FIVE ESTUARIES
OFFSHORE WIND FARM

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VOLUME 6, PART 6, ANNEX 8.1: TRAFFIC AND TRANSPORT BASELINE REPORT - PART 1 (CLEAN) – REVISION B

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In preparation of this document Five Estuaries Wind Farm Ltd has made reasonable efforts to ensure that the content is accurate, up to date and complete for purpose.

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Volume 6, Part 6, Annex 8.1 Transport Assessment (Onshore)

Five Estuaries Offshore Wind Farm

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Basis of Report

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Acronyms and Abbreviations

Acronym	Definition
AADT	Annual Average Daily Traffic
ADT	Average Daily Traffic
ATC	Automatic Traffic Count
CTMP	Construction Traffic Management Plan
DCO	Development Consent Order
DfT	Department for Transport
ECC	Export Cable Corridor
ECMS	East Coast Mainline Spur
EIA	Environmental Impact Assessment
ES	Environmental Statement
ETG	Expert Topic Group
HDD	Horizontal Directional Drilling
HGV	Heavy Goods Vehicle
JTC	Junction Turning Count
LHN	Local Highway Network
MfS	Manual for Streets
NGET	National Grid Electricity Transmission
NH	National Highways
NSIP	Nationally Significant Infrastructure Projects
OnSS	Onshore Substation
PEIR	Preliminary Environmental Information Report
PIA	Personal Injury Accident
PINS	The Planning Inspectorate
PRoW	Public Right of Way
SRN	Strategic Road Network
TCC	Temporary Construction Compounds
VE	Five Estuaries Offshore Wind Farm
WTG	Wind Turbine Generators

1.0 Introduction

1. Five Estuaries Offshore Wind Farm (VE) is a Nationally Significant Infrastructure Project (NSIP). An Environmental Impact Assessment (EIA) has been undertaken to inform an application for development consent in the form of a Development Consent Order (DCO) application, made under the Planning Act 2008. The full results of the EIA are presented in the Environmental Statement (ES).

2. This report provides a Transport Assessment (TA) of the construction and operation of the onshore aspects of the Project comprising the 80-wide cable corridor (including landfall), which is to be known as the onshore Export Cable Corridor (Onshore ECC) and onshore Substation (OnSS). The permanent cable easement width is expected to be approximately 60m.

3. This TA relates to Scenario 1 as described in Volume 6, Part 3, Chapter 1: Onshore Project Description, which is the construction of VE plus the additional onshore cable trenching and ducting works for North Falls Offshore Wind Farm (NF OWF) as part of a single civils campaign (ducting for four electrical circuits) as this is the Maximum Design Scenario (MDS).

1.1 Background

4. An EIA Scoping Report was prepared in accordance with Regulation 10 of the Infrastructure Planning (EIA) Regulations 2017 and Regulation 6 of the Marine Works (EIA) Regulations 2007. The Scoping Report was submitted to the Planning Inspectorate (PINS) in October 2021.

5. A Preliminary Environmental Information Report (PEIR) was prepared and issued to the Inspectorate in March 2023, which was supported by a Traffic and Transport Baseline Report. Section 42 responses were provided in May 2023.

6. Comments made in the Scoping Opinion and the Section 42 responses have been taken into account within this report, where relevant. The Scoping Report, Scoping Opinion, PEIR submission and Section 42 responses are available on the Planning Inspectorate website; their content is not repeated here, and readers should refer to the original documents for details.

1.2 Consultation

7. The scope of the baseline data that informs this report was set out in a series of Technical Notes and a Position Paper (see **Appendix A**) issued to Expert Topic Group (ETG) stakeholder members and has been discussed with traffic and transport ETG stakeholder members through a series of ETG meetings.

8. Since the publication of PIER, ETG meetings and other discussions with Essex County Council and National Highways (NH) have been undertaken regarding the assessment parameters and scope jointly with the NF OWF project team. Minutes from the traffic and transport ETGs and other key consultation correspondence are provided in **Appendix A.**

1.3 Study Area

9. The extent of the onshore highway study area, as shown in **Appendix B**, comprises highway links on the Local Highway Network (LHN) and Strategic Road Network (SRN) that would be impacted by the construction and operation of VE i.e. those crossed by the ECC during construction using open trenching, or used by construction traffic to access landfall, the ECC

or OnSS, and the permanent accesses. The study area also includes Public Rights of Way (PRoW) impacted by the ECC and the East Coast Mainline Spur (ECMS), which links Colchester with Walton-on-the-Naze.

10. The Onshore ECC is divided into discrete sections for ease of reporting, as set out in **Table 1-1**.

Table 1-1 ECC Route Sections

Section	Starts	Ends
Beach access (if required)	N/A	N/A
Landfall HDD	Transition Jointing Bay (TJB) north of Frinton Golf Course	N/A
Section 1	Landfall	Railway
Section 2	Railway	B1033 Thorpe Road
Section 3	B1033 Thorpe Road	B1035 Tendring Road
Section 4a	B1035 Tendring Road	Tendring Brook
Section 4b	Tendring Brook	A120
Section 5	A120	Bentley Road
Section 6	Bentley Road	Ardleigh Road
Section 7	Ardleigh Road	National Grid Electricity Transmission (NGET) Substation
400kV Works	VE OnSS	NGET Substation
Unlicensed Works at NGET Substation	NGET Substation	NGET Substation

1.4 Details of the Project

11. VE will comprise up to 79 Wind Turbine Generators (WTGs) and will include infrastructure that is required to transmit the power generated at the turbines to the offshore substation via inter-array cables before then being transmitted via export cables to the OnSS. VE will also comprise the infrastructure required for the operation and maintenance of the wind farm for both offshore and onshore components.

12. The export cable configuration will include up to two cable circuits connecting the offshore substation to the proposed OnSS and into the proposed NGET East Anglia Connection Node (EACN) Substation. The exact location for this is still being considered by NGET at this stage and is subject to a separate consent process.

13. A more detailed description of the project is provided within Volume 6, Part 3, Chapter 1: Onshore Project Description

1.5 Report structure

14. The report structure is as follows:

- **Section 2.0** summarises the data that has informed this report;
- **Section 3.0** describes the highway network and provides an analysis of the baseline traffic data, speed data and road safety data;

- **Section 4.0** describes and provides an analysis of the sustainable travel network;
- **Section 5.0** sets out the construction access strategy;
- **Section 6.0** sets out the trip generation and distribution;
- **Section 7.0** summaries the highway improvements required to facilitate the VE construction vehicle movements; and
- **Section 8.0** summarises the Abnormal Indivisible Load investigations.

2.0 Baseline Data Collection

2.1 Desk Study

15. A desk-based study has been undertaken to identify sources of pre-existing data of relevance, that have been used to inform this TA and the ES, as set out in **Table 2-1**.

Table 2-1: Baseline Data Sources

Source	Summary
Google Earth	Desktop appraisal of the traffic and transport aspects of the study area
NH (Webtris database[1])	Annual Average Daily Traffic (AADT) flows for the A120.
Department for Transport (DfT) Road Statistics[2]	Annual Average Daily Traffic (AADT) flows for the A12, A120 (SRN) and the A133.
Essex County Council	Accident data for the LHN in the study area
	Public Rights of Way (PRoW) online mapping for the locations
Tendring District Council	Promoted Cycle Routes
Crashmap[3]	Accident data for the SRN in the study area

2.2 Existing Traffic Data

16. Existing traffic data has been obtained from the Webtris database as set out in **Table 2-3.** The locations (Link ID) are shown in **Figure 2-1** and the data are provided in **Appendix C**.

Table 2-2: Webtris Data Locations

Link ID	Highway link	Date[4]
4	A12 (S) off-slip at Junction 29	February 2022
5	A12 (S) off-slip at Junction 29 (J29) Roundabout	February 2023
6	A12 (N) off-slip at the J29 Roundabout	October 2022
7	A12 (N) on-slip at the J29 Roundabout	February 2023
8	A120 (E) off-slip at the A12 J29 Roundabout	February 2022
9	A120 (E) on slip at the A12 J29 Roundabout	October 2022 and February 2023[5]

[1] https://webtris.highwaysengland.co.uk

[2] https://roadtraffic.dft.gov.uk

[3] https://crashmap.co

[4] No common date for data available across all datasets, so most recent used avoiding the Covid-19 pandemic.

[5] Calculated from other links.

Link ID	Highway link	Date[4]
11	A120 between the A133 and Harwich Road	August 2019[6]
14	A120 East of the B1035	June 2023
15	A120 at Harwich	June 2023

17. Existing traffic data has been obtained from the DfT Road Statistics database as set out in **Table 2-3.** The locations are shown in **Figure 2-1** and the data is provided in **Appendix C**.

Table 2-3: DfT Data Locations

Link ID	Highway link	Date
1	A12 north of the A120	2019[7]
2	A12 south of the A120	
3	Ipswich Road at the A12 J29	
10	A120 between the A12 and the A133	
11	A120 between the A133 and Harwich Road	
12	A120 between Harwich Road and Bentley Road[8]	
13	A120 between Bentley Road and B1035	
16	A133 between the A120 and the A133 Main Road	
17	A133 between the A133 Main Road and the B1033	
18	A133 between the B1033 and the B1027	
19	A133 Clacton Road (Elmstead Market)	
20	A133 Main Road	
21	B1027 St John's Road (west of Clacton)	
22	B1027 Colchester Road (St. Osyth Park)	
23	B1027 Valley Road (Clacton)	
44	B1027 (north of Harwich Road)	2022[9]
45	Waterhouse Lane	

[6] Used in the analysis of peak hour seasonality only.

[7] 2019 data as the most recent common date across all locations avoiding the Covid-19 pandemic.

[8] Estimated from Links 4 and 6.

[9] 2022 data was available for these links due to the assessment of these links at a later date during the preparation of this TA.

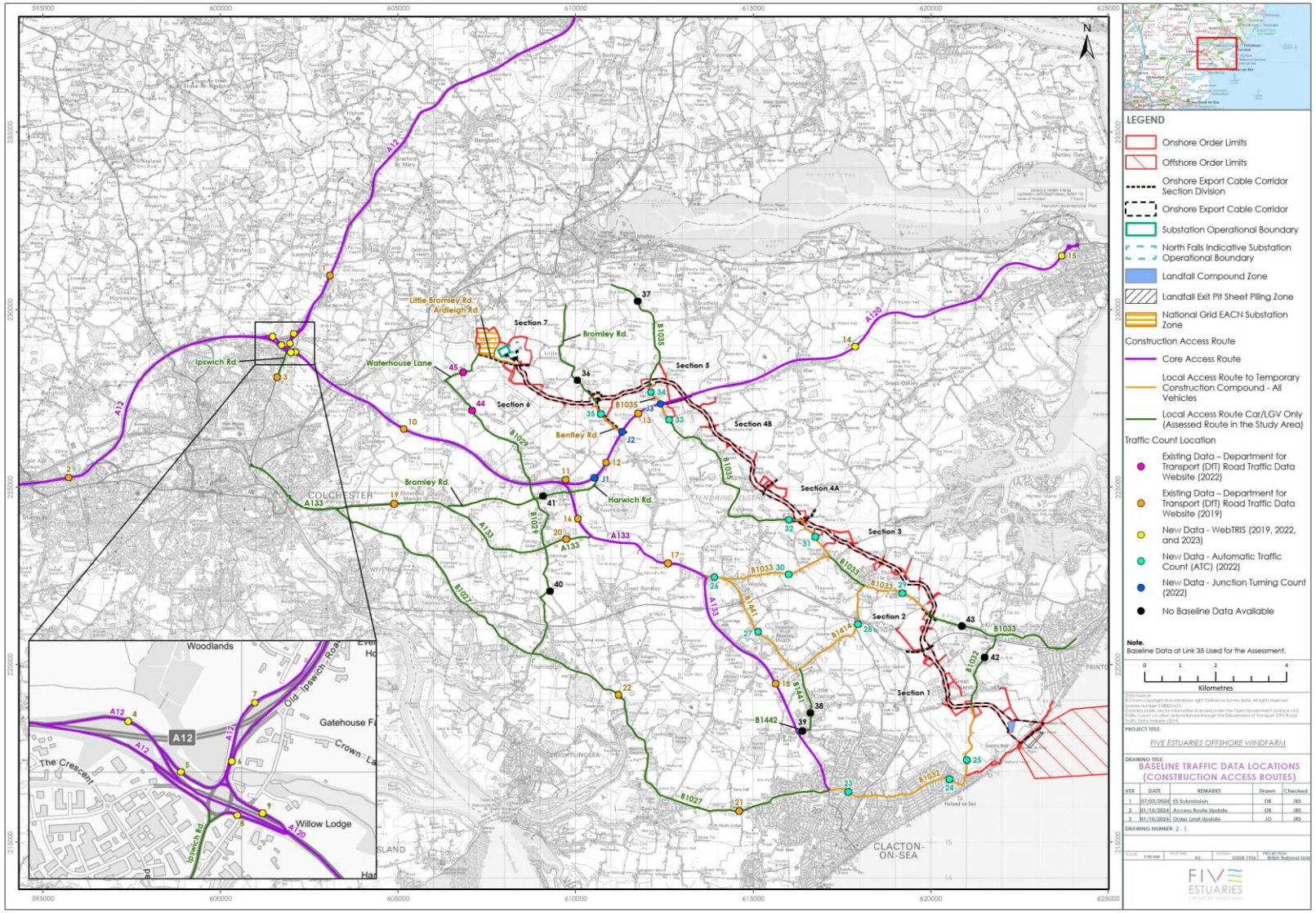


Figure 2-1: Baseline Traffic Data Locations (Construction Access Routes)

2.3 Commissioned Traffic Surveys

18. New baseline traffic data have been collected to inform the Traffic and Transport chapter of the EIA. The new traffic data was collected in August 2022 (to take account of uplifts in traffic as a result of tourism and agriculture during the summer) and September / November 2022 (neutral months, which is a month that is not impacted by seasonal variation in traffic flows).

2.1.1 Local Highway Network

19. Automatic Traffic Counters (ATC) were installed at the locations (**Figure 2-1)** on the local construction access routes as set out in **Table 2-4** and for a period of seven days in August 2022 (summer month) (**Appendix D**) and September/ November 2022 (neutral months) (**Appendix E).**

20. ATCs were also installed at the locations (**Figure 2-2)** where there would be a haul road crossing as set out in **Table 2-5** for a period of seven days in August 2022 (summer month) (**Appendix D**) and September/ November 2022 (neutral months) (**Appendix E).**

Table 2-4: ATC Locations (Construction Access Routes)

Link ID	Location	Summer	Neutral Month
18	A133 between the B1033 and the B1027	1 – 7 August 2022	19 – 25 September 2022
23	B1027 Valley Road (Clacton)		
24	B1032 Frinton Road (Clacton)		
25	B1032 Clacton Road (south of Great Holland)		
26	B1033 Colchester Road (west of the B1441)		
27	B1441 Clacton Road (Weeley Bypass)		
28	B1414 Harwich Road / Station Road		
29	B1033 Frinton Road		
30	B1033 Colchester Road (east of the B1441)		
31	B1035 Tendring Road (north of Thorpe-le-Soken)		
32	B1035 Thorpe Road		
33	B1035 south of the A120		
34	B1035 Clacton Road (north of the A120)		
35	Bentley Road		

Table 2-5: ATC Locations (Haul Road Crossings)

Link ID	Location	Summer	Neutral Month
1	Little Clacton Road	1 – 7 August 2022	19 – 25 September 2022
2	B1034 Sneating Hall Lane		
3	Damant's Farm Lane		

Link ID	Location	Summer	Neutral Month
4	B1414 Landemere Road		
5	Golden Lane		
6	Wolves Hall Lane		
7	Stones Green Road		
8	Payne's Lane	No surveys[10] undertaken	18 – 24 November 2022
9	Spratts Lane		
10	Barlon Road		

2.1.2 Strategic Road Network

21. Junction Turning Count (JTC) data (morning and evening peak periods between 07:00 and 10:00 and 16:00 and 19:00) at the junctions on the A120 shown in **Table 2-6** and in **Figure 2-1,** for a period of seven days in August (see **Appendix F**) and one weekday in a neutral month (see **Appendix G**), as agreed with NH.

Table 2-6: JTC Locations

Reference	Junction	Junction Type	Summer	Neutral Month
J1	A120/ Harwich Road	Roundabout	n/a[11]	Tuesday 20 September 2022
J2	A120/ Bentley Road	Left-in/ Left-out junction	3rd – 9th August 2022	
J3	A120/ B1035	Roundabout		

[10] These routes were not confirmed as roads that may be impacted prior to instructing the August or September surveys.

[11] The video equipment failed at this junction so a neutral month survey only. The August surveys at the other junctions have been used to derive indicative August flows at this junction.

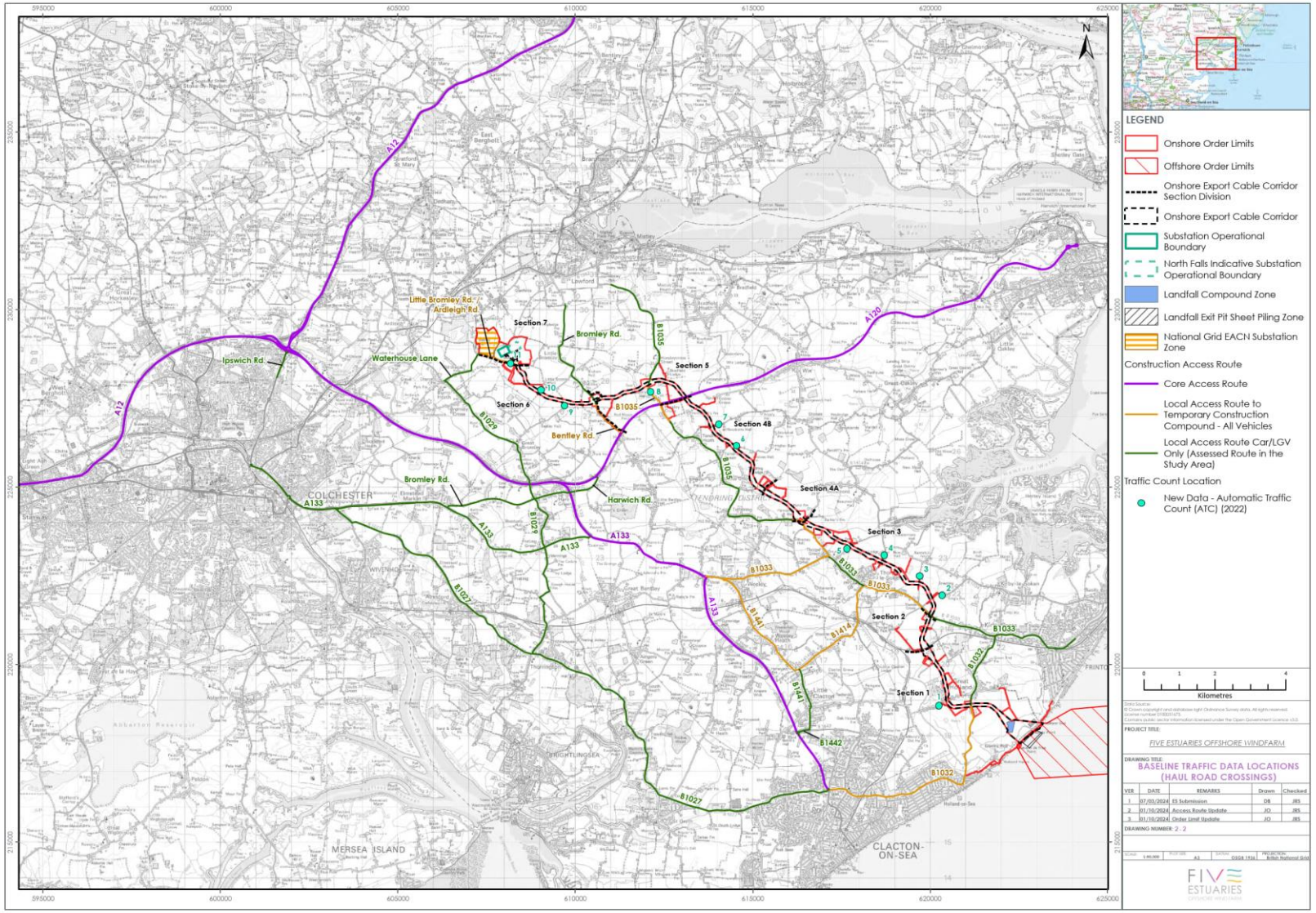


Figure 2-2: Baseline Traffic data Locations (Haul Road Crossings)

2.4 Accident Data

2.1.3 Local Highway Network

22. Personal Injury Accident (PIA) data for the LHN has been obtained from Essex County Council between 1st July 2015 and 30th June 2022 (for a robust assessment given the reduction in traffic in 2020 and 2021 due to the COVID-19 pandemic). The PIA data are in **Appendix J.**

2.1.4 Strategic Road Network

23. PIA data for the SRN (A12 and A120) has been obtained from the Crashmap website between 2015 and 2022[12] (to allow for five full years before the COVID-19 pandemic). As the assessment of PIAs on the SRN is based on the number, location, severity, timing and who was involved (i.e. involved a car driver, cyclist etc.) only and since the details in the PIA report in Crashmap are vague, the PIA reports have not been obtained; however an overview of the locations is provided in **Appendix L**.

2.5 Public Rights of Way

24. The PRoW data (the locations and path references) has been obtained from Essex County Council website online mapping.

2.6 Field Studies

25. A series of site visits have been undertaken to supplement the desktop appraisal of the study area to inform the assessment of the baseline of the study area.

26. **Table 2-7** sets out a summary of the field study activities.

Table 2-7: Field Study Activities

Activity	Summary	Date undertaken
Construction access options audit.	An audit of the proposed construction access options along the Onshore ECC.	April 2022
Construction traffic access routes inspection.	A visual route inspection of the proposed construction access routes between the A12 and the proposed construction accesses.	May 2022
Non-motorised user infrastructure review.	A visual inspection of the pedestrian, cyclist and equestrian routes that would be impacted by the Onshore ECC or OnSS	August 2022

[12] The most recent data available using Crashmap.

2.7 Highway Network

27. The following sections provide a description of the highway network within the defined study area, which forms the VE construction access routes, as shown in **Appendix H.**

2.7.1 Strategic Road Network

2.1.4.1 A12

28. The A12 connects London to Lowestoft in Suffolk and the section between Ipswich and London is part of the SRN, which is maintained by NH. At a grade-separated junction, A12 Junction 29 provides access to Colchester, via Ipswich Road and the A120.

29. The route starts north of the Blackwall Tunnel just east of Canary Wharf and extends northbound skirting the western fringes of Fish Island before turning north eastbound through Wanstead to meet the A406 at Redbridge Roundabout. The route then continues eastbound through Gants Hill and Newbury Park and north eastbound through Chelmsford and Colchester.

2.1.4.2 A120

30. The A120 is part of the SRN providing a west-east link between Puckeridge in Hertfordshire and Harwich in Essex passing through Bishop's Stortford, Braintree, Colchester and Dovercourt.

31. The section of the A120 within the study area is between Junction 29 of the A12 and Harwich International Port. In the study area, the A120 is a dual carriageway with varying speed limits and passes through a number of at-grade junctions including Harwich Road and Horsley Cross roundabouts and priority junctions with Little Bromley, Bentley, Harwich Roads and Cansey Lane on the approach to Wix.

2.7.2 Local Highway Network (South of the A120)

2.1.4.3 A133

32. The A133 is the main route on the LHN within the study area and connects Colchester to Clacton-on-Sea passing through Elmstead Market, Great Bentley, Weeley and Little Clacton along its routes.

33. The A133 starts at a gyratory junction with Marine Parade East near the coastline in Clacton-on-Sea as a single-carriageway trunk road subject to a speed limit of 30mph and extends northwest-bound as Carnavon Road to a three-arm roundabout with Wellseley Road and then to A133/ B1027 St John's Road roundabout. This section of the A133 would be used by VE workforce vehicles only.

34. The route then continues northbound as a 60mph road through the A133/Britton Way and A133/B1442 Progress Way and Weeley roundabouts. This section of the A133 would be used by all VE construction traffic.

35. The A133 then continues as:

- A single-carriageway road to the west (Main Street, towards Frating and Elmstead Market) with varying speeds towards the University of Essex (Colchester Campus) terminating at Greenstead Roundabout. This section of the A133 would be used by VE workforce vehicles only; and

- A dual carriageway subject to the national speed limit (70mph) to the north, merging into the A120 via an on-slip south of Cowey Green. This section of the A133 would be used by all VE construction traffic.

