

FIVE ESTUARIES OFFSHORE WIND FARM

PRELIMINARY ENVIRONMENTAL INFORMATION REPORT

VOLUME 5, ANNEX 8.2: TRAFFIC AND TRANSPORT TRIP GENERATION AND DISTRIBUTION

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FIVE ESTUARIES OFFSHORE WIND FARM

Volume 5, Annex 8.2 Trip Generation and Distribution

Prepared for: Five Estuaries Wind Farm Ltd



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Definition of Acronyms

| Acronym | Definition |
|----------|--|
| AADT | Annual Average Daily Traffic |
| ATC | Automatic Traffic Count |
| СТМР | Construction Traffic Management Plan |
| DCO | Development Consent Order |
| DfT | Department for Transport |
| ECC | Export Cable Corridor |
| EIA | Environmental Impact Assessment |
| EACN | East Anglia Connection Node |
| ES | Environmental Statement |
| ETG | Expert Topic Group |
| HDD | Horizontal Directional Drilling |
| HGV | Heavy Goods Vehicle |
| JTC | Junction Turning Count |
| LRN | Local Road 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 |
| SCL | Sunshine Coast Line |
| SRN | Strategic Road Network |
| SSA East | Substation Search Area East |
| SSA West | Substation Search Area West |
| тсс | Temporary Construction Compounds |
| VE | Five Estuaries Offshore Wind Farm |
| WTG | Wind Turbine Generators |

1.0 Introduction

1. This report is a technical annex (Volume 5, Annex 8.2) of Volume 3, Chapter 8: Traffic and Transport, of the Preliminary Environmental Information Report (PEIR).

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- 2. The report sets out the trip generation and distribution (parameters and results) associated with the Maximum Design Scenario (MDS) used for the assessment of the likely significant effects associated with the onshore elements of the Five Estuaries Offshore Wind Farm (VE) on traffic and transport.
- 3. 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.

2.0 Source of Data

- 4. The project design consultant has derived the trip generation forecasts for the construction phase of VE across the anticipated 18 month construction programme (see Figure 2 of Volume 3, Chapter 1: Onshore Project Description based on the forecast construction traffic and routeing associated with the Onshore Substation (OnSS) options (SSA East and SSA West)
- 5. The onshore ECC includes some optionality in routeing and crossing technology; however, this optionality does not alter trip generation forecasts or vehicle routeing.
- 6. The data and details of how the construction traffic forecasts have been calculated is provided in Appendix 01 and includes a breakdown of the anticipated daily number of two-way movements (arrivals and departures), employee and Heavy Goods Vehicle (HGV) movements per month, for the Route Sections that comprise the onshore ECC as set out in **Table 2-1**.

Table 2-1 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 4 | B1035 Tendring Road | A120 | | |
| Section 5 | A120 | VE Substation | | |
| 400kV Route | VE OnSS | National Grid Electricity Transmission (NGET) Substation | | |
| Unlicensed Works at NGET Substation | NGET Substation | NGET Substation | | |

7. The data provided in **Appendix 01** does not include the anticipated vehicular trip generation associated with the construction of the OnSS, which is considered separately and is provided at **Appendix 02**

3.0 Maximum Design Scenario (MDS)

3.1 Approach

- 8. The approach taken to derive the Maximum Design Scenario (MDS) is to establish the peak forecast vehicle movements to and from each ECC Route Section/ OnSS across the anticipated 18 month construction programme, based on HGVs and workforce vehicle movements independently, which would result in a robust assessment of vehicular impact on the Local Road Network (LRN) and Strategic Road Network (SRN).
- 9. **Table 3-1** below sets out a summary of the maximum two-way HGV daily trip generation for each of the ECC Route Sections and OnSS and the corresponding month. It also shows the difference between the number of HGVs in the month for the total across all Route Sections.

Table 3-1 Maximum HGV Trip Generation per ECC Route Section

| ECC Route Section | Maximum daily HGVs (2-way) | Month | Peak Month 18 (overall) Maximum daily HGVs (2-way) | Difference |
|----------------------|-------------------------------|---------|---|------------|
| Landfall/ 1 | 90 | 8 | 77 | 13 |
| 2 | 62 | 16 | 0 | 62 |
| 3 | 107 | 18 | 107 | 0 |
| 4 | 106 | 18 | 106 | 0 |
| 5 | 106 | 18 | 106 | 0 |
| Substation | 75 | All | 75 | 0 |
| Total | 546 | Various | 471 | 75 |

- 10. As **Table 3-1** shows, the assessment based on the maximum HGVs to each ECC Route Section is 75 two-way HGV movements greater than the total based on the peak month overall.
- 11. The same exercise has been undertaken for the anticipated workforce, as set out in **Table 3-1**.

Table 3-2 Maximum Number of Employees per ECC Route Section

| ECC Route Section | Maximum daily employees (2-way) | Month of VE construction programme | Overall peak month of construction programme (Month 7) Maximum daily employees (2-way) | Difference |
|----------------------|---------------------------------|------------------------------------|---|------------|
| Landfall/ 1 | 174 | 9 | 157 | 17 |
| 2 | 97 | 13 | 73 | 24 |
| 3 | 181 | 6/7 | 181 | 0 |
| 4 | 159 | 9 | 139 | 20 |
| 5 | 159 | 9 | 152 | 7 |
| Substation | 35 | All | 35 | 0 |
| Total | 805 | All | 737 | 68 |

- 12. As **Table 3-1** shows, the assessment based on the maximum number of employees to each ECC Route Section is 68 two-way employees movements greater than the total based on the peak month overall.
- 13. Given the above, the assessment of construction traffic for VE has been undertaken based on a set of robust forecasts.

3.2 Trip Generation and Distribution

3.2.1 Trip Generation Parameters

- 14. 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.
- 15. The key trip generation parameters are:
 - Core working hours 07:00 to 19:00, (some activities, such as HDD 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; and
 - 20% arriving between 07:00 and 09:00 and leaving between 16:15 and 18:15 (the peak hour period identified on the highway network
 - Core HGV deliveries 07:00 to 19:00;
 - The two-way HGV movements assumes 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 is not known and is not specifically assessed as part of Volume 3, Chapter 8. The VE construction traffic data that has been provided to inform Volume 3, Chapter 3.10: Noise and Vibration, for the assessment of receptors along the haul roads, it has assumed, as a worst case, that all HGVs arriving at a construction access would also travel along the haul roads once within the site;
 - 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 share travel costs; and
 - The two-way employee movements assumes a vehicle arriving at a construction access and TCC in the morning and leaving in the evening, as per the assumptions above.

3.2.2 Daily Trip Generation

16. The maximum daily trip generation for HGVs and employee vehicle movements based on **Table 3-1** and **Table 3-2** is summarised in **Table 3-3**, which also shows the minimum and average vehicle movements as a comparison.

