COUNCIL AI SOLUTION

CASE STUDY

Blackbook ai

Microsoft
Solutions Partner

Kerbside dumping is an ongoing problem faced by local council waste management teams around Australia. The clean-up of kerbside dumping can cost a local council upwards of $500K a year, and in some cases over $750K, not including environmental restoration or infrastructure damage. While illegal dumping is finable and refers to anything greater than 200 litres in size, rubbish piles outside of bins and bin collection days are of council interest as they pose a public health hazard and need to be flagged for removal.

THE CHALLENGE

A local council was frequently impacted by dumped rubbish piles and mattresses on kerbsides.

Regularly scheduled waste management trucks were unable to collect the rubbish piles and mattresses.

Reliance on rangers and citizens to report the rubbish piles and mattresses. Could take weeks to be discovered and reported.

Manual collection dispatch service was responsive rather than route and load optimised.

Lack of historic data for education/awareness campaigns, signage and patrols to deter future dumping behaviours.

CHALLENGE #1:
NO LABELLED TRAINING DATA

Annotated dataset was built from the councils smart enabled trucks historic database of video footage.

Via in-cabin controls the truck operator could trigger an image capture from the camera when they sighted a mattress or rubbish pile.

CHALLENGE #2:
ATTACHING A STREET ADDRESS

The GPS and GNSS camera footage could be linked with the trucks' GPS to triangulate the location of model detected rubbish piles and mattresses.

Using an API, return a user-friendly street address for the latitude and longitude.

THE SOLUTION

Blackbook ai was engaged by the council to develop a solution that would harness the garbage truck cameras as a reliable and consistent source of data for detecting rubbish piles and mattresses left on the kerbside.

THE PROCESS

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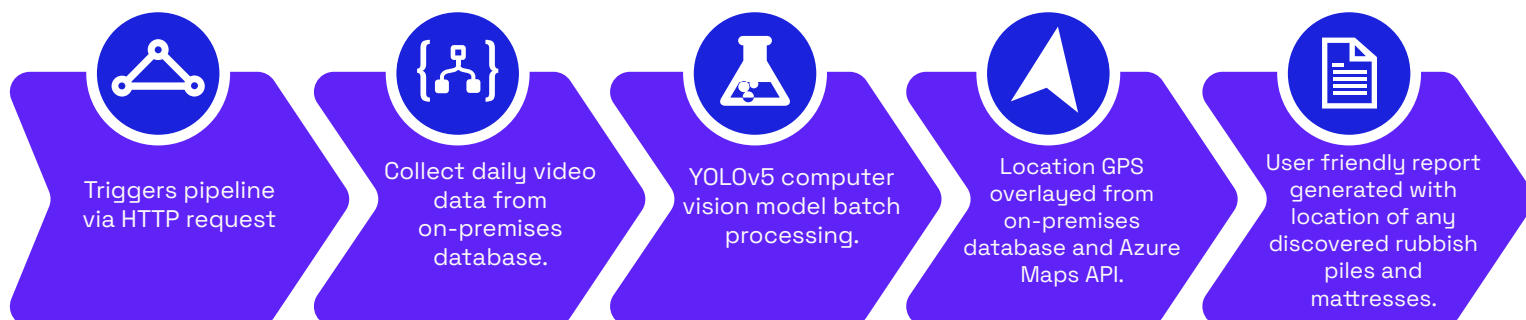
Prove that this was indeed possible.

After a successful POC, the crossover to production was streamlined and the council confident in the rapid adoption of the project into their waste management strategy.

THE TRAINING PIPELINE

Collect fresh training images from on-premises database.

Images pushed to Blob Storage Account

Council resources label images using Azure Machine Learning data labelling service

Labelled images merged into existing dataset.

Model re-trained monthly using Azure Machine Learning.

THE INFERENCE PIPELINE

Triggers pipeline via HTTP request

Collect daily video data from on-premises database.

YOLOv5 computer vision model batch processing.

Location GPS overlayed from on-premises database and Azure Maps API.

User friendly report generated with location of any discovered rubbish piles and mattresses.

THE RESULTS

The local council was able to unlock the value of their raw camera data to drive decision making.

- Cost savings through route and load optimisation of manual dispatches.
- Data driven behaviour change initiatives.
- Targeted campaigns and response monitoring.
- Reduced response time and improved rubbish pile and mattress detection coverage.
- Reduced environmental and infrastructure impact and restoration costs.