ADEPT LIVELABS
Transforming Local Places

ADEPT SMART Places
Live Labs Programme

Year 1 Summary 2019/20

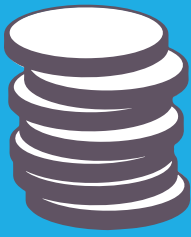Autumn 2020

ADEPT SMART Places Live Labs Projects

Buckinghamshire Council

Central Bedfordshire Council

Cumbria County Council

Kent County Council

Reading Borough Council
Working better with you

Staffordshire County Council

Suffolk County Council

Transport for West Midlands

@ADEPTLiveLabs

www.adeptnet.org.uk/
LiveLabs

#LiveLabs

Year 1 overview

£23m fund

Activity in over 115 locations

8 Live Labs

70 suppliers

4 core themes

plus an emerging theme...

Smart Communications

Smart Materials

Smart Mobility

Smart Energy

Smart Environment

Mix of projects

- Mobility
- Materials
- Environment
- Energy
- Communications
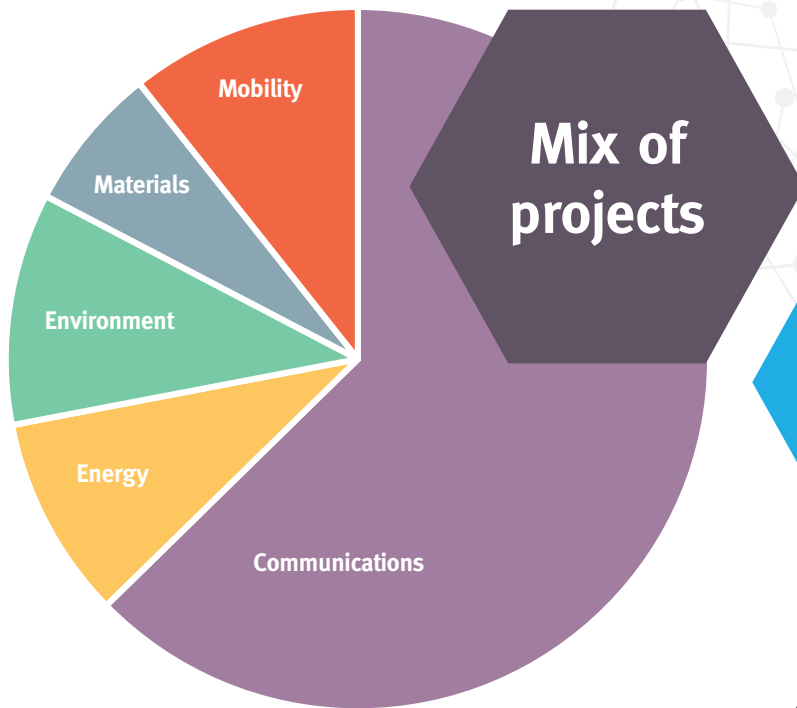
130 applications
from Mexico to Australia

Mix of suppliers

Category	Value
Academic	3
Air Quality	3
Analytics	11
Apps	1
Car Share	1
Composite Materials	2
Data Suppliers	7
Drone	1
Geothermal	1
Innovation	1
Kinetic	1
Management Systems	7
Mesh Networks	1
Micromobility	3
Sensors	20
Solar	2
Studies	5
Support	2
Tarmac	2
Utilities	1
Wind	2

0 2 4 6 8 10 12 14 16 18 20
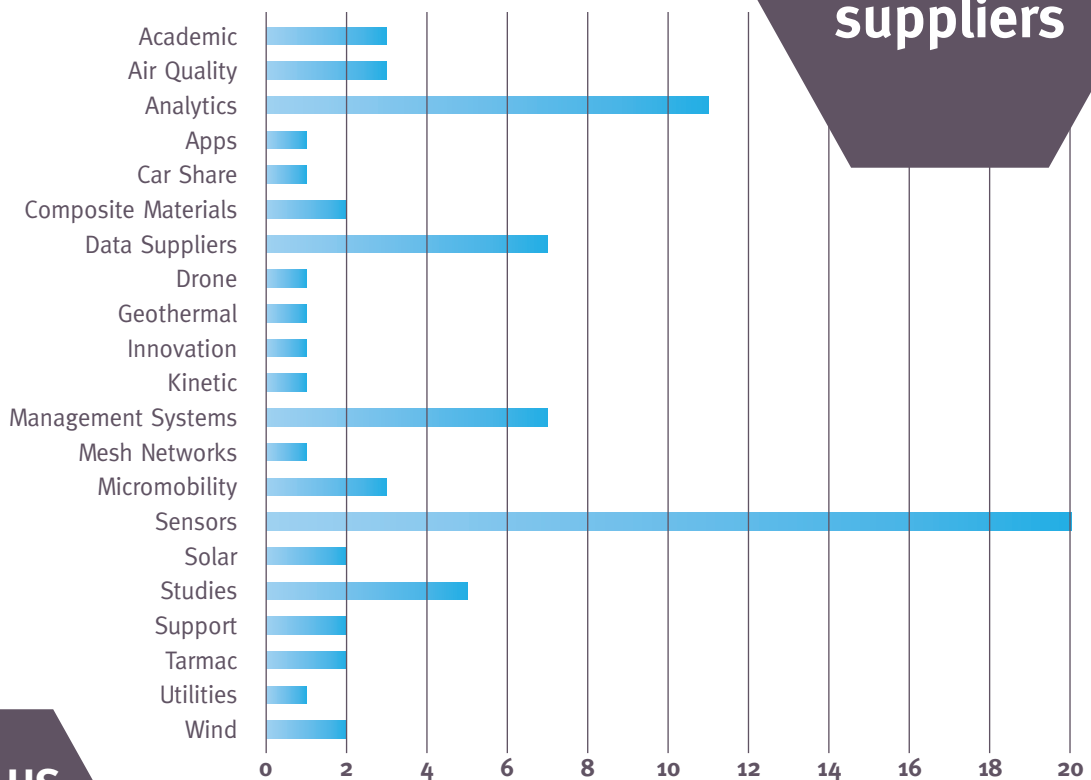
PLUS

1 further innovation competition within a Live Lab

In January 2019, ADEPT - the Association of Directors of Environment, Economy, Planning & Transport - which represents place directors from county, unitary and metropolitan local authorities, secured £22.9m funding from the Department of Transport for the SMART place Live Labs programme.

Eight Live Labs projects led by local authorities with university and private sector partners are piloting innovation across SMART communications, transport, highways maintenance, energy, materials and mobility.

Delivery in the time of Covid-19

When the Live Labs initiative was launched in May 2019, no one could have predicted the extraordinary times we find ourselves in with the Covid-19 pandemic. Live Labs is one of the only national innovation programmes that started before, will go on after, and has been impacted directly by Covid-19.

Mitigating the effects

While the situation has presented challenges such as having equipment held with suppliers because shipping staff are furloughed, manufacturing constraints impacting supply chains and not being able to get workers to site because of social distancing issues, it has also offered the opportunity to refocus the outcomes of some of the projects. For example, one Live Lab using data-led innovation to mitigate the effects of rising traffic conditions – particularly air quality – is now focusing on the unexpected benefits Covid-19 has afforded such as reduced traffic. The opportunity now exists to lock-in those benefits.

