Essex Highways

Essex Highways Vehicle Restraint Systems Strategy

2024

RINGWAY JACOBS | Essex County Council

Vehicle Restraint Systems Strategy

Foreword - Supporting Road Safety: Vision Zero

Welcome to the Essex Highways Vehicle Restraint Systems Strategy. Vehicle Restraint Systems (VRS) - also referred to as Safety Barriers or Road Restraint Systems - have been installed on Essex County Council's network to afford protection to highway users.

In the event of a vehicle leaving the road, VRS mitigate the risk, as far as practicable, of the vehicle entering areas where hazards exist. VRS are intended to contain and redirect a vehicle along the line of the barrier in the direction of travel, so the vehicle does not rotate or overturn. VRS also protects against damage to any asset located behind the system.

This Strategy supports the principles within the overarching Essex County Council Highways Maintenance Policy, published on the Essex Highways website, and describes the Council's approach to managing Vehicle Restraint Systems on the road network.

This Strategy takes account of the recommendations and best practice set out in the October 2016 'Well-managed Highway Infrastructure: A Code of Practice', published by the United Kingdom Roads Leadership Group (UKRLG, formerly called the United Kingdom Roads Liaison Group).

The installation, monitoring, and maintenance of Vehicle Restraint Systems on the road network has a positive impact on road safety and therefore contributes to Road safety: Vision Zero. Vision Zero is the aspiration that there should be no deaths or serious injuries on the roads by 2040.

Cllr. Tom Cunningham

Portfolio Holder for Highways, Infrastructure and Sustainable Transport

Essex Highways' assets are currently managed via the Essex Highways strategic partnership, which is a collaboration between ECC and contractor Ringway Jacobs, which was formed on the 1st of April 2012.

This Strategy is a supplementary strategic document to the Highways Infrastructure Asset Management Plan (HIAMP) which forms the keystone of the Essex Highways Strategic Partnership whose objective is to deliver the Council's strategic priorities.

Both Essex County Council and Ringway Jacobs are committed to long term efficient and cost-effective management of Highways' assets, to deliver a transport system that supports sustainable economic growth and promotes the very best quality of life for the residents of Essex.

Tom Blackburne-Maze
Director Highways and Transport

Simon Butt
Operations Director

Contents page

Vehicle Restraint Systems Strategy

1. Introduction

1.1 This Essex County Council (ECC) Vehicle Restraint Systems (VRS) Strategy has been introduced by maintenance engineers, inspectors, and other practitioners to take account of the recommendations and best practice set out in the October 2016 ‘Well-managed Highway Infrastructure: A Code of Practice’, and subsequent amendments (which hereafter will be referred to as ‘the Code of Practice’). The Code of Practice was published by the United Kingdom Roads Leadership Group (formerly United Kingdom Roads Liaison Group) and commissioned by the Department for Transport (DfT).

1.2 Neither legislation nor the Code of Practice has set out or prescribed the minimum standards to be employed. The Code of Practice is designed to promote the adoption of an integrated asset management approach to highway infrastructure based on the establishment of local levels of service through risk-based assessment. It is up to each Authority to establish and implement their own levels of service to suit their circumstances.

1.3 Vehicle Restraint Systems (VRS) - also referred to as Safety Barriers or Road Restraint Systems - have been installed on Essex County Council’s network to afford protection to highway users. In the event of a vehicle leaving the road, VRS mitigate the risk, as far as practicable, of the vehicle entering areas where hazards exist. VRS are intended to contain and redirect a vehicle along the line of the barrier in the direction of travel, so the vehicle does not rotate or overturn. VRS also protects against damage to any asset located behind the system.

1.4 Although Road Restraint Systems can be both vehicle and pedestrian restraint systems, the use of the term in this Strategy document refers to permanent VRS intended to provide containment for an errant vehicle. This Strategy does NOT include requirements for temporary VRS to protect highway operatives during site construction works. This Strategy does NOT include pedestrian restraint systems or other roadside modular fencing installations such as ‘post & rail’, since none of these systems are designed to provide containment for an errant vehicle.