2.1.4.4 B1027

36. The B1027 is a secondary road which serves as an alternative route to the A133 providing a connection between Colchester and Clacton-on-Sea and would be used by VE workforce vehicles only.

37. The route starts at a priority junction with B1028 as Brightlingsea Road, just west of Wivenhoe Nature Park and approximately 6km south-west of the proposed substation area and extends south-east bound as a 60mph road passing junctions with Broad Lanes and Tye Lane to get to its junction with School Road in Elmstead beyond which it transitions into a 40mph route.

38. It then continues south-east bound as Colchester Road to the eastern fringes of Alresford beyond which the posted limit then alternates between 60mph, 40mph and 30mph en route Clacton passing through Thorrington, Great Bentley and St Osyth terminating at a mini roundabout junction with B1032 Holland Road.

2.1.4.5 B1033 Colchester Road/ Thorpe Road

39. The A133 provides access to the settlement of Weeley via the B1033 at a three-arm roundabout, known as the Weeley roundabout. On the B1033, approximately 500m east of the Weeley roundabout, there is a four-arm roundabout, providing access to the B1033 Colchester Road, the B1441 Weeley Bypass and a minor access for Weeley Crematorium, a church and a small residential development.

40. The B1033 (for all VE construction traffic to Onshore ECC Sections 3 and 4a) connects the A133 to Frinton-on-Sea, via Thorpe-le-Soken and Kirby Cross and is known as Colchester Road/ Thorpe Road as it passes through Weeley and subject to a 30mph speed limit. There is a pub, car services, Weeley Ambulance Station, and Homstead Lake Park (a caravan park and associated facilities) on this section of the B1033. Dwellings are largely set back from the carriageway, with footways on either side. Between Weeley and Thorpe Green, the B1033 (Colchester Road) is subject to the national speed limit (60 mph), largely passing through open countryside and a few properties/ farms well set back from the carriageway. There are no footways along this section of the B1033.

41. At Thorpe Green the speed limit on the B1033 changes to 40 mph, reducing further to 30 mph at Thorpe-le-Soken. Approximately 250m east of the change in speed limit, there is a simple priority junction with the B1305, which connects the B1033 with the A120, via the village of Tendring and the hamlets of Goose Green and Tendring Green.

2.1.4.6 B1035

42. The B1035 (for all VE construction traffic to Onshore ECC Sections 3 and 4a) is known as Tendring Road between the B1033 and Swan Road, approximately 1.25 km to the north. There are several businesses, equestrian uses and dwellings for the first 300 m, with a footway on one side of the carriageway in the vicinity of the dwellings. It then passes through open countryside until Tendring and is known as Thorpe Road to the west of the junction with Swan Road, which is a minor rural road connecting with a number of hamlets to the east of the study area. The B1035 is subject to the national speed limit (60 mph) on this section.

43. Through Tendring (VE workforce vehicles only), where the speed limit is 30 mph and there are many dwellings close to the carriageway, with intermittent footways on one side. St

Edmund King and Martyr and Tendring Village Hall are also located in the village. Tendring Primary School and Goose Green playground are located to the north of the village, where there is a footway on one side of the carriageway connecting with Goose Green. At Goose Green, the footway continues on the other side of the carriageway until Tendring Green (with some gaps or very narrow sections).

44. At Goose Green (VE workforce vehicles only), where the speed limit increases to 40 mph, there are a number of local facilities including a village shop. At Tendring Green there are a number of dwellings, two care homes (Oak Tree Manor and Tendring Meadows) and a haulage yard.

45. Between Tendring Green and the A120 (for all VE construction traffic to Onshore ECC Section 4b), the B1035 largely passes through open countryside, with the exception of several businesses and is subject to the national speed limit (60 mph).

2.1.4.7 Lodge Lane/ Wolves Hall Lane/ Stones Green Road

46. Lodge Lane, Wolves Hall Lane and Stone Greens Road are minor rural roads that would be crossed by the Onshore ECC Route Section 4b and are described below:

- Lodge Lane (from the B1035 School Road opposite Tendring Primary School) is a single-track lane that provides access to a small number of dwellings and a car body shop business;
- Wolves Hall Lane (from the B1035 Heath Road via Parsonage Lane/ Chapel Lane between Goose Green and Tendring Green) is a single-track lane that provides access to one dwelling and some agricultural buildings and connects to a network of other minor rural roads to the east of the study area; and
- Stones Green Road (from the B1035 Heath Road at Tendring Green) is a single-track lane that provides access to several dwellings and farms and connects to a network of other minor rural road to the east of the study area.

2.1.4.8 B1441

47. The B1441 (for all VE construction traffic to Onshore ECC Route Sections 2 and 3) connects the B1033 and the B1442 and in the study area, passes through the settlement of Weeley and Weeley Heath and is a single carriageway with footways on either side, segregated by a verge for some sections and narrow at other sections. For the first 700 m, the B1441 is subject to the national speed limit (60 mph) and known as the Weeley Bypass. There are dwellings, a school, local facilities, businesses, and Weeley Fire Station on the B1441 through Weeley and Weeley Heath, where the speed limit is 30 mph and is known as Claton Road and Weeley Road.

2.1.4.9 B1414

48. The B1441 (for all VE construction traffic to Onshore ECC Route Sections 2 and 3) connects with the B1414 at a priority junction, known as Plough Corner and connects the B1441 with Thorpe-le-Soken and then continues to the northeast of the study area to Harwich. The B1414 between the B1441 and Thorpe-le-Soken is known as Harwich Road until Thorpe-le-Soken Railway Station, where it changes to Station Road.

49. On the B1414 there are a number of dwellings, businesses, and local facilities, including a sports and leisure facility. There is a footway on at least one side of the carriageway between the B1441 and Thorpe-le-Soken, which is segregated by a wide verge for a large section in the vicinity of dwellings and local facilities. The speed limit is 30 mph for the majority of the built-

up section, increasing to 40 mph until north of Thorpe-le-Soken Railway Station (where the B1414 changes to Station Road), where is increases to the national speed limit (60 mph), reducing again to 30 mph at Thorpe-le-Soken.

50. There is a gap in the B1414, where it crosses the B1033, accessed to the south via a priority junction (three-way) and to the north at a three-arm mini roundabout approximately 75 m to the west of the priority junction. The section of the B1414 to the north, which is through Thorpe-le-Soken, is known as Landemere Road and provides access to residential areas and Tendring Technical College and Thorpe-le-Soken Police Station. The B1414 Landemere Road is subject to a 30 mph speed limit and there are footways on both sides of the carriageway. On-street parking was observed, narrowing the carriageway at the southern end. At the edge of the village, the speed limit increases to national speed limit (60 mph) and passes through open countryside.

2.1.4.10 Golden Lane

51. Golden Lane (which would be crossed by the Onshore ECC Route Section 3) connects the B1414 Landemere Road with the B1033 Colchester Road to the north of Thorpe-le-Soken. Golden Lane is a minor rural lane which provides access to a number of dwellings and agricultural uses and is subject to the national speed limit (60 mph).

2.1.4.11 B1033 High Street/ Abbey Street/ Frinton Road/ Thorpe Road

52. To the west of the B1414, the B1033 provides access to the centre of Thorpe-le-Soken and is known as High Street. Along High Street, there are dwellings close to the carriageway, a large number of local facilities including pubs and shops, and a primary school. There is on-street parking and lots of pedestrian activity. There are footways on either side of the carriageway and a zebra crossing.

53. To the east of the B1414 (for all VE construction traffic to Onshore ECC Route Sections 2 and 3), the B1033 provides access to Kirby Cross and Frinton-on-the-Sea. In the built-up section on the edge of Thorpe-le-Soken, the B1033 is known as Abbey Street and Frinton Road, where there are dwellings, a nursery, and a holiday lodge park. There is a footway on at least one side of the carriageway and it is subject to a 30 mph speed limit.

54. The B1033 Frinton Road continues south where the speed limit increases to 40 mph and then the national speed limit at the village limits. There is a nursery and some dwellings along this section, with a narrow footway on one side of the carriageway. The B1033 continues south as Thorpe Road

2.1.4.12 B1034 Sneating Hall Lane

55. The B1034 Sneating Hall Lane (which would be crossed by the Onshore ECC Route Section 3), located off the B1033, is a two-way rural road providing access to Walton-on-the-Naze. There is a connecting link for vehicles arriving from the B1033 north which is subject to the national speed limit (60 mph).

2.1.4.13 Damant's Hall Lane

56. Damant's Farm Lane (which would be crossed by the Onshore ECC Route Section 3) is a minor and narrow rural lane connecting to Kentshill and Landemere. There is a connecting link for vehicles arriving from the B1033 north which is subject to the national speed limit (60 mph).

2.1.4.14 B1027 St John's Road/ Valley Road

57. The B1027 (for all VE construction traffic to landfall and the Onshore ECC Route Section 1), which is subject to a 30 mph speed limit for its' entire length, connects the A133 with the B1032, which forms the main route through the eastern areas of Clacton-on-Sea. At its western end, the B1027 is known as St John's Road, which is fronted by dwellings and provides access to local facilities. There is a footway on both sides of the carriageway and a controlled pedestrian crossing.

58. At a three-arm mini-roundabout, which provides access to the B1369, the B1027 continues east as Valley Road, passing through two further three-arm mini-roundabouts. There is a footway on either side of the carriageway and a zebra crossing. This section of the B1027 has a number of dwellings, which are largely set back from the carriageway and provides access to a number of local facilities, Clacton Ambulance Station, businesses (including an industrial estate/ retail park), a supermarket, Clacton Rugby Union Club. There is also a care home, a day centre and a holiday park at the eastern end.

2.1.4.15 B1032 Holland Road/ Frinton Road/ Clacton Road

59. The B1027 connects with the B1032 (for all VE construction traffic to landfall and the Onshore ECC Route Section 1) at a three-arm mini roundabout. At the western end, the B1032 is known as Holland Road, changing to Frinton Road approximately 700 m east of the mini roundabout. The B1032 changes to Clacton Road as it leaves the built-up areas of Clacton and Holland-on-Sea, where the 30 mph speed limit increases to the national speed limit (60 mph) until Great Holland, where is reduced again to 30 mph.

60. The section of the B1032 within the built-up area provides access to dwellings, which are largely set back from the carriageway, local facilities, and businesses. There is a care home at the eastern end. There is a footway on both sides of the carriageway, often wide and segregated by a verge and two zebra crossings in the vicinity of local facilities.

61. To the north of the built-up area, the B1032 provides access to Holland Haven Country Park and continues through open countryside and onto Kirby Cross.

2.1.4.16 Little Clacton Road

62. Little Claton Road (which would be crossed by the Onshore ECC Route Section 1) is a rural road between the B1032 Clacton Road and Holland Road/ Sladbury's Lane subject to a 30mph speed limit and provides access to a number of dwellings, businesses, and a nature reserve.

2.1.4.17 Harwich Road

63. At a four-arm roundabout, the A120 provides access to Harwich Road (which would be used by VE workforce vehicles only) runs parallel to the A120 and connects with Colchester via the A133. Harwich Road serves a number of dwellings and businesses and is subject to a 40 mph speed limit along this section, with a footway on at least one side of the carriageway. Approximately 2 km from the roundabout, there is a staggered priority junction with the B1029, which connects Brightlingsea in the south to the A12 to the north.

2.1.4.18 B1029 Frating Road / Bromley Road / Station Road

64. The B1029 (which would be used by VE workforce vehicles only) south of the A120 is a single-carriageway rural road connecting to the B1027 at Thorrington Cross and passes through Balls Green.

2.7.3 Local Highway Network (North of the A120)

2.1.4.19 Bentley Road

65. Bentley Road (for all VE construction traffic to Onshore ECC Route Section 5, 6, 7, the OnSS and 400kV route), is a rural road connecting the A120 at a left-in/ left-out junction arrangement, with Lawford, via Little Bromley and is subject to the national speed limit (60 mph). It is classified as a Priority 2 route in the Essex Functional Route Hierarchy. These perform an essential traffic management distributary function between the local highway network and Priority 1 County Routes or in this case the A120 Trunk Road.

66. Bentley Road has a 7.5-tonne weight restriction except for loading, which is to prevent heavy goods vehicles (HGVs) routeing between the A120 and Lawford. The section of Bentley Road in the study area passes through open countryside and a number of dwellings.

67. Whilst Bentley Road is suitable for HGVs, there are pinch-points in the geometry of the road in the vicinity of the junction with the A120 and between the junction and the proposed temporary construction accesses for Onshore ECC Section 5, 6/ 7, the OnSS and the 400kV route, which would be restricted for two HGVs passing. Details of the proposed improvements to Bentley Road to facilitate VE construction traffic are set out in **Section 7.2.**

2.1.4.20 B1035 Clacton Road

68. The B1035 Clacton Road (for ECC Route Section 5) is a rural road connecting the A120 at a four-arm roundabout, with Manningtree, via Horleycross Street and is subject to the national speed limit (60 mph). It also has a 7.5-tonne weight restriction except for loading, which is to prevent HGVs routeing between the A120 and Manningtree. The section of Bentley Road in the study area passes through open countryside and several properties.

2.1.4.21 Payne's Lane/ Spratt's Lane/ Barlon Road/ Ardleigh Road/ Grange Road

69. Payne's Lane, Spratt's Lane, Barlon Road, Ardleigh Road and Grange Road are minor rural lanes that would be crossed by the Onshore ECC Route Section 6. They are single-track lanes that provide access to a small number of dwellings and agricultural buildings.

2.1.4.22 B1029 (north of Harwich Road)

70. The B1029 (which would be used by VE workforce vehicles only) north of the A120 is known as Frating Road and is subject to a 40 mph speed limit. There is a footway adjacent to the dwellings and riding centre connecting to Harwich Road.

71. Further north the B1029 passes through the hamlet of Great Bromley, where the speed limit reduces to 30 mph. Through Great Bromley, there are a number of dwellings, largely set back from the carriageway, a school, and a church, with a footway on at least one side of the carriageway. The speed limit increases to 40 mph at the edge of the hamlet and connects to the village of Ardleigh, between which are a number of dwellings, local facilities, and businesses.

2.1.4.23 Waterhouse Lane/ Little Bromley Road/ Ardleigh Road[13]

72. Waterhouse Lane is accessed at a priority junction on the B1029 and is a minor rural lane subject to the national speed limit (60 mph), providing access to a number of dwellings, agricultural uses and a coachbuilding business. The road is single track for a large majority of its length, with regular passing places and no footways.

73. Waterhouse Lane connects with Little Bromley Road at a priority junction. Little Bromley Road, which continues as Ardleigh Road after the junction with Grange Road, is a single-track road with some passing places.

[13] No baseline traffic data is available for Little Bromley Road/ Ardleigh Road; however, is assumed to have very low baseline flows, with a small number of, if any, HGVs. The data on Waterhouse Lane has been used to represent the route between the B1209 and the Onshore ECC Route Section 7.

3.0 Baseline Traffic, Speed and Road Safety Data

75. This section sets out the following baseline traffic data:

- Traffic flow data;
- Speed data; and
- Road safety data

76. The majority of this data was identified in the data collection locations Technical Note (see **Appendix A**) which was shared with members of the Expert Topic Group (ETG) on 25 May 2022, with the exception of additional DfT data being used for the A12, A120 and some locations on the LHN, additional Webtris data now being used for the A12 and A120 and some additional ATC locations on the LHN. Also, due to the development of the Onshore ECC route, some of the data collected at locations identified in the Technical Note are no longer required for the assessment.

3.1 Traffic Flow Data

3.1.1 Webtris Data

77. **Table 3-1** sets out the baseline data (2019, 2022 or 2023) obtained from the Webtris database (see **Appendix C)**, for total vehicles, HGVs, and HGV percentage) in a neutral month.

Table 3-1: Webtris data (24 Hour Flow)

Link ID	Location	Year	24 Hour Flow (2-Way)[14]		HGV (%)
			Total Vehicles	HGVs	
4	A12 (S) off-slip at Junction 29 (J29) Roundabout	2023	2,903	249	8.6
5	A12 (S) on-slip at the J29 Roundabout	2022	12,435	1,219	9.8
6	A12 (N) off-slip at the J29 Roundabout	2022	9,485	793	8.4
7	A12 (N) on-slip at the J29 Roundabout	2023	9,170	1,112	12.1
8	A120 (E) off-slip at the A12 J29 Roundabout	2022	7,229	686	9.5
9	A120 (E) on-slip at the A12 J29 Roundabout	2022	8,468	836	9.9
14	A120 East of the B1035	2023	15,351	1,827	11.9
15	A120 at Harwich	2023	10,495	1,667	15.9

78. **Table 3-3** sets out peak hour data on the A120 (E) off-slip at Junction 29, used for the peak hour impact analysis of VE in **Section 6.3.4.**

[14] One-way on an on or off-slip

Table 3-2: Webtris data (Peak hour data on Highway Link 8)

Link ID	Location	Peak Period	Traffic Flow June 2024 (1-Way)
8	A120 (E) off-slip at J29	Morning	1,207
		Evening	620

79. **Table 3-3** sets out evening peak hour data on the A120 between the A133 and Harwich Road (eastbound) from August and September 2019 used for the peak hour impact analysis of VE in **Section 6.3.4.**

Table 3-3: Webtris data (PM Peak on Highway Link 11)

Link ID	Location	Date	PM Peak Hour Flow (1-Way)		HGV (%)
			Total Vehicles	HGVs	
11	A120 (A133 to Harwich Road (e/b))	August 2019	1,217	183	15.0
		September 2019	1,383	221	15.9

80. **Table 3-4** sets out morning and evening peak hour data from the A133 between the A120 and the A133 Main Road Roundabout (southbound) from September 2019 used for the peak hour impact analysis of VE in **Section 6.3.4.**

Table 3-4 Webtris data (AM and PM Peak on Highway Link 18)

Link ID	Location	Date	Total Vehicles (1-Way)	
			AM Peak	PM Peak
18	A133 (A120 to the A133 Main Road[15]	September 2019	1,003	1,539

3.1.2 DfT Data

81. **Table 3-54** sets out the baseline AADT data (2019) obtained from the DfT Road Statistics website (see **Appendix C**, for total vehicles, HGVs, and HGV percentage).

Table 3-5: DfT data (2019)

Link ID	Location	AADT (2-Way)		HGV (%)
		Total Vehicles	HGVs	
1	A12 north of A120	60,190	5,704	9.5
2	A12 south of A120	70,063	5,832	8.3
3	Ipswich Road at the A12 J29	21,007	527	2.5
10	A120 (A12 J29 to the A133)	44,278	2,685	6.1
11	A120 (A133 to Harwich Road)	12,248	1,402	11.4

[15] This is not the SRN but is a connecting link from the A120

Link ID	Location	AADT (2-Way)		HGV (%)
		Total Vehicles	HGVs	
12	A120 (Harwich Road to Bentley Road)	12,405	1,497	12.1
13	A120 (Bentley Road to the B1035)	12,561	1,591	12.7
16	A133 (A120 to the A133 Main Road)	32,030	1,283	4.0
17	A133 (A133 Main Road to the B1033)	30,732	1,134	4.0
18	A133 (B1033 to the B1027)	11,815	591	5.0
21	B1027 St John's Road (west of Clacton)	12,133	175	1.4
22	B1027 Colchester Road (St. Osyth Park)	10,964	155	1.4
23	B1027 Valley Road (Clacton)	12,133	175	1.4

82. **Table 3-5** sets out the baseline AADT data (2022) obtained from the DfT Road Statistics website (see **Appendix C**, for total vehicles, HGVs and HGV percentage).

Table 3-6: DfT data (2022)

Link ID	Location	AADT (2-Way)		HGV (%)
		Total Vehicles	HGVs	
44	B1029 (north of Harwich Road)	2,100	47	2.2
45	Waterhouse Lane	401	12	3.0

3.1.3 ATC data (Construction Access Routes)

3.1.3.1 Average Daily Traffic (August 2022 Surveys)

83. **Table 3-7** sets out the baseline Average Daily Traffic (ADT) data obtained from ATCs on the construction vehicle access routes on the LHN undertaken in August 2022 (**Appendix D**).

Table 3-7: ATC Data (ADT) - Construction Access Routes (August 2022)

Link ID	Location	24 Hour Flow (2-Way)		HGV (%)
		Total vehicles	HGVs	
18	A133 (B1033 to the B1027)	24,556	3,586	14.6
23	B1027 Valley Road (Clacton)	14,170	1,354	9.6
24	B1032 Frinton Road (Clacton)	8,068	874	10.8
25	B1032 Clacton Road (south of Great Holland)	7,031	760	10.8
26	B1033 Colchester Road (west of the B1441)	16,571	1,853	11.2
27	B1441 Clacton Road (Weeley Bypass)	5,593	916	16.4
28	B1414 Harwich Road / Station Road	5,900	720	12.2
29	B1033 Frinton Road	14,391	1,350	9.4
30	B1033 Colchester Road (east of the B1441)	12,021	1,470	12.2
31	B1035 Tendring Road (north of Thorpe-le-Soken)	1,894	260	13.7
32	B1035 Thorpe Road	2,651	313	11.8
33	B1035 south of the A120	5,795	833	14.4

Link ID	Location	24 Hour Flow (2-Way)		HGV (%)
		Total vehicles	HGVs	
34	B1035 Clacton Road (north of the A120)	8,019	1,237	15.4
35/ 36	Bentley Road	891	179	20.1

84. Whilst ATC data has been collected in August, this is to understand if there are any differences to typical traffic flows on the local highway network as a result of tourism and agriculture; however, the neutral month data collected has been used for the basis of the assessment in the EIA, which is considered to be robust in terms of the potential percentage impacts of VE.

3.1.3.2 ADT (September 2022 Surveys)

85. **Table 3-8** sets out the baseline ADT data obtained from ATCs on the construction vehicle access routes on the LHN undertaken in September 2022 (see **Appendix E**).

Table 3-8: ATC Data (ADT) - Construction Access Routes (September 2022)

Link ID	Location	24 Hour Flow (2-Way)		HGV (%)
		Total vehicles	HGVs	
18	A133 (B1033 to the B1027)	22,861	3,586	15.8
23	B1027 Valley Road (Clacton)	13,617	1,354	9.9
24	B1032 Frinton Road (Clacton)	7,079	614	8.7
25	B1032 Clacton Road (south of Great Holland)	6,798	760	11.2
26	B1033 Colchester Road (west of the B1441)	14,046	1,853	13.2
27	B1441 Clacton Road (Weeley Bypass)	5,584	916	16.4
28	B1414 Harwich Road / Station Road	5,212	698	13.4
29	B1033 Frinton Road	11,511	1,350	11.7
30	B1033 Colchester Road (east of the B1441)	9,415	1,470	15.6
31	B1035 Tendring Road (north of Thorpe-le-Soken)	1,478	260	17.6
32	B1035 Thorpe Road	2,133	313	14.7
33	B1035 south of the A120	5,245	826	15.7
34	B1035 Clacton Road (north of the A120)	7,869	1,237	15.7
35	Bentley Road	887	179	20.2

3.1.3.3 Peak Hours (August Surveys)

86. **Table 3-9** sets out the baseline morning peak hour (07:00 to 08:00 and 08:00 to 09:00) and evening peak hour (16:00 to 17:00 and 17:00 to 18:00) data (total vehicles only) obtained from ATCs on the construction vehicle access routes on the LHN undertaken in August 2022 (**Appendix D**).

Table 3-9: ATC Data Peak Hours) – Construction Access Routes (August 2022)

Link ID	Location	Peak Hour Flow (2-Way)			
		07:00 to 08:00	08:00 to 09:00	16:00 to 17:00	17:00 to 18:00
18	A133 between B1033 and B1027	1,296	1,395	1,883	1,860
23	B1027 Valley Road (Clacton)	507	685	1,047	982
24	B1032 Frinton Road	283	405	608	581
25	B1032 Clacton Road	241	404	552	494
26	B1033 Colchester Road (west of B1441)	786	940	1,234	1,202
27	B1441 Clacton Road	293	340	441	432
28	B1414 Harwich Road	280	376	503	465
29	B1033 Frinton Road	576	701	1,198	1,161
30	B1033 Colchester Road (east of B1441)	503	619	957	917
31	B1035 Tendring Road	86	77	197	216
32	B1035 Thorpe Road	115	120	268	289
33	B1035 south of A120	331	336	555	572
34	B1035 Clacton Road	567	534	684	687
35	Bentley Road	61	59	74	69

3.1.3.4 Peak Hours (September Surveys)

87. **Table 3-10** sets out the baseline morning peak hour (07:00 to 08:00 and 08:00 to 09:00) and evening peak hour (16:00 to 17:00 and 17:00 to 18:00) data (total vehicles only) obtained from ATCs on the construction vehicle access routes on the LHN undertaken in September 2022 (**Appendix D**).

