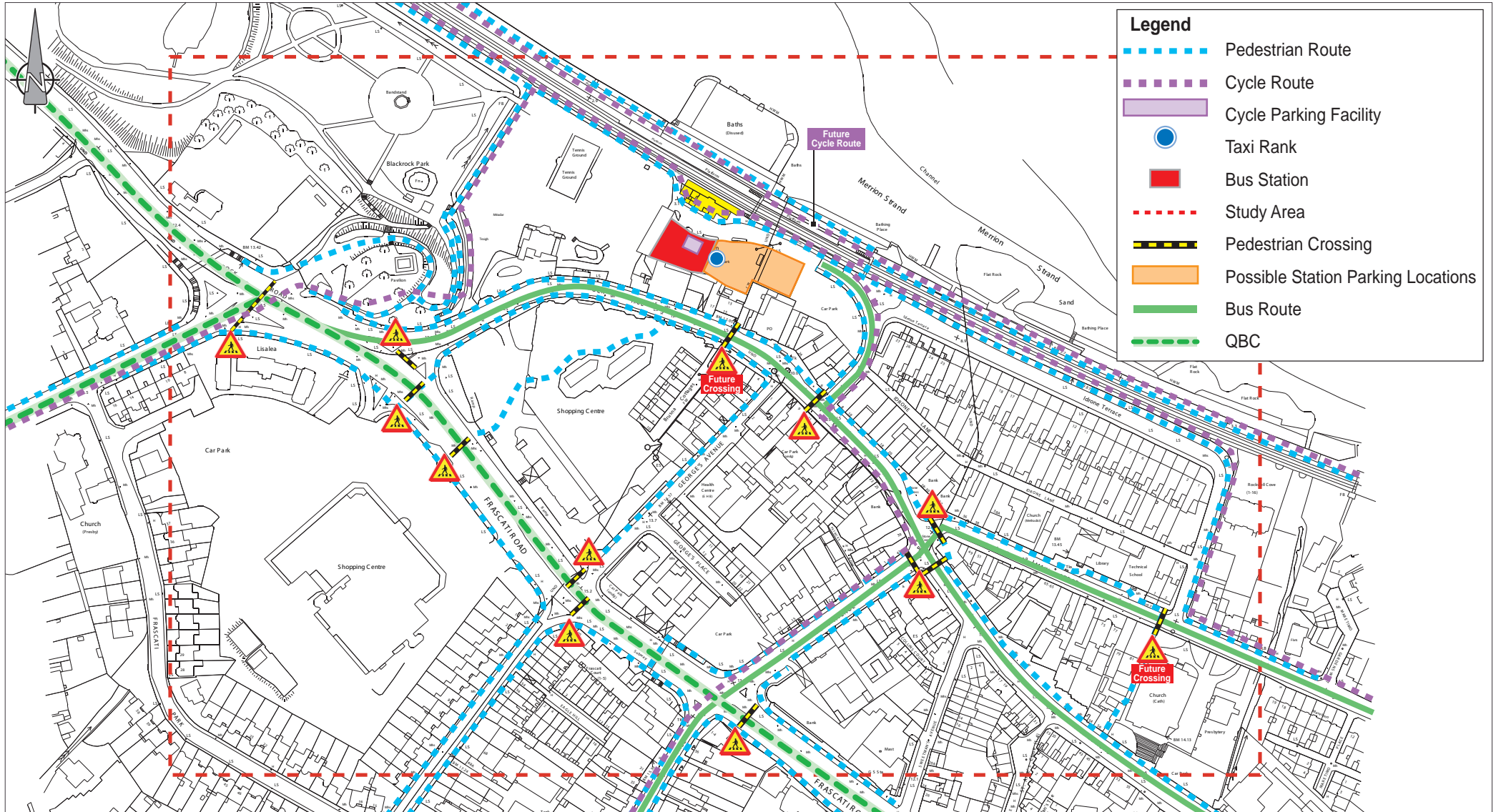
2016 Station Passenger Movements | PM Peak

Preliminary PTI Design Report | Blackrock

D4659.20

January 2006

Figure 5.0



## Local Area Access Strategy

Preliminary PTI Design Report | Blackrock

D4659.20

January 2006

Figure 6.0

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**DRAWINGS**

- Drawing 1 T0001/A1 Proposed PTI Site Plan**
- Drawing 2 T0001/A2 Proposed Station Layout**
- Drawing 3 T0001/06 Proposed PTI Area Layout**
- Drawing 4 T0001/07 Local Area Access Improvement**
- Drawing 5 T0001/08 Existing PTI Area Layout**



A1

10cm - SCALE WITH CAUTION AS DISTORTION CAN OCCUR

- Existing station building remodelled
- New bridge structure
- Hard & soft landscaping
- Existing buildings
- Existing car park
- Proposed car park
- Street lighting
- Feature lighting
- Landscape lighting
- Signage



- P1 Widened footpath and 'kiss&ride' area
- P2 Widened footpath
- P3 Idome Terrace/Bath place junction improvement
- P4 Designated pedestrian crossing
- P5 High level link bridge
- C1 Cycle parking
- C2 Cycle parking
- C3 Bath place cycle lanes
- C4 Link bridge to Sutton to Sandycove cyclepath
- B1 Bus boarding/alighting platforms
- B2 Roof canopy over bus station
- T1 Taxi pick-up/drop-off area
- K1 Drop-off/pick-up bays
- PK1 Reconfigured park and ride
- PK2 Recycle centre drop-off bays
- SG1 Way finding signage
- SG2 Way finding signage

Rev.	Date	By	Description	Chd By
A	02.09.05	MLC	Issued for information	

Job Title  
**PTI PRELIMINARY DESIGN  
BLACKROCK STATION**

Drawing Title  
**PROPOSED PTI SITE PLAN  
ARCHITECTURE & LANDSCAPING**

Drawing Status  
**PRELIMINARY**

**ARUP**  
Consulting Engineers

10 Wellington Road Dublin 4  
Tel 01-6144200 Fax 01-6683169  
E-Mail dublin@arup.com

DUBLIN CORK LIMERICK

Originator  
Scales **1:200**  
Checked Approved Date **02.09.2005**

Job No. **D4659.20** Drawing No. **T0001/A1** Rev. **A1**



Platform

Platform

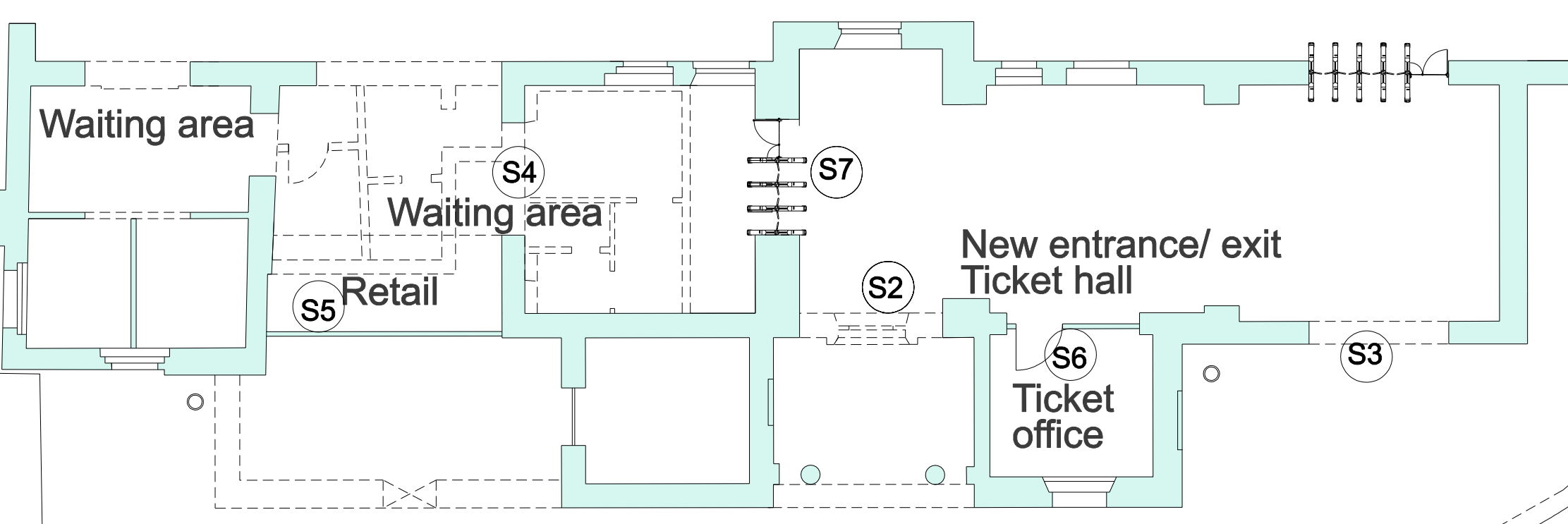
New footbridge

Plat

Pla

(Bridge)

S1



- (S1) New Station Footbridge (under construction)
- (S2) Widened station entrance
- (S3) New station entrance
- (S4) Expanded waiting area and platform access
- (S5) Retail offer
- (S6) New ticket office
- (S7) New ticket barriers

10cm

Rev.	Date	By	Description	Chd. By
A	02.09.05	M.C.	Issued for information	

Job Title  
**PTI PRELIMINARY DESIGN  
 BLACKROCK STATION**

Drawing Title  
**PROPOSED STATION LAYOUT**

Drawing Status  
**PRELIMINARY**

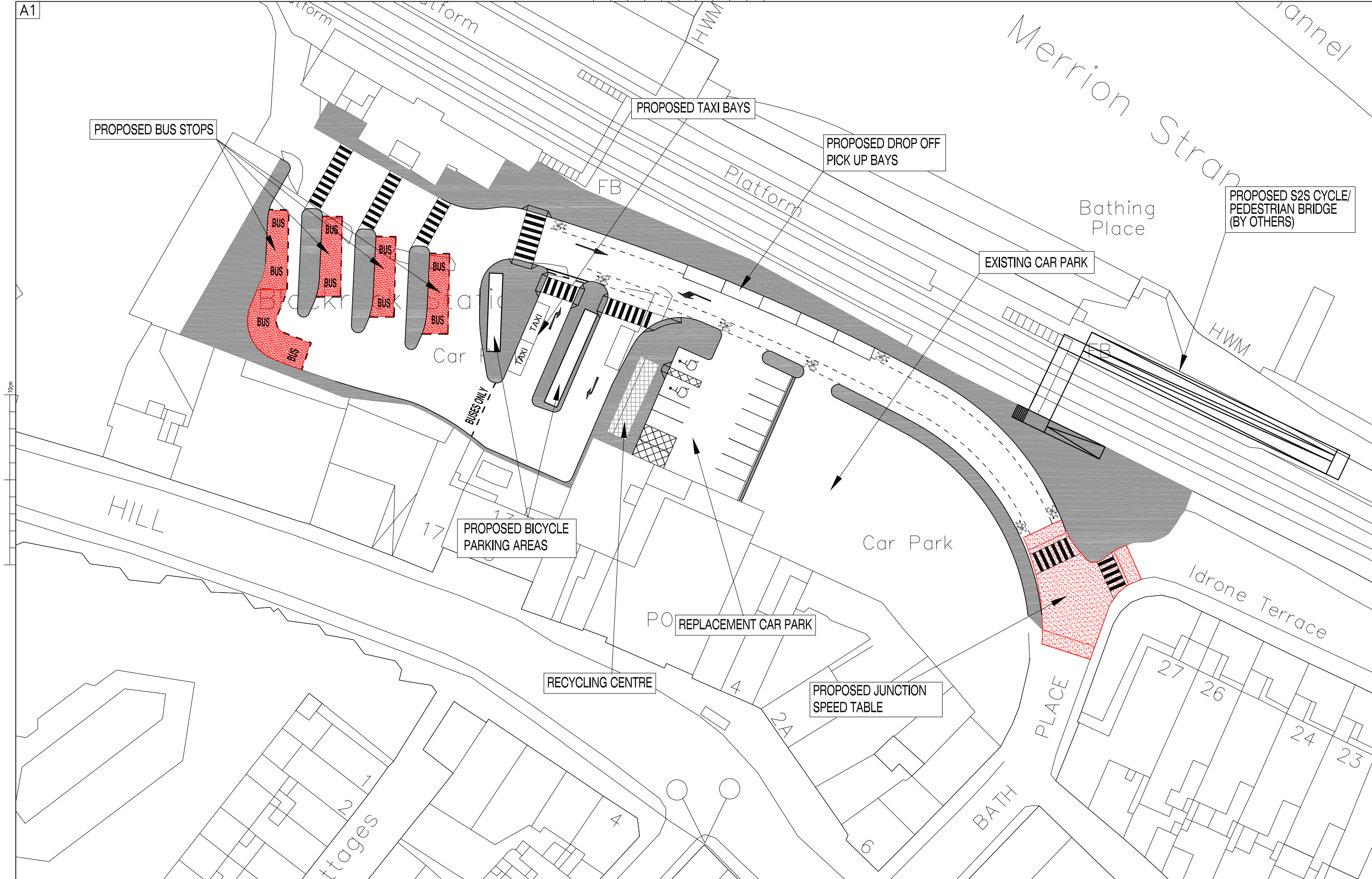
**ARUP**  
 Consulting Engineers

10 Wellington Road Dublin 4  
 Tel 01-6144200 Fax 01-6683169  
 EMail dublin@arup.com

DUBLIN CORK LIMERICK

Originator  
 Scales **1:100 @ A1**  
 Checked Approved Date **02.09.2005**

Job No. **D4659.20** Drawing No. **T0001/A2** Rev. **A**



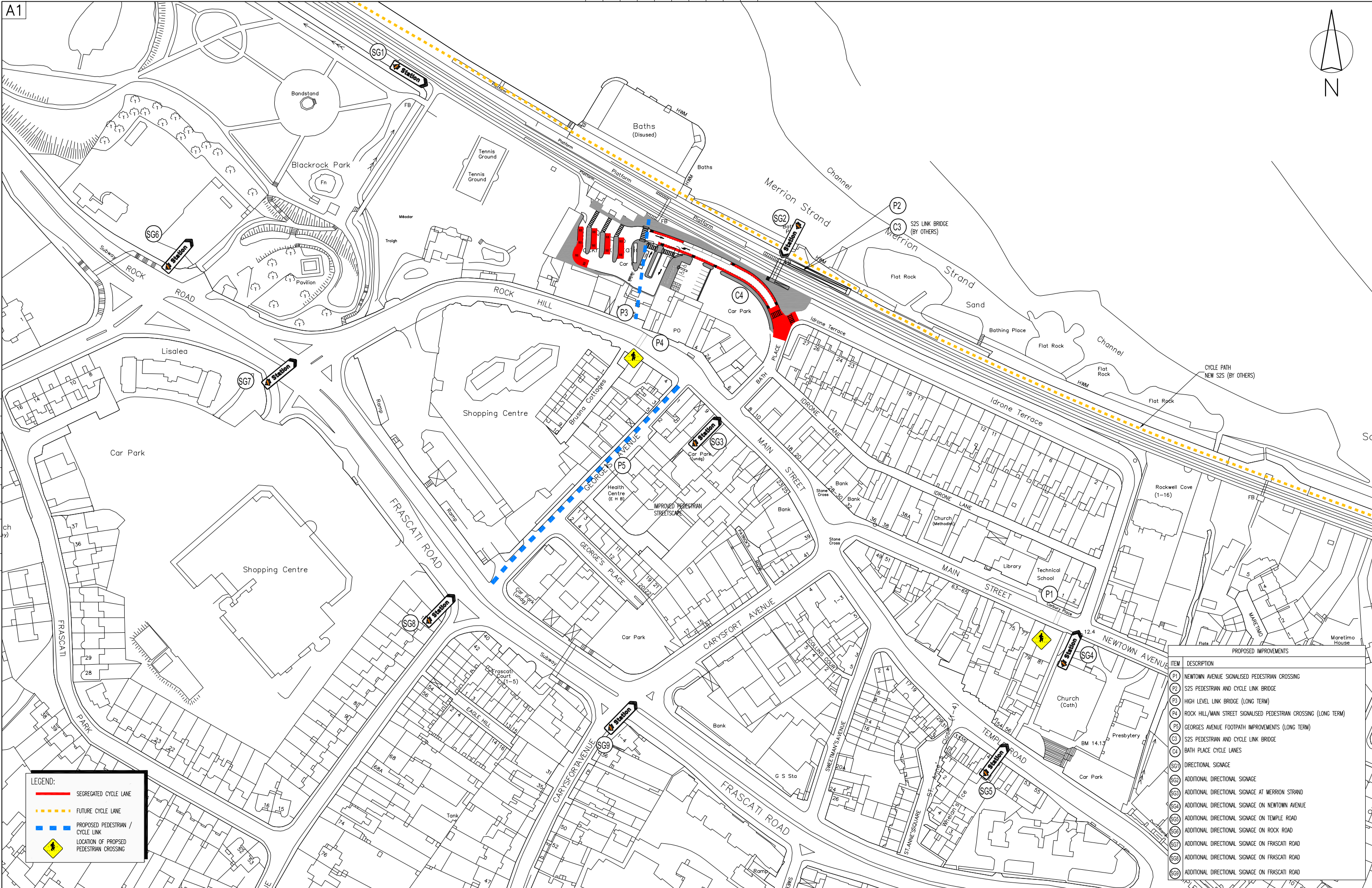
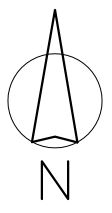
Rev.	Date	By	Description	Chd By

Job Title	PTI PRELIMINARY DESIGN BLACKROCK PTI
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Drawing Title	PROPOSED PTI AREA LAYOUT
Drawing Status	PRELIMINARY

<b>ARUP</b>	
10 Wellington Road Dublin 4 Tel 01-6144200 Fax 01-6683169 Email dublin@arup.com	
DUBLIN	CORK LIMERICK
Originator JE	
Checked	Approved
Date 23/01/06	
Job No. D4659.20	Drawing No. T0001-06
Rev. P1	





**LEGEND:**

- SEGREGATED CYCLE LANE
- - - FUTURE CYCLE LANE
- - - PROPOSED PEDESTRIAN / CYCLE LINK
- LOCATION OF PROPOSED PEDESTRIAN CROSSING

PROPOSED IMPROVEMENTS	
ITEM	DESCRIPTION
P1	NEWTOWN AVENUE SIGNALISED PEDESTRIAN CROSSING
P2	S2S PEDESTRIAN AND CYCLE LINK BRIDGE
P3	HIGH LEVEL LINK BRIDGE (LONG TERM)
P4	ROCK HILL/MAIN STREET SIGNALISED PEDESTRIAN CROSSING (LONG TERM)
P5	GEORGES AVENUE FOOTPATH IMPROVEMENTS (LONG TERM)
C3	S2S PEDESTRIAN AND CYCLE LINK BRIDGE
C4	BATH PLACE CYCLE LANES
SG1	DIRECTIONAL SIGNAGE
SG2	ADDITIONAL DIRECTIONAL SIGNAGE
SG3	ADDITIONAL DIRECTIONAL SIGNAGE AT MERRION STRAND
SG4	ADDITIONAL DIRECTIONAL SIGNAGE ON NEWTOWN AVENUE
SG5	ADDITIONAL DIRECTIONAL SIGNAGE ON TEMPLE ROAD
SG6	ADDITIONAL DIRECTIONAL SIGNAGE ON ROCK ROAD
SG7	ADDITIONAL DIRECTIONAL SIGNAGE ON FRASCATI ROAD
SG8	ADDITIONAL DIRECTIONAL SIGNAGE ON FRASCATI ROAD
SG9	ADDITIONAL DIRECTIONAL SIGNAGE ON FRASCATI ROAD

