

## 7 Traffic and Transport

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### 7.1 Introduction

This chapter describes the likely traffic and transport impacts associated with the construction and operation of the proposed scheme. A detailed description of the proposed scheme is included in **Chapter 4, *Description of the Proposed Scheme*** and the particular Traffic and Transport elements are described in **Section 7.4**.

Reference should be had to the full set of planning drawings accompanying the application for approval. A summary set of drawings in A3 format are included in **Appendix 4.1** and **Appendix 4.2**.

This assessment has considered likely significant effects during both the construction and operation of the proposed scheme. However, it is envisaged that it is during the construction of the proposed scheme that the likely impact on the various transport networks will be greatest.

This report will present the baseline transport environment including reporting on traffic counts carried out on the surrounding street network. The projected increase in traffic associated with the operation of the proposed scheme and its likely significant effects on the baseline transport networks is presented. The likely phasing and scheduling of the proposed construction works and their likely significant effects on the receiving environment is presented. Finally, any mitigation measures and monitoring which will assist in reducing the significant effects of the proposed scheme on the surrounding transport network and any resultant residual effects are presented.

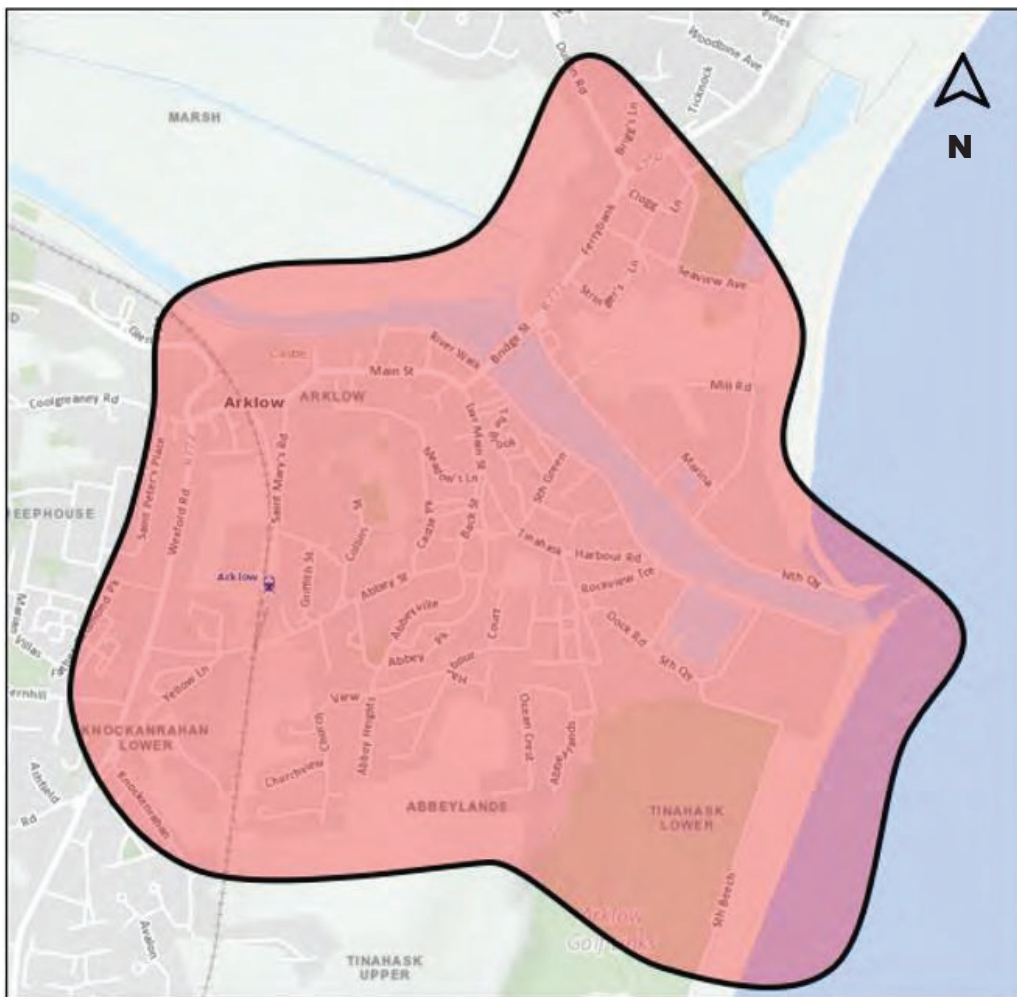
### 7.2 Assessment Methodology

The following section presents the methodology used in this transport assessment.

#### 7.2.1 Study Area

The study area considered as part of this transport assessment is illustrated in **Figure 7.1** and includes the following primary streets/ roads;

- Ferrybank;
- North Quay;
- South Quay;
- Dublin Road;
- Bridge Street;
- Arklow Bridge;
- Abbey Street;
- South Green;
- Tinahask Road; *and*
- Main Street.

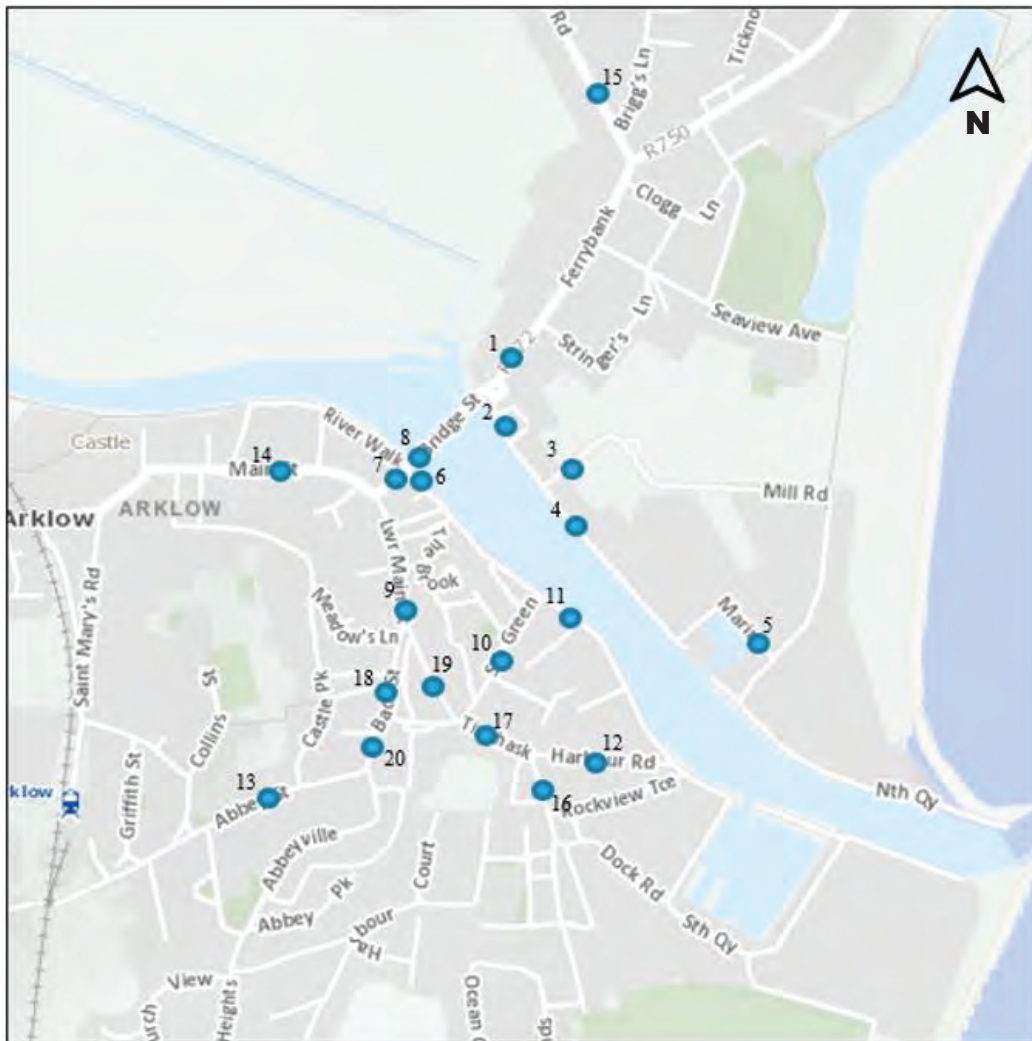


**Figure 7.1:** Study Area. Not to scale.

The study area in **Figure 7.1** is considered to be the primary zone of influence with respect to the management of traffic during the construction of the proposed scheme and is the area most likely to experience temporary changes in traffic flow during construction. **Section 4.6**, in **Chapter 4**, *Description of the Proposed Scheme*, describes the operation and maintenance of the proposed scheme. The traffic associated with the operation and maintenance activities is expected to be limited and occasional.

## 7.2.2 Traffic Count Data

Traffic counts were carried out in Sept 2020 and the traffic count locations are shown in **Figure 7.2**. The traffic counts were carried out to establish link flows during both the peak hour periods and on an all-day basis.



**Figure 7.2:** Traffic Count Locations. Not to scale.

The traffic surveys obtained data at the following locations.

- Location 1: R772-646 Ferrybank
- Location 2: L6909-0 Bridgewater Road
- Location 3: L6909-5 Off North Quay beside Aldi store
- Location 4: L6909-10 North Quay
- Location 5: L6909-35 Marina
- Location 6: L6907 South Quay
- Location 7: R775-656 Bridge Street
- Location 8: R772-652 Arklow Bridge
- Location 9: L2901-15 Lower Main Street
- Location 10: L6905-20 South Green
- Location 11: L6907-30 South Quay

- Location 12: L6909-20 Harbour Road
- Location 13: L2901-90 Abbey Street
- Location 14: R772-662 Main Street
- Location 15: R672 Dublin Road
- Location 16: Tinahask Lower
- Location 17: Tinahask
- Location 18: Back Street
- Location 19: Lower Main Street
- Location 20: Back Street (Lower).

The recorded traffic counts were increased to reflect the potential impact the Level 2 COVID -19 restrictions which were in place at the time may have had on baseline traffic flows. The rate of increase was based on traffic count data gathered by Transport Infrastructure Ireland<sup>1</sup> for locations on the M11 Motorway in the vicinity of Arklow. The increase factor applied to the traffic counts ensures that ‘normal’ or ‘regular’ traffic flows were considered in the baseline assessment, and not those associated with COVID-19 travel restrictions. The implicit assumption with this approach is that traffic levels in Arklow will return pre-pandemic levels and grow from there.

### 7.2.3 Future Year Traffic Growth Rates

Future traffic growth on the external road network is based on Transport Infrastructure Ireland’s growth rates<sup>2</sup> for the Wicklow Region. Based on **Table 6.2** of the guidelines<sup>2</sup> (as presented in **Figure 7.3**) the recorded traffic flows have been increased by the central growth rates to establish Year 2026 base year traffic flows. Again, it should be noted that the assumption here is that, after the COVID-19 pandemic and associated travel restrictions, traffic growth will return to a pre-pandemic pattern of growth

Year 2026 is expected to be the busiest year with respect to construction activity on the surrounding street/road network and thus has been used to present the likely significant effect of the construction of the proposed scheme. However, should the proposed scheme be delayed, there will be no change in the projected increase in traffic and resultant transport assessment as described herein.

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1 (<https://trafficdata.tii.ie/gmapbasic.asp?sgid=ZvyVmXU8jBt9PJESc7UXt6>)

<sup>2</sup> Transport Infrastructure Ireland Project Appraisal Guidelines for National Roads Unit 5.3 - Travel Demand Projections – May 2019.