1.5 VRS are safety critical, complex assets. All detailed inspections (this excludes routine and ad hoc, highway safety inspections), all detailed risk assessments including use of the Road Restraint Risk Assessment Process (RRRAP), and all installation of VRS, and all types of amendments to or works on VRS, as well as all designs for VRS, must be undertaken by suitably competent personnel. Evidence of competence must be demonstrated through the attainment of suitable qualifications, or attainment of certificates relating to training courses attended successfully, that are recognised within the industry as providing appropriate standards.

1.6 This Strategy is a supplementary, strategic document of Essex County Council Essex Highways Infrastructure Asset Management Plan (HIAMP) which is published on the Essex Highways website.

2. Systems Standards

2.1 The National Highways standards relating to 'Requirement for Road Restraint Systems' was updated in August 2006 with the publication of TD19/06 in the Design Manual for Roads and Bridges (DMRB) Volume 2, Section 2, Part 8. TD19/06 superseded TD19/85 which was subsequently withdrawn. TD 19/06 was superseded in January 2021 by 'CD 377 Requirements for road restraint systems', 5.5.3.

2.2 'CD 377 Requirements for road restraint systems' has two parts that must be used together:

Part 1 is the written standard CD 377 Requirements for road restraint systems, which relates to the general provision of road restraint systems.

Part 2 is the Road Restraint Risk Assessment Process (RRRAP), which is software driven. Part 2 is the RRRAP which is a software tool which is available to assist in making an assessment in many situations, based on risk, as to whether a VRS is warranted to prevent the occupants of a vehicle from hitting near side or offside hazards. A list of common hazards that may warrant inclusion in a risk assessment process is included under General Requirements in CD 377. However, the RRRAP is potentially inappropriate for a direct assessment of central reserves, roundabouts and junction areas or lay-bys, due to the complexity and

variability of hazards and their locations, traffic speed limits, road layouts and alignments, and variability of traffic incident data in these situations.

2.3 CD 377 includes standards relating to Terminals, which are applied to the end of VRS barriers such that the barrier ends do not represent a hazard. They are designed to provide a smooth transition from no containment to the containment of the barrier without introducing additional hazards for head on vehicle impacts.

2.4 CD 377 specifically relates to standards for the UK motorways and all-purpose trunk roads networks. It is not intended to apply to standards on Local Authority Roads, as these are more diverse in nature. However, Local Authorities can use the principles of CD 377 as a guide.

2.5 The specifications and design standards referred to in this Strategy are subject to review and alteration by external bodies. It is the Designer's responsibility to ensure that the most up to date standards, specifications, codes of practice, legislation, guidance notes etc. are used when designing the works. Should there be a significant time lapse between design and commencement of work on site then Essex County Council (ECC) reserves the right to insist the design is revisited and amended if necessary to comply with any latest document issue.

3. Road Restraint Risk Assessment Process (RRRAP)

3.1 This Strategy advocates that use of the CD 377 Part 2 Road Restraint Risk Assessment Process (RRRAP) software tool in assisting with determining whether a VRS is warranted, is optional at the discretion of the Engineer. The reason is because attempting to apply the CD 377 Part 2 RRRAP to the wider, low speed and or low traffic flow roads which are prevalent in Local Authority road networks, is thought unlikely to produce useful results because:

- The CD 377 Part 2 RRRAP data is based on high-speed routes that share a large number of common features;
- The data is for routes that have a substantially better road alignment;

- The data is from routes that have other safety features that would not typically be present on local highway authority routes; e.g. Motorway Incident Detection and Automatic Signalling.
- Local highway authority routes are much more diverse and include a huge variety of circumstances and layouts.

3.2 An alternative method of appraising sites for VRS to meet the needs of Local Authorities is detailed in a guidance document published by the United Kingdom Roads Leadership Group (UKRLG) in 2011: 'Provision of Road Restraint Systems on Local Authority Roads'. However, this UKRLG guidance document does not replace CD 377 but merely provides an alternative method of appraising sites.