Rev.	Date	By	Description	Old By

Job Title  
**PTI PRELIMINARY DESIGN  
BLACKROCK PTI**

Drawing Title  
**LOCAL AREA ACCESS  
IMPROVEMENTS**

Drawing Status  
**PRELIMINARY**

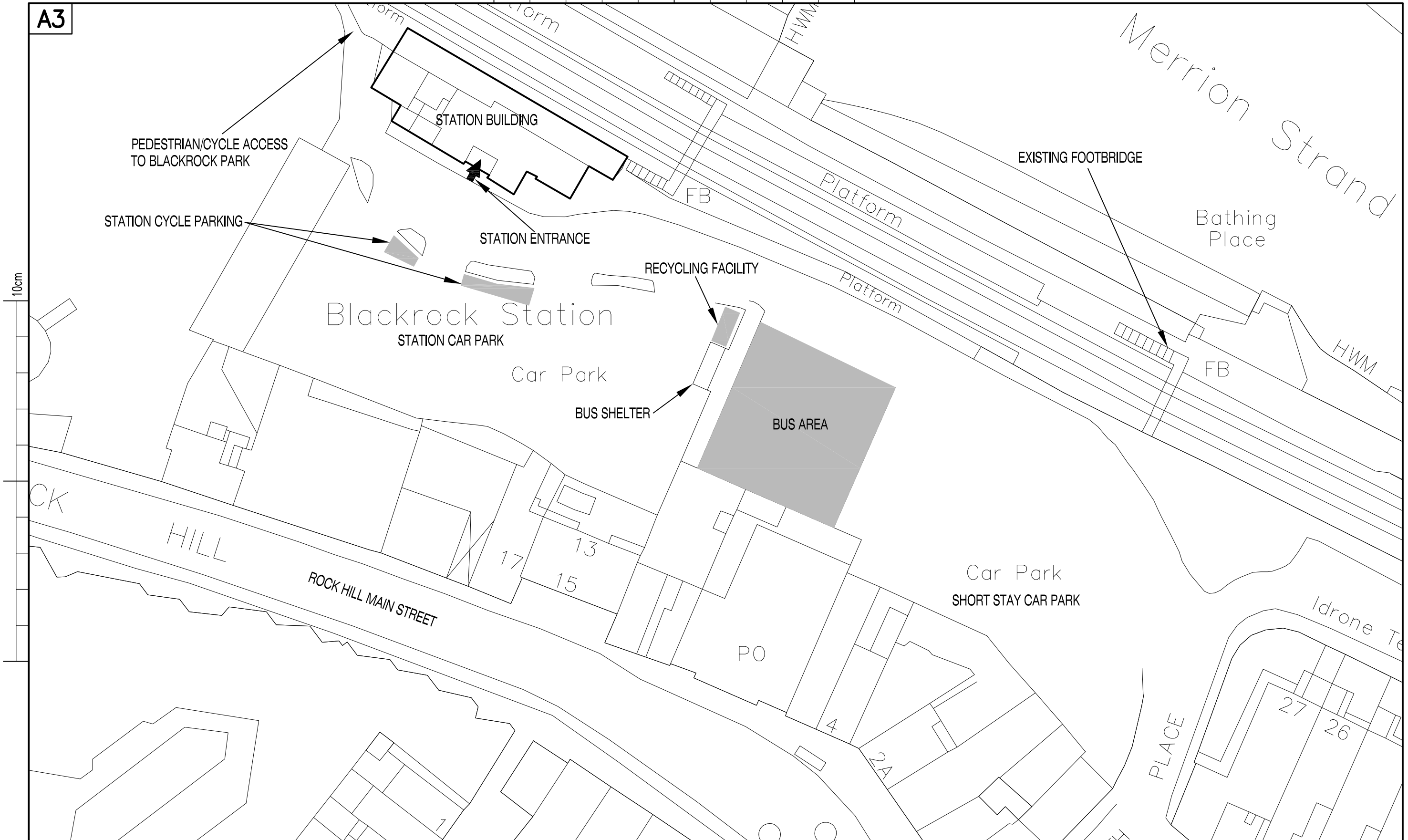
**ARUP**  
10 Wellington Road Dublin 4  
Tel 01-6144200 Fax 01-6683169  
Email dublin@arup.com

DUBLIN COBK LIMERICK  
Originator GMCT

Scales 1:1000 @ A1  
Checked Approved Date 23/01/06

Job No. **D4659.20** Drawing No. **T0001-07** Rev. **P1**

A3



Rev.	Date	By	Description	Chd By

Job Title  
**PTI PRELIMINARY DESIGN  
 BLACKROCK PTI**

Drawing Title  
**EXISTING PTI AREA LAYOUT**

Drawing Status  
**PRELIMINARY**

**ARUP**  
 10 Wellington Road Dublin 4  
 Tel 01-6144200 Fax 01-6683169  
 EMail dublin@arup.com  
 DUBLIN CORK LIMERICK

Scales 1:500 @ A3  
 Originator GMcT  
 Checked Approved Date 23/01/06

Job No. **D4659.20**  
 Drawing No. **T0001-08**  
 Rev. **P1**

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APPENDIX A

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**List of Stakeholders  
Representatives**

## **A1. LIST OF STAKEHOLDERS REPRESENTATIVE**

### **Dublin Transportation Office**

- Mr Ciaran McKeon
- Ms Marian Wilson

### **Dun Laoghaire Rathdown County Council**

- Ms Julienne Brown
- Ms Mary Henchy
- Mr Robert Hennessy

### **Dublin Bus**

- Mr Derry O'Leary

### **Iarnrod Éireann**

- Mr Cormac Downes

### **Coach Tourism and Transport Council**

- Mr Paul Morton
- Ms Cora Collins

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APPENDIX B

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**Survey Results**



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DTO

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**PTI Preliminary Design**

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Survey Report

Arup Consulting Engineers

DTO

**PTI Preliminary Design**

Survey Report

January 2006

This report takes into account the particular instructions and requirements of our client. It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

**Arup Consulting Engineers**  
10 Wellington Road, Dublin 4 Ireland  
Tel +353 1 614 4200 Fax +353 1 668 3169  
[www.arup.ie](http://www.arup.ie)

Job number D4659/20

Job title	PTI Preliminary Design	Job number	D4659/20
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Document title	Survey Report	File reference	
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Document ref

Revision	Date	Filename	Survey Report_Template.doc		
Draft 1	23/01/06	Description	First draft		
			Prepared by	Checked by	Approved by
		Name	Conor McGrath/Jose Izquierdo	John Lucas	Donal Mc Daid
		Signature			
Issue	23/01/06	Filename	Survey Report_D4659-20_Issue.doc		
		Description			
			Prepared by	Checked by	Approved by
		Name	Jose Izquierdo	John Lucas	Donal Mc Daid
		Signature			
		Filename			
		Description			
			Prepared by	Checked by	Approved by
		Name			
		Signature			
		Filename			
		Description			
			Prepared by	Checked by	Approved by
		Name			
		Signature			

Issue Document Verification with Document

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# 1. INTRODUCTION

## 1.1 Background

Dublin Transport Office, together with Irish Rail, Dun Laoghaire Rathdown County Council and Wicklow County Council is proposing to develop four high quality passenger interchanges at locations within the Greater Dublin Area. Arup Consulting Engineers were appointed by the DTO to provide transport planning input and generate preliminary designs for the proposed interchanges. In order to better understand the travel behaviour of the commuters, various forms of information was collected. The surveys carried out at the various PTIs were aimed at collecting data on all potential users of the PTI, which would include rail and bus passengers. This report details the data collection tasks.

The data collection tasks involve survey preparation, data collection and results presentation for the following surveys:

- Commuter interview survey – Interchange mode, origin/destination and supplementary information will be collected via a combination of face-to-face interviews and self completed questionnaires. Rail passenger would be surveyed and this information would be used to deduce bus passenger information.
- PTI passenger counts – The number of all bus and rail passengers at the immediate vicinity of the PTI would be counted to establish the existing passenger demand for the PTI.
- Parking survey – This survey would record the build up of PTI related parking during the three-hour morning and the exit pattern during the evening peak travel period. The data would be used to support the mode split and parking information extracted from the passenger interviews. Maximum bicycle parking accumulation will also be recorded in each PTI.

The locations of these surveys are displayed in Figures 1.1 and 1.2.

Additional passenger counts and taxi surveys may be necessary in Dun Laoghaire to assess the ferry PTI requirements. This requirement will be reviewed once ferry services have resumed.

This report explains the individual survey objectives and methodologies.

## 1.2 Scope

The data collection exercise is undertaken in anticipation of transport information needed to successfully design a high quality public transport interchange. This data is particular to this study and therefore should not be relied upon for any other transportation study where this project may be considered relevant.

## 1.3 Report Structure

Sections 2 to 4 present objective, methodology and a brief summary of the individual survey results.

## 2. PEDESTRIAN COUNT SURVEY

### 2.1 Objectives

This survey was carried out to determine the overall number of passengers using the PTI during the AM (07:00 – 10:00) and PM (16:00 – 19:00) peak travel periods. The survey results will be used to analyse the adequacy of PTI facilities and as expansion factors for the interview surveys.

### 2.2 Methodology

Passenger counts were undertaken at the PTIs, and where appropriate the general direction of travel was noted. Boarding and alighting passenger counts were conducted and tallied at 5-minute intervals at the station entrances and at the bus stops. The count locations per PTI are enumerated below and illustrated in Figures 1.1 and 1.2.

- Arklow and Wicklow (Tuesday 1 February 2005).
  - One in each station entrance
- Blackrock (Wednesday 2 February 2005):
  - Station Entrance – Directional counts in and out (to and from Blackrock park and to and from Rock Hill Main Street)
  - Scheduled Dublin Bus routes at the PTI (17, 46E, 114 and 115)
  - Executive Express Coach Stop
- Dun Laoghaire (Thursday 3 February 2005):
  - Station Entrance Crofton Road - Directional counts in and out (to and from Crofton Road and to and from Queen’s Road/Marine Road)
  - Station Entrance at Harbour Road
  - Crofton Road Bus Stands (46A/X, 75 and 746)
  - Marine Road Bus Stands (111, 59 and 45A)

### 2.3 Results

#### 2.3.1 Blackrock PTI

AM and PM peak passenger counts were carried out on Wednesday 2<sup>nd</sup> February 2005 at the Blackrock PTI. The counts comprise of rail, bus and coach passengers.

- Rail Passengers

The results for the rail passenger counts in the AM peak are included in the table below.

**Table 2.1. AM Peak Rail Passenger Counts at Blackrock PTI**

Period Ends	Alighting			Boarding		
	To Blackrock Park	To Main Street	Total Outbound	From Blackrock Park	From Main Street	Total Inbound
07:15	1	22	<b>23</b>	0	16	<b>16</b>
07:30	0	14	<b>14</b>	0	57	<b>57</b>
07:45	3	104	<b>107</b>	7	32	<b>39</b>
08:00	11	57	<b>68</b>	10	53	<b>63</b>
<b>Subtotal 7:00 - 8:00</b>	<b>15</b>	<b>197</b>	<b>212</b>	<b>17</b>	<b>158</b>	<b>175</b>
08:15	54	83	<b>137</b>	15	65	<b>80</b>
08:30	128	186	<b>314</b>	27	164	<b>191</b>
08:45	7	33	<b>40</b>	16	92	<b>108</b>
09:00	36	328	<b>364</b>	11	77	<b>88</b>
<b>Subtotal 8:00 - 9:00</b>	<b>225</b>	<b>630</b>	<b>855</b>	<b>69</b>	<b>398</b>	<b>467</b>
09:15	9	118	<b>127</b>	14	95	<b>109</b>
09:30	2	54	<b>56</b>	3	56	<b>59</b>
09:45	8	97	<b>105</b>	5	24	<b>29</b>
10:00	8	60	<b>68</b>	3	21	<b>24</b>
<b>Subtotal 9:00 - 10:00</b>	<b>27</b>	<b>329</b>	<b>356</b>	<b>25</b>	<b>196</b>	<b>221</b>
<b>Total 7:00 - 10:00</b>	<b>267</b>	<b>1156</b>	<b>1423</b>	<b>111</b>	<b>752</b>	<b>863</b>

The AM peak results above show a predominantly alighting pattern for rail passengers. The PTI is currently managing around 2300 rail passengers in the AM peak travel period (07:00 to 10:00), 62% of which alight at the DART station. The main pedestrian route to and from the PTI is via Bath Place and Rock Hill Main Street as it carries 87% and 81% of boarding and alighting passengers.

The results for the rail passenger counts in the PM peak are included in the table below.

**Table 2.2. AM Peak Rail Passenger Counts at Blackrock PTI**

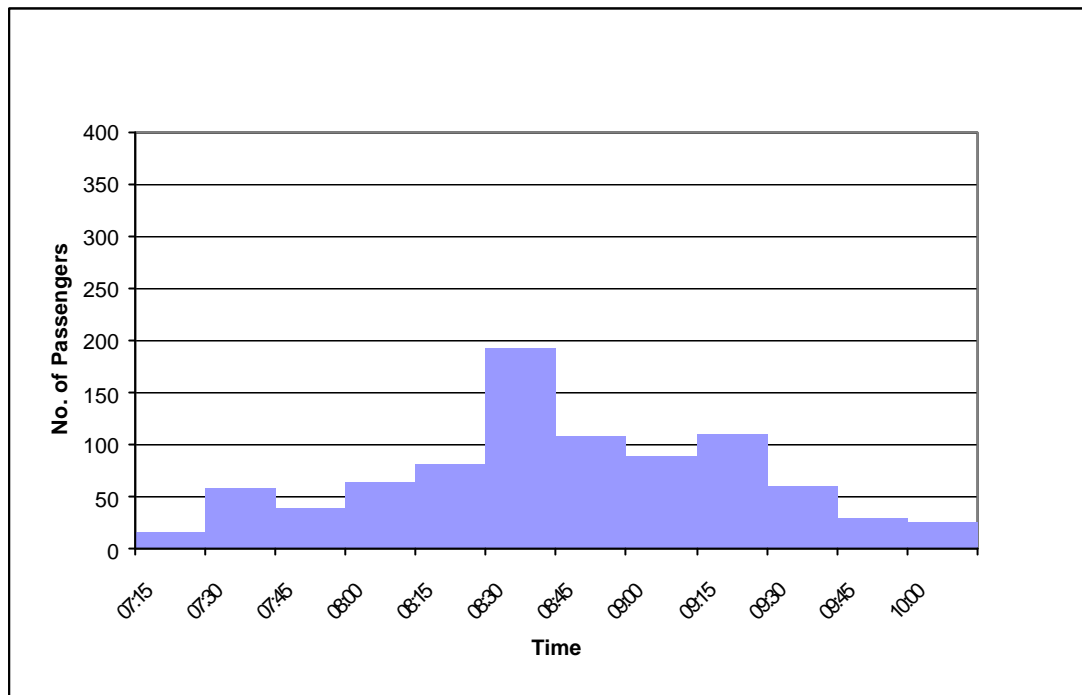
Period Ends	Alighting			Boarding		
	To Blackrock Park	To Main Street	Total Outbound	From Blackrock Park	From Main Street	Total Inbound
16:15	6	40	<b>46</b>	2	58	<b>60</b>
16:30	8	61	<b>69</b>	15	80	<b>95</b>
16:45	3	27	<b>30</b>	19	57	<b>76</b>
17:00	2	25	<b>27</b>	11	60	<b>71</b>
<b>Subtotal 16:00 - 17:00</b>	<b>19</b>	<b>153</b>	<b>172</b>	<b>47</b>	<b>255</b>	<b>302</b>
17:15	6	37	<b>43</b>	24	178	<b>202</b>
17:30	1	67	<b>68</b>	5	152	<b>157</b>
17:45	6	81	<b>87</b>	8	124	<b>132</b>
18:00	7	106	<b>113</b>	5	126	<b>131</b>
<b>Subtotal 17:00 - 18:00</b>	<b>20</b>	<b>291</b>	<b>311</b>	<b>42</b>	<b>580</b>	<b>622</b>
18:15	2	101	<b>103</b>	3	130	<b>133</b>
18:30	4	64	<b>68</b>	1	89	<b>90</b>
18:45	4	62	<b>66</b>	0	43	<b>43</b>
19:00	0	14	<b>14</b>	0	41	<b>41</b>
<b>Subtotal 18:00 - 19:00</b>	<b>10</b>	<b>241</b>	<b>251</b>	<b>4</b>	<b>303</b>	<b>307</b>
<b>Total 16:00 - 19:00</b>	<b>49</b>	<b>685</b>	<b>734</b>	<b>93</b>	<b>1138</b>	<b>1231</b>

The PM peak results above show a predominantly boarding pattern for rail passengers. The PTI is currently managing around 1950 rail passengers in the PM peak travel period (16:00 to 19:00), 63% of which board at the DART station. The main pedestrian route to and from the PTI is via Bath Place and Rock Hill Main Street as it carries 92% and 93% of boarding and alighting passengers.

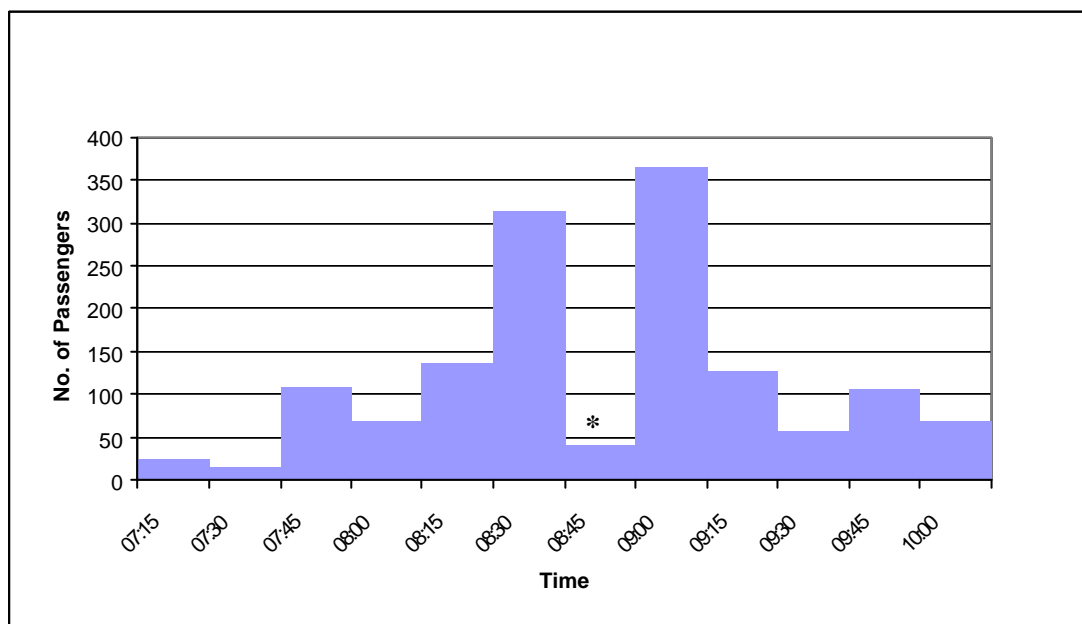
Included below are graphs showing the AM peak boarding and alighting profiles in passenger numbers per 5 minutes.



