TABLE OF CONTENTS

TABLES & FIGURES

TABLES

FIGURES

13 MATERIAL ASSETS

13.3 RAIL

13.3.1 Introduction

It is proposed to construct a dedicated rail freight link to serve the proposed Galway Harbour Extension and existing Galway Harbour Enterprise Park. The intention is to expand Galway Harbour's freight capability by connecting to the existing Galway - Athenry single track commuter line.

The proposed rail link is considered to be an essential item from a planning perspective to future proof the development and to facilitate future viable freight tonnage.

The Road Traffic Study currently assumes that all freight tonnages are to be transported by road but notes relief by rail may arise in due course. Even when rail freight services begin, it is likely to be a fraction of the new tonnage and specifically a newly won product e.g. woodchip as a bio-fuel to a specific site with its own siding. Rail freight services will only begin when they are commercially viable

The proposed rail link works will be facilitated within the construction sequence at the earliest possible date e.g. initial embankment and bridge to be constructed within Stage 2 and track to be laid in Stage 3. The proposed rail link within the site will be constructed and be ready to have linkage commissioned to the main line as soon as viable freight tonnage warrants the expenditure.

Works on the main line will be undertaken by CIE and is not a matter for this Planning Application.

Following preliminary studies, the following items were identified as requiring detailed investigation in order to provide recommendations to the above objectives.

- Geometric Design:

  Investigation into the feasibility of potential track alignments for three possible construction scenarios:
  - **a** Entry into the "top yard" only, using the available land area at the northern end of the site.
  - **b** Entry from the existing railway into the port development from the eastern side.
  - **c** Entry into the existing port development from the western side (i.e. reverse entry from the existing station area).

Review of each scenario on where the option is geometrically feasible and produce possible alignments. Review the possible layout of sidings within the port area to make maximum use of stabling/loading areas.

- Review of Completed and Proposed Rail Works undertaken by Iarnród Éireann

- Review of Commuter Services and Existing Line Capacity

- Review of Proposed Freight Requirements

- Review of operations and signalling

- Review design of the existing five over bridges and seven underbridges between Galway and Athenry and make an initial assessment of whether they are likely to be able to again accommodate twin line rail and freight traffic/container envelope.

13.3.2 Baseline Environment

13.3.2.1 CURRENT BASELINE

13.3.2.1.1 Existing Rail Infrastructure

The general condition and configuration of the existing 21km rail line between the existing Galway Ceannt station and the existing Dublin to Galway mainline station at Athenry has been investigated.

The entry and exit of the existing Galway Ceannt station comprises of two lines which extend approximately 1.0km from the existing station principal platform. The lines then join into a single track for the remainder of the route to Athenry.

The existing Galway – Athenry route passes over or below a number of existing bridge structures and associated level crossings which generally appear to be maintained to a reasonable standard.

A copy of the existing rail route showing the reference numbers of the existing bridge structures is contained in this appendix 13.3.1 with the review in Appendix 13.3.3.

The existing signalling system is controlled from the Central Signal Control (CSC) facility in Dublin. The signalling is a conventional colour light signalling system using 3 Aspect signalling. The Safety Interlocking Co-ordination (SIC) for the points and signals is controlled by conventional solid state interlocking, the existing interlocking being provided at strategic locations along the line from Dublin to Galway. The signalling system is relatively new and is believed to have been commissioned in circa 2005.

Figure 13.3.1 below shows Galway in relation to the existing major rail routes in Ireland.