Across the programme the Live Labs are still the same projects, but have been given the opportunity to view aims and objectives through an additional set of lenses and ask questions that before the pandemic we might not have asked.

DfT has now officially extended the programme to November 2021, but some Live Labs are continuing to work towards the original deadline of May 2021 – they are not looking at it as an extension, merely a buffer should they need it.

In addition, we are capturing Covid-19 impacts as part of the monitoring and evaluation process to assist future innovation programmes which may be impacted by shock-events.

Unexpected benefits

The teams have also had to adapt to a new way of working, which has itself brought about unexpected benefits. Because everything has had to shift online, many have found that working remotely means they are working more smartly. There is less of the lost time normally incurred by travelling to meetings, with a greater focus within online meetings, so, aspects of some projects have been able to be accelerated. Yes, there have been programme delays but time is being recovered in other ways.

One of the things we have asked ourselves is could we have prepared ourselves for such a cataclysmic event? We know that an innovation programme is going to be buffeted by low level things such as technology and staff changes, but knowing our recent history of crisis – in the last two decades there has been the outbreak of Foot and Mouth, the fuel crisis, the SARS epidemic, and the economic crash – could we have anticipated this? Of course, the very nature of a crisis is that it is completely unpredictable as to when it might happen and what it might look like, but arguably it would be naïve to think there won't be another.

Planning for the future

There is much to be learnt from the impact of the Covid-19 pandemic and we are looking at how we use it in a meaningful way for future projects. Future innovation programmes should have strategies specifically for dealing with shock events and external change.

Over the last few months we have seen incredible enthusiasm and energy from the Live Labs teams, with a real determination to continue to deliver these projects. The resilience of the people involved has been very impressive. It has brought the teams closer together and collaboration across the projects has intensified – everyone is reaching out to each other to find new ways of delivering.

We need to capture this and build on the positives as we come out of lockdown and navigate our way through the ever-changing world.

Stretching our Live Labs going forward

In parallel with the deployment of the Live Labs programme and projects, we have undertaken an extensive independent monitoring and evaluation programme conducted by Proving Service. Formal reviews are carried out every six months, with self-assessment mid-way between the face-to-face reviews. Findings from each monitoring and evaluation review are reported to the Commissioning Board – which comprises partners SNC-Lavalin's Atkins business, EY, Kier, O2, Ringway and WSP alongside ADEPT and DfT – and actions developed accordingly.

With two reviews completed, there are a number of themes emerging, which we see as important 'stretch' aspirations for our Live Labs between now and the programme end in November 2021.
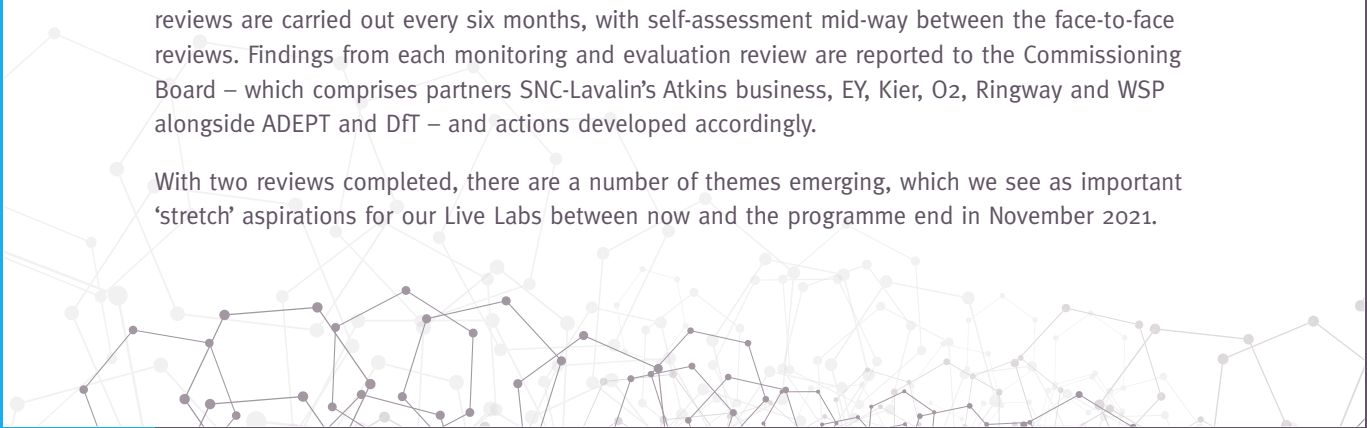
The importance of communications

One of the themes that has emerged is the need to make internal and external communications an intrinsic part of 'business as usual'. The link between this type of innovation project and the wider aims and objectives of lead local authorities, sub-national bodies and central government, is part of the potential catalyst to accelerated change.

The Live Labs programme has brought ADEPT's communications consultants into the bi-weekly group meetings to identify opportunities to raise the profile of the programme, sub-projects and solutions therein and, in particular, where there are overlaps between the various Live Labs.

We will be stretching our cohort to communicate their activities, learnings and insights within their own organisations, via social media channels, through the conference circuit and as we get into the latter stages of the programme, through formal papers.

Learn to share intelligence and ask for help

An unexpected finding to date has been a reticence to ask for help from other local authorities, particularly when perhaps there is a perception of a competitive element. Collaboration was a central tenant of the Live Labs programme and we are now positively encouraging our cohort to be open to sharing and asking for help. With emerging innovation, for example the adult social care theme emerging in Suffolk and Buckinghamshire, our Live Lab leaders are now collaborating and sharing knowledge thus reducing effort, eliminating repeated work and streamlining approaches.

We will be stretching our cohort to demonstrate their sharing, through the monitoring and evaluation programme, to establish a best practice approach that can be replicated in other innovation programmes.
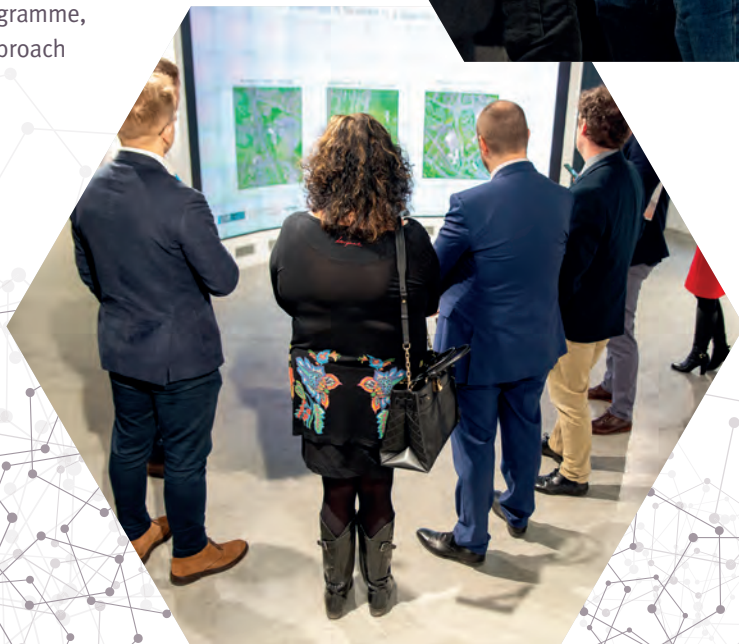
Capitalising on innovation

At the heart of Live Labs is accelerating the adoption of new solutions and technologies to deliver improved outcomes for the local roads sector, both here in the UK and further afield. We expect Live Lab partners and their suppliers to focus not only on delivery and associated benefits, but also on the underlying commercial factors that enable success – vital for achieving a wider step change. We expect our Live Labs to be collecting the technical, commercial and other supporting data to allow others to construct future business cases for their geographies.

