

JCT Submission 2024:

'The journey from parking guidance to urban traffic management and control with SWARCO MyCity' by Andrea Newman, Swarco UK and Ireland Ltd

Introduction

The rapid wheels of urbanisation show no signs of stopping. According to the UN, more than half of the world currently lives in urban areas, with this figure expected to rise to 70% by 2050.¹ The case for the UK is even more extreme, as more than 83%² of the population lives in towns and cities, which translates into vast road usage, and in turn the constant challenge of congestion. The latest statistics from the Department for Transport (DfT) show that motor vehicle traffic on Great Britain's roads continues to increase, up 2.2% between 2022 and 2023, to 330.8 billion miles.³ A recent survey from location technology company TomTom found the average UK driver is forced to spend 84 hours per year stuck in traffic.⁴

For city managers and local authorities, the primary traffic task is naturally to reduce congestion and increase the efficiency of traffic management within their town or city, as well as improving air quality and harmful emissions. Encouraging the use of public transport, implementing low emission zones, as well as priority lanes, route planning and parking guidance systems are some of the more common approaches.

Parking guidance systems are designed to provide drivers with real-time parking information to assist in finding a parking space as fast, convenient and efficiently as possible. Systems that provide data and clear signage to the nearest car park, coupled with information on the number of available parking spaces both on and off street are key to reducing the time spent by motorists searching for vacant spaces in urban areas. The result is a reduction in traffic volumes, as well as a reduction in harmful emissions, noise and sound pollution.

The most effective parking guidance systems combine many different technologies and elements, including traffic signage, detectors, indicators, controllers and more. Although they can be effective when implemented individually, they can be combined to create a complete and fully integrated system.

Beyond making parking a more seamless and stress-free experience for road users, parking guidance systems can play a key role in urban mobility management when upgraded to Urban Traffic Management and Control (UTMC) functionality.

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extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.un.org/en/ecosoc/integration/pdf/fact_sheet.pdf

² <https://www.gov.uk/government/publications/trend-deck-2021-urbanisation/trend-deck-2021-urbanisation>

³ <https://www.gov.uk/government/statistics/road-traffic-estimates-in-great-britain-2023/road-traffic-estimates-in-great-britain-2023-headline-figures>

⁴ <https://www.thesun.co.uk/motors/27434290/brit-drivers-175-days-in-traffic-over-life/#:~:text=DRIVERS%20spend%20175%20full%20days,twice%20the%20figure%20in%201994.&text=Over%2050%20years%2C%20that%20works,to%20148%20hours%20every%20year.>

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Addressing and managing these coexisting issues, however, is a challenge and not one with a single answer. The challenge primarily comes when a local authority relies on a series of separate data sources and separate monitoring, which presents a key issue: how to best manage the surplus of data relating to the separation of their traffic management system.

This is where SWARCO's MyCity solution comes in. The platform unifies the various elements of traffic management in a single, easy to use system. Recognising the need for a holistic solution, in 2017 SWARCO integrated the various elements of its software products together, combining them into one platform.

SWARCO has long-standing expertise and experience in traffic management and mobility, with a proven track record of working with many local authorities and city planners to make their transport systems more efficient, reduce emissions and improve the overall quality of life for local residents and communities. So when it came to creating its new UTMC system, to ensure that it would meet the needs of local authorities, it conducted more than 450 interviews with relevant stakeholders, which reveal several consistent preferences: automation, modularity and scalability.

Parking guidance to UTMC – A phased approach

The journey from upgrading parking guidance systems to UTMC functionality is, naturally, different for each individual customer, there is not a one-size-fits-all solution. But SWARCO's approach is based on the design and implementation of different phases. A process which begins with SWARCO conducting an initial audit process, working with the customer to get a full understanding of its current travel needs and existing infrastructure, as well as its future plans and objectives.

By way of example, let's consider a local authority customer that is currently using a parking guidance system in conjunction with parking guidance signs, full RGB Variable Messaging Signs (VMS) and car park counters to support drivers find available parking.

This customer is looking to expand its capability to further enhance the parking experience and wants to be able to monitor and access journey time information. This additional information and data can be used by the authority to provide the travelling public with specific journey times to location in real time, including journey time to car parks, via the full RGB VMS signs.

Pilot phase

SWARCO begins this journey with the customer, by outlining and providing an initial pilot phase. The pilot phase is designed to demonstrate how the overall project will be delivered on an initial smaller scale to provide confidence in how the platform works and how it can meet their requirements, whilst showcasing how it can be scaled up as necessary.

The pilot consists of SWARCO selecting up to five VMS signs and one local car park and migrating them from the customer's current system onto SWARCO MyCity. During the pilot phase, SWARCO provides the customer with in-depth training and workshop sessions on how to use the signs and car park modules within the MyCity platform. The team also shares useful hints and tips to maximise the pilot period, which typically runs from four to eight weeks. During this time, SWARCO hosts regular bi-weekly review meetings with the customer to inform them of any changes or connections made on the system, as well as receiving feedback on how the system is working for the customer.

At the end of the pilot, a completion meeting is held to discuss the performance of the pilot and to discuss the approach for a full phased migration process. The migration process works by selecting small areas of the customer's current system and recreating them on the MyCity platform. These assets are then connected at a suitable time for the customer to the on-street equipment, and tested to ensure the functionality is working correctly. The migration process gives the customer time to experience the system for longer and gradually get used to the key functionality and how the system works before fully moving over. The migration process can take between four weeks and three months depending on the size of system involved in the migration.