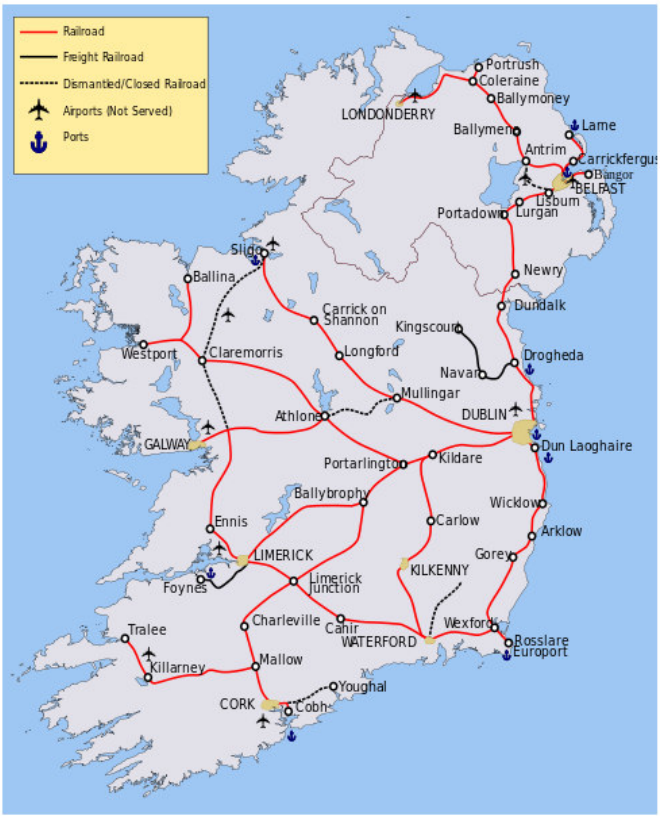

Figure 13.3.1 - Plan of existing major rail routes and ports in Ireland

13.3.2.1.2 Western Rail Corridor

Phase 1 works

Work is now completed on Phase 1 of the Western Rail Corridor. Track work began in October 2007 and was opened for use in early 2010. A plan of the proposed western rail corridor expansion programme is enclosed in Appendix 13.3.2.

The completed Ennis to Athenry railway:

- Delivers direct, regular Galway to Limerick via Ennis services timed to meet local commuter needs, these services are currently operated by Railcar
- Serves Limerick and Ennis with new stations at Sixmilebridge, Gort, Ardrahan, Craughwell, and Oranmore.
- Expands commuter links between Limerick and Galway.
- Provides connections with a range of inter-regional services currently not available, via links with the existing Limerick-Dublin and Galway-Dublin services.
- Promotes balanced regional development in line with National Spatial Strategy objectives, by linking the Limerick and Galway gateways and serving the hub of Ennis.

13.3.2.1.3 Existing Commuter Services

Intercity Services – Galway to Dublin

The existing Galway Ceannt station has nine services per day leaving to Dublin as per the timetable extract below:

Galway Ceannt to Dublin Heuston Train Timetable			
From	To	Dep. Time	Arr. Time
Galway	Dublin Heuston	05:30	08:01
Galway	Dublin Heuston	06:30	08:41
Galway	Dublin Heuston	07:30	09:47
Galway	Dublin Heuston	09:30	12:00
Galway	Dublin Heuston	11:05	13:40
Galway	Dublin Heuston	13:05	15:43
Galway	Dublin Heuston	15:05	17:42
Galway	Dublin Heuston	17:20	19:50
Galway	Dublin Heuston	19:20	21:47

13.3.1 - Galway Ceannt to Dublin Heuston Train Timetable (valid from 28.07.2013 www.irishrail.ie)

Intercity Services – Dublin to Galway

There are nine services per day running from Dublin to Galway as per the timetable extract below:

Dublin Heuston to Galway Ceannt Train Timetable			
From	To	Dep. Time	Arr. Time
Dublin Heuston	Galway	07:35	10:10
Dublin Heuston	Galway	09:25	11:47
Dublin Heuston	Galway	11:25	13:44
Dublin Heuston	Galway	13:25	15:43
Dublin Heuston	Galway	15:35	17:59
Dublin Heuston	Galway	16:30	18:48
Dublin Heuston	Galway	17:30	19:57
Dublin Heuston	Galway	18:30	20:50
Dublin Heuston	Galway	19:35	21:58

13.3.2 - Dublin Heuston to Galway Ceannt Train Timetable (valid from 28.07.2013 www.irishrail.ie)

Intercity Services – Galway to Limerick

The existing Galway Ceannt station has five services per day leaving to Limerick via Athenry as per the timetable extract below:

Galway Ceannt to Limerick Train Timetable			
From	To	Dep. Time	Arr. Time
Galway	Limerick	06:20	08:25
Galway	Limerick	10:30	12:22
Galway	Limerick	13:45	15:39
Galway	Limerick	17:50	19:43
Galway	Limerick	18:40	21:49

13.3.3 - Galway Ceannt to Limerick Train Timetable (valid from 28.07.2013 www.irishrail.ie)

Intercity Services –Limerick to Galway

There are five services per day running from Limerick to Galway via Athenry as per the timetable extract below:

Limerick to Galway Ceannt Train Timetable			
From	To	Dep. Time	Arr. Time
Limerick	Galway	05:55	08:10
Limerick	Galway	09:20	11:13
Limerick	Galway	14:20	16:12
Limerick	Galway	18:00	20:25
Limerick	Galway	19:45	21:40

13.3.4 - Limerick to Galway Ceannt Train Timetable (valid from 28.07.2013 www.irishrail.ie)

Local Services – Galway to Athenry

There is a dedicated local rail service between Galway and Athenry provided by Railcar. This service is also provided as part of the Galway to Dublin and Limerick intercity services as per the timetable extract below:

Galway Ceannt to Athenry Train Timetable			
From	To	Dep. Time	Arr. Time
Galway	Athenry	05:30	05:47
Galway	Athenry	06:20	06:41
Galway	Athenry	06:30	06:46
Galway	Athenry	07:30	07:47
Galway	Athenry	08:40	09:00
Galway	Athenry	09:30	09:45
Galway	Athenry	10:30	10:55
Galway	Athenry	11:05	11:25
Galway	Athenry	13:05	13:22
Galway	Athenry	13:45	14:06
Galway	Athenry	15:05	15:22
Galway	Athenry	16:30	16:50
Galway	Athenry	17:20	17:38
Galway	Athenry	17:50	18:15
Galway	Athenry	18:10	18:28
Galway	Athenry	18:40	19:06
Galway	Athenry	19:20	19:36
Galway	Athenry	22:15	22:31

13.3.5 - Galway Ceannt to Athenry Train Timetable (valid from 28.07.2013 www.irishrail.ie)

Local Services – Athenry to Galway

There is a dedicated local rail service between Galway and Athenry provided by Railcar. This service is also provided as part of the Galway to Dublin and Limerick intercity service as per the timetable extract below:

Athenry to Galway Ceannt Train Timetable			
From	To	Dep. Time	Arr. Time
Athenry	Galway	07:43	08:10
Athenry	Galway	08:16	08:35
Athenry	Galway	09:05	09:25
Athenry	Galway	09:48	10:10
Athenry	Galway	10:53	11:13
Athenry	Galway	11:26	11:47
Athenry	Galway	13:23	13:44
Athenry	Galway	15:23	15:43
Athenry	Galway	15:53	16:12
Athenry	Galway	16:55	17:15
Athenry	Galway	17:37	17:59
Athenry	Galway	18:28	18:48
Athenry	Galway	19:35	19:57
Athenry	Galway	20:04	20:25
Athenry	Galway	20:29	20:50
Athenry	Galway	21:18	21:40
Athenry	Galway	21:39	21:58

13.3.6 - Athenry to Galway Ceannt Train Timetable (valid from 28.07.2013 www.irishrail.ie)

13.3.2.1.4 Existing Passenger Line Capacity

The line currently requires a travel time of circa fourteen minutes between Galway and Athenry at the current line speed of 120 kph or 75 mph. It is assumed that as the average speed currently achieved between Galway and Athenry is 90kph (13 miles taking 14 minutes), Iarnród Éireann's current advice is that a line speed for freight trains of 80kph should be adopted for general purposes.

Given the travel time and the single track nature of the existing track, it would only be possible and / or safe to accommodate 4.3 passenger trains per hour along the existing line at present. This figure is derived from 60 minutes divided by 14 minutes travel time for passenger trains, which is the current safety separation timing for the line.

The line capacity could be increased further via the installation of further train control systems, allowing the trains to maintain a separation of seven minutes, which would lead to a theoretical line capacity of 8.5 trains per hour (60 minutes divided by 7 minutes). However, this would

require the construction of either a passing loop or loops and/or the provision of a full dual track layout in accordance with Iarnród Éireann's future capacity requirements to ensure that the correct separation could be maintained.

It is therefore apparent, given Iarnród Éireann's future expansion plans, that the existing single line would not be able to cope with the envisaged future level of passenger traffic predicted from the phase 2 and phase 3 stage of the Western Rail Corridor project.

The freight capacity of the Galway – Athenry line is detailed below.

13.3.2.1.5 Existing Freight Services – Currently Operated by Iarnród Éireann Freight

Iarnród Éireann's bulk freight business specialises in the movement of products in full train loads. Many of Iarnród Éireann's customer's products are transported in specialised wagons. For these companies Iarnród Éireann can operate trains with an achievable payload of up to 600 tonnes, a gross train weight of 780 or 900 tonnes including locomotive or locomotives and wagons as necessary.

Some of the products currently transported include ISO (International Standards Organisation) containers/tanks, mineral ores and pulpwood. In many situations, Iarnród Éireann's own dedicated rail infrastructure has been provided to enable the operation of trains directly from the customer's production facility to a port or warehouse.

Freight services in the Republic of Ireland have been severely rationalised in recent years. Currently, Mineral ore trains are operated from Tara Mines, Navan to Dublin Port. Pulpwood trains operate from Ballina and Westport to Waterford and container trains from Ballina to Dublin and Waterford Ports.

There are currently no freight services using the existing Galway Ceannt station or the existing Galway to Athenry line.

We believe that, potentially, freight can be moved to every station on the Iarnród Éireann network from the proposed Galway Harbour link. The existing rail network is shown in Fig. 13.3.1.

The maximum container train size permitted on the network is 42 TEUs (twenty-foot equivalent units) via the Dublin to Cork route and 36 TEUs on all other routes. Iarnród Éireann 201 and 071 class locomotives may haul a maximum gross weight of 780 tonnes over all routes except where their operation is prohibited (which is limited) and in some cases where speed restrictions apply.