**Figure 2.1. AM Peak Boarding Profile at Blackrock PTI (Rail Passengers)**



**Figure 2.2. AM Peak Alighting Profile at Blackrock PTI (Rail Passengers)**

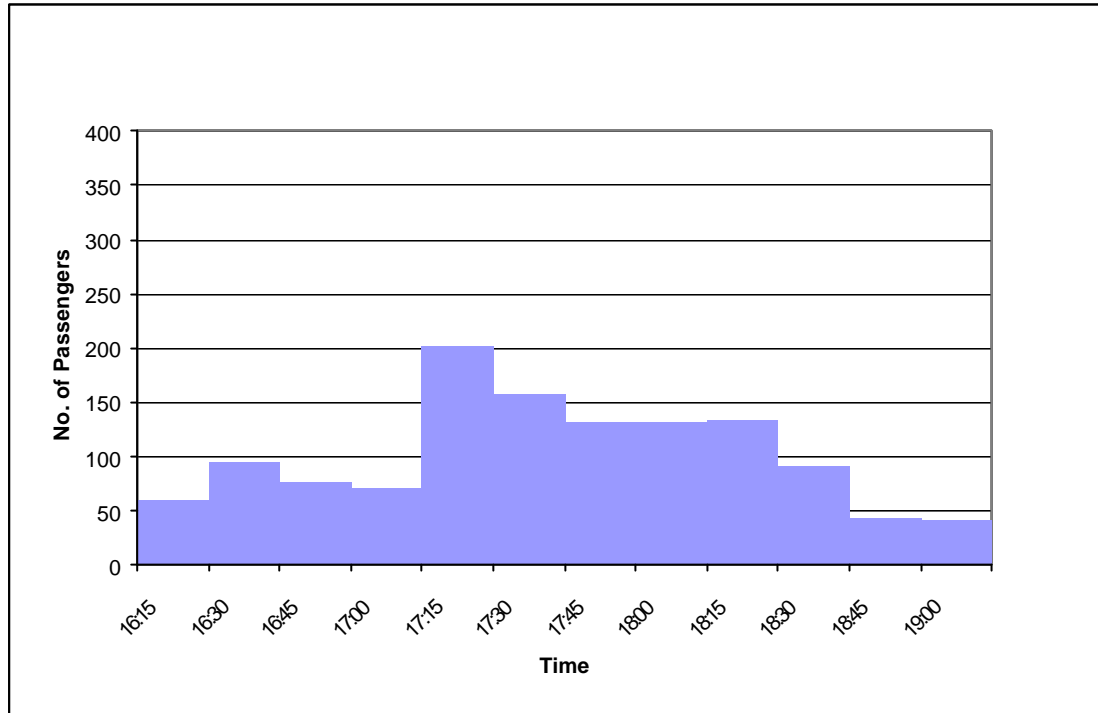


Note: \* Train delays experienced during 08:45 – 09:00

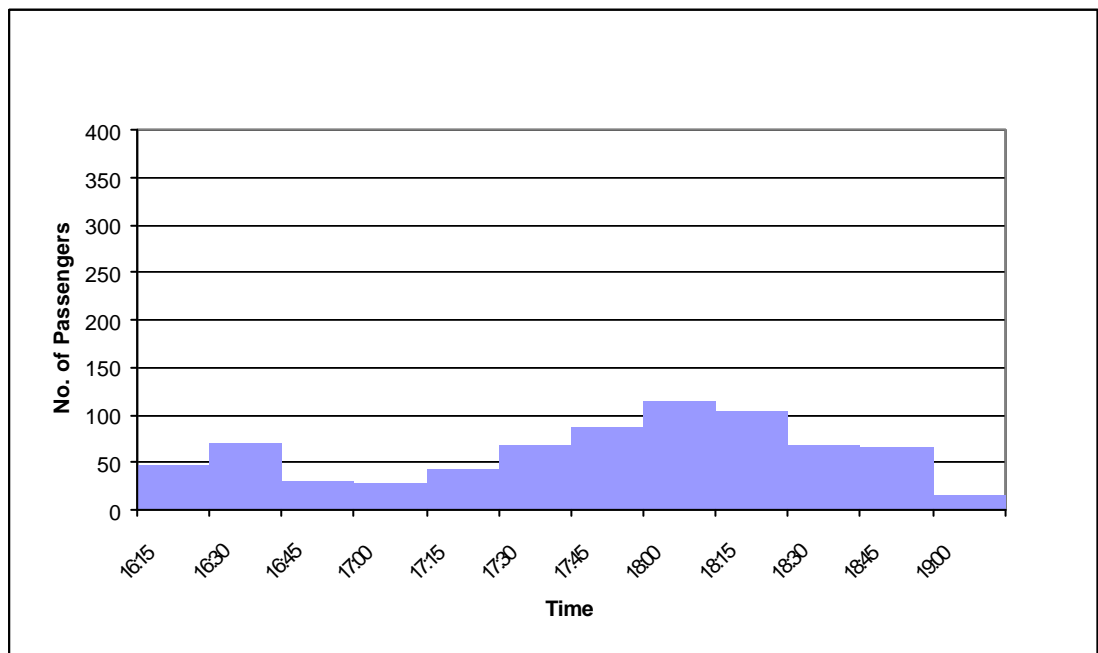
As it can be seen in the graphs above the highest AM boarding passenger volumes occur around 8:30. For alighting passengers the graph shows the highest volumes occurring between 8 and 9. Train delays noted during the surveys cause a significant fall in passengers around 8:45 but this would reflect average daily patterns.

Included below are graphs showing the PM peak boarding and alighting profiles in passenger numbers per 5 minutes.

**Figure 2.3. PM Peak Boarding Profile at Blackrock PTI (Rail Passengers)**



**Figure 2.4. PM Peak Alighting Profile at Blackrock PTI (Rail Passengers)**



As it can be seen in the graphs above the highest PM boarding passenger volumes occur between 17:00 and 17:30. The volumes of alighting passengers reach their peak after 18:00.

- Bus and Coach Passengers

Bus and coach passenger volumes were counted for the AM and PM peak travel periods at the PTI. The counts involved four Dublin Bus routes (17, 114, 115 and 46E) and two Executive Coach shuttle services (Central Park and Microsoft).

The results of the bus passenger surveys for the AM peak travel period are shown in the tables below, sorted by time period and route respectively.

**Table 2.3: AM Peak Bus Passenger Counts at Blackrock PTI**

Dublin Bus AM Peak	Alighting Passengers	Boarding Passengers
7:00 - 8:00	9 (5%)	103 (49%)
8:00 - 9:00	28 (6%)	68 (8%)
9:00 - 10:00	24 (11%)	36 (10%)
<b>TOTAL 7:00 - 10:00</b>	<b>61 (7%)</b>	<b>207 (14%)</b>

The Dublin bus services at the Blackrock PTI were boarded and alighted by 139 and 61 passengers respectively. Very few non-rail related passengers were noted alighting or boarding the buses during the surveys.

**Table 2.4: AM Peak Bus Route Choice at Blackrock PTI**

Route No.	17		114		115		46E		Coach	
	Alighting	Boarding	Alighting	Boarding	Alighting	Boarding	Alighting	Boarding	Alighting	Boarding
7:00 - 8:00	0	7	9	47	0	0	0	3	0	46
8:00 - 9:00	4	11	24	40	0	1	0	3	0	13
9:00 - 10:00	3	4	21	23	0	0	0	0	0	9
<b>TOTAL 7:00 - 10:00</b>	<b>7</b>	<b>22</b>	<b>54</b>	<b>110</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>6</b>	<b>0</b>	<b>68</b>

Regarding route choice, 79% and 16% of bus passengers board the No. 114 and 17 routes respectively. The remaining 5% boarding passengers take the 115 or the 46E, both of which provide a single AM peak service. 88% of alighting passengers use the 114 to arrive at the PTI with the remaining 12% alighting from the 17.

Route 17 provides the most frequent service with 10 buses observed between 07:00 and 10:00. Rote 114 has a slightly lower frequency with 8 buses observed within the same time period.

The results of the bus passenger surveys for the PM peak travel period are shown in the tables below, sorted by time period and route respectively.

**Table 2.5: PM Peak Bus Passenger Counts at Blackrock PTI**

Dublin Bus PM Peak	Alighting Passengers	Boarding Passengers
16:00 - 17:00	40 (13%)	45 (26%)
17:00 - 18:00	63 (10%)	54 (17%)
18:00 - 19:00	37 (12%)	25 (10%)
<b>TOTAL 16:00 - 19:00</b>	<b>140 (11%)</b>	<b>124 (17%)</b>

In the PM peak travel period Dublin bus services at the PTI were boarded and alighted by 124 and 64 passengers respectively. As for the AM peak counts, very few non-rail related passengers were observed alighting or boarding the buses at the PTI.

**Table 2.6: PM Peak Bus Route Choice at Blackrock PTI**

Route No.	17		114		115		46E		Coach	
	Alighting	Boarding	Alighting	Boarding	Alighting	Boarding	Alighting	Boarding	Alighting	Boarding
TOTAL 16:00 - 17:00	2	6	30	39	0	0	0	0	8	0
TOTAL 17:00 - 18:00	6	17	17	25	0	12	0	0	40	0
TOTAL 18:00 - 19:00	1	13	8	12	0	0	0	0	28	0
<b>TOTAL 16:00 - 19:00</b>	<b>9</b>	<b>36</b>	<b>55</b>	<b>76</b>	<b>0</b>	<b>12</b>	<b>0</b>	<b>0</b>	<b>76</b>	<b>0</b>

Regarding route choice, 61% and 29% of bus passengers board the No. 114 and 17 routes respectively. The remaining 10% boarding passengers take the 115, which provides a single PM peak service. 85% of alighting passengers use the 114 to arrive at the PTI with the remaining 15% alighting from the 17.

Route 17 provides the most frequent service with 8 buses observed between 16:00 and 19:00. Rote 114 has a slightly lower frequency with 7 buses observed within the same time period.

**2.3.2 Dun Laoghaire**

AM and PM peak passenger counts were carried out on Thursday 3<sup>rd</sup> February 2005 at the Dun Laoghaire PTI. The counts comprise of rail and bus passengers.

- Rail Passengers

The results for the rail passenger counts in the AM peak are included in the table below.

**Table 2.7. AM Peak Rail Passenger Counts at Dun Laoghaire PTI**

Period Ends	Alighting				Boarding			
	To Crofton Road	To Queens/Marine Road	To Harbour Road	Total Outbound	From Crofton Road	From Queens/Marine Road	From Harbour Road	Total Inbound
07:15	0	3	0	3	6	13	0	19
07:30	9	14	1	24	11	40	1	52
07:45	5	32	2	39	25	19	5	49
08:00	10	51	0	61	14	42	3	59
<b>Subtotal 7:00 - 8:00</b>	<b>24</b>	<b>100</b>	<b>3</b>	<b>127</b>	<b>56</b>	<b>114</b>	<b>9</b>	<b>179</b>
08:15	28	73	1	102	27	87	4	118
08:30	25	126	2	153	19	67	6	92
08:45	35	211	6	252	29	74	6	109
09:00	31	166	2	199	11	40	6	57
<b>Subtotal 8:00 - 9:00</b>	<b>119</b>	<b>576</b>	<b>11</b>	<b>706</b>	<b>86</b>	<b>268</b>	<b>22</b>	<b>376</b>
09:15	45	169	4	218	13	63	6	82
09:30	23	102	1	126	11	29	1	41
09:45	8	29	2	39	7	23	1	31
10:00	24	105	0	129	6	20	4	30
<b>Subtotal 9:00 - 10:00</b>	<b>100</b>	<b>405</b>	<b>7</b>	<b>512</b>	<b>37</b>	<b>135</b>	<b>12</b>	<b>184</b>
<b>Subtotal 7:00 - 10:00</b>	<b>243</b>	<b>1081</b>	<b>21</b>	<b>1345</b>	<b>179</b>	<b>517</b>	<b>43</b>	<b>739</b>

The AM peak results above show a predominantly alighting pattern for rail passengers. The PTI is currently managing around 2100 rail passengers in the AM peak travel period (07:00 to 10:00), 65% of which alight at the DART station. The main pedestrian route to and from the DART Station PTI is via Marine Road/Queen’s Road as it carries 70% and 80% of boarding and alighting rail passengers. Crofton Road takes approximately 24% and 18% of boarding and alighting rail passengers with the remaining passengers using the station entrance at Harbour Road.

The results for the rail passenger counts in the PM peak are included in the table below.

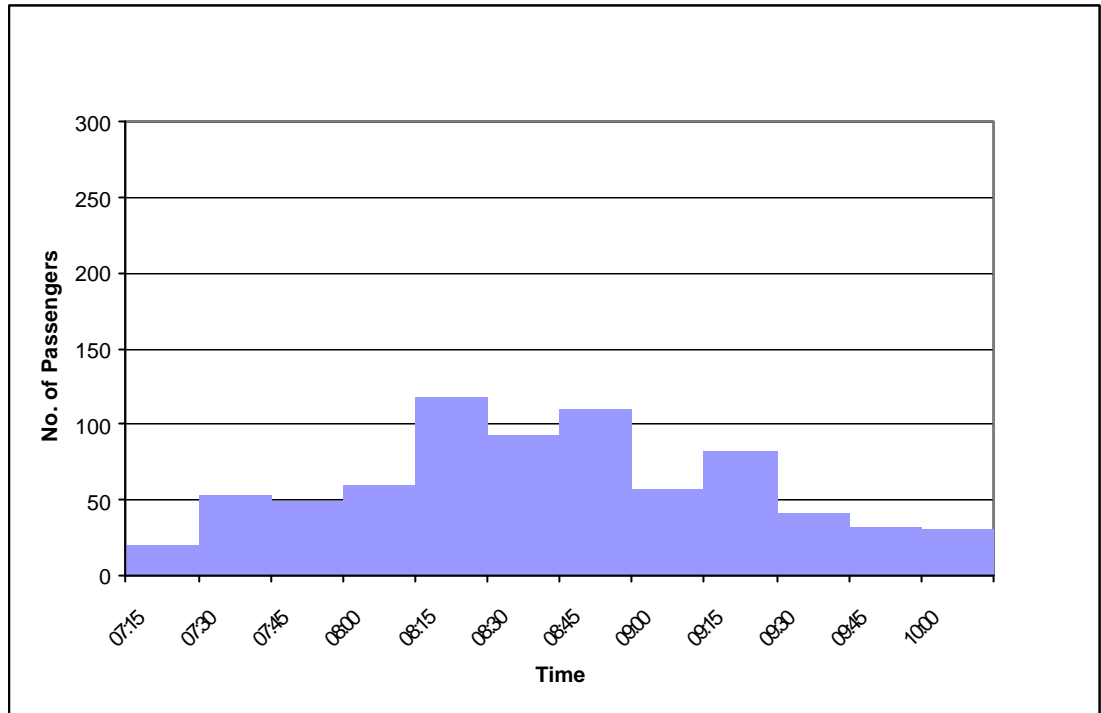
**Table 2.8. PM Peak Rail Passenger Counts at Dun Laoghaire PTI**

Period Ends	Alighting				Boarding			
	To Crofton Road	To Queens/Marine Road	To Harbour Road	Total Outbound	From Crofton Road	From Queens/Marine Road	From Harbour Road	Total Inbound
16:15	3	19	3	<b>25</b>	30	96	2	<b>128</b>
16:30	12	78	0	<b>90</b>	17	91	0	<b>108</b>
16:45	4	32	10	<b>46</b>	37	64	1	<b>102</b>
17:00	14	79	3	<b>96</b>	17	127	13	<b>157</b>
Subtotal 16:00 - 17:00	<b>33</b>	<b>208</b>	<b>16</b>	<b>257</b>	<b>101</b>	<b>378</b>	<b>16</b>	<b>495</b>
17:15	2	18	7	<b>27</b>	50	136	5	<b>191</b>
17:30	7	119	1	<b>127</b>	29	87	2	<b>118</b>
17:45	12	101	1	<b>114</b>	65	172	1	<b>238</b>
18:00	6	44	0	<b>50</b>	23	93	0	<b>116</b>
Subtotal 17:00 - 18:00	<b>27</b>	<b>282</b>	<b>9</b>	<b>318</b>	<b>167</b>	<b>488</b>	<b>8</b>	<b>663</b>
18:15	13	167	2	<b>182</b>	12	96	0	<b>108</b>
18:30	2	127	0	<b>129</b>	4	25	0	<b>29</b>
18:45	1	85	0	<b>86</b>	7	62	0	<b>69</b>
19:00	0	61	0	<b>61</b>	2	14	0	<b>16</b>
Subtotal 18:00 - 19:00	<b>16</b>	<b>440</b>	<b>2</b>	<b>458</b>	<b>25</b>	<b>197</b>	<b>0</b>	<b>222</b>
<b>Total 16:00 - 19:00</b>	<b>76</b>	<b>930</b>	<b>27</b>	<b>1033</b>	<b>293</b>	<b>1063</b>	<b>24</b>	<b>1380</b>

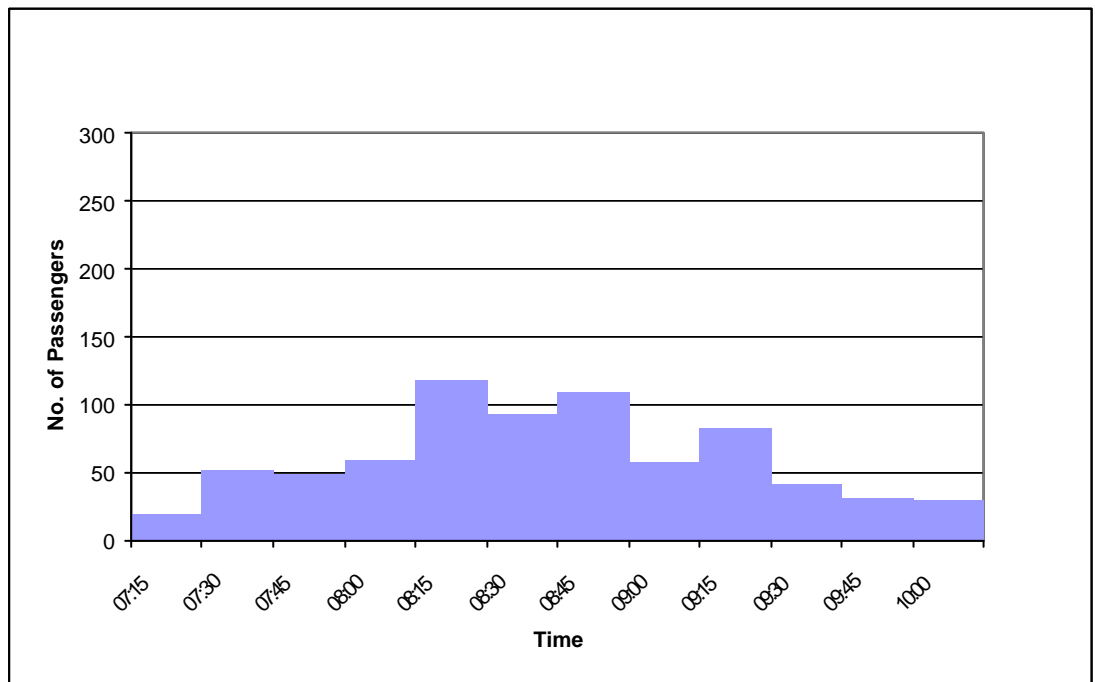
The PM peak results above show a predominantly boarding pattern for rail passengers. The PTI is currently managing around 2400 rail passengers in the PM peak travel period (16:00 to 19:00), 57% of which board at the station. As for the AM peak, the main pedestrian route to and from the rail station is via Marine Road/Queen’s Road as it carries 77% and 90% of boarding and alighting rail passengers. Crofton Road takes approximately 21% and 7% of boarding and alighting rail passengers with the remaining passengers using the station entrance at Harbour Road.