Table 3-10: ATC Data (Peak Hours) - Construction Access Routes (September 2022)

Link ID[16]	Location	Peak Hour Flow (2-Way)			
		07:00 to 08:00	08:00 to 09:00	16:00 to 17:00	17:00 to 18:00
18	A133 between B1033 and B1027	1,324	1,437	1,808	1,743
23	B1027 Valley Road (Clacton)	595	871	1,036	965
24	B1032 Frinton Road	294	583	528	481

[16] No peak hour data available on the Link 44 (B1029 (north of Harwich Road) or Link 45 (Waterhouse Lane); however these links are below the screening thresholds for the consideration of undertaking junction capacity assessments (see **Section 6.3.4**)

Link ID[16]	Location	Peak Hour Flow (2-Way)			
		07:00 to 08:00	08:00 to 09:00	16:00 to 17:00	17:00 to 18:00
25	B1032 Clacton Road	306	497	524	447
26	B1033 Colchester Road (west of B1441)	860	939	1,063	1,007
27	B1441 Clacton Road	351	495	459	405
28	B1414 Harwich Road	241	517	494	359
29	B1033 Frinton Road	671	785	926	880
30	B1033 Colchester Road (east of B1441)	563	610	744	690
31	B1035 Tendring Road	119	132	132	143
32	B1035 Thorpe Road	158	199	199	203
33	B1035 south of A120	423	451	478	509
34	B1035 Clacton Road	627	660	681	686
35	Bentley Road	70	75	73	63

3.1.4 ATC data (Haul Road Crossings)

3.1.4.1 ADT (August 2022 Surveys)

88. **Table 3-11** sets out the baseline ADT data obtained from ATCs at the haul road crossing locations on the LHN undertaken in August 2022 (**Appendix D**).

Table 3-11: ATC Data – Haul Road Crossings (August 2022)

Link ID	Location	24 Hour Flow (2-Way)		HGV (%)
		Total vehicles	HGVs	
44	Little Clacton Road	4,764	450	9.4
45	B1034 Sneating Hall Lane	3,547	367	10.3
46	Damant's Farm Lane	350	65	18.6
47	B1414 Landemere Road	3,090	395	12.8
48	Golden Lane	1,234	182	14.7
49	Wolves Hall Lane	141	24	17.0
50	Stones Green Road	119	29	24.4
51	Payne's Lane	No surveys undertaken		
52	Spratts Lane			
53	Barlon Road			

3.1.4.2 ADT (September 2022 Surveys)

89. **Table 3-12** sets out the baseline ADT data obtained from ATCs at the haul road crossing locations on the LHN undertaken in September 2022 (see **Appendix E**).

Table 3-12: ATC Data – Haul Road Crossings (September 2022)

Link ID	Location	24 Hour Flow (2-Way)		HGV (%)
		Total vehicles	HGVs	
44	Little Clacton Road	3,768	495	13.1
45	B1034 Sneating Hall Lane	2,906	378	13.0
46	Damant's Farm Lane	363	64	17.6
47	B1414 Landemere Road	3,307	431	13.0
48	Golden Lane	1,370	219	16.0
49	Wolves Hall Lane	87	16	18.4
50	Stones Green Road	199	39	19.6
51	Payne's Lane	20	7	35.0
52	Spratts Lane	84	13	15.5
53	Barlon Road	83	18	21.7

3.1.4.3 HGV Adjustments

90. HGVs would typically include Other Goods Vehicle 1 (OGV1), Other Goods Vehicles 2 (OGV2) and bus categories from the ATC data. However, a review of the DfT data compared to the ATC data at the same location (A133 and B1027 Frinton Road) shows the HGV percentages identified in the ATC data to be significantly higher.

91. The reason for the unrepresentative HGV percentages is due to the method of traffic data collection using ATC equipment, which is based on the length of the wheelbase. Since the introduction of this method of traffic flow data collection, there has been an increase in the number of different vehicle types with similar wheelbase lengths that identify them in the OGV1 classification, even though they are not HGVs.

92. Two examples are as follows:

- Some pick-up Trucks (4x4s) now have much longer wheelbase separation and therefore are classified as OGV1, even though it is a "car"; and
- Supermarket delivery vans or a Mercedes Sprinter van can be picked up as OGV1, but these are clearly not HGVs.

93. In order to make an allowance for this inaccuracy with the data, a comparison of the HGV percentages of the DfT data for the following two locations that have data from both sources:

- A133 (Link 18); and
- B1027 Frinton Road (Link 23).

94. The analysis between the DfT data and ATCs for the two sites shows the HGV percentages (using OGV1, OGV2 and bus) from the ATC data are 4.6 times greater on the A133 and 6.4 times greater on the B1027 Frinton Road.

95. Therefore, the number of HGVs recorded from the ATC data has decreased by a factor of 4.6 on the A133 and by a factor of 6.4 on all other local roads.

96. The factored ATC data is shown in **Table 3-13** to **Table 3-16.**

Table 3-13: ATC Data – Construction Access Routes (Adjusted HGV Percentages – August 2022)

Link ID	Location	24 Hour Flow (2-Way)		HGV (%)
		Total Vehicles	HGVs	
18	A133 (B1033 to the B1027)	24,556	779	3.2
23	B1027 Valley Road (Clacton)	14,170	38	0.3
24	B1032 Frinton Road (Clacton)	8,068	137	1.7
25	B1032 Clacton Road (south of Great Holland)	7,031	119	1.7
26	B1033 Colchester Road (west of the B1441)	16,571	290	1.7
27	B1441 Clacton Road (Weeley Bypass)	5,593	143	2.6
28	B1414 Harwich Road / Station Road	5,900	113	1.9
29	B1033 Frinton Road	14,391	222	1.5
30	B1033 Colchester Road (east of the B1441)	12,021	230	1.9
31	B1035 Tendring Road (north of Thorpe-le-Soken)	1,894	41	2.1
32	B1035 Thorpe Road	2,651	55	2.1
33	B1035 south of the A120	5,795	130	2.2
34	B1035 Clacton Road (north of the A120)	8,019	193	2.4
35	Bentley Road	891	28	3.1

Table 3-14: ATC Data – Construction Access Routes (Adjusted HGV Percentages – September 2022)

Link ID	Location	24 Hour Flow (2-Way)		HGV (%)
		Total vehicles	HGVs	
18	A133 between the B1033 and the B1027	22,861	780	3.4
23	B1027 Valley Road (Clacton)	13,617	212	1.6
24	B1032 Frinton Road (Clacton)	7,079	137	1.9
25	B1032 Clacton Road (south of Great Holland)	6,798	119	1.7
26	B1033 Colchester Road (west of the B1441)	14,046	290	2.1
27	B1441 Clacton Road (Weeley Bypass)	5,584	143	2.6
28	B1414 Harwich Road / Station Road	5,214	113	2.2
29	B1033 Frinton Road	11,511	211	1.8
30	B1033 Colchester Road (east of the B1441)	9,415	230	2.4
31	B1035 Tendring Road (north of Thorpe-le-Soken)	1,478	41	2.7
32	B1035 Thorpe Road	2,133	49	2.3
33	B1035 south of the A120	5,245	116	2.2
34	B1035 Clacton Road (north of the A120)	7,869	193	2.5
35	Bentley Road	887	28	3.2

Table 3-15: ATC Data – Haul Road Crossings (Adjusted HGV Percentages – August 2022)

Link ID	Location	24 Hour Flow (2-Way)		HGV (%)
		Total vehicles	HGVs	
44	Little Clacton Road	4,764	70	1.5
45	B1034 Sneating Hall Lane	3,547	57	1.6
46	Damant's Farm Lane	350	10	2.9
47	B1414 Landemere Road	3,090	62	2.0
48	Golden Lane	1,234	28	2.3
49	Wolves Hall Lane	141	4	2.7
50	Stones Green Road	119	5	3.8
51	Payne's Lane	No surveys undertaken		
52	Spratts Lane			
53	Barlon Road			

Table 3-16: ATC Data – Haul Road Crossings (Adjusted HGV Percentages – September 2022)

Link ID	Location	24 Hour Flow (2-Way)		HGV (%)
		Total vehicles	HGVs	
44	Little Clacton Road	3,768	70	1.9
45	B1034 Sneating Hall Lane	2,906	59	2.0
46	Damant's Farm Lane	363	10	2.8
47	B1414 Landemere Road	3,307	67	2.0
48	Golden Lane	1,370	31	2.3
49	Wolves Hall Lane	87	3	2.9
50	Stones Green Road	199	6	3.1
51	Payne's Lane	20	1	4.9
52	Spratt's Lane	84	2	2.2
53	Barlon Road	83	3	3.1

Junction Turning Count Data

3.1.4.4 August 2022 Surveys

97. A summary of the peak hour flows and mean maximum queue lengths from the JTC data collected in August 2022 (an average of the five weekdays of data collected) at the junctions on the A120[17] is provided in **Table 3-17** to **Table 3-19.**

[17] No August survey for the A120/ Harwich Road junction as the equipment failed.

Table 3-17: J1 A120/ B1035 (August 2022)

Arm	AM Peak (07:00 – 08:00)		PM Peak (16:00 – 17:00)	
	Total Vehicles	Mean Max Queue	Total Vehicles	Mean Max Queue
B1035 Clacton Road	278	3	470	10
A120 East	988	4	565	4
B1035	269	7	284	3
A120 West	457	5	931	4

Table 3-18: J2 A120/ Bentley Road (August 2022)

Arm	AM Peak (07:00 – 08:00)		PM Peak (16:00 – 17:00)	
	Total Vehicles	Mean Max Queue	Total Vehicles	Mean Max Queue
A120	502	n/a	952	n/a
Bentley Road	24	2	39	2

98. As an August JTC was not undertaken at the A120/ Harwich Road roundabout, the Webtris database has been used to identify peak hour flows on the A120 between the A133 and Harwich Road, using the most recent data avoiding the Covid-19 pandemic.

Table 3-19: J1 A120/ Harwich Road (August 2019)

Arm	Total Vehicles (Maximum recorded)	
	AM Peak (07:00 – 08:00)	PM Peak (17:00 – 18:00)
A120 Eastbound	411	1,217
A120 Westbound	876	434

99. Whilst JTC data was collected in August, this is to understand if there are any differences to typical traffic flows on the A120 as a result of tourism and agriculture; however, the neutral month data collected has been used for the basis of the assessment in the EIA.

3.1.4.5 September 2022 Surveys

100. A summary of the peak hour flows and mean maximum queue lengths from the JTC data collected in September 2022 at the junctions on the A120 is provided in **Table 3-20** to **Table 3-22** (see below**Appendix E**)

Table 3-20: J1 A120/ B1035 (September 2022)

Arm	AM Peak (07:00 – 08:00)		PM Peak (16:00 – 17:00)	
	Total Vehicles	Mean Max Queue	Total Vehicles	Mean Max Queue
B1035 Clacton Road	360	2	516	9

Arm	AM Peak (07:00 – 08:00)		PM Peak (16:00 – 17:00)	
	Total Vehicles	Mean Max Queue	Total Vehicles	Mean Max Queue
A120 East	1,124	10	538	8
B1035	430	12	237	3
A120 West	498	2	931	5

Table 3-21: J2 A120/ Bentley Road (September 2022)

Arm	AM Peak (07:00 – 08:00)		PM Peak (16:00 – 17:00)	
	Total Vehicles	Mean Max Queue	Total Vehicles	Mean Max Queue
A120	552	n/a	952	n/a
Bentley Road	28	0	33	0

Table 3-22: J1 A120/ Harwich Road (September 2022)

Arm	AM Peak (07:00 – 08:00)		PM Peak (16:00 – 17:00)	
	Total Vehicles	Mean Max Queue	Total Vehicles	Mean Max Queue
A120 East	1,072	2	515	2
Harwich Road East	67	2	35	1
Harwich Road South	310	6	337	2
A120 West	389	0	870	3

3.1.5 Seasonality

101. It was agreed with ETG stakeholders through the Evidence Plan process that a comparison of the neutral month (September) and summer month (August) traffic flow data collected in the study area would be undertaken to understand if there are any differences resulting from tourism and agricultural traffic.

3.1.5.1 Local Highway Network

24-Hour Vehicle Movements

102. The differences (volume and percentage) between the September and August 24 hour data on the LHN are shown in **Table 3-23** (construction access routes) and **Table 3-24** (haul road crossings).

Table 3-23: Difference of August Traffic Compared to September on the LHN (24 hour) – Construction Access Routes

Link ID	Location	Difference (2-Way)		Difference (%)	
		Total Vehicles	HGV	Total Vehicles	HGV
18	A133 between the B1033 and the B1027	1,695	121	6.9	13.4
23	B1027 Valley Road (Clacton)	553	-27	3.9	-14.5
24	B1032 Frinton Road (Clacton)	989	-41	12.3	-42.3
25	B1032 Clacton Road (south of Great Holland)	233	-10	3.3	-9.5
26	B1033 Colchester Road (west of the B1441)	2,525	16	15.2	5.2
27	B1441 Clacton Road (Weeley Bypass)	9	-13	0.2	-9.7
28	B1414 Harwich Road/ Station Road	686	-13	11.6	-13.4
29	B1033 Frinton Road	2,880	-77	20.0	-57.2
30	B1033 Colchester Road (east of the B1441)	2,606	-17	21.7	-8.2
31	B1035 Tendring Road (north of Thorpe-le-Soken)	416	-1	22.0	-3.2
32	B1035 Thorpe Road	518	-49	19.5	66.1
33	B1035 south of the A120	550	-64	9.5	-122.3
34	B1035 Clacton Road (north of the A120)	150	20	1.9	9.6
35	Bentley Road	4	-5	0.4	-22.6

Table 3-24: Difference of August Traffic Compared to September on the LHN (24 hour) – Haul Road Crossings

Link ID	Location	Difference (2-Way)		Difference (%)	
		Total Vehicles	HGV	Total Vehicles	HGV
44	Little Clacton Road	996	1	20.9	0.8
45	Sneating Hall Lane	641	-2	18.1	-3.0
46	Damant's Farm Lane	-13	0	-3.7	1.5
47	B1414 Landemere Road	-217	-6	-7.0	-9.1
48	Golden Lane	-136	-2	-11.0	-8.5
49	Wolves Hall Lane	54	1	38.3	33.3
50	Stones Green Road	-80	-2	-67.2	-34.5

103. As shown in **Table 3-23** and **Table 3-24,** the majority of the highway links show a greater number of vehicle movements in August compared to September, between 0.2 and 38.3%. The four locations with a lower traffic flow in August are Damant's Farm Lane, Stones Green Road and Golden Lane (low baseline flow and 2 vehicle or fewer difference) and B1414 Landemere Road, which will be due to the reduction in vehicle movements associated with Tendring Technology College.

104. With the exception of the A133, the B1033 Colchester Road (west of B1441) and the B1035 (Thorpe Road / Clacton Road), the data show a reduction in HGVs on the LHN in August.

Peak Hour Vehicle Movements (Construction Access Routes)

105. The differences (volume and percentage) between the September and August morning peak hour (which varies on each highway link) data on the construction access routes on the LHN is shown in **Table 3-25** for total vehicles only.

Table 3-25: Difference of August Traffic Compared to September on the LHN (Morning Peak)

Link ID	Location	Difference (2-Way)	
		Total Vehicles	Percentage (%)
18	A133 between the B1033 and the B1027	-42	-3.0
23	B1027 Valley Road (Clacton)	-186	-27.1
24	B1032 Frinton Road (Clacton)	-178	-44.0
25	B1032 Clacton Road (south of Great Holland)	-94	-23.3
26	B1033 Colchester Road (west of the B1441)	1	0.1
27	B1441 Clacton Road (Weeley Bypass)	-156	-45.8
28	B1414 Harwich Road / Station Road	-140	-37.3
29	B1033 Frinton Road	-84	-11.9
30	B1033 Colchester Road (east of the B1441)	8	1.4
31	B1035 Tendring Road (north of Thorpe-le-Soken)	-46	-52.8
32	B1035 Thorpe Road	-78	-64.9
33	B1035 south of the A120	-115	-34.4
34	B1035 Clacton Road (north of the A120)	-94	-16.6
35	Bentley Road	-14	-22.7

106. The differences (volume and percentage) between the September and August evening peak hour (which varies on each highway link) data on the construction access routes on the LHN is shown in **Table 3-26,** for total vehicles only.

Table 3-26: Difference in August Traffic Compared to September on the LHN (Evening Peak)

Link ID	Location	Difference (2-Way	
		Total Vehicles	Percentage (%)
18	A133 between the B1033 and the B1027	75	4.0
23	B1027 Valley Road (Clacton)	11	1.0
24	B1032 Frinton Road (Clacton)	81	13.3
25	B1032 Clacton Road (south of Great Holland)	28	5.1
26	B1033 Colchester Road (west of the B1441)	172	13.9
27	B1441 Clacton Road (Weeley Bypass)	-18	-4.1
28	B1414 Harwich Road / Station Road	9	1.8
29	B1033 Frinton Road	272	22.7
30	B1033 Colchester Road (east of the B1441)	214	22.3
31	B1035 Tendring Road (north of Thorpe-le-Soken)	73	34.0
32	B1035 Thorpe Road (south of Thorpe-le-Soken)	87	29.9

Link ID	Location	Difference (2-Way	
		Total Vehicles	Percentage (%)
33	B1035 south of the A120	63	11.0
34	B1035 Clacton Road (north of the A120)	2	0.2
35	Bentley Road	1	0.6

107. As shown in **Table 3-25,** the majority of the highway links show a greater number of vehicle movements in September compared to August (apart from the B1033 Colchester Road, which is marginally higher in August).

108. However, for the evening peak hour, **Table 3-26** shows the majority of the highway links show a greater number of vehicle movements in August compared to September (apart from the B1441 Clacton Road (Weeley Bypass), which is marginally higher in September). The reason for the higher vehicle movements in August in the evening peak hour is due to the additional vehicles on the highway network associated with tourism during or at the end of a day out. The morning peak is less likely to be affected by tourist traffic due to drivers choosing to avoid travelling in the typically busiest period of the day.

109. A further analysis has been undertaken by comparing the maximum peak hour vehicle movements (morning or evening) between September and August, which is presented in **Table 3-27.**

Table 3-27: Difference of Maximum Peak Hour August and September Traffic on the LHN (Total Vehicles)

Link ID	Location	Maximum Peak Hour (2-Way)		Difference
		August	September	
18	A133 between the B1033 and the B1027	1,108	1,036	72
23	B1027 Valley Road (Clacton)	688	583	105
24	B1032 Frinton Road (Clacton)	613	524	89
25	B1032 Clacton Road (south of Great Holland)	1,234	1,063	172
26	B1033 Colchester Road (west of the B1441)	441	495	-54
27	B1441 Clacton Road (Weeley Bypass)	503	517	-14
28	B1414 Harwich Road / Station Road	1,198	926	272
29	B1033 Frinton Road	957	744	214
30	B1033 Colchester Road (east of the B1441)	216	143	73
31	B1035 Tendring Road (north of Thorpe-le-Soken)	289	203	87
32	B1035 Thorpe Road	572	509	63
33	B1035 south of the A120	687	686	2
34	B1035 Clacton Road (north of the A120)	74	75	-1
35	Bentley Road	1,883	1,808	75

110. **Table 3-27** shows, with the exception of the B1033 Colchester Road (west of the B1441), the B1441 Clacton Road (Weeley Bypass) and B1035 Clacton Road (north of the A120), there are a greater number of vehicle movements (between 2 and 272) in a peak hour in August, compared to September. As the September ATC data is being used in this TA (and for the assessment in the Volume 6, Part 3, Chapter 8: Traffic and Transport) to represent baseline traffic flows throughout the year apart from the summer and since peak hour vehicle VE construction vehicle movements are most likely in the winter months (see the daylight assessment in **Appendix I)** and less likely in the summer, it can be concluded that in theory, there is spare capacity in the peak hours on these highway links to accommodate VE peak hour construction vehicle movements should this occur. An analysis of this is presented in **Section 6.3.4.**

3.1.5.2 Strategic Road Network

24-Hour Vehicle Movements

111. Webtris data has been reviewed to consider if there are differences in traffic flows on the A120 between September and August (using 2019 data with the exception of the A120 at Junction 29 where the most recent data available for the comparison is 2015), across 24 hours on the A120 This is presented in **Table 3-28.**

Table 3-28: Difference in August Traffic Compared to September on the SRN (24 hour)

Link ID	Location	24 Hour (2-Way)		Difference	
		August	September	Total Vehicles	Percentage (%)
10	A120 at Junction 29	27,464	24,844	2,620	10.5
11	A120 (A133 to Harwich Road)	13,477	12,564	913	7.3
14	A120 east of the B1035	14,922	14,567	355	2.4
15	A120 at Harwich	10,226	10,202	24	0.2

112. **Table 3-28** shows the A120 between the A120 and A133 is impacted by traffic associated by tourism to a greater extent than the section of the A120 with the junctions that would be most impacted by VE construction vehicle turning movements.

Peak Hours

113. The differences (volume and percentage) between the September and August data on the SRN has been analysed in terms of the morning and evening peak hour flows, including the specific peak hours and are summarised in **Table 3-29** for the morning peak and **Table 3-30** for the evening peak hour.

Table 3-29: Differences Between August and September Data on the SRN (AM Peak)

Junction number	Junction	August (of 5 surveyed days)		September		Percentage difference (%)
		AM Peak Hour	Maximum Total vehicles	AM Peak Hour	Maximum Total vehicles	
1	A12/ Harwich Road	n/a	n/a	07:15 to 08:15	1,838	No August survey for comparison
2	A120/ Bentley Road	07:00 to 08:00/ 07:15 to 08:15	526		580	10.3
3	A120/ B1035		1,991		2,412	21.1

114. As **Table 3-29** shows, the morning peak hour traffic flows at the A120/ Bentley Road and A120/ B1035 junctions are higher in September compared to August. This may be due to this section of the A120 not being affected by tourism and reflects the reduction in peak-hour traffic during the school holidays that are typically expected on the highway network. There is no material difference in the specific morning peak hours.

Table 3-30: Differences Between August and September Data on the SRN (PM Peak)

Junction number	Junction	August (of 5 surveyed days)		September		Percentage difference (%)
		PM Peak Hour	Maximum Total vehicles	PM Peak Hour	Maximum Total vehicles	
1	A12/ Harwich Road	n/a	n/a	16:45 to 17:45	1,757	No August survey for comparison
2	A120/ Bentley Road	16:15 to 17:15/ 16:30 to 17:30/ 16:45 to 17:45	991	16:30 to 17:30	985	-0.6
3	A120/ B1035		2,250		2,212	-1.7

115. As **Table 3-30** shows, the evening peak hour traffic flows at the A120/ Bentley Road and A120/ B1035 junctions are marginally lower in September compared to August. There is no material difference in the specific evening peak hours.

3.2 Vehicle Speed Data

116. **Table 3-31** sets out the 85th percentile vehicle speed data obtained from the ATC surveys in September 2022 as the neutral month (see **Appendix E),** for the locations proposed for construction accesses or haul road crossings.

Table 3-31: Vehicle Speed Data (September 2022)

Link ID	Link	Direction	85th Percentile* speed (mph)	Direction	85th Percentile speed (mph)
25	B1032 Clacton Road	Northbound	43.4	Southbound	46.2
29	B1033 Frinton Road	Eastbound	42.5	Westbound	43.2
31	B1035 Tendring Road	Northbound	40.2	Southbound	40.3
32	B1035 Thorpe Road	Eastbound	52.0	Westbound	52.8
33	B1035 (south of A120)	Northbound	48.4	Southbound	53.5
34	B1035 Clacton Road	Northbound	48.4	Southbound	48.3
35	Bentley Road	Northbound	48.6	Southbound	48.7
44	Little Clacton Road	Eastbound	38.3	Westbound	38.7
45	Sneating Hall Lane	Northbound	48.4	Southbound	47.4
46	Damant's Farm Lane	Northbound	42.7	Southbound	43.4
47	B1414 Landemere Road	Northbound	43.3	Southbound	39.8
48	Golden Lane	Eastbound	44.3	Westbound	43.5
49	Wolves Hall Lane	Eastbound	34.3	Westbound	34.4
50	Stones Green Road	Eastbound	36.9	Westbound	38.4
51	Payne's Lane	Northbound	24.4	Southbound	29.3
52	Spratts Lane	Northbound	24.6	Southbound	57.3
53	Barlon Road	Eastbound	27.6	Westbound	27.4`

** the speed at which 85% of traffic was recorded travelling at, or below*

117. Using the 85th percentile speeds identified in **Table 3-31** the required visibility splays for the construction access points have been determined; the required splays distances are determined using DMRB for speeds over 37 mph, or Manual for Streets (MfS) Table 7.1 for speeds of 37 mph or less.