**Table 6.2: Link-Based Growth Rates: County Annual Growth Rates (excluding Metropolitan Area)**

County	Low Sensitivity Growth Rates						Central Growth Rates						High Sensitivity Growth Rates					
	2016-2030		2030-2040		2040-2050		2016-2030		2030-2040		2040-2050		2016-2030		2030-2040		2040-2050	
	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV
Dublin	1.0163	1.0303	1.0046	1.0123	1.0036	1.0143	1.0180	1.0317	1.0062	1.0139	1.0050	1.0158	1.0211	1.0348	1.0100	1.0170	1.0099	1.0250
Kildare	1.0180	1.0363	1.0044	1.0135	1.0035	1.0169	1.0197	1.0378	1.0062	1.0155	1.0053	1.0187	1.0229	1.0413	1.0098	1.0191	1.0107	1.0283
Laois	1.0130	1.0265	1.003	1.0105	1.0018	1.0136	1.0147	1.0280	1.0047	1.0125	1.0036	1.0155	1.0179	1.0314	1.0082	1.0160	1.0090	1.0248
Longford	1.0119	1.0298	1.0019	1.0104	1.0000	1.0138	1.0134	1.0313	1.0038	1.0124	1.0027	1.0157	1.0167	1.0347	1.0072	1.0161	1.0073	1.0256
Louth	1.0134	1.0347	1.0054	1.0153	1.0048	1.0180	1.0148	1.0363	1.0070	1.0174	1.0063	1.0198	1.0177	1.0397	1.0100	1.0211	1.0103	1.0295
Meath	1.0156	1.0349	1.0052	1.0164	1.0043	1.0189	1.0173	1.0365	1.0070	1.0186	1.0059	1.0207	1.0205	1.0400	1.0108	1.0226	1.0116	1.0304
Offlay	1.0103	1.0307	1.0021	1.0119	1.0014	1.0158	1.0118	1.0323	1.0042	1.0139	1.0033	1.0176	1.0152	1.0357	1.0081	1.0176	1.0100	1.0272
Westmeath	1.0145	1.0300	1.0042	1.0126	1.0033	1.0156	1.0161	1.0316	1.0062	1.0147	1.0053	1.0176	1.0194	1.0352	1.0101	1.0185	1.0100	1.0279
Wicklow	1.0140	1.0361	1.0033	1.0153	1.0029	1.0185	1.0157	1.0377	1.0051	1.0173	1.0047	1.0204	1.0189	1.0412	1.0091	1.0211	1.0110	1.0305
Cavan	1.0098	1.0295	1.0024	1.0108	1.0010	1.0140	1.0112	1.0311	1.0041	1.0127	1.0028	1.0158	1.0141	1.0345	1.0076	1.0164	1.0084	1.0256
Donegal	1.0097	1.0270	1.0024	1.0123	1.0017	1.0142	1.0111	1.0286	1.0039	1.0141	1.0035	1.0161	1.0139	1.0320	1.0072	1.0178	1.0094	1.0258
Galway	1.0243	1.0430	1.0087	1.0177	1.0088	1.0218	1.0259	1.0446	1.0109	1.0198	1.0105	1.0236	1.0294	1.0480	1.0148	1.0236	1.0181	1.0336
Leitrim	1.0044	1.0299	0.9973	1.0105	0.9927	1.0140	1.0060	1.0313	0.9990	1.0124	0.9971	1.0157	1.0090	1.0348	1.0025	1.0161	1.0029	1.0257
Mayo	1.0111	1.0314	1.0009	1.0128	1.0005	1.0173	1.0127	1.0330	1.0028	1.0148	1.0026	1.0192	1.0161	1.0364	1.0063	1.0186	1.0097	1.0290
Monaghan	1.0103	1.0236	1.0032	1.0093	1.0021	1.0119	1.0115	1.0252	1.0047	1.0112	1.0041	1.0138	1.0141	1.0285	1.0079	1.0147	1.0080	1.0234
Roscommon	1.0092	1.0267	1.0012	1.0115	1.0001	1.0152	1.0107	1.0284	1.0031	1.0135	1.0022	1.0172	1.0142	1.0318	1.0069	1.0174	1.0075	1.0270
Sligo	1.0133	1.0307	1.0028	1.0118	1.0018	1.0154	1.0147	1.0323	1.0045	1.0136	1.0041	1.0171	1.0178	1.0357	1.0082	1.0173	1.0107	1.0268
Carlow	1.0116	1.0309	1.0027	1.0124	1.0016	1.0161	1.0133	1.0324	1.0047	1.0144	1.0034	1.0178	1.0165	1.0359	1.0085	1.0180	1.0093	1.0275
Clare	1.0139	1.0402	1.0019	1.0138	1.0011	1.0179	1.0156	1.0417	1.0038	1.0157	1.0029	1.0197	1.0191	1.0451	1.0075	1.0193	1.0105	1.0292
Cork	1.0173	1.0361	1.0067	1.0141	1.0059	1.0181	1.0189	1.0377	1.0087	1.0160	1.0078	1.0200	1.0223	1.0411	1.0124	1.0197	1.0154	1.0297
Kerry	1.0094	1.0269	0.9990	1.0094	0.9983	1.0129	1.0111	1.0285	1.0011	1.0113	1.0000	1.0146	1.0144	1.0319	1.0048	1.0150	1.0079	1.0245
Kilkenny	1.0108	1.0253	1.0016	1.0109	1.0006	1.0147	1.0124	1.0268	1.0037	1.0129	1.0027	1.0166	1.0157	1.0302	1.0075	1.0166	1.0087	1.0261
Limerick	1.0199	1.0307	1.0071	1.0110	1.0069	1.0158	1.0215	1.0323	1.0092	1.0130	1.0088	1.0177	1.0249	1.0357	1.0129	1.0167	1.0163	1.0274
Tipperary	1.0102	1.0290	1.0019	1.0096	1.0008	1.0136	1.0119	1.0306	1.0037	1.0116	1.0027	1.0155	1.0152	1.0340	1.0073	1.0152	1.0084	1.0250
Waterford	1.0154	1.0342	1.0059	1.0157	1.0053	1.0203	1.0171	1.0358	1.0079	1.0179	1.0073	1.0220	1.0205	1.0393	1.0119	1.0218	1.0143	1.0319
Wexford	1.0051	1.0196	0.9999	1.0096	0.9989	1.0122	1.0068	1.0211	1.0022	1.0116	1.0006	1.0140	1.0100	1.0245	1.0060	1.0152	1.0077	1.0232

Figure 7.3: Future traffic growth (Source: Table 6.2 of the guidelines<sup>2</sup>)

## 7.2.4 Traffic Generation

The estimation of projected change in traffic flows associated with the construction and operation of the proposed scheme is based on the following information:

- The volume of construction traffic activity is based on the scale of the individual construction phases, the level of deliveries on site, the removal of dredged material/ soil and other construction waste from the site in addition to staff and ancillary traffic movements (i.e. servicing, visitors, etc.); and
- The volume of operational traffic activity is based on the number of service vehicles expected with the maintenance and upkeep of the pumping stations and other mechanical installations employed as part of the works, as well as periodic operational maintenance works
- Traffic Distribution

The distribution of generated traffic is expected to reflect the existing distribution of traffic recorded by the traffic counts carried out on the local road network. In addition, the distribution of construction traffic is based on the following:

- All construction deliveries to the Site Compound SC1, SC2, SC3 and SC5 and works to the north of the Avoca River will access and egress these work areas from Junction 20 on the M11 Motorway.



**Figure 7.4:** Access Routes for compounds and work areas North of the Arklow River. Not to scale

- All construction deliveries to Site Compound SC4 and SC6 and work areas to the south of the Arklow Bridge, will access the works area from Junction 21 on the M11 Motorway if their origin/destination is south, while all deliveries to/from the north will be from Junction 20 on the M11 Motorway.



**Figure 7.5:** Access Routes for compounds and work areas South of the Arklow River.  
Not to scale

- The internal movement of construction vehicles will be permitted between the Work Areas and the individual site compounds.

### 7.2.5 Time Periods Assessed

The time periods assessed as part of this transport assessment include the 08:00-09:00 period (i.e. during the morning peak period), the 17:00 - 18:00 period (i.e. during the evening peak period) and on an all-day basis (i.e. 24-hour period).

In terms of future assessment years, it is proposed to assess the proposed scheme for Year 2026 as this is the expected busiest period of the construction programme. The operational assessment will be based on Year 2027 flows.



## 7.2.6 Consultation

Wicklow County Council was consulted during the development of the traffic management plans to facilitate the construction of the proposed scheme. In principle, they are in agreement with the proposed traffic management plans, subject to the finalisation and submission of these plans on appointment of a contractor(s).

## 7.2.7 Impact Assessment Methodology

The significance of effects has been assessed based on the criteria presented in **Table 7.1** and has been based on the projected change in prevailing travel conditions which has regard to the EPA draft guidance<sup>3</sup> and with reference to professional judgement of the author who has more than 20 years' experience in undertaking traffic and transport assessments.

**Table 7.1:** Assessment Criteria

Significance of Effects	Topic Specific Criteria
Imperceptible	No perceived impact on prevailing travel conditions
Not Significant	A small change in traffic flows without causing a real change in travel conditions
Slight Effects	A change in traffic flow resulting in a minor change in travel conditions
Moderate Effects	A change in traffic flows resulting in a modest change in travel conditions
Significant Effects	A marked change in travel conditions resulting in long delays to traffic
Very Significant Effects	A significant change in travel conditions resulting in very long delays to traffic
Profound Effects	A major change in travel conditions resulting in the breakdown in traffic flow and significant delays to traffic

## 7.2.8 Guidance and Legislation

The following documents have been referred to in the preparation of this transport chapter:

- Traffic and Transport Assessment Guidelines (Transport Infrastructure Ireland – May 2014)
- Transport Infrastructure Ireland Project Appraisal Guidelines for National Roads Unit 5.3 - Travel Demand Projections – May 2019.

<sup>3</sup> Environmental Protection Agency (2017) Draft Guidelines on the Information to be contained in Environmental Impact Assessment Reports (Draft August 2017)

- Environmental Protection Agency (2017) Draft Guidelines on the Information to be contained in Environmental Impact Assessment Reports (Draft August 2017)
- Highways Agency (UK) *DMRB Volume 5 Section 1 Part 3b (TA 79/99) Assessment and preparation of road schemes. Assessment of road schemes. Traffic capacity of urban roads (including Amendment No.1 dated May 1999)*

## 7.3 Baseline Conditions

### 7.3.1 Site Location

The proposed works are located along the Avoca River travelling through Arklow and include a number of sites remote from the river to support the construction of an embankment and ancillary site activities. The location of the proposed works is presented in **Figure 1.1** in **Chapter 1, Introduction**.

To support the construction of the proposed scheme the following river access points and construction compounds have been identified and form part of the transport assessment. These are identified in **Figure 5.3** in **Appendix 5.1**.

### 7.3.2 Local Road Network

A brief description of the local road/street network in the vicinity of the proposed scheme is provided in **Sections 7.3.2.1 - 7.3.2.11**. The local road networks are indicated on **Figure 7.6**.

#### 7.3.2.1 Ferrybank

Ferrybank is the primary route serving the northern side of Arklow and is the main road connecting Arklow to Junction 20 (Templeraíne) on the M11. Ferrybank is a two-way roadway and directly serves adjacent residential properties. The roadway has good pedestrian facilities with footpaths located on both sides of the roadway and there are formal pedestrian crossings outside Abercorn Masonic Hall and about 120m north of this location.

