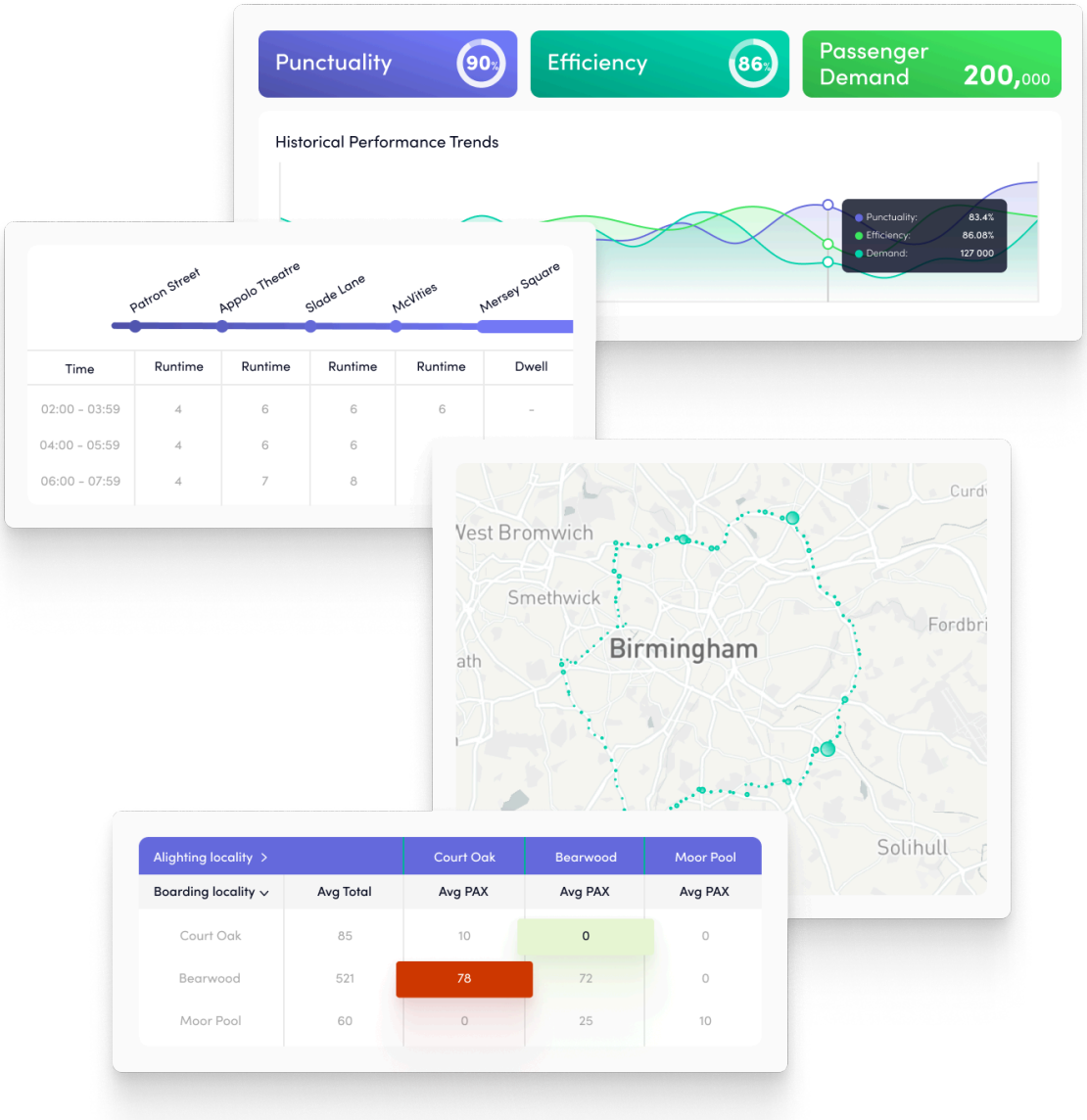
cityswift.

CitySwift

G-Cloud 14, Service Definition



cityswift.

Table of contents

Introduction

Company Overview

CitySwift is an Irish intelligent transport data company that powers major bus networks across the globe. CitySwift's cloud-based platform offers bus network providers and local authorities precise historical and predictive data analysis and insights at speed. The CitySwift team merges a background of real-world bus industry experience with deep knowledge of data science, to give bus networks the best of both worlds.