We will be stretching our cohort to think about the application of technology and solutions, the relevant use cases and documenting learning in a way that allows an 'off the shelf' approach to the justification of future interventions.

Developing the 'brand'

Finally, we collectively recognise the value of the 'Live Labs' brand as a catch-all for cross thematic innovation. Some of our Live Labs have grown their scope, levered further investment and brought in new suppliers. Recognising that our geographies are 'open for innovation' and that ADEPT, DfT and importantly minsters are committed to change is of huge value.

We will be stretching our Live Labs partners, stakeholders and their supply chains to capitalise upon the Live Labs brand and perhaps use it as a common approach for transportation innovation in the UK.

KEY ACHIEVEMENTS TO DATE

& aims for the next six months

(from our Live Labs)

Case Study - Buckinghamshire Council

Key statistics

- 10 e-bikes installed and in service
- 20 gulley sensors now installed to provide real time drainage data
- 2400 sensors, 170 composite modular lampposts, 10 wind and solar turbines and 20 energy harvesters being manufactured for installation autumn 2020 to spring 2020
- In-depth business and use cases being developed
- Last mile service solutions desk study underway

Year one summary

iDAPS – Illuminated Data Access Points

We are planning to install around 170 replacement lamp columns using new techniques and materials. Typically, our lamp columns are made from metal and have a half-life of around 20 years. By using a special composite material, which is a combination of recycled components (Plastic and Fibreglass), we are creating new lamp posts that will be more cost effective and better for the environment. In addition to this, we will be modifying the existing lighting housing with 3-D printed elements; these are to be created to hold a number of new sensors that we are putting within the lamps. The columns will also have the ability to charge electric vehicles.

Smart Communication Sensor installation & Control Management System

A number of SMART sensors are going to be installed in lamp posts and beyond that will enable of network managers to have better control and understanding of the network in real time. These sensors include but are not limited to: traffic type, traffic count, air temp, ground temp, air quality, flood sensors and Bluetooth sensors. The latter in particular is interesting as we intend to work with our adult and social care department to complement existing care packages. In addition, and in order to manage and control these sensors, a control management system will also be created. This will give us greater remote management of these sensors and will save time and effort for in-field staff.
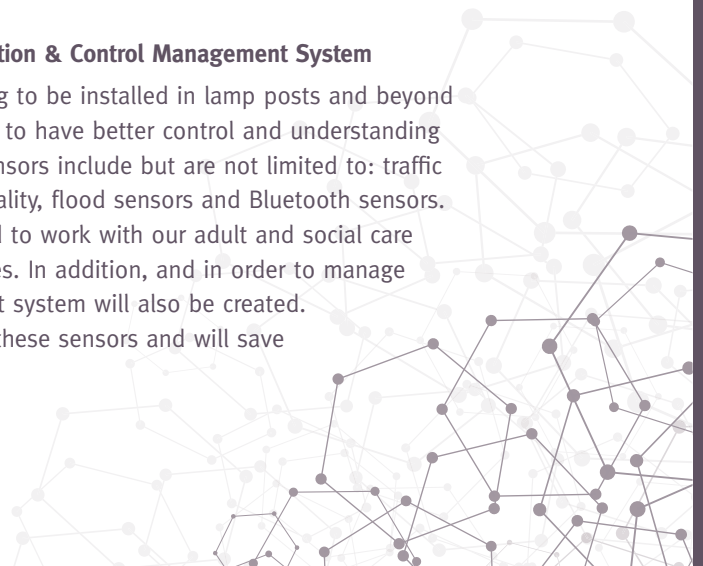
Electric Bikes & Autonomous Vehicles

We are in the process of installing a small fleet of electric cycles at key points across Aylesbury – for example, Aylesbury train station and either side of the new greenway that connects the Waddesdon estate and Aylesbury Vale Parkway. There are discussions with the Local Enterprise Partnership (LEP) to extend this programme to have a small number of cycles at Westcott. This is a new addition and further details will follow. To better understand the impact that autonomous vehicles may have on our network, Connected Catapult has been commissioned to run a feasibility study on the impact of autonomous vehicles as a last mile solution. This study will look at all elements of network traffic such as private, public and freight and will look into what options we may have and what we need to prepare for to be future proof.

Solar, Wind and Kinetic Recovery

With strain on our grid and the need to look into more sustainable ways to create energy, our aim is to tackle this head on with the installation of solar panels and mini turbines that attach to the taller lamp posts to create energy to power the sensors and lights. In addition to this, and in collaboration with Lancaster University, we are going to research and develop a kinetic energy road, which using the weight and friction of vehicles can also generate energy that we will store either in roadside storage or put straight back into the grid.

Adult Social Care integration

The live data collected from the sensors will be used to support clients, their carers (both formal and informal) as well as social care professionals to better understand fluctuations in need. It will also provide improved communication between social care workers and clients to support the Better Lives strength based approach. The overall aim of introducing new assistive technologies is to facilitate greater independence, choice and quality of life to support people in their own homes. The inclusion of data with a more transport focus, such as air quality and road sensors, will be an innovative step that will support and enable vulnerable people to interact with their community and environment in a way that is both safer and provides increased control. The enhanced infrastructure will support the principle of enabling older people, people with disabilities, people with mental health problems and other vulnerable people to live as independently as possible in their own homes whilst providing long term savings to the Local Authority, enabling resources to be planned and deployed as effectively as possible.

What's Next

In the next six months we will have fully delivered our e-bike solution with a full commercial operation. We will have just delivered our feasibility study. Our sensors across the network will have been installed along with our gulley sensors and supporting software. The wind and solar offerings will have also been installed and we will have a final product for the kinetic road ready for installation in the following months. Adult social care will be starting to install sensors and rollout wearables to proposed users. Composite columns will be installed. Our adult social care app will have been developed and tested during this time period.