Included below are graphs showing the AM peak boarding and alighting profiles in passenger numbers per 5 minutes.

**Figure 2.5. AM Peak Boarding Profile at Dun Laoghaire PTI (Rail Passengers)**



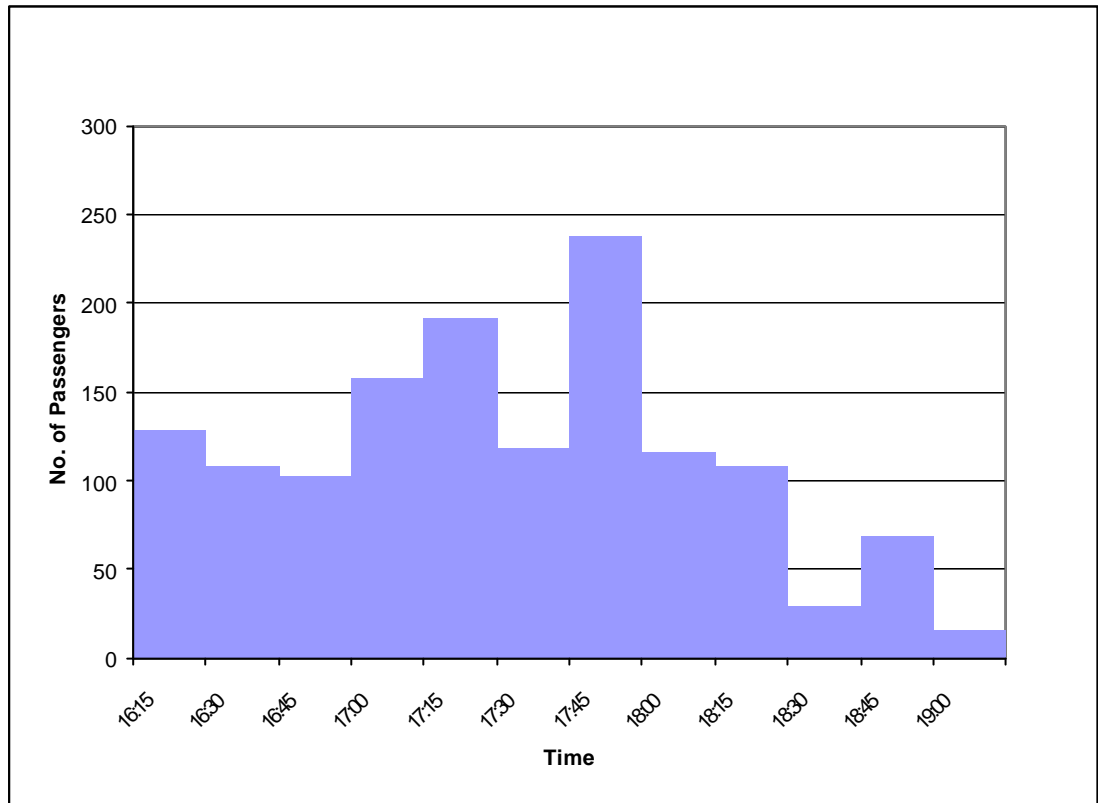
**Figure 2.6. AM Peak Alighting Profile at Dun Laoghaire PTI (Rail Passengers)**



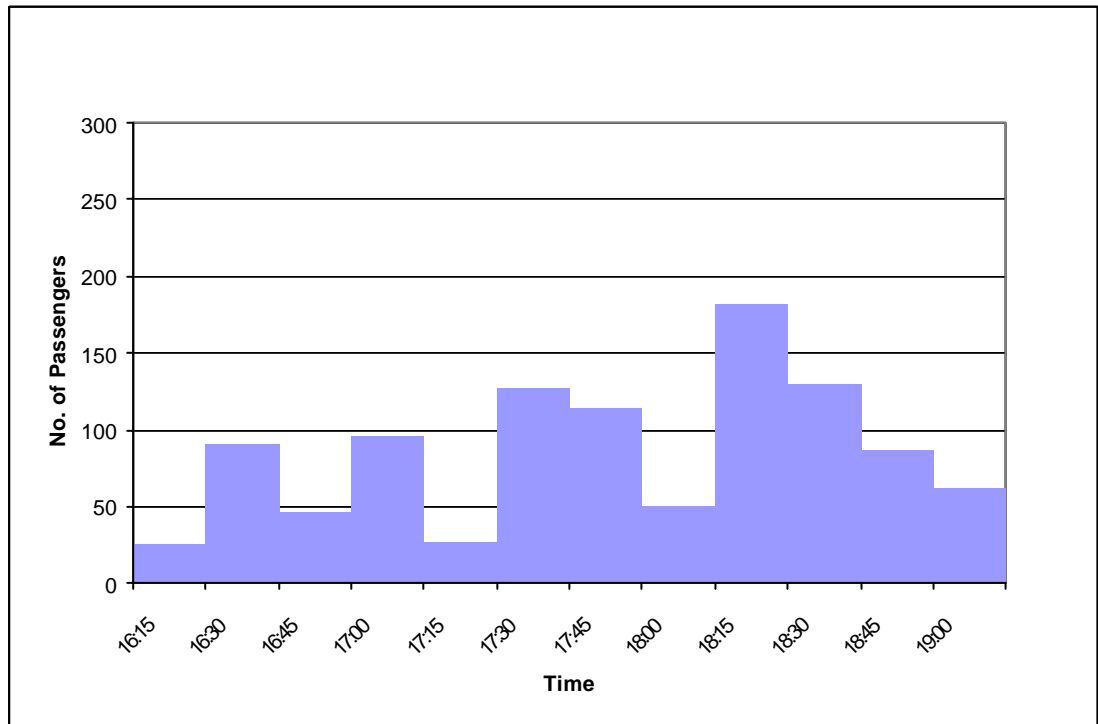
As it can be seen in the graphs above the highest AM boarding and alighting rail passenger volumes occur between 08:00 and 09:00.

Included below are graphs showing the PM peak boarding and alighting profiles in passenger numbers per 5 minutes.

**Figure 2.7. PM Peak Boarding Profile at Dun Laoghaire PTI (Rail Passengers)**



**Figure 2.8. PM Peak Alighting Profile at Dun Laoghaire PTI (Rail Passengers)**





As it can be seen in the graphs above the highest PM boarding rail passenger volumes occur between 17:00 and 18:00. The volumes of alighting passengers increase significantly after 17:30, reaching their maximum by 18:15.

- Bus Passengers

Dublin Bus passenger volumes were counted for the AM and PM peak travel periods at the PTI. Six Dublin Bus routes were surveyed, three of which terminate at the Marine Road stands (45A, 59 and 111) and the remaining three (46A, 75 and 746) stopping along Crofton Road by the station’s entrance.

The results of the bus passenger surveys for the AM peak travel period are shown in the tables below, sorted by time period and route respectively. Station (rail) and non-station related passengers are tallied separately

**Table 2.9: AM Peak Bus Passenger Counts at Crofton Road Stands, Dun Laoghaire PTI**

AM Peak	Alighting Passengers			Boarding Passengers		
	Station	Non Station	Total	Station	Non Station	Total
7:00 - 8:00	17	8	25	25	9	34
8:00 - 9:00	42	24	66	72	30	102
9:00 - 10:00	26	46	72	30	33	63
<b>TOTAL 7:00 - 10:00</b>	<b>85</b>	<b>78</b>	<b>163</b>	<b>127</b>	<b>72</b>	<b>199</b>

The Dublin bus services at the Crofton Road stands of the Dun Laoghaire PTI were boarded and alighted by 199 and 163 passengers respectively. A significant percentage of these (41%) were not rail-related passengers.

**Table 2.10: AM Peak Bus Passenger Counts at Marine Road Stands, Dun Laoghaire PTI**

AM Peak	Alighting Passengers			Boarding Passengers		
	Station	Non Station	Total	Station	Non Station	Total
7:00 - 8:00	22	0	22	1	0	1
8:00 - 9:00	35	0	35	9	2	11
9:00 - 10:00	10	3	13	8	0	8
<b>TOTAL 7:00 - 10:00</b>	<b>67</b>	<b>3</b>	<b>70</b>	<b>18</b>	<b>2</b>	<b>20</b>

The Dublin bus services at the Crofton Road stands of the Dun Laoghaire PTI were boarded and alighted by 20 and 70 passengers respectively. Unlike for the Crofton Road bus stands, the results reflect a vast majority of bus passengers transferring to and from the trains.

**Table 2.11: AM Peak Bus Route Choice at Crofton Road stands, Dun Laoghaire PTI**

Route No.	46A		75		746	
	Alighting	Boarding	Alighting	Boarding	Alighting	Boarding
7:00 - 8:00	10	12	15	19	0	3
8:00 - 9:00	66	94	0	3	0	5
9:00 - 10:00	51	48	21	12	0	3
<b>TOTAL 7:00 - 10:00</b>	<b>127</b>	<b>154</b>	<b>36</b>	<b>34</b>	<b>0</b>	<b>11</b>

In terms of route choice, 77% and 17% of bus passengers board the No. 46A and 75 routes respectively. The remaining 6% boarding passengers take the 746, which is a less frequent service linking the PTI to the airport. 78% of alighting passengers use route No. 46A to arrive at the PTI with the remaining 22% alighting from route No. 75.

Route 46A provides the most frequent service with 23 buses observed between 07:00 and 10:00. Routes 75 and 746 have lower frequencies with 6 and 3 buses observed within the same time period.

**Table 2.12: AM Peak Bus Route Choice at Marine Road stands, Dun Laoghaire PTI**

Route No.	45A		111		59	
	Alighting	Boarding	Alighting	Boarding	Alighting	Boarding
7:00 - 8:00	11	0	7	1	4	0
8:00 - 9:00	8	0	26	8	1	3
9:00 - 10:00	2	1	10	3	1	4
<b>TOTAL 7:00 - 10:00</b>	<b>21</b>	<b>1</b>	<b>43</b>	<b>12</b>	<b>6</b>	<b>7</b>

Route 111 takes 61% and 60% of boarding and alighting passengers with routes 45A and 59 carrying the remaining passengers. Route 111 is the most frequent service between 07:00 and 10:00, with 13 services observed. It is followed by route 45A (9 services) and route 59 (6 services).

The results of the bus passenger surveys for the PM peak travel period are shown in the tables below, sorted by time period and route respectively.

**Table 2.13: PM Peak Bus Passenger Counts at Crofton Road stands, Dun Laoghaire PTI**

Dublin Bus AM Peak	Alighting Passengers			Boarding Passengers		
	Station	Non Station	Total	Station	Non Station	Total
16:00 - 17:00	40	37	77	41	13	54
17:00 - 18:00	24	16	40	20	23	43
18:00 - 19:00	26	14	40	28	14	42
<b>TOTAL 16:00 - 19:00</b>	<b>90</b>	<b>67</b>	<b>157</b>	<b>89</b>	<b>50</b>	<b>139</b>

The Dublin Bus services at the Crofton Road stands of the Dun Laoghaire PTI were boarded and alighted by 139 and 157 passengers respectively. A significant percentage of these (40%) were not rail-related passengers.

**Table 2.14: PM Peak Bus Passenger Counts at Marine Road stands, Dun Laoghaire PTI**

Dublin Bus AM Peak	Alighting Passengers			Boarding Passengers		
	Station	Non Station	Total	Station	Non Station	Total
16:00 - 17:00	2	0	2	25	20	45
17:00 - 18:00	3	3	6	26	35	61
18:00 - 19:00	2	0	2	42	26	68
<b>TOTAL 16:00 - 19:00</b>	<b>7</b>	<b>3</b>	<b>10</b>	<b>93</b>	<b>81</b>	<b>174</b>

The Dublin Bus services at the Marine Road stands of the Dun Laoghaire PTI were boarded and alighted by 174 and 10 passengers respectively. A significant percentage of these (45%) were not rail-related passengers.

**Table 2.15: PM Peak Bus Route Choice at Crofton Road stands, Dun Laoghaire PTI**

Route No.	46A		75		746	
	Alighting	Boarding	Alighting	Boarding	Alighting	Boarding
16:00 - 17:00	53	42	24	10	0	1
17:00 - 18:00	26	30	7	13	7	0
18:00 - 19:00	26	42	14	0	0	0
<b>TOTAL 16:00 - 19:00</b>	<b>105</b>	<b>114</b>	<b>45</b>	<b>23</b>	<b>7</b>	<b>1</b>

Regarding route choice in the PM peak, 82 and 17% of bus passengers board the No. 46A and 75 routes respectively. 67% of alighting passengers use route No. 46A to arrive at the PTI followed by 29% alighting from route No.

As in the morning peak period route 46A provides the most frequent service with 24 buses observed between 07:00 and 10:00. Route 75 has a lower frequency with 5 buses observed within the same time period.

**Table 2.16: PM Peak Bus Route Choice at Marine Road stands, Dun Laoghaire PTI**

Route No.	45A		111		59	
	Alighting	Boarding	Alighting	Boarding	Alighting	Boarding
16:00 - 17:00	0	14	2	16	0	15
17:00 - 18:00	3	28	3	25	0	8
18:00 - 19:00	0	43	2	9	0	16
<b>TOTAL 16:00 - 19:00</b>	<b>3</b>	<b>85</b>	<b>7</b>	<b>50</b>	<b>0</b>	<b>39</b>

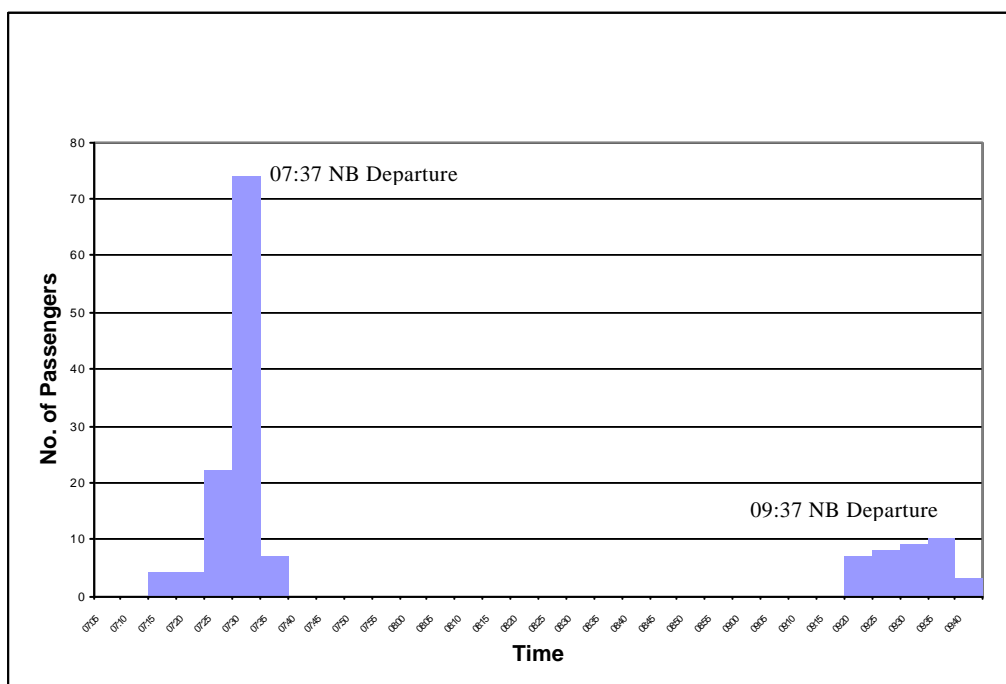
Route 45A takes 49% of boarding passengers followed by route 111 with 29% and route 59 carrying the 22% remaining passengers. The number of alighting passengers is not significant, with a total of 10 for the three routes. Route 111 is the most frequent service between 07:00 and 10:00, with 11 services observed. It is followed by route 45A (10 services) and route 59 (6 services).

**2.3.3 Wicklow PTI**

AM peak passenger counts were carried out on Tuesday 1<sup>st</sup> February 2005 at the Wicklow PTI for the northbound 07:34 and 09:37 trains. The counts resulted in 111 and 37 boarding passengers for two morning peak period trains. In the PM peak 92 alighting passengers were counted on Arup’s request by station staff for the southbound 18:34 train (which departs at 17:25 from Connolly Station).

The AM boarding passenger profile below shows the number of passengers per 5 minutes. Most of passengers arrive within 15 minutes of the scheduled departure time.

**Figure 2.9. AM Peak Boarding Profile at Wicklow PTI (Rail Passengers)**



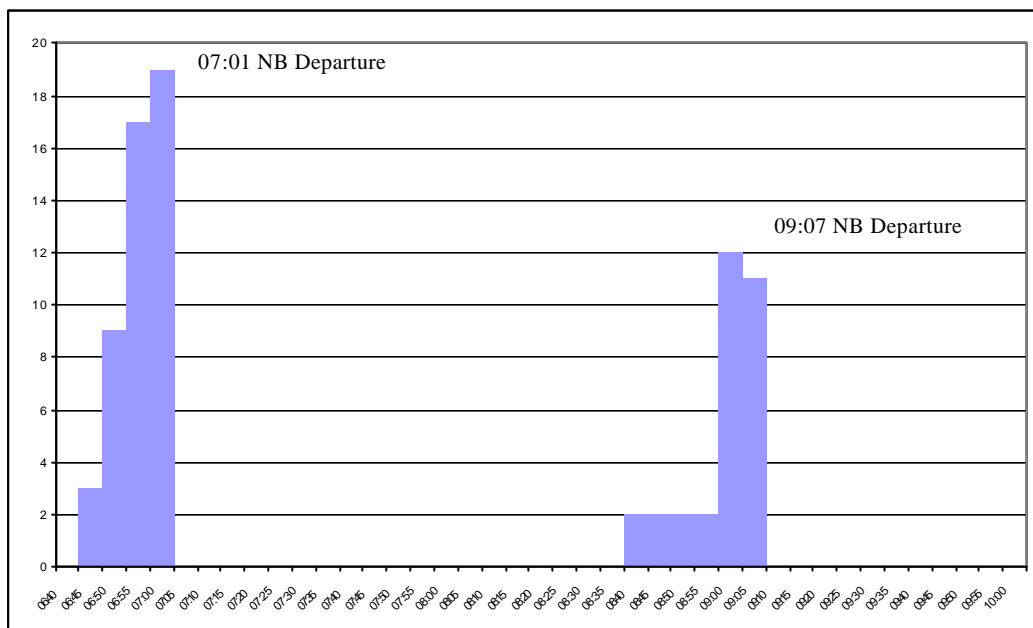
There were very few alighting passengers during the morning peak. The southbound 08:38 service had 8 alighting passengers.

**2.3.4 Arklow PTI**

AM peak passenger counts were carried out on Tuesday 1<sup>st</sup> February 2005 at the Arklow PTI for the northbound 07:01 and 09:07 trains. The counts resulted in 48 and 31 boarding passengers with almost no alighting passengers in the AM peak. In the PM peak 110 passengers were counted on Arup’s request by station staff alighting from the 19:04 train (which departs at 17:25 from Connolly Station).

The AM boarding passenger profile below shows the number of passengers per 5-minutes. Most of passengers arrive within 15 minutes of the scheduled train departure time.

