



**Energy from Waste & Recycling Facility
Trident Park, Cardiff**

Transport Assessment

Viridor

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solutions for today's environment

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1.0 INTRODUCTION

This Transport Assessment (TA) has been produced by SLR Consulting on behalf of Viridor. Viridor proposes the development of an Energy from Waste and Recycling Facility (EfW & RF) at Trident Park in Cardiff (see Drawing 16-1 for location). This TA has been produced to assess the potential impacts on the local highway and transport network as a result of the scheme.

The content of this TA has been produced with guidance from the document 'Guidance on Transport Assessment' (GTA), which was published by the Department for Transport in March 2007, and following consultation with Cardiff Council.

This TA assesses the impact of the EFW & RF from the construction stage right through to its future operation, which is anticipated to commence in 2014. It covers all the relevant issues relating to the proposed development including the effect of construction and development traffic on local junctions, sustainability and road safety. Particular attention has been paid to the impact as a result of increased levels of HGV traffic.

The TA accompanies the planning application submitted to Cardiff Council. This TA updates an assessment undertaken for a previous application (ref 08/02616) on this site for a similar proposal. The traffic generation associated with this scheme will accord with that previously proposed: the key differences are updated traffic data and the need to take into account new traffic-generating development in the area. A summary of this TA is included in the accompanying Environmental Statement which has been prepared to report the findings of the Environmental Impact Assessment.

Following this introduction, Section 2 describes the scope of work that was agreed with Cardiff Council. Section 3 provides a description of the proposed development whilst Section 4 gives details of the various consultation exercises that were carried out to ensure that all key stakeholders were aware of the proposals.

The baseline information that was gathered for assessing the potential transport impacts is detailed in Section 5. Comprehensive assessments of the potential traffic impact on the local highway network during the construction and operational phases of the scheme can be found in sections 6 and 7 respectively.

Section 8 advises on the parking spaces that should be provided during the construction and operational phases. Section 9 provides information relating to the road traffic accidents that have been recorded over the past 5 years.

Section 10 gives consideration to importing waste by alternative methods, whilst Section 11 describes the sustainable options for travelling to and from the EFW & RF. Sections 12, 13 and 14 tie up the report with Mitigation, Summary and Closure information.

The TA has employed ARCADY (Assessment of Roundabout Capacity and Delay); this program has been developed over the last 20 years by TRL and is used for predicting capacities, queue lengths, delays and accident risk at roundabouts.

Wherever possible a worst-case scenario has been considered in order to ensure that the most robust assessment possible has been undertaken.

2.0 PROJECT SCOPE

2.1 Initial Scoping

The scope of this TA has been agreed with Cardiff Council prior to undertaking the assessment work. A scoping report (included as Appendix A) was submitted to Cardiff Council in October 2007. The report included a description of the development proposals and the trips predicted to be generated by them, proposals for gaining access to the site, accident analysis, sustainable travel and the study area to be assessed. It should be noted that at that time, it was proposed that the throughput of the development would be 400,000 tonnes per annum. The planning application has been submitted for an EFW & RF with an annual capacity of 350,000 tonnes, a reduction of 12.5% from the original scoping report.

The scope agreed with Cardiff Council includes:

- TA to assume all development trips are made by road;
- TA to include capacity assessments of Glass Avenue / Ocean Way roundabout;
- traffic impact to be calculated at "Magic Roundabout" (i.e. junction of Ocean Way, East Tyndall Street (east), East Tyndall Street (west) and Windsor Road) and at the roundabout east of Glass Avenue;
- parking will be provided in line with Cardiff Council's document 'Access, Circulation and Parking';
- accident records over a 5-year period will be assessed; and
- all relevant policy documents to be reviewed.

SLR consulted with Cardiff Council during September/October 2007 regarding the scoping report. The consultation concluded that the Council agreed with the scope of work proposed by SLR. Cardiff Council also confirmed that the study area need not extend beyond the site access roundabout. This is on the condition that SLR can demonstrate that the proposed development would not have an impact that would exceed 5%.

Further engagement with CC was undertaken during the determination process of application 08/2616. This report includes those matters (including a Transport Implementation Strategy) are addressed herein.

2.2 On-going Scoping

The timescale associated with undertaking the EIA is such that the preparation of the TA has been an iterative process. The TA has developed as the scale and design of the development has changed, as well as a change in circumstances associated with other proposals in the area.

A number of changes / additions have been made to the original scope as a result of communications between Cardiff Council and SLR which adds to the accuracy and robustness of the TA. These are summarised as follows.

- the TA considers the export of residual waste (i.e. bottom ash, metals) from the site for recycling;
- 24-hour ATC data has not been collected as it was considered unnecessary;
- operational trips total 26 per hour (not 21 per hour as originally scoped). This is due to residual waste trips (bottom ash and metals) which were not included in the original assessment of trips; and

- the Nettlefold Road / Ocean Way T-junction has not been assessed as this is not proposed to be used by EFW & RF traffic. All EFW & RF traffic will utilise the Glass Avenue junction only.
- the future year to be tested is 2019 (instead of 2017). The original scoping assumed an opening year of 2012, which has now subsequently become 2014, thus pushing the future year assessment on two years. This provides for a more robust assessment.

A further meeting was held between SLR and Cardiff Council on Tuesday 2 September 2008 to discuss the draft TA, which was submitted to Cardiff Council prior to the meeting. At the time of the meeting, comments had not been received from the relevant departments within Cardiff Council. However, the general view on the TA was that the scope of study was acceptable and that it covered all the necessary issues. It should be noted that this informal opinion does not confirm acceptance or approval of the findings or conclusions of the TA in any way by the Highways Authority. The Authority will be a statutory consultee as part of the determination of the planning application.

3.0 CONSULTATION

3.1 Cardiff Council

Cardiff Council gave detailed consideration to the previous TA for application 08/02616. The assessment made by CC explained that:

- the 9% traffic impact during the construction phase was temporary and that the Travel Plan would set out the framework for reducing the amount of construction traffic;
- the 3% traffic impact during the operational phase would not necessitate improvements to the highway network;
- transportation of waste by rail is not feasible due to the lack of railway links and technical issues with hauling waste.

The final conclusion made by CC was that there were no transport related issues that would preclude development at Trident Park.

In addition, the Operational Manager Transportation advised that further to the additional information provided by the applicant, there are no objections subject to conditions requiring details to be submitted regarding the access road junction, loading, unloading and parking within the site, the provision of 15 No. cycle stands on site, details of roads and footpaths within the site, and a scheme of construction management prior to the commencement of each phase of development.

3.2 Cardiff Bus

As part of the TA it is important to consider the issue of alternative forms of transport. In the case of this proposed development, this is relevant in terms of the travel to work patterns of construction workers, and members of staff once the EFW & RF is operational.

In the case of Trident Park, the key public transport provider would be Cardiff Bus. The bus operator was contacted in October, 2007 to obtain its opinion on the potential for increasing the bus frequencies at Ocean Way. The following response from Cardiff Bus was received via email:

“Currently, the few journeys which serve Ocean Way and provided commercially by Cardiff Bus and their low frequency reflects the low level of demand.

Any increase in the level of the bus service would have to be funded by either the local authority or the developer.

For information, our company hopes to relocate its operational base to Trident Park next year, and such a move would see a major increase in the level of bus service provision between the City Centre and Trident Park”.

Since the above communication took place, Cardiff Bus' plan to relocate to Trident Park have been withdrawn. Therefore no further consideration needs to be given to this development in terms of traffic.

3.3 Welsh Assembly Government

A consultation exercise has also been undertaken with the Welsh Assembly Government (WAG) in their role as motorway and trunk road agents for Wales. The Roads Network Management Division has advised that there would be no objection on the basis that vehicles related to the development would not access the A4232 at Culverhouse Cross Junction during the AM peak. A copy of the response from WAG is included at Appendix B.

3.4 Network Rail

Network Rail was consulted on 22 July 2008 to obtain their views on the potential for transporting waste by rail from the Project Gwyrdd area (see paragraph 4.2) to Trident Park. Details of this consultation can be found in Section 10.

4.0 PROPOSED DEVELOPMENT

4.1 Background

The proposed development at Trident Park would involve the construction and operation of an Energy from Waste and Recycling Facility that would treat residual waste arisings (waste that cannot be recycled) by means of combustion. It would also include a materials reception area and an incinerator bottom ash (IBA) treatment area. It is proposed that the EFW & RF will be operational by 2014 based on the following timetable:

- January 2010 Planning application submitted;
- Late 2011 Construction commences;
- Late 2013 Commissioning; and
- 2014 Fully operational

The site is located on the former Nippon Electric Glass factory located between Ocean Way and the Port of Cardiff. The application site extends to 4.6 hectares, with sole access being gained via Glass Avenue, a dedicated single carriageway road off Ocean Way. Drawing 16-2 illustrates the boundary of the application site.

The EFW & RF will consist of the following key elements/operations:-

- a tipping hall;
- dry flue gas treatment;
- an administration building, workshops and visitors centre;
- a turbine;
- electrical rooms;
- air cooled condenser;
- water treatment; and
- bottom ash storage and screening.

The technology employed at the EFW & RF is such that two identical lines of plant would operate on a 24-hour basis, each accepting 175,000 tonnes of waste per annum.