Case Study -
# Central Bedfordshire Council

Central Bedfordshire

Key statistics

- **Five geothermal probes extending 150 metres into the ground are being designed to deliver a de-icing and heating solution for the Highways Depot at Thorn Turn, Houghton Regis**

- **216 modules of solar carriageway surfacing will deliver an annual production estimated at a maximum of 17,400kWh/year to light the Highways Depot at Thorn Turn, Houghton Regis**

- **Two kinetic walkway arrays will be used to deliver power to two smart benches and a digital advertising and information screen at Leighton Buzzard Railway Station.**

Year one summary

We have been continuing with the project despite delays due to Covid-19, using digital technology to maintain contact with partners at Eurovia in Europe and completing the detailed design for the geothermal project during lockdown. We have completed the detailed design for the kinetic project during lockdown and are continuing to liaise with Network Rail despite a significant number of their staff being furloughed.
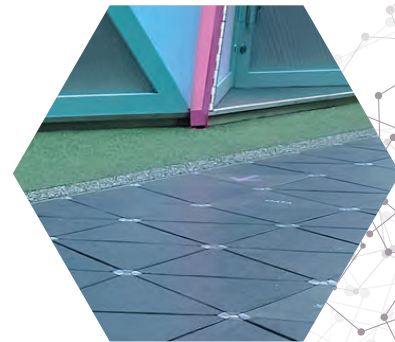
We have overcome the challenge of local authority procurement processes to successfully obtain a waiver to facilitate the formal commissioning of the detailed design stage for the WattWay solar project from Colas.

All three energy projects are now on track to be delivered on the ground in the autumn 2020.

Due to the delays caused by suppliers, supervisors and products being stuck in Europe or on furlough during lockdown, we will now have four separate projects occurring at the Thorn Turn Highways Depot during Summer 2020 (1. Solar, 2. Thermal, 3. EV Charging, 4. Building Extension).

We have successfully liaised with the Project Managers for each project to ensure that the projects do not conflict with each other in terms of location and the space needed to deliver each project.

We have ensured that the staff working both on the site and in the building will continue to have safe access to the site, parking and the office building. Safe access will consider all Government guidelines in relation to Covid-19.

What's Next

All CBC Live Labs were due to be installed in Spring 2020, however Covid-19 restrictions have caused delays to the installations as products and supervisors were in mainland Europe. With restrictions easing, the installation of all three Live Labs is now scheduled for Autumn 2020.

Over the next three months we intend to formally commission Cranfield University and work with them to determine the effectiveness and sustainability of the Live Labs projects and products and look at how they can be rolled out in the future.

Case Study - Cumbria County Council

Key statistics

- Five highways surfacing trials and three quarry trials, with three surfacing contractors laying over 1000 tonnes of material are planned

- The team is working with several testing companies and laboratories to assess the performance of materials

- A total area of 3000m2 (100mm inlay) of surfacing was laid at Lowther Street, in central Carlisle in the summer

- 940m of 60mm binder and 1019m2 40mm surface course containing the MacRebur additive was laid in Carlisle

- Figures from supplier MacRebur have said that the equivalent of 238,958 single use plastic bags were used in the Lowther Street surfacing scheme alone

Year one summary

We have been continuing with the project despite delays due to Covid-19, using digital technology to maintain contact with partners at Eurovia in Europe and completing the detailed design for the geothermal project during lockdown. We have completed the detailed design for the kinetic project during lockdown and are continuing to liaise with Network Rail despite a significant number of their staff being furloughed.

WSP were procured through Cumbria County Council (CCC) professional services framework to manage the project. The WSP project team, with input from the CCC technical team, have collated all of the information from MacRebur and the gap analysis is now complete. Around 200 documents were supplied by MacRebur and have been indexed with full literature review undertaken. The testing and supervision processes, and the documentation to be used, is now agreed.

The first highways surfacing trial as part of the Live Labs project was completed on the 28 July on Lowther Street in central Carlisle. Lowther Street is one of the busiest roads in Carlisle so all works were undertaken at night to minimise disruption.

CCC, working with contracting partners Hanson, completed surfacing trials of around 240 tonnes of asphalt at their quarry and batching plant at Keepershield, near Hexham, laying a combination of materials and additives. This provides the opportunity to gain a better understanding of whether there are differences in mixing or laying and allows for testing, coring and sampling to commence. Materials were laid where all HGVs enter the site and provides a great opportunity for advanced wear testing/monitoring.

Plans are being finalised with Aggregate Industries to undertake surfacing trials at their Back Lane quarry ahead of highways surfacing in South Lakeland. The CCC project team have agreed with DSD contracting and Cemex to undertake trials at the Cemex quarry and plant at Moota near Wigton.

Though our work with WSP has, in the most part, not been affected by Covid-19, investigation and surfacing work has. Staff at our testing company, PTS, were furloughed delaying the results of cores and GPR surveys being processed. Hansons stopped operating at pre-lockdown capacity with their quarry not operating. As a result, the surfacing planned for the end of April was postponed until July.

We have worked with the contractor to ensure that the return to work was safe in relation to Covid-19. Contractors have considered government guidelines to ensure works were carried out safely.

Electricity Northwest, with their civils partner Gallagher's, have undertaken two phases of trench reinstatement trials and are planning a third phase.

What's Next

- Complete all post surfacing testing on Lowther Street
- Finalise and issue video coverage of the Lowther Street surfacing scheme
- Complete quarry trials with Aggregate Industries and DSD
- Commence works on the Kendal Bypass surfacing trial
- Identify and finalise remaining test sites
- Complete third phase of trench reinstatement trials with Electricity Northwest
- Commence / complete the environmental and economic assessment
- Procure academic support for rheological testing – Professor Gordon Airey
- Complete the review of MacRebur quality control procedures

Some key statistics for the Lowther Street installation

- **Total area of surfacing was 3000m² (100mm inlay)**
- **940m of 60mm binder containing the MacRebur additive**
- **1019m² 40mm surface course containing the MacRebur additive**

Case Study -
Kent County Council

Key statistics

- **86 innovation opportunities identified and explored, resulting in 30 projects across all workstreams**
- **11 data integration innovations have deployed on HADMS digital platform**
- **20 asset detection sensors have been installed to date with four gully sensor manufacturers pitted against each other to drive innovation**
- **To date over £600k+ of further funding drawn in to the Kent Live Lab**

Year one summary

We have completed identification of 86 innovation opportunities through engagement and data exploration, alongside development of bespoke agile methodology to scale and grow them. Working alongside Amey, we engaged our operational business from the ground-up to understand their challenges and the opportunities for data-driven highways solutions. This comprehensive review of our operational business delivered 86 opportunities, which were then distilled into 30 different projects to be delivered within the Live Lab.

Working alongside AmeyVTOL we have deployed multiple drone flights in Kent, the first of their kind to assess capability for tracking detailed road defects.

Working with partners Amey, Kaarbontech, UK Flood Defence Alliance (UKFDA) and Map16 we have deployed multiple sensors in 'side-by-side' trials to assess efficacy, while we have deployed the Kaarbontech risk management system in a scientific approach in one of our districts to determine value for money. Deployment of 20 sensors across public bus and KCC fleet tracking video, movement, and telematics data to feed into a defect assessment and prediction algorithm. This innovation will collect ongoing data during 2020, which will then be fed into the HADMS platform to drive intelligent maintenance schedules.

We have developed a customer facing 'info-lytics' platform designed around customer self-service, alongside Amey. This platform will mark a transition to digital customer engagement, mapped around key touchpoints within the business.