Where specifically authorised, the 201 and 071 class locomotives (shown in figures below) may haul freight trains up to a maximum load of 942 tonnes gross weight.

Figure 13.3.2 - 201 Class Locomotive

Figure 13.3.3 - 071 Class Locomotive

Review of operations and signalling

The existing track layout between Galway and Athenry is shown in the plan reproduced in Appendix 13.3.1. The track length between Galway Ceannt Station and Athenry Station is 21 km. If the freight train can move at an average speed of 80kph then the freight train will clear the main line between Galway and Athenry in approximately 16 minutes.

Current Available Freight Capacity during the Day				
Time for	**Hr:mm**			
Gap to signal	00:07			
Freight Outbound	00:16	Thus		
Coupling	**00:05**	1 full run + 1 outbound run = 01:00		
Freight Return	**00:16**	1 return run + 1 full run = 01:00		
Total	**00:44**	2 Full Runs = 01:28		
Route	Depart	Arrive	Gap to Next	Capacity for Freight Runs
Galway to Athenry	05:30:00	05:47:00	00:33:00	
Galway to Athenry	06:20:00	06:41:00	00:00:00	
Galway to Athenry	06:30:00	06:46:00	00:44:00	1 (possible)
Galway to Athenry	07:30:00	07:47:00	00:00:00	
Athenry to Galway	07:43:00	08:10:00	00:06:00	
Athenry to Galway	08:16:00	08:35:00	00:05:00	
Galway to Athenry	08:40:00	09:00:00	00:05:00	
Athenry to Galway	09:05:00	09:25:00	00:05:00	
Galway to Athenry	09:30:00	09:45:00	00:03:00	
Athenry to Galway	09:48:00	10:10:00	00:20:00	
Galway to Athenry	10:30:00	10:55:00	00:00:00	
Athenry to Galway	10:53:00	11:13:00	00:00:00	
Galway to Athenry	11:05:00	11:25:00	00:01:00	
Athenry to Galway	11:26:00	11:47:00	01:18:00	1
Galway to Athenry	13:05:00	13:22:00	00:01:00	
Athenry to Galway	13:23:00	13:44:00	00:01:00	
Galway to Athenry	13:45:00	14:06:00	00:59:00	1
Galway to Athenry	15:05:00	15:22:00	00:01:00	
Athenry to Galway	15:23:00	15:43:00	00:10:00	
Athenry to Galway	15:53:00	16:12:00	00:18:00	
Galway to Athenry	16:30:00	16:50:00	00:05:00	
Athenry to Galway	16:55:00	17:15:00	00:05:00	
Galway to Athenry	17:20:00	17:38:00	00:00:00	
Athenry to Galway	17:37:00	17:59:00	00:00:00	
Galway to Athenry	17:50:00	18:15:00	00:00:00	
Galway to Athenry	18:10:00	18:28:00	00:00:00	
Athenry to Galway	18:28:00	18:48:00	00:00:00	
Galway to Athenry	18:40:00	19:06:00	00:14:00	
Galway to Athenry	19:20:00	19:36:00	00:00:00	
Athenry to Galway	19:35:00	19:57:00	00:07:00	
Athenry to Galway	20:04:00	20:25:00	00:04:00	
Athenry to Galway	20:29:00	20:50:00	00:28:00	
Athenry to Galway	21:18:00	21:40:00	00:00:00	
Athenry to Galway	21:39:00	21:58:00	00:17:00	
Galway to Athenry	22:15:00	22:31:00	06:59:00	unlimited
Galway to Athenry	05:30:00			
		Available freight windows		3

13.3.7 - Current available freight capacity during the day

The current timetable for the Galway-Athenry and Athenry-Galway has sufficient daily capacity gaps to accommodate only 3 full freight runs taking 16 minutes Galway to Athenry at 80kph, a five minute decoupling time and a 16 minute return run as per Table 13.3.7.

From Table 13.3.7., it is envisaged that only 3 freight runs will be available per day within the existing timetable (approximately a maximum operating capacity of 1800 tonnes per day) during normal working hours. Should the Phase 2&3 Western Rail Corridor be reopened with another seven trains per day, there may be no future available freight capacity during the day based upon single line usage. The future available freight capacity will have to be accommodated in those circumstances at night.

An example for illustration from the existing timetable is as follows: a passenger train departure at 06:30 from Galway Ceannt means that this train would arrive at Athenry at 06:46. The freight train at Galway could be released at 06:37 (using an appropriate intermediate block signal) and arrive at the Athenry depot clear of the mainline at 06:53. The departure time from Athenry for the next train to Galway would be 07:35. This example is probably close to the best case scenario for the existing route.

Sufficient gaps currently exist within the existing timetable to accommodate a limited daytime freight service. This assumes that the 80kph line speed advised by Iarnród Éireann's can be achieved by a fully laden freight train.