Value Proposition

The CitySwift platform cleans, connects, and analyses key data sources across the bus network to build a range of historical and predictive insights. Bus network providers and local authorities can finally make data-driven decisions with confidence, by understanding and optimising the bus network based on high-quality and reliable data.

Social Value

CitySwift is helping bus operators and local authorities to fight the climate crisis by using data to improve public transportation, making it more efficient, reliable, and user-friendly. Smoother journeys will grow demand for services, driving passengers away from private car use and encouraging the modal shift to bus.

CitySwift's platform is designed to give bus network providers and local authorities fast and easy access to a range of insights that highlight network performance, including trends and problem-areas. CitySwift's dashboards will show where there are congestion and passenger delays in the network, in order to prioritise where to implement bus priority measures and infrastructure improvements. CitySwift's runtime analysis tool analyses historical bus network performance data to deliver optimised runtimes alongside the predicted impact

of each set of runtimes against performance and resources. These runtimes will improve on-time performance and reduce passenger wait times.

CitySwift's analysis has been proven to improve service performance for passengers, while enabling bus networks to maximise resources. The detailed range of metrics offered by CitySwift gives public authorities and operators the data and single source of truth to engage collaboratively to deliver a better bus network for people and communities.

CitySwift is Cyber Essentials certified.

Overview of the G-Cloud Service

CitySwift's platform gives bus network providers and local authorities the intelligent analytics needed to operate high performing, data-driven networks. The CitySwift platform automatically cleans, connects, and analyses vehicle location, schedule, and ticket data to deliver a comprehensive analysis of the bus network's performance.

This analysis is delivered in the CitySwift platform via a range of route to stop-level data visualisations and dashboards across almost fifty metrics. The platform also generates new and improved runtimes based on historical performance analysis, while also predicting the impact of these runtimes on performance metrics and resource use.

This means you can save time, plan ahead, and act with confidence to dramatically grow the bus network (whether it's punctuality, reliability, demand, or profits).

With buses in our DNA, we have the experience to help private bus operators and public authorities plan, predict, and adapt to shifts in operating conditions. Transport providers including Transport for London and Transport for Wales are using CitySwift to drive patronage and maximise efficiency to deliver growing networks.

Use CitySwift to:

1. gain full, network to stop-level insight into all aspects of network performance,
2. generate AI runtimes for quicker, more efficient, and punctual journeys,
3. predict the impact of proposed runtimes on resource and performance,
4. improve productivity with fast, easy data analysis and data-driven conversations with operators

CitySwift Explore

CitySwift Explore is a business intelligence tool for bus networks, showcasing bus network data visualisation and analytics. The platform ingests and analyses vehicle location (such as GPS data and AVL data), schedule data and ticket data. Before data and insights are delivered to the platform, the data engine will clean and enrich all data to ensure maximum quality of data. Analytics are delivered through visualisations and dashboards in the CitySwift application.

Features:

- **Bus network data analysis with data cleaning and data joining**: automatic ingestion, cleaning, joining, analysis and enrichment of vehicle location (GPS/AVL), schedule, and ticket data to ensure maximum data quality.
- **Automated** data analysis and bus network performance insights
- Bus network **data visualisation** based on schedule data, ticketing data, vehicle location (GPS/AVL) data
- **Bus performance metrics**: punctuality metrics, efficiency metrics, demand metrics
- **Bus punctuality metrics**: Start Point Punctuality, Intermediate Punctuality, Excess Wait Time
- **Bus efficiency metrics**: Average Speed, Layover Time, Dwell Time
- **Bus stop level metrics**: Bus runtime metrics, bus layover metrics, bus speed metrics, bus punctuality metrics
- **Integrate seamlessly** with existing technology infrastructure.
- **Network, corridor, route, and stop** level performance data
- **Benchmark** operators and route performance.

- **Filter by time periods** such as time of day, day of the week, week, month, season, year
- **Easily export and share** data and reports with shareholders, e.g. CSV format
- **Lost mileage calculation and validation:** automated and manual identification and categorisation (coding) of lost mileage and non-operated trips to ensure accurate service fee, bonus, and penalty calculations.