We have completed full deployment of the operational HADMS data platform with Amey solutions, created in response to engagement workshops and transformation into business monitoring

operational performance. This includes full visibility around operational performance and compliance measures for reactive maintenance and winter services. Feedback from users is helping to refine and improve the platform to ensure it meets the needs of the business.

Another exciting trial has involved working with an Italian company, Iterchemica, a graphene specialist company, to carry out resurfacing utilising graphene enhanced asphalt in a trial site in north Kent. The material is expected to have a much longer life span than traditional asphalt and over the life of the Live Lab, laboratory testing and site visits will be used to determine the effectiveness of the trial.

The main impact of COVID-19 on the project has been in relation to innovations and trials that rely upon traffic volumes. This has mainly been traffic count sensors and cameras. Additionally, some schemes and major highway projects were either brought forward or delayed and this impacted our work programme. Some sub-contractors have also been affected by supply chain difficulties, which has slowed the start of a few of the trials. These impacts have now been addressed as 'business nearer to usual' has resumed.

In the next three months

- (New workstreams) Planning and discovery for new workstreams (Environment & Air Quality, Trees & Vegetation, Mobility, Pavement Maintenance, Public Transport, Terrain Movement)
- Business analysis and exploration for new workstreams
- Market and vendor assessment for new workstreams
- Lighting network integration
- Strategic platform pilot development
- Risk data service integration
- Drainage tech: monitoring
- Pavement route monitoring tech: commence operational trials
- Smart Winter phases 2b & 3

In the next six months

- Network risk data-science prediction
- Intelligent road defect prioritisation through the use of data-science, exploiting scientific methods to extract knowledge and insights from many structural and unstructured data
- Street Lighting Operational performance analytics
- Trees and arboriculture operational performance analytics
- Computer vision traffic counting and near miss predictive analytics
- Ongoing monitoring and evaluation of RouteReports asset condition data
- Ongoing monitoring and evaluation of gully sensor testbed
- Full customer touch-point mapping and development of 'info-lytics' platform for public engagement with the service
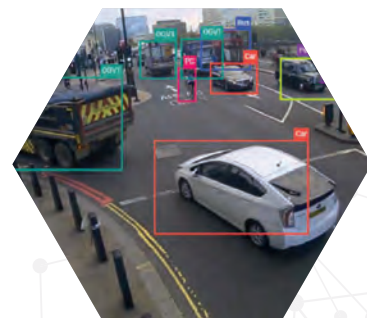
# Case Study - Reading (Thames Valley Berkshire)

Key statistics

- Air quality monitoring has been deployed in three authorities at three focused sites, 30 sensors in total with a further six on order
- Collaboration via 16 multiparty workshops (not including steering committee meetings) sharing knowledge and developing innovation to date
- 16 transport related datasets are being opened up
- Two smart data analytics platforms are being developed
- Four Council owned sites have been identified for smart energy management

Year one summary

Navigating State Aid and Procurement

The separation between the competition run by ADEPT / DfT, which awarded funding to the consortium, and the legal requirement resting with Reading Borough Council (RBC) to meet state aid requirements in passing that funding on to the project partners, resulted in significant challenges for the project. The combination of the value of the contracts, the ownership of intellectual property rights resting with commercial parties, and the lack of a term contactor to RBC that could cover all activities being undertaken meant that RBC was not able to contract as other ADEPT projects have. Navigating these challenges involved two different but linked contracts with different partners and significant delay before the actual contract negotiations could commence, which in turn had their own challenges. For example, University expectations over intellectual property rights vs commercial interests. The achievement of the position in reaching agreement for the contracts is a significant achievement.
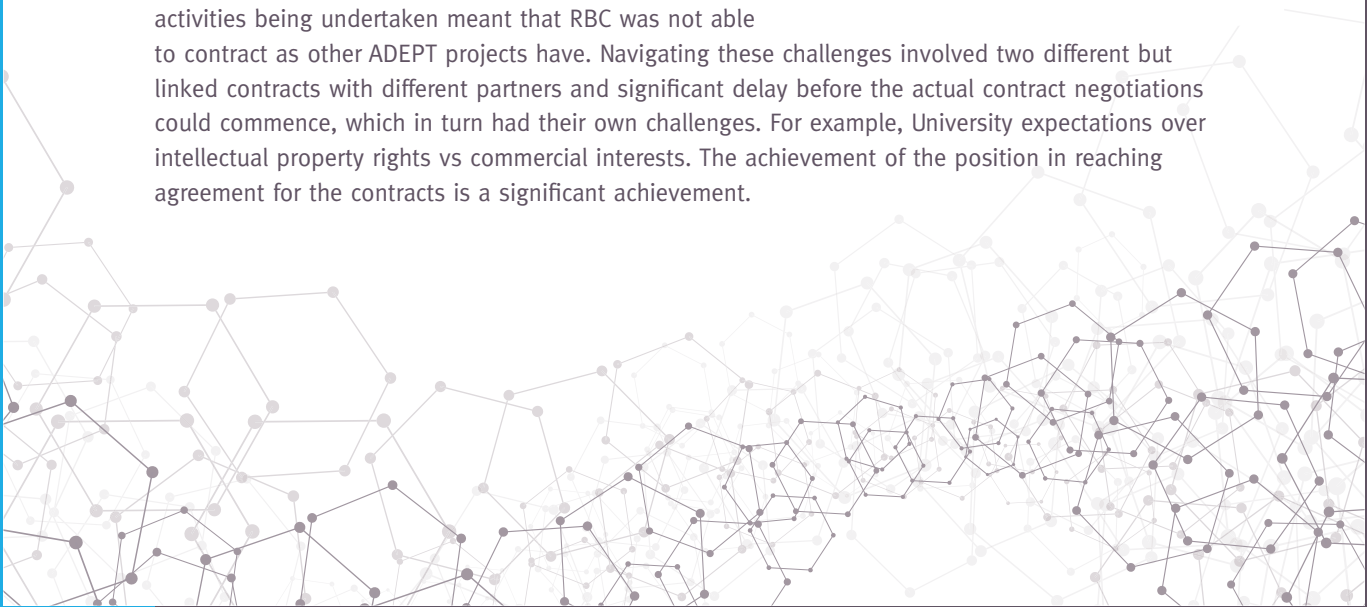
Collaboration to develop a stronger project

As this is a large and complex project, ensuring collaborative working has been a challenge bringing together parties that are used to working in different ways. Success to date has been achieved through an extensive programme of workshops and multiparty meetings, and these have continued through lockdown. To some extent it has been easier to get people together as, without the expectation that people should attend meetings in person, the time involved in the meeting doesn't involve travel. Work is still ongoing to reach the full potential of collaborative working. However, taking air quality as one example, bringing together five different parties along with the local authorities to bring different viewpoints and to debate the objectives of the project and how to achieve them, has led to a stronger and more agile project.