For the existing layouts, it is expected that there would be no infrastructure operational constraints if the freight traffic was operated in the period at night when there are no timetabled passenger trains.

However, consideration of track maintenance would need to be factored in.

Night Freight Traffic

It would appear from the inspection of the existing timetable that it would be possible to service the freight element of the port outside of daytime hours as currently no services use the line between 22:31 and 05:30 giving an available six hour and fifty nine minute hour working window, which could allow 9 return trips to Athenry.

Assuming all trains are 600 tonne payload (36 TEU) net freight weight this could allow for 5,400 tonnes / night to be moved by rail or 7,200 tonnes / 24 hour.

However, night working is likely to meet with objections from local residents living close to the existing line who currently enjoy noise free nights.

It is also the case that line maintenance is carried out by Iarnród Éireann at night. Freight trains and rail line maintenance will have to be planned and co-ordinated. This should not be a major issue due to the rare event nature of major line maintenance.

Review of signalling system

The existing signalling management system is based on a Centralised Traffic Control (CTC) system (a general electric system), the control centre being located in Dublin. The CTC controls and communicates with (Westinghouse) Solid State Interlocking's (SSI): Interlocking areas are distributed along the line. In the case of the Galway - Athenry line it is understood that the safety interlocking is located at Athenry and communicates with signalling inputs and outputs from Athenry and Galway so that routes may be set and cancelled from Dublin for that stretch of line.

The signalling is new at both Athenry and Galway and again it is understood that this signalling was commissioned in 2005. Iarnród Éireann developed the scheme, purchased the equipment,

undertook the interlocking SSI data preparation on their own workstations and installed and tested the equipment and systems.

13.3.3 Future Baseline

It is proposed to construct a new 1.352 km long freight only twin rail branch line to serve the planned expansion of Galway harbour originating from within the existing dual track section of the line.

13.3.3.1 Western Rail Corridor

Phase 2 works

It is planned to re-open the existing passenger service line between Tuam and Athenry as part of the Western Rail Corridor Phase 2 works. Phase 2 works were due to be completed by 2011, however at present the works are on hold.

Phase 3 works

Phase 3 focuses on the reopening of the line from Tuam to Claremorris. The line from Claremorris to Collooney is to be preserved. The Phase 3 line was planned to be operational by 2014, however the works are presently on hold.

A plan of the proposed Western Rail Corridor Phase 2&3 works is also included within Appendix 13.3.2.

13.3.3.2 Proposed Commuter Services

It is our understanding that the completed Phase 1 works to the Western Rail Corridor has now resulted in a further ten trains per day using the existing single track line between Galway and Athenry.

We believe that the Phase 2 works to the Western Rail Corridor could result in a further ten trains per day being required to use the existing single track line between Galway and Athenry.

Due to the travel time and existing train separation safety devices, we envisage the rail link between Galway and Athenry will require major upgrading works to be undertaken to reinstate a twin rail line over the length of the existing single rail line, prior to the opening of the Phase 2 works exclusive of any rail freight requirements. Works on the main line will be undertaken by CIE and is not a matter for this Planning Application.

The original Galway to Athenry lines operated as a twin up and down line system. This is supported by the original width of the bridge abutments which have subsequently been amended to accommodate the present single line track bed.

13.3.3.3 Proposed Freight Generated by Galway Harbour Development

Review of Rail Traffic Demand

It is envisaged that initially 600 tonne (36 TEU) freight trains could be handled between the port area and a potential new goods marshalling / road freight terminal which could be located to the north west of Athenry.

A single 600 tonne payload freight train would equate to approximately 25 HGV movements on the existing road network.

We believe that due to the nature of the freight expected to be handled by the port development, the potential freight terminal will be divided into two parts:

- General goods/container facility.
- Petrochemical facility.

It is envisaged that both facilities would have direct access to rail and road infrastructure to enable freight to be handled by Iarnród Éireann's current rail freight infrastructure and the newly constructed N18 motorway link, and the remainder of the rail network.

The following table shows the weights and dimensions for the twenty-foot equivalent units (TEUs). The weights and dimensions quoted below are averages. Different manufacturer series of the same type of container may vary slightly in actual size and weight.

Weights and dimensions of TEUs		
20′ container		
external dimensions	length	6.096 m
	width	2.438 m
	height	2.591 m
maximum gross mass		24,000 kg
empty mass		2,200 kg
net load		21,800kg

13.3.8 - Weights and dimensions of TEUs

According to Iarnród Éireann the maximum net freight payload load a train can carry is 600 tonnes or 28 No. 21.6 tonne TEUs.

The train wagons are 18.3m long and the class 201 locomotive is 20.9m long respectively.

A 600 tonne payload train would be 14 wagons plus a locomotive unit giving a length of circa 277.1m.