**Figure 2.10. AM Peak Boarding Profile at Arklow PTI (Rail Passengers)**



There were very few alighting passengers during the morning peak. The southbound 09:07 service had three alighting passengers.

### 3. PASSENGER INTERVIEW SURVEY

#### 3.1 Objectives

The purpose of the passenger interview survey was to understand the travel behaviour of the potential PTI users. This survey gathered travel characteristics through face-to-face and self-completed questionnaires distributed among rail commuters.

Specifically the objectives of the survey were to identify:

- Mode of transport to/from PTI
- Trip origin/destination
- Type of ticket used
- Frequency of use

Only rail commuters were surveyed, as they are the main population group using the PTI. Mode and origin information for buses, which attract non-rail passengers was derived from the rail survey and passenger counts.

#### 3.2 Methodology

Surveys were carried out in each of the 4 PTIs: Dun Laoghaire, Blackrock, Wicklow and Arklow. The methodologies vary slightly from PTI to PTI and were based on PTI visits and available ridership information.

##### *Dun Laoghaire and Blackrock:*

**Boarding Passengers:** Three surveyors were assigned to boarding passengers in each rail station. Surveyors employed a combination of interviewing waiting passengers and if passenger was willing, handed over questionnaires in clipboards with pencils.

**Alighting Passengers:** Passengers were approached outside the station area. Four surveyors were assigned to each rail station. Surveyors administered half-minute face-to-face interviews to rail passengers. Interviews were conducted on the 2<sup>nd</sup> (Wednesday) and 3<sup>rd</sup> (Thursday) February 2005 for 3-hour periods during the AM and PM peaks (07:00 – 10:00 and 16:00 – 19:00).

##### *Wicklow Town and Arklow:*

**Boarding Passengers:** Questionnaires were distributed to the passengers at the platform or the waiting area. Two surveyors were assigned in Arklow station and three in Wicklow. Surveyors employed a combination of interviewing waiting passengers and if passenger was willing, handed over questionnaires in clipboards with pencils. Completed forms were collected on-site by the surveyor. To increase the response rate, one surveyor boarded the train and continued to conduct the survey among passengers not approached in the platform. All morning trains were surveyed in this manner.

**Alighting Passengers:** This survey was conducted on-board trains. Three surveyors boarded the southbound train in Greystones. Passengers alighting in Wicklow and Arklow were selected and interviewed. All arriving passengers were approached during the trip but some refused to complete a questionnaire. Surveyors employed a combination of interviewing waiting passengers and if passenger was willing, handed over questionnaires in clipboards with pencils.

Interviews were conducted on Tuesday 1<sup>st</sup> February 2005 for 3-hour periods during the AM peak (07:00 – 10:00). Evening peak return trip information was collected during the morning journey

All survey questionnaires are presented in Appendix A.

### 3.3 Results

#### 3.3.1 Blackrock PTI

Table 3.1 shows the modal split for rail passengers arriving and departing from Blackrock station for the 3-hour AM and PM peak hour survey periods. There are currently no non-rail related passenger activity at the PTI. It can be clearly seen below that the vast majority of rail passengers (about 75%) walk to and from the PTI. The modal split values below have been adjusted to be consistent with the bus counts in section 2.

**Table 3.1 Blackrock Rail Passenger Mode Split**

		Walk	Bus	Car	Car (pass)	Bicycle	Taxi	Other	Total Passengers	Response Rate
Arrivals	AM	84%	15%	0%	1%	0%	0%	0%	1423	39%
	PM	72%	10%	7%	9%	1%	0%	1%	734	40%
Departures	AM	72%	7%	8%	10%	2%	0%	1%	863	37%
	PM	78%	11%	3%	4%	1%	0%	3%	1231	45%

Of the passengers who walked to or from the PTI, the majority of these walked to locations close to the PTI, i.e., zones 1 – 6. The results are presented in Table 3.2. The zoning diagram used for developing this table is shown in Figure 3.1. Figure 3.1a illustrates the directional distribution.

**Table 3.2 Origin/ Destination of passengers walking to the PTI**

		Zone 1	Zones 2	Zone 3	Zone 4	Zone 5	Zone 6	All Other Zones
Arrivals	AM	64%	1%	1%	10%	15%	5%	4%
	PM	36%	2%	1%	25%	21%	8%	7%
Departures	AM	22%	4%	2%	17%	31%	13%	10%
	PM	16%	8%	5%	39%	21%	3%	8%

Bus users make up the second largest share of the modal split with 13% of rail passengers surveyed arriving by bus in the AM peak. Table 3.3 below shows the percentage using each route.

**Figure 3.3 Bus passengers per route**

		Route 114	Route 17	Route 46E	Route 115	Private Coach
Arrivals	AM	53%	11%	3%	1%	32%
	PM	61%	29%	0%	10%	0%
Departures	AM	88%	12%	0%	0%	0%
	PM	39%	6%	0%	0%	55%

It can be seen from Table 3.3 that the majority of people using the bus to get to or from Blackrock PTI use route number 114. There is also quite a high proportion that takes the shuttle bus to and from Sandyford Industrial Estate from the PTI.

Of those driving to the station, 64% parked in the adjacent station car park. The remaining 36% parked in various locations ranging from on street parking in Blackrock to private parking facilities.

### 3.3.2 Dun Laoghaire PTI

Dun Laoghaire is the only PTI that is also used by non-rail passengers, therefore the total PTI patronage will include non-rail bus and ferry passengers. Bus passenger counts were presented in Section 2. Ferry passengers surveys are still to be conducted.

The below table show the modal split for rail passengers at Dun Laoghaire station and is separated to show arrival and departures for AM and PM peaks. The modal split values below have been adjusted to be consistent with the bus counts in Section 2.

**Table 3.4 Dun Laoghaire Rail Passenger Mode Split**

		Walk	Bus	Car	Car(pass)	Bicycle	Taxi	Other	Total Passengers	Response Rate
Arrivals	AM	88%	11%	0%	1%	0%	0%	0%	1366	28%
	PM	79%	17%	1%	3%	0%	0%	0%	1030	26%
Departures	AM	62%	21%	5%	11%	1%	0%	0%	714	43%
	PM	83%	13%	1%	3%	0%	0%	0%	1384	37%

Table 3.4 shows the modal split for rail passengers arriving and departing from Dun Laoghaire station for the 3-hour AM and PM peak survey periods. As for Blackrock station, the majority of people arrived or left the station on foot, having the greatest share (86%) for arriving passengers in the morning peak.

Table 3.5 below displays the origins and destinations of rail passengers walking to/from Dun Laoghaire station. The zoning system used to derive this table is shown in Figure 3.2. Figure 3.2a illustrates the directional distribution.

**Figure 3.5 Origin/ Destination of rail passengers walking to the PTI**

		Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	All Other Zones
Arrivals	AM	34%	54%	7%	1%	1%	0%	1%	2%
	PM	41%	42%	4%	0%	2%	0%	4%	8%
Departures	AM	45%	35%	2%	4%	0%	0%	3%	9%
	PM	42%	44%	5%	0%	1%	0%	3%	4%

The majority of rail passengers walking to/from the station walked to/from zones very close to the PTI (zones 1 and 2).

A high percentage (18% in PM peak) of rail users left the station by bus. The table below shows the bus routes used by rail passengers to get to or leave the station.

**Figure 3.6 Bus passengers per route**

		Route 46A	Route 59	Route 75	Route 111	Route 7/A	Route 45A
Arrivals	AM	63%	0%	15%	15%	8%	0%
	PM	43%	0%	7%	24%	15%	11%
Departures	AM	33%	2%	8%	33%	17%	6%
	PM	55%	2%	6%	9%	28%	0%

As can be seen in Table 3.6, the majority of rail passengers also using the bus, arrive or leave on bus route 46A. There is also a high level of interchange between passengers on route 111 and the rail station. It can also be seen that there is a significant number in the PM of rail passengers using bus route 7/A, which stops on the Georges Street (citybound) and Marine Road (outbound).

Very few passengers drove to/from the station and therefore any information regarding location of parking may be disregarded due to statistical insignificance.

**3.3.3 Wicklow PTI**

The below table shows the modal split for Wicklow station and is separated to show arrival and departures for AM and PM peaks. There is currently no non-rail related passenger activity at the PTI.

**Table 3.7 Wicklow Rail Passenger Mode Split**

		Walk	Bus	Car	Car(pass)	Bicycle	Taxi	Other	Total Passengers	Response Rate
Arrivals	AM	77%	0%	0%	23%	0%	0%	0%	13	100%
	PM*	41%	0%	31%	29%	0%	0%	0%	N/A	N/A
Departures	AM	42%	0%	28%	30%	0%	0%	0%	148	70%
	PM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Note: \*Taken during AM departure survey.

As can be seen from Table 3.7 the majority of departing rail passengers arrive at the PTI by car, i.e., 28% as a driver and 30% as a passenger. The remaining 42% walk to the PTI.

The majority of passengers (77%) arriving in the AM peak left the PTI by foot. PM Peak arriving passenger mode split information was taken during the AM departure survey.

Table 3.8 below displays the origins and destinations of passengers walking to/from Wicklow PTI. The zoning system used to derive this table is shown in Figure 3.3. Figure 3.3a illustrates the directional distribution.

**Table 3.8 Origin/ Destination of passengers walking to the PTI**

Zone Number		101	104	106	108	109	112	113	114	110	Other
Arrivals	AM	25%	0%	0%	25%	13%	0%	0%	25%	0%	13%
	PM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Departures	AM	22%	10%	20%	2%	5%	5%	12%	5%	10%	10%
	PM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

As can be seen from Table 3.8, the origin and destination of walkers is quite varied. The most common destination zones for arriving passengers were 101, 108 (both in Wicklow Town) and 114 (Station Road offices). The most common origins for departing passengers were zones 101 and 106.



**3.3.4 Arklow PTI**

The below table show the modal split for Arklow station and is separated to show arrival and departures for AM peak period surveys. There are currently no non-rail related passenger activity at the PTI.

**Table 3.9 Arklow Rail Passenger Mode Split**

		Walk	Bus	Car	Car(pass)	Bicycle	Taxi	Other	Total Passengers	Response Rate
Arrivals	AM*	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	PM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Departures	AM	41%	0%	33%	26%	0%	0%	0%	79	58%
	PM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Note: \* Only three passengers alighted trains in Arklow and information is therefore statistically insignificant.

As can be seen from Table 3.9 the majority of departing rail passengers travel to the PTI by car, i.e., 33% as a car driver and 26% as a car passenger. The remaining 41% walk to the PTI.

Table 3.10 below displays the origins and destinations of passengers walking to/from Arklow PTI. The zoning system used to derive this table is shown in Figure 3.4. Figure 3.4a illustrates the directional distribution.

**Table 3.10 Origin/ Destination of passengers walking to the PTI**

Zone Number		6	11	12	18	29	41	69	70	76	80
Arrivals	AM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	PM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Departures	AM	5%	11%	11%	5%	11%	5%	21%	5%	5%	21%
	PM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

As in the case of Wicklow PTI, the origin/destinations are quite varied. The zone generating the highest number of walking trips was zone 80, which is directly beside the PTI. However, there is also considerable demand from the area west of the rail track (zones 6-29).

## 4. PARKING SURVEYS

### 4.1 Objectives

This survey recorded the PTI car park occupancy (where applicable) for the surveyed periods. The data is used to support the mode split and parking information extracted from the passenger interviews. The data will also be used to paint an accurate picture of the parking issues at the PTI. Peak bicycle parking accumulation was also recorded at each PTI.

### 4.2 Methodology

For Arklow and Wicklow PTIs, the number of cars parked along Station Road, which are deemed to be PTI related after the departure of the two morning trains were recorded.

For Blackrock: There are two surface parking areas adjacent to the PTI. The one immediately in front of the station (70 spaces) is the only one available for park and ride, at €5/day, as the second has a three-hour duration limit. Our initial site visit indicates that second car park is not used by morning peak passengers. A snap shot of parking utilisation was recorded by tallying every 15 minutes during the peak hour (0700-1000 and 1600-1900) via roving survey. Survey staff recorded both legal and illegal parking during this period. Pick-up and drop-off activity was also recorded.

As there is no designated PTI parking for Dun Laoghaire, it would have been difficult to identify PTI users using the numerous adjacent on-street and off-street car parks. However, most of these facilities charge €10 per day, which is double the Park and Ride cost at Blackrock PTI. The expected level of use is therefore minimal.

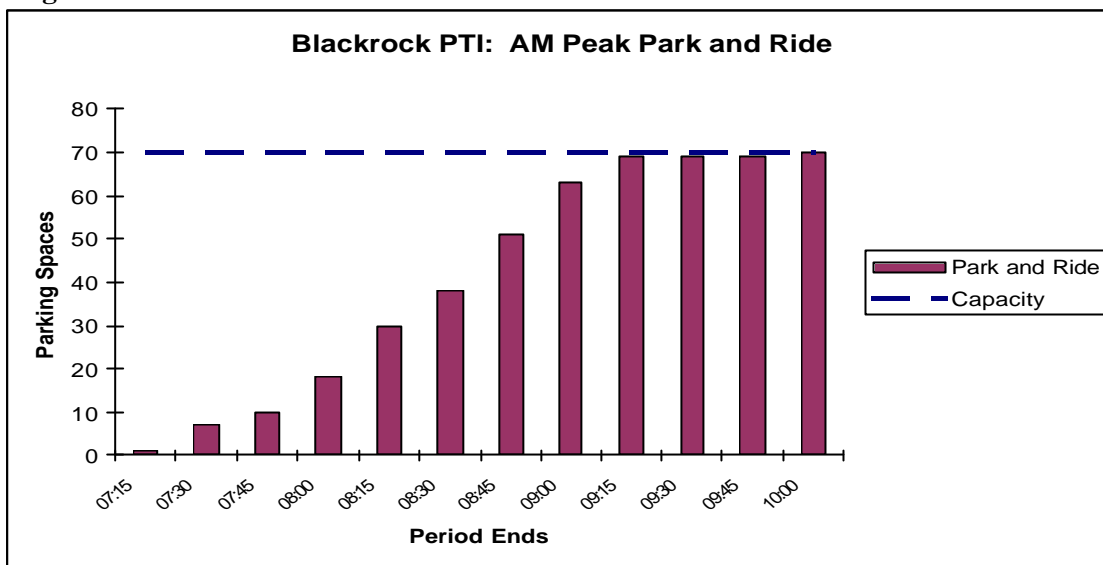
The number of bicycles parked at the beginning and end of the morning and evening commute periods was also recorded in each PTI.

### 4.3 Results

#### 4.3.1 Blackrock PTI

An AM and PM peak parking survey was carried out on Wednesday 2<sup>nd</sup> February 2005 at the Blackrock PTI. The below graphs show the AM and PM peak accumulation of parking in the surveyed areas.

**Figure 4.1 Blackrock PTI: AM Peak Park and Ride**



Blackrock station car park can currently provides parking space for 70 spaces. Figure 4.1 shows that there is a steady accumulation of traffic in the station car park from 07:00 until 09:15, when the car park reaches capacity. It was observed that a few cars were still trying to park after the lot was full. The nearest alternative full day parking is available at Idrone Terrace for €10 but only one car was observed to have a full day ticket (at around 10:00) and spaces were available.

The PM parking accumulation is graphed below in Graph 4.2

**Figure 4.2 PM Peak Park and Ride**

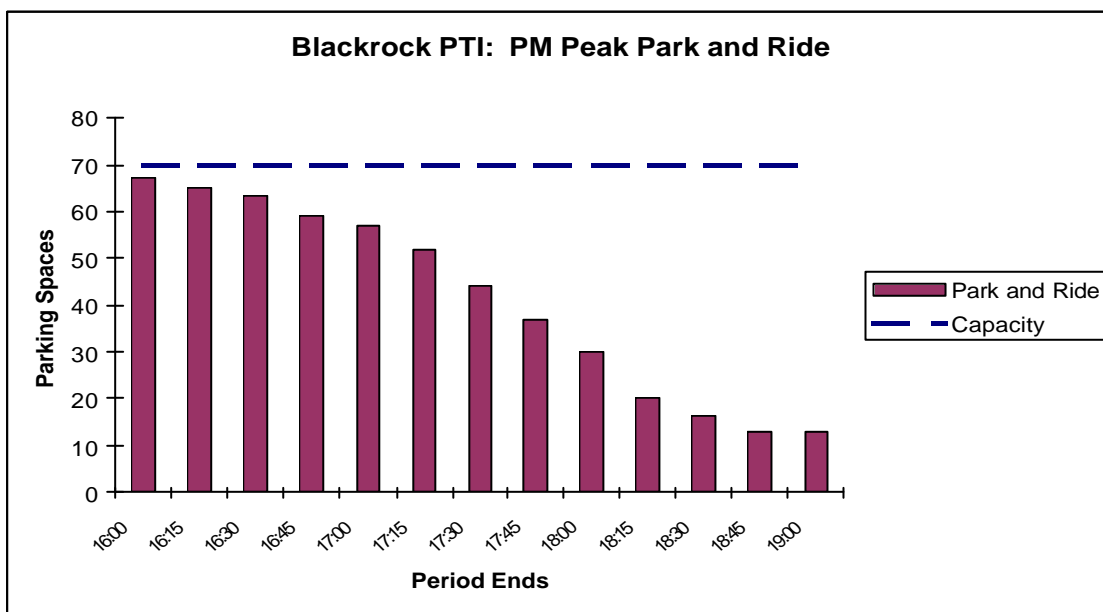


Figure 4.2 shows that the station car park empties gradually from 16:00. It can be seen that the car park was not full at 16:00 with 3 spaces available. The car park had not emptied by the end of the survey. Some illegal parking was observed within the car park.

Bicycle parking counts were also carried out in the vicinity of the PTI. A total of 46 spaces are provided for at the PTI. Of these, only 16 spaces were observed to be used. A similar parking accumulation was observed as to that of cars.

**4.3.2 Dun Laoghaire PTI**

As there is no designated PTI parking for Dun Laoghaire, no parking surveys were carried out in the vicinity. Parking behaviour information can be derived from the train passenger interviews. It should however be noted that the proportion of car drivers is only 5% and only about half of these were interviewed. The distribution information derived is therefore only indicative. The survey results show that about 60% of drivers use public parking and 40% use private lots. The main parking facility used in on-street with 47%.

Bicycle parking counts were also carried out in the vicinity of the PTI. There is capacity for 14 the back entrance to the PTI but these were observed unused. There is a further provision for 16 bicycles at the corner of Marine Road/Crofton Road. 9 bicycles were observed parked at 7:00 AM, of which 4 appeared to be unserviceable. 11 bicycles were parked here at the end of the AM survey period.