Table 3-3 Daily trip generation summary

| ECC Route | Т | otal vehic | cles | HGVs Emplo | | | Employee | | |
|-------------|-----|------------|------|------------|-----|---------|----------|-----|---------|
| Section | Min | Max | AM | PM | Max | Average | Min | Max | Average |
| Landfall/ 1 | 52 | 206 | 145 | 17 | 90 | 65 | 35 | 116 | 80 |
| 2 | 0 | 127 | 68 | 0 | 62 | 25 | 0 | 65 | 44 |
| 3 | 48 | 228 | 139 | 14 | 107 | 66 | 34 | 121 | 73 |
| 4 | 50 | 212 | 131 | 16 | 106 | 63 | 34 | 106 | 68 |
| 5 | 53 | 212 | 140 | 19 | 106 | 68 | 34 | 106 | 72 |
| Substation | 105 | 105 | 105 | 75 | 75 | 75 | 30 | 30 | 30 |

3.2.3 Peak Hour Trip Generation

17. The forecast vehicular traffic associated with VE during the morning and evening peak hours on the highway network is summarised in **Table 3-4** based on the assumptions set out in **Section 3.2.1**.

Table 3-4 Peak hour trip generation summary (AM or PM peak)

| ECC Route | Total v | ehicles | HG | iVs | Employee | e vehicles |
|-------------|---------|---------|----|-----|----------|------------|
| Section | AM | PM | AM | PM | AM | PM |
| Landfall/ 1 | 20 | 20 | 12 | 12 | 8 | 8 |
| 2 | 17 | 17 | 12 | 12 | 5 | 5 |
| 3 | 21 | 21 | 12 | 12 | 9 | 9 |
| 4 | 21 | 21 | 12 | 12 | 9 | 9 |
| 5 | 21 | 21 | 12 | 12 | 9 | 9 |
| Substation | 9 | 9 | 3 | 3 | 6 | 6 |

3.2.4 Traffic Distribution Parameters

- 18. In terms of the traffic distribution parameters, all HGV traffic associated with the construction phase of VE is assumed to arrive from and depart to the Junction 29 of the A12 (with the exception of Abnormal Indivisible Loads (AILs), which are assumed might arrive from the Port of Harwich via the A120 east.
- 19. For the purposes of the assessment HGVs and construction employee vehicles will use the same routes to ensure a robust assessment along these highway links and junctions. However, in reality, depending on the proportion of local employees and the availability of local accommodation for workers who do not live in the local area, the distribution of construction worker vehicles is likely to be spread across the wider network, reducing the level of likely impact across the LRN and SRN.
- 20. Three assessment scenarios have been considered to take account of the maximum likely impact on all highway links in the study area, for the OnSS options.
- 21. The assessment scenarios are:

- Scenario 1: SSA East/ ECC Route Section 5 via B1035 Clacton Road;
- Scenario 2: SSA East or SSA West/ ECC Route Section 5 via Bentley Road; and
- Scenario 3: SSA West via Waterhouse Lane and the B1209

Table 3-5 Trip Distribution Scenarios

| TCC | ECC route section | Access route | Distribution (% |) | |
|---------------|-------------------|--|-----------------|------------|------------|
| | | | Scenario 1 | Scenario 2 | Scenario 3 |
| 1,2 and 3 | 1 | A12, A120, A133, B1027 Valley Road/ Frinton Road, B1032 Clacton Road | 100 | 100 | 100 |
| 4 | 2 | A12, A120, A133, B1033, B1441 Weeley Road/ Clacton Road, B1414 Harwich Road/ Station Road, B1033 Frinton Road/ Thorpe Road | 100 | 100 | 100 |
| 5 | 3 | A12, A120, A133, B1033, B1441 Weeley Road/ Clacton Road, B1414 Harwich Road/ Station Road, B1033 Frinton Road/ Thorpe Road, B1034 Sneating Hall Lane | 50 | 50 | 50 |
| 6 | 3 | A12, A120, A133, B1033 Colchester Road, B1035 Tendring Road | 50 | 50 | 50 |
| 7 | 4 | A12, A120, A133, B1033 Colchester Road, B1035 Tendring Road, B1035 Thorpe Road | 50 | 50 | 50 |
| 8 | 4 | A12, A120, B1035 | 50 | 50 | 50 |
| 9a, 9b and 9c | 5 | A12, A120, B1035 | 100 | 0 | 0 |

| TCC | ECC route section | Access route | Distribution (%) | | |
|------------------|-------------------|---|------------------|------------|------------|
| | | | Scenario 1 | Scenario 2 | Scenario 3 |
| | SSA East | Clacton Road | 100 | 0 | 0 |
| 10a, 10b and 10c | 5 | A12, A120, Bentley | 100 | 100 | 100 |
| | SSA East | Road | 0 | 100 | 0 |
| | SSA West | | 100 | 100 | 0 |
| n/a | SSA West | A12, A120, Harwich Road, B1029, Waterhouse Lane | 0 | 0 | 100 |

22. It should be noted that the assessment of maximum traffic flow impacts as a result of VE results in some links shown with no traffic flows assigned; however, this is unlikely to be the case in reality. ie. Scenario 1 tests the maximum on the B1035 Clacton Road, with none assigned to the B1035 Clacton Road in Scenario 2, which tests the maximum traffic flows on Bentley Road.

3.2.5 Daily Trip Generation per Highway Link

- 23. The maximum daily two-way vehicular trip generation (total, LGV and HGV) on each highway link based on assessment scenarios 1 to 3 is shown in **Table 3-6** to Error! Reference source not found.
- **24. Table** 3-8 and in **Appendix 03, 04 and 05.**

Table 3-6 Maximum Two-Way Daily Vehicle Movements on Each Highway Link (Scenario 1)

| Reference | Highway Link | Maximum two-way | | | | | | |
|-----------|--|-----------------|-----|-------|--|--|--|--|
| | | HGV | LGV | Total | | | | |
| 1 | A12 north of A120 | 272 | 305 | 577 | | | | |
| 2 | A12 south of A120 | 272 | 305 | 577 | | | | |
| 3 | A120 between A12 and A133 | 546 | 610 | 1,156 | | | | |
| 4 | A120 between the A133 and Harwich Road | 234 | 204 | 438 | | | | |
| 5 | A120 between Harwich Road and Bentley Road | 234 | 204 | 438 | | | | |
| 6 | A120 between Bentley Road and B1035 | 234 | 174 | 408 | | | | |
| 8/9 | A133 between B1033 and B1027 | 90 | 116 | 206 | | | | |
| 10/ 42 | B1027 Valley Road | 90 | 116 | 206 | | | | |
| 11 | B1032 Clacton Road | 90 | 116 | 206 | | | | |
| 12 | B1033 Colchester Road (west of B1441) | 222 | 290 | 512 | | | | |
| 13 | B1441 Clacton Road | 116 | 174 | 290 | | | | |
| 14 | B1414 Harwich Road | 116 | 174 | 290 | | | | |
| 15 | B1033 Frinton Road | 116 | 174 | 290 | | | | |
| 16 | B1033 Colchester Road (east of B1441) | 107 | 116 | 223 | | | | |