#### 7.3.2.2 North Quay

The junction of Ferrybank and North Quay is controlled via a roundabout and is a relatively busy intersection as North Quay also provides access to the Bridgewater Shopping Centre. The roadway is a single carriageway road with a footpath provided along one side of the roadway only. North Quay generally serves a combination of industrial and commercial properties.

### 7.3.2.3 South Quay

South Quay is a two-way roadway primarily serving residential properties. Also, there is commercial traffic from the Dock area accessing Main Street and Arklow Bridge via South Quay. The roadway is generally narrow in width and has only intermittent footpath provision. The northern end of South Quay operates one-way northbound and there are no footpaths provided along this section of roadway. The junction of Bridge Street and South Quay is a give-way junction but traffic is not permitted to access South Quay from Bridge Street.

### 7.3.2.4 Bridge Street

Bridge Street connects Main Street with Arklow Bridge. The street is two-way and supports on-street commercial and retail premises, no parking is permitted along Bridge Street. Bridge Street has footpaths located on both sides of the roadway and also has a pedestrian crossing provided close to its junction with Main Street.

The junction of Bridge Street/ Lower Main Street is non-standard with traffic travelling from Main Street having to give-way to traffic travelling between Bridge Street and Lower Main Street. This junction is a very busy location for both vehicular and pedestrian traffic.

### 7.3.2.5 Lower Main Street

Lower Main Street connects Main Street with Back Street and Abbey Street and is generally one-way westbound with a small section of two-way providing access to the main car park in Arklow via Laffin's Lane. Lower Main Street has footpaths on both sides of the roadway and supports on-street parking. The area closer to Bridge Street is characterised by retail and commercial premises while the section closer to Back Street/Abbey Street is more residential in character.

### 7.3.2.6 Abbey Street

Abbey Street serves the south west districts of Arklow and can provide access to Junction 21 on the M11 Motorway. The street is two-way and supports mainly residential properties. The street has footpaths on both sides of the roadway and also supports some on-street parking.

### 7.3.2.7 Back Street

Back Street connects Abbey Street to Lower Main Street. Back Street serves the south west districts of Arklow. The street is two-way and supports mainly residential properties. The street has footpaths on both sides of the roadway. An old industrial building is also located on Back Street. No on-street parking is permitted on Back Street.

### 7.3.2.8 South Green

South Green connects South Quay with Lower Main Street. The street is residential in nature, is two way and supports on street parking.

### 7.3.2.9 Tinahask Road

Tinahask Road connects Abbey Street to the southern end of South Quay, via Old Chapel Ground and Harbour Road. The street is two-way, however the connection to Abbey Street requires the utilisation of a system of one-way streets encompassing Lower Main Street/ Back Street and Old Chapel Ground. The roadway is supports on-street parking and has footpaths provided on both sides of the roadway.

### 7.3.2.10 Harbour Road

Harbour Road connects Tinahask Road with the South Quays, The street is a wide two-way street and supports parking on both sides of the roadway along with footpaths. The street primarily supports residential uses.

### 7.3.2.11 Main Street

Main Street connects Wexford Road with Bridge Street, via Upper Main Street. The street is two-way and supports on-street commercial and retail premises. The street has footpaths on both sides of the roadway and supports on-street parking along one side of the roadway. On occasion, delays on Main Street can be experienced when two larger vehicles pass one another particularly where the street narrows to support on-street parking.

As noted previously traffic on Main Street has to yield to traffic on the Bridge Street- Lower Main Street route as part of the existing management of traffic. Main Street also provides access to Wexford Road which is the primary route south towards Junction 21 on the M11 Motorway.

## 7.3.3 Public Transport Network

Arklow is served by a rail service with Arklow train station located approximately 10 minutes' walk from the junction of Main Street/ Bridge Street. Regular services connect Arklow with Wicklow, Greystones, Bray and Dublin to the north, and Wexford and Rosslare Port to the south.

In addition, Arklow is served by regional bus services connecting it with the surrounding towns and cities including:

- Wexford Bus (Route 740) Wexford to Dublin Airport also serving Enniscorthy, Gorey, and University College Dublin. – Frequency generally 1 an hour.
- Intercity Route 2: Wexford to Dublin Airport also serving Gorey, Enniscorthy and Wexford – Frequency generally 1 an hour; and

- Regional Route 133: Dublin to Arklow serving Rathnew, Wicklow, Bray – frequency twice a day.

The location of the train station and the primary bus route in Arklow is presented in **Figure 7.6**.

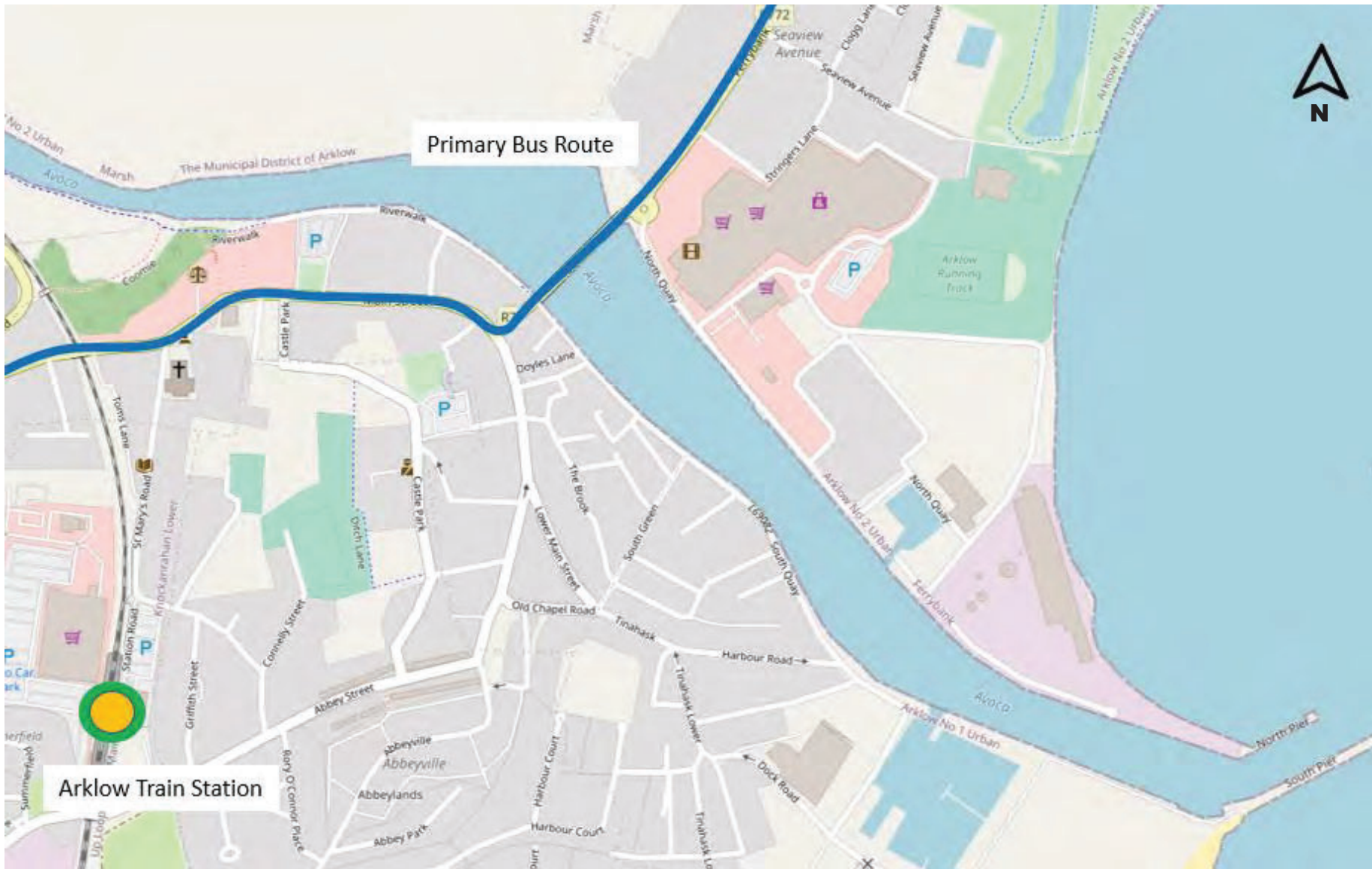


Figure 7.6: Public Transport Network. Not to scale

### 7.3.4 Existing Traffic Patterns

In order to assess the potential impact of the proposed scheme on the local road network an examination of the existing traffic flows was necessary. **Section 7.2.2** presented the location of the traffic counts which were carried out in September 2020 to capture the return of school traffic and **Table 7.2** presents the morning peak (08:00-09:00), evening peak (17:00-18:00) and weekday daily traffic flows for the key streets in the vicinity of the proposed scheme. The reported traffic flows in **Table 7.2** included for the projected uplift resulting from the COVID-19 restrictions.

**Table 7.2:** Existing Traffic Flow

Link	08:00 - 09:00	17:00 – 18:00	Daily
Ferrybank	1315 pcu	1333 pcu	16363 pcu
North Quay	211 pcu	614 pcu	7082 pcu
South Quay – One Way Section	213 pcu	242 pcu	2968 pcu
Dublin Road	984 pcu	1012 pcu	13456 pcu
Bridge Street	1163 pcu	1241 pcu	16929 pcu
Arklow Bridge	1262 pcu	1318 pcu	18036 pcu
Abbey Street	309 pcu	420 pcu	4589 pcu
South Green	185 pcu	193 pcu	2239 pcu
Tinahask Road	203 pcu	314 pcu	3502 pcu
Main Street	1107 pcu	1177 pcu	16064 pcu

Note: pcu = passenger car units

From the information in **Table 7.2**, it can be seen that the busiest routes include Ferrybank, Arklow Bridge and Main Street, all strategic road links in Arklow, with lower traffic flows using the remaining streets particularly on the south side of the Avoca River. The North Quay is not a strategic road link but is relatively busy due to the presence of the Bridgewater Shopping Centre.

### 7.3.5 Committed Development

As noted in **Section 1.3.4** of **Chapter 1, Introduction**, the Arklow Wastewater Treatment Plant (WwTP) project received planning consent in 2019. The proposed WwTP will mitigate the current practice of discharging raw effluent to the Irish Sea.

As noted in **Section 2.6.1** of **Chapter 2, Background and Need for the Scheme**, the proposed WwTP will physically overlap with the Arklow Flood Relief Scheme (FRS) as there are common areas within the town where works for both the proposed WwTP and FRS developments will be undertaken. Depending on the final construction programme for both the WwTP and FRS, construction works for both projects may occur in parallel or sequentially. Refer to **Section 2.6.3** of

**Chapter 2, *Background and Need for the Scheme***, for further details on the interactions between the two schemes.

As noted previously the recorded baseline traffic flows have been increased by the growth rates as presented by Transport Infrastructure Ireland<sup>2</sup> (Refer to **Table 7.1**). The inclusion of these growth rates reflects the potential increase in traffic generation on the surrounding road network from committed schemes in the general Arklow area, outside of the specific traffic volumes associated with the Arklow WwTP Project.

