

Route Safety Solutions

Route safety encompasses a range of solutions for enhancing the safety of all road users, including motorists, cyclists, and pedestrians



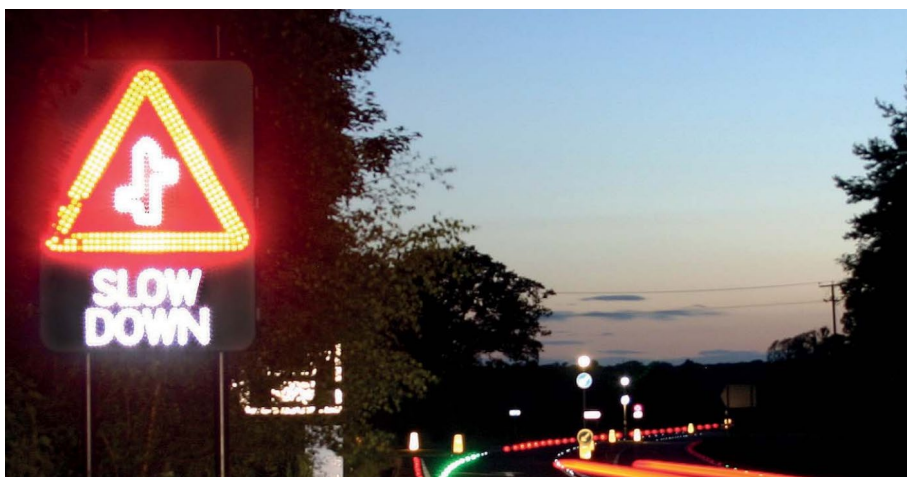
For more information visit www.clearview-intelligence.com/solutions/route-safety/

The most important thing on a journey is to be safe. Clearview Intelligence is dedicated to improving safety on roads, pathways, and cycle routes globally through a diverse array of products and services. Each solution is designed with the client's goals, budgetary limits, environmental considerations, and reliability needs in mind.

Every solution we implement is designed to meet the authorities objective, financial constraints, environment and reliability requirements.

The front image of the brochure showcases a project delivered in Chetwynd, Wales, illustrating how various technologies can address multiple challenges. This case study focuses on minimising road accidents resulting from excessive speed, limited visibility, complex junctions, and adverse **weather conditions**.

The project's intelligence lies in monitoring vehicle speeds and leveraging **dynamic speed warning** signs to modify **driver behaviour** and encourage **speed compliance**.



In this scheme the sign is highlighting speeding with the slow down message but also provides a **hazard warning** of the upcoming staggered junction to improve **junction safety** on this route.



To enhance safety for drivers at night in areas susceptible to fog and limited visibility, a series of Intelligent Road Studs (IRS2) from our *Lite* collection of active road studs are positioned along the road's curves.



In addition 200 SolarLite Active Road studs are also deployed along the route providing enhanced visibility of junctions, layout and reducing **lane transgressions** at night.



The effectiveness of a dynamic route safety solution is significantly influenced by the expertise and intelligence used to activate the driver communication technologies. Utilising a variety of detection and classification technologies, our Connex platform plays a crucial role in managing communications, detections and providing the intelligence to bring it all together. The Connex's Road Safety Controller ensures the appropriate responses are activated based on various inputs and scenarios, tailoring the safety measures to meet the specific needs effectively.

Route Safety Solution reliability and performance is critical and our **Insight** Data Management Platform provides the equipment monitoring and analysis tools in a single cloud-based platform.

The Chetwynd solution is just one example of the many bespoke solutions we have delivered using our proven products and in-house expertise. The following use cases also show how our products and expertise can also be used to enhance safety for **vulnerable road users** via **cyclist protection** and **smart pedestrian crossings** or to reduce collisions with infrastructure such as **bridges and tunnels**.



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1: Hazard Warnings



Coulter Bridge Warnings Scheme

Roads are hazardous and come in many shapes and forms. These hazards can vary widely in nature and severity, understanding and recognising these hazards is crucial for road safety.

The one thing road hazards have in common is the risk to road users which can often be identified, warnings provided, and road safety improved to help with:

- Road Crash Reduction
- Junction Safety
- Queue Protection
- Bridge Incidents
- Hazardous Road Conditions

Road Crash Reduction

Rural roads with tight bends and a lack of street lighting present a major challenge to drivers at night particularly on busy routes. Improving visibility of the road through the use of SolarLite's was so successful in reducing accidents over 10 years the local authority choose to re-instate SolarLites after re-surface works.