118. The visibility splay requirements are shown in **Table 3-32.**

Table 3-32: Construction Access Visibility Splay Requirements

Link ID	Link	Direction	Visibility Splay 'y' Distance (Metres)	Direction	Visibility Splay 'y' Distance (Metres)
25	B1032 Clacton Road	Northbound	160	Southbound	160
29	B1033 Thorpe Road	Eastbound	160	Westbound	160
31	B1035 Tendring Road	Northbound	120	Southbound	120
32	B1035 Thorpe Road	Eastbound	160	Westbound	160
33	B1035 (south of A120)	Northbound	160	Southbound	160
34	B1035 Clacton Road	Northbound	160	Southbound	160
35	Bentley Road	Northbound	160	Southbound	160
44	Little Clacton Road	Eastbound	120	Westbound	120
45	Sneating Hall Lane	Northbound	120	Southbound	120
46	Damant's Farm Lane	Northbound	120	Southbound	120
47	B1414 Landemere Road	Northbound	120	Southbound	120
48	Golden Lane	Eastbound	160	Westbound	160
49	Wolves Hall Lane	Eastbound	59	Westbound	59
50	Stones Green Road	Eastbound	120	Westbound	120
51	Payne's Lane	Northbound	43	Southbound	43

Link ID	Link	Direction	Visibility Splay 'y' Distance (Metres)	Direction	Visibility Splay 'y' Distance (Metres)
52	Spratts Lane	Northbound	43	Southbound	43
53	Barlon Road	Eastbound	43	Westbound	43

119. The visibility splay requirements identified in **Table 3-32** are considered to provide a starting point for design purposes, however, these may be reduced through the implementation of traffic management measures and any temporary speed limit reductions.

3.3 Road Safety Data

3.3.1 Local Highway Network

120. Personal Injury Accident (PIA) data for the period between 01 June 2015 and 31 July 2022 as agreed with Essex County Council (seven years but has been assessed as five years to take account of the reduction in traffic on the highway network during 2020 and 2021 as a result of the Covid-19 pandemic) was received from Essex County Council for all of the proposed construction vehicle access routes (that would be used by both HGVs and cars/LGVs) between the A120 and the proposed construction accesses. The accident locations and corresponding descriptions are provided in **Appendix J.**

121. It should be noted that PIAs are classified into three categories: slight, serious and fatal, and the definition of these are provided below:

- **Slight Injury**: Injuries of a minor nature, such as sprains or cuts not judged to be severe, or slight shock requiring only roadside attention [medical treatment not a pre-requisite for an injury defined as slight];
- **Serious Injury:** Injuries for which a person is detained in hospital, as an in-patient, or any of the following injuries, whether or not a person is detained in hospital: fractures, concussion, internal injuries, severe cuts and lacerations, severe general shock requiring medical treatment and injuries which result in death 30 days after the collision. The serious category, therefore, covers a very broad range of injuries; and
- **Fatal Injury:** Injuries which cause death either immediately or any time up to 30 days after the collision.

3.3.1.1 Severity

122. An analysis of the PIAs has been undertaken for sections of the proposed construction routes and the number of accidents per severity and route length is provided in **Table 3-33.**

Table 3-33: PIA Severity Analysis (LHN)

Link ID	Highway Link Section	Start	End	Section Length (Miles)	PIAs (No.)			
					Slight	Serious	Fatal	Total
16-19	A133	A120	B1027 St John's Road	7.8	72	24	5	101
23	B1027 St John's Road/ Valley Road	A133	Railway (ECMS)	0.6	17	2	0	19
23	B1027 Valley Road/ Holland Road	Railway (ECMS)	Windermere Road	0.9	10	6	0	16
24	B1032 Frinton Road	Windermere Road	King's Parade	1.0	8	1	0	9
25	B1032 Clacton Road	King's Parade	Little Clacton Road	1.7	3	2	0	5
26	B1033 Colchester Road	A133 Colchester Road	B1035 Tendering Road	2.2	9	4	1	14
27	B1441 Weeley Bypass	B1033 Colchester Road	B1441 The Street	0.5	8	1	0	9
28	B1414 Harwich Road/ Station Road	B1441 The Street	B1033 Abbey Street	2.0	9	9	0	18
29	B1033 Abbey Street/ Frinton Road	Landermere Road	B1034 Sneating Hall Lane	1.2	5	1	0	6
29	B1033 Thorpe Road	Sneating Hall Lane	Pork Lane	0.3	2	1	0	3
30	B1033 Colchester Road/ High Street	B1035 Tendering Road	Landermere Road	0.7	1	0	0	1
31/ 32	B1035 Thorpe Road/ Tendring Road	Lodge Lane	B1033 Colchester Road	2.7	4	2	0	6
33	B1035 (south of the A120)	A120	Lodge Lane	2.2	4	4	0	8
34	B1035 Clacton Road	Stream Mill Road	A120	1.6	2	2	1	5
35	Bentley Road	Payne's Lane	A120	1.1	1	1	0	2

3.3.1.2 PIA Rate

123. The number of PIAs per billion vehicle miles in the UK was 413[18] in 2022, which has been used as a benchmark to assess the PIA rate for each of the sections identified in **Table 3-33.** This has been undertaken using the following calculation:

[number of casualties x 1,000,000,000 / (AADT x 365 days x section length (miles) x five years)]

124. **Table 3-34** shows the calculated PIA rate for each highway link section in the study area:

Table 3-34: PIA Rate Analysis

Link ID	Highway Link Section	AADT	Section Length	PIAs	PIA Rate
16-19	A133	24,556	7.8	101	290.8
23	B1027 St John's Road/ Valley Road	14,170	0.6	19	1,185.0
23	B1027 Valley Road/ Holland Road	14,170	0.9	16	712.8
24	B1032 Frinton Road	7,031	1.0	9	707.1
25	B1032 Clacton Road/ Frinton Road	7,031	1.7	5	232.8
26	B1033 Colchester Road	12,021	2.2	14	285.9
27	B1441 Weeley Bypass	5,593	0.5	9	1,777.7
28	B1414 Harwich Road/ Station Road	5,900	2.0	18	817.1
29	B1033 Abbey Street/ Frinton Road	14,391	1.2	6	193.9
29	B1033 Thorpe Road	14,391	0.3	3	368.5
30	B1033 Colchester Road/ High Street	12,021	0.7	1	61.3
31/ 32	B1035 Thorpe Road/ Tendring Road	5,795	2.7	6	212.8
33	B1035 (south of the A120)	5,795	2.2	8	348.6
34	B1035 Clacton Road	5,795	1.6	5	293.3
35	Bentley Road	891	1.1	2	1,166.9

125. The analysis of PIA rates shows that the following links have a significantly higher accident rate than the national average (2022), per billion vehicle miles:

- Bentley Road;
- B1027 St. Johns Road/ Valley Road (west of the ECMS);
- B1441 Weeley Bypass/ Clacton Road/ Weeley Road; and
- B1414 Harwich Road/ Station Road

126. The analysis shows that the following links have a marginally higher accident rate than the national average:

[18] Reported road casualties in Great Britain: 2022 annual report, DfT (September 2020)

- B1027 Valley Road (east of the ECMS); and
- B1032 Frinton Road.

127. The other highway links within the study area all have an accident rate similar to, or less than, the UK rate in 2022.

3.3.1.3 Clusters

128. A summary of the PIAs with greater than the UK PIA rate (2022) is provided in **Table 3-35**, identifying any clusters of PIAs along these routes (defined as three or more PIAs in the same location for the purposes of the analysis).

Table 3-35: Locations with More Than 425.5 PIAs per 100 Billion Vehicle Miles

Link ID	Location	PIA Rate	Number of PIAs	Clusters (3 or more PIAs)
23	B1027 St. John's Road	1,185.0	19	3
23	B1027 Valley Road	712.8	16	1
24	B1032 Frinton Road	707.1	9	No
27	B1441 Weeley Bypass	1,777.7	9	No
28	B1414 Harwich Road/ Station Road	817.1	18	No
35	Bentley Road	1,116.9	2	No

129. **Table 3-35** shows that, despite six highway links having a higher PIA rate than the UK rate (2019), there are no clusters on Bentley Road, the B1032 Frinton Road, the B1441 Weeley Bypass or the B1414 Harwich Road/ Station Road.

130. The clusters on the B1027 (as shown in **Appendix K**) had some common causation factors, associated with driver error and no indication of deficiencies in the geometry of the junctions. No PIAs at the clusters involved HGVS and only one PIA involved a non-motorised user (a cyclist).

131. Given the above, it is not considered there to be an issue of road safety on the proposed access roads that vehicle movements associated with VE would exacerbate. Notwithstanding this, the locations identified in **Table 3-35** will be considered in the final Construction Traffic Management Plan(s) (CTMP) when this is prepared. Volume 6, Report 24: Outline CTMP sets out the types of measures that could be adopted to ensure safety along the construction access routes, with some specific measures discussed and agreed upon with Essex County Council.

3.3.2 Strategic Road Network

132. The PIA data between 2015 and 2022 have been obtained (as agreed with NH) from the Crashmap database for the SRN at the A12/ A120 junction (A12 Junction 29) and the A120 between the A12 Junction 29 and the A120/ B1035 junction (see **Appendix L).**

133. Crashmap is based on official accident data reported by the Police and is approved by the National Statistics Authority and reported on by the DfT each year. It is therefore a reliable data source to analyse any safety issues on the highway network.

3.3.2.1 Severity

134. An analysis of the PIAs has been undertaken for the A120 based on the number per severity and route length is provided in **Table 3-33.** This also shows the calculated PIA rate per billion vehicle miles.

Table 3-36: PIA Severity Analysis (A120)

Link ID	Highway Link Section	Section Length (miles)	AADT	PIAs (No.)				PIA rate
				Slight	Serious	Fatal	Total	
10	A12 J29[19] to the A133	6.8	44,278	55	16	2	73	132.9
11-13	A133 to the B1035	2.5	12,405	15	3	1	19	335.7
14	B1035 to Parkeston Road	8.0	15,351	23	15	7	45	200.8
15	Parkeston Road to Harwich	1.6	10,495	6	3	0	9	293.7

135. As **Table 3-36** shows, the A120 has a PIA rate lower than the UK 2022 PIA rate (413), which would suggest there isn't a particular issue with road safety in this section of the SRN.

136. A further analysis has been undertaken regarding vehicle type and timing of the PIAs, to understand if there are any particular trends. **Table 3-37** shows the number of PIAs per vehicle type (Cars/ LGVs or HGVs):

Table 3-37: PIA Severity Analysis by Vehicle Type (A120)

Vehicle Type	Severity			Total
	Slight	Serious	Fatal	
HGV/LGV	27	11	4	42 (29%)
Car	85	15	4	104 (71%)
Total	**112**	**26**	**8**	**146**

137. Given the percentage of HGVs on the A120 is between around 6% and 13%, it can be surmised that there are a higher number of HGV PIAs in the assessment period with respect to the proportion of HGVs on the A120 compared to cars and LGVs.

138. However, only five (6%) of the total PIAs and two (10%) of the HGV PIAs occurred during the summer months, when AADT flows on the A120 are up to 10% higher (as set out in **Section 3.1.5**) and therefore there is no correlation between the increase in traffic flows on the A120 and the number of PIAs (of any vehicle types); in fact, the majority of all PIAs in the assessment period on the A120 occurred when traffic flows are lower.

[19] Including all slip roads and the circulating carriageway

3.3.2.2 Clusters

139. A summary of the PIA clusters on the A120 between the A12 and the A120/ A133 interchange is as follows:

- There is a cluster of PIAs at the circulating carriageway in the vicinity of the A12 south off-slip / A12 north on/off slip; and
- There are no clusters on the A120 mainline.

140. A summary of the PIA clusters on the A120 to the east of the A133 is as follows:

- There have been six PIAs at the A120/ Harwich Road roundabout, with a cluster of five; however, these were all prior to the roundabout being constructed;
- There have been four PIAs at the A120/ B1035 roundabout, all slight in severity and at different locations;
- There have been three PIAs at the A120/ Bentley Road and A120/ Little Bromley Road junctions; with two of these prior to these becoming left-in/ left-out junctions and the gap in the central reservation blocked; and

141. There have been five other PIAs at other sections between the A120/ Harwich Road and A120/ B1035 roundabouts; four slight in severity, one serious in severity and all at different locations

4.0 Sustainable Travel

142. This section provides a description of the sustainable travel network within the study area.

4.1 Public Rights of Way

143. The PRoW routes are shown in **Appendix M** and set out for each ECC Route Section in **Table 4-1** to **Table 4-4.**

Table 4-1: PRoW (Onshore ECC Route Section 1)

PRoW	Designation	Route		Baseline assessment (including relationship to proposed construction works)
		Start	End	
FP29 167	Footpath	Clacton-on-Sea	FP3 164	Part of the proposed England Coast path is very well used, particularly in the summer months. Would be crossed by vehicles accessing the beach. (The export cable would be installed under the path using HDD or other trenchless technique)
FP3 164	Footpath	FP29 167	BR2 164	Uses the track to be used for operation and maintenance
BR2 164	Bridleway	Second Avenue	Church Lane	
FP1 164	Footpath	First Avenue	Church Lane	
FP5 164	Footpath	B1023 Clacton Road	Little Clacton Road	
FP10 164	Footpath	Little Clacton Road	Pork Lane	
FP6 164	Footpath	Little Clacton Road	FP11 164	Edge of Onshore ECC
FP11 164	Footpath	FP6 164	FP10 164	Would be crossed by the cable trenches/haul road/off-route haul road
FP38 164	Footpath	FP6 164	Kew Lane	Would be crossed by off-route haul road

Table 4-2: PRoW (ECC Route Section 3)

PRoW	Designation	Route		Baseline assessment (including relationship to proposed construction works)
		Start	End	
FP13 180	Footpath	B1033 Frinton Road	Damant's Farm Lane	Would be crossed by cable trenches/haul road

PRoW	Designation	Route		Baseline assessment (including relationship to proposed construction works)
		Start	End	
FP7 180	Footpath	B1033 High Street	B1414 Landemere Road	Would be crossed by an off-route haul road at CR-5. Crosses the track to be used for operation and maintenance.
FP4 180	Footpath	Golden Lane	FP15 159	Would be crossed by off-route haul road
FP3 180	Footpath	FP16 159	B1035 Tendring Road	Would be crossed by off-route haul road
FP1 180	Footpath	B1035 Tendring Road	Barkers Farm	Would be crossed by cable trenches/haul road
FP18 159	Footpath	Bakers Farm	P18 180	Could be crossed by cable trenches/haul road
FP18 180	Footpath	FP18 180	B1035 Tendring Road	Could be crossed by cable trenches/haul roads. Would be through TCC4

Table 4-3: PRoW (ECC Route Section 4b)

PRoW	Designation	Route		Baseline assessment (including relationship to proposed construction works)
		Start	End	
FP8 179	Footpath	FP7 159	FP3 179	Would be crossed by off-route haul road/track to be used for operation and maintenance/cable trenches/haul road
FP22 179	Footpath	FP18 179	FP8 179	Would be crossed by off-route haul road/track to be used for operation and maintenance
FP3 179	Footpath	B1035 School Road	Wolves Hall Lane	Would be crossed by the cable trenches/haul road
FP1 179	Footpath	Wolves Hall Lane	Stones Green Road	Would be crossed by the cable trenches/haul road/ track to be used for operation and maintenance
FP31 183	Footpath	Stones Green Road	FP32 183	Would be crossed by the cable trenches/haul road

PRoW	Designation	Route		Baseline assessment (including relationship to proposed construction works)
		Start	End	
FP32 183	Footpath	FP14 183	FP15 183	Would be crossed by the cable trenches/haul road
FP37 183	Footpath	B1035	FP15 183	Shared with AC-6
FP15 183	Footpath	Stones Green Road	A120	Would be crossed by off-route haul road

Table 4-4: PRoW (ECC Route Section 5)

PRoW	Designation	Route		Baseline assessment (including relationship to proposed construction works)
		Start	End	
FP17 172	Footpath	Spratt's Lane	Bradley Hall Road	Would be crossed by the Onshore ECC/ haul road
FP16 172	Footpath	Barlon Road	FP5 166	
FP15 172	Footpath	FP3 166	Ardleigh Road	Would be through OnSS Ardleigh Road Drainage Zone

4.2 Cycle Infrastructure

4.2.1 Strategic Road Network

144. There is a small section (around 50 m) of a shared path for pedestrians and cyclists adjacent to the eastbound carriageway on the A120 at the junction with Bentley Road. There is a dropped kerb for access for cyclists to transition between Bentley Road and the shared-use path, which connects to an informal staggered crossing facility across the A120 to another section of the shared-use path adjacent to the westbound carriageway. The shared-use path continues for a length of around 80m to the junction with Little Bromley Road and on Little Bromley Road for approximately 50m, where there is a dropped kerb for cyclists to transition to and from the carriageway.

4.2.2 Local Highway Network

145. Whilst there is no specific cycle infrastructure on the proposed construction access routes on the LHN, Essex County Council promotes a number of cycle routes in and around Clacton, Great Bromley, Little Bromley and Thorpe-le-Soken (see **0**), that could be used by construction workers to access the TCCs, should they be staying locally.

146. The promoted cycle routes that use or cross the proposed VE construction access routes, or would be affected by a temporary road closure due to the installation of the export cable across a road are summarised below:

- Clacton Bicycle ride from Clacton via Great Bentley:
    - Use of B1032 Holland Road, which is part of a VE construction access route, for 430 m; and
    - Use of B1441 Clacton Road, which is part of a VE construction access route, for 1.2 km,

- Tendring Bicycle ride from Great Bentley via Wix:
    - Use of B1441 Clacton Road/ Weeley Bypass, which is part of a VE construction access route, for 850 m
    - Use of B1033 Thorpe Road, which is part of a VE construction access route, for 175 m,;
    - Use of Wolves Hall Lane, which would be crossed by the ECC and temporarily closed when the export cable is installed across it;
    - Use of Stones Green Road, which would be crossed by the ECC and temporarily closed when the export cable is installed across it; and
    - Use of A133 Colchester Road, which is part of a VE construction access route, for 185 m.

- Clacton Bicycle ride around Frinton, Walton and Weeley:
    - Use of B1035 Thorpe Road / Tendring Road, which is part of a VE construction route for 1.75 km;
    - Use of B1033 Colchester Road, which is part of a VE construction route, for 175 m; and
    - Use of Golden Lane, which would be crossed by the ECC and temporarily closed when the export cable is installed across it.

147. Also, there are some cycle improvements identified in the Tendring District Cycling Action Plan[20] on the B1027 corridor, which has been identified as having a higher PIA than the UK 2019 PIA rate, which, should these be implemented, will assist in improving safety for cyclists.

148. These are:

- New on-road advisory cycle lanes along B1032 (Holland Road) between High Street and Valley Road;
- Potential for the off-road segregated route on the section between Southcliff Park and Deanhill Avenue;
- Segregated cycle route on the B1027 Valley Road between the junction with B1032 Holland Road and Old Road;

149. Finally, there are the following two National Cycle Routes in the study area:

- Route 150 starts at Frinton Golf Club and continues along the esplanade along the coast to Jaywick, which would be crossed by VE construction vehicles accessing the beach at landfall (the export cable would be installed under the cycle path using HDD or other trenchless technique; and

[20] Tendring District Cycling Action Plan, Essex County Council, 2018

- Route 51 passes through the study area on Stones Green Road, which would be crossed by the Onshore ECC.

4.3 Access by Bus

150. The bus service network is set out below in relation to the construction access points where this is available, to provide an assessment of the options for construction workers travelling to and from those construction sites. It is assumed that all construction workers will arrive at the relevant TCC prior to the commencement of a shift.

4.3.1 AC-0, AC-1 and AC-2

151. The nearest bus stops to AC-0 are on the B1032 Clacton Road, approximately 100m south of the Holland Haven Car park access road. The southbound bus stop has a shelter and seating. The northbound bus stop is a flag and pole only.

152. The nearest bus stops to AC-1 and AC-2 are on the B1032 main Road, approximately 600m and 1.2 km from the TCC, respectively. The southbound bus stop has a shelter and seating. The northbound bus stop is a flag and pole only. Given there are no footways on the B1032 between AC-1 and AC-2 and the bus stops and the distance from AC-2, the bus may not be a suitable travel mode by workers accessing the TCCs for Onshore ECC Route Section 1.

153. The route and typical frequency of the bus services that can be accessed from the nearest bus stops to AC-0 to AC-2 are shown in **Table 4-5.**

Table 4-5: Summary of bus services serving Access A, B and C

Service	Route	Typical Weekday Frequency	Typical Saturday Frequency
9	Clacton to Walton-on-the-Naze via Frinton-on-Sea	1 per hour	1 per hour
97	Clacton to Walton-on-the-Naze via Kirby Cross	1 per hour	1 per hour
98	Clacton to Walton-on-the-Naze via Kirby-le-Soken	1 per hour	1 per hour

4.3.2 AC-3A, AC-3B, AC-4 and AC-5

154. The nearest bus stops to AC-3A and AC-3B are on the B1033 Fronton Road, approximately 150 m and 350 m from the TCCs, respectively. The bus stops are flag and pole only. Given there are no footways on the B1033 in the vicinity of the bus stops, the bus may not be a suitable travel mode by workers accessing these TCCs.

155. The nearest bus stops to AC-4 and AC-5 are on the B1033 Colchester Road approximately 1 km and 1.5 km from the TCCs, respectively. The southbound bus stop has seating and shelter, and the northbound bus stop is a flag and pole only. Given there are limited footways on the B1035 Tendring Road and B1035 Thorpe

Road between the buss tops and the TCCs at AC-4 and AC-5, the bus may not be a suitable travel mode for workers accessing these TCCs.

156. The route and typical frequency of the bus services that can be accessed from the nearest bus stops to AC-3A, AC-3B, AC-4 and AC-5 are shown in **Table 4-6.**

Table 4-6: Summary of bus services serving AC-3A and AC-3B

Service	Route	Typical Weekday Frequency	Typical Saturday Frequency
105/ 107	Colchester to Walton-on-the-Naze via Frinton, Kirby Cross, Tendring, Weeley, Thorpe-le-Soken, Little Bentley, Great Bromley	1 per hour	1 every 2 hours
99a	Great Clacton to Walton on the Naze via Thorpe le Soken	1 service	2 services

4.3.3 AC-6, AC-7, AC-8A and AC-8B

157. The nearest bus stops to AC-6, AC-7, AC8A and AC-8B and are on the B1035 Clacton Road, approximately 400 m from the TCC that would be accessed at AC-6 or AC-7 and approximately 400m from AC-8A and AC-8B. There is no evidence of bus stops despite the service provision. Given there are no footways on the B1035 in the vicinity of the bus stops and since the A120 requires crossing to and from the TCC at AC-6 or AC-7, the bus may not be a suitable travel mode for workers accessing these TCCs.

158. The route and typical frequency of the bus services that can be accessed from the nearest bus stops to AC-6, AC-7, AC8A and AC-8B are shown in **Table 4-5.**

Table 4-7: Summary of bus services serving Access H and I

Service	Route	Typical Weekday Frequency	Typical Saturday Frequency
2/2a	Clacton to Manningtree, via Tendring, Little Bromley, Little Bentley and Lawford	1 every 2 hours	1 every 2 hours

4.3.4 AC-9, AC-10 and AC-11

159. The nearest bus stops to AC-9, AC-10 and AC-11` and are on Little Bromley Road, approximately 2 km from the TCCs that would be accessed from these accesses. It is therefore highly unlikely bus would be a suitable travel mode for workers accessing these TCCs.

4.3.5 AC-12

The nearest bus stop to AC-12 is on the B1029 Frating Road approximately 2 km from the TCC which would be accessed from these accesses. It is therefore highly unlikely

bus would be a suitable travel mode for workers accessing this TCC.

