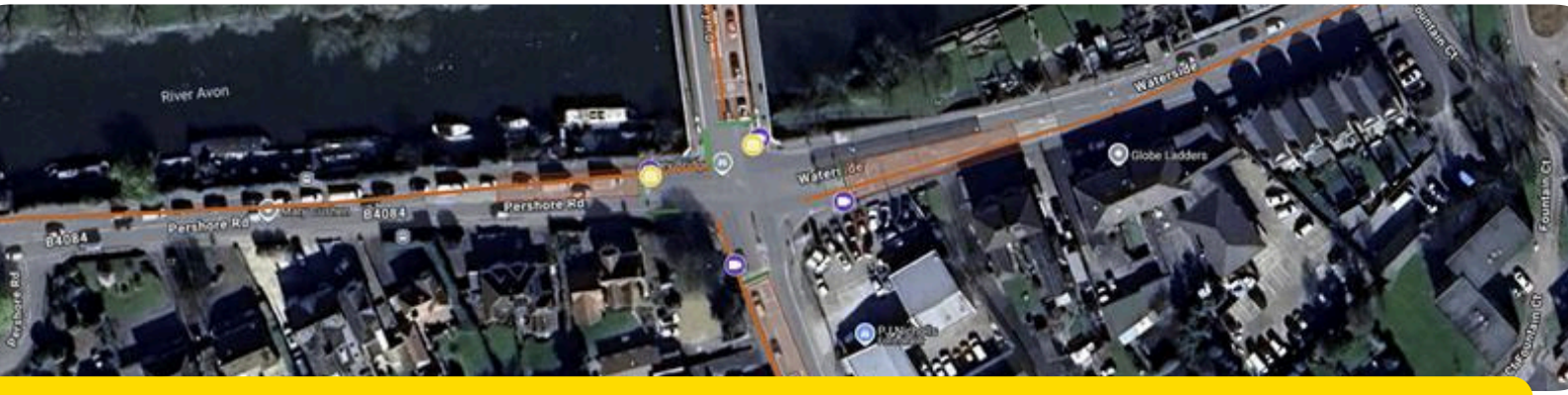
Client: Worcestershire County Council (WCC)
Location: Abbey Bridge Junction, Worcester
Application: Connex Vision



Case Study: Using AI to Deliver Smarter Bus Priority at Abbey Bridge Junction, Worcester

Background

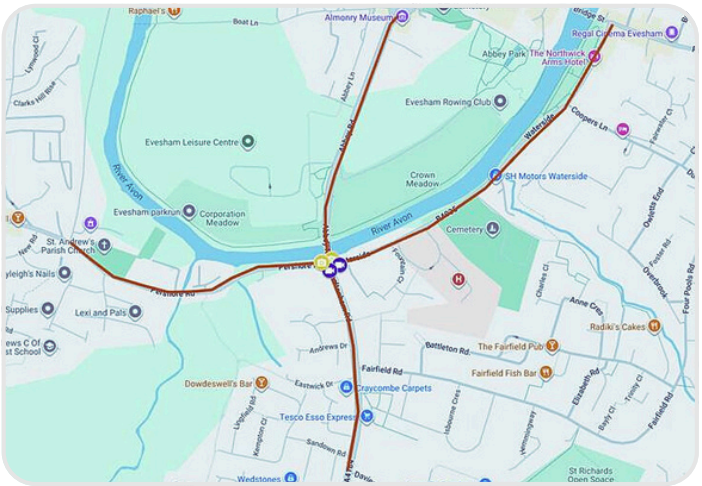
As part of its ongoing Bus Service Improvement Plan (BSIP), Worcestershire County Council is pursuing innovative, evidence-led ways to improve bus reliability, reduce congestion and support sustainable travel.
Having already worked with Clearview Intelligence to validate the performance of vision-based transport sensors across several schemes, the Council identified an opportunity to move beyond data collection and into real-time, automated network optimisation.
Abbey Bridge Junction in Worcester was selected as the site for a Proof of Concept (PoC), providing a controlled, low-risk environment in which the Council could test whether data-driven bus priority could measurably improve public transport performance without negatively affecting wider traffic conditions.

The Challenges

- Complex junction environment: Abbey Bridge Junction is a busy four-arm signalised junction located on a key bus corridor. Each approach covers journey-time spans of approximately 800m to 1.2km, accommodating a diverse mix of buses, private vehicles, pedestrians and cyclists.
- Identifying the causes of bus delays: Bus delays at the junction can result from several factors, including traffic signal timings, congestion, passenger boarding times and general traffic conditions. Without accurate, classified movement data, it was difficult to distinguish genuine congestion-related delays from normal operational dwell times, limiting the Council's ability to develop targeted and effective interventions.
- The need for intelligent, responsive traffic management: The Council required a solution capable of capturing accurate, multi-modal movement data, understanding network occupancy by vehicle classification and demand, and using this intelligence to dynamically influence traffic signal timings in response to real-world conditions.