70% reduction in night time accidents*

Based on a reduction in accidents over a 2 year period on A143 Haddiscoe, Norfolk and a reduction in accidents on A4226 Barry over a 3 year period.

Junction Safety

Following a number of accidents at a junction in a rural location, a vehicle detection system and vehicle activated signs were used to reduce speeding and increase safety at the junction by notifying drivers of turning vehicles. Due to the location, the whole scheme including signs, detection and communications is solar powered.



Queue Protection

After a series of near misses the Police highlighted concerns of potential rear end shunts on a major route caused by traffic queuing on and off a slip road. A dual location detection system was deployed which activated different messages in different locations dependent on the location of queuing traffic.

Bridge Incidents (Over Height Vehicle)

Bridge strikes caused by over height vehicles can cause major disruption, crashes, congestion and incur significant costs for repairs. Detection and dynamic alerts targeted at drivers can drastically reduce the likelihood of bridge strikes. This use case is part of a wider scheme to improve safety and reduce congestions around an urban city location. The over height detection is deployed strategically in multiple locations to enable large vehicles to turn around before approaching the low-bridge.



Bridge Incidents (Narrow Bridge)

Utilising vehicle classification as opposed to just detection enables this use case to show how multiple warnings can be used to not only reduce collisions on narrow bridges with large vehicles but to also provide personalised warning based on vehicle types.



"Transport Scotland and Amey have worked with Clearview on many safety schemes and value their innovative solution design. However complex the issue, we can be confident that Clearview will develop a solution for it. The Coulter Bridge road safety scheme is another example of an innovative solution to multiple hazards, which we expect will be highly effective in encouraging drivers to change their behaviour."

Pat Shields, Principal Civil Engineer, Amey Consulting

Hazardous Road Conditions

The ability to detect road conditions such as ice, snow and rain can provide valuable information to road users. Clearview Intelligence were asked to provide a solution for a high speed road that is prone to flooding. The road surface was due for renewal in a few years so a more cost-effective solution was sought in the meantime

A solar and wind solution was deployed with non-invasive standing water detection triggering a local variable message sign to alert drivers to the danger.

2: Vulnerable Road Users



Oxford Road Conflict Scheme

Vulnerable road users such as pedestrians, cyclists and motorcyclists face higher risks in traffic environments due to their lack of protection compared to vehicle occupants. Ensuring their safety requires a multifaceted approach that combines infrastructure design, technology, education, and legislation. As a technology business Clearview Intelligence have contributed to the protection of vulnerable roads users by deploying a number of solutions:

- Cyclist Protection
- Conflict Zones
- Night Time Safety
- Smart Pedestrian Crossings

Cyclist Protection

This scheme highlights the issues of drivers crossing over the path of cyclists when turning into or out of a junction, changing directions, or changing lanes. This innovative solution detects cyclists and activates Intelligent Road Studs (IRS2) to alert drivers to the presence of cyclists.



"In a UK first, Hull City Council has worked with Clearview intelligence to bring improvements to the Stoneferry Road corridor. One of these improvements is to bring about better road safety for those using the roads, particularly cyclists and pedestrians." **Hull City Councillor Mark Leronimo, Portfolio Holder for Transportation, Roads and Highways**



Conflict Zones

Manchester's Oxford Road, one of Europe's busiest bus routes and the city's main cycling path, has been revamped to alleviate congestion, pollution, and enhance cyclist safety. Key to these improvements are the new 'Dutch-style' cycle lanes positioned on both sides of the road and routed behind bus stops. This design effectively separates cyclists from buses at bus stops, improving safety.

However, it requires bus passengers to cross the cycle lane, posing a potential risk. To address this, a solution was sought to make the pedestrian crossing area more visible to both cyclists and pedestrians, ensuring cyclists yield appropriately. Additionally, the transition of the cycle lane off and back onto the road around bus stops needed to be clearly marked. The solution.... SolarLite Active Road Studs.



Night Time Safety

The use of SolarLite Active Studs on footpaths and cycleways is often used to provide guidance of hazards such as exits, obstacles and layout. They are a sustainable alternative to street lighting in areas where it is not practical to be deployed as shown in this use case for Malmö in Sweden.

A number of similar schemes have been deployed across the world on rural paths, guided busways, rivers and canal sides. The use of SolarLite studs on unlit paths provides active travel users with the confidence to use these areas at night.