| Reference | Highway Link | Maximum two-way | | | | | | | |
|-----------|----------------------------|-----------------|-----|-------|--|--|--|--|--|
| | | HGV | LGV | Total | | | | | |
| 17 | B1035 Tendring Road | 107 | 116 | 223 | | | | | |
| 18 | B1035 Thorpe Road | 53 | 58 | 111 | | | | | |
| 19 | B1035 (south of A120) | 53 | 58 | 111 | | | | | |
| 20 | B1035 Clacton Road | 181 | 146 | 327 | | | | | |
| 21 | Bentley Road | 0 | 0 | 0 | | | | | |
| 22 | B1027 Frinton Road | 90 | 116 | 206 | | | | | |
| 43 | A133 between A120 and B133 | 312 | 406 | 718 | | | | | |

Table 3-7 Maximum Two-Way Daily Vehicle Movements on Each Highway Link (Scenario 2)

| Reference | Highway Link (different to Scenario 1) | Maximum two-way | | | | | | |
|-----------|--|-----------------|-----|-------|--|--|--|--|
| | | HGV | LGV | Total | | | | |
| 20 | B1035 Clacton Road | 0 | 0 | 0 | | | | |
| 21 | Bentley Road | 181 | 146 | 327 | | | | |

Table 3-8 Maximum Two-Way Daily Vehicle Movements on Each Highway Link (Scenario 3)

| Reference | Highway Link (different to Scenario 1) | Maximum two-way | | | | | | |
|-----------|--|-----------------|-----|-------|--|--|--|--|
| | | HGV | LGV | Total | | | | |
| 20 | B1035 Clacton Road | 0 | 0 | 0 | | | | |
| 21 | Bentley Road | 106 | 116 | 222 | | | | |
| 37 | Waterhouse Lane | 75 | 30 | 105 | | | | |
| 38 | B1029 | 75 | 30 | 105 | | | | |

3.2.6 Trip Generation per Highway Link (Peak Hours)

25. The maximum daily two-way vehicular trip generation (total, LGV and HGV) in the morning or evening peak hours on each highway link based on assessment scenarios 1 to 3) is shown in **Table 3-9** to **Table 3-11** and in **Appendix 06, 07 and 08.**

Table 3-9 Maximum Two-Way Peak Hour Vehicle Movements on Each Highway Link (Scenario 1)

| Reference | Highway Link | Maximum two-way HGV LGV Total 23 31 54 | | |
|-----------|-------------------|--|-----|-------|
| | | HGV | LGV | Total |
| 1 | A12 north of A120 | 23 | 31 | 54 |

| Reference | Highway Link | Maximum two-way | | | | | | |
|-----------|--|-----------------|-----|-------|--|--|--|--|
| | | HGV | LGV | Total | | | | |
| 2 | A12 south of A120 | 23 | 31 | 54 | | | | |
| 3 | A120 between A12 and A133 | 45 | 61 | 106 | | | | |
| 4 | A120 between the A133 and Harwich Road | 19 | 20 | 39 | | | | |
| 5 | A120 between Harwich Road and Bentley Road | 19 | 20 | 39 | | | | |
| 6 | A120 between Bentley Road and B1035 | 19 | 17 | 36 | | | | |
| 8/9 | A133 between B1033 and B1027 | 8 | 12 | 20 | | | | |
| 10/42 | B1027 Valley Road | 8 | 12 | 20 | | | | |
| 11 | B1032 Clacton Road | 8 | 12 | 20 | | | | |
| 12 | B1033 Colchester Road (west of B1441) | 19 | 29 | 48 | | | | |
| 13 | B1441 Clacton Road | 10 | 17 | 27 | | | | |
| 14 | B1414 Harwich Road | 10 | 17 | 27 | | | | |
| 15 | B1033 Frinton Road | 10 | 17 | 27 | | | | |
| 16 | B1033 Colchester Road (east of B1441) | 9 | 12 | 21 | | | | |
| 17 | B1035 Tendring Road | 9 | 12 | 21 | | | | |
| 18 | B1035 Thorpe Road | 4 | 6 | 10 | | | | |
| 19 | B1035 (south of A120) | 4 | 6 | 10 | | | | |
| 20 | B1035 Clacton Road | 15 | 15 | 30 | | | | |
| 21 | Bentley Road | 0 | 0 | 0 | | | | |
| 22 | B1027 Frinton Road | 8 | 12 | 20 | | | | |
| 43 | A133 between A120 and B133 | 26 | 41 | 67 | | | | |

Table 3-10 Maximum Two-Way Peak Hour Vehicle Movements on Each Highway Link (Scenario 2)

| Reference | Highway Link (different to Scenario 1) | Maximum two-way | | | | | | |
|-----------|--|-----------------|-----|-------|--|--|--|--|
| | | HGV | LGV | Total | | | | |
| 20 | B1035 Clacton Road | 0 | 0 | 0 | | | | |
| 21 | Bentley Road | 15 | 15 | 30 | | | | |

Table 3-11 Maximum Two-Way Peak Hour Vehicle Movements on Each Highway Link (Scenario 3)

| Reference | Highway Link (different to Scenario 1) | Maximum two-way | | | | | |
|-----------|--|-----------------|-----|-------|--|--|--|
| | | HGV | LGV | Total | | | |
| 20 | B1035 Clacton Road | 0 | 0 | 0 | | | |
| 21 | Bentley Road | 9 | 12 | 21 | | | |

| Reference | Highway Link (different to Scenario 1) | Maximum two-way | | | | | | |
|-----------|--|-----------------|-----|-------|--|--|--|--|
| | | HGV | LGV | Total | | | | |
| 37 | Waterhouse Lane | 6 | 3 | 9 | | | | |
| 38 | B1029 | 6 | 3 | 9 | | | | |

- 26. As **Table 3-9** to **Table 3-11** and the traffic flow diagram **Appendix 06** show, even with a robust estimate of 20% of construction workers arriving at or departing from the construction sites during highway peak hours, the maximum number of two-way vehicle movements at a junction on the SRN is forecast to be 40 at the A120/ Harwich Road junction.
- 27. Whilst it is forecast that there would be 106 two-way vehicle movements on the A120 between the A12 and the A133 (as shown in Table 3-9), these vehicles would be distributed across four slip roads or free-flow links at the A12 Junction 29, likely resulting in fewer than 30 two-way vehicle movements on each and therefore a negligible impact. Also, the A120/ A133 interchange is a free flow link and therefore, there would be no specific capacity impacts at this junction.
- 28. The maximum number of two-way vehicle movements at a junction on the LRN is forecast to be 67 on the A133 at the B133 junction (Weeley roundabout). The number of two-way VE constriction vehicles at all other junctions on the LRN in the study area is less than 30.
- 29. Given the robust assessment parameters (car occupancy, proportion of personnel movements in the peak hours and the distribution adopted), SLR does not consider VE construction traffic would have a material impact at the junctions; and given the actual number of vehicle movements associated with the construction of VE would not be confirmed until Principal contractors are identified, it is not considered necessary to undertake any junction capacity assessments at PEIR or ES stages.