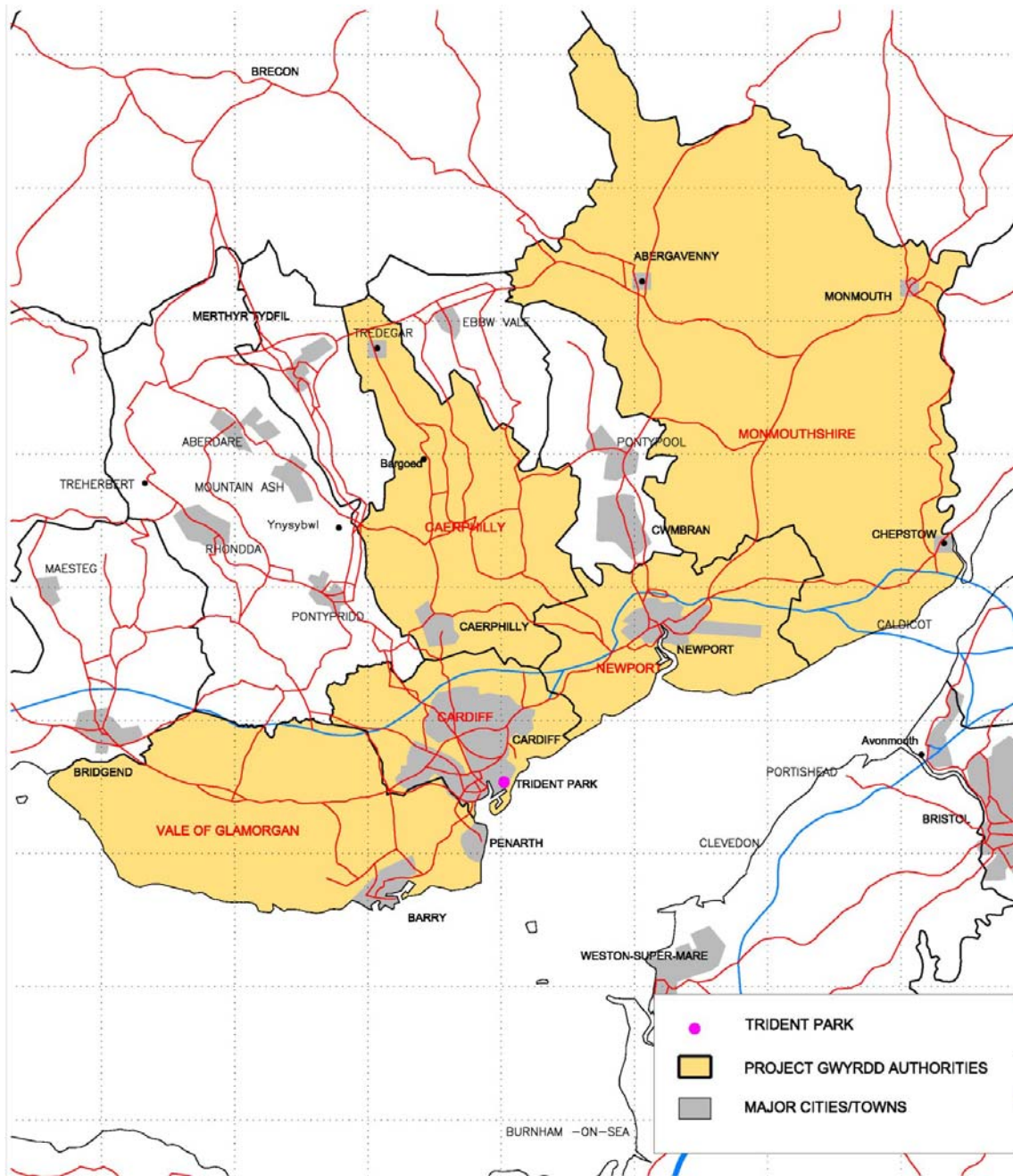
4.2 Project Gwyrdd

The proposed EFW & RF would accept residual waste from five local authorities: Caerphilly; Cardiff; Monmouthshire; Newport; and Vale of Glamorgan. These authorities have formed a consortium under the banner "*Project Gwyrdd*" in order to deliver a sustainable solution to

residual waste management in this part of South East Wales. Figure 4-1 on the following page illustrates the extent of the Project Gwyrdd area.

Drawing 16-3 illustrates the layout of the proposed development.

**Figure 4-1
Project Gwyrdd Area**



4.3 Operating Hours

The nature of the technology to be employed at Trident Park is such that the combustion process would operate on a 24 hour per day, 7 days per week basis. Similarly, the EFW & RF has the potential to receive waste on a similar basis.

However, the nature of waste collections and disposal regimes means that the vast majority of waste would be delivered to the site between 0800 and 1700 hrs between Monday and Saturday. The modelling undertaken pursuant to this TA has been based on this assumption, but it should be noted that a small proportion of waste deliveries will take place outside of these hours, including on Sundays.

It is understood from Viridor that, in reality, approximately one third of the bulk traffic generated by the EFW will be on the highway outside of the core period (i.e. 1800 – 0800), thus reducing the impact during the peak periods.

4.4 Site Access

Access to the proposed development would be via Glass Avenue which is the main existing access to Trident Park. Glass Avenue is a single carriageway road of width approximately 8m and is accessed off the Glass Avenue roundabout on Ocean Way. The site access (Glass Avenue) is illustrated in Drawing 16-2.

4.5 Internal Traffic Movements

The internal HGV traffic movements will involve waste deliveries and bottom ash and fly ash exports. There will also be car trips made by staff. Drawing 16-4 illustrates indicatively how the various traffic movements will be routed around the site.

5.0 BASELINE SITUATION

5.1 Historic Traffic Movements

The application site was previously occupied by the Nippon Electric Glass (NEG) factory. The factory, which was opened in 1995, employed 650 staff and ceased operations in November 2005. It is understood that the factory operated shift patterns whereby up to 200 staff would have been on site at any one time along with a further 150 full-time day staff, a total of 350 staff.

As part of the TA a discussion was had with a former employee of NEG who estimated that the factory would have generated approximately 40 two-way HGV trips per working day.

With regards to historic staff movements (cars), the NEG factory occupied approximately 12,000m² of the total application area. This is approximately 35% of the total gross floor area for the factory. Assuming most staff would have driven to work alone (i.e. due to site location, poor bus services and need for shift work), it is estimated that the proportion of the NEG factory on the application site would have generated 122 car trips (244 two-way trips) per shift. It should be noted that the number of car trips estimated to have been generated during week days by the former use is greater than that expected to be generated by the proposed EFW & RF.

5.1.1 TRICS Analysis

In order to provide a robust comparison of the likely number of generated trip a TRICS analysis has been undertaken based upon the GFA of the former NEG factory that would have occupied the application site. The results of the assessment are summarised in Table 5-1.

**Table 5-1
 Summary of TRICS Output (HGVs only)**

	Arrivals		Departures		Combined	
	Trip Rate	Count	Trip Rate	Count	Trip Rate	Count
12-Hour	0.29	35	0.23	27	0.52	62
24-Hour	0.30	36	0.2	27	0.5	63
AM Peak	0.02	3	0.02	3	0.05	6
PM Peak	0.01	1	0.01	1	0.02	2

The TRICS assessment shows that general industry development of 12,000m² gross floor area would generate 62 HGV trips (2-way) over a 12 hour period. The former NEG employee (as referred to in the TA under paragraph 5.1) indicated that daily HGV trips would have been in the order of 40 two-way movements per day.

In terms of the peak hours, the TRICS assessment suggests a maximum of 6 two-way HGV movements would be generated during the AM peak. Our assessment of HGVs (20-tonne bulkers – not RCVs) in the Transport Assessment (TA) concluded that 7 two-way HGV movements would have been generated during the peak hours. Therefore it is concluded that the assumptions made in the TA are commensurate with the TRICS data base.

A similar TRICS assessment has been made of the cars that would have been generated. Table 5-2 shows a summary of the output.

**Table 5-2
 Summary of TRICS Output (all vehicles)**

	Arrivals		Departures		Combined	
	Trip Rate	Count	Trip Rate	Count	Trip Rate	Count
12-Hour	1.89	227	1.99	238	3.88	465
24-Hour	2.08	250	2.10	254	4.20	504
AM Peak	0.32	39	0.09	10	0.41	49
PM Peak	0.06	7	0.32	38	0.38	45

Table 5-2 shows that general industry development of 12,000m² gross floor area, would generate over 500 total traffic movements (2-way) over 24 hours. Therefore it can be derived that 441 car trips (504 minus 63) would be generated.

Table 5-3 shows a comparison of the daily traffic movements predicted in the TA against the movements provided by the TRICS database.

**Table 5-3
TA Predicted traffic / TRICS Data Comparison**

	TRICS Data	TA Traffic	Difference
Cars / day	441	244	-197
HGVs / day	63	40	-23

As shown in Table 5-3, it can therefore be concluded that, according to the TRICS database, the proposed development (during both the construction and operational phases) would generate less traffic than if the site was occupied by general industrial development.

It should be noted that trips have been predicted for the EfW and the site's extant permission for general industrial development. The trips for the EfW have been predicted using a methodical system based on operating hours, vehicle capacities and anticipated staff numbers. Trips for the extant permission (based on 12,000m² gross floor area) have been derived through interrogation of the TRICS database.

Although a 12,000m² general industrial development would generate fewer trips in the peak hours, over a typical 24-hour period, it would generate a greater number of trips. This is because of the nature of the development types. An EfW is not a significant trip generator and the staff numbers required to operate such a facility are relatively low in comparison to general industrial development. A manufacturing development, for example, may have picking lines and high numbers of machine operators and administration staff, which would generate higher number of trips overall throughout a working day.

The TRICS computer output is included at Appendix C.

5.2 Existing Site Access

Access to the site is currently gained from Glass Avenue, which meets with Ocean Way in the form of a roundabout. The roundabout has a 40m diameter and has two-lane approaches on all four arms (Glass Avenue, Ocean Way eastbound and westbound and Portmanmoor Road).

Ocean Way is a single-carriageway road subjected to a speed limit of 30mph and is the main route linking the eastern area of the docks with Cardiff City Centre. The road is considered to be heavily trafficked, particularly during peak hours. As expected, due to the industrial nature of the area, it is also frequently used by heavy goods vehicles (HGVs).

Ocean Way, although unclassified, is of significant importance to Cardiff. It is considered by Cardiff Council to be a Main Distributor road which carries all the industrial traffic south of the City out towards the primary road network (A48(M) and M4 via Rover Way). Its significance is enhanced by its role as the main access route for the Port of Cardiff and for the Celsa steelworks.

5.3 Existing Traffic Flows

12-hour classified turning count data was provided by Cardiff Council for the Glass Avenue roundabout. The surveys were undertaken by Cardiff Council on 16th January 2007, and are considered by the Highway Authority to be suitable for the purpose of assessing the capacity of the roundabout. This data indicates that the roundabout has an AM peak hour 2-way throughput on Ocean Way of approximately 1920 vehicles, which reduces slightly in the PM peak with a 2-way flow of 1868 vehicles.