The Solution

To address these challenges, Worcestershire County Council deployed Clearview Intelligence's **Connex Vision AI multi-modal sensors** at Abbey Bridge Junction. These sensors use advanced machine learning and computer vision technology to detect, classify and track different road users in real time, including buses, general traffic, cyclists and pedestrians.
The system was configured to establish journey-time spans across each junction approach, enabling the Council to accurately measure how long vehicles, particularly buses, took to travel through the corridor. Specialised bus detection and occupancy zones were created to identify approaching buses and estimate passenger demand.
This enabled the team to assess how frequently priority "hurry calls" could be issued to the traffic controller and test intelligent logic capable of dynamically adjusting traffic signal timings in response to real-time demand.
All captured data is securely hosted within the Connex Vision platform, which brings together vision analytics, floating vehicle data and signal performance metrics within a single, data-agnostic environment. This provides a consistent, auditable and defensible evidence base, ensuring that investment decisions and policy development are supported by robust, transparent data.



Journey time spans

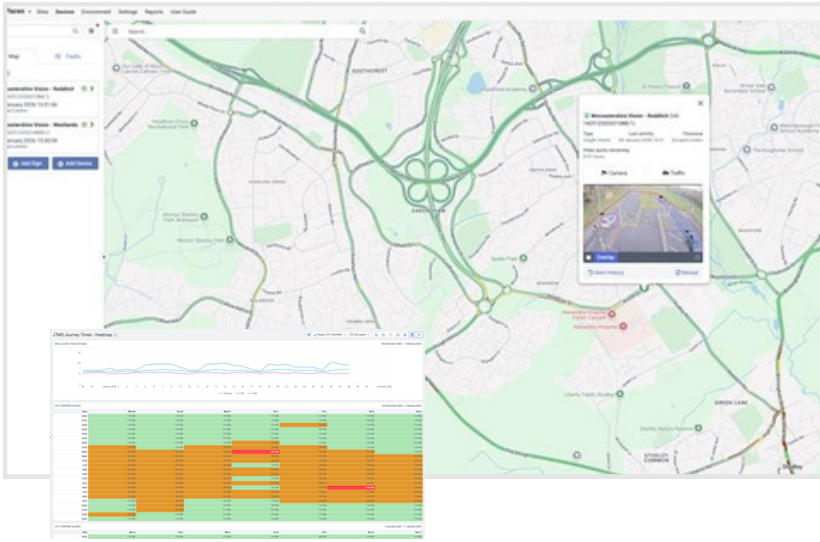
Clearview Intelligence

Implementation

A key strength of the Connex Vision solution was its rapid, low-disruption deployment. By using above-ground sensors and existing traffic signal infrastructure, the scheme avoided intrusive civil works, reduced installation time and minimised disruption to road users.
Clearview Intelligence provided a dedicated project manager to oversee delivery, coordinating installation, commissioning and integration with Worcestershire County Council's operational teams. The physical deployment was completed over just two consecutive days, demonstrating how AI-driven transport technology can be integrated with existing infrastructure quickly, cost-effectively and with minimal disruption.
This approach not only helped reduce capital expenditure but also established a repeatable, scalable model for future deployments across the county.

What the Project Enables

of automated bus priority on both public transport performance and the wider road network.
Through Connex Vision, the Council gains valuable insights into bus journey times, reliability and timetable adherence. This allows the Council to assess whether dynamic traffic signal optimisation can reduce delays, improve service consistency and enhance the passenger experience.
Importantly, the system also monitors the impact of bus priority on general traffic flow, helping ensure that improvements to public transport do not create unintended congestion elsewhere. By distinguishing between normal bus dwell times and genuine congestion-related delays, the Council gains a clearer understanding of the factors affecting bus reliability and where targeted interventions could deliver the greatest benefit.
Beyond bus performance, Connex Vision's AI-powered sensors capture detailed pedestrian and cyclist movements across all junction approaches. This provides a more comprehensive understanding of how the corridor is used, supporting informed decisions around active travel, road safety and sustainable transport planning.



Insight Map Layer and Heatmap Report

Wider Impact and Strategic Value

The Abbey Bridge Junction Proof of Concept (PoC) aligns closely with Worcestershire County Council's wider strategic priorities, including reducing congestion, improving air quality and encouraging the shift towards more sustainable transport.
By demonstrating how AI-powered technology can support automated, data-driven traffic management, the project highlights how local authorities can modernise their transport networks without replacing existing infrastructure or significantly increasing operational demands.
Connex Vision provides a secure, G-Cloud-compliant platform that brings together valuable transport data in a single, accessible and auditable environment. This supports evidence-based decision-making, long-term transport planning and the potential for scalable deployment across the county, helping the Council build a smarter, more efficient and sustainable transport network.

Impact & Value

- **Quicker, more reliable bus journeys** - through data-driven signal priority
- **Clear visibility of true delay causes** -separating congestion from dwell time
- **Protected wider network performance -** avoiding unintended traffic impacts
- **Robust, auditable evidence** - to support BSIP funding and investment decisions
- **Low-risk, scalable model** - for future BSIP and intelligent transport rollout

Conclusion

The Abbey Bridge Junction PoC demonstrates a practical, low-risk pathway to delivering data-driven bus priority. By combining AI-powered vision sensing with dynamic signal optimisation, Worcestershire County Council is building a scalable, evidence-based approach to improving bus reliability while safeguarding overall network performance.

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