3.3 The UKRLG guidance document 'Provision of Road Restraint Systems on Local Authority Roads', 'Table 5.1 – Hazards (within close proximity of running lane)', provides a list of hazards which justify an appraisal process to help Local Authorities decide when a VRS is justified. The appraisal process takes account of many diverse influencing factors including risk assessment, alternative solutions, system feasibility and cost benefit analysis as well as advice on performance specification. It also includes advice on outline design to allow ease of cross reference to the most important aspects of CD 377.

4 'Legacy Safety Barrier Systems'

4.1 The VRS asset inventory within Essex includes what the Manual of Contract Documents for Highway Works (MCHW), on the Specification for Highways Works, refers to as 'Legacy Systems'. These are road safety barrier systems that were installed prior to the establishment of the BS EN 1317 standard which was established in 1998 to define a common testing and certification procedure for road restraint systems. Legacy Systems do not comply with the BS EN 1317 standard and therefore do not include a CE (conformite europeene) kitemark. Note that road safety barrier systems that include a CE kitemark, are designated as complying with the BS EN 1317 standard.

4.2 Legacy Systems are also known as 'Non-Proprietary Safety Barrier Systems' (NPSBS). 'Proprietary Systems' are those that have been tested and comply

with the BS EN 1317 standard. The VRS asset inventory within Essex is a mix of ‘Proprietary Systems’ and ‘Non-Proprietary Safety Barrier Systems’ (NPSBS).

Legacy Systems (also known as ‘Non-Proprietary Safety Barrier Systems’) are limited to the following barrier types only:

Untensioned corrugated beam (UCB),
Tensioned corrugated beam (TCB),
Open box beam (OBB),
Double Rail Open Box Beam (DROBB),
Rectangular Hollow Section beam (RHSB), and
Wire Rope Safety Fence (WRSF).

4.3 Guidance for the installation, inspection, and repair of Legacy Systems (‘Non-Proprietary Safety Barrier Systems’) are detailed in BS 7669-Part 3 1994. This Strategy advocates that existing Legacy Systems can be repaired or altered, within the restrictions which are detailed in MCHW Volume 1 Series 400, and MCHW Volume 2 Series NG 400. However, this Strategy advocates that since ‘Non-Proprietary Safety Barrier Systems’ do not conform to BS EN 1317 they must NOT be installed at new locations. This Strategy also advocates early engagement with utility companies who wish to install VRS to protect their assets on the Essex Highways network, with the objective of ensuring as far as practicable that utility companies do not install ‘Non-Proprietary Safety Barrier Systems’.

4.4 This Strategy advocates that for Legacy Systems, the repair, re-tensioning, amendment, or any other remedial works will be undertaken in accordance with BS 7669-Part 3 1994 by competent personnel who have attained and are able to demonstrate Lantra or other nationally recognised accreditation as trained Installers of these barrier types.

4.5 In relation to 4.4, the VRS contractor will need to provide a Completion Certificate that confirms compliance with the Instruction/Order. The client Engineer (acting on behalf of ECC) will need to verify compliance as well as record and store all related certificates/reports in a secure system that provides access only to those who have right of access.

4.6 In relation to 4.5, for any instance where the works reflect a deviation from -

- the permitted Design standards outlined in BS 7669-Part 3 1994;
- the folio drawings detailed in the Highway Construction Details;
- the restrictions detailed in MCHW Volume 1 Series 400 and MCHW Volume 2 NG 400;
- CD377 (or where an existing Legacy System was installed under TD19/06)

  - the VRS Contractor will need an Exception Report signed off by the Client Engineer. The Exception Report will be recorded and stored, together with any related documentation, in a secure system that provides access only to those who have right of access.

4.7 For any instance where a new VRS installation is required, or where existing VRS is to be significantly altered as part of other works, e.g. road widening; provision of new junction; alteration to road layout or alignment; provision of new pedestrian crossing; etc., then the Engineer will need to request a Road Safety Audit.

5. 'Proprietary Systems' complying with BS EN 1317

5.1 Proprietary systems (i.e. whereby a product is marketed under or protected by a registered trade name) are manufactured and tested to comply with BS EN 1317. For all new installations the VRS (barrier/terminals/cushions) must comply with the relevant parts of BS EN 1317 and be accompanied by the relevant testing certification.