## 7.4 Characteristics of the Proposed scheme

### 7.4.1 Introduction

The following sections presents the proposed scheme and the likely changes to the existing transport networks needed to accommodate the construction of the proposed scheme. In transport terms, the construction of the proposed scheme can be divided into five Work Packages:

- **WP 1:** Lowering the floor of Arklow Bridge including Bridge underpinning, Bridge remedial works and scour protection works. Bat tubes will also be installed under the bridge deck during and upon completion of works.
- **WP 2:** Channel dredging upstream and downstream of Arklow Bridge. Works will include an extension of the north riverbank into the river, upstream of the Bridge, and planting it with trees, and the installation of floating bird roosting platforms upstream of Arklow Bridge.
- **WP 3:** Construction of debris and gravel traps with associated maintenance access ramp on the south bank. Bat tubes will also be installed on the downstream face of the debris trap piers.
- **WP 4:** Construction of flood defence walls along River Walk, South Quay and around the dock on the south (right) bank, including the adjacent stormwater drainage. Installation of bat tubes along the flood defence walls. Public realm and landscape features including footpaths, terraces, planters and seating will be constructed in the working area.
- **WP 5:** Construction of flood defence earth embankment and flood defence wall on north (left) bank along eastern side of Arklow Town Marsh including stormwater drainage diversion works. Upon completion of the earth embankment, the green space on the dry side of embankment will be planted with trees. Landscaping will be carried out on the river side of the flood defence wall.

Refer to **Chapter 5 *Construction Strategy*** for further details on the individual work packages.

The operation of the proposed scheme will be considered separately.



## 7.4.2 Site Compounds and River Access Locations

### 7.4.2.1 Site Compounds

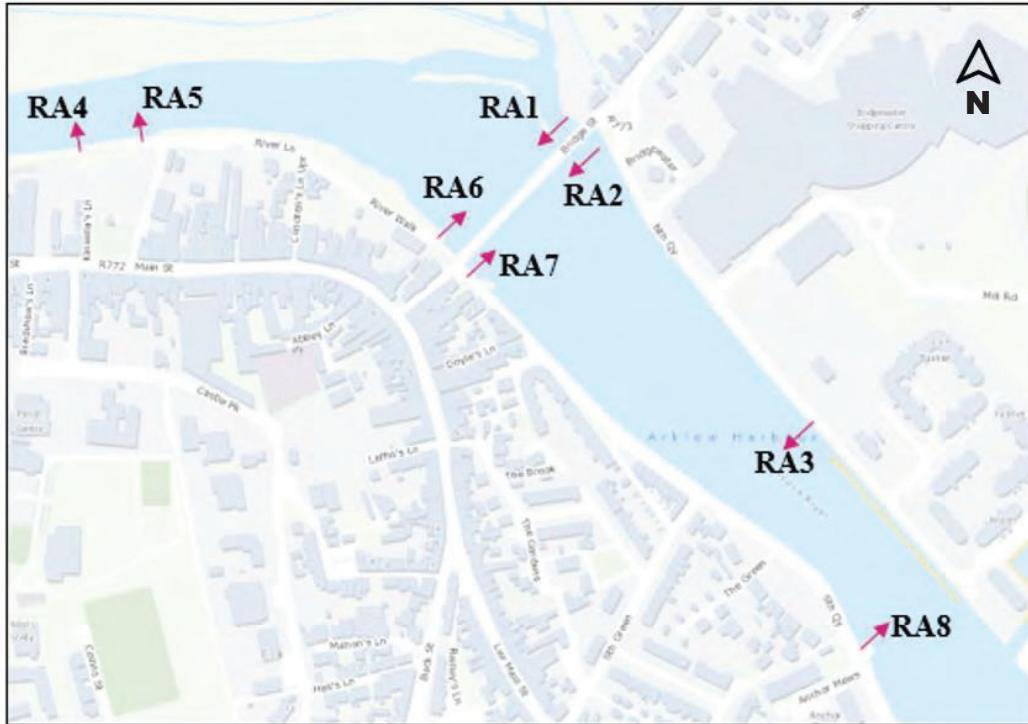
The proposed scheme requires a network of construction compounds and river access locations as part of the works. A total of six site compounds have been identified and are presented in **Figure 7.7**. The site compounds will have a range of functions including the storage of materials, the stockpiling and archaeological monitoring of dredged material, construction offices and welfare facilities. In addition to the dedicated site compounds, it is envisaged that welfare facilities, some material storage and local site offices will also be provided within each of the work areas themselves. Refer to **Figure 5.3** in **Appendix 5.1** for further details on the site compounds.



**Figure 7.7:** Site Compound Locations. Not to scale.

### 7.4.2.2 River Access Locations

The proposed scheme requires construction access to the river to complete the required construction works and a number of River Access points have been identified and will be used for the different stages of the project. **Figure 7.8** shows the location of the proposed River Access points.



**Figure 7.8:** River Access Points. Not to scale.

## 7.4.3 Work Package 1: Bridge Underpinning, Bridge Remedial Works and Scour Protection

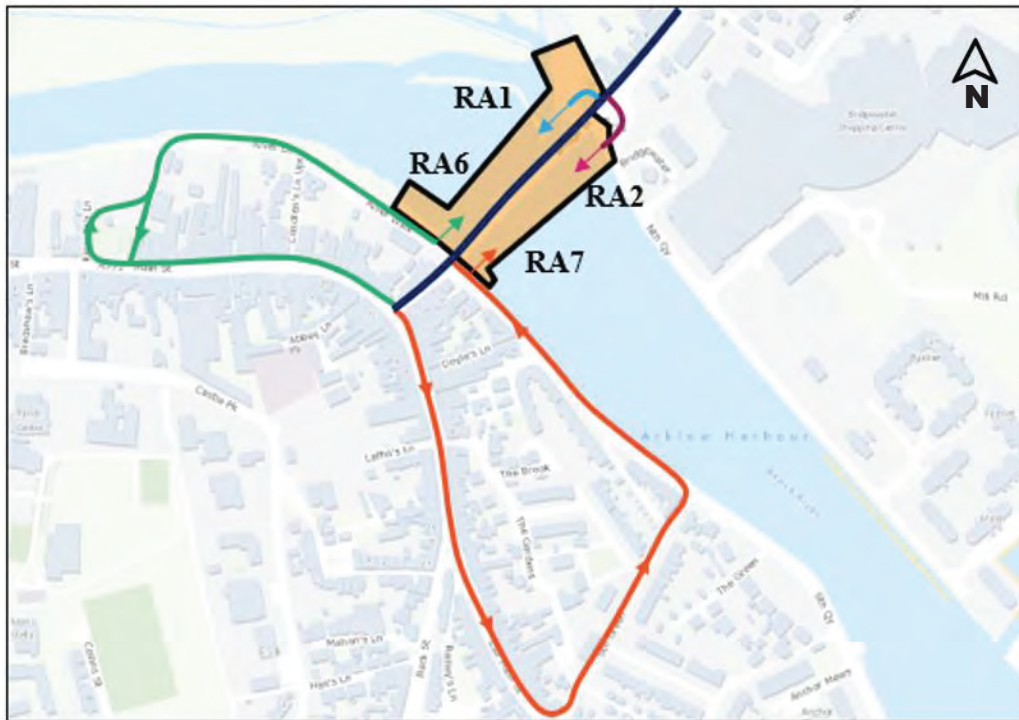
### 7.4.3.1 Overview

Work Package 1 (WP1) includes lowering the river bed under the Arklow Bridge, including the underpinning of the bridge abutments and piers and the reconstruction of the scour protection slab at the new riverbed level. In addition, the existing bridge will be repaired and strengthened as part of the works.

The location of the Works Area associated with Work Package 1 is presented in **Figure 7.9**. It is envisaged that this Works Area will have multiple access routes with Ferrybank and Arklow Bridge providing the central access route to each of the multiple access routes.

- **River Access 1 (RA1 – Light Blue)** will be accessed via the roundabout on Ferrybank;
- **River Access (RA2 – Pink)** will be accessed via the North Quays via the roundabout on Ferrybank

- **River Access (RA6 – Green)** will be accessed via River Walk and will operate via Main Street in both directions and in a one-way direction with entering traffic utilising Kinsella’s Lane with traffic exiting via River Lane (West).
- **River Access (RA7 – Orange)** will be access via South Quays and will operate in a one direction utilising Lower Main Street, South Green and South Quays.



**Figure 7.6:** Access to Work Package Area 1. Not to scale.

### 7.4.3.2 Construction Phase

The construction works associated with Arklow Bridge, WP1, are expected to take approximately 36 months to complete, however works are not expected to be continuous over this period as there are seasonal restrictions with respect to in-channel works. The works will, as such, span three summers. It is envisaged that the construction works will employ up to 25 persons during the peak construction period, which will be during the summer months when restrictions are lifted for in-channel works.

The primary characteristics of this phase of works include the following:

- There will be a requirement to close one lane of traffic on Arklow Bridge to accommodate some of the grouting works from the bridge deck and any superstructure remedial works carried out via a mobile work platform sited on the bridge deck. Traffic will be managed using a shuttle stop/go system. Any scheduled lane closures will commence after 21:00 and will be lifted before 07:00. It is expected that this grouting work will take approximately six months to complete and will be carried out over three summers.

Some of the grouting will also take place with access from the riverbed which does not require the closure of one of the traffic lanes on the bridge.

- The closure of one lane of the Bridge will also require the closure of the adjacent footpath to facilitate access to the bridge structure. To ensure safe pedestrian access to the single footpath over the bridge, suitable pedestrian crossing points will be required at each end of the works, these can be provided either through temporary traffic signals or managed by dedicated traffic management personnel.
- In terms of the underpinning construction technique, the final construction methodology has yet to be determined and will only be finalised following the appointment of a contractor(s) once planning permission is granted. Therefore, a number of different construction techniques will be evaluated in this assessment including:
  - Traditional underpinning at riverbed
  - Piling from riverbed
  - Piling from the bridge deck (the hours of operation will be 21:00 -07:00);
  - Reinforced Concrete wall with extensive grouting
- Other works including the construction of bunds, temporary haul roads and the concrete scour protection slab will all be carried out during the summer period as well.
- All four River Access points, RA1, RA2, RA6, and RA7 will be utilised to construct in-channel access roads. As required, the in-channel access roads will be removed at the end of each working summer season and reinstated at the beginning of the next summer working season.
- It is envisaged that RA6 and RA7 will be utilised during the first summer with RA7 servicing two thirds of the construction activity with RA6 servicing the remainder;
- RA1 and RA2 will be utilised during the second and third summers with RA2 servicing two thirds of the construction activity with RA1 servicing the remainder;
- Riverside Walk will remain accessible for all traffic during the course of the construction works for WP1.
- It may be necessary to remove some parking (2 spaces) in the immediate vicinity of the proposed river access point (RA6) to ensure safe construction.
- The provision of a safe access route via Main Street car park to access the proposed river access point (RA6) will result in the loss of some parking spaces. The number of spaces requiring removal will be kept to a minimum for the duration of the works but is estimated to be ~42 parking spaces, any parking spaces for the disabled or age friendly spaces impacted will be relocated within the existing car park.
- A safe pedestrian accessway will be secured along the southside of River Walk and the South Quay for the duration of the construction works.

### 7.4.3.3 Traffic Generation

WP1 will result in additional traffic associated with the delivery of fill to create the in-channel access roads, the delivery of materials to support the grouting and piling works and the general operations of the construction site. However, it is noted that the proposed lane closures will have a more significant impact on vehicular movements in the town compared to the actual additional traffic generated during the construction works.