The throughput of HGVs during the AM peak constitutes 7.7% of the total flow, reducing in the PM peak to 4.6%.

The raw traffic survey data can be found in Appendix D. Drawing 16-5 illustrates the baseline peak hour traffic flows.

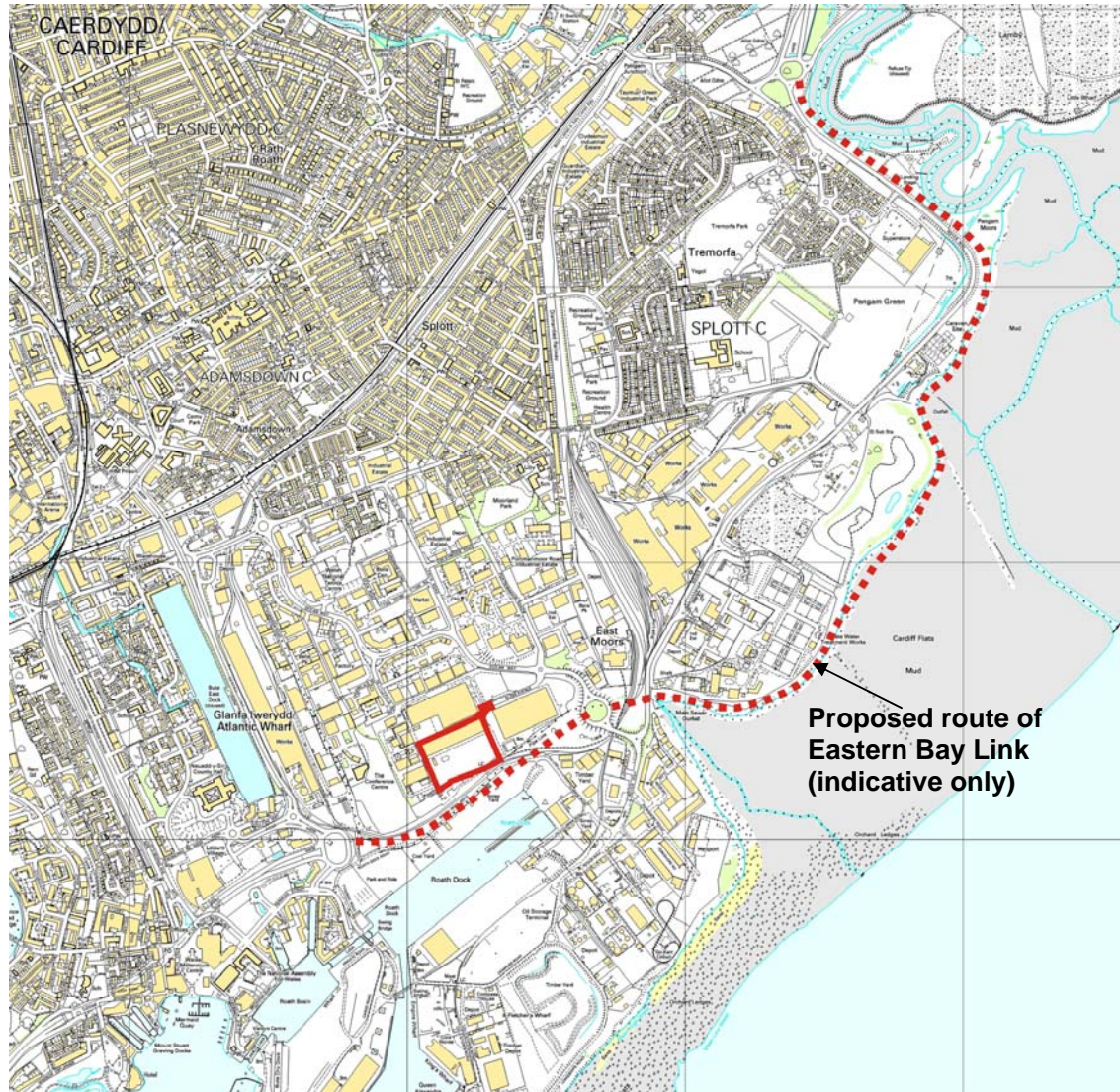
5.4 Committed Developments

In considering the impact of the proposed development on the overall pattern of traffic in Cardiff, it is relevant to consider those other proposals that are likely to come forward during the short to medium term.

5.4.1 Eastern Bay Link

Consideration has been given to including the effect of the proposed Eastern Bay Link (EBL) road on traffic movements in the area. The EBL will complete the Peripheral Distributor Road (PDR) by connecting the Butetown Link with Southern Way. Figure 5-1 illustrates the approved reserved route of the EBL.

**Figure 5-1
Reserved Route for the Eastern Bay Link**



The PDR is the key element of Cardiff's transport strategy to the east and west of the city, ensuring ready access from most areas of the city to the regional, national and international highway network. The primary function of the EBL would be to improve access from the east to the waterfront and City Centre. It would also serve the industrial employment areas at Ocean Way and Pengam Green. Completion of the road would make a significant contribution to the reduction of congestion on the A4161 Newport Road (approximately 2km to the north of the application site). It would also contribute towards enabling the reallocation of road space for public transport, cycling and walking on Newport Road.

SLR consulted Cardiff Council on 11 October, 2007 to establish what the latest situation was with regards to implementing the EBL. The response was:-

"The route that was approved by the Council is included in the Local Plan. We are currently investigating alternative options. However, we do not have any details regarding timescales at this stage".

It was further confirmed by Cardiff Council in January 2010 that the status of the EBL proposals remains as per the response received in October 2007.

In light of the above statement from Cardiff Council it has not been considered appropriate to consider the impact of the proposed EFW & RF with the EBL in place at this time.

5.4.2 Maritime Court

Planning permission for an office development (known as Maritime Court) in Trident Park was granted in July 2007. This development would require the use of the Glass Avenue roundabout as its access. The traffic that could be potentially generated by this development of 13,000 square metres has been considered in this TA through use of the TA undertaken for the Maritime Court development.

The TA for the development was produced by Savell Bird & Axon (SBAX). SBAX has confirmed that the following trips are predicted to be generated by the office development.

Table 5-4 Maritime Court Trips (2-way)

AM Peak		PM Peak	
Arrivals	Departures	Arrivals	Departures
191	21	32	137

Table 5-4 indicates that a total of 212 two-way trips could be generated by the proposed office development, when fully occupied in the AM peak and 169 two-way trips in the PM peak. These trips have been included in this TA for junction assessment purposes.

The trip distribution assumed by SBAX is 65% west towards Magic roundabout, 5% straight on along Portmanmoor Road and 30% east towards Rover Way.

5.4.3 Former Sandstore, Trident Park

The former sandstore at Trident Park has been granted planning permission for refurbishment and the introduction of use classes B1 and B8 (to accompany the existing B2 permission). The TA for the proposed indicated that the redevelopment would generate 100 arrivals in the AM peak and 100 departures in the PM Peak.

5.4.4 Veterinary Surgery

A development site on the western area of Trident Park is proposed to be developed and accessed off a new proposed junction on Nettlefold Road.

An assessment was undertaken which considered the implications of the above development on the local highway, in particular, at the junction of Nettlefold Road with Ocean Way. The assessment concluded that the trips in Table 5-5 would be added to this junction if the site was fully developed.

**Table 5-5
 Veterinary Surgery Trips**

	AM Peak (0800-0900)		PM Peak (1630-1730)	
	Arrivals	Departures	Arrivals	departures
No. of Trips	40	20	20	40
Totals	60		60	

It should be noted that none of the trips in Table 5-5 require access to Trident Park via the Glass Avenue roundabout. However 40% of the above trips have been assumed to travel from the east via Rover Way and will be required to travel through Glass Avenue roundabout. The impact of these trips on the roundabout has been considered in all capacity assessments.

5.4.5 CMC Steel Group

In September 2008, CMC occupied the buildings immediately to the north of the application site at Trident Park. The development trades and distributes steel products.

SLR met with CMC to discuss its typical peak hour traffic movements. It was confirmed by CMC that traffic movements usually take place outside of the peak hours and therefore it has not been considered necessary to add any CMC related trips to the baseline traffic flows. However, for the sake of being robust a nominal five 2-way movements are assumed to be generated by CMC during the morning and evening peak hours.

5.4.6 Total Committed Development Trips

Table 5-4 below indicates the number of trips that would be generated as a result of developing those parts of Trident Park excluding the application site and are either likely to require the continued use of the Glass Avenue roundabout as the primary means of access or would be required to travel through the Glass Avenue roundabout.

**Table 5-6
 Total Committed Development Trips (2-way)**

AM Peak (0800-0900)		PM Peak (1630 – 1730)	
Arrivals	Departures	Arrivals	Departures
331	41	52	277
372		329	

The trips in Table 5-6 have been included as part of the baseline traffic for the purpose of assessing the capacity at the Glass Avenue roundabout.

The distribution of the above trips on the local highway network has been assumed as follows:

- **Maritime Court:** The trip distribution assumed by SBAX is 65% west towards Magic roundabout, 5% straight on along Portmanmoor Road and 30% east towards Rover Way.
- **Former Sandstore:** Assumed that 50% is distributed east and 50% distributed west due to unknown residing location of potential employees.

- **PDSA:** Assumed to be in line with current traffic patterns on Ocean Way. This has been confirmed through the traffic survey as being approximately 40% to/from the east towards Rover Way and 60% to/from the west towards the 'Magic' roundabout.

The above developments are either constructed or have planning permission and as such the distributions have been agreed with the local planning and highway authority.

In addition to the above, a nominal number of bus and CMC trips, have been included in the base traffic for assessment purposes, to add to the robustness of the assessment.

6.0 TRAFFIC IMPACT ASSESSMENT: CONSTRUCTION PHASE

6.1 Introduction

In order to consider the implications for the highway network as a result of the construction of the proposed EFW & RF, a construction phase Transport Assessment has been undertaken. It covers all transport issues relating to the construction of the proposed development including the effect of construction traffic on the local highway network, sustainability, road safety and parking.