Developing a Smart Energy Platform

Significant progress has been made on the smart energy workstream with the building of a new cloud-based energy management platform for council assets such as schools and offices. This combines energy generation (e.g. solar) with a variety of electric demands including electric vehicle (EV) charging and for some of the assets, EV fleet management. The objectives and use cases to be addressed were developed through energy-focused workshops bringing together SGS, Stantec, O2 and the local authorities. These were converted into a set of platform capabilities and this first phase was completed in May 2020. Two authorities were best placed for the initial deployment with this planned for autumn 2020 and site visits have been undertaken. The platform has been developed and is in the final testing stage to 'go live' in the next couple of weeks ready for deployment and we will have publicity around this.

Development of the Insights Platform

O2 has developed its insights platform ready for the integration of external data. This has included both historic and real-time capability and an API capability to enable integration of data feeds from other project partners, primarily through discussion with Siemens, which will provide one of the main sources of external data feeds for the project. O2 has also developed the algorithms that will be used to turn O2 mobile network data into insights around people movement, travel behaviours and profiles in-line with the project objectives and the outcomes of the project workshops around transport, health and energy.
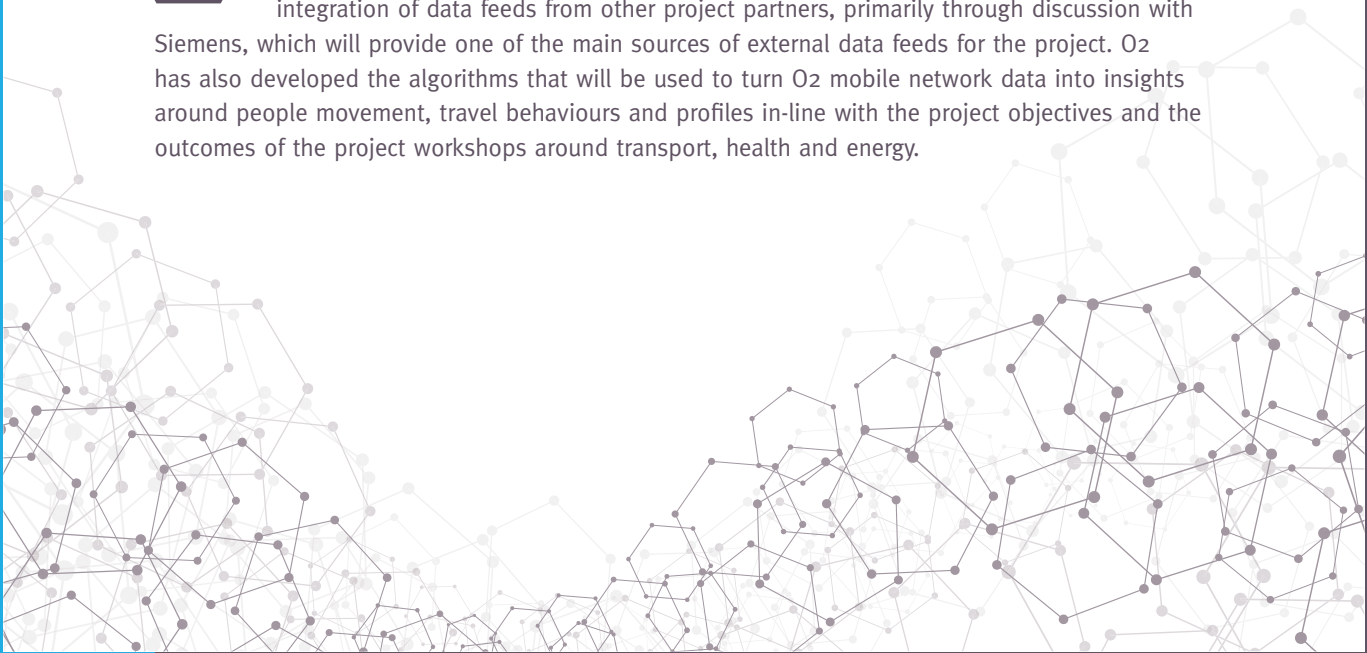
Sub-Contracting Innovation

Key areas of innovation in the project are to be delivered by specialist sub-contractors to O2 and also Siemens. The contract requirements with Reading has put more onus on the procurement process as the sub-contracting has to be more like a local authority procurement – O2 has developed a process to meet these requirements. O2 is 95% of the way to onboarding the first sub-contractor who will cover both the potholes and air quality use cases. Whilst there have been delays in the overall contracting of the project, these have provided opportunities and O2 has used the time and the maturing of the market during this time to adapt the project and to procure a better solution. The O2 approach and process of final selection has been presented to, and discussed, with the all-party steering group. In addition, the first round of Wayra onboarding has been undertaken and O2 has several companies with relevant experience to meet the challenges that will be set through collaboration with the wider project team. This process has been presented to all partners at the Steering Committee.

In the next three months

- Deployment of 30 air quality monitors with data being collected
- Mobilise pot-hole supplier mid-September with the aim to have started installation of camera-based sensors on refuse vehicles with data being collected
- Completion of deployment of the smart energy management system into at least two of the four initial sites with data being collected
- Opened up initial datasets with live data feeds from at least one authority
- Detailed review of transport data from UTC for key routes and identification of any faults that would affect project success
- Extracted mobile data for key roads across Berkshire and commenced data sharing between O2 and Siemens

In the next six months

- With the success in contracting in the last period, the next six months will see significant progress. This will include the deployment of the air quality sensors and the on-vehicle pot-hole sensors. Specialist sub-contractors will have been appointed to provide innovation around pot-hole identification and prediction, air quality modelling and prediction, and energy (EV demand prediction to link to the energy management and O2 workstreams). We expect to have substantially opened up the transport-related data across the six authorities including the Siemens UTMC data and non-Siemens data feeds
- The above will enable data to flow into the insights platform along with the mobile phone data with the commencement of the development of insights and the development of a focus for the Wayra innovation projects
- As a data focused project, we will also start to see much more collaboration as we move from delivering the basic building blocks of the project to innovating around these data

Case Study - Staffordshire County Council

Key statistics

- **131 Innovations reviewed**
- **£1million in grant funding obtained for start-ups and SMEs**
- **A further three bids have been made into Innovate UK to build on SIMULATE achievements to date**
- **11 SMEs brought into the programme for incubation and trialling**
- **Nine live trials in collaboration to achieve lasting improvements in mobility and air quality**
- **Three Air Quality Management Areas (AQMAs) have now been sensorised**
- **Two Micro-mobility operators with over 200 scooters and bikes are going live**
- **Six Demand Responsive Transport simulations, two Green walls to improve air quality, one electric car share service are planned**
- **To date, four different organisations across four different major industries have been brought together**

Year one summary

We became the most subscribed mobility accelerator in the UK with over 100 attendees at the London launch event. The SIMULATE programme (https://simulate-adeptlivelabs.co.uk/) received a total of over 130 applications from all over the UK and world, with applications from Mexico to Australia, The high quality of applications was particularly pleasing and showed the desire of leading SMEs to trial and pilot in Staffordshire.

We are designing and completing feasibility on a mobility hub strategy to be implemented across Staffordshire. Amey's Intelligent Mobility team conducted a study that formed the base for mobility challenges realised by the market. The results indicated that a network of interconnected Mobility Hubs and Transport Nodes providing multi-modal, sustainable and demand responsive transport solutions, could solve many of problems faced by predominately rural counties, delivering on the hypothesis set out at the beginning of the programme.