The projected increase in traffic associated with WP1 during the busier summer periods when in-channel work is permitted is noted in **Table 7.3** based on the following key assumptions:

- Limited parking will be provided for staff within the works area, with staff accessing the site from the site compounds (SC 1) by shared transport provided by the contractor(s) or walk;
- Approximately 25 construction staff will be employed at the working areas.
- In terms of deliveries the expected busiest period will be associated with the construction of the in-channel access roads combined with grouting/ piling works on the bridge itself (although some of these latter works will not take place during the peak hour periods);
- An estimated 8,374m<sup>3</sup> of material will be excavated and removed as part of this programme of works utilising an excavator and dump trucks, the latter of which have a carrying capacity of 9m<sup>3</sup>. An estimated 1,888 m<sup>3</sup> will be removed immediately with the remainder (6,486 m<sup>3</sup>) will be transferred to SC1 for archaeological examination.
- It is envisaged that there will be construction traffic on-going on an all-day basis between the Works Area and compound SC1 for archaeological monitoring of the material.
- Average delivery projections have been increased by 30% to reflect the potential for some peaking in activity throughout the construction programme associated with WP 1.

**Table 7.3:** Peak Traffic Generation (two-way) – Work Package 1

	Light Goods Vehicles		Heavy Goods Vehicles			TOTAL	
	Staff	Service	Deliveries	Excavation	Service		
Daily	75 LGV	11 LGV	36 HGV	9 HGV	4 HGV	135 vehs	199 pcu
AM Peak	13 LGV	2 LGV	3 HGV	1 HGV	1 HGV	20 vehs	27 pcu
PM Peak	13 LGV	2 LGV	3 HGV	1 HGV	1 HGV	20 vehs	27 pcu

pcu = passenger car units, HGV = heavy goods vehicle, LGV = light goods vehicle

## 7.4.4 Work Package 2: Channel Dredging

### 7.4.4.1 Overview

Work Package 2 (WP2) involves dredging in the river both upstream and downstream of Arklow Bridge. The location of the Works Area associated with WP2 is presented in **Figure 7.10**. It is envisaged that this Works Area will have multiple access routes with Ferrybank and Arklow Bridge providing the central access route to each of these.

- **River Access 1 (RA1 – Light Blue)** will be accessed via the roundabout on Ferrybank;
- **River Access 2 (RA2 – Purple)** – via North Quay
- **River Access 3 (RA3 – Yellow)** via North Quay
- **River Access 8 (RA8 – Orange)** will be accessed via South Quay and will operate via South Green.



Figure 7.10: Works Area – Works Package 2. Not to scale.

#### 7.4.4.2 Construction Phase

The construction works associated with WP2 dredging are expected to take approximately five months to complete, with estimated two months of work associated with the dredging upstream of Arklow Bridge and three months downstream with a further month allowed for the mobilisation and demobilisation of the works. The dredging will not commence until the completion of WP1. It is envisaged that the construction works associated with WP2 will employ approximately ten persons during the peak construction period.

The primary characteristics of this phase of works include the following:

- There will be a requirement to stockpile some of dredged material at either SC1, SC2, SC5 or SC6 to allow for archaeological monitoring prior to removal off site, or potential reuse in the earth embankment.

- The final disposal locations for the material has not yet been determined but for the purposes of this assessment all disposed material will be on land and leave Arklow via the Dublin Road and Junction 20 on the M11 Motorway.
- In total, the volume of dredged material which will be generated in WP2 is 77,126m<sup>3</sup> of which 9,882 m<sup>3</sup> will be brought to SC1 for reuse (utilising RA1), 4,200 m<sup>3</sup> will be brought to SC2, 3,900 m<sup>3</sup> to SC5 and 17,367 m<sup>3</sup> to SC6. All of this material will be removed offsite on completion of the archaeological monitoring and the confirmation of the status of the material. The balance of 41,777 m<sup>3</sup> (54.2%) will be removed directly offsite.
- Some of the dredged material will be reused to build the embankment between SC1 and the Arklow River.
- For a 5-month period, the river walk to the west of River Lane along the southside of the river will need to be closed to the public.
- It is envisaged that RA3 and RA8 will be utilised for downstream works and will be used twice as much as RA1 which will be used for the upstream works;
- It may be necessary to restrict informal parking in the immediate vicinity of the proposed river access points RA8 and RA3 to ensure safe construction.
- A safe pedestrian accessway will be secured along River Walk, South Quay and North Quay for the duration of the construction works.

#### 7.4.4.3 Traffic Generation

WP2 will result in additional traffic associated with the removal of the dredged material from the river and the temporary stockpiling of the material at the various site compounds and its ultimate reuse or disposal (following examination) offsite.

The projected increase in traffic associated with WP2 is noted in **Table 7.4** based on the following key assumptions:

- Limited parking will be provided for staff within the works area, with staff accessing the site from the site compound (SC6) by shared transport provided by the contractor(s);
- Approximately ten construction staff will be employed at the working areas.
- The excavation of the material will take place over a 5-month construction phase (approximately 120 days);
- In total 8,570 truckloads of material will be dredged from the river resulting in a total of approximately 25,000 HGV trips (this includes the double handling of material between river to site compounds and then off-site, and dump trucks with a carrying capacity of 9m<sup>3</sup>).
- It is envisaged that the following site compounds will be used for archaeological monitoring under WP2, SC1, SC2, SC5, and SC6.



**Table 7.4:** Peak Traffic Generation – Work Package 2

	Light Goods Vehicles		Heavy Goods Vehicles			TOTAL	
	Staff	Service	Deliveries	Excavation	Service		
Daily	30 LGV	8 LGV	6 HGV	209 HGV	6 HGV	259 vehs	546 pcu
AM Peak	5 LGV	1 LGV	1 HGV	21 HGV	1 HGV	29 vehs	59 pcu
PM Peak	5 LGV	1 LGV	1 HGV	21 HGV	1 HGV	29 vehs	59 pcu

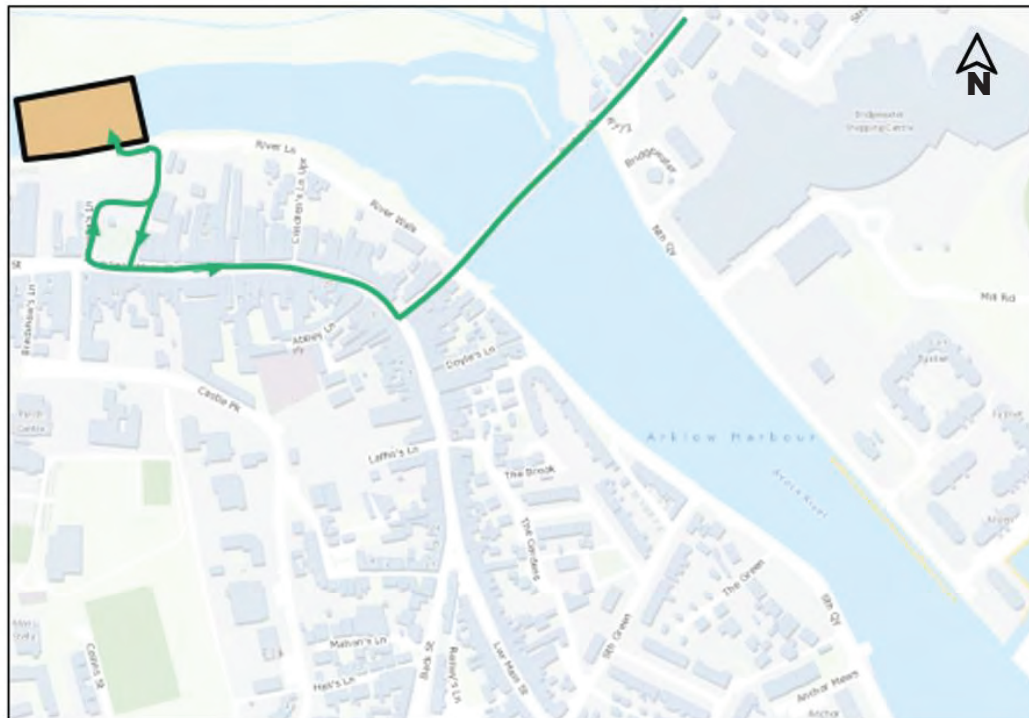
pcu = passenger car units

## 7.4.5 Work Package 3: Debris and Gravel Traps

### 7.4.5.1 Overview

Work Package 3 (WP3) involves the construction of a debris trap and a gravel trap upstream of Arklow Bridge. The location of the Works Area associated with WP3 is presented in **Figure 7.11**. It is envisaged that this Works Area will have access via both RA4 and RA5.

- **River Access (RA4 and RA5 – Green)** will be accessed via River Walk and will operate via Main Street in both directions and in a one-way direction with entering traffic utilising Kinsella’s Lane with traffic exiting via River Lane (West).



**Figure 7.11** Works Area – Works Package 3. Not to scale.

### 7.4.5.2 Construction Phase

The construction works associated with WP3 debris and gravel traps are expected to take approximately six months to complete, with an estimated four months of work associated with the debris trap and two months associated with the gravel trap with a further month allowed for the mobilisation and demobilisation of the works. The construction of the debris and gravel trap will be carried out during the first summer and will coincide with the works to the Arklow Bridge (WP1). It is envisaged that the construction works associated with WP3 will employ approximately up to 12 persons during the peak construction period.

The primary characteristics of this phase of works include the following:

- There will be a requirement to construct temporary haul roads within the river to facilitate construction, stockpile dredged material at SC1 to allow for archaeological monitoring prior to removal off site, or potential reuse in the earth embankment.
- There will be a requirement to reuse/dispose of some excavated riverbed materials and the delivery of concrete, stone and steel and other materials to support the construction of the debris and gravel traps.
- For a 6-month period the river walk to the west of River Lane along the southside of the river will need to be closed to the public.
- As noted previously the provision of a safe access route via Main Street car park to access the proposed river access point (RA4) will result in the loss of approximately 42 parking spaces.

### 7.4.5.3 Traffic Generation

- WP3 will result in additional traffic associated with both the removal of excavated material and the delivery of construction materials (concrete, steel, hardcore, etc). The projected increase in traffic associated with WP3 is noted in **Table 7.5** based on the following key assumptions:
- Limited parking will be provided for staff within the works area, with staff accessing the site from the site compounds (Primarily SC4) by shared transport provided by the contractor(s);
- Approximately 12 construction staff will be employed at the working areas.
- The volume of excavated material is expected to low at 800m<sup>3</sup> and will not take place continuously over the course of the construction period
- The number of deliveries is also expected to be low to construct both the debris and gravel trap.
- It is envisaged that there will some service movements on an all-day basis between the Works Area and the different site compounds (SC4 and SC1).

**Table 7.5:** Peak Traffic Generation – Work Package 3

	Light Goods Vehicles		Heavy Goods Vehicles			TOTAL	
	Staff	Service	Deliveries	Excavation	Service		
Daily	36 LGV	8 LGV	3 HGV	5 HGV	6 HGV	58 vehs	76 pcu
AM Peak	6 LGV	1 LGV	1 HGV	1 HGV	1 HGV	10 vehs	14 pcu
PM Peak	6 LGV	1 LGV	1 HGV	1 HGV	1 HGV	10 vehs	14 pcu

pcu = passenger car units

## 7.4.6 Work Package 4: Flood Defence Walls and Drainage on South Bank

### 7.4.6.1 Overview

Work Package 4 (WP4) includes the construction of new flood defence both upstream and downstream of Arklow Bridge. The new flood defence walls include the construction of a stormwater drainage system and pump stations. Following the completion of the new defence walls, public realm works will be provided along both River Walk and South Quay.

