

Policy-driven optimisation with ImFlow in Cheshire East

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Synopsis

We showed last year how SWARCO's adaptive traffic optimiser, ImFlow, can improve general traffic flow. Can we use dynamic policies to benefit certain road users? Is it possible to balance the conflicting needs of different groups and the wider public?

Problem Statement

The Council's Strategic Infrastructure, Active Travel, Transport Services, and Air Quality teams have potentially conflicting objectives or policies. We therefore needed to consider the following stakeholders:

- Motorists wanted shorter more consistent journey times and less queues.
- Bus drivers wanted priority over other road users and again more consistent journey times and less queues.
- Cyclists wanted better facilities at junctions including priority over other road users.
- Pedestrians and vulnerable road users wanted more crossing points and reduced waiting time for pedestrians and vulnerable road users.
- Everyone wanted improved air quality.

However, anything which favours cyclists or pedestrians usually has an adverse effect upon motorists and air quality. Anything which favours motorists has an adverse effect upon cyclists and pedestrians.

We therefore need a flexible method of control which can be quickly and easily adjusted to achieve a reasonable balance for all users. We also need to be able to objectively measure the impact of any changes we make.

What we have done

We chose a busy signalised crossroads at Hightown in Crewe as a pilot site. All four approaches to the junction have pedestrian crossings.

Smart Cameras

We chose SWARCO Smart Cameras for detection. These have several relevant advantages:

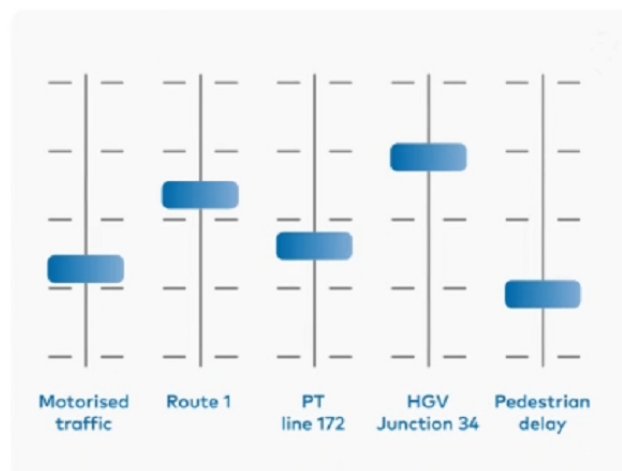
- Inbuilt AI allows them to quickly and reliably classify various modes of transport. This includes volumetric measurements of pedestrians waiting to cross.
- They provide detection at various distances from the camera, meaning that potentially fewer detectors are needed.
- They can act as traffic cameras, allowing engineers to remotely assess the road network.
- A network of Smart Cameras can accurately measure and record journey times and traffic flow. This allows short and long-term feedback on any changes to traffic control.

ImFlow

We demonstrated last year that ImFlow can improve general traffic flow. For this pilot we are going to selectively use the dynamic policies of ImFlow to favour different road users. The Smart Cameras should allow us to quickly measure and record the effects of any changes we make.

Each policy is supported by pre-defined code that can provide different degrees of benefit to each mode. Policies can be applied to individual junctions, corridors, or an entire City, allowing identification and special handling of buses and HGVs, for example.

ImFlow is a distributed system that doesn't need a central server for control, although adjacent junctions communicate so they can coordinate themselves. For this pilot we are supplying the cloud-based ImFlow Central system, which comes with sliders that allow the user to remotely and instantly change priorities.



Outcome

The pilot is expected to last for up to four weeks. The hoped-for outcome is that we demonstrate the ability of varying sliders to benefit some road users (e.g., buses) or council policies (e.g., reduced tailpipe emissions), without excessive detriment to others.