It is predicted by 2035 that the proposed Galway harbour capacity will be increased to circa 1.932m tonnes per year, or approximately 5,300 tonnes per day. Thus, 9 No. 600 tonne payload freight trains per day for 365 days a year would be required to fully service the proposed freight requirement via rail alone. However we believe rail freight services will likely be a fraction of the new tonnage and specifically a newly won specific product.

13.3.4 Design Considerations

In terms of the horizontal alignment, the feasibility of potential track alignment for three possible construction scenarios has been investigated –

(1) Entry into the "top yard" only, using the available land area at the northern end of the site.

Due to gradient and level issues it is not possible to provide a new freight rail link to serve the top yard area only. A suitable grade area of rail cannot be formed within the top yard due to the level difference's and the gradient criteria required by Iarnród Éireann. We also note that these lands are currently either occupied or pre-booked for relocations of existing businesses from sites around the harbour.

Therefore this option has not being investigated further within this report.

(2) Entry from the existing railway into the port development from the eastern side.

This access route is possible with minimum third party land issues as the existing Bus Éireann bus park is located within the proposed scheme footprint. This section of embankment construction forms the basis of our Clients design proposals.

In order to provide the new rail link it will be necessary to construct a new rail-over-road bridge crossing the entrance to the Bus Éireann bus park. A bridge clearance of 5.3m is shown in Drawing No. 2139-2182-A.

The Proposed Rail Link is detailed in Drawings Nos. 2139-2181A to 2139-2183A.

(3) Entry from the existing port development from the western side (i.e. reverse entry from the existing station area).

It would be possible to construct a link from the proposed port area to the existing station entrance line in a north westerly direction. However, this would require extensive and extremely difficult land take requirements to be addressed, as per point (1) above and would not provide any further usable freight capacity. For these stated reasons, this proposal has not being investigated further within this report.

The most obvious solution is therefore to obtain access to the new port development from the eastern side and the initial review of the track geometry indicates that this is possible.

In order to develop these proposals further, the development objectives and geometric constraints have been discussed with Iarnród Éireann and our summary geometric design is as follows:

- The new connection to the existing Galway to Athenry Line will be in the vicinity of the existing Bus Éireann bus park. The proposed twin track connection will require a new double junction comprising 2 No. turnouts and a diamond.
- On inspection of the existing Galway to Athenry Line geometry, it appears that an existing transition curve is likely to exist in the vicinity of the proposed new junction. During the design stage the existing track geometry will need to be surveyed in sufficient detail and the existing alignment analysed in order to confirm the extents of the existing transitions and optimal position for the proposed double junction. This may require some realignment of the existing line in order to ensure that the new Switches & Crossings (S&C) is clear of any cant transition, and preferably be on a constant circular curve, if possible.
- The proposed alignment is based on a minimum 200 metre minimum radius of curvature to the proposed connection to avoid any requirement for check rails and gauge widening etc (note the design minimum radius is 150.00m for passenger lines and 125m for freight only routes, based on UK Railway Group Standards). At detailed design stage consideration may need to be given to lateral restraint/strengthened track construction on this curve.
- The General Arrangement Drawing No. 2139-2181A shows the permanent way alignment within the port utilising transition curves. Use of transition curves within UK Ports/depots and sidings is not mandatory and can complicate maintenance, however use of such would be beneficial in reducing potential wear on track components. The use/requirement for transition curves can be reviewed and will be subject to construction design detailing.

- The turnout from the existing mainline has been constructed at a flat gradient. This land is accommodated within the current red line planning application boundary.
- The port side rails level will be constructed level to allow the maximum use of quay and loading from the proposed materials handling yards.
- A maximum track gradient of 1 in 100 has been provided. The section of 200m radius curved track has a 1 in 400 gradient in order to avoid any potential issues with curving resistance for heavy freight traffic. The Proposed Rail Link is detailed in Drawings Nos. 2139-2181A to 2139-2183A.
- As the new ballasted section of track will be elevated on a significant embankment, a piped track drainage system over this section is not likely to be required.
- The proposed Galway to Athenry line improvements required by Iarnród Éireann should include for the provision of the required signalling within its design to alleviate unnecessary secondary works being required in the future.
- The new infrastructure will be suitable for the use of Iarnród Éireann class 201 or 071 locomotives combined with 65' bogies capable of trafficking a single 40' ISO container or a combination of 40' and 20' containers.
- The internal dockside track layout shown on the General Arrangement Drawing has been simplified to show twin parallel plain track. Associated Switches & Crossings (S&C)/crossover requirements are to be determined by operational and signalling requirements during outline/detailed design.
- Due to the radius (200m) on the new Underbridge on the existing Bus Éireann access road and 1 in 100 gradients within the vicinity, derailment incursion protection measures are considered necessary. Bridge parapets will be constructed. Drawing No. 2139-2167-A presents details of the proposed underbridge.
- At detailed design any necessary track realignment/gauge enhancement works will need to be taken into consideration and are considered to be outside the scope of the current planning application.