Trip Generation Data – ECC Route Sections



Average Total Two-Way Vehicle Movements Per Day

Including miscellaneous allowances

| | | Months | | | | | | | | | | | | | | | | |
|---------------------------|--------------|--------------|---------------|-------------|------------|-------------|--------------|-------------|-------------|------------|-----------|------|-----|-----|-----|-----|-----|-----|
| Route Section | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| Section 1 | 97 | 144 | 135 | 168 | 227 | 235 | 246 | 253 | 250 | 236 | 186 | 195 | 156 | 193 | 154 | 150 | 150 | 157 |
| Section 2 | 98 | 89 | 121 | 106 | 106 | 91 | 90 | 90 | 76 | 39 | 106 | 97 | 127 | 107 | 133 | 142 | 0 | 0 |
| Section 3 | 115 | 181 | 181 | 219 | 247 | 264 | 263 | 215 | 199 | 161 | 151 | 136 | 134 | 91 | 137 | 100 | 178 | 187 |
| Section 4 | 115 | 170 | 155 | 105 | 183 | 209 | 188 | 202 | 220 | 224 | 206 | 115 | 113 | 165 | 135 | 98 | 177 | 186 |
| Section 5 | 115 | 163 | 123 | 208 | 200 | 234 | 233 | 218 | 234 | 226 | 209 | 116 | 161 | 134 | 137 | 98 | 177 | 186 |
| 400kV Works | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Unlicensed Works at | | | | | | | | | | | | | | | | | | |
| Substation | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| (Note - Programme of unli | censed works | shown is inc | dicative only | . Timing of | unlicensed | works deper | ndant on Pro | ject Substa | tion and NG | Substation | Programme | etc) | | | | | | |
| Total | 540 | 747 | 715 | 806 | 963 | 1033 | 1020 | 978 | 979 | 886 | 858 | 659 | 691 | 690 | 696 | 588 | 682 | 716 |

| Overall | Minimum | Maximum | Average |
|-----------------------------|---------|---------|---------|
| Section 1 | 97 | 253 | 185 |
| Section 2 | 0 | 142 | 90 |
| Section 3 | 91 | 264 | 176 |
| Section 4 | 98 | 224 | 165 |
| Section 5 | 98 | 234 | 176 |
| 400kV Works | 0 | 0 | 0 |
| | | | |
| Unlicensed Works Substation | 0 | 0 | 0 |
| Total | 540 | 1033 | 792 |

Average Total Two-Way HGV Movements Per Day

Including miscellaneous allowances

| moraama miseemanee as and | ma <u>nees</u> | | | | | | | | | | | | | | | | | |
|---------------------------|----------------|-------------|---------------|-------------|------------|------------|--------------|--------------|-------------|------------|-----------|--------|-----|-----|-----|-----|-----|-----|
| | | Months | | | | | | | | | | | | | | | | |
| Route Section | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| Section 1 | 44 | 64 | 60 | 73 | 86 | 89 | 89 | 90 | 76 | 73 | 45 | 49 | 17 | 56 | 41 | 73 | 70 | 77 |
| Section 2 | 45 | 36 | 39 | 22 | 18 | 18 | 17 | 19 | 10 | 12 | 26 | 13 | 30 | 23 | 53 | 62 | 0 | 0 |
| Section 3 | 62 | 99 | 93 | 95 | 79 | 83 | 82 | 52 | 49 | 40 | 41 | 43 | 41 | 14 | 53 | 49 | 98 | 107 |
| Section 4 | 62 | 90 | 80 | 41 | 73 | 77 | 49 | 56 | 61 | 70 | 63 | 18 | 16 | 72 | 51 | 47 | 97 | 106 |
| Section 5 | 62 | 83 | 48 | 98 | 76 | 82 | 81 | 72 | 75 | 72 | 66 | 19 | 48 | 41 | 53 | 47 | 97 | 106 |
| 400kV Works | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Unlicensed Works at | | | | | | | | | | | | | | | | | | |
| Substation | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| (Note - Programme of unli | censed works | shown is in | dicative only | . Timing of | unlicensed | works depe | ndant on Pro | oject Substa | tion and NG | Substation | Programme | e etc) | | | | | | |
| Total | 275 | 372 | 320 | 329 | 332 | 349 | 318 | 289 | 271 | 267 | 241 | 142 | 152 | 206 | 251 | 278 | 362 | 396 |

| Overall | Minimum | Maximum | Average |
|---------------------|---------|---------|---------|
| Section 1 | 17 | 90 | 65 |
| Section 2 | 0 | 62 | 25 |
| Section 3 | 14 | 107 | 66 |
| Section 4 | 16 | 106 | 63 |
| Section 5 | 19 | 106 | 68 |
| 400kV Works | 0 | 0 | 0 |
| Unlicensed Works at | | | |
| Substation | 0 | 0 | 0 |
| | | | |
| Total | 142 | 396 | 286 |

Average Total Employees Two Way Movements per day

| | Months | | | | | | | | | | | | | | | | | |
|---|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Route Section | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| Section 1 | 53 | 80 | 75 | 95 | 141 | 146 | 157 | 163 | 174 | 163 | 141 | 146 | 139 | 137 | 113 | 77 | 80 | 80 |
| Section 2 | 53 | 53 | 82 | 84 | 88 | 73 | 73 | 71 | 66 | 27 | 80 | 84 | 97 | 84 | 80 | 80 | 0 | 0 |
| Section 3 | 53 | 82 | 88 | 124 | 168 | 181 | 181 | 163 | 150 | 121 | 110 | 93 | 93 | 77 | 84 | 51 | 80 | 80 |
| Section 4 | 53 | 80 | 75 | 64 | 110 | 132 | 139 | 146 | 159 | 154 | 143 | 97 | 97 | 93 | 84 | 51 | 80 | 80 |
| Section 5 | 53 | 80 | 75 | 110 | 124 | 152 | 152 | 146 | 159 | 154 | 143 | 97 | 113 | 93 | 84 | 51 | 80 | 80 |
| 400kV Works | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Unlicensed Works at Substation | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| (Note - Programme of unlicensed works shown is indicative only. Timing of unlicensed works dependant on Project Substation and NG Substation Programme etc) | | | | | | | | | | | | | | | | | | |
| Total | 265 | 375 | 395 | 477 | 631 | 684 | 702 | 689 | 708 | 619 | 617 | 517 | 539 | 484 | 445 | 310 | 320 | 320 |

| Overall | Minimum | Maximum | Average |
|-----------------------------------|---------|---------|---------|
| Section 1 | 53 | 174 | 120 |
| Section 2 | 0 | 97 | 65 |
| Section 3 | 51 | 181 | 110 |
| Section 4 | 51 | 159 | 102 |
| Section 5 | 51 | 159 | 108 |
| 400kV Works | 0 | 0 | 0 |
| Unlicensed Works at Substation | 0 | 0 | 0 |
| | | | |
| Total | 265 | 708 | 505 |