**4.3.3 Wicklow PTI**

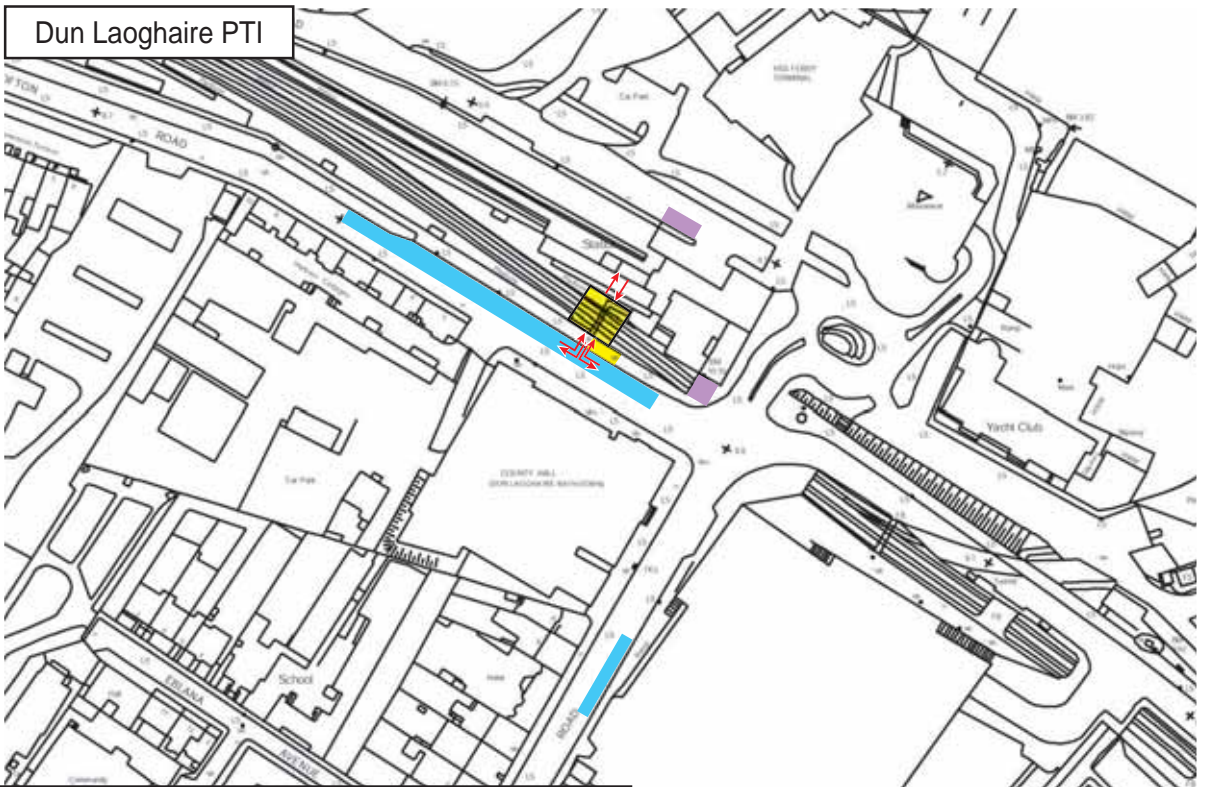
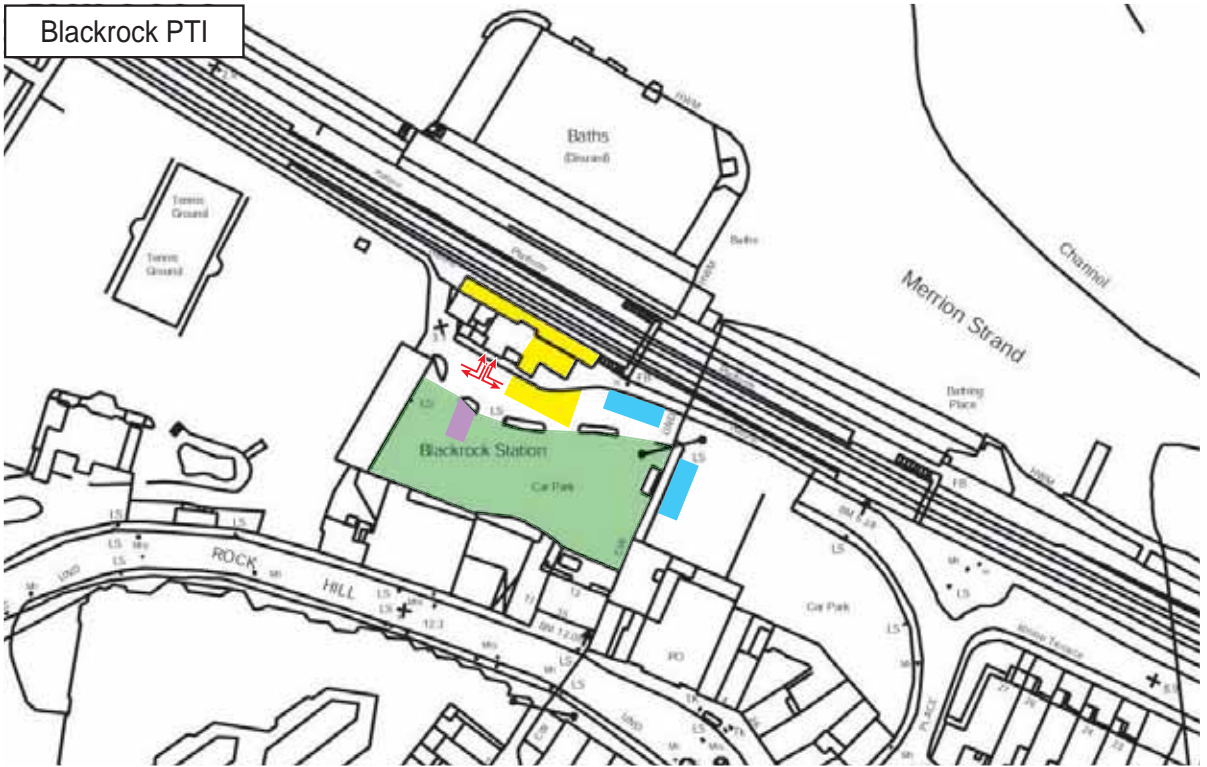
At Wicklow PTI, the number of cars parked outside the station were counted after the departure of the two northbound morning trains. This showed that a total of 34 cars parked along Station Road after the departure of the 07:37 train. A further 2 cars were parked after the departure 09:37 train.

There was no cycle activity observed in the vicinity of the PTI and hence no cycle parking was noted.

**4.3.4 Arklow PTI**

As in the case of Wicklow PTI, the number of cars parked on Station Road after the two morning trains (07:01 and 09:07) were recorded. This showed a total of 20 cars after the 07:01 train. A further 5 cars were observed on Station Road after the departure of the 09:07 train.

There was no cycle activity observed in the vicinity of the PTI and hence no cycle parking was noted.



**Legend**

- Car Park Count
- Bicycle Count
- Passenger Interviews
- Bus Count
- Pedestrian Count

Surveys - Blackrock and Dun Laoghaire PTIs

PTI Survey Report

D4659.20

March 2005

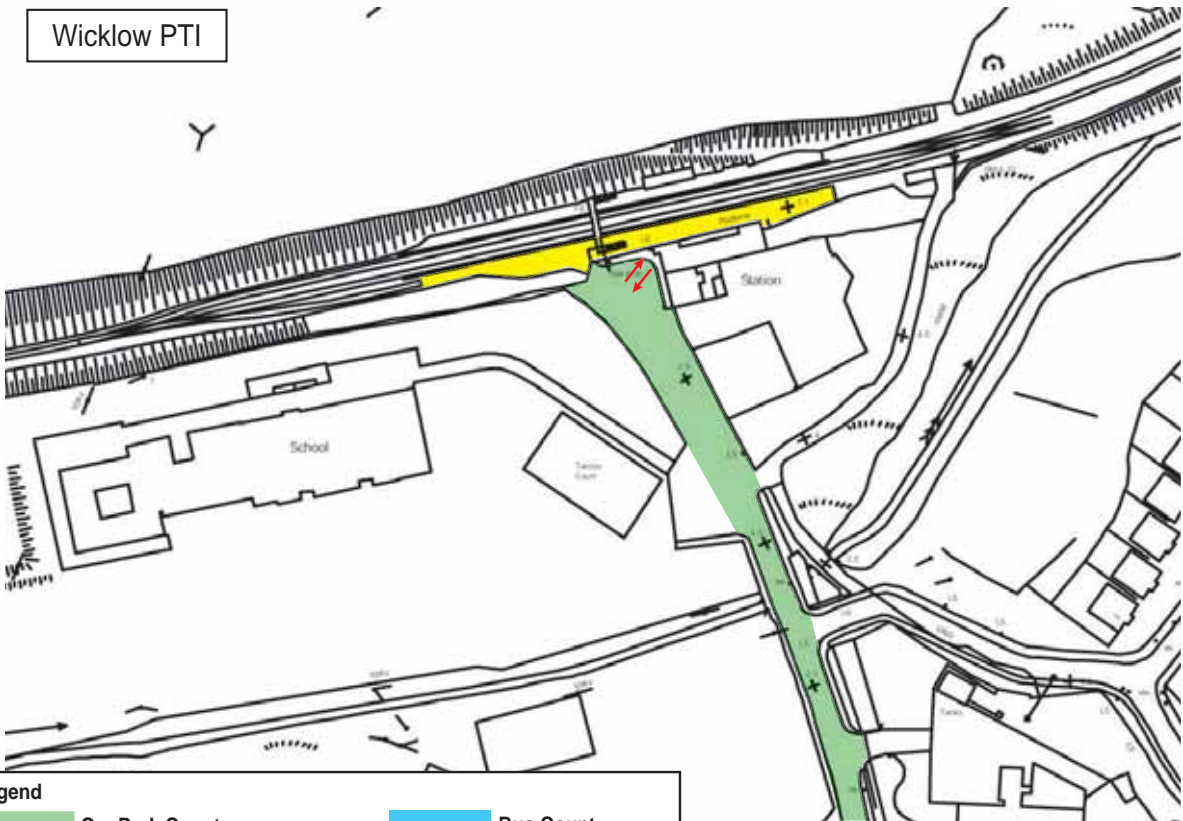
Figure 1.1



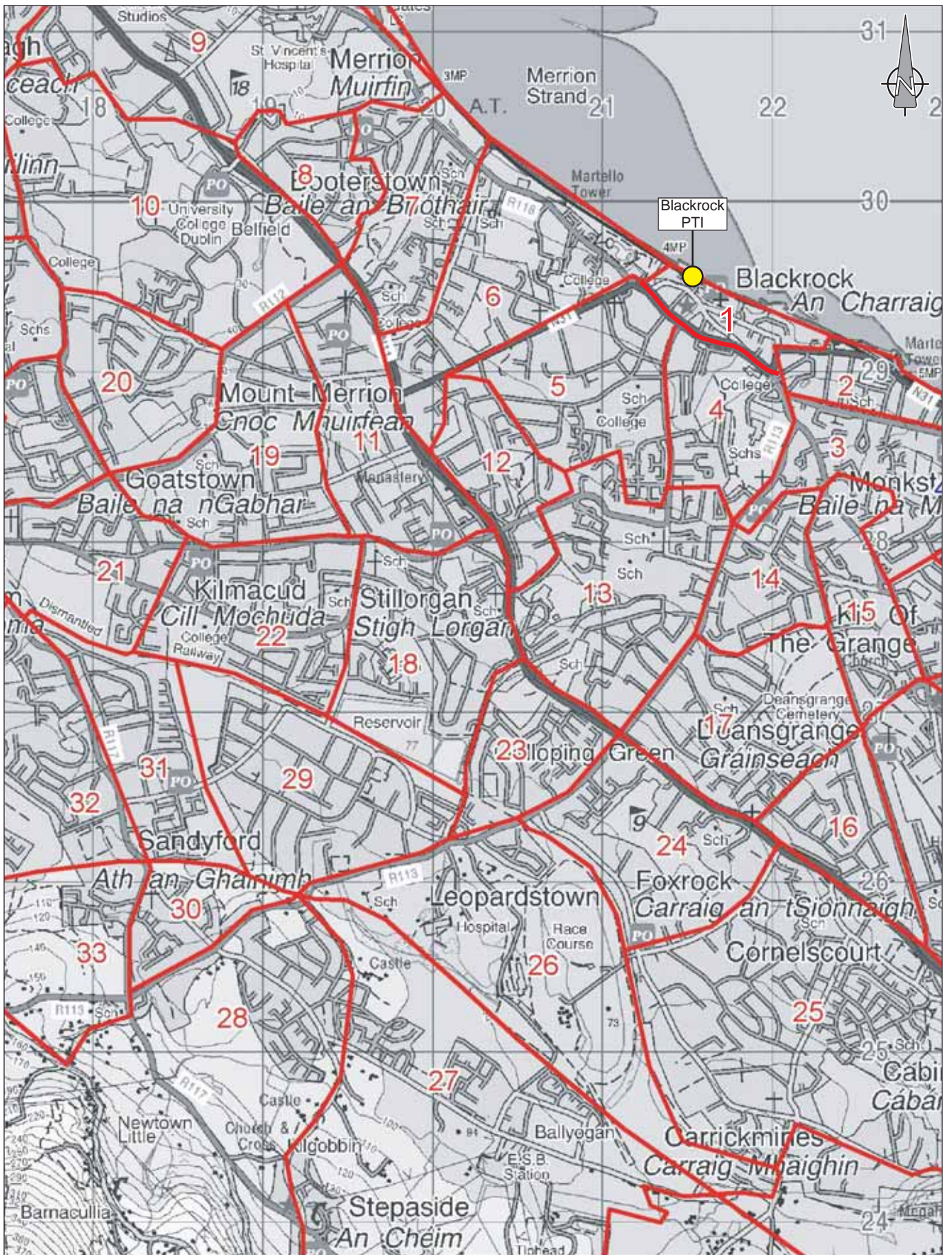
Arklow PTI



Wicklow PTI







## Blackrock Zoning Diagram

PTI Survey Report

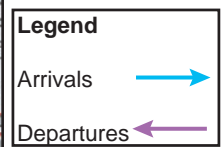
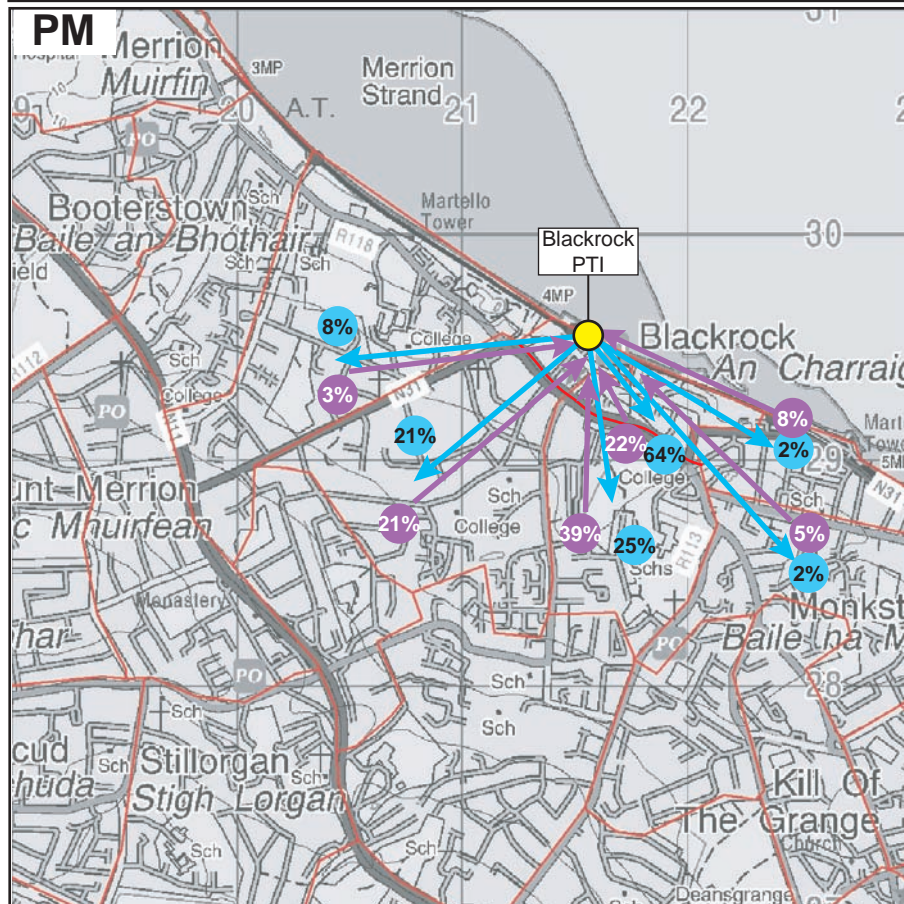
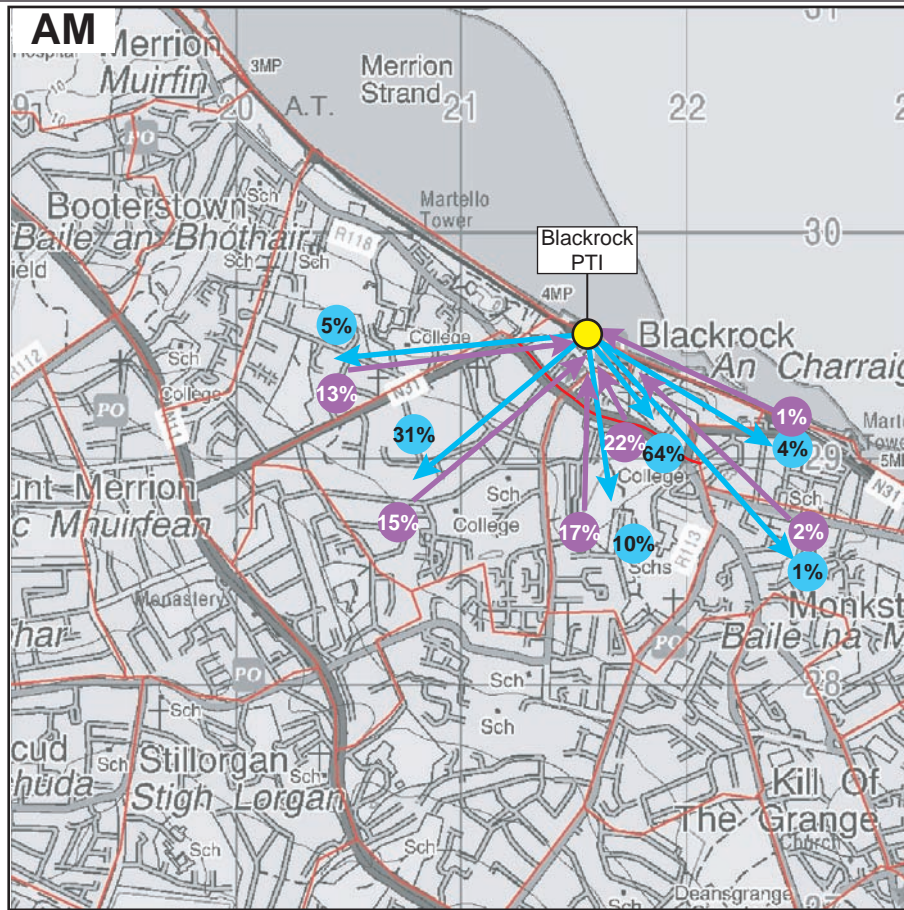
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March 2005