In addition to the above, systems must also comply with:

- DMRB CD377 'Requirements for Road Restraint Systems';
- where appropriate, a Road Restraint Risk Assessment Process (RRRAP);
- where a RRRAP is not appropriate then a written risk assessment identifying the hazards and areas at risk must be provided to the Client Engineer for approval;
- MCHW Volume 1 Series 400 and MCHW Volume 2 NG 400;
- Any requirements specified by the Manufacturer.

5.2 This Strategy advocates that for the installation, repair, removal, amendment, or any other remedial works undertaken to Proprietary Systems, it will be undertaken in accordance with the above documents and will be carried out by competent personnel who have attained and able to demonstrate LANTRA or other recognised accreditation as trained Installers of that proprietary system.

5.3 In relation to 5.2, the VRS contractor will need to provide a Completion Certificate that confirms compliance with the Instruction/Order and that the system has been constructed in accordance with the manufacturers specification. The Client Engineer will need to verify compliance as well as record and store all related certificates/reports and documents in a secure system that provides access only to those who have right of access.

5.4 For any instance where a deviation from the Design standards or Manufacturers specification is required, the Manufacturer of the system will need to provide written confirmation of acceptance, and the Contractor Engineer will need an Exception Report signed off by the Client Engineer. All documentation, certificates/reports relevant to the deviation will need to be recorded by the Client Engineer and stored in a secure system that provides access only to those who have right of access.

6. Types of VRS Inspections

6.1 VRS assets are complex in design and require appropriate asset maintenance and replacement to sustain containment performance. Inspections of the VRS assets, to facilitate identification of defects and corresponding risk-based priority of repair, are a fundamental part of this process. The Council undertakes the following inspections for VRS inventory assets:

- Routine, Safety Inspections (‘In-Service Safety Inspections’).
- Reactive, Ad Hoc Safety Inspections.
- Detailed Inspections.

7. Routine, Highway Safety Inspections

7.1 The purpose of Routine, Highway Safety inspections is to identify any defects that are risk assessed by the Highway inspector as likely to create a potential danger or serious inconvenience to the public, and which therefore require a high priority in terms of repair. In the case of a defect requiring an urgent response, the Inspector arranges a ‘make safe’ which will mitigate the safety risks as far as practicable prior to a permanent repair being undertaken.

7.2 In the case of VRS, the Highway Inspector seeks to identify damaged, moving, or misaligned assets or projecting components. This is largely a visual risk assessment and does not include detailed inspection of the intricate and complex components upon which the containment performance of the VRS is dependant. All defects are recorded in an electronic asset management system, together with an identified risk evaluation.

7.3 Inspection intervals for VRS assets are based upon the strategic importance of the functional hierarchy of the related asset. For example, in the case of VRS installed at the side of roads to contain errant vehicles leaving the road, the inspection interval is governed by the functional hierarchy of the road in question.

7.4 For VRS attached to structures, these will be subject to inspection frequency in accordance with ECC approach to Structures General Inspections (GIs) and Structures Principal Inspections (PIs).

7.5 Routine, Highways Safety Inspections will encompass all VRS up to the parapet or terminal at a structure, in line with the frequency for the carriageway/footway/cycleway asset in question.

7.6 For more information on the inspection, risk assessment process, and defect recording process and repair prioritisation process, as well as the intervals relating to Routine, Safey Inspections, refer to the ‘Maintenance Strategy: Carriageways, Footways & Cycleways’ published on the Essex Highways website. (For VRS attached to structures, refer also to the ‘Maintenance and Inspection Strategy: Structures’, published on the Essex Highways website).

Note that the standards referenced in the ‘Maintenance Strategy: Carriageways, Footways & Cycleways’ comply with the Code of Practice but may represent a departure from CD 377 and ’BS 7669-Part 3 1994’ in some instances.