Trip Generation Data – Substation

Substation transport metrics

Substation Construction - maximum vehicle movements

| Parameter | Base Value | Comments | Reference | | |
|---|---|--|--|--|--|
| Total movements - Civil main works - (AADT) | 71 | e.g. 21,085 over 60weeks This is a naturally conservative value, dominated by the assumption of imported Engineered Fill | Construction Methodologies and Parameters - S27, 004369960-01. Site 2 values used as worst case for 4 sites considered in S99 and S27 | | |
| Total movements - M&E equipment deliveries - (AADT) | 1.33 | e.g. 150 over 45weeks | Parameters - S27, 004369960-01. Not site specific | | |
| Total movements - Abnormal load deliveries | Approx. 8 two way movements for transformers on 20 Axle frame trailers or similar Approx. 16 - 24 two way movements oversized indivisible plant | 2- 4 Transformers on 20-24 axle frame trailers 8 -12 items of Oversized indivisible plant such as shunt reactors and STATCOM equipment buildings. These delivered via special order vehicles (>44t and oversize) | Construction Methodologies and Parameters - S27, 004369960-01. Not site specific. Typo in document - corrected by Motts via email 01/09/22, with further details 07/09 | | |
| Total movements - light vehicles/cars (AADT) | 20-30 | Vans, 4x4 and cars | Construction Methodologies and Parameters - S27, 004369960-01. Not site specific. | | |
| Total movements - hazardous waste (AADT) | 0.7 | e.g. 200 over 60 weeks 8x8 rigid skip/tipper lorry | Construction Methodologies and Parameters - S27, 004369960-01. Not site specific. | | |
| Total movements - non hazardous waste (AADT) | 0.4 | e.g. 116 over 60 weeks 8x8 rigid skip lorry | Construction Methodologies and Parameters - S27, 004369960-01. Not site specific. | | |

Comments on Section

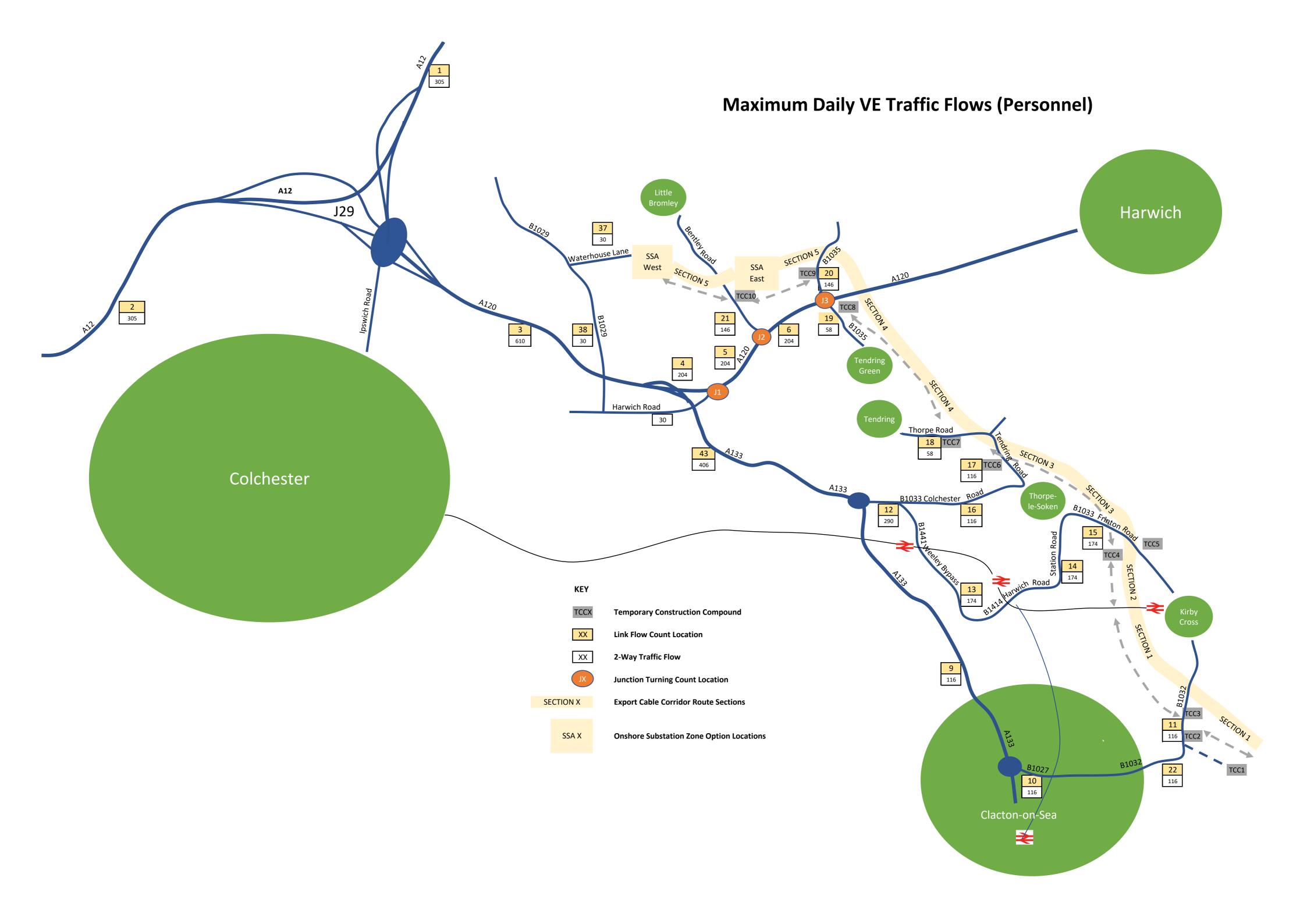
AADT = Annual Average Daily Traffic

Forecast vehicle movements will be refined as the design is refined. Values are indicative average two-way numbers of construction vehicle movements