Phase one

Phase one of the migration process is all about taking learnings from the pilot and implementing these. Again here, the focus is on selecting a small number of traffic management assets or focusing on a specific location within the customer's local area, and migrating these assets, whether that's VMS signs, vehicle activated signs, school signs or car park counters, onto MyCity. MyCity provides monitoring to share, process and analyse data from different systems in an urban environment and acts as an aggregator of mobility-relevant data sources. Moreover, the data can be collected in real time to respond to situations as and when they occur, or for historical insight to be used for long-term planning.

As with the pilot, phase one is focused on providing the customer with training to enable them to train their operational staff on how to utilise and maximise the MyCity platform to increase familiarity with the new system. At the end of phase one, which typically lasts between one and four weeks, another review session with the customer is held to confirm the operators are happy with functionality and operation of the platform, and then the journey can move forward into phase two.

Phase two

Phase two of the migration process is generally larger than phase one, increasing the number of suitable infrastructure assets, or specific locations, to migrate from the current system onto MyCity. Typically, at this stage, the customer, and their operational staff, are comfortable with utilising the functionality of MyCity, enabling more assets to be migrated, and making it easier

for day-to-day operations to be managed, and in turn enabling greater control of the whole traffic area network.

Following another review meeting with the customer, the project can move forward to phase three.

Phase three

The third and, generally, final phase of the migration process is about completing the migration of traffic management and assets, taking all of the assets that remain on the customer's current system and adding these to their MyCity platform. This will enable the customer to manage their entire estate of signage, signals and controllers across their city or town through a single platform. SWARCO conducts final testing to confirm and ensure the migration has been successfully implemented.

However, this is not the end of the journey. From here, SWARCO works with the customer to help identify and develop additional requirements and interfaces that can be fulfilled through MyCity.

All of the customer's parking guidance assets are now all being monitored and controlled by a system capability of UTMC functionality, being a modular system the customer can choose what additional data and therefore functionality it requires to make informed decisions about its transport links, and traffic flow around the network. This includes the integration of the MyCity Journey Time functionality.

Enhanced functionality

The MyCity Journey Time functionality visualises and reports on the extracted data from connected detectors regarding average, minimum or maximum journey times and gives the customer an overview of vehicle speed and waiting times. It also monitors the status of vehicles moving on a particular set of paths or sectors of paths. MyCity identifies which routes have the most and the least traffic delays and visualizes this data in real-time with colour-coding on a map. Historical data can be evaluated in the system and extracted.

It also takes advantage of Floating Car Data (FCD) to evaluate journey time. With FCD, not only is the data between points A and B as a straight journey being evaluated, but so too is the data for any possible exceptions that might happen along the way, for instance, the traveller stopping at a petrol station and, therefore, leaving the original route. This provides cities with a more accurate view of how real-life journeys look and enables cities to create strategies to improve traffic flow on the most congested routes.

In addition to journey time, a number of additional models – including strategy manager, traffic light controllers, environmental devices, public transport information, roadwork data and more

– can be added to the customer’s MyCity platform to further enhance urban mobility and management.

Created, setting and searching for messages to be displayed on the VMS signs is seamless via MyCity. In the platform, customers can create their own message library with an easy-to-use search function that enables VMS messages to be applied in the click of a button to allow agile communication to road users.

MyCity’s strategy manager function gives customers the ability to use data which is being received from different interfaces, and allowing this data to be used to trigger different actions across the platform.

For example, the strategy manager can use the journey time going into a city and monitor for when it goes above a specific travel time to indicate that there is a delay going into the city. It can also take additional data in from a car park within that city centre and monitor when the occupancy of that car park goes above a specific percentage to show the occupancy level of the car park. With these two pieces of information together, the system can monitor the specific day or time of day and if that meets with the requirements set out in the strategy manager, the system will automatically change a plan on a traffic signal, set messages on VMS signs to inform road users before they get into the city that there are delays and suggest different routes or car parks to use, and information operations staff of issues in the area in real-time. This can help reduce congestion in a city before it gets to an unmanageable state, and provides road users with more.

The system can also be used to direct road users to park and ride facilities outside of the city to reduce emissions in the localised area. This can be achieved by monitoring the inner city car parks and when the number of free spaces is greater than 50%, to use VMS messaging to alert road users of busy car parks and to suggest they use the park and ride facilities. This can be completely automated on the MyCity platform, and additional data can be used to help supplement this process, such as air pollution, vehicle count, journey times and even multiple car parks.

Each of the modules are available to add to the system to increase the functionality from ‘just a Parking Guidance System’ to a more complete UTMC system. The overall vision is that the connections are agnostic from any external system, regardless of manufacturer or software, can be connected to the MyCity platform to allow users to have the flexibility to view and use all of its data for traffic improvement and flow to be accessible in one location.

Conclusion

Smart urban management and mobility solutions, such as SWARCO MyCity, provide real benefits when it comes to realising greater efficiencies in enhancing traffic management. SWARCO MyCity is a holistic traffic management system providing all the tools and solutions local authorities and city planners need in one piece of user-friendly software. Its modularity allows flexibility to meet

specific requirements, size and budget of the city, as well as scalability for those operators looking to prepare for the future. It is, in short, a global solution built to solve local challenges.

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