Subject to planning permission, it is proposed that construction of the EFW & RF would commence in 2011 and be completed within three years. The main elements of construction on the site are summarised below:

- earth moving operations and the removal of any waste as necessary;
- construction of building foundations and below ground elements;
- construction of building structure and facades;
- installation of mechanical equipment;
- site groundworks and landscaping; and
- testing and commissioning.

In terms of construction workers, the numbers involved would be variable in accordance with the programme of works. It is likely that the workforce would peak during months 18 to 30 of the build programme, during which period it is likely that there would be some 200-250 construction workers each requiring access to the development site on a daily basis.

The construction process will require imports of construction materials, machinery and plant to accord with the above elements. This section summarises the likely volumes of traffic associated with these activities and the impact that this could have on the adjacent transport network.

6.2 Construction Trip Generation and Distribution Assumptions

This section considers all traffic that would be generated during the construction phase and its distribution on the local road network. There are also a number of developments that are either already operational or committed within the Trident Park redevelopment area and details of the traffic that would be generated by them can be found in Section 5.

The distribution of the construction trips on the local highway network is based on the current east/west flow on Ocean Way as indicated by the survey data provided by Cardiff Council, which is approximately 50% east / 50% west.

6.2.1 Construction Trips

Based on the construction operations detailed above and an anticipated construction commencement date of 2011, construction traffic will access the site over a three year period, with peak construction vehicle movements likely to occur in 2011 and 2012.

All vehicular access to the construction works will be taken from Glass Avenue roundabout. It is envisaged that the construction traffic would be routed equally from the east and west.

HGV Trips

The number of HGV trips associated with the construction phase on a daily basis will depend on the successful contractor's preferred construction methods. Based on similar development, it is considered that, on average, there would be up to 25 HGV trips (50 movements) per day associated with construction.

This level of trip generation could reduce depending on certain construction methods, for example, use of a temporary concrete batching facility on site.

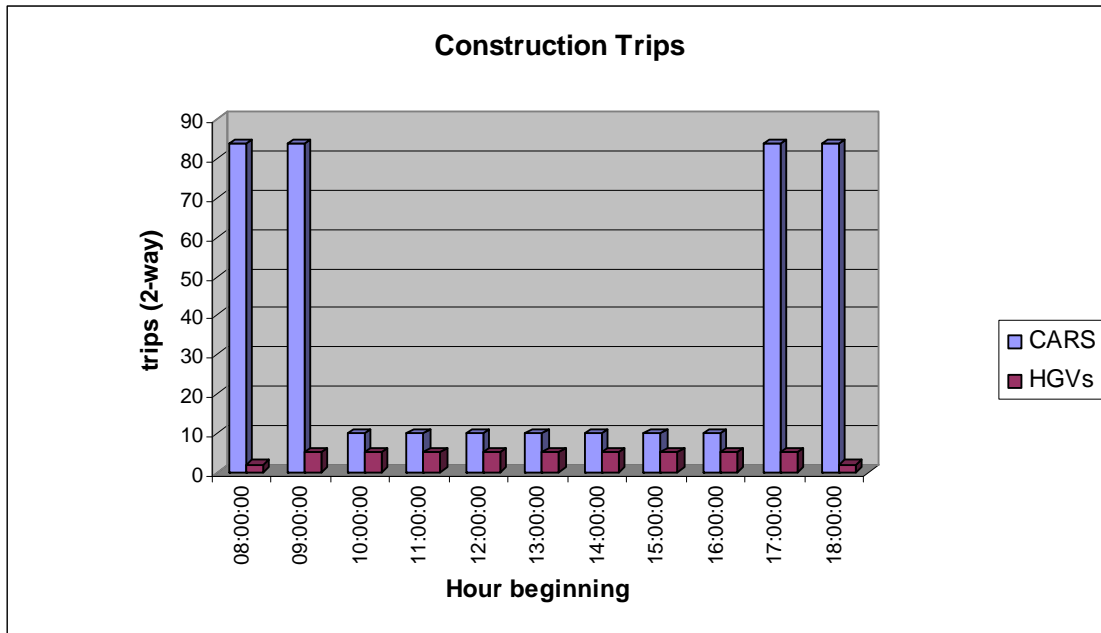
Car / Light Vehicle Trips

It is estimated that there would be up to approximately 250 construction personnel during the peak of the construction period (years 2 and 3). Given the location of the site, and the limited public transport provision at present, the assumption has been made that all of these personnel would be expected to arrive by road, as a car driver or passenger, or the successful contractor's own transport arrangements.

Cardiff Council has indicated that their latest available data indicates an average car occupancy rate in Cardiff of 1.39 persons per vehicle; this equates to **360 light vehicle trips per day** (2-way).

The distribution of the construction trips could not be determined without prior knowledge of workers' location of residence. Therefore, for the purpose of this assessment it has been assumed that there would be an even 50 / 50 split of traffic at the Glass Avenue roundabout. Figure 6-1 illustrates the expected flow of construction-related traffic over a typical day.

**Figure 6-1
 Construction Trips**



6.2.2 Duration of Construction

It is anticipated that following planning permission, construction would commence in 2011, with commissioning of the site planned for late-2013.

6.2.3 Days of Construction

It is expected that access to the construction site would be required on a daily basis. However, in order to provide a robust assessment it has been assumed that all construction trips would be generated during weekdays only.

6.3 Traffic Impact

The following sets out the predicted traffic impact that could be had on the local highway during the existing peak hours. The construction trips are based on the assumptions outlined above. The impact is based on the year 2012, by which time it is expected that the flow of construction traffic would be at its greatest.

**Table 6-1
 Construction Traffic Impact on Glass Avenue Roundabout**

2012 Base*		Construction Trips		Impact	
AM	PM	AM	PM	AM	PM
2562	2873	192	192	7.0%	6.3%

Table 6-1 demonstrates that, with less than a 10% increase on the background traffic, the impact of construction traffic on the Glass Avenue roundabout is not significant.

6.4 Junction Capacity Assessment

Given the limited availability of public transport to the site at present, in traffic impact terms, a worst case has been assessed which assumes that all construction workers would travel to the site by car. This assumption has been made purely for the undertaking of a robust capacity assessment.

6.4.1 Glass Avenue Roundabout

An ARCADY assessment of the Glass Avenue roundabout has been undertaken to determine how it would function with the construction trips added to the highway network.

ARCADY (**A**ssessment of **R**oundabout **C**apacity **A**nd **D**ela**Y**) is a computer software package, produced by the Transport Research Laboratory (UK), which provides information on traffic flow including modelling capacity queues and delays at roundabouts.

ARCADY requires inputs to be made by the program user in the form of roundabout geometry and traffic flows, including the percentage of HGVs.

With ARCADY the user can either use the default value for HGVs which is 10%, which the program will apply to all arms of the roundabout, or can introduce actual %HGVs if such information is available.

This data was made available through Cardiff Council's traffic count and therefore actual HGV proportions were input into the program. For information the HGV percentages are:

Table 6-2
Existing HGV Proportions

Roundabout Arm	AM	PM
Ocean Way East	7.3%	6.1%
Glass Avenue	0.0%	0.0%
Ocean Way West	9.2%	2.8%
Portmanmoor Road	19.0%	1.0%

A worst case has been considered which assumes that all construction related traffic would arrive in the AM peak and depart in the PM peak. The assessment considers the design year of 2012 by which time it is expected that the construction traffic would be at its greatest in terms of the number of vehicle movements. The ARCADY capacity results are measured as a Ratio of Flow to Capacity (RFC) and vehicle queue lengths and are shown in Table 6-3.

**Table 6-3
 Predicted Queues and Capacities at the Glass Avenue Roundabout, 2012, during
 Construction Phase**

Arm	Maximum RFC ¹		Maximum Queue	
	AM	PM	AM	PM
Ocean Way (East)	0.933	0.725	11	3
Glass Avenue	0.031	0.379	0	1
Ocean Way (West)	0.816	0.663	4	2
Portmanmoor Road	0.186	0.569	0	1

It is widely accepted, and stated in the Institute of Highways and Transportation publication ‘*Guidelines for Traffic Impact Assessment*’, that a roundabout operating with a Ratio of Flow to Capacity (RFC) of 0.85 is operating within its theoretical capacity, thus allowing 15% spare capacity for fluctuations in traffic, future traffic growth etc.

It can be seen in Table 6-3 that the Glass Avenue roundabout is predicted to operate over the recommended threshold figure but within its maximum capacity whilst the EFW & RF is under construction in 2012 with a maximum RFC of 0.905. This is not an indication that the junction would fail under the predicted future traffic loadings, particularly as queues are relatively low, but an indication that the junction is unlikely to be able to take a significant amount of additional traffic and still operate satisfactorily.

The above results are based on a worst case of no car-sharing taking place. As part of the planning application, a Construction Phase Travel Plan has been prepared (included at Appendix 8 of the ES).

In comparison to the 2017 assessment with the development in place, the difference in RFC is marginal (0.016) which indicates that the impact at the Glass Avenue Roundabout would remain consistent throughout the construction period and into the first few years of operation. Beyond this time, it is expected that measures will be in place (e.g. car share scheme) which will contribute towards reducing reliance on the private car.

6.5 Road Safety

With the introduction of a suitable traffic management scheme, it is considered that the works may be accommodated without an adverse impact on the public highway in terms of road safety.

As Principal Contractor under the CDM Regulations, the contractor will have an obligation to ensure that all works on site are undertaken in a safe manner. This will include deliveries to the site, and the Health and Safety Plan developed by the contractor will include a requirement for all drivers delivering to the site to drive with due care and attention and with specific regard to the safety of other road users.

Subject to the above consideration, it is envisaged that there would be no adverse impact on road safety during the construction phase.

¹ Ratio of Flow to Capacity

6.6 Mitigation

The key mitigation measure proposed is the preparation and effective implementation of a Travel Plan during the construction period. This is included at Appendix 8 of the ES.

The Travel Plan will be implemented in order to mitigate the impact of construction traffic during network peak hours. Elements of this plan include:

- coordination of car share for construction personnel;
- implementation of contractor operated mini bus service;
- restriction of unnecessary vehicle movements during the day; and
- co-ordination of deliveries to arrive outside of peak times where appropriate.