The location of the Works Area associated with WP4 is presented in



**Figure 7.** Access to the flood defence works upstream of Arklow Bridge will be via Main Street in both directions and in a one-way direction with entering traffic utilising Kinsella's Lane with traffic exiting via River Lane (West). Not to scale.

Access to the flood defence works downstream of Arklow Bridge will be via South Quay with access available via South Green, Harbour Road and Dock Road available to support the construction works.



**Figure 7.12** Works Area – Works Package 4. Not to scale.

#### 7.4.6.2 Construction Phase

The construction works associated with Work Package 4 are expected to take approximately 23 months to complete, with an estimated ten months' work associated with works along Riverwalk and 11 months associated with the works along South Quay with a further two months allowed for the mobilisation and demobilisation of the works. The construction of the flood defence walls and associated drainage system will be carried out at the same time as WP1, the works associated with Arklow Bridge.

It is envisaged that the construction works associated with WP4 will employ approximately up to 15 persons during the peak construction period.



- There will be a requirement to remove the existing riverside parking (10-12 parking spaces) along South Quay to facilitate the construction works. On River Walk there will be a requirement to temporarily remove approximately 50% of the parking along this street over the course of the works here (five months).

### 7.4.6.3 Traffic Generation

WP4 will result in additional traffic associated with the construction and removal of the temporary causeway, the construction of the flood defences and associated drainage works and finally the proposed public realm and reinstatement works.

- The projected increase in traffic associated with WP4 is noted in **Table 7.6** based on the following key assumptions:
- Limited parking will be provided for staff within the works area, with staff accessing the site from the site compounds (SC4 and SC6) by shared transport provided by the contractor(s);
- Approximately 15 construction staff will be employed at the working areas.
- The volume of imported material to construct the temporary causeway has been estimated at 8,573 m<sup>3</sup> of material resulting in 952 truckloads over the course of the proposed scheme.
- The expected level of peak deliveries will be in the region of 15 per day.
- The construction of flood relief walls and associated drainage system is expected to generate less traffic and deliveries compared to the construction (and removal) of the temporary causeway.
- It is envisaged that there will be some service movements on an all-day basis between the Works Area and the different site compounds particularly SC1.

**Table 7.6:** Peak Traffic Generation – Work Package 4

	Light Goods Vehicles		Heavy Goods Vehicles			TOTAL	
	Staff	Service	Deliveries	Excavation	Service		
Daily	45 LGV	12 LGV	30 HGV	5 HGV	6 HGV	98 vehs	151 pcu
AM Peak	8 LGV	2 LGV	3 HGV	1 HGV	1 HGV	15 vehs	22 pcu
PM Peak	8 LGV	2 LGV	3 HGV	1 HGV	1 HGV	15 vehs	22 pcu

pcu = passenger car units

## 7.4.7 Work Package 5: Flood Defence Embankment and Wall Drainage on North Bank

### 7.4.7.1 Overview

Work Package 5 (WP5) includes the construction of new flood defence embankment (550 metres) to the west of Ferrybank and a 60-metre flood defence wall between it and the riverbank.

The location of the Works Area associated with Work Package 5 is presented in 7.14 Access to the Works Area will be primarily via site compounds SC1.



Figure 7.14 Works Area – Works Package 5. Not to scale.

#### 7.4.7.2 Construction Phase

The construction works associated with WP5 are expected to take approximately six months to complete, with an estimated five months' work associated with the construction of the embankment and the flood defence wall with a further month allowed for the mobilisation and demobilisation of the works. The construction of the flood defence walls and associated drainage system will be carried out at the same time as WP2, and the embankment will re-use 9,882 m<sup>3</sup> of dredged material from the River. It is envisaged that the construction works associated with WP5 will employ approximately up to 12 persons during the peak construction period.



The primary characteristics of this phase of works include the following:

- There will be limited need to import fill material for the embankment, however deliveries of concrete, steel, drainage pipes, bedding, etc. will be required, resulting in approximately eight deliveries per day.
- Construction traffic will enter the works area either via SC1 or SC3.

### 7.4.7.3 Traffic Generation

WP5 will result in a limited increase in additional generated traffic associated with the embankment and wall construction. The projected increase in traffic associated with WP5 is noted in **Table 7.7** based on the following key assumptions:

- Parking will be provided for staff within SC1;
- Approximately 12 construction staff will be employed at the working areas.
- It is estimated that 9,928 m<sup>3</sup> of natural material will be removed from site during WP5.
- The volume of additional traffic will be modest as the majority of the imported material will be dredged material from the River.
- It is expected that there will be less demand for vehicles to travel to other site compounds compared to the other elements of the project.

**Table 7.7:** Peak Traffic Generation – Work Package 5

	Light Goods Vehicles		Heavy Goods Vehicles			TOTAL	
	Staff	Service	Deliveries	Excavation	Service		
Daily	36 LGV	4 LGV	16 HGV	18 HGV	2 HGV	76 vehs	123 pcu
AM Peak	6 LGV	1 LGV	2 HGV	2 HGV	0 HGV	11 vehs	16 pcu
PM Peak	6 LGV	1 LGV	2 HGV	2 HGV	0 HGV	11 vehs	16 pcu

## 7.5 Minor Drainage Upgrade Works

In addition to the five work packages, as outlined above, there will be a number of smaller upgrades to the surface water drainage network within Arklow which will be carried out as part of the overall proposed scheme. The works include the installation of underground storm water pipes as illustrated in the following figure, **Figure 7.15**.



**Figure 7.15** Minor Drainage Upgrade Works. Not to scale.

### 7.5.1 Main Street and Bridge Street

The works here are expected to take between 2 to 3 weeks and, considering the business of the street, it is proposed that these works will only take place at night time utilising the same traffic management regime as proposed for WP1 (Arklow Bridge). The minor drainage works required along Bridge Street and Main Street will not be carried out at the same time as the works along Arklow Bridge as that would result in difficulties in managing traffic through the town.

Pedestrian access will be maintained at all times, however it is likely that there will be some restrictions placed on traffic at night time to ensure the safe operation of the construction works and the external street network.

The construction of the drainage works on Main Street will cause some short-term delays to traffic when the works are on-going at night. During the day there should be no significant change to prevailing conditions.

### 7.5.2 Harbour Road

The construction works on Harbour Road are expected to take approximately 2 weeks to complete. Harbour Road is a relatively wide roadway and it is possible to install the new drainage network without the need to close traffic lanes, however it is likely that there will be some loss of parking during the course of the construction.

The construction of works at Harbour Road will have little impact on traffic flows in Arklow, however there will be some inconvenience to local residents during the course of the works.

### **7.5.3 Dock Road**

The construction works on Dock Road are expected to take approximately 1 week to complete. Due to the width of Dock Road it will be necessary to close one of the traffic lanes to facilitate the works, with traffic operating on a stop-go basis, most likely managed with temporary traffic signals. The construction works area will be arranged to ensure continued access is maintained to the nearby furniture store and any local residential properties impacted by the proposed works.

The construction of works on Dock Road will have little impact on traffic flows in Arklow, however there will be some inconvenience to local traders and residents during the course of the works.

## **7.6 Likely Significant Effects**

The following sections present the projected change in traffic flows on the surrounding road network based on the projected additional traffic associated with the construction works. The projected increase in traffic flow reflects the peak activities on site which will be carried out in tandem, namely WP2 (dredging) and WP5 (embankment). It is expected that these peak activities will be carried out over a 6-month period. For all other time periods the projected increase in traffic will be less on the wider street network.

It is recognised under WP1 that although the projected increase in traffic is less than the combined traffic generation associated with WP2 and WP5 together, the traffic management measures required (i.e. one-way night time shuttle for traffic) to accommodate the works will have a slight negative impact when operational at night resulting in delays to traffic wishing to cross the bridge.

### **7.6.1 Do Nothing Scenario**

Under a 'Do Nothing Scenario' no temporary increase in traffic is expected and traffic conditions on the surrounding road network will remain as current with some queues and delays evident along Ferrybank Road and approaching Main Street and Arklow Bridge in the town. However, under the 'Do Nothing Scenario', flood waters from recurring flooding would disrupt pedestrian and vehicular movement in the town, and potentially traffic between the north and the south of the town in the event of a bridge closure due to flooding.

## **7.7 Assessment of Effects during Construction**

### **7.7.1 Traffic Generation**

The programme of works allows for the running of Work Packages in tandem with each other.

The peak period is expected to be when both WP2 and WP5 are in under construction at the same time. Therefore, this likely construction sequence will result in the following increase in traffic flows.

**Table 7.8:** Projected Peak Traffic Generation – Construction Phase (WP2 and WP5)

	Light Goods Vehicles		Heavy Goods Vehicles			TOTAL	
	Staff	Service	Deliveries	Excavation	Service		
Daily	66 LGV	12 LGV	22 HGV	227 HGV	8 HGV	335 vehs	669 pcu
AM Peak	11 LGV	2 LGV	3 HGV	23 HGV	1 HGV	40 vehs	75 pcu
PM Peak	11 LGV	2 LGV	3 HGV	23 HGV	1 HGV	40 vehs	75 pcu

pcu = passenger car units.

It is worth noting that, to reflect a potential worst-case scenario, it has been assumed that under WP2 that a single river access point could potentially generate the peak volume of daily/ hourly traffic at any one time, however it is more likely that two or more river accesses will be used on a daily basis reducing the potential impact of traffic immediate to each of the river access points.

### 7.7.2 Traffic Distribution

The distribution of generated traffic will reflect the existing distribution of traffic recorded by the traffic counts carried out on the local road network. In addition, the assignment of construction traffic is based on the following prescribed routing.

- All external construction deliveries/ removals to Site Compounds SC1, SC2, SC3 and SC5 and works to the north of the Avoca River will access and egress these work areas from Junction 20 on the M11 Motorway.
- All external construction deliveries/removals from the south to Site Compounds SC4 and SC6 and work areas to the south of the Arklow Bridge will access the works area from Junction 21 on the M11 Motorway, while all deliveries/ removals from the north will be from Junction 20 on the M11 Motorway. For the purposes of this assessment, 50% of external deliveries/ removals are expected from the North and 50% from the South of the M11 Motorway.
- All HGV access to Junction 21 on the M11 Motorway will be via Main Street and the Wexford Road and no HGV access associated with the proposed scheme will be permitted to use Abbey Street, Old Chapel Ground, Abbey Street, Harbour Court, etc. to access Junction 21.
- The internal movement of construction vehicles will be permitted between Work Areas and the individual site compounds using Arklow Bridge.

Construction staff trips will not be subject to the above traffic management plans and the following table presents the expected distribution of staff traffic.

**Table 7.9:** Projected Distribution of Staff Vehicular Trips

Link	Distribution
Ferrybank	45%
Abbey Street	15%
Main Street	40%

### 7.7.2.1 Traffic Assignment

**Table 7.10** presents the projected increase in traffic associated with the construction of the proposed scheme taking into account the envisaged sequencing of construction stages. The projected traffic flows have been calculated for the Year 2026 as this is the time period when construction activity is expected to be at its peak.

**Table 7.10:** Traffic Assignment

Link	08:00 - 09:00	17:00 – 18:00	Daily
Ferrybank	47 pcu	47 pcu	427 pcu
North Quay	42 pcu	42 pcu	393 pcu
South Quay – One Way Section	23 pcu	23 pcu	212 pcu
Dublin Road	33 pcu	33 pcu	279 pcu
Bridge Street	36 pcu	36 pcu	361 pcu
Arklow Bridge	28 pcu	28 pcu	311 pcu
Abbey Street	4 pcu	4 pcu	14 pcu
South Green	23 pcu	23 pcu	212 pcu
Tinahask Road	27 pcu	27 pcu	227 pcu
Main Street	47 pcu	47 pcu	423 pcu

### 7.7.2.2 Projected Traffic Increases

The following tables (**Table 7.11**, **Table 7.12** and **Table 7.13**) present the projected future traffic flows during construction both with and without the proposed scheme as well as the projected percentage change in traffic flows.