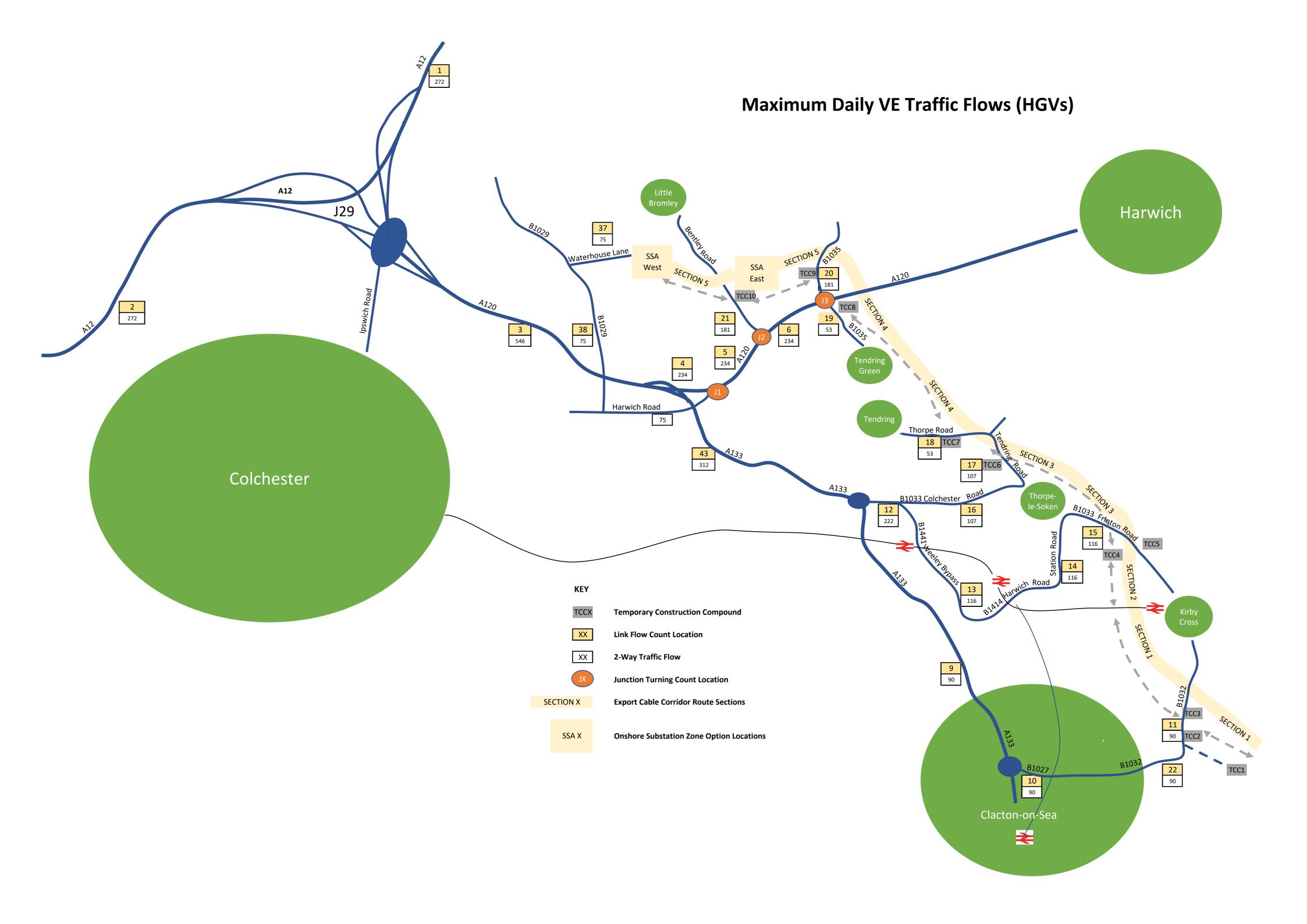
Request: "Construction Traffic Data. Require overall and Heavy Duty Vehicles (HDV) in 24-hour Annual Average Daily Traffic format (along with developmental and committed development trips disaggregated), corresponding to the development scenarios of consideration (i.e. Base, Future Base and Do-Something, and also potential phasing of construction works, if available). Links should be provided in GIS or CAD format. Also, data from traffic counts, if deployed in support of project. Construction traffic data including worst case hourly HGV movements at the site including routing"

Traffic figures are the total of arrivals + departures

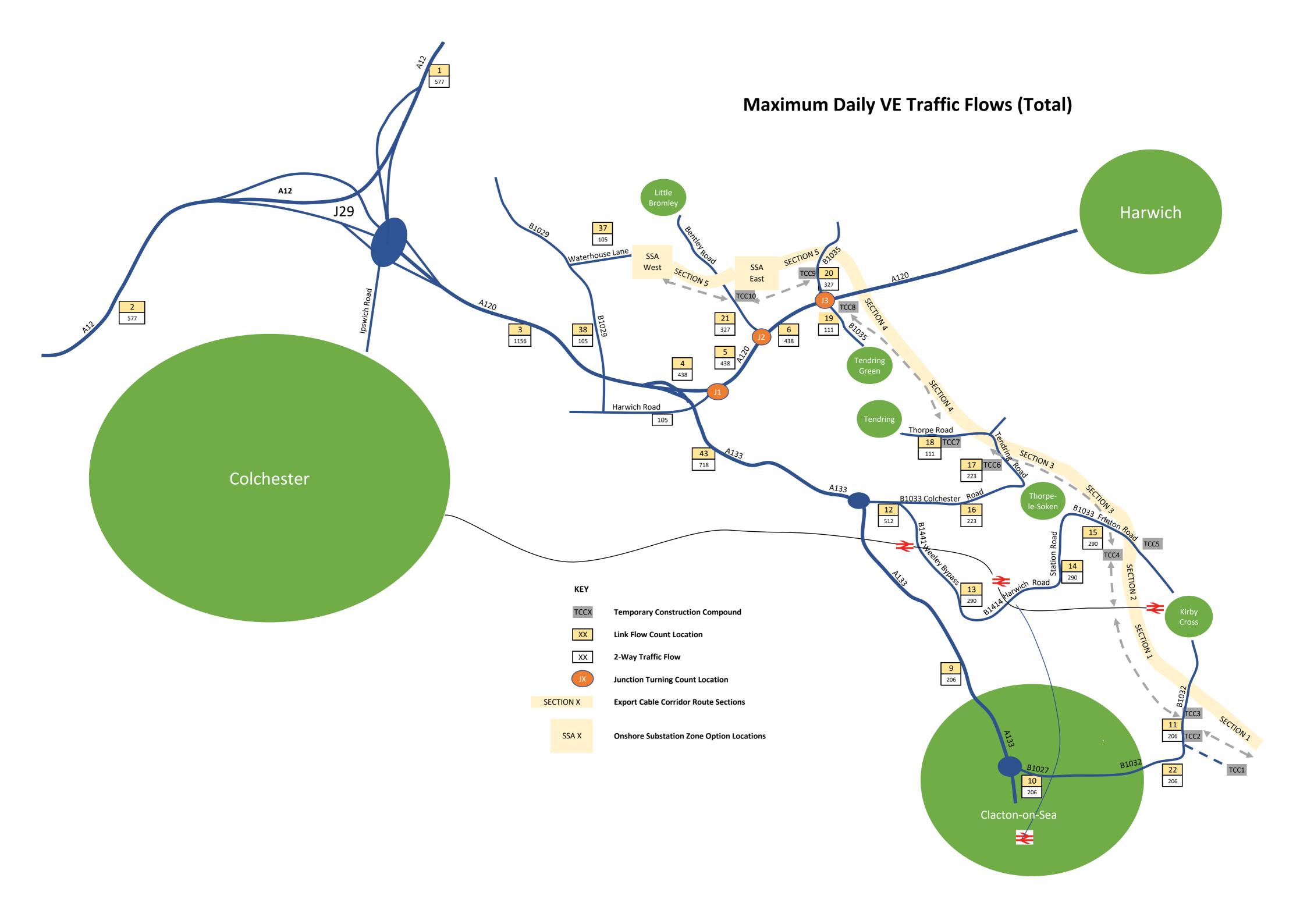
Maximum Daily VE Traffic Flows – Personnel