With the implementation of these measures, it can be expected that the level of light vehicles and HGVs can be effectively reduced.

6.6.1 Transport Implementation Strategy

A Transport Implementation Strategy has been produced which can be found at Appendix E. The TIS is designed to identify what policy objectives and requirements are set by the development plan, identify what access arrangements are required for a successful development and specify the package of physical, management and promotional measures needed to accommodate the requirements.

7.0 TRAFFIC IMPACT ASSESSMENT: OPERATIONAL PHASE

7.1 Introduction

Following the construction of the EFW & RF, commissioning of the site is likely to take place in mid-2013, with an anticipated fully operational date of 2014. This section of the TA considers fully, the traffic impacts that would result from operating the EFW & RF.

7.2 Trip Generation and Distribution Assumptions

In order to calculate the number of trips likely to be generated by the proposed EFW & RF , a number of assumptions have been made in relation to the source of journeys, the types of vehicle involved and the hours of operation. These are as follows:

7.2.1 Type of Vehicle

An assessment has been undertaken of the number and type of vehicles currently employed to discharge the waste management obligations of the five unitary authorities that constitute Project Gwyrdd.

On the basis of the information obtained, the assumption has been made that, in terms of HGV traffic, 50% of the waste received by Trident Park would arrive in 7-tonne capacity refuse collection vehicles (RCVs) and 50% of the waste would arrive in 20-tonne capacity bulk vehicles. In numerical terms this is considered to be a "worst-case" scenario, and that it is likely that the number of bulk vehicles would exceed 50% of the total number of movements.

7.2.2 Hours of Operation

Operations at the proposed site would be 24 hours a day. However, in order to calculate the “worst case” highway capacity assessment, it has been assumed that all deliveries would take place over a ten-hour period between 0700 and 1700 hrs. It should be noted that this does not imply any actual restriction on movement times. Occasional deliveries will occur outside of these hours.

7.2.3 Days of Operation

Again, to reflect “worst-case”, the traffic assessment has been based on 305 days per year (i.e. no Sundays or Bank Holidays). In reality, during the operational period, deliveries will be made every day including Sundays and Bank Holidays. Operations on Sundays and Bank Holidays would mean that there would be less burden on the highway during weekdays.

7.2.4 Residual Movements

As a result of the combustion process, residual products are fly ash, bottom ash and metals; all of these materials will be removed from the development site by road.

The specification for the EFW & RF envisages that the average residual output will be approximately 25% of input (i.e. 87,500 tonnes per annum). However, for the purposes of a worst-case situation, the TA assumes an output of 30% (i.e. 105,000 tonnes per annum).

7.3 Trip Generation and Distribution

7.3.1 Waste Trips

The proposed EFW & RF is designed to have the capacity to receive up to 350,000 tonnes of waste per annum. The following calculations have been provided to demonstrate how the development trips have been derived.

RCVs are expected to cease delivering to the EFW & RF by approximately 1600 hrs, thus reducing the number of EFW & RF-related trips on the highway network during the evening rush hour. The following figures therefore represent the AM peak only as this would be the worst case. To further increase the robustness of the capacity assessments, it has been assumed that all EFW & RF related trips would be on the highway between 0700 and 1500 hours.

All trips quoted are two-way.

- 350,000tpa;
- 7 tonne RCVs – 50%;
- 20-tonne bulk vehicles – 50%;
- 8-hour operation (0700 -1500);
- waste received 305 days per year;
- therefore, 1148 tonnes per day: 574t by RCV, 574t by bulk.
 - = 164 trips per day / 20 trips per hour by RCV
 - = 58 trips per day / 7 trips per hour by 20-tonne bulk vehicles
- **Total of 221 trips per day / 22 trips per hour**

There would be EFW & RF-related traffic on the highway until 1700hrs but the number of vehicles would be less after this time as all RCVs would have finished their deliveries by then. However, for the purpose of undertaking a robust assessment, it has been assumed that the above trips would also be present during the PM peak hour.

7.3.2 Residual Waste Trips

Following the combustion process, there would be a 30% residual fly ash, bottom ash and metals produced which would require exportation. This would result in the following trips being generated. All trips quoted are 2-way.

- 105,000 tonnes of bottom ash, fly ash and metals;
- all residual waste to be exported in 10 tonne lorries;
- assume residual waste exported 305 days per year;
- exported over 10 hours per day;

- **Therefore 320 tonnes per day = 34 trips per day / 3-4 trips per hour.**

7.3.3 Staff Trips

The proposed development is anticipated to create up to 50 direct jobs. Employees will rotate on a shift basis and therefore approximately 25-30 staff would be employed at the site at any one time. However, as a worst case, it has been assumed that 50 staff would arrive individually by car in the AM peak and depart individually during the PM peak.

7.3.4 Total Development Trips

Table 7-1 illustrates the breakdown of total trips that are predicted to be generated by the proposed EFW & RF.

**Table 7-1
Total EFW & RF Trips (2-way)**

Vehicle type	AM Peak (0800-0900)		PM Peak (1630-1730)		24 hours	
	Arrivals	departures	Arrivals	departures	Arrivals	departures
7-tonne RCVs	10	10	0*	0*	82	82
Bulk Vehicles (waste)**	4	4	4	4	29	29
10-tonne Vehicles (residual waste)	2	2	2	2	17	17
Cars (staff)	50	0	0	50	50	50
Total Trips	66	16	6	56	178	178

*assumes RCVs would not operate in the PM peak hour.

**Figures rounded up for robustness.

It can be seen in Table 7-1 that the proposed development is not anticipated to generate a significant number of trips, particularly when compared to the existing situation and historic usage of the site, even though traffic flows have been overestimated for robustness. This is demonstrated in percentage impact terms in Table 7-3.

The above table represents a worst case for staff traffic. It is expected that, through a Travel Plan (Appendix 8) which accompanies the Planning Application for the development, car movements can be reduced further through car-sharing, walking and cycling.

The development trips are represented diagrammatically in Drawing 16-6.

7.4 EFW & RF Trip Distribution

7.4.1 Waste Trips

The exact source of waste is not defined in detail at present. However, for the purpose of assessing the potential impact, a worst possible scenario has been considered. The worst case from a highway impact perspective is that the majority of waste traffic would utilise Rover Way / Lamby Way as the main route to and from the application site. It has been assumed that 70% of the waste traffic would travel this route.

It should be noted that RCVs are unlikely to be on the road after 1600hrs, thus not impacting on afternoon peak hour traffic. Furthermore, at the request of Cardiff Council, it has been agreed that HGVs would not be routed along Portmanmoor Road or Seawall Road during peak times.

7.4.2 Cars

The residing location of staff is unknown at present. Therefore, for the purpose of this TA it has been assumed that all cars would be distributed as per the current east/west movements on Ocean Way. Based on the survey undertaken by Cardiff Council, this is a split of approximately 50/50 during both peak hours.

The distribution of the development traffic (waste and staff traffic) is shown on Drawing 16-7.

7.5 Traffic Impact Assessment

As agreed with Cardiff Council, due to the relatively low number of trips that are predicted to be generated in the context of the surrounding road network, the study area consists of the Glass Avenue Roundabout only. This is on the basis that it can be demonstrated that the impact on other local roads in the vicinity of the site, would not exceed 5%.

Baseline traffic information has been obtained from Cardiff Council in the form of a 12-hour manual turning count for the Glass Avenue roundabout. The surveys were undertaken on Tuesday 16th January, 2007 (and are included at Appendix D).

Although the proposed would operate on a 24/7 basis, it is anticipated to receive waste 10 hours per day (0700 to 1700). RCVs are not anticipated to deliver waste after 1600hrs.

The baseline traffic data suggests that traffic is heaviest during the following periods and have therefore been the periods used for assessment purposes:-

- AM peak 0800 – 0900
- PM peak 1630 – 1730

It is anticipated that the development would be in place by 2014. Therefore, the impact on the local highway has been assessed for the opening year of 2014 and, as agreed with Cardiff Council, a design year of 2019.

7.5.1 Traffic Growth

In order to provide 2014 and 2019 baseline traffic flows, the Department of Transport's National Trip End Model (NTM) factors have been adjusted using Tempro to provide local traffic growth factors which are representative of Cardiff.. The Department has developed the NTM as an analytical and policy-testing tool. NTM provides a systematic means of comparing the national consequences of alternative national transport policies or widely-applied local transport policies, against a range of background scenarios which take into account the major factors affecting future patterns of travel.

This method of traffic forecasting is different to that used for the previous application which was based on the National Road Traffic Forecasts; this method is no longer used by transport planning practitioners as the results do not accurately represent the traffic flows to a specific local area. The above method, used for this TA, is the latest methodology used for forecasting local traffic growth.

NTM is subject to a programme of continuous improvement. Model development takes place alongside its use within the Department to provide "best available" advice to policy-makers.

The factors in Table 7-2 have been applied to the 2007 survey data in order to obtain traffic flows for 2014 and 2019.

**Table 7-2
 Traffic Growth Factors**

Period	NRTF Central factor	
	AM	PM
2007 - 2010	1.036	1.035
2007 - 2014	1.141	1.140
2007 - 2019	1.233	1.233

7.5.2 Traffic Impact

The impact that the proposed development could have on the Glass Avenue roundabout has been calculated as per Table 7-3.

**Table 7-3
 Traffic Impact on Glass Avenue Roundabout**

2014 Base*		Development Trips		Impact	
AM	PM	AM	PM	AM	PM
2668	2993	82	62	3.1%	2.1%

* includes traffic generated by other committed developments at Trident Park.

Table 7-3 indicates that the proposed development would add up to 82 trips to the junction in the AM peak hour, an impact on the existing situation of 3.1%.

Guidance published by the Institute of Highways and Transportation recommends that a development which has a traffic impact exceeding 5%, should normally result in undertaking capacity assessments to ensure that the junction(s) in question would continue operating satisfactorily when subjected to increased traffic flows.

However, under new guidance (GTA) the above is no longer considered a suitable means for determining whether a junction should be assessed or not. Therefore, although the impact shown in Table 7-3 does not exceed 5%, for completeness and robustness, capacity assessments have been undertaken to determine the future operation of the Glass Avenue roundabout with the development in place.