13.3.5 Impacts

13.3.5.1 Impact:

Impact on existing rail services by Freight Generated by Galway Harbour Development

Discussion and Mitigation:

Sufficient gaps currently exist within the existing timetable to accommodate a limited daytime freight service. This assumes that the 80kph line speed advised by Iarnród Éireann's can be achieved by a fully laden freight train.

For the existing layouts, it is expected that there would be no infrastructure operational constraints if the freight traffic was operated in the period at night when there are no timetabled passenger trains. However, consideration of track maintenance would need to be factored in.

At present if freight trains between Galway and Athenry were required to run regularly during the day then the provision of a passing loop would be needed at approximately the half way point for the parking of the freight train whilst the commuter services met their timetable. This could be provided in the vicinity of the new Oranmore station. Such a passing loop would increase transit times between Galway and Athenry. The frequency of a train between Athenry and Galway would be in the order of 44 minutes if the services were regularly spaced. A train leaving the terminal at Galway would have 25 minutes to park up in the passing / parking loop. When the

passenger train passes there would be another 20 minutes to get the freight train into the Athenry depot and clear of the line. This would not affect the existing passenger route timetable.

With the opening of the Phase 2 Western Rail Corridor works, a total of 34 services into and out of Galway Ceannt would operate on a daily basis. In these circumstances a freight service during the day would not be feasible even with the passing loop installed with a single line of track. In this situation, if a freight service operated through the day interposed with passenger traffic then the track between Galway and the Athenry depot would need to be double tracked.

It is generally accepted that dual tracks will be required for Phase 2&3 of the Western Rail Corridor with or without the implementation of the proposed rail freight hub at the New Galway Harbour.

The Phase 2&3 works completion should not impact on nightly operations assuming that the period at night when there were no trains was not adversely affected with the expansion of the service.

13.3.5.2 Impact:

Impact on existing signalling system

Discussion and Mitigation:

With regard to the existing line, a rail link with the proposed Galway Harbour Extension would require a change in track layout on the mainline at the junction with the new container terminal spur and also at the new junction into a proposed depot at Athenry. This would need new signals to protect the proposed junctions, new point controls and new SSI data to accommodate the new Athenry control table interlocking configuration at both locations. In addition, it may be necessary to introduce an intermediate block between Galway and Athenry in both directions so that a train from the container facility may follow a passenger train as soon as possible to get a tighter headway. Additional SSI equipment may be needed for this modification.

In the event of a passing loop being installed, when required, new signals, to protect the passing loop, would be required along with new point controls. The SSI interlocking at Athenry would need to be modified with possible equipment expansion.

In the event that future double tracking is undertaken, then this would require a major modification to the Athenry SSI and a major purchase of additional equipment, although the existing equipment because of its relative newness could be re-used.

In all cases the CTC control software data at Dublin would need to be changed.

13.3.5.3 Impact:

Impact of Rail Link Construction on Existing Environment

Discussion and Mitigation:

The Railway embankment will run at the same level as the existing CIE railway embankment as it branches from the mainline and turns south towards the future quays. This will regenerate the form of rail to quay link which originally existed from the Ceannt Station freight yards onto the original quays in the original 1850's railway and docks layout, remnants of which still remain.

The embankment will begin to reduce in level after it passes over the realigned road access into the CIE bus park. The road level will be lowered to provide the full 5.03m clearance with sag allowance (totals 5.30m) to allow significant vehicles access the bus park and amenity areas and facilities on the East side of the development. The embankment will have come to ground level

before it fully crosses the relocated open space linking the Marina area on the West side to the nautical centre area on the East side so there will be at grade access for pedestrians, cyclists and maintenance vehicles across the railway lines at the gated location at the south-eastern corner of the link open space. The gates will curtail unauthorised access on to the railway embankment or into the Harbour security area via the quayside railway lines. The gates will be linked to the railway CTC (Centralised Traffic Control) system and will open to allow rail freight to pass. By opening for freight they will temporarily close off the amenity link which would then have to be via the rail under bridge. The amenity link closures would correspond only to freight train movement requirements and be similar to other level crossing gate closures and allowing in this instance for slowness of terminal movements and significant train lengths. As most movements are expected to be at night, open space use will not be significantly impacted. A pedestrian over bridge is not presently considered to be warranted, but could be provided in the future.

The rail link capacity has been seen as a valuable material asset to the development from initial concept stages. The rail link's geometrical and embankment requirements have contributed to the evolution of the layout as proposed and have consequently facilitated and generated interesting landscape features as follows:

As the harbour railway embankment side slopes are to be planted with medium height species it was decided to move an extent of the proposed open space for the Harbour Extension lands up onto the existing GHEP lands adjacent to the embankment and hence to enhance it and benefit from it from a landscape perspective.