Figure 3.1

ARUP





**Blackrock Walk Origin and Destination**

PTI Survey Report

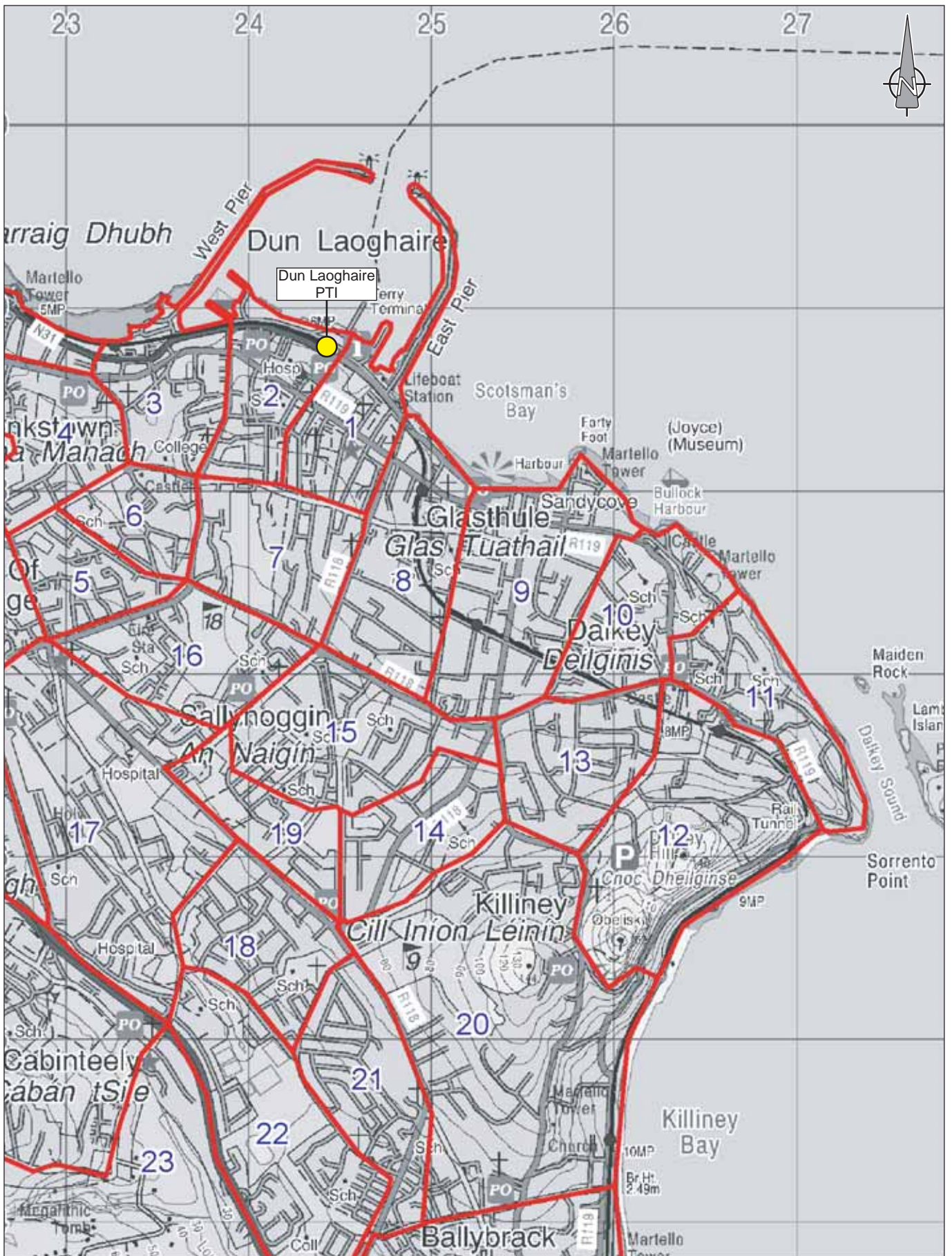
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March 2005

Figure 3.1(a)







Dun Laoghaire Zoning Diagram

ARUP

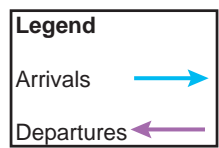
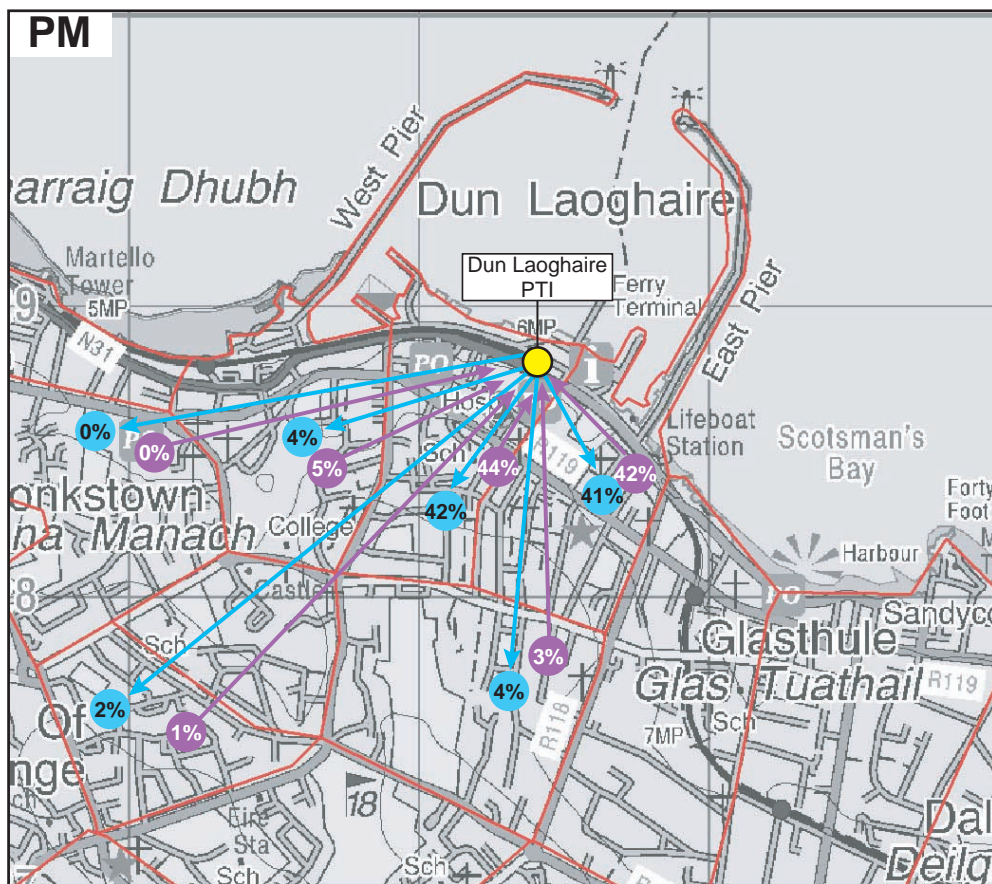
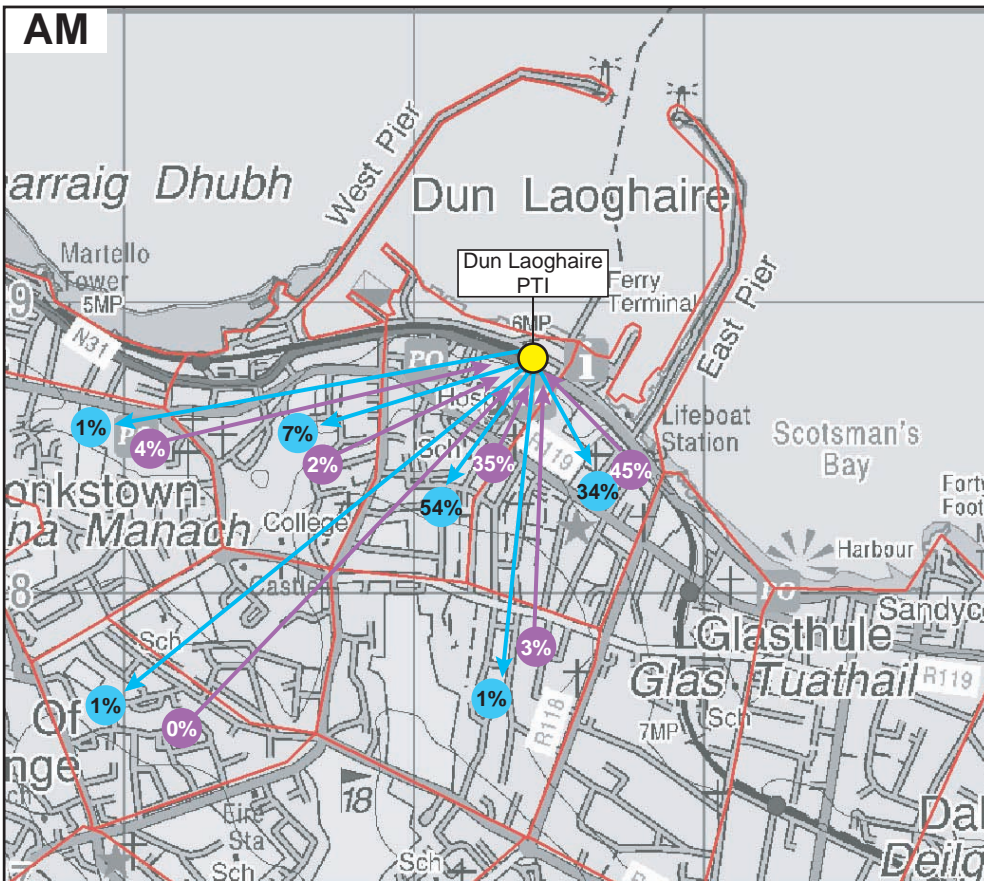
PTI Survey Report

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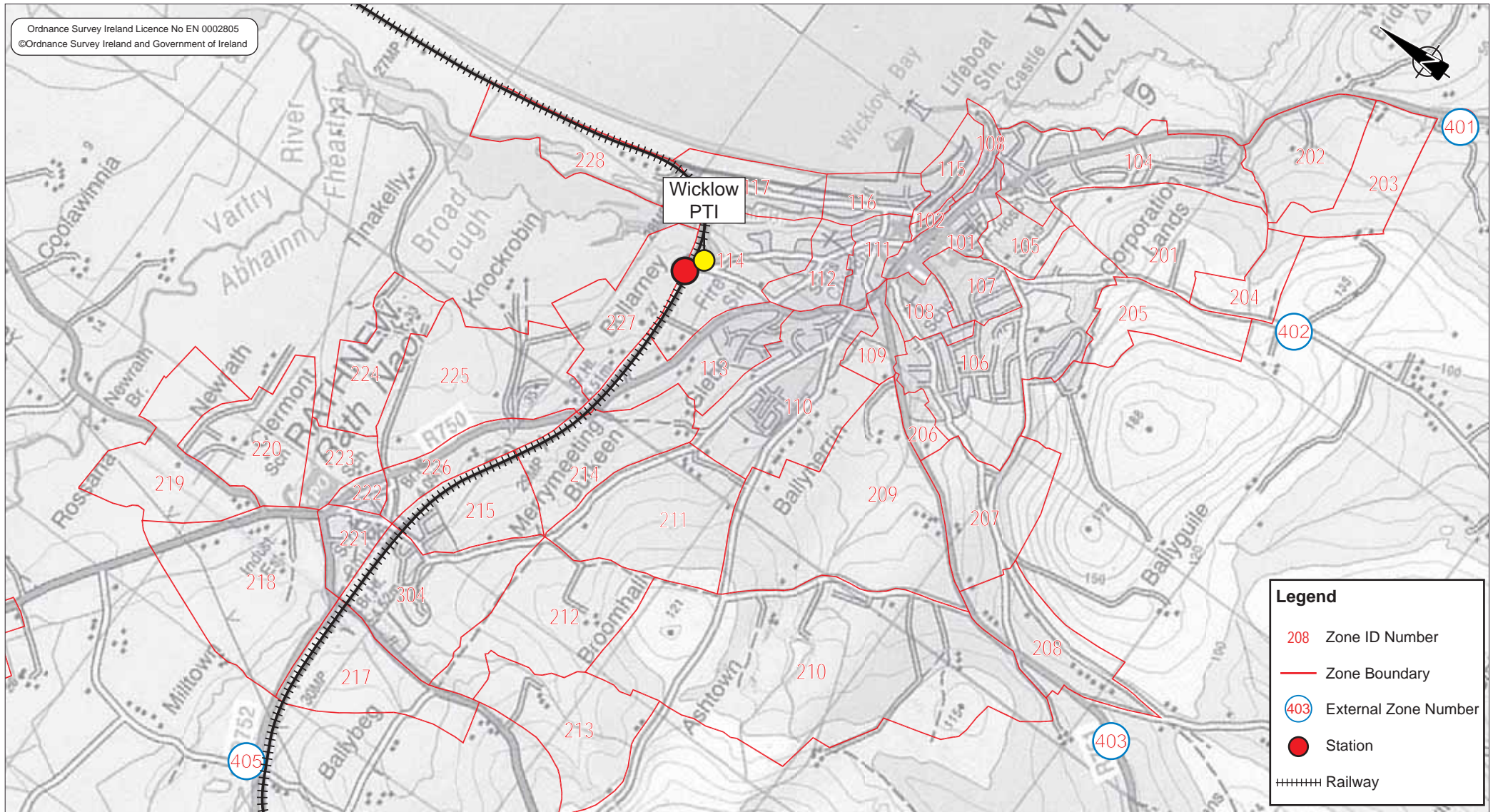
March 2005

Figure 3.2





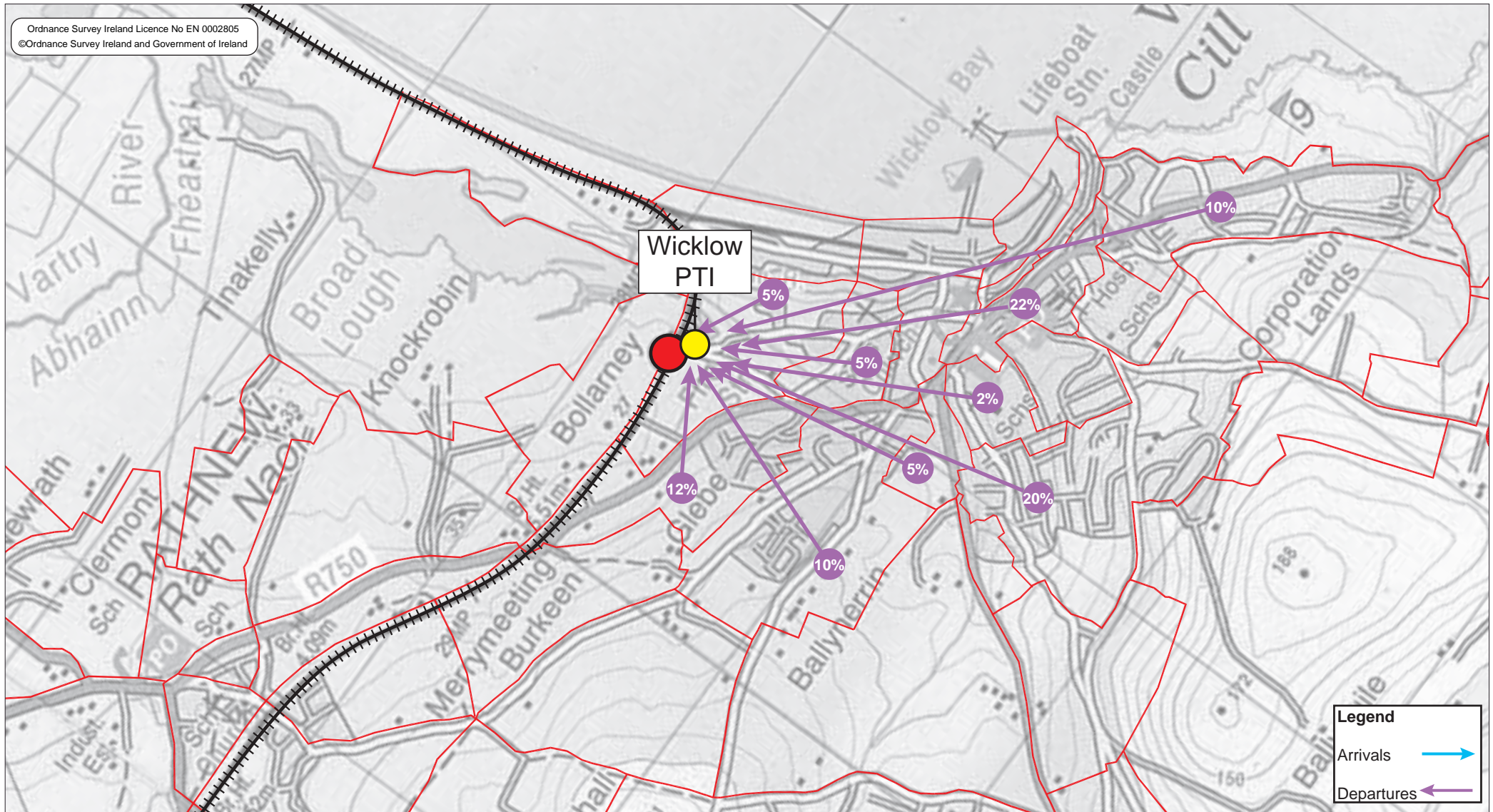




**Legend**

- 208 Zone ID Number
- Zone Boundary
- 403 External Zone Number
- Station
- ⋯⋯⋯ Railway





### Wicklow Departures Walk Origin

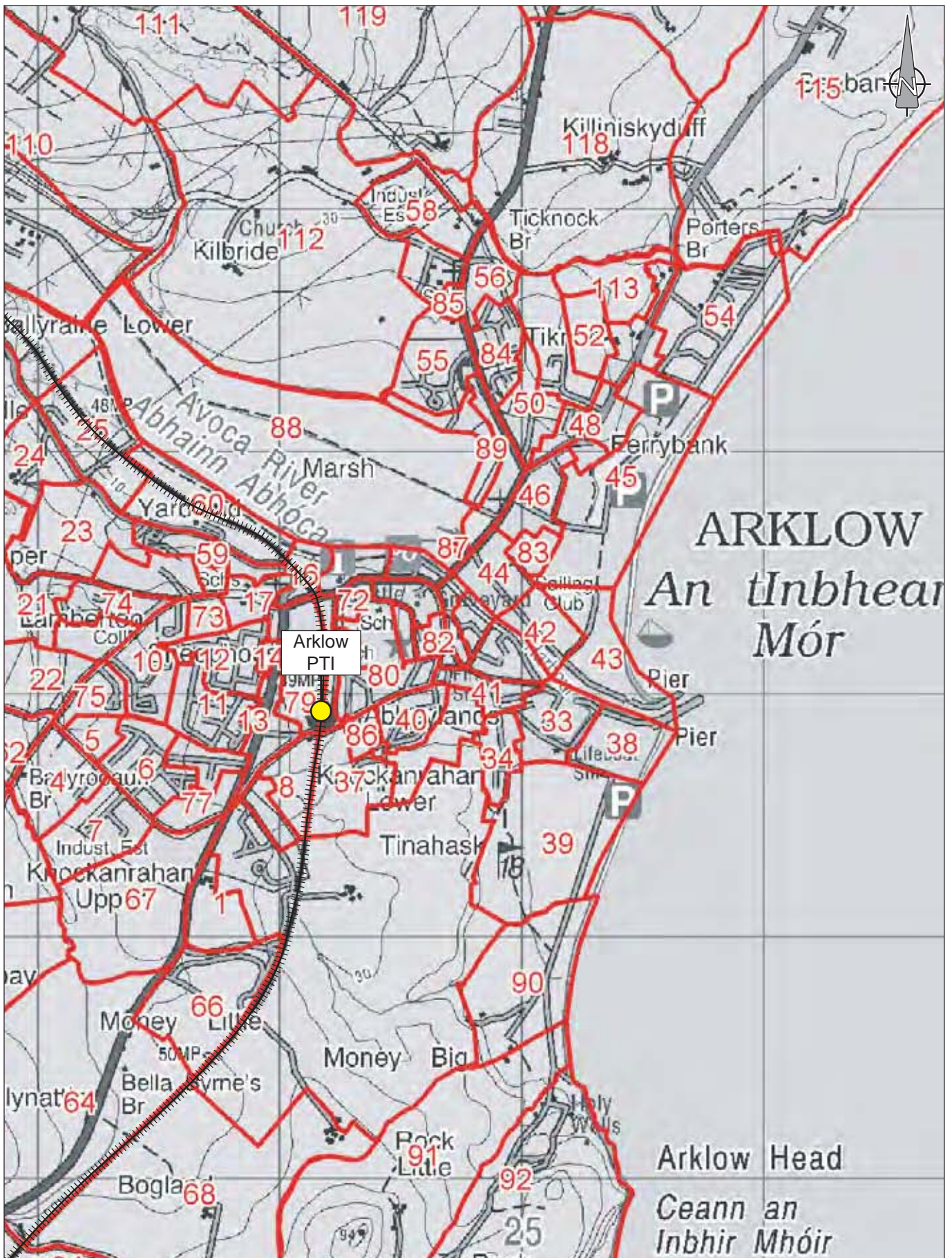
PTI Survey Report

D4659.20

March 2005

Figure 3.3(a)