7.6 Junction Assessment

In accordance with the scoping opinion of Cardiff Council, capacity assessments have been undertaken for the Glass Avenue roundabout using the ARCADY computer program. Assessments have been undertaken for the anticipated opening year of 2014 and a design year of 2019.

7.6.1 Current Situation (2010)

The Glass Avenue roundabout has been assessed using baseline traffic figures, which incorporates the traffic that could be generated by the other committed developments described in Section 5. The purpose of this is to provide, as accurately as possible, a platform on which to compare the junction's predicted future performance. Table 7-4 contains a summary of the ARCADY results for 2010.

**Table 7-4
 Existing Queues and Capacities at the Glass Avenue Roundabout, 2010 (no development)**

Arm	Maximum RFC		Maximum Queue	
	AM	PM	AM	PM
Ocean Way (East)	0.662	0.670	2	2
Glass Avenue	0.006	0.013	0	0
Ocean Way (West)	0.631	0.544	2	1
Portmanmoor Road	0.138	0.455	0	1

The results in Table 7-4 indicate that the Glass Avenue roundabout is currently operating with an RFC of 0.662 during the AM peak and 0.670 during the PM peak. Both AM and PM peak hour RFC values are lower than the recommended maximum threshold of 0.85 which suggests that there are no operational issues with this junction at present. The table also demonstrates that there is no notable queuing at the roundabout at present.

7.6.2 2014 Assessment (no Development)

Table 7-5 shows a summary of the ARCADY output for the Glass Avenue roundabout in 2014 without the development in place.

**Table 7-5
 Existing Queues and Capacities at the Glass Avenue Roundabout, 2014 (no development)**

Arm	Maximum RFC		Maximum Queue	
	AM	PM	AM	PM
Ocean Way (East)	0.788	0.688	4	2
Glass Avenue	0.030	0.161	0	0
Ocean Way (West)	0.719	0.608	3	2

Arm	Maximum RFC		Maximum Queue	
	AM	PM	AM	PM
Portmanmoor Road	0.162	0.493	0	1

Table 7-5 shows that the Glass Avenue roundabout is predicted to continue operating satisfactorily in 2014 without the development in place with a maximum RFC of 0.788 and queue of 4 vehicles.

7.6.3 2014 Assessment (with Development)

Table 7-6 contains a summary of the ARCADY output for the 2014 assessment with the proposed development in place.

**Table 7-6
 Predicted Queues and Capacities at the Glass Avenue Roundabout, 2014, (with development)**

Arm	Maximum RFC		Maximum Queue	
	AM	PM	AM	PM
Ocean Way (East)	0.824	0.764	5	3
Glass Avenue	0.048	0.245	0	0
Ocean Way (West)	0.741	0.695	3	2
Portmanmoor Road	0.166	0.605	0	2

It can be seen in Table 7-6 that, with the proposed development in place in 2014, the Glass Avenue roundabout is predicted to operate within capacity and within the maximum threshold RFC of 0.85 and with negligible queuing. .

7.6.4 2019 Assessment (no Development)

Table 7-7 provides a summary of the ARCADY results for the Glass Avenue roundabout in 2019 with no development in place.

**Table 7-7
 Predicted Queues and Capacities at the Glass Avenue Roundabout, 2019, (without development)**

Arm	Maximum RFC		Maximum Queue	
	AM	PM	AM	PM
Ocean Way (East)	0.930	0.688	11	2
Glass Avenue	0.037	0.161	0	0
Ocean Way (West)	0.847	0.608	5	2
Portmanmoor Road	0.212	0.493	0	1

Table 7-7 shows that, without the development in place, the Glass Avenue roundabout is predicted to operate close to its maximum capacity with an RFC of 0.930 in the AM peak. The roundabout is predicted to operate satisfactorily in the PM peak with a maximum RFC of 0.688. The critical arm of the junction is Ocean Way westbound. All other approaches are predicted to operate satisfactorily during both peak hours.

7.6.5 2019 Assessment (with Development)

Table 7-8 contains a summary of the queues and capacity predicted for the roundabout in 2019 with the proposed development and all currently known committed developments in place and fully occupied.

**Table 7-8
 Predicted Queues and Capacities at the Glass Avenue Roundabout, 2019, (with development)**

Arm	Maximum RFC		Maximum Queue	
	AM	PM	AM	PM
Ocean Way (East)	0.968	0.691	17	2
Glass Avenue	0.058	0.222	0	0
Ocean Way (West)	0.870	0.616	6	2
Portmanmoor Road	0.219	0.503	0	1

Table 7-8 indicates that the Glass Avenue roundabout is predicted to operate within its maximum theoretical capacity in 2019 when the proposed development is in place with a maximum RFC of 0.968 and maximum queue of 17 vehicles. However, the predicted RFC is greater than the desirable maximum figure of 0.85.

As junctions exceed an RFC value of 0.85 and approaches 1.00, they may start to see signs of delay and congestion. It is therefore recommended that minor improvement works are undertaken at the roundabout in order to accommodate future development traffic.

Such works have been investigated by SLR and Drawing 16-8 illustrates the improvements required to ensure that the roundabout will continue operating satisfactorily with the proposed development in place in 2019.

The roundabout has been re-assessed for 2019 assuming the improvements are in place. The results of the assessment are shown in Table 7-9.

**Table 7-9
 Predicted Queues and Capacities at the Improved Glass Avenue Roundabout, 2019, (with development)**

Arm	Maximum RFC		Maximum Queue	
	AM	PM	AM	PM
Ocean Way (East)	0.838	0.600	5	1
Glass Avenue	0.059	0.222	0	0
Ocean Way (West)	0.870	0.616	6	2
Portmanmoor Road	0.219	0.503	0	1

It can be seen from the results in Table 7-9 that, with improvements made to the Glass Avenue roundabout, it is predicted to operate better in 2019 with the development in place than in 2019 without the development. It can therefore be concluded that the proposed improvements would provide suitable mitigation for the development traffic.

The ARCADY outputs can be found in Appendix F.

7.7 Impact at 'Magic' Roundabout and Roundabout East of Glass Avenue

As requested by Cardiff Council an assessment has been carried out to determine what the impact would be on the Magic roundabout (i.e the junction of Ocean Way and East Tyndall Street) and the roundabout east of the Glass Avenue roundabout. The tables below display the traffic impact that would be had at each of these junctions.

Table 7-10
Traffic Impact at 'Magic' Roundabout and Roundabout East of Glass Avenue

Roundabout	2014 base*		development trips		impact	
	AM	PM	AM	PM	AM	PM
'Magic' Roundabout	2190	2174	33	29	1.5%	1.3%
Roundabout east of Glass Avenue	2050	2431	47	35	2.2%	1.4%

*Includes committed development traffic.

In producing this TA, traffic data was supplied by Cardiff Council for the Glass Avenue Roundabout. However, in order to provide a more detailed impact assessment of the 'Magic' roundabout peak hour traffic surveys were carried out on the Ocean Way approach of the roundabout on Tuesday 27 January 2009. The resulting impact of the proposed EfW facility is shown in Table 7-11.

Assessing the impact on Ocean Way only is the most robust method of assessing the impact on the Magic roundabout. Assessing the impact on the roundabout as a whole would result in even less of an impact as the background traffic would be much greater.

Table 7-11
Traffic Impact at Magic Roundabout (Ocean Way approach)

2013* base		development trips		impact	
AM (0800-0900)	PM (1630 - 1730)	AM (0800-0900)	PM (1630 - 1730)	AM (0800-0900)	PM (1630 - 1730)
1002	1423	4	28	0.4%	1.9%

*opening year

It can be seen in Table 7-11 that the impact at the 'Magic' roundabout remains negligible at less than 2%, which is below Cardiff Council's threshold figure of 5%.

The conclusion to be drawn from Tables 7-10 and 7-11 is that the impact on the local highway east and west of Glass Avenue roundabout is negligible. The greatest impact can be had in the morning peak hour on the roundabout east of Glass Avenue with an impact of 2.2%. As suggested by Cardiff Council, an impact of less than 5% is not deemed significant and therefore there is no requirement for assessing the highway beyond Glass Avenue roundabout.

7.8 Conclusion

The Glass Avenue roundabout is currently operating within capacity which means that there is spare capacity within the junction to allow for future traffic growth. By 2014 it is predicted to continue operating satisfactorily. With the development fully operational in 2014, the Glass

Avenue roundabout is still predicted to continue operating satisfactorily. However, by 2019 the roundabout is predicted to operate close to its maximum theoretical capacity in 2019 with a maximum Ratio of Flow to Capacity (RFC) of 0.930, even without the development in place. With the development in place, the maximum RFC predicted is 0.968, which means that the roundabout is very close to operating at its maximum capacity with no spare capacity for fluctuations in traffic, forecast traffic growth etc.

It is therefore proposed to carry out improvement works to the Glass Avenue Roundabout in order to accommodate the development traffic. The works are required to increase the flare length and entry width at the roundabout and with these improvements in place the roundabout is predicted to operate with spare capacity.

As indicated in Table 7-10 and 7-11, the proposed development is anticipated to have a negligible impact east and west of Glass Avenue on Ocean Way; the overall traffic impact is not anticipated to exceed 2.2% of the existing traffic on Ocean Way. This figure is considered by Cardiff Council to be insignificant in terms of additional traffic generated (i.e. less than 5% of the total existing traffic on Ocean Way).

8.0 PARKING

8.1 Construction Phase

This section addresses the issues relating to parking at the development site during the construction process. Where possible, the proposals for providing parking spaces contained in this TA have been designed whilst following the guidance in Cardiff Council's document 'Access, Circulation and Parking Requirements' (ACPR).

Parking for construction workers would be provided prior to the commencement of construction works on site. It is not possible to accurately determine the number of workers and their travel patterns at this stage and therefore the number of parking spaces to be introduced cannot be planned in detail. However, it is likely that the majority of construction workers would travel to the site by car, either alone or by car sharing.