**Table 7.11:** Projected Traffic Flows - 2026 Without Development

Link	08:00 - 09:00	17:00 – 18:00	Daily
Ferrybank	1447 pcu	1467 pcu	17998 pcu
North Quay	232 pcu	676 pcu	7789 pcu
South Quay – One Way Section	235 pcu	266 pcu	3265 pcu
Dublin Road	1083 pcu	1114 pcu	14801 pcu
Bridge Street	1279 pcu	1365 pcu	18620 pcu
Arklow Bridge	1389 pcu	1450 pcu	19838 pcu

Link	08:00 - 09:00	17:00 – 18:00	Daily
Abbey Street	340 pcu	462 pcu	5048 pcu
South Green	203 pcu	213 pcu	2463 pcu
Tinahask Road	223 pcu	345 pcu	3852 pcu
Main Street	1218 pcu	1294 pcu	17669 pcu

**Table 7.12:** Projected Traffic Flows - 2026 With Development

Link	08:00 - 09:00	17:00 – 18:00	Daily
Ferrybank	1494 pcu	1514 pcu	18425 pcu
North Quay	274 pcu	718 pcu	8182 pcu
South Quay – One Way Section	258 pcu	289 pcu	3477 pcu
Dublin Road	1116 pcu	1146 pcu	15080 pcu
Bridge Street	1315 pcu	1402 pcu	18981 pcu
Arklow Bridge	1417 pcu	1478 pcu	20149 pcu
Abbey Street	344 pcu	466 pcu	5062 pcu
South Green	227 pcu	236 pcu	2675 pcu
Tinahask Road	250 pcu	372 pcu	4078 pcu
Main Street	1265 pcu	1341 pcu	18092 pcu

**Table 7.13:** Projected Percentage Change in Traffic Flows – 2026

Link	08:00 - 09:00	17:00 – 18:00	Daily
Ferrybank	3.3%	3.2%	2.4%
North Quay	18.0%	6.2%	5.0%
South Quay – One Way Section	10.0%	8.8%	6.5%
Dublin Road	3.0%	2.9%	1.9%
Bridge Street	2.8%	2.7%	1.9%
Arklow Bridge	2.0%	1.9%	1.6%
Abbey Street	1.2%	0.9%	0.3%
South Green	11.6%	11.1%	8.6%
Tinahask Road	12.1%	7.8%	5.9%
Main Street	3.8%	3.6%	2.4%

From the above, it can be seen that the construction of the proposed scheme is expected to increase traffic flows on the wider road network (i.e. Ferrybank, Abbey Street, Arklow Bridge, Main Street) by less than 5% during the peak hour periods, and by less than 3% on an all-day basis. The two quays (North Quay and South Quay along with South Green and Tinahask Road) which will be used as key access routes to the construction works are expected to have increases of between 10% -18% during the peak hour periods, and between 5% and 10% on an all-day basis.

These increases are due to the low baseline traffic flows and these streets will remain within capacity during the construction phase of the proposed scheme.

Based on the above, it can be concluded that the proposed construction works at a wider network level will have a temporary slight negative effect on traffic conditions in Arklow, as traffic increases on the primary road/street network (i.e. Ferrybank, Arklow Bridge and Main Street) are all 5% or less during the peak hour periods.

However, at the individual river access points the effect, while still temporary, will be more significant but accepted considering the low traffic flows on the receiving environment in the vicinity of the construction works. and the following sections describe the likely significant effects of these individual construction stages.

### 7.7.3 Assessment of Effects during Operation

During the operation of the proposed scheme the projected increases in traffic flows will be very small, with only occasional service traffic expected.

The annual removal of material from debris trap will have a temporary and short-term impact on traffic movement in the operational phase but impacts will be significantly less than those stated in construction impact assessment.

The proposed maintenance dredging of the river channel which is proposed approximately every 10 years will result in temporary and short-term effects on traffic movement. These effects will similarly be less than those stated in construction impact assessment

## 7.8 Mitigation Measures and Monitoring

### 7.8.1 Mitigation During Construction

#### 7.8.1.1 Construction Traffic Management Plan

A Construction Traffic Management Plan (CTMP), covering all stages of construction, shall be prepared by the Contractor and included in the Construction Environmental Management Plan. The construction traffic management information detailed below shall be included in the CTMP and have been transposed into the CEMP presented in **Appendix 5.1**.

The appointed contractor(s) for the proposed scheme will develop individual CTMPs, based on the overall CTMP in the CEMP, for its/their contract packages and construction methodologies. These individual CTMPs will also take into account other potential construction works in the area as well including the proposed Arklow Wastewater Treatment Plant construction project. The individual CTMPs will contain detailed plans to ensure pedestrians, cyclists and motorised vehicles can pass through the working areas safely and that measures are in place which ensure traffic operates in as an efficient manner possible.

The individual CTMPs will include a detailed consultation strategy to deal with third-party queries from both residents and retail/commercial operators. This strategy will assign ownership of communications (names, companies etc), methods of communication (eg website, twitter accounts etc), manage contact details for communications etc). This strategy will form part of the overall Communications Management Plan which is presented in the CEMP in **Appendix 5.1**. The individual CTMPs will require agreement with both Wicklow County Council and An Garda Síochána. Should a contractor be appointed for the Wastewater Treatment Plant (WwTP), its traffic management plans will need to be coordinated between the parties.

The individual CTMPs will be prepared for all Work Packages specifying the designated access routes, to the various site compounds and works areas as described in **Chapter 7** of the EIAR and shall include measures to ensure safe passage of pedestrians, any required laydown areas, temporary diversion routes including location of signage, etc.

As part of the CTMP, the contractor(s) is required to implement the following measures in relation to traffic management throughout the course of the construction works:

- The site compounds (SC) and river access (RA) points will be located as described in **Chapter 5 Construction Strategy** of the EIAR;
- The contractor will designate specific access routes to be used to access the working areas (WA), site compounds and river access points as described in **Chapters 5 and 7** of the EIAR;
- Night-time works will be carried out for some elements of the construction works as described in **Chapters 5 and 7** of the EIAR;
- Haul Roads in the river channel will be used for WP2, rather than from street level, as described in **Chapter 5** of the EIAR;
- The contractor will coordinate with the WwTP project with regards construction programme and subsequent traffic movements;
- All trucks entering and exiting the site will be covered with a tarpaulin;
- Adequate parking will be provided to avoid queuing at the site entrances and prevent disruption to neighbouring businesses. Construction vehicles will not be allowed to park on the public road either outside a working area or site compound or on any of the approach roads leading to it;
- All trucks entering a working area or site compound will be restricted to suitable speed limits and will be directed to the relevant waiting areas by the Site Manager;
- Trucks required to wait in a working area or site compound will switch off engines to avoid unnecessary fuel usage and noise;



- All trucks exiting a working area or site compound will be required to pass through a wheel wash. A lance will be provided to clean down the bodies and sides of the truck prior to leaving a working area or site compound;
- Roads outside a working area or site compound will be visually inspected on a daily basis and power swept and washed as and when required;
- All site staff including truck drivers will be required to abide by the normal rules of the road;
- Construction safety signs and signals will be installed at identified locations in accordance with the CTMP to coordinate the direction and flow of traffic at working areas. The contractor will be responsible for the maintenance of all construction safety signs and signals.
- Traffic routes affected by the works will be communicated to Arklow residents by the Contractor in advance of commencement of works as per Communications Management Plan described in the CEMP.
- As part of the individual CTMPs, a Mobility Management Plan (Workplace Travel Plans) will be prepared by each contractor to ensure construction workforce access to the working areas and site compounds by sustainable travel modes is encouraged. The Mobility Management Plan (Workplace Travel Plans) shall follow the guidance set out by the National Transport Authority (<https://www.nationaltransport.ie/wp-content/uploads/2013/04/Workplace-Travel-Plans-A-Guide-for-Implementers.pdf>)

### 7.8.1.2 Communications Management Plan

The individual CTMPs will be included in the Communications Management Plan and will be used to deal with third-party queries from both residents and retail/commercial operators. The individual CTMPs will require agreement with both Wicklow County Council and An Garda Síochána. Should a contractor be appointed for the Wastewater Treatment Plant, its traffic management plans will need to be coordinated between the parties.

The contractor(s) will appoint a single point of contact to facilitate the communication of the various traffic management plans.

### 7.8.1.3 Mobility Management Plan

As part of the individual CTMPs, a Mobility Management Plan will be prepared by each contractor to ensure construction workforce access to the working areas and site compounds by sustainable travel modes is encouraged. The following measures will be included within the Mobility Management Plan:

- Arrangements for the provision of showers/ changing rooms for construction staff;
- Arrangements for the provision of cycle parking for staff; and

- The promotion of car sharing among staff, including van pooling to travel between the different working areas.

#### **7.8.1.4 Individual Traffic Management Plans**

The individual CTMPs will be prepared for all Work Packages specifying the designated hauls, as described above, to the various site compounds and works areas, measures to ensure safe passage of pedestrians, any required laydown areas, temporary diversion routes including location of signage, etc.

The individual CTMPs will be prepared in consultation with the contractor for the Wastewater Treatment Plant. Construction traffic associated with the Flood Relief project will have to follow any required diversion route needed to deliver the Wastewater Treatment Plant, with particular consideration of possible restrictions on the following streets:

- Arklow Bridge (night-time closures)
- South Quay (diversion of traffic onto Harbour Road and South Green)
- North Quay (particularly the proposed diversion of traffic via Seaview Avenue)
- Marina (diversion of traffic onto Mill Road)

For any works to Arklow Bridge that require lane closures the following measures are suggested:

- No scheduled lane closures should commence before 21:00 and all lane closures should be lifted by 07:00 in the morning.
- The length of lane closure and the required working area needs to be kept as small as possible to reduce the length of the shuttle system.

### **7.8.2 Mitigation During Operation**

The mitigation measures which are intrinsic to the construction approach, as discussed in Section 7.8.1 and where are relevant for the maintenance activities will be implemented.

No further mitigation measures have been proposed with respect to effects from the operation of the proposed scheme as the insignificant projected increase in traffic will have no impact on prevailing traffic conditions.

### **7.8.3 Monitoring**

#### **7.8.4 Monitoring During Construction**

For each construction stage the individual CTMP will be continually monitored to ensure the impact on traffic capacity and operations on the surrounding street network are minimised and additional mitigation measures will be introduced as required to assist traffic safety or the flow of traffic.

The monitoring regime will include all road users including pedestrians, cyclists, and public transport users, as well as car parking provision.

### 7.8.5 Monitoring During Operation

No monitoring has been proposed with respect to effects arising from the operation of the proposed scheme as the projected increase in traffic will have no impact on prevailing traffic conditions.

## 7.9 Cumulative Effects

### 7.9.1 Cumulative Effects (Construction Phase)

This section includes an assessment of the potential for likely significant direct and indirect cumulative effects of the projects listed in **Table 20.1 in Chapter 20** ‘*Cumulative and Interactive Effects*’ in combination with the proposed scheme. It also includes an assessment of the potential for likely significant direct and indirect cumulative effects of all the projects listed in **Table 20.1 in Chapter 20** ‘*Cumulative and Interactive Effects*’ taken together in combination with the proposed scheme

#### **Action Health Enterprises GP Limited The Former Boland's Builders Providers, Castle Park (181170)**

This project relates to the development of a primary care facility at Castle Park. Due to the scale of the proposed development, the quantum of parking provided and the location of the vehicular entrance to the proposed development no negative significant direct, indirect cumulative effects are identified with respect to the transport networks.