5.0 Access Strategy

5.1 Construction Access Locations/ Temporary Construction Compounds

160. This section describes the proposed access locations that have been identified for use by construction vehicles to access TCCs that then lead to haul roads along the Onshore ECC for the construction of VE (and NF OWF should this project also go ahead in Scenario 1 or Scenario 2 as set out in Volume 9, Report 30: Delivery Scenarios Document).

161. The proposed access locations are shown in **Appendix O** and summarised in **Table 5.1.**

Table 5.1: Construction access points and TCCs

Access/ TCC	Highway link	Details
AC-0	Holland Haven Country park access/ Manor Way	For access to the beach for personnel to monitor HDD (or other trenchless technique) progress
AC-1/TCC 1	B1032 Clacton Road	For access to Onshore ECC Route Section 1, between landfall and the Great Eastern Mainline Spur
AC-2/TCC 2	B1032 Clacton Road	For access to Onshore ECC Route Section 1, between landfall and the Great Eastern Mainline Spur
AC-3A/TCC 3	B1033 Thorpe Road	For access to Onshore ECC Route Section 2 between the Great Eastern Mainline Spur and the B1033 Thorpe Road
AC-3B	B1033 Thorpe Road	For access to Onshore ECC Route Section 3 between the B1033 Thorpe Road and the B1035 Tendring Road
AC-4/TCC 4	B1035	For access to Onshore ECC Route Section 3 between the B1033 Thorpe Road and the B1035 Tendring Road
AC-5/TCC 5	B1035 Thorpe Road	For access to Onshore ECC Route Section 4a between B1035 Tendring Road and Tendring Brook
AC-6/TCC 6	B1035 south of A120	For access to Onshore ECC Route Section 4b between the A120 and Tendring Brook
AC-7/TCC 6	B1035 south of A120	For access to Onshore ECC Route Section 4b between the A120 and Tendring Brook

Access/ TCC	Highway link	Details
AC-8A/TCC 7	B1035 Clacton Road	For access to Onshore ECC Route Section 5 between the B1035 Clacton Road and the A120
AC-8B/TCC 8	B1035 Clacton Road	For access to Onshore ECC Route Section 5 between the B1035 Clacton Road and Bentley Road
AC-9/TCC 11	Bentley Road	For access to Onshore ECC Route Section 6/ 7, the OnSS and 400kV route
AC-10/TCC 9	Bentley Road	For access to Onshore ECC Route Section 5 between the B1035 Clacton Road and Bentley Road
AC-11/TCC 10	Bentley Road	For access to Onshore ECC Route Section 6/ 7, the OnSS and 400kV route
AC-12/12A/OnSS TCC	Ardleigh Road	Could be used during periods of construction works set up or close down

162. The construction access locations (at existing accesses and with minimising temporary vegetation removal wherever feasible) have been discussed with Essex County Council at a number of ETG meetings and have been agreed in principle.

163. General Arrangement (GA) drawings of the construction access designs are provided in **Appendix P** prepared by:

- Royal Haskoning DHV (RHDHV) for AC-1 to AC-8B; and
- Mott MacDonald for AC-9 to AC-12.

164. The designs of AC-1 to AC-8B and AC-11 have been based on the largest vehicle type required to utilise the access (with the exception of a large low loader for AC-1 to AC-8B, which is an AIL (non-special order), which would use the accesses when there would be no other construction vehicle movements and use the whole width of the access if required).

165. AC-9 has been designed to accommodate a large low loader and the AIL for the OnSS and AC-10 has been designed to accommodate a large low loader.

166. Visibility splays are based on 85th percentile speeds and the criteria in the Design Manual for Roads and Bridge (DMRB) (Section 3 of CD 123 Geometric design of at-grade priority and signal-controlled junctions and Table 2.10 of CD 109 Highway Link Design) for speeds above 37mph, or Manual for Streets (MfS) Table 7.1 for speeds of 37mph or lower.

167. The construction access designs have been subject to a Stage 1 Road Safety Audit (RSA) (see **Appendix R).** RHDV and Mott Macdonald responded to the Stage 1 RSA in the Designer's Response Reports (see **Appendix S**)

168. The construction access designs have been discussed and agreed in principle with Essex County Council; however, the final location, layout and control measures that

will be required at the construction accesses would be discussed and agreed with Essex County Council through detailed design investigations post DCO consent.

169. Based on discussions with Essex County Council the following known traffic management measure ha beesn identified:

Temporary speed limit reduction to 30mph on the B1035 Thorpe Road/ Tendring Road / Swan Road in the vicinity of AC-5.Details of other types of measures that could be introduced at the construction access are set out in Volume 6, Report 24: Outline CTMP and will be discussed and agreed upon with Essex County Council as part of the approval of the final CTMP(s)

170. It is proposed that the majority of the construction accesses would be temporary and following the completion of construction works will be removed. The following construction accesses are improvements of existing access points and may be retained :

- AC-1 off Clacton Road;
- AC-2 off Clacton Road;
- AC-4 off the Tendring Road;
- AC-6 off Tendring Road; and
- AC-8B off Clacton Road, north of Horsley Cross.

171. Where accesses are located opposite each other i.e. Bentley Road, they would also allow construction traffic to cross from one side of the public highway to the other i.e. to traverse along the temporary haul road and minimise trips included on the LHN.

172. Whilst the access locations have been identified, the exact locations may change once detailed design investigations have been undertaken, should the DCO be consented, to be agreed by Essex County Council as part of the approvals process.

5.2 Permanent Access

173. Upon completion of the construction works there will be a requirement for periodic visits to the OnSS to undertake routine checks and carry out maintenance. The OnSS is not however expected to be permanently manned. These movements would typically be made by light vehicles, cars, vans etc. however, occasional access may be required by HGVs to deliver larger components.

174. The VE transformers are designed not to require replacement during the lifetime of the VE and as such, operational access for AILs is not anticipated to be required.

175. It is anticipated that NGET will construct a new permanent private access road suitable for AIL movements to the proposed EACN Substation. This new private access road is expected to be consented to and owned by NGET. The exact alignment of this is to be confirmed. Dependant on its location, personnel and AIL loads accessing the VE OnSS during the construction phase may, in addition to the public highway, utilise this new private NGET route if it is available. Alternatively, they will use the temporary haul road along the Onshore ECC. The AIL access and access route is described further in **Section 8.0**

5.3 Construction Access Routes

5.3.1 HGV and Workforce Vehicles

176. **Table 5-2** summarises the access routes that have been identified for use by VE HGVs and workforce vehicles (cars/ LGVs) between the A12/ A120 and the construction access points described in **Section 5.1.** These are also shown in **Appendix H.**

Table 5-2: Construction Access Routes (HGVs and Cars/ LGVs)

Access/ TCC	ECC Route Section	Access Route
AC-0/ TCC 1 AC-1/ TCC 2/ AC-2/ TCC 3	1	A12, A120, A133, B1027 Valley Road/ Frinton Road, B1032 Clacton Road (Holland Haven Country Park access/ Manor Way for AC-0) or A120, U-turn at A12 J29, A120, A133, B1027 Valley Road/ Frinton Road, B1032 Clacton Road (Holland Haven Country Park access/ Manor Way for AC-0)
AC-3/ TCC 4	2/ 3	A12, A120, A133, B1033, B1441 Weeley Road/ Clacton Road, B1414 Harwich Road/ Station Road, B1033 Frinton Road/ Thorpe Road or A120, U-turn at A12 J29, A120, A133, B1033, B1441 Weeley Road/ Clacton Road, B1414 Harwich Road/ Station Road, B1033 Frinton Road/ Thorpe Road
AC-4/ TCC 5	3	A12, A120, A133, B1033 Colchester Road, B1035 Tendring Road or A120, U-turn at A12 J29, A120, A133, B1033 Colchester Road, B1035 Tendring Road
AC-5/ TCC 6	4a	A12, A120, A133, B1033 Colchester Road, B1035 Tendring Road, B1035 Thorpe Road or A120, U-turn at A12 J29, A120, A133, B1033 Colchester Road, B1035 Tendring Road, B1035 Thorpe Road
AC-6 or AC-7/ TCC 8	4b	A12, A120, B1035 or

Access/ TCC	ECC Route Section	Access Route
		A120, B1035
AC-8A/ AC-8B/ TCC 9A/ TCC 9B/ TCC 9C	5	A12, A120, B1035 Clacton Road or A120, B1035 Clacton Road
AC-11/ TCC-10C	5	A12, A120, Bentley Road or A120, U-turn at Harwich Road roundabout, Bentley Road
AC-9/ AC-10/ TCC-10A/ TCC 10B/ OnSS TCC	5/ 6/ 7/ 400kV Route/ OnSS	A12, A120, Bentley Road (then Ardleigh Road/ Little Bromley Road for access to the propsoed location of the NGET Substation) or A120, U-turn at Harwich Road roundabout, Bentley Road (then Ardleigh Road/ Little Bromley Road for access to the propsoed location of the NGET Substation)

5.3.2 Workforce Vehicles

177. In addition to the access routes identified in **Table 5-2**, other highway kinks within the study area would be used by the construction workforce in cars and LGVs, with the following main routes considered in the assessment of traffic and transport:

- B1035 via Tendring, Goose Green and Tendring Green;
- B1033 via Kirby Cross;
- B1032 via Great Holland;
- B1027 between Colchester and the A133);
- B1029 between the B1027 and Waterhouse Lane;
- A133 between Colchester and the A133;
- Waterhouse Lane;
- Bromley Road/ Shop Road/ Bentley Road (north of AC-9); and
- Progress Way/ B1441

5.4 Haul Road Crossings

178. This section describes the proposed haul road crossing locations that have been identified for the construction of VE to allow construction traffic to cross the public highway (but not take direct access) for the construction of VE (and NF OWF should

this project also go ahead in Scenario 1 or Scenario 2 as set out in Volume 9, Report 30: Delivery Scenarios Document).

179. The proposed haul road crossing locations are shown in **Appendix Q** and summarised in **Table 5-3**.

Table 5-3: Haul Road Crossing Locations

Reference	Haul Road Crossing Location
CR-1	Little Clacton Road
CR-2	B1034 Sneating Hall Lane
CR-3	Damant's Farm Lane
CR-4	B1414 Landermere Road
CR-5	Golden Lane
CR-6	Lodge Lane
CR-7	Wolves Hall Lane
CR-8A ad CR-8B	Stones Green Road
CR-9A ad CR98B	Payne's Lane
CR-10A ad CR-10B	Spratt's Lane
CR-11 A and CR-11B	Barlon Road
AC-12	Ardleigh Road

180. The haul road crossing locations (at existing accesses and with minimising temporary vegetation removal wherever feasible) have been discussed with Essex County Council at a number of ETG meetings and have been agreed in principle.

181. Based on discussions with Essex County Council the following known traffic management measures have been identified:

- Temporary speed limit reduction to 30mph on Little Clacton Road in the vicinity of CR-1, due to restricted visibility; and
- Temporary speed limit reduction to 40mph or temporary speed limit to 40mph and temporary traffic signal operation on Golden Lane in the vicinity of CR-5, due to restricted visibility.

182. Details of other types of measures that could be introduced at the haul road crossings are set out in Volume 6, Report 24: Outline CTMP and will be discussed and agreed upon with Essex County Council as part of the approval of the final CTMP(s)

183. It is proposed that the majority of the haul road crossings would be temporary and following completion of construction works will be removed. The following haul road crossing is an improvement to existing access points and may be retained:

- CR-4 off Landemere Road in both directions

184. GA drawings of the haul road crossings are provided in **Appendix Q** and have been prepared by RHDHV. AC-12, which would also be a crossing for construction vehicles for VE and NF OWF) has been designed by Mott MacDonald and could be used for vehicles associated with the construction of the EACN Substation.

185. The haul road crossing designs have been subject to a Stage 1 RSA (see **Appendix R).** RHDV and Mott Macdonald responded to the Stage 1 RSA in the Designer's Response Reports (see **Appendix S**)

186. The haul road crossing designs have been discussed and agreed upon with Essex County Council in principle; however, the final location, layout and control measures that will be required at the haul road crossings will be discussed and agreed with Essex County Council through detailed design investigations post DCO consent, through the approvals process.

2.8 Onshore ECC Crossing Locations

187. Horizontal directional drilling (HDD) or another trenchless technique would be used to install the cable under the majority of the roads in the study area, with the exception of Damant's Farm Lane (Onshore ECC Section 3), Payne's Lane and Barlon Road (Onshore ECC Route Section 6), which would be temporarily closed to enable the cable to be installed used open trenching.

188. It is assumed that any temporary road closure(s) would be for a maximum of seven days and these would not be simultaneous unless agreed with Essex County Council in advance or via approval of the final CTMP (s).

6.0 Trip Generation

6.1 Methodology

189. The section sets out the trip generation and distribution (parameters and results) associated with the MDS used for the assessment of the likely significant effects associated with the onshore elements of the VE on traffic and transport.

190. The MDS sets out the maximum design parameters of the combined project assets that result in the greatest potential for change in relation to each impact assessed.

191. The project design consultant has derived the trip generation forecasts for the construction phase of VE across the anticipated 18-month construction programme for the Onshore ECC and 19-month construction programme for the OnSS (see Figure 1.17 of Volume 6, Part 3, Chapter 1: Onshore Project Description which illustrates the likely staging of works and date ranges for these works).

192. The Onshore ECC includes some optionality in routeing and crossing technology; however, this optionality does not alter trip generation forecasts or vehicle routeing.

193. The data and details of how the construction traffic forecasts have been calculated are provided in **Appendix T** and includes a breakdown of the anticipated daily number of two-way HGV and workforce movements (arrivals and departures), per month, for the Route Sections that comprise the Onshore ECC and 400kV connection to the NGET Substation, and the OnSS, as set out in **Table 1-1.**

6.2 Maximum Design Scenario

6.2.1 Approach

194. The approach taken to derive the MDS is to establish the peak forecast vehicle demand to and from each Onshore ECC Route Section, the OnSS and the 400kV Connection have been added together to create a theoretical 'in-combination worst case' whereby the peak construction activity for all sections would occur concurrently.

195. This method has the advantage of assessing the peak impact on all links and is therefore appropriate for applying assessment screening. However, there is a drawback in that the potential combined traffic flows on the core vehicle access routes are overestimated by assigning peak vehicle demand for all of the Onshore ECC Route Sections or OnSS when in reality, these peaks would not necessarily occur at the same time. Therefore, a 26.7% HGV and a 19.5% workforce vehicle reduction factor (derived from the maximum daily HGV / workforce vehicle movements from the combined Onshore ECC Route Sections, the OnSS/and the 400kV Connection compared to the maximum daily HGV / workforce vehicle movements for each Onshore ECC Route Section, the OnSS and 400kV Connection individually) has been applied to the core construction vehicle access routes, as set out in **Section 6.3.2.1** and **6.3.2.2.**

196. The peaks of the HGVs and workforce vehicle movements have been derived independently, both of which would result in a robust assessment of vehicular impact on the LHN.

6.2.1.1 HGVs

197. **Table 6-1** sets out a summary of the maximum two-way HGV daily trip generation for each Onshore ECC Route Sections and the corresponding month. It also shows the difference between the peak HGVs for each Onshore ECC Route Section, the OnSS and the 400kV Connection, and the number of HGVs in the month with the greatest total number of HGV movements across the Onshore ECC Route Sections the OnSS and the 400kV Connection (excluding the beach access, as this would overinflate the likely maximums on the route from the A133 through Clacton, as most of the potential daily HGV movements for the beach access are thee or less throughout the construction programme, apart from two months, which wouldn't be during the peak month overall).

Table 6-1: Maximum HGV Trip Generation

Route Section	Maximum Daily HGVs (2-Way)	Month	Overall Peak Month of Construction Programme for HGVs (Month 4) Maximum daily HGVs (2-way)	Difference
Landfall/ 1	106	6	86	20
2	33	16	21	12
3	87	4	87	0
4a	39	4	39	0
4b	72	15	59	13
5	57	3	39	18
6 & 7	91	15	55	36
400kV Connection	42	9	0	42
OnSS and unlicensed works	133	10	96	37
Total	**660**	**n/a**	**482**	**178**

198. As **Table 6-1** shows, the assessment based on the peak month overall is 178 two-way HGV movements (26.7%) lower than the assessment based on the maximum HGVs to each Route Section.

6.2.1.2 Workforce Vehicles

199. The same exercise has been undertaken for the anticipated workforce vehicles, as set out in **Table 6-2.**

Table 6-2: Maximum Number of Employees per Onshore ECC Route Section

Route Section	Maximum Daily Workforce Vehicles (2-Way)	Month of VE Construction Programme	Overall Peak Month of Construction Programme for the Workforce (Month 10) Maximum Daily Workforce Vehicles (2-Way)	Difference
Beach access	53	13	0	53
Landfall/ 1	145	9	112	33
2	77	11	57	20
3	109	11	87	22
4a	59	10	59	0
4b	84	11	79	5
5	83	8 or 10	83	0
6 & 7	81	7 or 9	68	13
400kV Connection	55	10	55	0
OnSS and unlicensed works	201	10	201	0
Total	**947**	**n/a**	**801**	**146**

200. As **Table 6-2** shows, the assessment based on the maximum number of workforce vehicles to each Route Section is 146 two-way movements (15.4%) greater than the total based on the peak month overall.

201. It should be noted that the construction of the OnSS could commence after the onshore ECC up to a total overall programme of 36 months, so the assessment presented is robust.

202. For HGVs, the maximum daily movements anticipated for each onshore ECC route section or 400kV grid connection are during seven different months (between months 3 and 16) and therefore the likelihood of all of these peaks occurring at the same time due to delays to the programme, is negligible.

203. For workforce vehicles (which are already robust, particularly on the SRN due to the inflated proportions from Colchester and Ipswich, as agreed with NH and Essex County Council) the maximum daily movements anticipated for each ECC route section or the 400kV grid connection are during six different months (between months 8 and 13) and whilst there is a greater likelihood of some of these peaks, which are closer together, occurring at the same time due to delays in programme, for example, assessing the absolute (and unrealistic) worst case and providing mitigation based on this (should it be required), does not align with the DfT's most recent policy in Decarbonising Britain: Plan A Better, Greener Britain (2021), which states at page 158:

"*We need to move away from transport planning based on predicting future demand to provide capacity ('predict and provide') to planning that sets an outcome*

communities want to achieve and provides the transport solutions to deliver those outcomes (sometimes referred to as 'vision and validate')."

6.3 Trip Generation and Distribution

6.3.1 Trip Generation Parameters

204. In order to undertake an assessment of the likely significant effects of the MDS identified for the construction phase of VE, a number of trip generation parameters have been identified, which have been discussed with Expert Topic Group (ETG) members as part of the Evidence Plan process. The assumptions have been informed by the evolving project design parameters and are considered suitable in order to provide a robust but reasonable forecast of the likely traffic effects of VE during the construction period.

205. The key trip generation parameters are:

- Core working hours – 07:00 to 19:00, (some activities, such as HDD or other trenchless techniques may require continuous 24 hours working for short periods);
- The construction workforce would arrive and depart in cars or light goods vehicles (LGVs);
- Construction workforce arrival and departures:
    - 80% arriving before 07:00 and leaving after 18:15 (April to October), or before 16:15 (November to March), based on approximate daylight hours in Essex (see **Appendix I);** and
    - 20% (within one hour) arriving between 07:00 and 09:00 and leaving between 16:15 and 18:15 (the peak hour period identified on the highway network, most likely to be in the winter months due to daylight availability;
- Core HGV deliveries - 07:00 to 19:00;
- The two-way HGV movements assume a vehicle arriving at a construction access and TCC, uploading and departing at the same access;
- The HGV movements along each of the haul roads are not known and are not specifically assessed as part of Volume 6, Part 3, Chapter 8: Traffic and Transport;
- Car occupancy – 1.5 people per car, which is considered a conservative estimate, given core working hours will be the same for the majority of workers, who may frequent the same local accommodation and wish to share travel costs; and.
- The two-way employee movements assume a vehicle arriving at a construction access and TCC in the morning and leaving in the evening, as per the assumptions above.

6.3.2 Daily Trip Generation

206. The maximum daily trip generation for HGVs and workforce vehicle movements based on **Table 6-1** and **Table 6-2** is summarised in **Table 6-3**, which also shows the which also shows the average (across the assumed construction programme of 18 months for the Onshore ECC and 400kv Connection and 19 months for the OnSS) vehicle movements as a comparison.

Table 6-3: Daily (Two-Way) Trip Generation Summary

Route Section	Total vehicles		HGVs		Workforce (Cars/LGVs)	
	Max	Average	Max	Average	Max	Average
Beach access	83	12	39	5	53	11
Landfall/ 1	251	153	106	71	145	82
2	110	60	33	22	77	38
3	196	134	87	62	109	72
4a	98	57	39	21	59	36
4b	156	111	72	50	84	61
5	140	87	57	38	83	49
6 & 7	172	107	91	50	81	57
400kV Connection	97	23	42	9	55	14
OnSS and unlicensed works	334	173	133	61	201	112
Total	**1,462**	**916**	**662**	**386**	**800**	**530**

2.8.1 Peak Hour Trip Generation

207. The forecast maximum vehicular traffic associated with VE during the morning and evening peak hours on the highway network is summarised in **Table 6-4** based on the assumptions set out in **Section 6.3.1**.

Table 6-4: Peak Hour Trip Generation Summary (AM or PM peak)

Route Section	Total Vehicles	HGVs	Workforce (Cars/LGVs
Beach access	8	3	5
Landfall/ 1	24	9	15
2	11	3	8
3	18	7	11
4a	9	3	6
4b	14	6	8
5	13	5	8
6 & 7	16	8	8
400kV Connection	9	4	5
OnSS and unlicensed works	31	11	20
Total	**150**	**55**	**95**

2.8.2 Traffic Distribution Parameters

6.3.2.1 HGVs

208. Whilst is likely that HGVs associated with the construction of VE would arrive from and depart to Junction 29 of the A12 via the A120 west, following discussions with Essex County Council and NH at ETG meetings and to align with the NF OWF assessment presented at PIER, as a sensitivity test, 100% of HGVs have been assumed to arrive from the Port of Harwich via the A120 east (although this is highly unlikely), in addition to the assume 100% from Junction 29 of the A12 via the A120 west.

209. Therefore, the following assessment scenarios have been considered in this TA:

- Scenario A: 100% HGVs arrive from and depart to the A120 east of the B1035 Horsley Cross Roundabout; and
- Scenario B: 100% of HGVs arrive from and depart to the A12 Junction 29.

210. The Special Order AILs are likely to arrive from the Port of Harwich via the A120 east; however, are included in the assessment of vehicular impact in this TA since these would occur at different times to the main construction works of VE.

211. The HGV trip distribution used for the assessment is set out in **Table 6-5** for HGVs arriving from the A12 Junction 29 or the Port of Harwich.

Table 6-5: HGV Trip Distribution

Access / TCC	ECC Route Section	Access Route	Distribution (%)
AC-0 / AC-1/ TCC 1/ AC-2/ TCC 2	1	A12, A120, A133, B1027 Valley Road/ Frinton Road, B1032 Clacton Road (and Holland Haven Country Park access/ Manor Way for AC-0) or A120, U-turn at A12 J29, A120, A133, B1027 Valley Road/ Frinton Road, B1032 Clacton Road (and Holland Haven Country Park access/ Manor Way for AC-0)	100
AC-3A/ TCC 3	2	A12, A120, A133, B1033, B1441 Weeley Road/ Clacton Road, B1414 Harwich Road/ Station Road, B1033 Frinton Road/ Thorpe Road or	100

Access / TCC	ECC Route Section	Access Route	Distribution (%)
		A120, U-turn at A12 J29, A120, A133, B1033, B1441 Weeley Road/ Clacton Road, B1414 Harwich Road/ Station Road, B1033 Frinton Road/ Thorpe Road	
AC-3B	3	A12, A120, A133, B1033, B1441 Weeley Road/ Clacton Road, B1414 Harwich Road/ Station Road, B1033 Frinton Road/ Thorpe Road or A120, U-turn at A12 J29, A120, A133, B1033, B1441 Weeley Road/ Clacton Road, B1414 Harwich Road/ Station Road, B1033 Frinton Road/ Thorpe Road	50
AC-4/TCC 4	3	A12, A120, A133, B1033 Colchester Road, B1035 Tendring Road or A120, U-turn at A12 J29, A120, A133, B1033 Colchester Road, B1035 Tendring Road	50
AC-5/TCC 5	4a	A12, A120, A133, B1033 Colchester Road, B1035 Tendring Road, B1035 Thorpe Road or A120, U-turn at A12 J29, A120, A133, B1033 Colchester Road, B1035 Tendring Road, B1035 Thorpe Road	100
AC-6/ AC-7/ TCC 6	4b	A12, A120, B1035 or A120, B1035	100

Access / TCC	ECC Route Section	Access Route	Distribution (%)
AC-8A/ TCC 7/ AC-8B/ TCC 8	5	A12, A120, B1035 Clacton Road or A120, B1035 Clacton Road	50
AC-10/TCC 9	5	A12, A120, Bentley Road or A120, U-turn at Harwich Road roundabout, Bentley Road	50
AC-9/ AC-11/AC-12/ TCC 10/ TCC 11/ OnSS TCC	5/ 6/ 7/ 400kV Route/ OnSS	A12, A120, Bentley Road (and Ardleigh Road for access to the proposed location of the NGET EACN substation) or A120, U-turn at Harwich Road roundabout, Bentley Road (and Ardleigh Road for access to the proposed location of the NGET EACN substation)	100 (for the route to Bentley Road only)

6.3.2.2 Workforce

212. At PEIR, it was assumed that 100% of the workforce would arrive from and depart to the A12 J29, for a robust assessment of the SRN and the A133 as the key route on the LHN in the study area. This approach was different to the NF OWF assessment at PIER, which was a gravity model based on journey-to-work data of employees in the construction sector and the availability of local accommodation.