The embankment which runs from north to south will thus shelter the open space to be provided on its eastern side. The extended area will give access to the Renmore Beach / Renmore Lagoon open space lands preserved as part of the GHEP planning permission and to the Renmore promenade now proposed extending down to the slipway and nautical centre passing the bathing steps to be provided along that route, as well as connecting to the amenity link to the Marina area and the western promenades. This spacious area of open space will be a sheltered shoreline amenity area accessible to the town and the GHEP via the bus park under pass. It will be accessible to the new harbour extension via the link amenity space and to the Renmore Lough Atalia area via the old railway under pass. See Landscape Section 12 for further detail.

The railway embankment will therefore form a naturalised boundary and enhance and define an attractive usable open space amenity of considerable merit. The embankment / open space will define the extended GHEP area north of the link amenity area and when at grade level define the new quay freight marshalling yards. It will enhance the bus park by making it independent of the harbour related uses, while linking it to the amenity elements.

Modelling of the rail traffic noise at the Galway Harbour Extension is considered in Chapter 10 of the EIS. The rail traffic comprises a twin track siding and due to the low volume of traffic associated with the operation of the development, the model predicts that there are unlikely to be any excesses of any statutory limits on noise levels. The model was prepared with a 1.5m high noise barrier located on the eastern side of the track from where it separates from the mainline to where it joins the new port development at grade, i.e. for the full incline. The noise model is presented in Figure 10.11 of Chapter 10 and an examination of noise levels at Mellows Park indicates a significant benefit in installing the barrier.

Two of the most significant noise sources associated with slow moving rail freight traffic noise are the braking technology used on freight vehicles and corrugation of the track on curved track sections. Due to the geometry of the siding, these factors have significant potential to exacerbate noise emissions from the rail operation. The impact of these sources is likely to result in screeching and grinding type noises which are beyond the scope of any model but are the sorts of noises that will startle birds and mammals. As there are no seal haul out sites in the vicinity of the proposed railway line, there will be no disturbance effects from rail traffic. With regard to birds, the only area that may be affected is the section of Renmore Beach to the east of the proposed rail track. However, as this has been found not

to be an important roosting/feeding site for any species, it is considered that the level of disturbance on any bird species will be minimal.

'Wheel squeal' arises when the wheel-sets of a vehicle are mounted on bogies or towards the end of a two axle vehicle. They will be mounted parallel to each other, although there may be some yaw compliance incorporated. When negotiating a curve neither axle will lie on a curve radius and some lateral creepage of the wheel tread over the railhead will take place. Some designs of bogie are now being applied that are capable of steering or being steered around curves. Rudd (1976) has estimated that squeal will occur when the track radius of curvature is less than 100 times the vehicle or bogie wheelbase. Generally a bogie with 2m wheelbase will squeal on a curve tighter than 200m radius. All proposed track curve radii are greater than 200m in this development to minimise squeal.

13.3.6 Conclusions and Recommendations

- From the review of track geometry, it is possible to gain access to the new port development through the construction of a rail link from the eastern side.

- At present a harbour freight capacity could be accommodated on a limited basis within the existing Galway – Athenry timetable. Sufficient gaps currently exist within the current timetable to allow the safe passage of a freight service along the line from the proposed port to a possible rail freight terminal. It would appear from the inspection of the existing timetable that it would be possible to service the freight element of the port outside of daytime hours.

- At present if freight trains between Galway and Athenry were required to run regularly during the day then the provision of a passing loop would be needed at approximately the half way point for the parking of the freight train whilst the commuter services met their timetable.

- By the proposed port rail link operational date only an overnight freight service could be operated on the existing single track arrangement due to the planned increases in passenger rail traffic projected by Iarnród Éireann. A regular freight train service would not be possible during the day even with the provision of a passing loop on the single line.

- We are of the opinion that Iarnród Éireann has already calculated that the existing single line capacity will be exceeded shortly under its own planned increases in commuter services which will require the existing single line track from Athenry to Galway to be double tracked. This would allow freight trains to run regularly during the day. The works on the main line will be undertaken by CIE and is not a matter for this Planning Application.

- The proposed rail link works will be facilitated within the construction sequence at the earliest possible date e.g. initial embankment and bridge to be constructed within Stage 2 and track to be laid in Stage 3. The proposed rail link within the site will be constructed and be ready to have linkage commissioned to the main line as soon as viable freight tonnage warrants the expenditure.

- Rail freight services will only begin when commercially viable and, it is likely to be a fraction of the new tonnage and specifically a newly won product e.g. woodchip as a bio-fuel to a specific site with own siding.