Benefits:

- Understand **operator performance** data and bus network **trends**
- Improve **data quality**
- Identify areas for further **investigation**
- Use data as a single source of truth for **operator engagement**
- Make **data-driven decisions** quickly and with confidence
- Share reports to **prove investments**, **justify decisions**, and **collaborate with stakeholders**
- Deliver **punctual and reliable** bus services **matched to passenger demand**
- Analyse **passenger movement patterns** to predict future trends and opportunities

CitySwift Evolve

CitySwift Evolve is a bus network runtime analysis and scenario planning module. The platform ingests and analyses vehicle location (such as GPS data and AVL data), schedule data and ticket data to deliver new, optimised runtimes that balance performance with resources and remove inefficiencies in the network, such as excess dwell time. Plan for different scenarios and simulate how they may impact your journeys, so that you can make every decision with confidence and justify network planning choices.

Features:

- **Historical runtime analysis**
- **Runtime generation and runtime optimisation:** New, suggested runtimes optimised for layover and optimised for dwell, based on historical runtime analysis
- **Runtime simulation and runtime scenario analysis:** generate 5 sets of runtimes against predicted PVR metrics, punctuality metrics, cost
- **Runtime comparison:** Compare suggested runtimes with other suggested runtimes and with original runtime performance
- **Export and share runtimes:** Export runtimes to Omnibus, Optibus, and Trapeze scheduling systems
- **Integrate** seamlessly with existing technology infrastructure
- **Export and share** data and reports with stakeholders, e.g. CSV format

Benefits:

- **Optimise bus network performance** with **new runtimes** based on the real-world operating conditions of the network
- Quickly **deploy and adapt schedules** to shifting operating conditions
- **Compare different operating scenarios** and **simulate** how operating scenarios may impact runtimes, performance, and resources
- Accurately **predict journey times**
- **Improve the performance** of existing timetables and schedules.
- Improve **reliability, EWT, punctuality** and **passenger experience**
- **Easy to use**, and easy to **export and upload** runtimes to all major scheduling systems
- **Fast and easy deployment**

CitySwift Discover

CitySwift Discover is a range of bus network performance dashboards for detailed bus data analysis, performance insights, data visualisation, and information into bus network problem-areas. Dashboards enable deeper troubleshooting and more opportunities for data-driven collaboration with stakeholders.

Features:

- **Bus network data analysis with data cleaning and data joining:** automatic ingestion, cleaning, joining, analysis and enrichment of vehicle location (GPS/AVL), schedule, and ticket data to ensure maximum data quality.
- **Automated** data analysis and bus network performance insights
- Bus network **data visualisation**
- **Congestion**, **speed**, and passenger impact of **delays**, network pinch points, bus priority measures
- **Origin destination** analysis and passenger movement patterns, including **boarding and alighting insights**
- Bus **capacity** and bus **occupancy** insights
- Anonymised **driver performance** analysis, including driver punctuality, early departures, late arrivals. Analyse individual driver performance or compare driver performance in a depot
- **Vehicle block analysis**, with block analysis for slippage
- Demand forecasting and **frequency simulations**
- Easily **export and share** data and reports with stakeholders, e.g. in CSV format.

Benefits:

- Understand **operator performance data**
- Identify network performance for **further investigation**
- Use data as a **single source of truth** for **operator engagement**
- Make **data-driven decisions** quickly and with confidence
- Share reports to **prove investments**, **justify decisions**, and **collaborate with stakeholders**
- Deliver **punctual and reliable** bus services matched to passenger demand
- Analyse **passenger movement patterns** to understand the **passenger experience** and to predict future trends and opportunities
- Find where there is **unfulfilled demand** in the network
- Use bus network performance data **inform network redesigns**
- Use data as evidence and justification to implement **bus priority measures**

- Understand where bus priority will have the **biggest impact**

Data Protection

Information Assurance

The data provided by buyer and supplier networks is protected by TLS (Version 1.2 or above), IPsec or TLS VPN gateway and the data storage and processing locations are hosted in both the United Kingdom and European Economic Area (EEA).

All data ingested by the CitySwift engine undergoes pentests and are tested internally only. An "IT Health Check" is performed by a Tiger Scheme qualified provider or a CREST-approved service provider.

The CitySwift system is hosted in Google GCP cloud facilities.

Data back-up and restoration

CitySwift data is stored in various ways. Some data types have strict retention policies that prevent immediate deletion for a number of months, others can be deleted immediately if requested but may also have a restore option.