213. Following discussions with Essex County Council and NH at ETG meetings it was agreed that the workforce distribution should be based on journey-to-work data from the 2011 Census. A number of discussions and meetings with Essex County Council were undertaken to agree the final distribution.

214. At the ETG meeting on the 5th September 2023, AECOM (consultants on behalf of NH) stated it would defer to Essex County Council in the workforce distribution and therefore it has been agreed with both stakeholders.

215. The workforce distribution (see **Appendix U)** based on journey to work data from the 2011 Census using the following mid layer super output areas (MSOAs):

- MSOA Tendering 003;
- MSOA Tendering 005; and
- MSOA Tending 007

216. However, it was discussed and agreed with Essex County Council that the resulting distribution resulted in an underestimation of movements from the Colchester and Ipswich zones. In order to address this, for the Colchester and Ipswich zones, the maximum distribution of movements to each of the MSOAs has been used, instead of the average (which has been used for the other origin zones). This results in some double counting and approximately 120% of workforce vehicle movements, providing a very robust assessment. The resulting workforce vehicle distribution is set out in **Table 6-6.**

Table 6-6: Workforce Distribution

Origin	Distribution (%)
A12 North (south of the A14)	14.5
A12 North (A14/ Ipswich)	4.4
A12 South	9.4
Colchester	24.5
Colchester via A12/ A120	8.8
East of A133/ Manningtree	19.5
Tendring (north of A133)	4.1
B1027 corridor south of Colchester	8.3
Clacton	13.8
Frinton/ Walton on the Naze	6.6
Thrope-Le-Soken and surrounding areas	5.6
Total	**119.5**

217. Whilst the majority of workforce vehicles to access the Onshore ECC Route Sections 5, 6 and 7, the OnSS and 400kV connection are assumed to use Bentley Road via the A120, a sensitivity test of the average workforce vehicle movements across the 18/19 month construction periods (for the Onshore ECC and OnSS) from the A12 North, east of A133/ Manningtree and Tendring (north of A133), which equates to 42.5%, has been included with these vehicles arriving from and departing to the north via Bentley Road/ Shop Road/ Bromley Road .e. north of AC-9, AC-10 and AC-11.

218. Additionally, an option for workforce vehicles accessing the construction of the VE OnSS via the B1029 (north of Harwich Road), Waterhouse Lane and Little Bromley Road/ Ardleigh Road has been included. The maximum average workforce vehicle movements over any 12-month period during the 19-month construction has been identified, rather than the peak month for this route.

6.3.3 Trip Generation per Highway Link (Peak Hours)

219. The maximum (from Scenario A or B) two-way vehicular trip generation (total, HGV and workforce vehicles) in the morning or evening peak hours on each highway link is shown in **Table 6-7** and **Figure 6-1, Figure 6-2** and **Figure 6-3.**

Table 6-7: Maximum Two-Way Peak Hour Vehicle Movements on Each Highway Link

Link ID	Highway Link	Maximum Two-Way		
		Total Vehicles	HGVs	Workforce (Cars/LGVs)
1	A12 (N)	35	20	15
2	A12 (S)	35	20	15
6	A12 (N) off-slip at J29 Roundabout	18	10	8
7	A12 (N) on-slip at J29 Roundabout	18	10	8
8	A120 (E) off-slip at J29 Roundabout	24	16	8
9	A120 (E) on-slip at J29 Roundabout	24	16	8
10	A120 (A12 J29 to the A133)	70	40	30
11	A120 (A133 to Harwich Road)	40	24	16
12	A120 (Harwich Road to Bentley Road)	84	34	50
13	A120 (Bentley Road to the B1035)	81	34	47
14	A120 East of B1035	56	40	16
15	A120 at Harwich	56	40	16
16	A133 (A120 to the A133 Main Road)	31	16	15
17	A133 (A133 Main Road to the B1033)	49	16	33
18	A133 (B1033 to the B1027)	30	6	24
19	A133 Clacton Road (Elmstead Market)	21	0	21
20	A133 Main Road	23	0	23
21	B1027 St John's Road (west of Clacton)	9	0	9
22	B1027 Colchester Road (St Osyth Park)	2	0	2
23	B1027 Valley Road (Clacton)	31	9	22
24	B1032 Frinton Road	35	9	26
25	B1032 Clacton Road	36	9	27
26	B1033 Colchester Road (west of B1441)	34	13	21
27	B1441 Clacton Road	17	6	11
28	B1414 Harwich Road	18	6	11
29	B1033 Frinton Road	24	6	17
30	B1033 Colchester Road (east of B1441)	19	7	12
31	B1035 Tendring Road	30	7	23
32	B1035 Thorpe Road	21	3	18
33	B1035 south of A120	27	6	21
34	B1035 Clacton Road	7	2	4
35	Bentley Road	57	18	39
36	Bentley Road (north of AC-9)	10	0	10
37	B1035 Clacton Road (north of AC-8)	0	0	0
38	B1441 via Little Clacton	0	0	0

Link ID	Highway Link	Maximum Two-Way		
		Total Vehicles	HGVs	Workforce (Cars/LGVs)
39	Progress Way	0	0	0
40	B1029 Harwich Road	20	0	20
41	Harwich Road	20	0	20
42	B1032 Kirby Cross	2	0	2
43	B1033 Thorpe Road	11	0	11
44	B1029 (north of Harwich Road)	16	0	16
45	Waterhouse Lane	16	0	16
	Little Bromley Road/ Ardleigh Road	20	4	16

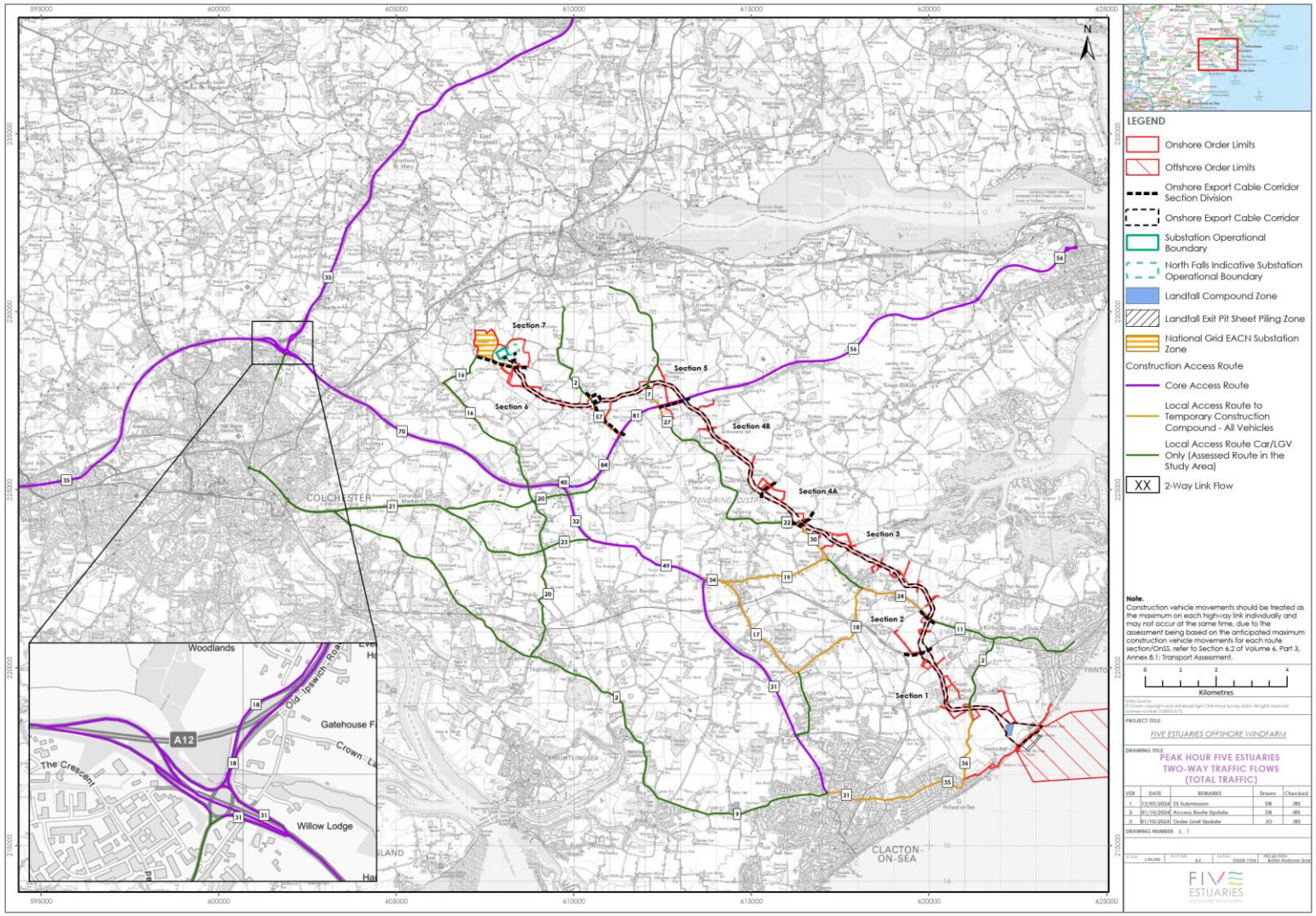


Figure 6-1: Maximum Peak Hour VE Two-Way Vehicular Trip Generation (Total Vehicles)

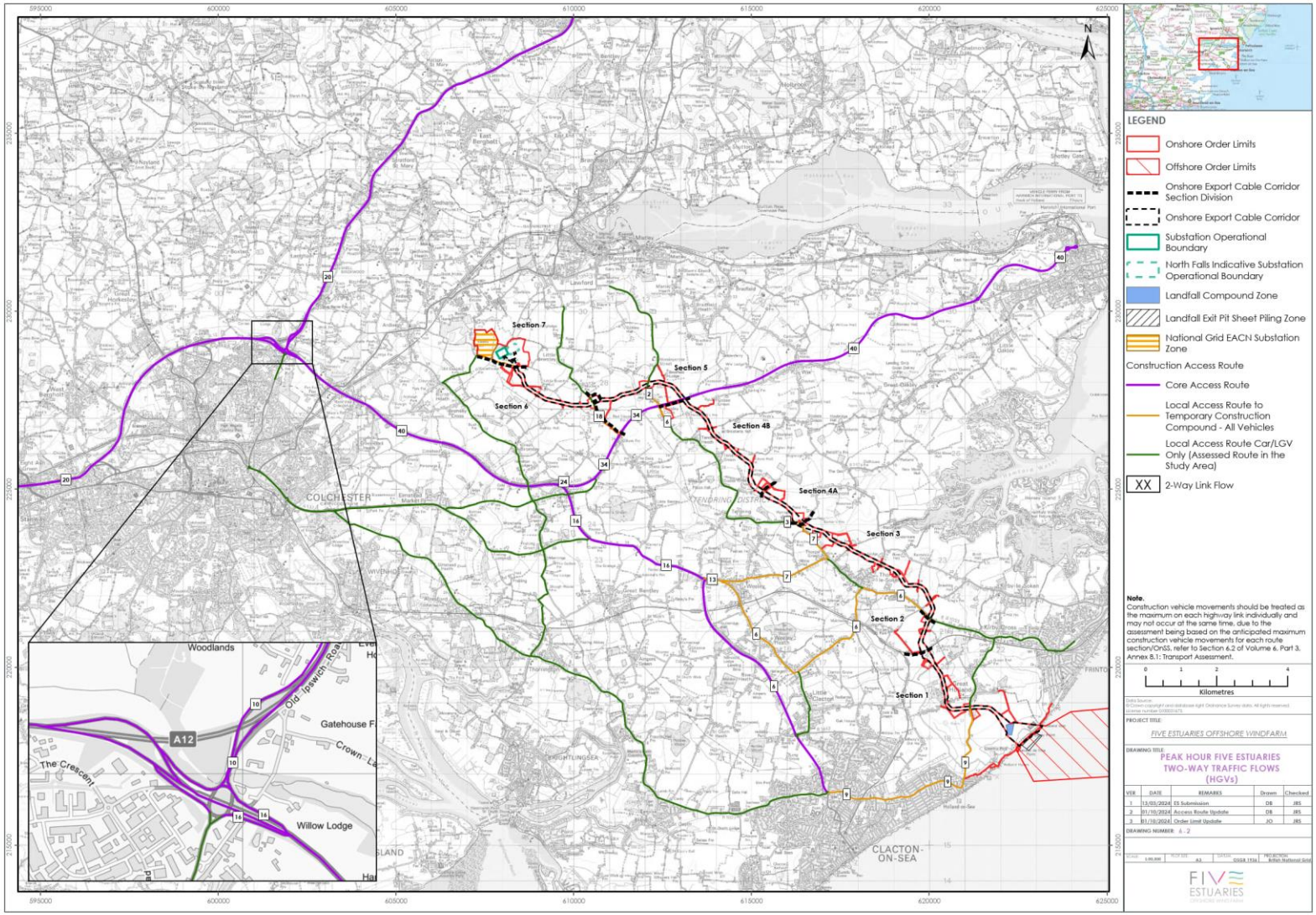


Figure 6-2: Maximum Peak Hour VE Two-Way Vehicular Trip Generation (HGVs)

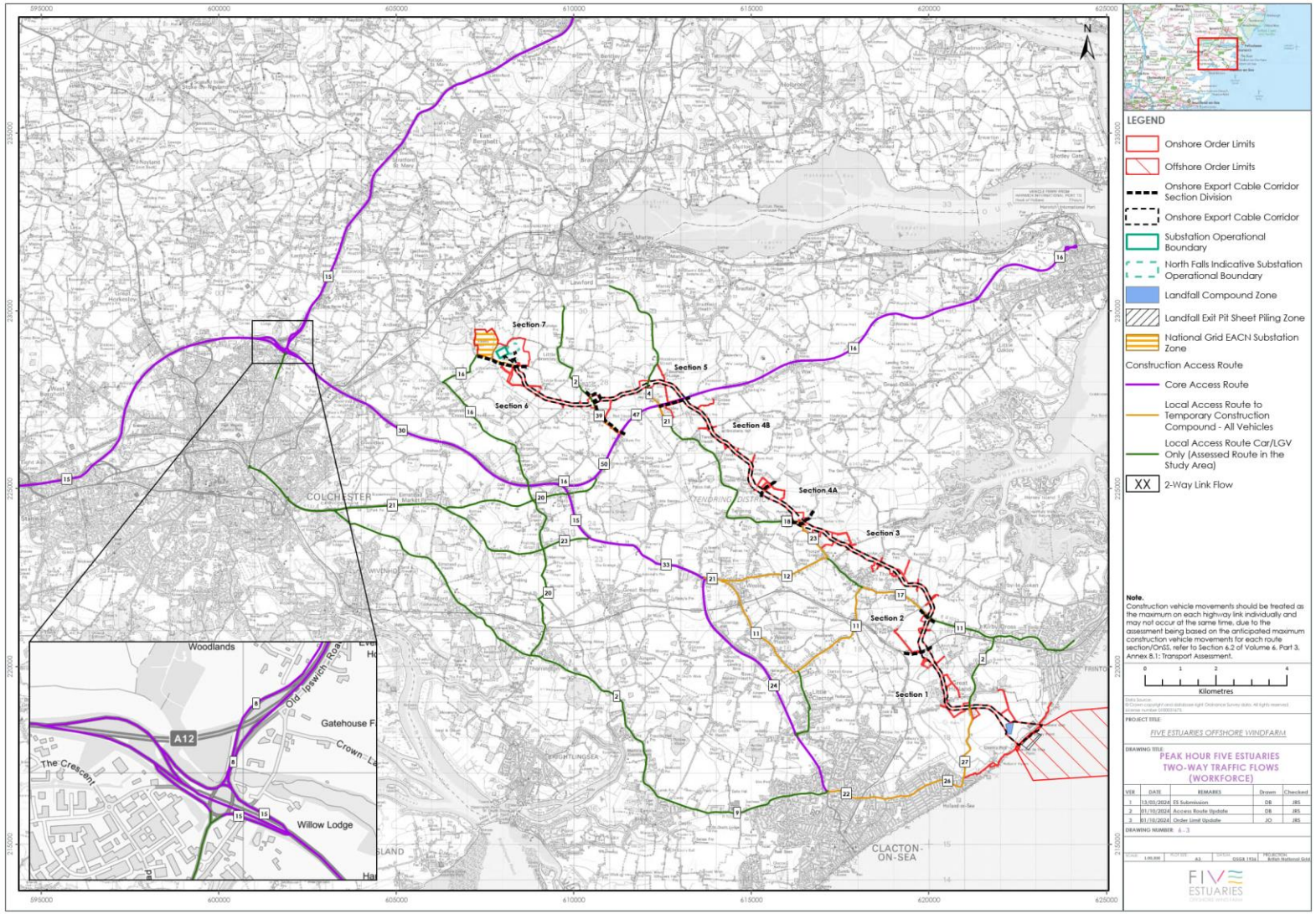


Figure 6-3: Maximum Peak Hour VE Two-Way Vehicular Trip Generation (Workforce Vehicles)

220. The average across the construction programme two-way vehicular trip generation (total, HGV and workforce vehicles) in the morning or evening peak hours on each highway link is shown in **Table 6-8.**

Table 6-8: Average Two-Way Peak Hour Vehicle Movements on Each Highway Link

Link ID[21]	Highway Link	Average Two-Way		
		Total Vehicles	HGVs	Workforce (Cars/LGVs)
1	A12 (N)	25	16	9
2	A12 (S)	25	16	9
6	A12 (N) off-slip at J29 Roundabout	9	4	5
7	A12 (N) on-slip at J29 Roundabout	9	4	5
8	A120 (E) off-slip at J29 Roundabout	12	7	5
9	A120 (E) on-slip at J29 Roundabout	12	7	5
10	A120 (A12 J29 to the A133)	50	31	19
11	A120 (A133 to Harwich Road)	31	17	14
12	A120 (Harwich Road to Bentley Road)	57	26	31
13	A120 (Bentley Road to the B1035)	55	26	29
14	A120 East of B1035	41	31	10
15	A120 at Harwich	41	31	10
16	A133 (A120 to the A133 Main Road)	24	15	9
17	A133 (A133 Main Road to the B1033)	35	15	20
18	A133 (B1033 to the B1027)	20	6	14
19	A133 Clacton Road (Elmstead Market)	12	0	12
20	A133 Main Road	12	0	12
21	B1027 St John's Road (west of Clacton)	4	0	4
22	B1027 Colchester Road (St Osyth Park)	1	0	1
23	B1027 Valley Road (Clacton)	16	6	10
24	B1032 Frinton Road	18	6	12
25	B1032 Clacton Road	18	6	12
26	B1033 Colchester Road (west of B1441)	20	8	12
27	B1441 Clacton Road	10	4	6
28	B1414 Harwich Road	10	4	6
29	B1033 Frinton Road	13	4	9
30	B1033 Colchester Road (east of B1441)	11	4	7

[21] Highway Links 36 to 43 are workforce access routes only, where no baseline traffic data has been collected.

Link ID[21]	Highway Link	Average Two-Way		
		Total Vehicles	HGVs	Workforce (Cars/LGVs)
31	B1035 Tendring Road	18	4	14
32	B1035 Thorpe Road	13	2	11
33	B1035 south of A120	17	4	13
34	B1035 Clacton Road	4	2	2
35	Bentley Road	35	11	24
36	Bentley Road (north of AC-9)	1	0	1
37	B1035 Clacton Road (north of AC-8)	0	0	0
38	B1441 via Little Clacton	0	0	0
39	Progress Way	0	0	0
40	B1029 Harwich Road	10	0	10
41	Harwich Road	11	0	11
42	B1032 Kirby Cross	1	0	1
43	B1033 Thorpe Road	6	0	6
44	B1029 (north of Harwich Road)	12	0	12
45	Waterhouse Lane	12	0	12
	Little Bromley Road/ Ardleigh Road	17	1	16

6.3.4 Peak Hour Impact Analysis

221. This section sets out an analysis of the potential impact of VE construction vehicle movements on the highway network, using the 30 two-way vehicle movement in any hour threshold, typically used as a basis for considering the impact on capacity of a junction and the need to undertake a junction capacity assessment.

222. The highway links forecast to have greater than 30 two-way peak hour vehicle movements as a result of the construction of VE are shown in **Table 6-9.** The average peak hour flow on these highway links is also shown as a comparison and identifies highway links 1, 2, 16, 24, 25 and 26 with fewer than 30 vehicle movements in a peak hour.

223. The analysis of the forecast maximum and average VE peak hour vehicle movements, noting these are most likely during the winter months in the evening due to the daylight hours availability, is provided in **Sections 6.3.4.1** to **6.3.4.11.**

224. It should be noted that as the VE construction vehicle movements are a worst-case scenario on each highway link including the maximum from Assessment Scenario A and B, the forecast construction vehicle movements shown on each link would not necessarily occur at the same time. This is relevant to junctions between the A12 Junction 29 and Harwich. For example, at the A12 Junction 29, there would only be workforce vehicle movements on A12 (N) off-slip in the morning and on the A120 (E) off-slip in the evening i.e. the diagram shows both together.

Table 6-9: Highway Links with Greater Than 30 Two-Way Vehicle Movements in a Peak Hour

Link ID	Highway Link	Maximum	Average
1/ 2	A12 (N)/ A12 (S)	35	25
10	A120 (A12 J29 to the A133)	70	50
11	A120 (A133 to Harwich Road)	40	31
12	A120 (Harwich Road to Bentley Road)	84	57
13	A120 (Bentley Road to the B1035)	81	55
14	A120 East of B1035	56	41
15	A120 at Harwich	56	41
16	A133 (A120 to the A133 Main Road)	31	24
18	A133 (B1033 to the B1027)	49	35
24	B1032 Frinton Road	35	18
25	B1032 Clacton Road	36	18
26	B1033 Colchester Road (west of B1441)	34	20
35	Bentley Road	57	35

6.3.4.1 A12 Junction 29

225. **Table 6-4** shows the maximum VE construction vehicle movements on the A12 (N) or A12 (S) in a peak hour to be marginally above the 30 two-way vehicles threshold and would be imperceptible in peak hour fluctuations of traffic.

226. In terms of the combined total number of peak hour VE construction vehicles at the A12 Junction 29 circulating carriageway (which include vehicle movements from the A12 (S) and A12 (N) off-slips and the A120 (E) off-slip), the following is forecast, which is below the 30 two-way vehicle threshold (a total of 28):

- A12 (N) off-slip – 10 HGVs;
- A120 (E) off-slip – 10 HGVs; and
- A12 (N) off-slip (morning peak) or A120 (E) off-slip (evening peak) – 8 workforce vehicles.

227. Also, the peak hour baseline flows on the A120 (E) off-slip (see **Table 3-2**), which is more likely to have a greater number of VE construction vehicle movements in the evening peak hour, are significantly higher in the morning peak compared to the evening peak, minimising the potential impacts at the A12 Junction 29 even further.

6.3.4.2 A120/ Harwich Road Roundabout

228. **Figure 6-4** shows the forecast maximum VE construction vehicle movements at the A120/ Harwich Road roundabout during the morning peak hour added to the baseline traffic flows (October 2022).

229. **Figure 6-5** shows the forecast maximum VE construction vehicle movements at the A120/ Harwich Road roundabout during the evening peak hour added to the baseline traffic flows (October 2022).