#### **Circle K Safeway Service Station (20426)**

This project relates to the demolition of the existing, and construction of a new, fuel forecourt at the existing Circle K service station, which is located immediately adjacent to Arklow Town Marsh and SC1 of the proposed scheme. The volume of any traffic using the new forecourt is likely to be similar to that currently generated by the existing service station and no significant direct, indirect cumulative effects are identified with respect to the transport networks.

#### **Frank and Sandra Duffy No 7 and 8 Bridge Street and, No 34 Main Street (19750)**

The project relates to the demolition of 2 existing buildings and the construction of a new retail and commercial building on Main Street. The proposed development does not include any additional parking so will not generate additional traffic demands directly, however its construction on a busy street within Arklow will require some traffic and pedestrian management. However, due to the scale of the construction works associated with the project no negative likely significant direct, indirect cumulative effects are identified with regards to the transport networks.

**Gaines Europe Ltd Unit 1A Lower Tinahisk, South Quay (16248)**

This project relates to the development of a new warehouse and distribution facility at Arklow Harbour. The nature and scale of the proposed development would indicate that the projected levels of traffic generation will be low although a large proportion of the vehicles will be heavy goods vehicles. The proposed development will have no negative likely significant direct, indirect cumulative effects with regards to the receiving transport networks.

**Gaines Europe Ltd Tinahask Lower, South Quay (16414)**

This project relates to the demolition of an existing industrial building at Arklow Harbour. The demolition of the proposed building will generate low levels of traffic and will have no negative likely significant direct, indirect cumulative effects with regards to the receiving transport networks.

**Irish Water - WwTP Arklow, Co. Wicklow (SI201801)**

Due to the construction timelines associated with the Arklow Flood Relief Scheme and the Arklow Wastewater Treatment Plant there is likely to be cumulative impacts should the peak construction of both projects run concurrently. In addition, should both projects be carried out simultaneously, a co-ordinated traffic management plan will need to be prepared and agreed with Wicklow County Council for both projects.

As the proposed Arklow Wastewater Treatment Plant has received planning permission, it is possible to carry out a combined assessment on traffic and transport based on the data presented in the EIAR to support the Wastewater Treatment Plant. **Table 7.14** presents the projected change in traffic flow associated with the Arklow Wastewater Treatment Plant.

**Table 7.14:** Projected Traffic Flows – Wastewater Treatment Plant

Link	08:00 - 09:00	17:00 – 18:00	Daily
Ferrybank	56 pcu	56 pcu	423 pcu
North Quay	76 pcu	76 pcu	588 pcu
South Quay – One Way Section	15 pcu	15 pcu	63 pcu
Dublin Road*	56 pcu	56 pcu	63 pcu
Bridge Street	31 pcu	31 pcu	211 pcu
Arklow Bridge	35 pcu	35 pcu	251 pcu
Abbey Street	12 pcu	12 pcu	91 pcu
South Green	4 pcu	4 pcu	30 pcu
Tinahask Road*	12 pcu	12 pcu	91 pcu
Main Street	22 pcu	22 pcu	160 pcu

\*Estimates based on the information provided for in the EIAR for the Wastewater Treatment Plant

The worst-case cumulative traffic flows should the peak construction of the permitted Wastewater Treatment Plant and the Arklow Flood Relief Scheme coincide is presented in **Table 7.15** and the percentage change in traffic flows is presented in **Table 7.16**.

**Table 7.15:** Projected Traffic Flows – FRS and Wastewater Treatment Plant - 2026

Link	08:00 - 09:00	17:00 – 18:00	Daily
Ferrybank	1550 pcu	1570 pcu	18848 pcu
North Quay	350 pcu	794 pcu	8770 pcu
South Quay – One Way Section	273 pcu	304 pcu	3540 pcu
Dublin Road*	1172 pcu	1202 pcu	15143 pcu
Bridge Street	1346 pcu	1433 pcu	19192 pcu
Arklow Bridge	1452 pcu	1513 pcu	20400 pcu
Abbey Street	356 pcu	478 pcu	5153 pcu
South Green	231 pcu	240 pcu	2705 pcu
Tinahask Road*	262 pcu	384 pcu	4169 pcu
Main Street	1287 pcu	1363 pcu	18252 pcu

\*Estimates based on the information provided for in the EIAR for the Wastewater Treatment Plant

**Table 7.16:** Projected Percentage Change in Traffic Flows – 2026 FRS and Treatment Plant

Link	08:00 - 09:00	17:00 – 18:00	Daily
Ferrybank	7.1%	7.1%	4.7%
North Quay	50.8%	17.4%	12.6%
South Quay – One Way Section	16.4%	14.5%	8.4%
Dublin Road*	8.2%	8.0%	2.3%
Bridge Street	5.3%	4.9%	3.1%
Arklow Bridge	4.5%	4.3%	2.8%
Abbey Street	4.7%	3.5%	2.1%
South Green	13.5%	12.9%	9.8%
Tinahask Road*	17.4%	11.3%	8.2%
Main Street	5.6%	5.3%	3.3%

\*Estimates based on the information provided for in the EIAR for the Wastewater Treatment Plant

At a wider level, the construction of both projects simultaneously will result in greater traffic flows, including Heavy Goods Vehicles on all the relevant streets within Arklow with temporary traffic increases of between 8% - 13% expected for the primary road and street network on Arklow (i.e. Main Street, Arklow Bridge, Ferrybank, etc). This projected increase in traffic is expected to result in a temporary slight negative impact on traffic conditions in Arklow, as traffic increases on the primary road/street network (i.e. Ferrybank, Arklow Bridge and Main Street) are all 8% or less during the peak hour periods.

For the Quays and some of the access routes (i.e. South Green and Tinahask Road) larger increases are expected. However, these streets have the potential capacity to carry up to 1,500 pcu/hr (UK DMRB Chapter 3 Determination of Urban Road Capacity) and considering the current low traffic flows and the projected increase in traffic associated with both schemes it is likely they will have limited impact on capacity and operations, again resulting in a slight negative impact on traffic conditions on these streets. The implementation of co-ordinated construction traffic management plans will assist in mitigating any resulting traffic impacts on these key streets.

#### **Joby Developments North Quay, Arklow (15857)**

This project relates to the demolition of existing structures and construction of retail and residential units at North Quay. The proposed development will increase flows in the North Quay area, however the scale of traffic generation likely to be modest and the proposed development will have a slight negative direct cumulative effect with regards to the receiving transport networks should the development eventually begin construction before its planning expiry date of Sept 2021.

#### **Mill Sea Ltd North Quay, Arklow (18316)**

This project relates to the demolition of existing structures at Arklow Harbour. The demolition of the proposed building will generate low levels of traffic and will have no negative likely significant direct, indirect cumulative effects with regards to the receiving transport networks.

#### **Wicklow County Council Inner Harbour / Dock, Off South Quay (20469)**

This project relates to the development of storage units at Arklow Harbour. The nature and scale of the proposed development would indicate that the projected levels of traffic generation will be low although a large proportion of the vehicles will be heavy goods vehicles. The proposed development will have no negative likely significant direct, indirect cumulative effects with regards to the receiving transport networks.

#### **Crag Digital Avoca Limited (18940/201285)**

This project includes the construction and operation of a data storage facility at Avoca River Park, Arklow, County Wicklow. Due to the location of the proposed development and the relatively low traffic generation associated with the proposed development there will be will have no negative likely significant direct, indirect cumulative effects with regards to the receiving transport networks.

#### **Arklow Wind Park, Co. Wicklow- Pre-Application (306662)**

This project relates to the development of onshore transmission connection infrastructure related to the Arklow Bank Wind Park offshore wind energy project. Due to the location of the proposed development and the relatively low traffic generation associated with the proposed development, there will be no negative likely significant direct, indirect cumulative effects with regards to the receiving transport networks with Arklow.

However, due to the concentration of the works at the Avoca River Business Park at Shelton Abbey, to the northwest of Arklow, there is likely to be some slight direct cumulative effects on traffic flows on Dublin Road.

### **Parade Ground- WCC Part 8**

This project relates to public realm improvement works at Parade Ground, off Main Street, Arklow. Due to the nature of this development and the requirement to implement temporary traffic management measures to manage the construction of the works there is likely to be some slight negative direct cumulative effects with regards to the receiving transport networks.

### **FORESHORE**

#### **FS007049 Sure Partners Site Investigations at Arklow Bank**

Due to the offshore location and nature of this development, and the low levels of traffic generation occurring in either the construction or operational phase of the proposed scheme, no negative likely significant direct, indirect cumulative effects are identified with regards to the receiving transport networks.

#### **All projects taken together in combination with the proposed scheme**

Overall, taking all of the projects together in-combination with the proposed scheme, it is likely that there will be a slight negative direct, indirect cumulative impact during the construction phase of the proposed development due to the additional traffic generated by other schemes in the study area. It is noted that some of this potential increase in traffic has been included for in the application of traffic growth rates to recorded baseline traffic data included for in the transport assessment of the proposed scheme.

## **7.10 Residual Effects**

### **7.10.1 Residual Effects during Construction**

The construction of the proposed scheme will result in a slight increase in traffic congestion within the town, particularly when construction works are taking place on Arklow Bridge. These effects will be temporary in nature and following the completion of the construction works will have no residual effects.

During all construction stages, the individual working areas will result in some restrictions and inconvenience to the movement of people and traffic. These restrictions will be temporary in nature and particularly felt in the immediate vicinity of the proposed working areas.

Should the construction of the Arklow Flood Relief Scheme coincide with the construction of the Arklow Wastewater Treatment, there will be a greater increase in traffic in Arklow resulting in a temporary slight increase in traffic congestion along the primary road network. It is expected that at North Quay, South Quay, South Green and Tinahask Road that the impacts on traffic delays and queuing will be greatest should the two construction projects be carried out in tandem, however these temporary impacts will be over a shorter duration.

### 7.10.2 Residual Effects during Operation

During the operation of the proposed scheme the projected increases in traffic flows will be very small, with only occasional service traffic expected.

The annual removal of material from debris trap will have a temporary and short-term impact on traffic movement in the operational phase but impacts will be significantly less than those stated in construction impact assessment.

The proposed maintenance dredging of the river channel which is proposed approximately every 10 years will result in temporary and short-term effects on traffic movement. These effects will similarly be less than those stated in construction impact assessment.

## 7.11 References

Environmental Protection Agency (2017) *Draft Guidelines on the Information to be contained in Environmental Impact Assessment Reports (Draft August 2017)*

Transport Infrastructure Ireland *Project Appraisal Guidelines for National Roads Unit 5.3 - Travel Demand Projections – May 2019.*

Highways Agency (UK) *DMRB Volume 5 Section 1 Part 3b (TA 79/99) Assessment and preparation of road schemes. Assessment of road schemes. Traffic capacity of urban roads (including Amendment No.1 dated May 1999)*

([https://trafficdata.tii.ie/gmapbasic.asp?sgid=ZvyVmXU8jBt9PJE\\$c7UXt6](https://trafficdata.tii.ie/gmapbasic.asp?sgid=ZvyVmXU8jBt9PJE$c7UXt6))