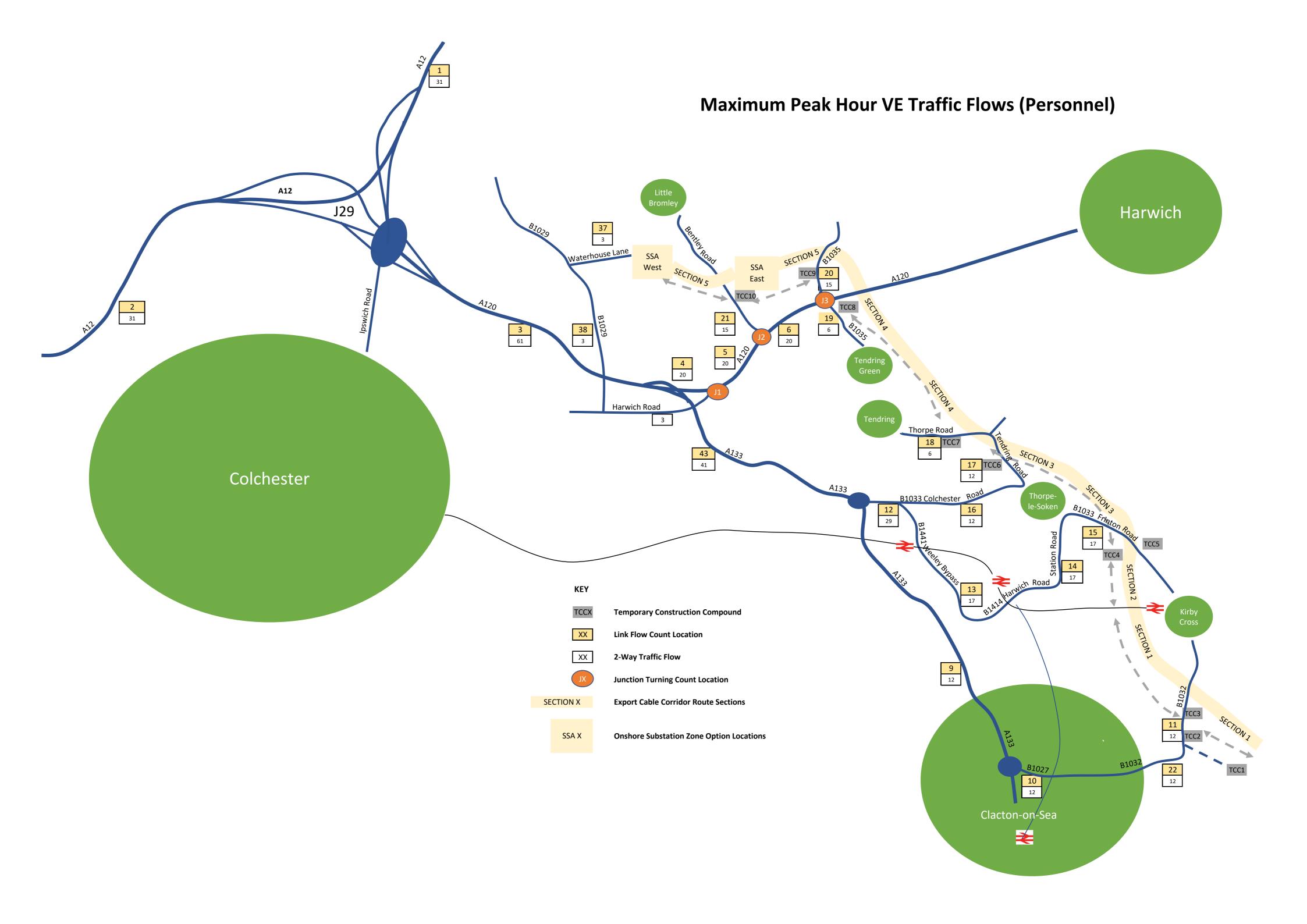
Maximum Daily VE Traffic Flows – HGVs



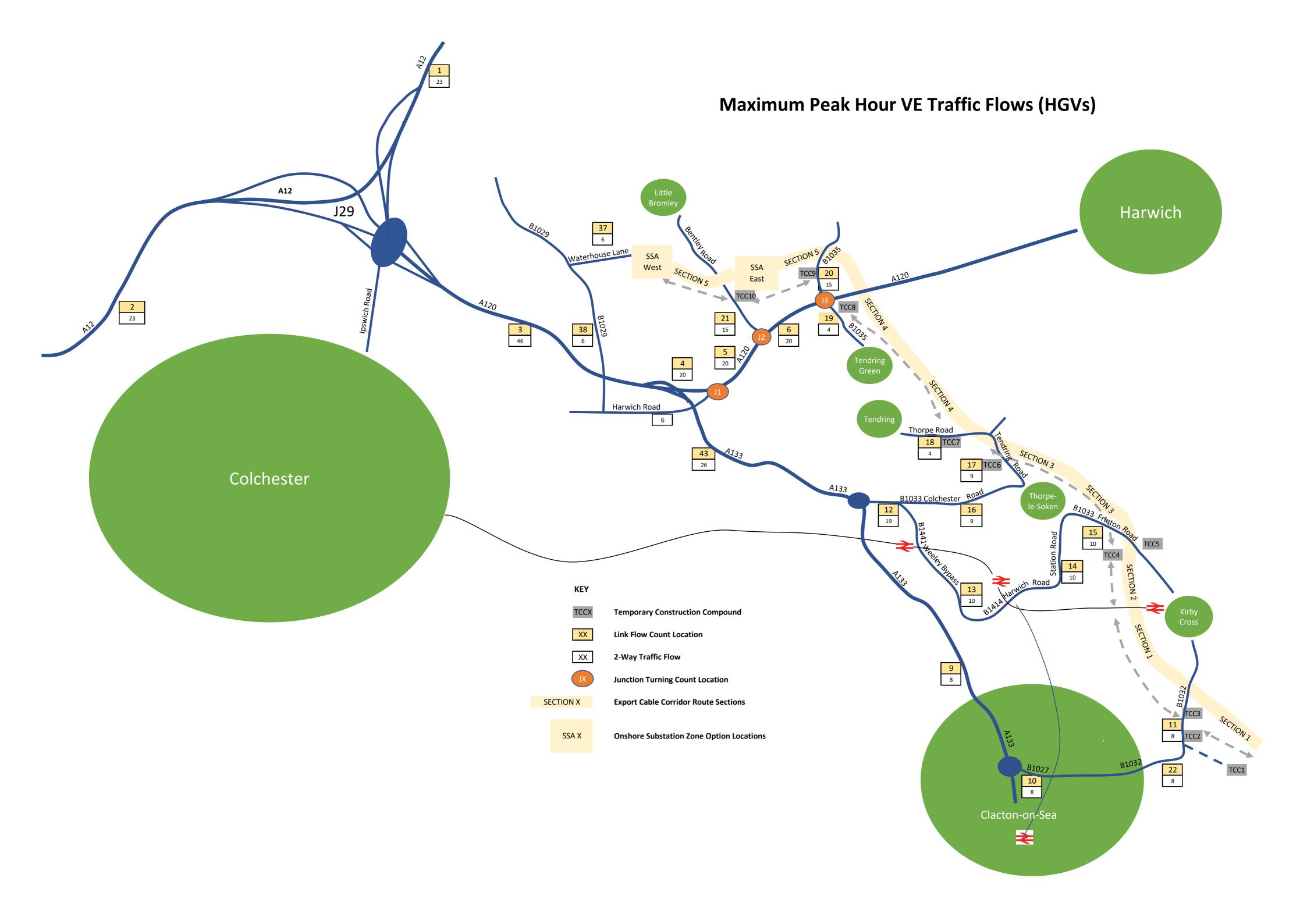
Maximum Daily VE Traffic Flows – Total



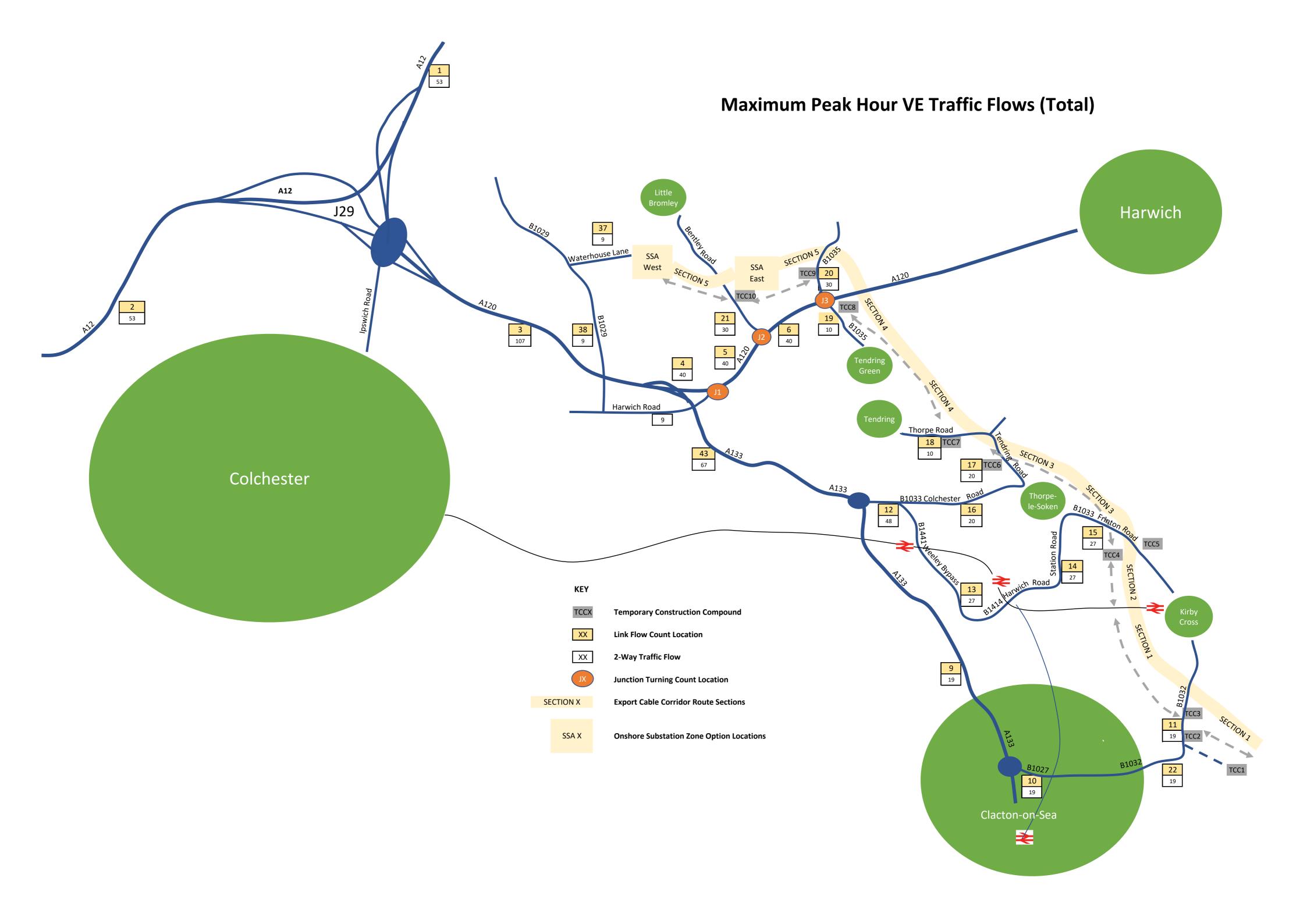
Maximum Peak Hour VE Traffic Flows – Personnel



Maximum Peak Hour VE Traffic Flows – HGVs



Maximum Peak Hour VE Traffic Flows – Total



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