230. For the A120 west approach to the roundabout, the critical peak hour (the peak hour with the highest baseline traffic flows) is in the evening, and the traffic flow at this approach is much higher in the summer (1,217 in August 2019 as set out in **Table 3-3**, compared to 870 surveyed in October 2022, as set out in **Table 3-22**), when peak hour VE construction vehicle movements are less likely due to the availability of daylight hours.

231. For the A120 north approach to the roundabout, the critical peak hour is in the morning and whilst no data is available for the summer on this approach, given the August 2019 data on the A120 west, it is likely the traffic flows are also higher.

232. Given the above, the conservative assumptions in terms of workforce vehicles distribution **(Table 6-6**) and since the 20% of workforce vehicle movements during the peak hour is a robust estimate, it can be concluded that there would be no peak hour impact associated with VE construction vehicle movements at the A120/ Harwich Road roundabout.

Figure 6-4: Forecast Maximum Morning Peak Hour VE Construction Vehicle Movements at the A120/ Harwich Road Roundabout

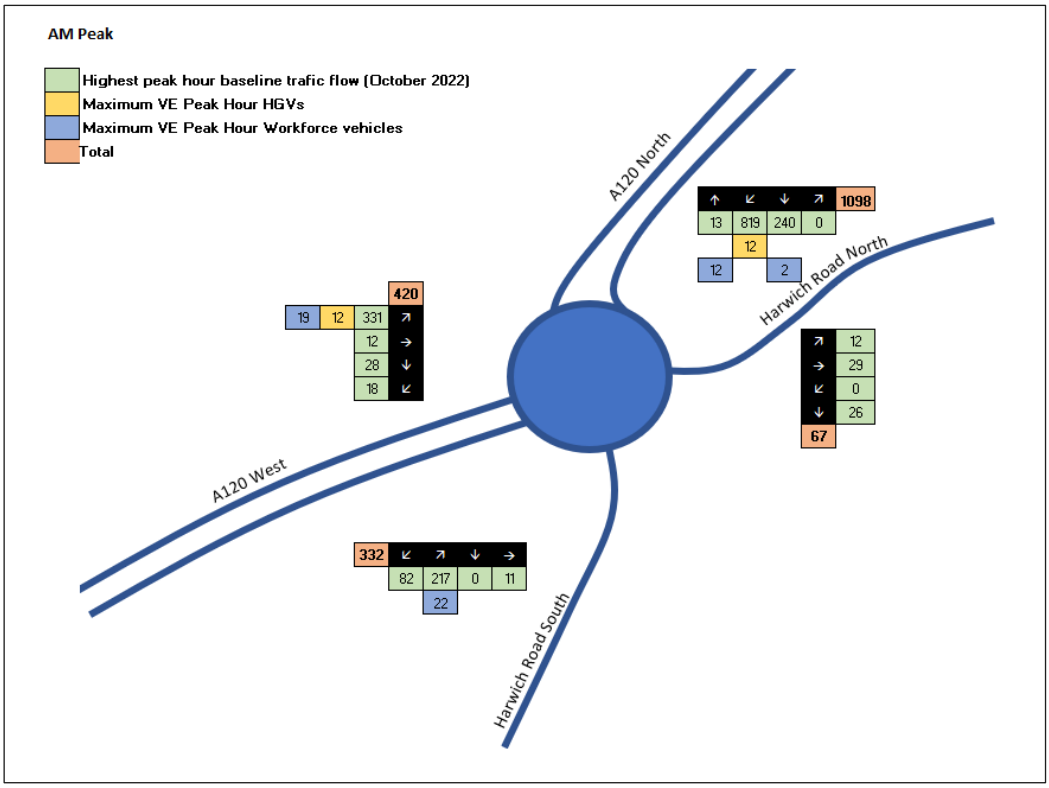
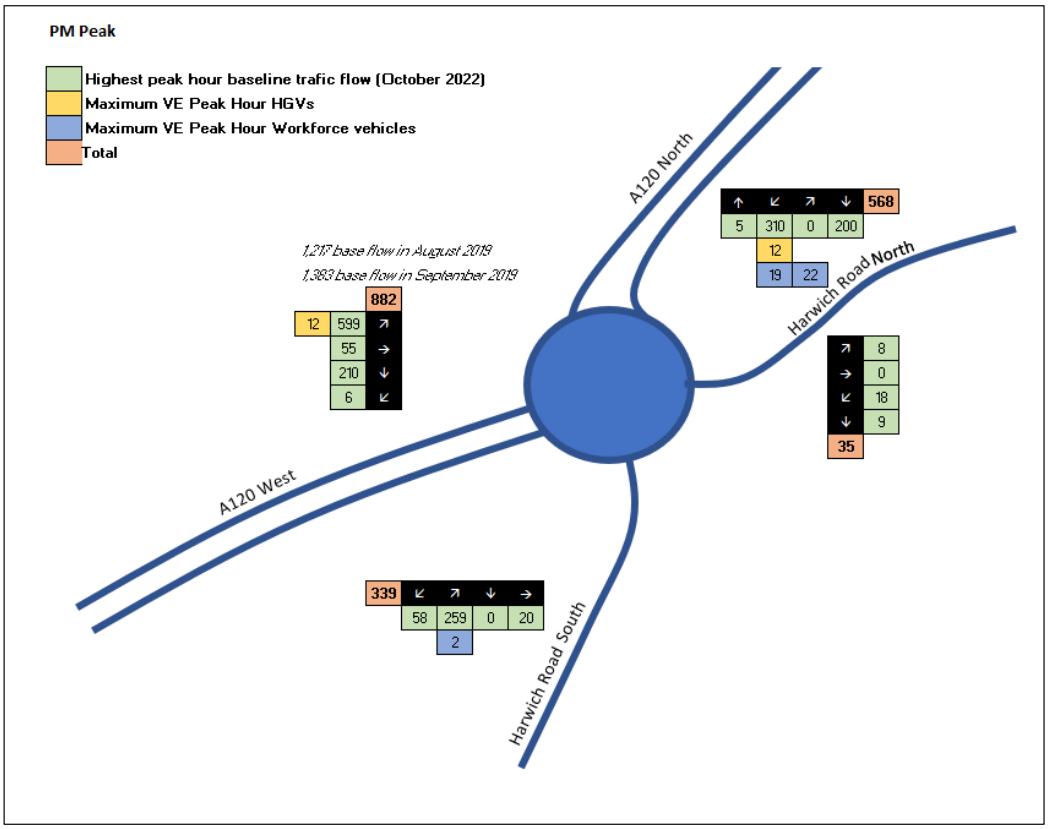


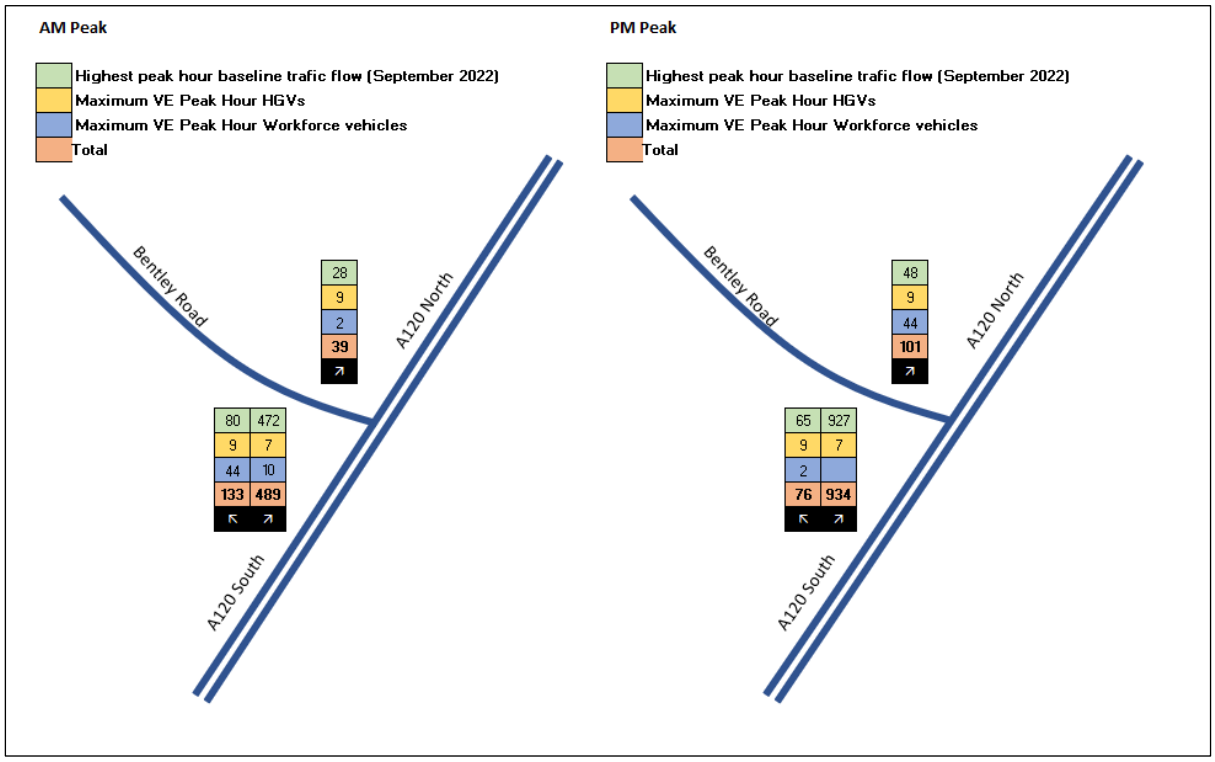
Figure 6-5: Forecast Maximum Evening Peak Hour VE Vehicle Movements at the A120/ Harwich Road Roundabout



6.3.4.3 A120/ Bentley Road

233. **Figure 6-6** shows the forecast maximum VE construction vehicle movements at the A120/ Bentley Road junction during the morning and evening peak hour added to the baseline traffic flows (September 2022)

Figure 6-6: Forecast Maximum Peak Hour VE Construction Vehicle Movements at the A120/ Bentley Road Junction



234. As the only potential queue at the A120/ Bentley Road junction would be on Bentley Road, there would be no capacity issues associated with the addition of VE construction vehicle movements on the SRN at this junction. Also, given the very low baseline vehicle movements in Bentley Road (fewer than 50 vehicles at the approach to the A120 and the maximum surveyed queue of 1 vehicle), the maximum 53 VE construction vehicles forecast on this approach in the evening peak hour is unlikely to have any material impact on Bentley Road.

6.3.4.4 A120/ B1035 (Horsley Cross) Roundabout

235. **Figure 6-7** shows the forecast maximum VE construction vehicle movements at the A120/ B1035 roundabout during the morning peak hour added to the baseline traffic flows (September 2022).

236. **Figure 6-8** shows the forecast maximum VE construction vehicle movements at the A120/ B1035 roundabout during the evening peak hour added to the baseline traffic flows (September 2022).

Figure 6-7: Forecast Maximum Morning Peak Hour VE Construction Vehicle Movements at the A120/ B1035 Roundabout

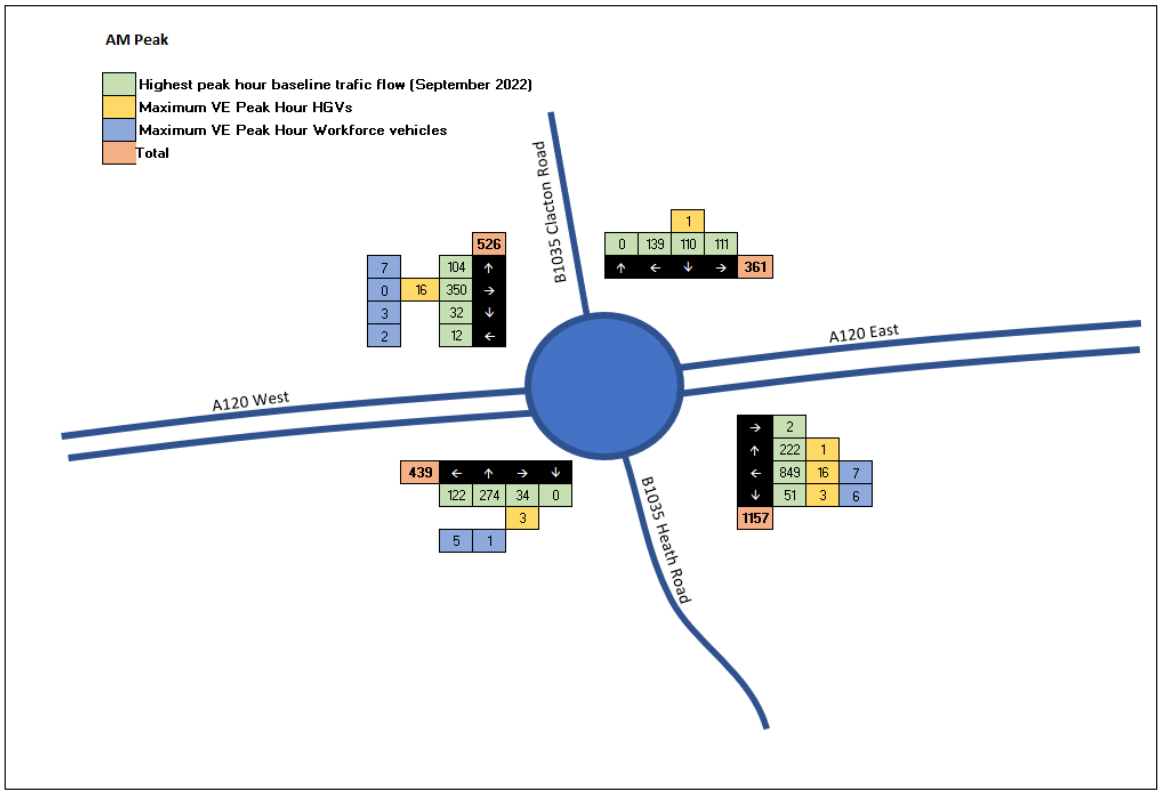
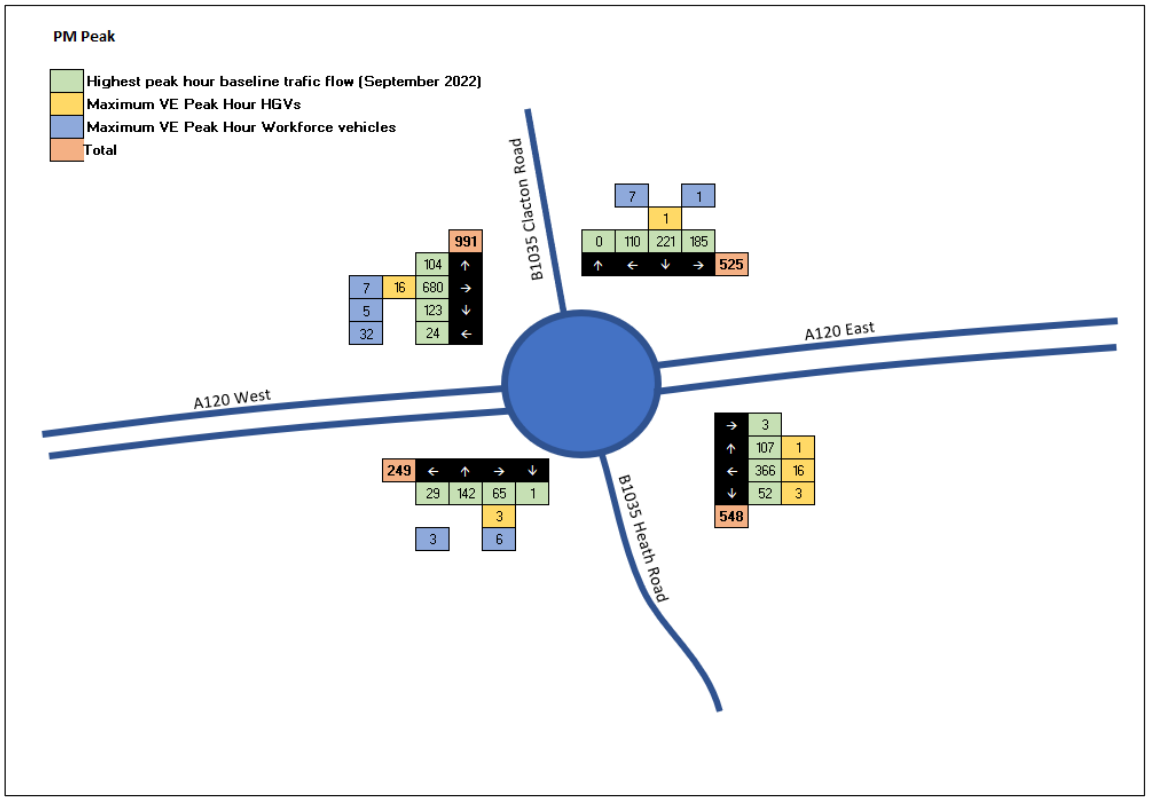


Figure 6-8: Forecast Maximum Evening Peak Hour VE Vehicle Movements at the A120/ B1035 Roundabout



237. For the A120 west approach to the roundabout, the critical peak hour is in the evening. Using the queue length data from the JTC surveys at this roundabout, the mean maximum queue length in the evening peak hour (16:30 to 17:30) only increases by one vehicle (from four to five) for the range of baseline vehicle movements on this approach between 856 and 972. Given the total vehicle movements on the approach to the roundabout including the maximum forecast peak hour VE construction vehicles is 991, there is unlikely to be any material impact in terms of additional queue length.

238. For the A120 east approach to the roundabout, the critical peak hour is in the morning Using the queue length data from the JTC surveys at this roundabout, the mean maximum queue length in the morning peak hour (07:15 to 08:15) increases by five vehicles (from six to 11) for the range of baseline vehicle movements on this approach between 960 and 1,124, which is around one additional vehicle per 32 vehicles added. Given the average forecast peak hour VE construction vehicles on this approach is 33, an estimate would be for the mean maximum queue to rise by one to 12, which would not be a material impact.

239. Given the above, the conservative assumptions in terms of workforce vehicles distribution **(Table 6-6**) and since the 20% of workforce vehicle movements during the peak hour is a robust estimate, it can be concluded that there would be no peak hour impact associated with VE construction vehicle movements at the A120/ B1035 roundabout.

6.3.4.5 Junctions on the A120 East of Horsley Cross Roundabout

240. **Table 6-9** shows the maximum VE construction vehicle movements on the A120 to the east of the B1035 Horsley Cross Roundabout in a peak hour to be 56, with the average of 42. However, as 100% of HGV arriving from and departing to the Port of Harwich is an unlikely scenario, the peak hour impact on this section of the SRN is likely to be much less. For example, even with 50% arriving from and departing to the Port of Harwich, which is still very robust, the maximum peak hour vehicle movements would be 36 and the average would be 26, which would be imperceptible in peak hour fluctuations on the A120.

6.3.4.6 A133/ A133 Main Road Roundabout

241. **Table 6-9** shows the maximum VE construction peak hour vehicle movements on the A133 between the A120 and the A133 Main Road Roundabout to be 31 and the average to be 24. 22 of the vehicle movements in the morning peak would be arriving at the junction from the A133 north. i.e. southbound. The data in **Table 3-4** shows the baseline morning peak hour flow on the southbound carriageway of the A133 to be significantly lower (over 500 vehicles) and therefore, providing a buffer for the addition of the maximum workforce vehicles and southbound HGVs during the morning peak hour. As the only other VE vehicle movements approaching from the A133 south are forecast to be 14, it is concluded that there would be no material impact at the A133/ A133 Main Road Roundabout in the morning peak.

242. Whilst data is unavailable for the baseline peak hour flows on the northbound carriageway on the A133 between the A133 Main Road Roundabout and the A120 it is likely that the evening peak hour (in which the majority of any northbound peak hour VE construction vehicle movements on this highway link would occur)., flow would be significantly lower than the morning peak hour, providing a buffer as per the southbound carriageway.

243. It is therefore concluded that there would be no material impact at the A133/ A133 Main Road Roundabout in the evening peak hour.

6.3.4.7 A133/ B1027 Roundabout

244. Using the data in **Table 3-27**, the number of two-way vehicle movements on the A133 at the B1027 roundabout would be 75 greater in August compared to a neutral month and therefore the impact at the junction with the additional 49 peak hour two-way vehicle movements associated with the construction of VE most likely in the winter months due to daylight availability, would be no worse than the vehicle movements already using the junction in August.

6.3.4.8 B1032 Frinton Road

245. Using the data in **Table 3-27**, the number of two-way vehicle movements on the B1032 Frinton Road would be 81 greater in August compared to a neutral month and therefore the impact at the junction with the additional 35 peak hour two-way vehicle movements associated with the construction of VE most likely in the winter months due to daylight availability, would be no worse than the vehicle movements already using this highway link in August.

6.3.4.9 B1032 Clacton Road

246. Using the data in **Table 3-27**, the number of two-way vehicle movements on the AB1032 Frinton Road would be 28 greater in August compared to a neutral month and therefore the impact at the junction with the additional 36 peak hour two-way vehicle movements associated with the construction of VE most likely in the winter months due to daylight availability, would only be eight vehicles movements more than the vehicle movements already using this highway link in August, which is negligible.

6.3.4.10 B1033 Colchester Road (west of the B1441)

247. Using the data in **Table 3-27**, the number of two-way vehicle movements on the B1032 Frinton Road would be 172 greater in August compared to a neutral month and therefore the impact at the junction with the additional 34 peak hour two-way vehicle movements associated with the construction of VE most likely in the winter months due to daylight availability, would be no worse than the vehicle movements already using this highway link in August.

6.3.4.11 Peak Hour Vehicle Movement Impact Summary

248. Given the robust assessment parameters (based on the maximum VE construction vehicle movements, which would be for a short period only, the 1.5 person car occupancy and the assumed proportion of workforce movements in the peak hours), SLR does not consider VE construction traffic would have a material impact at junctions on the LHN or SRN; and given the actual number of vehicle movements associated with the construction of VE would not be confirmed until a Principal Contractor(s) is identified, it is not considered necessary to undertake any junction capacity assessments to inform the DCO application.