7.7 The ‘Maintenance Strategy: Carriageways, Footways & Cycleways’ includes the ‘investigatory levels’ for the different assets which are subject to Routine, Safety Inspection. These indicate the condition characteristics of the asset which must be met before a risk assessment is undertaken. The risk assessment, risk evaluation process, identifies the consequence of a risk event occurring as well as the likelihood of the event occurring, to identify a priority of response. In the case of VRS, these are a complex asset group and similar defects can have entirely different consequences on each individual site. It is therefore not possible to assign generic investigatory levels. Instead, the Lead Inspector/Engineer will determine the appropriate response for the site in question at the time of inspection.

7.8 Routine, Highway Safety Inspections will not include the identification of VRS components which are no longer within current specification requirements. This will be included in the detailed inspections – refer to ‘Section 9 Detailed Inspections, and Torque Maintenance’.

7.9 Routine, Highways Safety inspections of VRS reflect a departure from BS 7669-Part 3 1994.

8 Ad Hoc Highway Safety Inspections

8.1 Ad Hoc, Safety Inspections are similar to routine, highway safety inspections but they are unplanned, reactive inspections undertaken in response to reports of safety concerns. The Council receives reports and enquiries from a variety of sources regarding its highways assets, and it operates systems that allow these to be received either electronically or via traditional methods such as letter or telephone call. It also operates a system to receive reports or enquiries of an emergency nature outside of normal working hours. The priority in terms of timing of reactive inspections is undertaken on a risk-based assessment carried out by Essex Highways for each report.

9 Detailed Inspections, and Torque Maintenance

9.1 Detailed inspections are carried out at less frequent intervals than routine, safety inspections and are generally designed to identify and record defective components and assets from which a programme for routine maintenance works not requiring urgent execution can be established. For Legacy Systems, the items to be inspected and associated technical requirements (excluding inspection frequency) will follow BS 7669-Part 3 1994. For ‘proprietary systems’, the items to be inspected and associated technical requirements (excluding inspection frequency) will follow that prescribed by the manufacturer or where not provided they will follow BS 7669-Part 3 1994 (excluding inspection frequency).

9.2 BS 7669-Part 3 1994, specifies bolt torque requirements for certain types of VRS that need to be maintained in tension. A programme of re-tensioning will be conducted periodically to ensure this is achieved. The exception to this, will be where a VRS is defective such that it will not permit torque adjustments, in which case the VRS and the defects in question will be recorded so that these may be programmed for repair and subsequent torque correction in accordance with ‘Section 11 Detailed Inspections: Works Prioritisation and Programming’.

9.3 Defects identified during detailed inspections are currently recorded in hard copy. However, there are plans to use the Confirm asset management system for recording such defects, once plans to develop Confirm as a VRS asset register have been completed.

9.4 Detailed Inspections of VRS must be undertaken by suitably competent personnel. Evidence of competence must be demonstrated through the attainment of suitable qualifications, or attainment of certificates relating to training courses attended successfully. For example, personnel undertaking detailed inspections of VRS must be LANTRA accredited or have attained a nationally recognised similar industry standard. Note that LANTRA is a leading awarding body for training in the land-based industries, which has developed training in nationally recognised qualifications.

9.5 Detailed Inspections will include identification of VRS components which are no longer within current specification requirements. Where the Engineer or Road Safety Team identifies components out of current specification, which

represent a concern, the replacement of these components and the timing of their replacement, where this is deemed practicable and affordable, will be the subject of a separate business case to petition ECC for the required investment. Alternatively, consideration will be given to replacing components which are out of specification during routine maintenance over time. However, there will NOT be a presumption that assets outside current specification requirements will be programmed for replacement, as this would place impracticable burden on the Authority in terms of required investment and resources. It would also create significant disruption to highway users.

9.6 Detailed inspections will include an assessment of whether the VRS for the sites in question is no longer required; i.e. following removal of the hazard which was the reason for VRS being installed. It will also include an assessment as to whether the VRS for the sites in question represent a safety risk to errant vehicles equal to or greater than the hazard in question.

10 Detailed Inspections - Frequency

10.1 Frequency of inspection may reflect a departure from BS 7669-Part 3 1994.

10.2 For VRS where the installation date has been recorded, and component material type is known, detailed inspection will be undertaken at a frequency not greater than once every two years for assets that have wooden or steel components where their installation date is more than ten years from the date proposed for detailed inspection. However, inspection frequency will be less than once every two years where the Council deems this more practicable and affordable.