Smart Pedestrian Crossings

Smart pedestrian crossings incorporate different technologies to enhance safety, efficiency, and the overall pedestrian experience at road crossings. They are often used where traditional crossings are not practical to deploy or don't meet the needs of the specific situation.

Advanced detection systems, including cameras and sensors, identify when pedestrians are waiting to cross or are currently crossing the street. This information can trigger the crossing signal, message signs, intelligent road studs and inform other integrated traffic management systems.

Data can be gathered on pedestrian movements and crossing patterns, smart crossings can help city planners and traffic management systems to better understand and respond to mobility needs.

3: Driver Behaviour



A75 Dynamic Speed Warnings

Influencing driver behaviour for road safety involves a combination of education, enforcement, engineering, and encouragement strategies, often referred to as the "Four Es". These strategies aim to modify driving habits to reduce accidents and enhance overall safety on the roads. Clearview Intelligence focus on engineering and encouragement to provide solutions that change driver behaviour for the better.

- Speed Compliance
- Tailgating and Speeding
- Lane Transgression
- Wrong Way Driving

Speed Compliance (Forced Stop)

Ensuring speed compliance is often associated with enforcement but at Clearview Intelligence we focus on changing driver behaviour. The Fairlie case study provides a unique way to reduce speed by changing the traffic signals to a red phase and stopping vehicles that were detected speeding further down the road.



Speed Compliance (Dynamic Speed Warnings)

Clearview Intelligence were initially commissioned to conduct speed surveys at twelve locations along the A75 in Scotland. The surveys highlighted a recurring problem along the length of the A75 with the 85th percentile speed being unacceptably high, most notably with HGV's. Scotland TranServ, as the road operator, wished to put in place a solution that would encourage speed compliance and change driver behaviour.

		Before (mph)	After (mph)
Stranraer	EB	51	46
	WB	50	38
Carsluith	EB	50	45
	WB	51	45
Castle Douglas	EB	53	48
	WB	51	45
Mouswald	EB	50	43
	WB	46	44
Gretna	EB	50	46
	WB	53	45

Data produced by the client Scotland Transerv showing significant improvement in speeding offences

Tailgating – Vehicle Gap Analysis and Warning

Following a series of accidents on the A701 road in Scotland it was identified that the main cause was tailgating (driving too close to another vehicle) and speeding. Building on the success of the A75 Speed Warning scheme the A701 solution was developed to also warn of tailgating using the data collected.

The hardware solution uses the Connex platform to detect, communicate and perform the logic on the incoming data. The Insight Data Management Platform generates gap analysis reports to highlight vehicle class transgressions, measuring performance and providing continuous data for monitoring the scheme's effectiveness.



"By working closely with our supply chain partners at Clearview Intelligence we have delivered an innovative road safety solution that we are confident will deliver real results and save real lives. This solution hits drivers directly behind the wheel as they engage in this potentially life-threatening behaviour."

Vincent Tait, Road Safety Manager, Scotland TranServ



Sherrifhall Lane Transgression Scheme

Lane Transgression

Lane transgression on roundabouts and roads is a common cause of road crashes and collisions. The Sherrifhall Roundabout scheme in this case study was the first of its kind to utilise Intelligent Road Studs (IRS2) and won 7 industry awards in the year it was completed.

Independent evaluation by researchers from the Transport Research Institute at Edinburgh Napier University conducted a full 'before and after' study on driver behaviour at the roundabout. The research showed a reduction in lane transgression activity across nearly all vehicle types and manoeuvres, even during daylight hours, with a significant reduction in transgression rate (>50%) for medium-sized vehicles. Overall, the study has concluded that the intelligent road stud scheme has significant positive impact on collision risk at the roundabout through reduced lane transgressions, meaning less congestion and fewer accidents.