2.8.3 Daily Trip Generation per Highway Link

249. The maximum (from Assessment A or B) daily two-way vehicular trip generation (total, HGV and workforce vehicles) on each highway link is shown in **Table 6-10** and in **Figure 6-9**: **, Figure 6-10**: and **Figure 6-11**: **.**

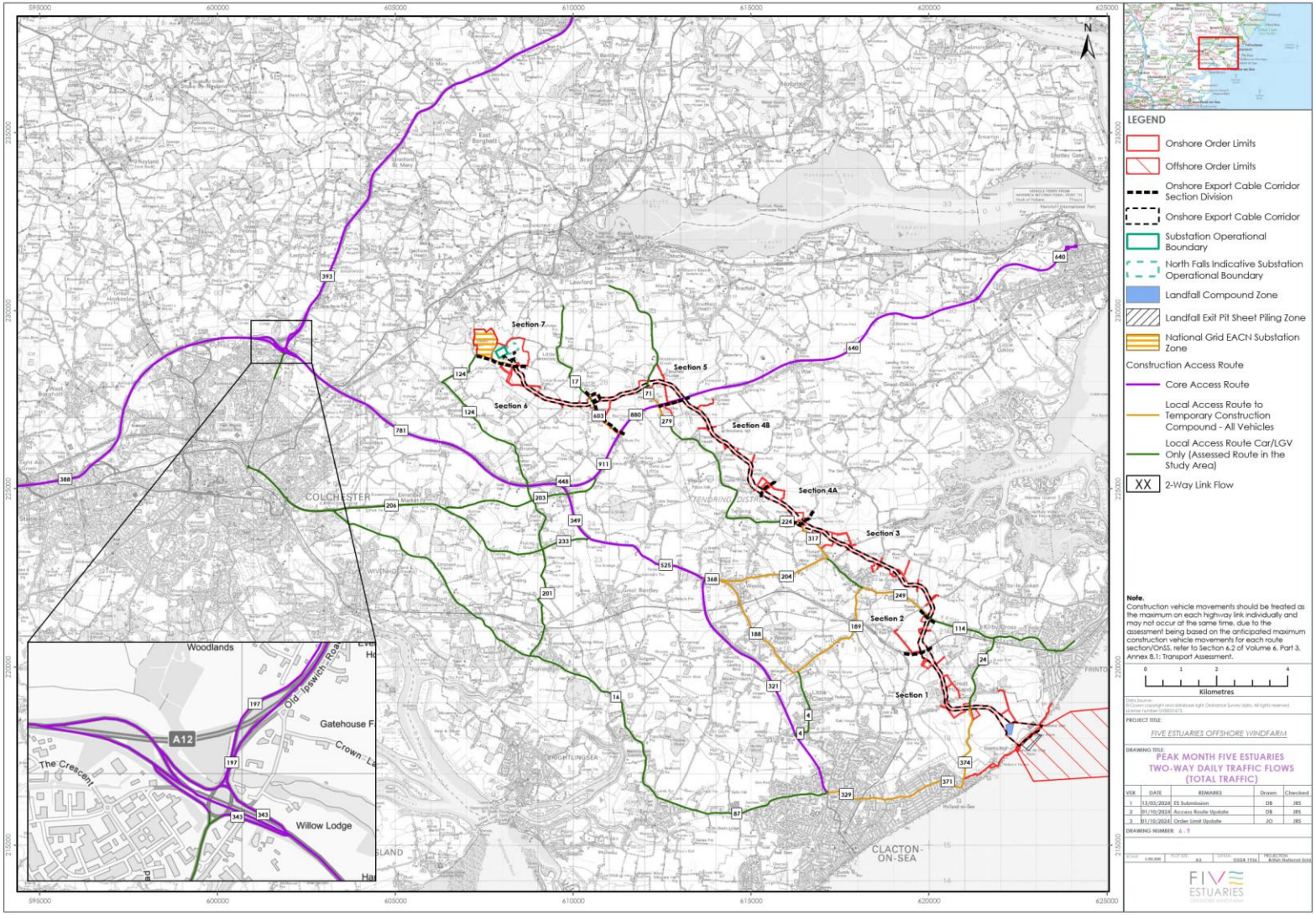


Figure 6-9: Maximum Daily VE Two-Way Vehicular Trip Generation (Total)

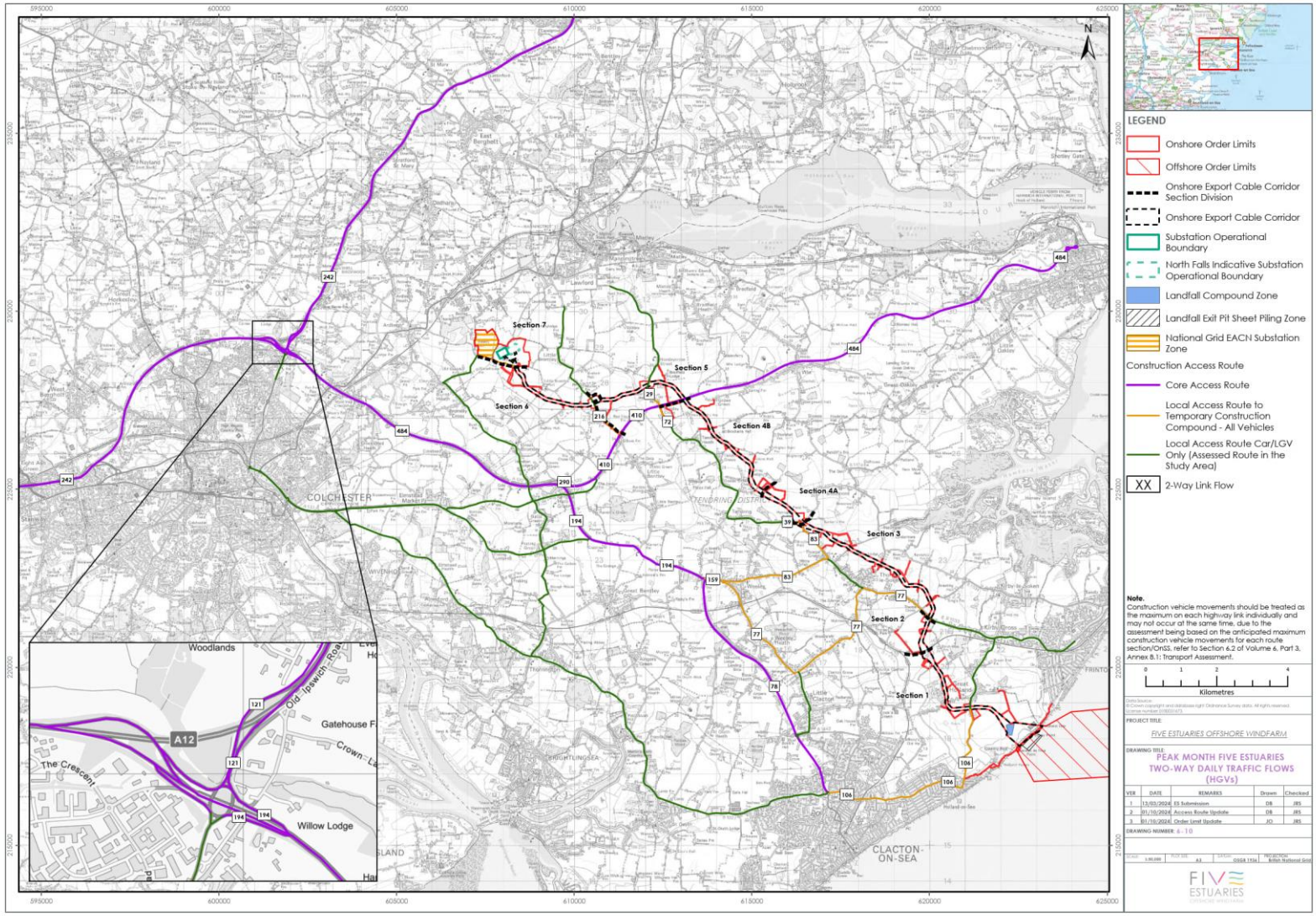


Figure 6-10: Maximum Daily VE Two-Way Vehicular Trip Generation (HGVs)

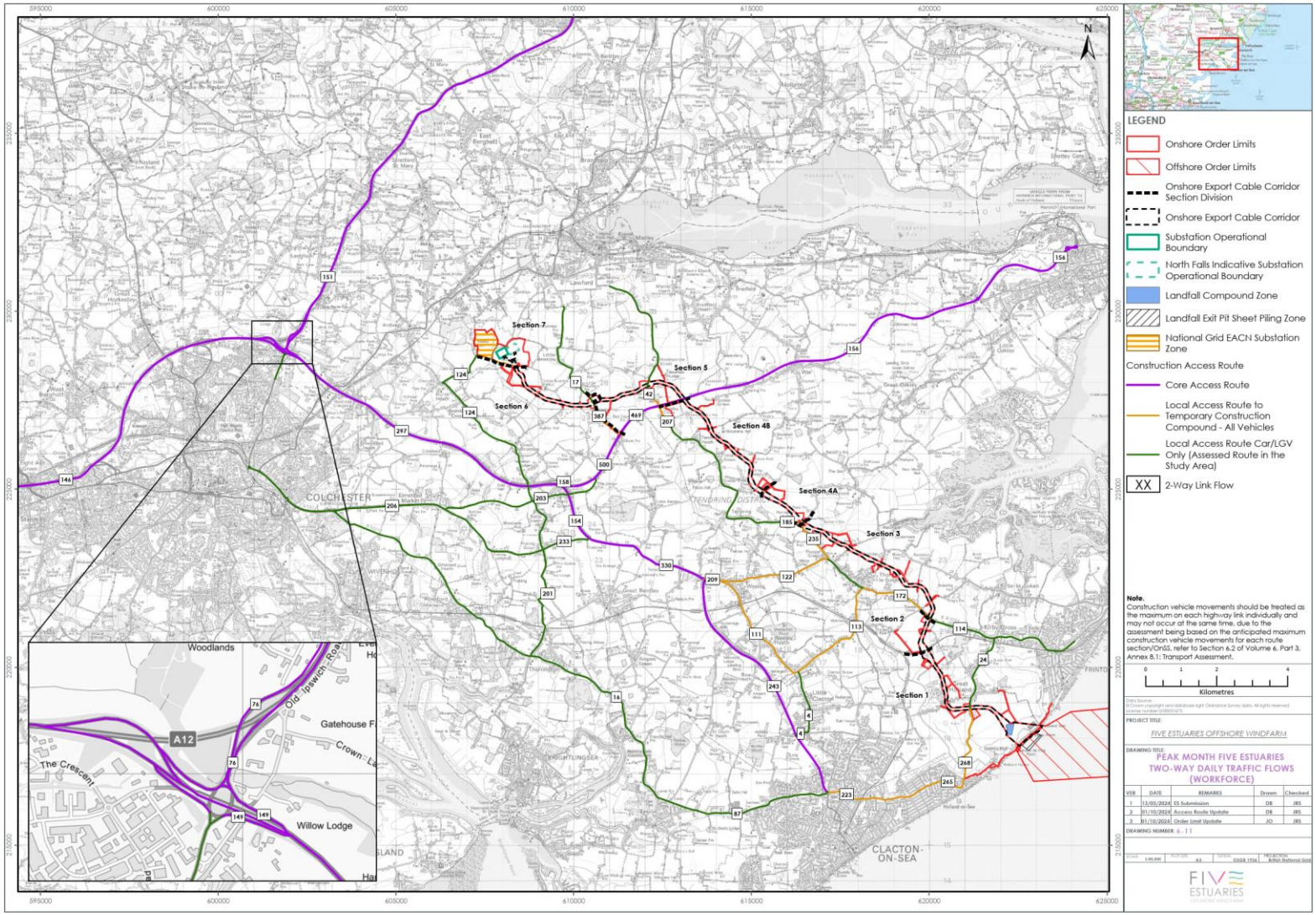


Figure 6-11: Maximum Daily VE Two-Way Vehicular Trip Generation (Workforce Vehicles)

Table 6-10: Maximum Two-Way Daily Vehicle Movements on Each Highway Link

Link ID[22]	Highway Link	Maximum Two-Way		
		Total Vehicles	HGVs	Workforce (Cars/LGVs)
1	A12 (N)	393	242	151
2	A12 (S)	388	242	146
6	A12 (N) off-slip at J29 Roundabout	196	121	76
7	A12 (N) on-slip at J29 Roundabout	196	121	76
8	A120 (E) off-slip at J29 Roundabout	270	194	76
9	A120 (E) on-slip at J29 Roundabout	270	194	76
10	A120 (A12 J29 to the A133)	781	484	297
11	A120 (A133 to Harwich Road)	448	290	158
12	A120 (Harwich Road to Bentley Road)	911	410	500
13	A120 (Bentley Road to the B1035)	880	410	469
14	A120 East of B1035	640	484	156
15	A120 at Harwich	640	484	156
16	A133 (A120 to the A133 Main Road)	349	194	154
17	A133 (A133 Main Road to the B1033)	525	194	330
18	A133 (B1033 to the B1027)	321	78	243
19	A133 Clacton Road (Elmstead Market)	206	0	206
20	A133 Main Road	233	0	233
21	B1027 St John's Road (west of Clacton)	87	0	87
22	B1027 Colchester Road (St Osyth Park)	16	0	16
23	B1027 Valley Road (Clacton)	329	106	223
24	B1032 Frinton Road	371	106	265
25	B1032 Clacton Road	374	106	268
26	B1033 Colchester Road (west of B1441)	368	159	209
27	B1441 Clacton Road	188	77	111
28	B1414 Harwich Road	189	77	113
29	B1033 Frinton Road	249	77	172
30	B1033 Colchester Road (east of B1441)	204	83	122
31	B1035 Tendring Road	317	83	235
32	B1035 Thorpe Road	224	39	185
33	B1035 south of A120	279	72	207

[22] No VE construction vehicle movements anticipated on highway links 3 and 4. Highway Links 36 to 43 are workforce access routes only, where no baseline traffic data has been collected.

Link ID[22]	Highway Link	Maximum Two-Way		
		Total Vehicles	HGVs	Workforce (Cars/LGVs)
34	B1035 Clacton Road	71	29	42
35	Bentley Road	603	216	387
36	Bentley Road (north of Onshore ECC)	96	0	96
37	B1035 Clacton Road (north of Onshore ECC)	0	0	0
38	B1441 via Little Clacton	4	0	4
39	Progress Way	4	0	4
40	B1029 Harwich Road	201	0	201
41	Harwich Road	203	0	203
42	B1032 Kirby Cross	24	0	24
43	B1033 Thorpe Road	114	0	114
44	B1029 (north of Harwich Road)	158	0	158
45	Waterhouse Lane	158	0	158
	Little Bromley Road/ Ardleigh Road	200	42	158

250. The average across the construction programme daily two-way vehicular trip generation (total, HGV and workforce vehicles) on each highway link is shown in **Table 6-11.**

Table 6-11: Average Two-Way Daily Vehicle Movements on Each Highway Link

Link ID[23]	Highway Link	Average Two-Way		
		Total Vehicles	HGVs	Workforce (Cars/LGVs)
1	A12 (N)	282	187	95
2	A12 (S)	278	187	91
6	A12 (N) off-slip at J29 Roundabout	94	47	47
7	A12 (N) on-slip at J29 Roundabout	94	47	47
8	A120 (E) off-slip at J29 Roundabout	138	88	47
9	A120 (E) on-slip at J29 Roundabout	138	88	47
10	A120 (A12 J29 to the A133)	560	374	186
11	A120 (A133 to Harwich Road)	333	198	135
12	A120 (Harwich Road to Bentley Road)	622	308	314
13	A120 (Bentley Road to the B1035)	603	308	295
14	A120 East of B1035	472	374	98

[23] Highway Links 36 to 43 are workforce access routes only, where no baseline traffic data has been collected.

Link ID[23]	Highway Link	Average Two-Way		
		Total Vehicles	HGVs	Workforce (Cars/LGVs)
15	A120 at Harwich	472	374	98
16	A133 (A120 to the A133 Main Road)	269	176	93
17	A133 (A133 Main Road to the B1033)	372	176	196
18	A133 (B1033 to the B1027)	215	76	139
19	A133 Clacton Road (Elmstead Market)	123	0	123
20	A133 Main Road	116	0	116
21	B1027 St John's Road (west of Clacton)	45	0	45
22	B1027 Colchester Road (St Osyth Park)	7	0	7
23	B1027 Valley Road (Clacton)	176	76	100
24	B1032 Frinton Road	197	76	121
25	B1032 Clacton Road	196	76	120
26	B1033 Colchester Road (west of B1441)	219	100	119
27	B1441 Clacton Road	110	51	60
28	B1414 Harwich Road	111	51	60
29	B1033 Frinton Road	144	51	94
30	B1033 Colchester Road (east of B1441)	123	49	74
31	B1035 Tendring Road	186	49	137
32	B1035 Thorpe Road	128	20	108
33	B1035 south of A120	175	48	127
34	B1035 Clacton Road	42	19	24
35	Bentley Road	368	132	236
36	Bentley Road (north of Onshore ECC)	96	0	96
37	B1035 Clacton Road (north of Onshore ECC)	1	0	1
38	B1441 via Little Clacton	2	0	2
39	Progress Way	2	0	2
40	B1029 Harwich Road	104	0	104
41	Harwich Road	108	0	108
42	B1032 Kirby Cross	11	0	11
43	B1033 Thorpe Road	60	0	60
44	B1029 (north of Harwich Road)	124	0	124
45	Waterhouse Lane	124	0	124
	Little Bromley Road/ Ardleigh Road	185	27	158

7.0 Highway Mitigation Proposals

251. This section describes the highway mitigation works that have been identified to facilitate the forecast vehicular trip generation associated with the construction of VE as set out in **Section 6.0.** The highway mitigation is also required to facilitate the construction of NF OWF and EACN, with some variations in scope.

7.1 Approach

252. A review of the construction access routes has been undertaken by SLR to identify any pinch points where improvements might be required to accommodate VE construction vehicles. The conclusion of this review identified the A120/ Bentley Road junction to be restricted and would require widening to allow two HGVs to pass each other safely, without causing any safety issues or blocking onto the A120 and likely further widening along Bentley Road where sections of carriageway would also be restrictive for two HGVs to pass safely.

253. In parallel to the review of potential mitigation required (in collaboration with RHDHV for NF OWF), Mott MacDonald investigated access requirements associated with the construction of the VE and NF OWF OnSS and prepared a strategy for the highway improvements at the A120/ Bentley Road junction and along Bentley Road, which is set out in:

- Co-Located Substation Early Design: A120 - Bentley Road Junction Road Improvements Technical Note (December 2023) provided at **Appendix W.**

7.2 Highway Improvement Proposals

254. Based on the access strategy, which has also been discussed with NGET, the following package of embeddF4-4``ed mitigation measures have been developed, which have been discussed with Essex County Council and NH (for the proposals affecting the A120):

- A120/ Bentley Road junction improvement – widening of the carriageway and the acceleration taper for merging vehicles onto the A120 (required for VE, NF OWF and EACN – see **Appendix X**);
- Widening of Bentley Road to between 6.0 and 6.75m between the A120 and the VE construction accesses on Bentley Road (the scope would vary for VE, NF OWF and EACN – see the drawings in **Appendix X**; and
- Provision of a temporary 40mph speed limit along Bentley Road from the junction with the A120;

255. The Order Limits will also include land to construct a segregated Non-Motorised User (NMU) path along Bentley Road (in the scenario when all three projects are constructed simultaneously.

256. The above proposals are described further in **Sections 7.2.1** to **7.2.4**

7.2.1 A120/ Bentley Road Junction Improvement

257. As shown in **Appendix X**, the following would be implemented at the A120/ Bentley Road junction:

- The carriageway widened to 6.5m;

- An increase to the length of the acceleration taper to 90m for merging vehicles onto the A120;
- The existing section of the pedestrian/cycle facility to the west of the A120 will be upgraded and continued along Bentley Rd; and
- New vertical signage and road markings

258. A Stage 1 RSA will be undertaken of the proposals. The audit brief has been submitted to NH for approval

7.2.2 Bentley Road Widening

259. As shown in the drawings in **Appendix X,** the carriageway would be widened to a minimum of 6.0 m in four sections.

260. As there are a number of options for the widening works, a Stage 1 RSA has not been undertaken and would be undertaken as part of the detailed design process, should the DCO be approved.

7.2.3 Temporary Speed Limit Reduction

261. The proposal is to implement a temporary speed limit reduction from national speed limit (60 mph) to 40 mph on the section of Bentley Road that would be used by construction vehicles during the construction periods of VE, NF OWF and EACN. This is proposed to maintain highway safety in combination with the widening works described in **Section 7.2.2**, given the increase in the number of HGVs and also to minimize the impacts of traffic noise associated in the cumulative scenario with VE, NF OWF and EACN projects being constructed simultaneously.

7.2.4 Segregated NMU Path

262. The option to construct a segregated NMU path along Bentley Road (in the scenario when all three projects are constructed simultaneously) has been discussed with Essex County Council; who suggested that it is unlikely that this would be adopted by Essex County Council due to the rural nature of Bentley Road and could be required to be removed at the end of the construction periods.

263. As there are a number of options for the NMU path, a Stage 1 RSA has not been undertaken and would be undertaken as part of the detailed design process, should the DCO be approved.

7.3 Summary

264. With the application of the above embedded measures (noting the NMU path may not be required, based on future surveys of the use of Bentley Road by pedestrians, cyclists and horse-riders and through discussions with Essex County Council), the impact of the construction vehicle movements associated with VE, NF OWF and EACN can be mitigated.

265. Notwithstanding this, it is acknowledged that, given the current vehicle movements on Bentley Road (particularly the very low number of HGVs), the changes in traffic movements will be discernible for the residents of the properties along this section of Bentley Road and consequently the DCO Application is supported by Volume 6, Report 24: Outline CTMP and Volume 6, Report 26: Outline WTP, that will include measures to further reduce peak in construction vehicle movements, such as:

- Coordination between projects to reduce the maximum daily construction vehicle movements, wherever practicable; and
- Where appropriate use of satellite car parks (either at TCCs) or similar offsite parking facilities) that do not require using Bentley Road and a shuttle bus service for the construction workforce.

266. The Principal Contractor will therefore be required to implement additional measures as part of the CTMP and WTP to reduce the forecast numbers of peak construction traffic movements along Bentley Road.

8.0 Special Order Abnormal Indivisible Load (AIL) Deliveries

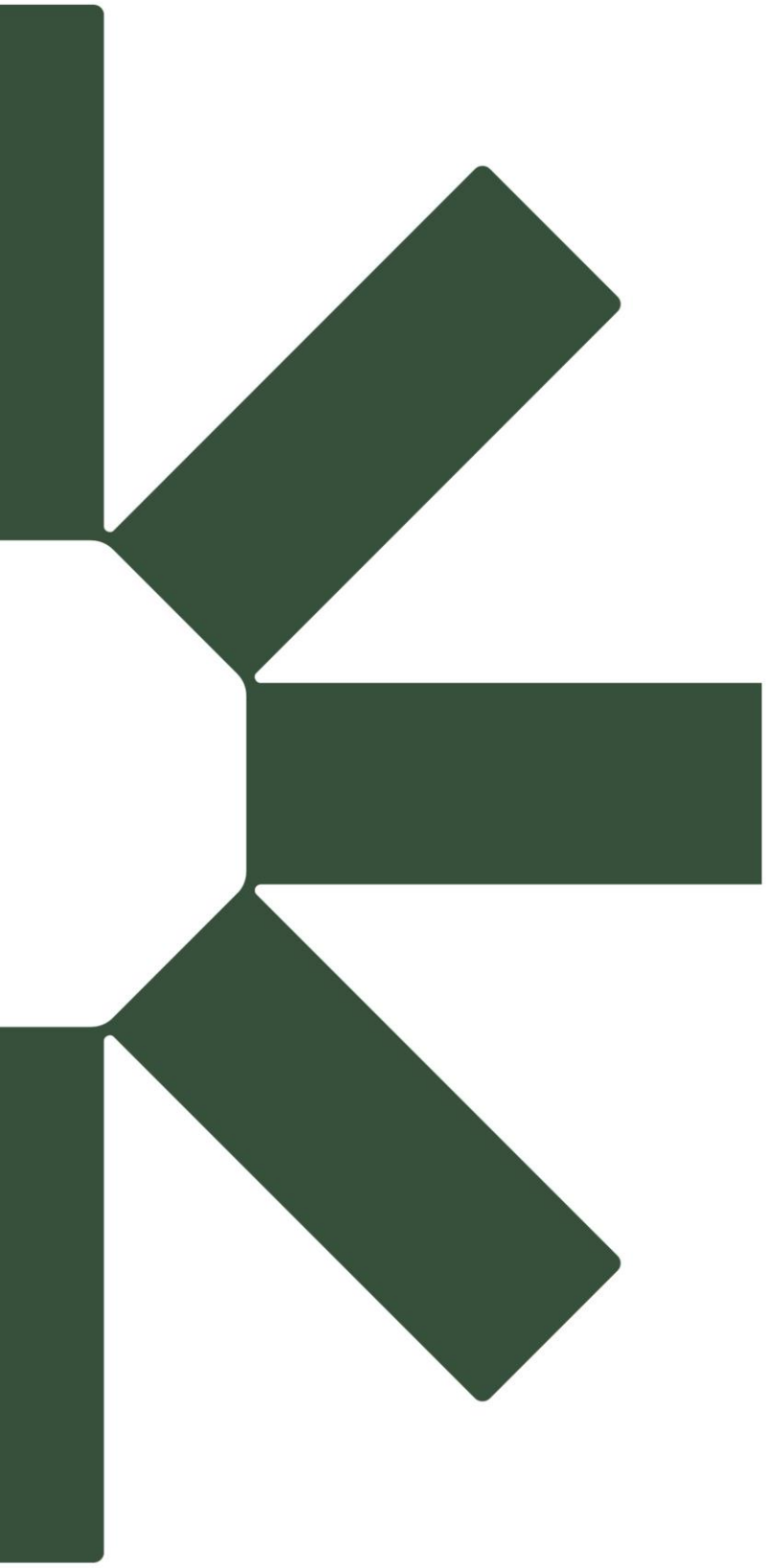
267. This Section provides details of the AIL delivery (the transformers and shunt reactors for the OnSS) between the anticipated delivery Port (Harwich) and the proposed OnSS location.

268. Mott Macdonald has undertaken an assessment of the anticipated vehicle type that would be used to transport the AIL at the A120/ Bentley Road junction, which is provided in **Appendix Y.**

269. To facilitate the turn into Bentley Rod, it is proposed to use the eastbound carriageway of the A120 with a contraflow for a section of around 200m.

270. Whilst the above proposal has been agreed in principle by NH, additional options may be considered during the detailed design stage, should the DCO be approved

271. Details of the traffic management measures that could be implemented to facilitate the delivery of the AILs are set out in Volume 9, Document 24: Outline CTMP.



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