Most other modes of travel to the site are not easily achievable and therefore car-sharing would be the most practical way of reducing the traffic impact on the local highway. Car sharing would be promoted through a Construction Phase Travel Plan.

8.2 EFW & RF Operation

Where possible, the proposals for providing the various forms of parking spaces contained in this TA have been designed in the context of the ACPR.

8.2.1 Car Parking

Appendix A of ACPR stipulates that for industry (premises over 1000m²) located in non-central areas, the non-operational requirement is a maximum of 1 space per 120m² gross floor area (GFA). The GFA of the proposed development is approximately 11,850m², which would stipulate a maximum of 98 parking spaces to be introduced on site. The proposed development as shown in Drawing 16-3 illustrates that 52 parking spaces are to be introduced, which is well within the maximum that could be allocated.

8.2.2 Cycle Parking

The Cycle Parking Guidelines are contained in Appendix C of the ACPR and state that, for industrial development, one stand is required for every 500m² of development for employees. Based on the footprint area of the proposed development, this equates to a minimum requirement of 23 cycle parking spaces. There is also a minimum requirement of 1 cycle stand per 1000m² of development for visitors, equating to 12 cycle stands.

Therefore it is proposed that 15 cycle stands be provided, which could accommodate up to 30 bicycles. This is in accordance with the Supplementary Planning Guidance: Access Circulation and Parking Requirements, Cardiff Council, June 2006. The design and layout of these will be dealt with by condition. It is proposed to introduce these spaces in the form of 'Sheffield' (or similar) cycle stands as shown in Photo 8-1.

Photo 8-1
'Sheffield' Cycle Stand



8.2.3 Parking for Mobility Impaired

Appendix A of the ACPR states that parking bays for disabled people should be provided as follows:-

- in car parks of up to 200 spaces, individual bays for each employee who is a disabled motorist plus 2 bays or 5% of total car park capacity, whichever is the greater.

The number of disabled persons that would be employed is currently unknown. 5% of the total car park capacity equates to 3 disabled bays. However, it is recognised that this is a minimum requirement and therefore the proposal is to introduce 4 disabled spaces.

8.2.4 Parking for Powered 2-wheelers

The ACPR states that parking for motorcycles should be provided at a rate of 1% - 5% of the total number of parking spaces. This equates to 1 – 5 parking spaces. To encourage use of motorcycles as an alternative to the car, it is proposed that the maximum of 5 motorcycle parking spaces be provided.

9.0 ACCIDENTS – AWAITING UPDATED DATA

9.1 Introduction

In considering the effect of a proposed development on an existing road network, it is relevant to review the situation with regards to accidents and whether the scheme would adversely impact on accident rates and severity.

Personal injury accident data has been obtained from Cardiff Council for the period 1 July 2004 to 1 July 2009 for Ocean Way between and including its junctions with Rover Way and Guest Road. The data indicates that 6 accidents have been recorded over this period, all of which were classified as being “slight” (i.e. casualties involved only received minor injuries). A summary of the accidents can be found below.

These accidents are summarised below.

9.1.1 Accident 6758

This accident took place on Rover Way at the northbound approach to the roundabout junction with Ocean Way. The accident was a rear shunt which involved three cars. The accident took place under fine, dry conditions and was the result of driving too close.

9.1.2 Accident 6928

This accident took place at the junction of Ocean Way with Guest Road. It involved a light goods vehicle (LGV) and a car. The LGV turned right (in or out of the junction) into the path of the car causing a collision. The accident took place during daylight and in fine, dry conditions. The driver of the LGV had failed to look properly.

9.1.3 Accident 7756

This accident took place at the large roundabout on Ocean Way between Rover Way and Glass Avenue. It involved a single car which hit a kerb and barrier whilst travelling around the roundabout. The accident took place in fine, dry conditions and during daylight. The driver had lost control of the vehicle.

9.1.4 Accident 8185

This accident took place at the junction of Ocean Way with Lewis Road and involved two cars. One of the cars had turned right into the path of the other. The weather was fine and dry and the time of the accident. The accident was the result of a motorist who failed to look properly.

9.1.5 Accident 10119

This accident took place at the roundabout at the junction of Ocean Way with Rover Way and involved a car and a goods vehicle. The car entered the roundabout in the wrong lane

and collided with the goods vehicle. The accident took place during darkness (street lights lit) and in dry conditions.

9.1.6 Accident 10996

This accident took place at the roundabout at the junction of Ocean Way with Rover Way and involved two cars. The accident took place in fine weather but the road surface was wet. The accident was due to one or both of the motorists driving carelessly / recklessly / in a hurry.

9.2 Accidents Conclusion

Due to the low number of accidents recorded, the accident data suggests that Ocean Way is not a dangerous road. Furthermore, there have been no accidents recorded in the past 5 years that have involved pedestrians or cyclists. It is demonstrated by the causes described in the records that the accidents were a result of driver error.

Based on the above factors, it is therefore unlikely that the relatively modest increase in the number of trips, that would result from the proposed EFW & RF, would have a significantly detrimental impact on Ocean Way in terms of road safety.

The raw accident data can be found along with a location plot of the accidents in Appendix G.

10.0 ALTERNATIVE WASTE MOVEMENT

10.1 Introduction

The most obvious option for reducing the numbers of HGV movements would appear to be the importation of waste by rail as the site is located adjacent to railway lines associated with port-related operations. This section therefore gives detailed consideration to the option of importing waste to the EfW & RF by rail.

10.2 Consultation

In order to consider the options available for importing waste to the proposed EfW & RF by rail, SLR consulted with Network Rail's (NR) Senior Route Freight Manager on 22 July 2008.

There were a number of points made by NR with regard to importing waste by rail. Some points were related to economics whilst others were more of a routing and availability of train path nature. The key issues identified were:

- trains would be required to transport 1000 tonnes of waste per train to make the rail option viable;
- options for transporting waste are by container or sheeted open wagons;
- there are no rail paths available during peak periods;
- if containers were used, they would require chamfered roofs to be able to get under bridges which were originally designed to accept coal wagons which were much smaller than containers.
- a minimum haulage arrangement of 5 years would be required.
- an agreement would have to be made with Associated British Ports (ABP) over the use of their land for installing new rail infrastructure and operating trains.
- trains on ABP land are not regulated.

- NR recommended speaking to the Welsh Assembly Government regarding grant funding and revenue support.
- NR recommended talking to at least two rail operators to establish the viability of using their trains for importing waste to the EFW & RF.

Further investigation has been undertaken following the meeting with NR to establish the full potential for importing waste by rail.

It is understood through discussions with NR that an agreement would need to be sought from ABP for the use of railway workings on their land.

SLR contacted ABP to determine the correct protocol in operating a freight rail service on its land. ABP responded with the following advice:-

“Infrastructure ownership in the area is quite complicated with a possibility of having to involve Network Rail, EWS and Celsa as well as ABP. Making a rail connection to your client’s site could involve all of these organisations.

Irrespective of the connection arrangements trains would have to access your client’s site via ABP land. Permissions to use the rail infrastructure would be obtained by the nominated Freight Operating Companies (FOC’s).

Fees for access would be incorporated into the charges quoted by the FOC for the carriage of the goods.

Under arrangements that will soon be changing, ABP would make a charge for trains using our rail infrastructure”.

10.3 Waste Transfer

In addition to the complicated nature of the track arrangements and routes, a further issue is the availability of land for waste transfer points onto the rail network.

In order for rail to become a viable option for importing waste, there must be sufficient land available at suitable locations in the rail network to introduce the infrastructure necessary for bringing in waste. This would include enough land to install an interchange point for offloading waste from RCVs, bulk loaders etc into rail containers or open wagons. Each depot would also require land for a small office and parking spaces. It is envisaged that an area of approximately 1 – 2 hectares would be required for introducing each waste transfer location. Such a facility would require appropriate road links as well as being in close proximity to railway infrastructure.

A review of potential locations within the 5 authorities of Project Gwyrdd has been undertaken.

10.3.1 Cardiff

The location of the site within Cardiff precludes the potential for rail transfer given the limited transfer distances.

10.3.2 Vale of Glamorgan

The rail network in the Vale is limited to the main line from Cardiff to Bridgend, and the routes to Barry. The only potential sites would be located in Barry. There may be

opportunities to provide a transfer facility north of Harbour Road; waste lorries could access the area from Powell Duffryn Way. This area of land is bounded to the northeast by Barry Docks and to the east by existing industrial development. Railway sidings run along the west of the site. The site is approximately 14 hectares in area and therefore large enough to manage the waste arisings from the Vale of Glamorgan.

There may also be opportunities along Ffordd y Mileniwm for introducing a transfer facility. There are two locations which could be suitable for introducing the necessary facilities. One of these sites is approximately 3.6 hectares and is situated adjacent to the main railway line running through Barry and is located directly north of Barry Docks. The other suitable site is located approximately 1km to the north east and has an area of approximately 7 hectares. However, both the road and rail network run parallel to one another to the northwest of the site and therefore there could be transport infrastructure issues to overcome. This may involve the road network being re-aligned or new rail infrastructure introduced which would have to cross the road network. It is therefore considered that these options are unlikely to be feasible.

10.3.3 Monmouthshire

The rail network in Monmouthshire is such that there is no potential for rail freight facilities.

10.3.4 Newport

The most obvious location, for a waste transfer facility in Newport, is the Llanwern Steelworks site. Planning permission has recently been granted for a mixed use development to include an area of B1, B2 and B8 uses.

The other potential option in Newport is the former Pirelli Cable site, which is located approximately 3km west of the Llanwern Steelworks site. A waste transfer facility at this location however, would require a frequent flow of waste vehicles to travel through the adjacent residential area.

Other options in Newport include the Wall's Recovery site and the Mon Bank Sidings site (to the west of the City Centre). The Wall's Recovery site is currently occupied and would therefore have to be acquired. This site is ideally suited to locate a waste transfer facility as railway sidings exist directly adjacent to the site and there are good road links to the site.

Mon Bank Sidings is a site which Newport Unlimited are looking to develop as a Hospital District and residential development. However, this site has potential for transferring waste from road to rail due to the existing railway sidings.