Business continuity statement/plan

The Business Continuity plan for the CitySwift organisation identifies the critical business functions for the business to operate and the risks the business is exposed to. The plan outlines the steps and people involved in recovering the business should any interruption occur. CitySwift makes every effort to mitigate and treat any risk exposure but for the risks that cannot be totally eradicated, we have prepared a comprehensive BCP that

includes every department and details of any key personnel who may need to be contacted. Formal qualitative risk assessment methods have been used in the formulation of this plan. This plan is tested annually to ensure it is effective. Success is defined as being within the time parameters listed in the maximum downtime section of the plan and that all relevant legislation has been adhered to if it is data related.

Plan Scope & Applicability

The scope of this plan covers CitySwift. The plan is applicable once the life safety of employees, customers, and guests has been verified and in the event that a facility is or will become inaccessible.

It can be active during normal business hours and after hours, with and without warning.

The executive authority to invoke the BCP lies with management, either the CEO or COO. Similarly, once operations are fully restored, the approval to revoke the BCP will be at the discretion of the CEO or COO.

The BCP is maintained by the information security team and is reviewed and tested annually. The document is saved in the Google cloud in the Risk & Compliance folder and is accessible to all staff.
The BCP is also stored locally on the CEO & COO laptops. The BCP can be accessed remotely.

Plan Objectives

The CitySwift Business Continuity Plan objective is to facilitate the resumption of critical operations, functions, and technology in a timely and organised manner to ensure a viable and stable organisation.

The primary objectives of the plan are to:

- Maintain Critical Business Functions
- Most critical departments/business functions
- Ensure employees are able to access an alternate safe facility or can operate remotely

- Protect vital records & ensure that they are accessible under all conditions

Plan assumptions

- The following assumptions were used while creating this plan:
- An event has occurred that affects normal business operations.
- There is limited or no access to the affected facility.
- Documents and equipment within the facility are inaccessible.
- Qualified personnel are available to continue operations.

Critical Business Functions

Critical business functions are those functions and vital activities that an organisation must maintain in a continuity situation, when there has been a disruption to normal operations, in order to sustain the mission of the organisation, comply with legal requirements and support life-safety. They are the backbone of a business and must be continued in order for the organisation to meet its mission. These functions are not meant to be the name of a division, program, unit, etc. but meant to be the actual process/function that must be continued. These processes/functions can be supported or 'owned' by different divisions/units but the unit itself is not a critical business function.

Critical business functions:

- Providing the CitySwift platform to customers
- Data analysis
- Finance
- HR
- Customer success

***Resources required to conduct critical business operations*:**

- Data engineering team
- Internet connection & power
- GCP / network production environment
- Laptops / physical production environment
- Communication mechanism
- Software: necessary applications, utilities, operating system for production

Privacy by design

CitySwift has an internal information security policy that aligns with industry standards (ISO 27001:2013 Information Security standards) and current applicable legislation. To ensure policies are followed, they are reviewed annually, communicated with staff. Staff are trained during onboarding and made aware of reporting procedures. CitySwift has a functional reporting structure. Any reports that are made are logged and reviewed and escalated as necessary. If policies are not adhered to then grievance procedures are followed.

Operational Security

Tools and monitoring are in place to help assess the severity and impact of a potential vulnerability. Dependent on vulnerability, however, we expect to fix and deploy all instances with fixes immediately after a vulnerability is identified. Information about potential threats is obtained from our internal monitoring tools/alerts and subscriptions to security newsletters, and working with our security pentest supplier

We identify potential compromises using:

- Virus scanning on all instances using ClamAV.
- TLS versions with a restricted cipher suite
- Firewalls that block malicious requests
- DDOS protection

We respond to issues using the following structure:

1. Identifying Vulnerabilities
2. Evaluating Vulnerabilities
3. Treating Vulnerabilities
4. Reporting Vulnerabilities

Response to incidents is dependent on severity. High and medium-rated incidents are worked on and treated immediately. To date a high priority issue found has been fixed on the day of discovery.

Using the service

Ordering and invoicing process

The payment method is electronic bank transfer [EFT], invoices will be issued electronically to the buyer and payment will be taken annually in advance. Please contact finance@cityswift.com.

Pricing overview

CitySwift's products are offered for purchase on a modular basis. Annual subscriptions are priced on an annual basis price per module and fleet size. Discounts are applied based on the number of modules purchased, contract length and fleet size.

CitySwift does not offer a trial service.

