



## ADEPT Buckinghamshire Live Labs Programme Environmental Sensors

### Key statistics

The trial involves the installation of the following sensors:

1. **50 EnSense packs**, each with two sensors from:
  - Microclimate – Air Temperature, Relative Humidity, Barometric Pressure
  - Surface Temperature – Road , Pavement
  - Noise Level – Traffic Volume, Alert Sounds (e.g. breaking glass)
  - PIR Motion – Traffic Activity Levels, People Detection
2. **Five Air Quality Packs** measuring:
  - NO<sub>2</sub> & Ozone levels \* Dewpoint, Particulate Matter 2.5, Relative Humidity, Temperature



### Overview of trial

#### *Timeline and progress*

The trial which was originally due to end in Nov 2021 has been delayed and both EnSense and Air Quality packs have not been installed to date.

Regarding the EnSense Packs, the design and integration work for the platform has been completed by the manufacturer, awaiting Contractor resource availability to install and deploy.

As for the Air Quality packs, all the software integration work has been carried out by a third-party overseas supplier, however, COVID restrictions impacted hugely on the lead times to obtain the products and therefore are not available for installation yet. The packs will be available for installation once they are shipped to the UK in due course (shipping date is yet to be confirmed).

#### *Successes*

The sensors have the potential to facilitate better decision-making by Buckinghamshire Council, improving the quality of life for residents in several ways:

- Localised assessment of air quality conditions – integration of air pollution sensors with Traffic Management Control System can dynamically adjust traffic signals according to pollution levels to reduce congestion and reduce CO<sub>2</sub> emissions. This may help reduce instances of respiratory illness in residents, as well as contributing to meeting the net-zero targets.
- Improved security – PIR sensors can trigger alarms and or security lights by motion detection. Noise detection sensors can also be used for incident management and crime detection.
- Improve safety for road users - Micro-climate and temperature sensors monitor and notify transport network managers of weather conditions such as fog or ice. This allows them to take action such as gritting the right roads at the right time and alerting users to poor weather conditions. It may also allow them to target resources, such as gritting lorries, more efficiently, reducing use of gritting materials.



## Lessons

We identified a number of lessons to be taken forward for future implementation.

- The trial relied on a bespoke mesh network. Whilst no detailed assessment has been carried out, it is likely that a commercially available communication network, such as 5G, may have proved more cost-effective and less risky than a bespoke solution.
- Purchasing data from other sources rather than investing in sensor technology may be a more efficient solution and needs further investigation. This could include floating vehicle data from third-party providers (e.g. Here, INRIX, Google and Tom-Tom) and safety related data from vehicle manufacturers.

## Business case

### Benefits

The environmental sensors may help Buckinghamshire Council achieve the following objectives:

- **Connected Buckinghamshire** – Promoting connectivity, new technology and innovation.
- **Growing Buckinghamshire** – Improving response time to asset failures and issues on the transport network whilst making resource and budgets efficiencies hence providing well-maintained transport assets and providing a reliable road network for the citizens.
- **Healthy, Safe and Sustainable Buckinghamshire** – Tackling crime, improving air quality and reduction of congestion hence improve residents' health and quality of life. Helping road users and network operators plan and navigate through difficult weather conditions hence reducing no. incidents, reduce congestion hence providing a safe transport network.
- **Empowered Buckinghamshire** – Facilitating modal shifts to public and active transportation by providing more accurate, timely and useable information, this enables large-scale modal shifts, leading to greener outcomes alongside the benefits for health and wellbeing that active modes bring by encouraging walking and cycling for shorter journeys.

### Costs

Trial costs:

- £257k (complete end-end solution for both environmental sensors and mesh network).

Annual ongoing fees (subject to supplier confirmation):

- £90-150k for 6-month extension (incl. Enlight support and extended product warranties for the complete end to end solution only – excl. Yotta costs).

## Next Steps

- Subject to business case being proven, assess wider appetite for installation.
- Use the lessons learnt from this trial to help ensure successes in future projects of this nature.