Arklow Zoning Diagram

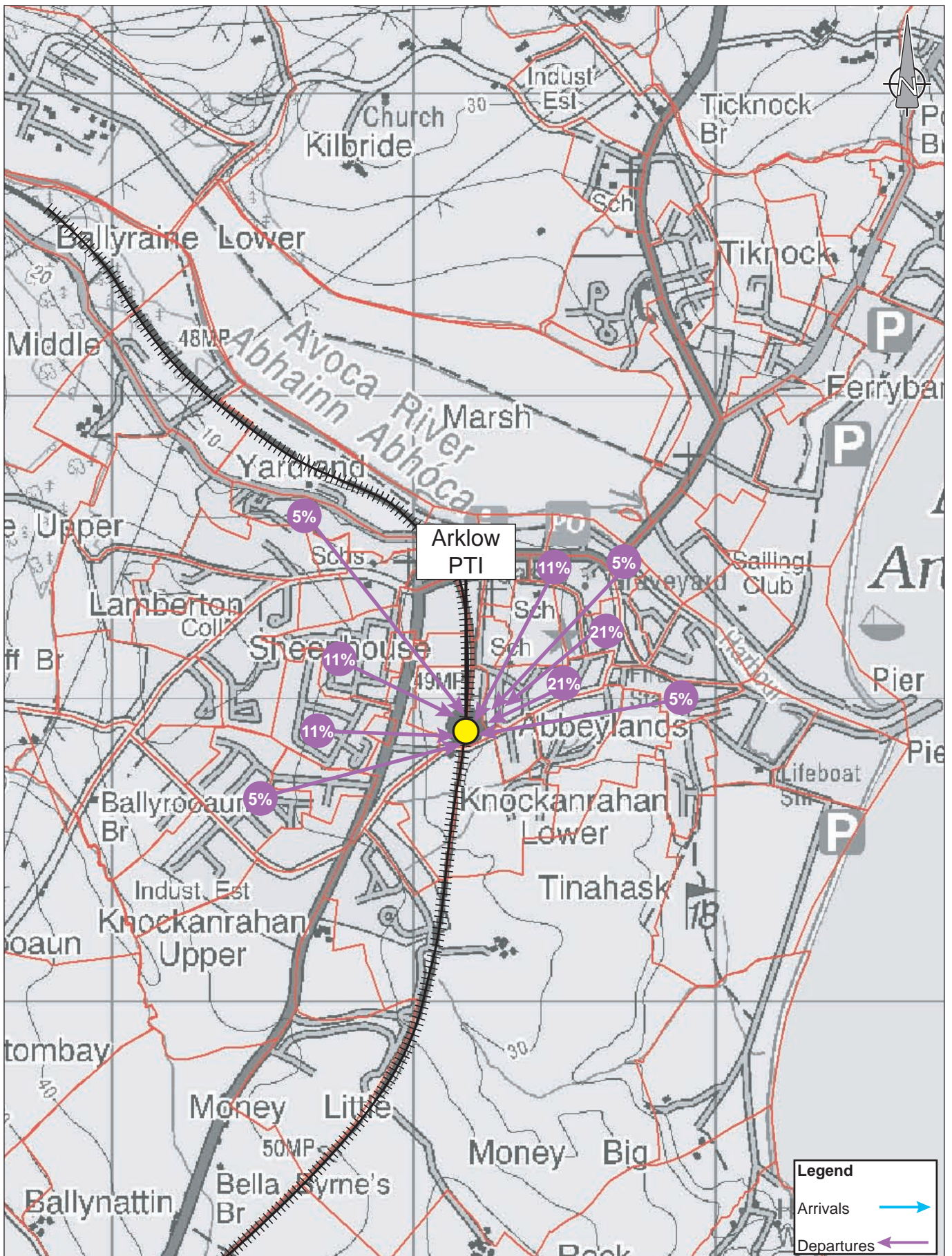
PTI Survey Report

D4659.20

March 2005

Figure 3.4





### Arklow Departures Walk Origin

PTI Survey Report

D4659.20

March 2005

Figure 3.4(a)

# ARUP

Arup Consulting Engineers

APPENDIX C

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**Materials Sample Board**



# PTI SAMPLE BOARD



Canopies & Shelters



Granite



Slate



Timber



Stone



Tree grill



Material interfaces



Glass



Concrete



Material interfaces

ARUP Hard Landscape Materials



Single aspect seating



Double aspect seating



Landscape seating



Landscape seating



Stainless steel seating



Timber seating



Landscape seating

Seating



Street lighting



Street lighting



Street lighting



Low level bollard



Pavement level bollard

Lighting



Cycle racks



Cycle racks



Rubbish bins



Signage



Directional signage

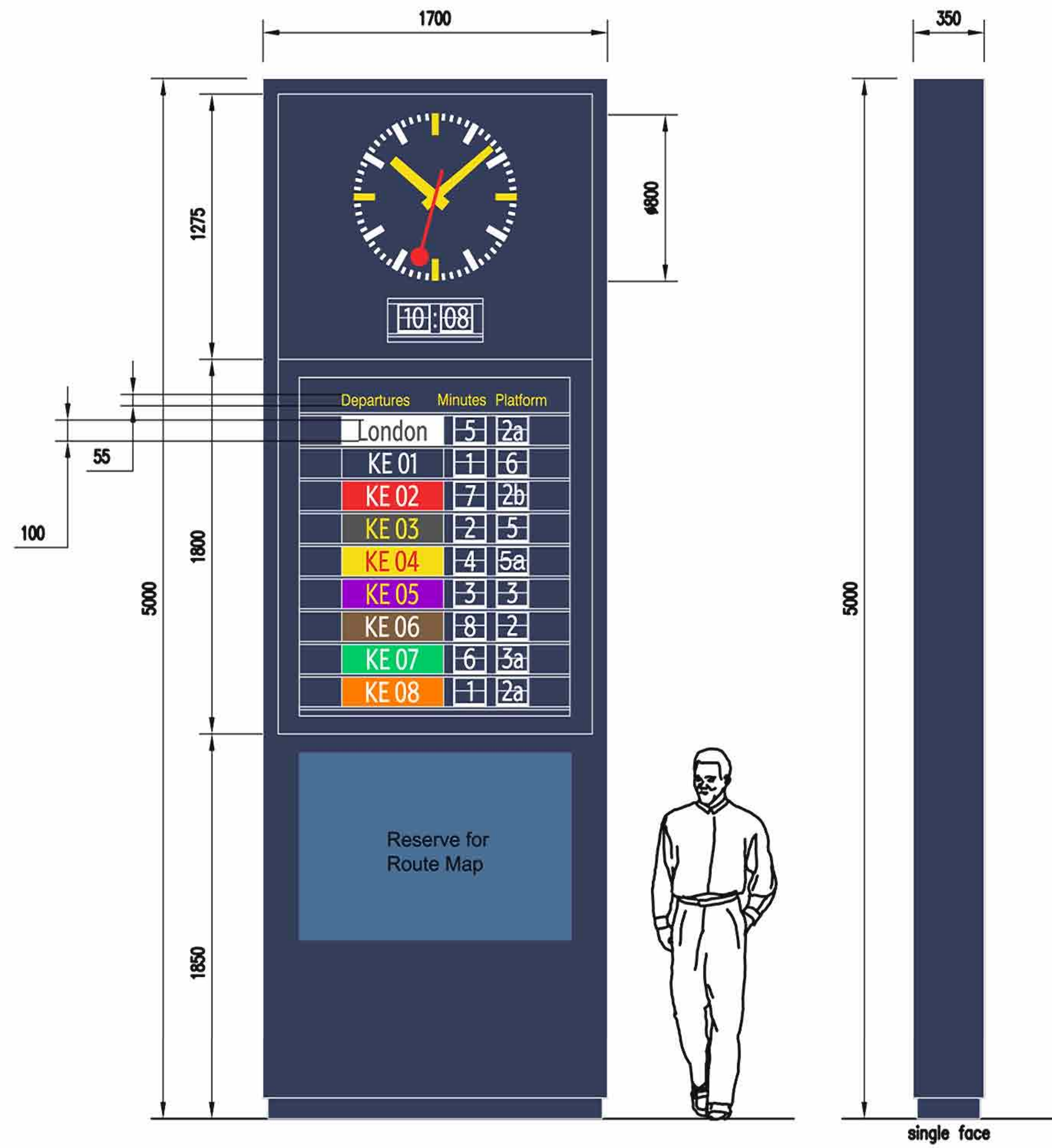


Directional signage

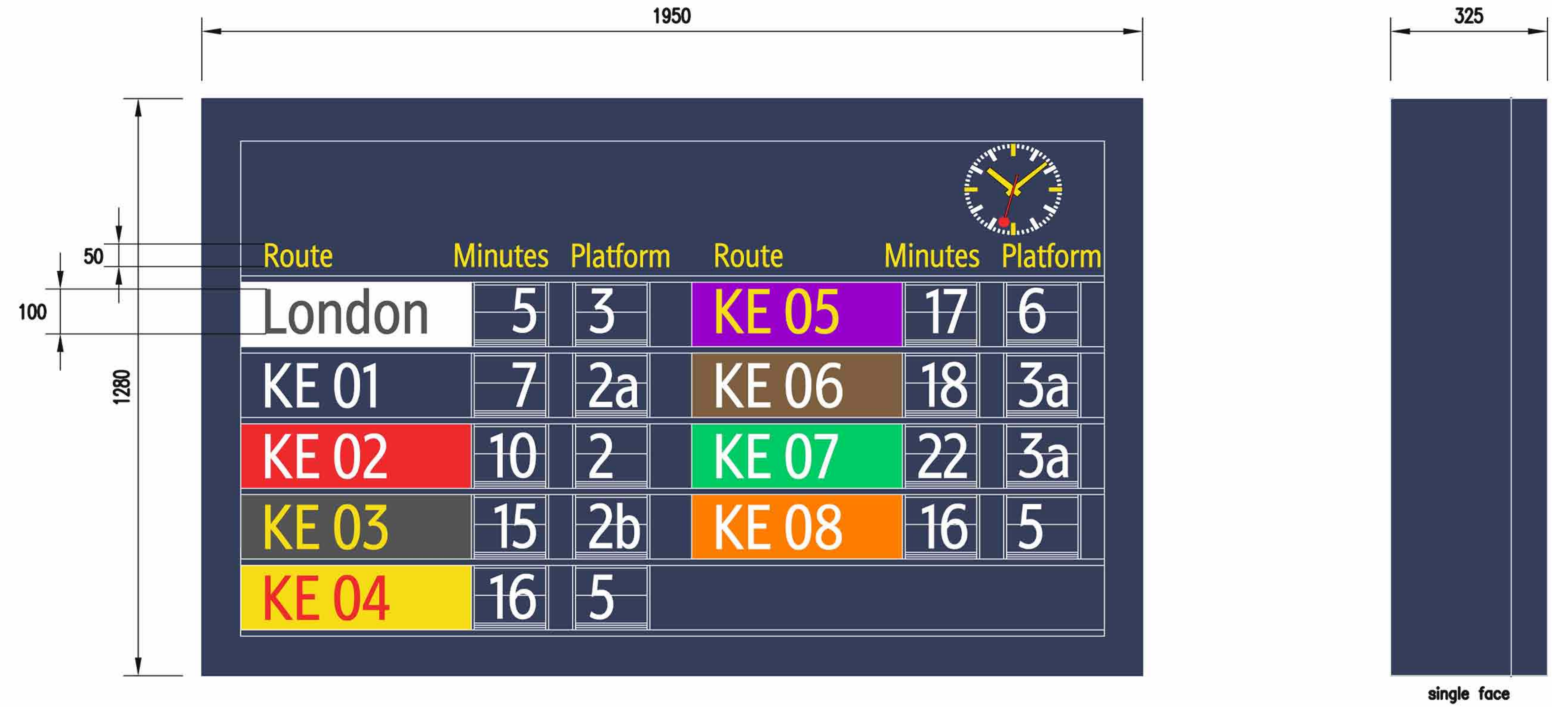
Street Furniture



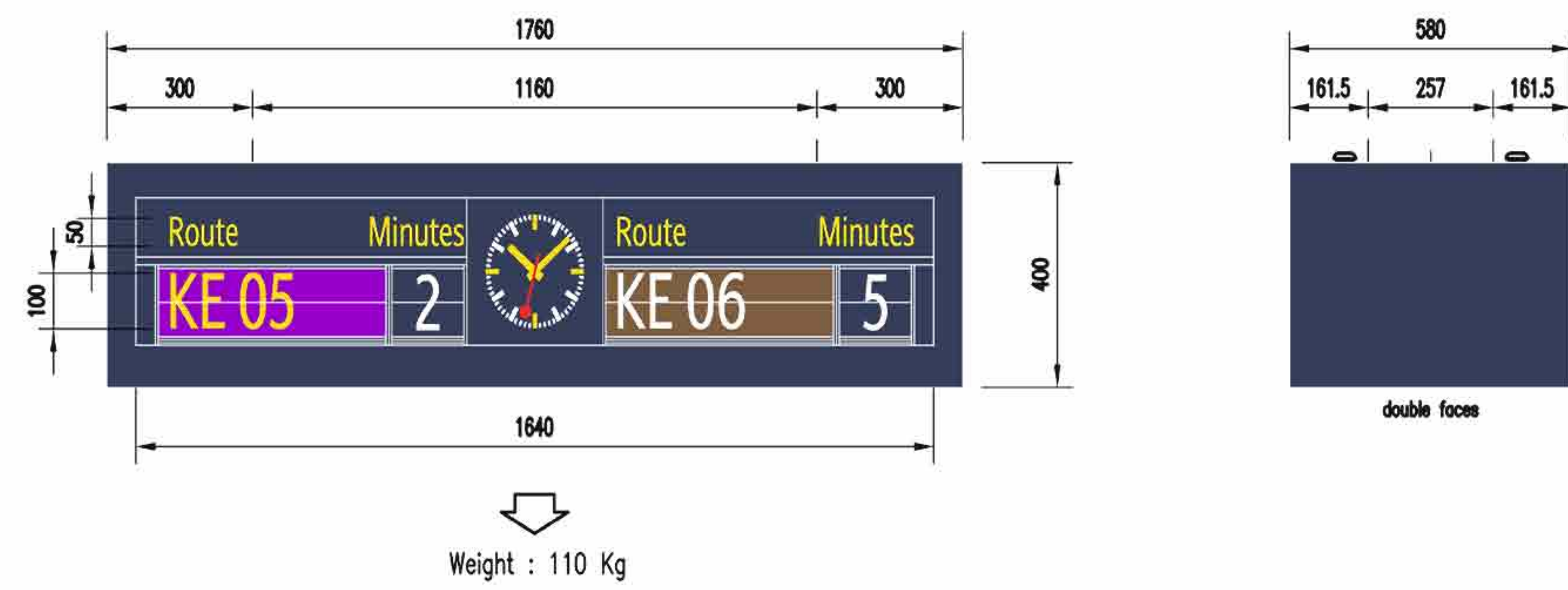
# PTI DIRECTIONAL SIGNAGE



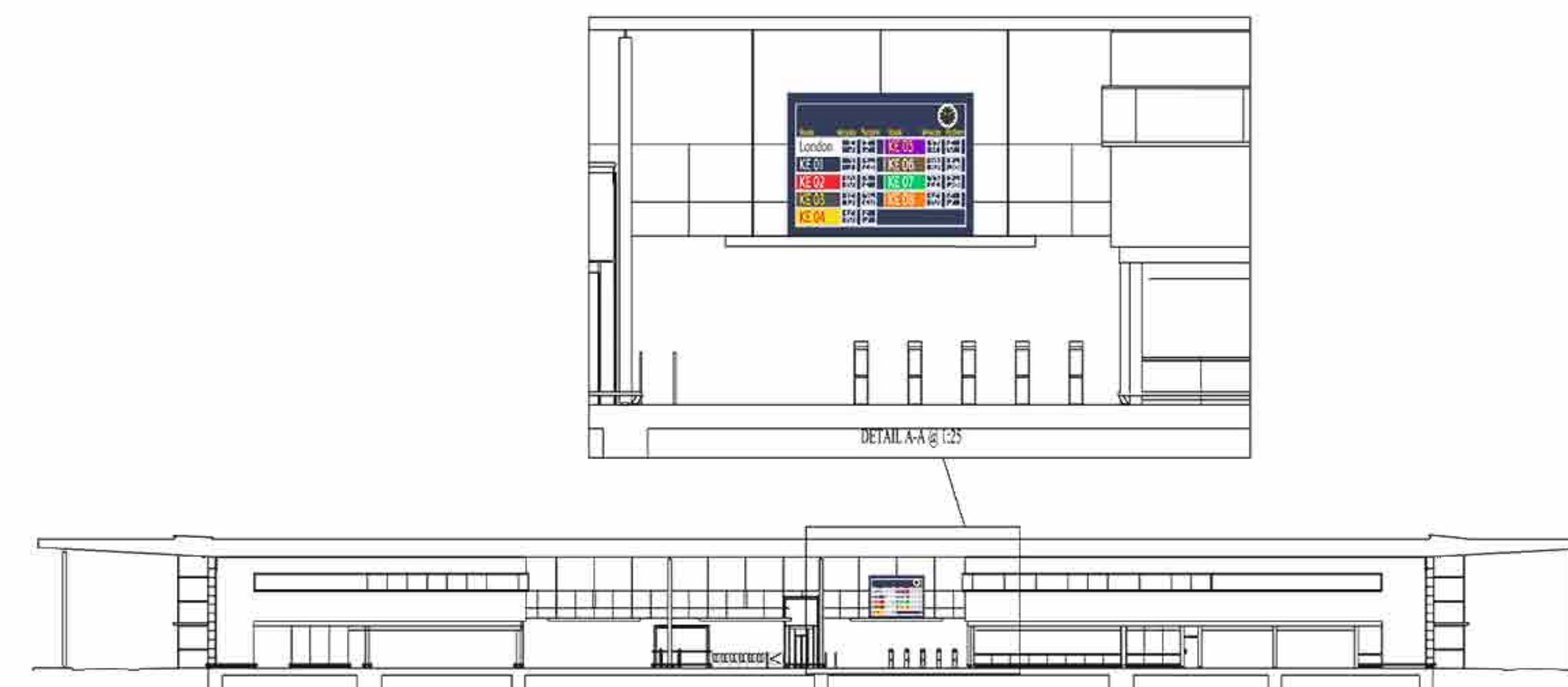
Passenger Display



DIS Display



Platform Display



Context