10.3 For VRS where the installation date has been recorded, and component material type is known, detailed inspection will be undertaken not greater than once every five years for assets that have wooden or steel components where their installation date is ten years or less from the date proposed for detailed inspection. However, inspection frequency will be less than once every five years where the Council deems this more practicable and affordable.

10.4 For VRS where the installation date has been recorded, and component material type is known, detailed inspection will be undertaken not greater than once every two years for assets that have concrete components where their installation date is more than fifteen years from the date proposed for detailed inspection. However, inspection frequency will be less than once every two years where the Council deems this more practicable and affordable.

10.5 For VRS where the installation date has been recorded, and component material type is known, detailed inspection will be undertaken not greater than once every five years for assets that have concrete components where their installation date is fifteen years or less from the date proposed for detailed inspection. However, inspection frequency will be less than once every five years where the Council deems this more practicable and affordable.

10.6 For VRS which do not comply with criteria referenced in 10.2 to 10.5, the detailed inspection frequency will be not greater than once every two years. However, inspection frequency will be less than once every two years where the Council deems this more practicable and affordable.

11 Detailed Inspections: Works Prioritisation and Programming

11.1 The defects recorded during the Detailed Inspections will be reviewed by the Engineer and programmed for remedial works on a risk-based priority. Different types of defects, as well as different combinations of defects, will reflect different levels of risk.

11.2 The prioritisation process for each site may include a process that assigns a risk score to each defect, as well as a risk score to other characteristics associated with the site, such as but not limited to, the speed limit of the road, as well the functional hierarchy of the road, and the type of VRS in question, so that the overall risk evaluation of each site will be a summation of the risk scores.

11.3 Works prioritisation and programming will include assets which have been referred for repair due to issues with torque maintenance.

11.4 Works prioritisation and programming will include the identification of defects which have precluded re-tensioning being undertaken – refer to ‘Section 14. Re-tensioning’.

11.5 Works prioritisation and programming will include assets which have been identified as requiring removal, as per ‘Section 12. Removal of VRS Assets’.

12 Removal of VRS Assets

12.1 In some circumstances a VRS is no longer required on site. For example, the hazard requiring protection or presenting risk to the occupants of an errant vehicle, may have been removed, or there has been a change in the road usage resulting in a reduction in traffic flow or speed. If a site is identified as potentially no longer requiring a VRS, a request for a Road Safety Audit of the site is to be made to the Road Safety Team by the Engineer, so that a road safety impact assessment can be undertaken relating to the proposed removal of the VRS. The Road Safety Audit process will highlight any safety related problems which may result from the proposed removal of the VRS as well as any safety related problems relating to any other recommendations made by the Engineer for the site.

12.2 The decision regarding removal of the VRS rests with the Engineer who must consider the outcome of the Road Safety Audit prior to any planned removal of the VRS. If the Engineer, following consideration of the Road Safety Audit, decides that a VRS is no longer required at a site, the decision for its removal as well as any other relevant investigation documents are to be recorded and held on file in a secure system that provides access only to those who have right of access. Works to undertake removal of the VRS will be programmed in accordance with ‘Section 11. Detailed Inspections: Works Prioritisation and Programming’.

13 Identification/review of hazards which require VRS

13.1 There will NOT be a review undertaken of all hazards on the network requiring VRS. The requirement for installation of VRS will be considered during the design stage of highway schemes, in particular where new assets are being

added to the network by Essex Highways. However, the requirement for VRS will also be considered where recommendations are made via Road Safety Audits (whether for an Essex Highways scheme or Third Party/Development Management scheme) where a potential hazard has been identified and the recommendation is that a RRRAP is undertaken.

13.2 Where assets are added to the network or near to the network by external organisations, such that they represent a hazard to errant vehicles leaving the road, or such that the asset itself requires protection, it is anticipated that the requirement for VRS will be managed by Development Management or Network Assurance teams.

