

# ADEPT President's Awards 2023

Entry form

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<b>Award category</b>	Digital Innovation/Technology
<b>Project Title</b>	Digital Structures Inspections
<b>Local authority entrant</b>	Essex Highways - Essex County Council
<b>Partner/s if applicable</b>	Ringway Jacobs, Taylor Woodrow, Eurovia

## Headline summary (150 characters max.)

To conduct effective inspections of structures, means that staff need to gain access over, and close to hazards and this reduces both risks and costs.

## Video - please paste links to any video evidence here. (Leave blank if not relevant.)

[https://youtu.be/Y\\_Ve0pENXhs](https://youtu.be/Y_Ve0pENXhs)

## Digital innovation: How has this project shown evidence of successful digital innovation and the imaginative use of new technology? (150 words max.)

Structures inspections are undertaken in high-risk environments which can be disruptive to the travelling public and are costly, creating budget challenges for ECC.

This innovation seamlessly integrates several existing and emerging technologies, together with highly skilled operators and engineers, to create an efficient, digitally enabled end to end process.

To reduce the cost and risk associated with traditional inspections, Essex Highways together with Taylor Woodrow trialled the use of sophisticated drone platforms (flown, floating, submerged) and imaging technology (LIDAR, photogrammetry, heat), with a simple to use digital platform to plan, manage and analyse inspections. Aerial bridge inspections were conducted in partnership with expert pilots, who have vast experience in undertaking asset inspections in several industries.

The use of AI powered technology to assist engineers to identify and target optimised maintenance regimes has increased the efficiency, quality and cost effectiveness of the overall inspection and maintenance service.

## Digital innovation: How has this project shown evidence of improved outcomes for users? (150 words max.)

The use of inspections by drone in 2021/22 proved to be very successful and has resulted in reduced:

- working hours in both inspection time and the time needed to review and evaluate inspection data.
- risk to staff by reducing the length of time they are working in and above water,
- time that staff are exposed to live traffic.
- the amount of time required to inspect Network Rail structures.
- the amount of specialist access equipment required – reducing the carbon footprint of the operation.
- the cost of inspections and improve the efficiency of the team.
- disruption to road users – reducing congestion means improved social value.

On completion of the demonstration day, a Bridge Inspector commented "it's a step into the future and prevents the need for a crew of four in a boat in a fast-flowing river".

**Digital innovation: How has this project shown evidence of the transformation of a service/department/organisation by changing behaviours, delivering savings or improving ways of working? (150 words max.)**

The innovative use of drones for the inspection of structures seamlessly integrates several existing and emerging technologies, together with highly skilled operators and engineers, to create an efficient, digitally enabled, end to end process. This not only reduces the risk to staff but also reduces the cost of inspections and provides video evidence.

The assessment of the 2021/22 inspection programme identified savings of £1,600 per span inspected. Savings are being reinvested by Essex CC which has resulted in,

- more structures are now receiving a Principal Inspection,
- enhancing our records,
- improving our understanding of the bridge stocks condition.
- improved safety and value for money.

It also empowers the engineers responsible for the evaluation of the inspection data, with the introduction of AI enabled analysis reducing time consuming manual visualisation, focusing more on adding value through their engineering expertise.

**Digital innovation: How can the innovation/technology in this project be applied in multiple sectors/areas? (150 words max.)**

This innovation empowers the engineers responsible for the evaluation of the inspection data, with the introduction of AI enabled analysis reducing time consuming manual visualisation, focusing more on adding value through their engineering expertise.

This technology could be applied to any structural inspection regime including buildings, bridges, tunnels etc where personal access is challenging but there is space to fly the drone. This innovation allows a video to be produced and recorded which is then a permanent record of the condition of the structure at the time and can be then reviewed at any time.

**Digital innovation: How does this project demonstrate scalability and resilience - the ability to use technology in a wider scope and in a way that encourages longevity of use? (150 words max.)**

The use of this innovative digitally enabled process has pushed the boundaries of traditional highway structures inspections and seamlessly integrates several existing and emerging technologies, together with highly skilled operators and engineers, to create an efficient, digitally enabled, end to end process. Carbon – the use of drones has several benefits that reduce carbon impact: reduced energy consumption, fuel consumption and carbon emissions, resulting from:

- reduced travel to/from the inspection site.
- reduced use of powered access equipment.
- reduced network congestion.

EDI – high risk traditional inspection activities, such as boat, rope, MEWP access have traditionally been a male dominated sector. The introduction of drone pilots and remotely operated inspections contributes to a more inclusive and diverse activity.

Professionalism – the use of drones has removed significant safety risks e.g., working adjacent to live traffic, and using advanced technology, has empowered the engineers to deliver a professional service.

**All categories: please add anything else that supports your award entry**

To conduct effective inspections of structures, the location of these mean that staff need to gain access over water, across and alongside busy roads. These inspections are therefore undertaken in high-risk environments, can be disruptive to the travelling public and are costly, creating budget challenges for ECC.

The innovative use of drones for the inspection of structures seamlessly integrates several existing and emerging technologies, together with highly skilled operators and engineers, to create an efficient, digitally enabled, end to end process. This not only reduces the risk to staff but also reduces the cost

of inspections and provides video evidence.