10.3.5 Caerphilly

The Ffos-Y-Fran Land Reclamation Scheme, located to the east of Merthyr Tydfil, involves the reclamation of over 400 hectares of derelict land. Adjacent to the site (under Miller Argent's ownership) is an existing coal Disposal Point with a rail head and several rail sidings.. It may be possible for the rail infrastructure in this area to be utilised for importing waste to the EFW & RF facility.

Approximately 0.5km south of Rhymney Station is an area of significant industrial activity within which it may be possible to introduce a waste transfer station. The railway line runs northwest to southeast along the eastern perimeter of this site and the A469 runs along the opposite side of the site which makes it suitable in terms of road and rail access.

10.4 Rail Conclusions

It was indicated by NR that pathway availability over the South East Wales rail network is at a premium, particularly through Cardiff Queen Street Station. The limitations imposed by this, allied with transfer station constraints, preclude the potential to transport waste by rail to Trident Park.

10.5 Sea-borne Transport

The proximity of the site to the Port of Cardiff (Roath Dock) is such that consideration has been given to the potential for water-borne movements. As with the potential for rail imports, the practicality of this is severely restricted by the quantity of waste available, the location from which it arises, and the logistics of road-ship-road haulage. These factors all diminish the potential environmental benefits that might otherwise arise.

11.0 SUSTAINABILITY

11.1 Public Transport

The potential exists to mitigate the relatively small impact that construction workers and staff travel might have on the amenity and capacity of the road network. In order to assist in the achievement of this, both during construction and operational phases, a Travel Plan has been prepared and submitted as Appendix 8. The Applicant is prepared for this plan (or any subsequent reasonable revision) to be implemented as a pre-commencement condition. In terms of existing alternatives for travelling to the private car, the following constitutes the available options.

11.1.1 Rail

The rail network directly associated with Cardiff Docks and the Trident Park site is associated exclusively with industrial activity in the area and the passenger infrastructure is poor. The industrial railway network is not considered to be appropriate to accommodate a passenger station and there are no proposals by the Welsh Assembly Government, Cardiff Council or Network Rail to introduce one.

There are three existing passenger railway stations within 2.5 kilometres of the site: Cardiff Central (2km) Cardiff Queen Street (1.7km) and Cardiff Bay (1.3km).

Cardiff Central Railway Station

Cardiff Central is a main line station located on the London to Swansea inter-city route. It is also a hub for local suburban and Valley Lines services.

Cardiff Queen Street Railway Station

Queen Street Station serves the eastern side of Cardiff City Centre and accommodates trains for the suburban railway system. In addition, a short and regular shuttle service operates between Queen Street Station and Cardiff Bay.

Cardiff Bay Railway Station

This station serves the Cardiff Bay and Butetown areas of Cardiff. It is the southern terminus of the Butetown Branch Line, 1.5 km south of Cardiff Queen Street.

It is recognised that the three most local railway stations are not ideally located for employees working at Trident Park. However, travel by rail will be promoted in a Travel Plan and in particular would be aimed at those willing to travel by interchanging between cycle and train.

Although there are bus services which link Cardiff Central Station with Ocean Way, services are currently limited. The following section describes the bus services which could be utilised by those working at Trident Park.

11.1.2 Bus

The current bus service in the vicinity of Trident Park is a limited service operated by Cardiff Bus. There are currently only three buses per day which stop on Ocean Way.

1 – Bay Circle Clockwise

This service travels to Cardiff Central Station from Ocean Way, calling at Freshmoor Road and Tyndall Street, and runs only once a day, leaving Ocean Way at:

- 1706

2 – Bay Circle Anti-clockwise

This service operates from Cardiff Central Station and stops at Tyndall Street and Freshmoor Road before stopping at Ocean Way. This service arrives at Ocean Way twice a day in the morning peak at:

- 0722 and 0820

11.2 Walking and Cycling

The Travel Plan assesses the quality of facilities for those who may wish to walk or cycle to work. Although the residential density in the area is significant, the footway network is poor, and crossing Ocean Way on cycle or on foot is difficult.

12.0 MITIGATION

The conclusion of the construction and operational traffic impact assessments has determined that the proportional increase in traffic movements on Ocean Way and all the relevant junctions is such that there would be an adverse effect on the highway in terms of traffic capacity at the Glass Avenue roundabout. Therefore it is proposed to introduce minor improvement works to increase the available capacity at the roundabout in 2019. Details of the proposed works are described below. The proposals are also included in the Transport Implementation Strategy.

12.1 Improvements to Glass Avenue Roundabout

The impact on the Glass Avenue roundabout in 2019 has resulted in the need to mitigate against the adverse effect on capacity by introducing minor improvement works.

The improvement works will include providing a wider 3-lane entry on the westbound approach on Ocean Way and increasing the length of the flared approach from 21m to 64m.

The proposed works are illustrated in Drawing 16-8.

12.2 Travel Plans

One of the key impacts as a result of the EFW & RF is caused by the increase in traffic. The main method of helping to address the issues of traffic generated by new developments is to introduce Travel Plans. It is proposed to introduce two Travel Plans on the site; one for the construction phase and another for when the facility is operational.

12.2.1 Construction Phase Travel Plan

The Construction Phase Travel Plan will address how construction workers will travel to and from the site. The majority of workers would require the use of a van to carry equipment. However, it is envisaged that workers would arrive in 'gangs' and therefore reduce the need for each individual worker to travel to the site alone. Other incentives for reducing unnecessary journeys are by the introduction of on-site catering facilities (a café is proposed as part of the development), which would remove the need for lunchtime journeys.

12.2.2 Operational Travel Plan

The Operational Phase Travel Plan will contain a number of objectives targets and measures for limiting the number of single-occupancy car-borne journeys. Example objectives include providing pool bikes and producing a leaflet which clearly sets out the options for travelling to the site, which would be distributed to all staff.

It is anticipated that detailed discussions will take place between SLR and Cardiff Council to agree the initiatives prior to finalising the Travel Plan.

12.3 Indirect Mitigation

There is indirect mitigation to be introduced by others which would have a positive mitigating effect on the EFW & RF. Mitigation measures are to be undertaken by Cardiff Council with financial contribution from those developments that have recently been granted planning permission; namely Maritime Court. Details of the proposed measures are described below.

12.3.1 Indirect Mitigation Measures

With funding from the Maritime Court developments, improvements are to be made to Ocean Way in the form of a new uncontrolled crossing near the existing bus stops (between the junctions of Guest Road and Nettlefold Road).

Subject to available funding, there is the possibility that in the future buses will divert into Trident Park and this would contribute greatly to reducing the amount of car traffic travelling to and from all developments within Trident Park including the EFW & RF.

12.4 Anticipated Mitigation Resulting from Viridor Financial Contributions

It is the aspiration of Cardiff Council to introduce signalised pedestrian crossings on all arms of the Magic roundabout. It is therefore anticipated that any financial contribution from Viridor would go some way towards providing these crossings. Alternatively, Cardiff Council has also expressed a desire to improve public transport in the area and therefore any contributions may be used for improving bus frequencies or introducing a bus shelter within Trident Park.

12.5 Mitigation Conclusion

There are a number of mitigation measures that will be introduced (e.g. crossing on Ocean Way and improvements to the Glass Avenue roundabout) and others that are more long-term possibilities (e.g. bus route through Trident Park) that would contribute to minimising single-occupancy private car journeys. Some mitigation would be a direct result of the EFW & RF, such as Travel Plans and contributions to providing physical measures, whilst others are indirect as a result of other committed developments within Trident Park. However, all measures are for the greater good of Trident Park as a site and the wider local area.

13.0 SUMMARY AND CONCLUSIONS

The Transport Assessment has been undertaken on the basis of an Energy from Waste and Recovery Facility with a capacity of up to 350,000 tonnes per annum, in addition to which will be traffic flows associated with residual output (ash and metals) and staff movements.

Prior to and during the preparation of the TA, consultation took place with all relevant parties including Cardiff Council, Welsh Assembly Government, Network Rail and Cardiff Bus.

The principal of the proposed facility in highway and transport terms has been accepted by Transport officers at Cardiff Council.

The TA has concluded that, in total, construction of the EFW & RF would generate approximately 170 additional 2-way trips on the local highway network during each of the peak hours (0800-0900 and 1630-1730). These figures are based on experience of other waste developments. In the context of the existing and forecast traffic flows, these additional trips generated by the construction of the EFW & RF represent an increase of between 6.3% and 7.0% over the baseline situation.

In addition, the applicant has given comprehensive consideration to the implications of employee movements, and the Travel Plan (Appendix 8 of the ES) aims to mitigate the effect of staff trips.

The TA has concluded that in total the EFW & RF, once operational, would generate approximately 82 additional 2-way trips on the local highway network during the morning peak (i.e. 0730 to 0900) and some 62 trips during the evening peak. These figures are based on a number of assumptions relating to the types of vehicle used, their source and the trip distribution. In the context of the existing and forecast traffic flows, these additional trips generated by the EFW & RF and its associated activities represents an increase of between 2.1% and 3.1%. This relatively low increase has obviated the need to implement rail or water-borne movements.

Capacity assessments have been undertaken at the Glass Avenue roundabout which concluded that the roundabout would operate satisfactorily in 2014 but by 2019 is predicted to operate close to its maximum capacity and over the recommended RFC threshold of 0.85. Therefore, it is proposed to undertake minor improvement works at the roundabout in order to provide adequate spare capacity in 2019.

Road accident statistics for the local area indicate that there are no issues with Ocean Way. However, there have been a notable number of accidents at the Magic roundabout over the past five years, many of which involved pedestrians or cyclists. This is recognised by Cardiff Council and therefore the Council has aspirations to introduce signalised pedestrian crossings on all approaches to the junction.

The Applicant has given comprehensive consideration to the implications of employee movements, and the Travel Plan (Appendix 8) aims to mitigate the effect of staff trips.

In conclusion, it is considered that there are no transport related issues that would preclude development at Trident Park.

14.0 CLOSURE

This report has been prepared by SLR Consulting Limited with all reasonable skill, care and diligence, and taking account of the manpower and resources devoted to it by agreement with the client. Information reported herein is based on the interpretation of data collected and has been accepted in good faith as being accurate and valid.

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