13.3 Installation of VRS for sites where VRS is not currently installed, will be considered, following feedback from the Road Safety Team or Essex Police or via any other reports which raise safety concerns. The decision to provide or omit a VRS must be taken and recorded at an appropriate level by those who appropriately trained and are best able to obtain and assess the evidence on which to base a decision. The decision must be recorded and held on file in a secure system that provides access only to those who have right of access.

13.4 Where assets are deemed life expired and their replacement is to be programmed as routine maintenance, the Engineer will consider undertaking a review to determine if VRS is still required at the site. Where a decision is made to remove but not replace the VRS, this will be recorded in accordance with 14.3 above.

14 Re-tensioning

14.1 Some types of VRS on the network require re-tensioning for appropriate operation to be maintained. The types of VRS that require re-tensioning currently on the ECC network are as follows:

- Wire rope
- Tensioned corrugated beam, and,
- Rectangular hollow section (RHS)

Inventory records for assets which require routine, re-tensioning, are held on file in a secure system which provides access only to those who have right of access.

14.2 Re-tensioning must be undertaken by suitably competent personnel. Evidence of competence must be demonstrated through the attainment of suitable qualifications, or attainment of certificates relating to training courses attended successfully. For example, personnel must be LANTRA accredited or have attained a nationally recognised similar industry standard. Note that LANTRA is a leading awarding body for training in the land-based industries, which has developed training in nationally recognised qualifications.

14.3 Assets will be programmed for re-tensioning at a frequency not greater than once every two years, or at a frequency less than once every two years where the Council deems this more practicable and affordable. The exception to this will be where assets have been repaired or amended and therefore require the rehabilitation of the correct tensions to fulfil fitness of purpose. Records of when assets are re-tensioned will be held on file and stored in a secure system which provides access only to those who have right of access.

14.4 If tensioned VRS is defective, such that re-tensioning will not maintain appropriate operation of the asset, an appropriate report will be sent to the asset management in box asset.management@essexhighways.org, so that assets can be prioritised for repair as per 'Section 11. Detailed Inspections: Works Prioritisation and Programming'.

15 Passively Safe Road Furniture and Equipment

15.1 Consideration can be given to the installation of passively safe road furniture as an alternative to protecting the hazard through the installation of VRS. Examples of this type of roadside furniture are, but not limited to, sign/signal supports and lighting columns. It is recommended that the Engineer liaise with the Road Safety Team to determine if the use of passively safe assets to reduce the necessity for protection by VRS, will support *Vision Zero and is practicable and affordable for the site in question.

*Vision Zero is the ambition of the Safer Essex Roads Partnership (SERP) to have ZERO road deaths and serious injuries on roads in the Essex, Southend, and Thurrock council areas by 2040.

15.2 Locations where this may be a viable alternative are at roundabouts or junctions where there is insufficient room for full VRS provision, or where VRS can be vulnerable to full frontal impact or cannot be provided with the correct orientation for all the anticipated directions of traffic movement. Circumstances may exist, however, that may preclude this consideration, such as if there is another hazard at the location which cannot be removed, relocated, or made passively safe, that requires the provision of VRS.

16 VRS and powered, two-wheeled vehicles.

16.1 Motorcycle groups have identified that interaction with VRS can be problematic for powered two-wheeled vehicles. For example, it is possible for powered two-wheeled vehicles to go under VRS beams, or for VRS terminals to have a more significant impact for them than for other vehicles. In specific locations, alternative VRS components, such as ‘rubbing rails’ to fill the gap below the beam section and ground, and in some instances ‘terminals that are better for motorcycle riders’, have been installed on the Essex network. This has only occurred on specific sites which have been identified through a previous issue with powered two-wheeled vehicles or where use by a high volume of powered two-wheeled vehicles has been evident. It should also be noted that ‘rubbing rails’ decrease the working width of VRS and are therefore not appropriate for all VRS.

16.2 There will NOT be a presumption that all VRS will be fitted with new components or amended/modified to address the specific needs of powered two-wheeled vehicles. However, the implications for powered-two-wheeled vehicles will be considered during the design stage for VRS. The fitting of new components or the amendment/modification of existing components will only be implemented where the Engineer determines that such a requirement is practicable and affordable and is supported through data and evidence. It is anticipated that such sites will be relatively rare.