Wrong Way Driving

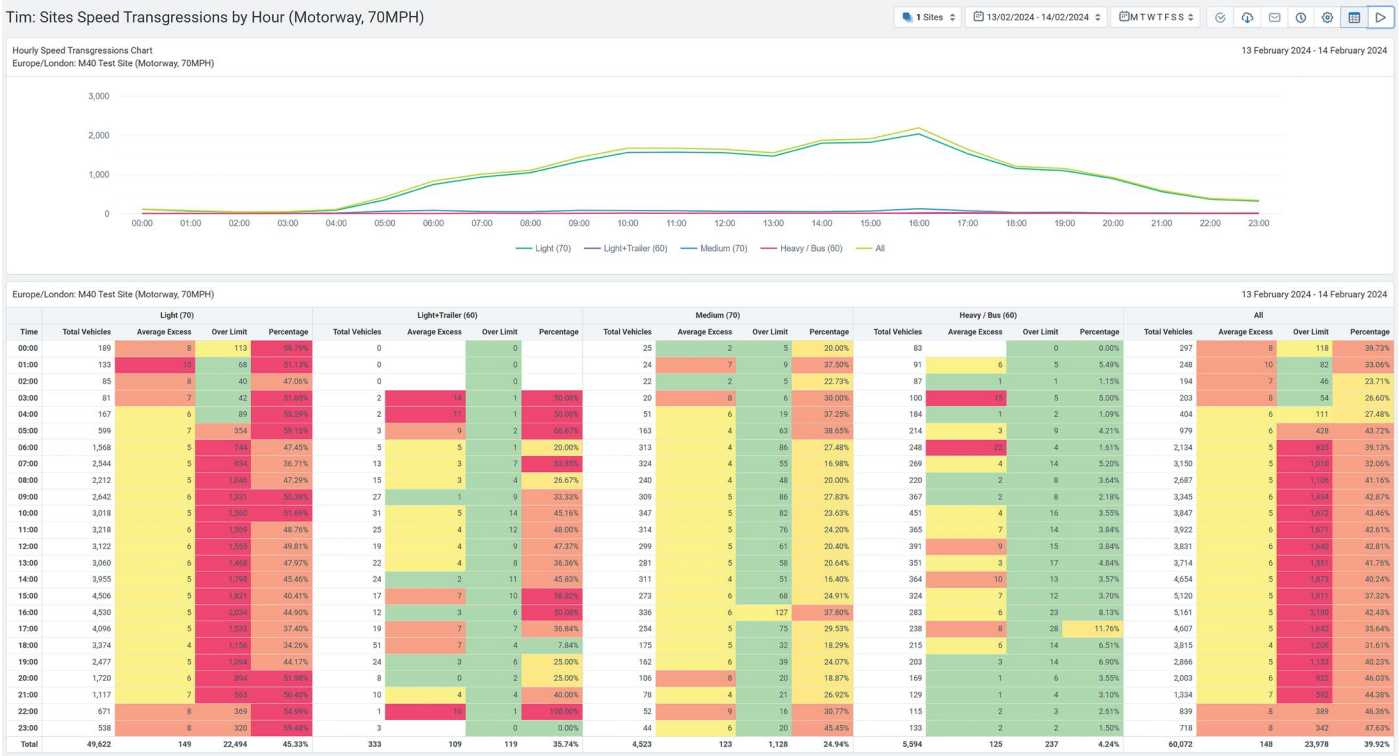
Wrong way driving is a serious issue with the potential to cause multiple car crashes. The route highlighted in this case study suffered issues with drivers travelling the wrong way down slip roads towards fast moving, multi-carriageway traffic.

At both locations, there were static 'no entry' signs but continued reports of drivers travelling the wrong way down an exit slip lane, towards vehicles exiting the motorway or dual carriageways at fast speeds and risking a head-on collision required a solution.

After working closely with Clearview over a number of years, Amey approached the team to discuss how technology and new thinking could be employed to provide an enhanced warning system. In order to attract the attention of drivers it was recommended that the new solution only triggers when a dangerous situation is detected.

4: Analyse performance and risks

Data and analysis play a crucial role in enhancing road safety by providing insights that lead to informed decision-making and targeted interventions. The Insight platform provides a suite of tools to monitor deployed equipment, communications and reports in a single application.



Speed Transgression Analysis by Vehicle Type

Equipment and communications monitoring and alerts provide confidence that safety solutions are operational or aid in identifying issues for remedy. Data analysis supports the development of evidence-based policies and regulations, such as speed limits and ensures the solutions align with objectives.

Do you have a Route Safety problem we can help with?

While this guide covers only a small selection of the route safety schemes we're involved with, we acknowledge that every challenge is unique. Even if your issue isn't described here, we can likely design a solution tailored to your needs.

Clearview Intelligence remains at the forefront of route safety innovation, introducing new products designed to address specific needs. These include Insight Vision AI Edge for event detection, SolarLite Path for pathway guidance, SolarLite Click for enhanced delineation, Connex for Vehicle-to-Infrastructure communication, and Insight Places for speed compliance analysis.





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