We have created a new collaborative innovation methodology and a new innovation procurement methodology that is replicable elsewhere. The methodology will be used for assessing and engaging SMEs through problem statement generation and outcome evaluation, through the constant logging of process, success and failure alongside peer-review.

We have been deploying innovative and potentially game changing air quality monitors, alongside established air quality monitors to test the performance and durability against a leading supplier in the UK.

Over £1 million in-kind contributions attracted into the programme through partners and SMEs. Overwhelming contributions from partners including many SMEs who want to trial for free. This fully ratifies one of the programme's original hypotheses; that innovation propagates innovation, when the environment is right, this attracts further partners and investment into the Live Lab.

In the next six months

- Over the next six months the SIMULATE programme will incubate and begin the trials of 10 innovative solutions put forward by leading SMEs from around the world in the county of Staffordshire.
- SIMULATE will put a radical new vision of a network of interconnected mobility hubs and nodes to the test, to prove the theory that underpins the revolutionary intermodal mobility ecosystem. Amey will support the strategic deployment and integration of new mobility modes to meet the demands of travel across the county
- SIMULATE will also deploy and test a varied number of air quality interventions across four live test beds, getting to the heart of air quality problems that have affected residents for generations and understanding the solutions that can mitigate the many problems associated with it. Followed by preparing all the successful solutions for imminent scaling across the ADEPT network

More details can be found on the Staffordshire Live Lab at https://simulate-adeptlivelabs.co.uk/

Case Study -
Suffolk County Council

Key statistics

- 2200 lighting nodes to facilitate digital connectivity
- 10 Adaptive Lighting locations to minimise energy use
- 35 gully / flood sensors to provide improved network resilience
- 60 road surface sensors to help winter planning
- 30 air quality sensors & five parking sensors for air quality to help reduce pollution
- 20 bin / waste detection sensors to help manage servicing schedules
- 26 cameras for traffic detection with an additional 10 bridge strike sensors to improve safety
- 30 in-home / adult social care devices to help support the most vulnerable in the community
- Five wind generation sites with five in-column air quality devices

Year one summary

Internal Connectivity

A Smarter Suffolk has capitalised on Suffolk County Council's rollout of a countywide low-power wide-area network LoRaWAN. The creation of this new communications network has enabled a myriad of sensors to be concurrently installed, thereby allowing an additional compare and contrast scenario of sensors. Colleagues within the Transport Strategy groups are also using the results from our project data to build upon their strategies and make better informed purchasing decisions.

Renewables

Suffolk's Live Lab project sufficiently encouraged SSE Enterprise to step forward as a central management system and sensor provider for comparing and contrasting its products with those of its competitors. However, due to the aspiration to explore lighting column-mounted wind and solar power technology, SSE Enterprise is now developing the business case for wind and solar power on Council land, equivalent on a sunny day to the energy output of a nuclear power station.

Match-funding

The National Composite Centre's 'SME Boost' programme has match funded 50% of the costs to create a composite material cowl in which to house sensors on lighting columns. In addition, the main supplier is developing a lighting column to house sensors internally at low level to obtain accurate air quality data. This aligns with Suffolk County Council's drive to attain as much added value as possible from the DfT / ADEPT funding.

Positive communications

Richard Webster (Project Director) was asked to present a webinar to an international audience explaining our 'A Smarter Suffolk' project. In conjunction with the project being promoted by our partner, Telensa, his presentation was very well received - Richard has been contacted by colleagues and counterparts across the UK, asking about our successes in Suffolk.

Resilience

In spite of the worldwide impact of COVID-19, Suffolk County Council has continued to install sensor equipment, enabling the project to continue, and data to stream in for analysis and utilisation. This business continuity was achieved through due diligence and strong, accountable leadership and first-class liaison with technical staff.

In the next three months

- All orders placed with identified vendors
- Discussions with all stakeholders to conclude resulting in identification of all sites for sensor location
- All sensors installed as per project plan
- Lighting Node installation commenced
- Proposal for Adult and Social Care developed

In the next six months

- As Terms and Conditions have now been agreed, it is the intention that all sensors will be installed to enable a year's data for all sensors
- All lighting nodes installed
- Reports from University of Suffolk and the British Standards Institute to be drafted including results from data gathered and updated as further data is available
- We are now at the stage where discussions with other local councils, to identify meaningful trial areas for sensors, are nearing conclusion enabling the remaining orders to be raised
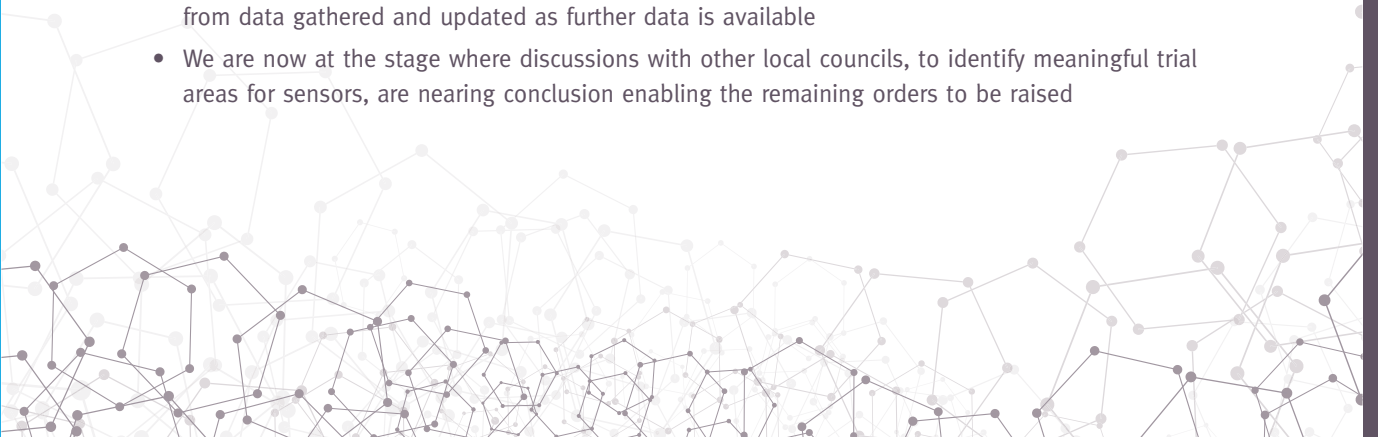
Case Study - West Midlands

Key statistics

- **28 existing cameras across four routes being accessed via a MoU with West Midlands Police**
- **29 new cameras across four routes are being installed via supplier TIS**
- **Cameras are now processing approximately 20,000 traffic records a day to help understand movements**
- **Two separate digital analytics approaches are being pursued**
- **Eight customer segments are being developed across the West Midlands to help understand movement needs in more detail**

Year one summary

In the early stages of the pilot project, partners agreed that the title for the Birmingham and Solihull Live Lab would be 'Network Resilience Live Lab'. This reflects the nature of the project, that it is being coordinated by the Transport for West Midlands directorate of the same name, and that the deployment of cameras and video analytics technology in the project is taking place across a wider geography.

It was agreed that Transport for West Midlands (TfWM), the transport arm of the West Midlands Combined Authority (WMCA) and a new ADEPT member, would lead and coordinate the project. A project board was instigated and working groups are underway, involving Birmingham City Council and Solihull Metropolitan Borough Council as key partners.

Memorandum of Understanding with West Midlands Police

Through frequent and detailed discussion, we have set up a Memorandum of Understanding (MoU) with West Midlands Police (WMP). This includes a Service Level Agreement (SLA), which extends to WMP's contactor that provides the ANPR (automatic number plate recognition) data. This has meant the Live Lab has access to ANPR cameras without the need to deploy more equipment. It also allows for efficiencies with the greater use of the existing cameras and maintenance of those cameras. The main challenge has been ensuring the data we receive is of high enough detail to be useful while also complying with privacy laws.

40% Camera Installation Complete

The strategy the Network Resilience Live Lab has taken has meant that the MoU with WMP would only cover part of the network and we need to deploy more cameras to cover the remaining planned routes. Even with the Covid-19 pandemic, we have been able to deploy 40% of the required cameras, both CCTV and ANPR, with our incumbent supplier, Total Integrated Solutions (TIS). The main challenge through this process has been with the negotiations with the local authorities when certain locations have been identified due to contractor agreements. For example, some lighting columns identified in Coventry are still under the care of the contractor that installed them, and the contractor is not comfortable with taking on the additional liability of adding a camera. This has meant identifying alternative locations.

Birmingham City University Phase 1

One of the approaches the Network Resilience Live Lab is taking towards video analytics is commissioning Birmingham City University to develop a system that utilises open source software. This approach has shown to be accurate in tracking vehicles through the field of view of the camera as well as counting the number of vehicles entering and leaving a junction on recorded video data. The success has led to the commissioning of phase 2 of this work where live camera feeds will be fed to a consumer level computer for further development. Additionally, the software is being developed to be open source and to be able to be redeployed to different systems (on site computer, off site server, cloud computing service). The main challenges have been around getting access to live feeds for further development due to the security around accessing those feeds.

Covid-19 dashboard

As mentioned, several camera sites have now been brought online and the data from these cameras, specifically the WMP ANPR cameras, have been fed to a server run by Amazon Web Services (AWS). This data is anonymised so no personal information is available to us and we are able to classify the vehicle in terms of ownership type (private, commercial, public), body type (car, van, truck, bus, etc.) and fuel type (petrol, diesel, hybrid, electric). This has enabled us to understand the road usage changes during the pandemic and help decision makers understand what is happening on the network. The main challenge has been ensuring coverage across the network when the camera deployment is partially complete. The shortfall has been made up by additional data sources.

Knowledge-sharing and communications

The Live Lab has a clear knowledge and learning plan, and a communications strategy. Through this, we have joined fellow Live Labs in Buckinghamshire and Kent to share our learning to date. We are developing a look and feel that exemplifies the Live Lab. An account of our first external event follows.
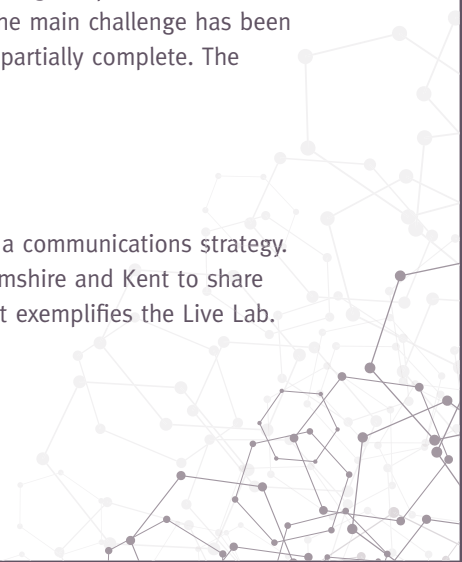
Going Dutch – Enabling Smarter Travel Webinar

We worked with Arcadis in the UK and the Netherlands, to deliver a knowledge-sharing webinar around demand management techniques. This had been originally planned as an in-person event, but the pandemic had forced us to pivot to a webinar. The webinar contained presentations from the Live Lab team and wider TfWM teams, Amsterdam City Council and Arcadis, all around smarter travel initiatives. Thirty plus attendees joined the session and it is now available on the WMCA You Tube channel. The main challenge was getting a time for all the presenters to meet and practise the session, especially as most them are based in the Netherlands.

Watch the webinar here - https://www.youtube.com/watch?v=5HeheiYeBdA

In the next six months

- Complete the deployment of the remaining cameras. Currently eight routes are covered by a combination of cameras from WMP and TIS. A further three have been identified and have been quoted against. Within the next six months the plan is to have the cameras deployed along these routes and linked back into the TfWM analytics systems

- Investigate the cost of extending the coverage to the rest of the West Midlands Key Route Network. In addition to completing the planned 11 routes, the suppliers will be asked to quote against the remaining KRN routes. This will allow TfWM to expand the network camera coverage quicker. The expansion is based on favourable results of the analytics work and will consider any optimisations that come from that work

- Continue development of the AWS analytics system. The system is currently processing over 20,000 records a day from a the A34 south and Birmingham Cross City routes. This will increase as more cameras come online and can be fed into the system allowing for optimisation and nuances of traffic across the network. This work will potentially allow for human centric routes used to be mapped which can lead to better route design

- BCU analytics system using live data to improve the efficiency, accuracy and reliability of the system. This will allow for an alternative system to those developed by standard providers while allowing for TfWM to develop bespoke systems for various situations. The current state of development shows good accuracy with known video data, the next phase will use live camera feeds. This will allow for optimisation of the system

- Begin work with a strategic marketing agency via a procurement exercise with Connected Places Catapult (CPC) to engage customers in the West Midlands in ethnographic research. CPC have now developed the roadmap to build on the existing All Traveller Segmentation

- Begin work on developing the communications strategy for the emerging Granular Personas based on the work with CPC. As the ethnographic work is being completed, the implementation of the messages will be fleshed out in line with the research results

- Where possible, attend events to promote and discuss the Live Lab with colleagues and peers. Many events are still planned to go ahead in person but there is still a threat that these events will have to switch to virtual events. If this is the case, TfWM now has experience of presenting via platforms such as GoToWebinar. This allows for discussions and promotion of the Live Lab with new parties beyond the project

More details can be found on the West Midlands Live Lab at - www.tfwm.org.uk/livelab

ADEPT **LIVE**LABS
Transforming Local Places

ADEPT SMART Places Live Labs Programme

Steering Group

ADEPT
Association of Directors of
Environment, Economy, Planning & Transport

Department for Transport

SNC·LAVALIN

ATKINS
Member of the SNC-Lavalin Group

EY

KIER

O₂

RINGWAY

WSP

@ADEPTLiveLabs

www.adeptnet.org.uk/
LiveLabs

#LiveLabs