Onboarding

In order to provide the services the buyer will need to provide some or all of the following datasets to CitySwift and complete the actions described below:

Automatic Vehicle Location
Dataset Required:

- Vehicle ID
- Fleet number
- Sequence
- Journey number
- Journey start time
- Running board name
- Public service code
- Driver number
- Lat
- Long
- Heading

- Deviation
- Panic
- State
- Timestamp

In order to gather historical data for a period of more than 12 months, the buyer must work with its third party provider or internal technical team to export the maximum historical time period available and provide it to CitySwift.

Ticketing Data

Dataset Required:

- Date and time
- Route
- Schedule
- Trip
- Shift
- Origin
- Passenger
- Destination
- Ticket
- Card ID
- Transaction type
- Ticket no.
- Canc
- Full (£)
- Ps
- Dst
- Fare (£)

The buyer must work with its third party provider to export the maximum amount of historical ticketing data for the past 12 months (at a minimum), or provide CitySwift with access to the third party provider's ticketing machine web portal.

Once onboarded the buyer must continue to upload its most recent ticketing data every 24 hours and no less than every 72 hours for the term of the contract.

TransXchange

Customer must provide the following dataset to CitySwift in an extended version form of 2.4 or above:

- Block number
- Journey code
- Days of week
- Days of non-operation
- Line IDs
- Stop to stop runtimes
- Stop to stop, stop point IDs
- Distance between stops (metres)
- Stop IDs
- Route line strings
- Timing status (timing points and non-timing points)

The buyer must upload historical files for the past 24 months (at a minimum) in its cloud storage folder directly onto CitySwift's platform.

Once onboarded, the buyer must upload the above data set onto the CitySwift platform on a continuous basis for the term of the contract.

Siri Vehicle Monitoring - Live Feed

The buyer must provide a live feed of Siri Vehicle Monitoring data at least every 30 seconds.

CitySwift's onboarding service includes on-site / online training with a dedicated customer success manager. Demonstrations are done by CitySwift to show the functionality of the platform. Workshops are conducted to make sure client staff are familiar with the platform. The Customer Success Manager (CSM) sets up weekly check-ins while the customer is using the platform. CSM is available during business hours via email / telephone to answer any questions.

Offboarding

On expiry of the contract, the following steps shall be taken to ensure a satisfactory completion of the contract for the parties:

The buyer will disconnect all Secure File Transfer Protocol (SFTP) connections to the Supplier relating to:

(1) Automatic Vehicle Location (AVL) data
(2) ticketing data
(3) TransXchange data
(4) Siri Vehicle Monitoring data

CitySwift will destroy all historical AVL, Ticketing, TransXchange and Siri Vehicle Monitoring data from its servers.

CitySwift will remove all buyer access to the CitySwift platform and decommission the buyer's platform application.

CitySwift will destroy all the buyer's user data from the CitySwift servers.

Termination terms

By consumers (i.e. consumption)

?

By the supplier (removal of the G-Cloud Service)

?

Training

The CitySwift dashboard is hosted on a seamless and easy-to-use platform and training and support on its usage is offered as part of the onboarding process. A

dedicated Customer Success Manager will be allocated to each client to conduct the following:

- One-on-one and/or group trainings conducted on-site.
- Virtual trainings and check-in calls.
- Workshops take place as required by the customer to ensure users are maximising use of the platform.

As product updates are released, the Customer Success Manager will ensure each customer has advance notice and any training required.

The Customer Success Manager is available during business hours via email / live chat / telephone to answer any questions as required. Users can access an online help documentation portal to access self-service training guides and tutorials.

Lastly, the CitySwift Dashboard contains a Help Center resource library, with dozens of how-to and FAQ articles, as well as instructional videos. There is also an in app chat function where you can ask questions and receive replies within the platform.

Implementation Plan

CitySwift builds a tailored onboarding service for every new partner that will include the following:

- Assigned Customer Success Manager
- Delivery timeline with phases and milestones
- Kick off meeting
- Weekly (or as required) check ins
- Training (on site preferrably or remote if required)
- Launch of the platform
- Continued support as required via telephone / email
- Monthly account team check ins to provide overview of status
- Post implementation ROI review

Service Management

Each account is assigned an Account Manager and a Customer Success Manager that the customer can contact directly. During implementation and onboarding, Support will include a mixture of online and onsite training and workshops. Post-onboarding and implementation, regular check-in calls, quarterly reviews, and training on new features will take place as needed. Note that training and support comes at no additional cost.

Service Levels

CitySwift will aim to achieve at least 98% Platform Uptime each Quarter. Uptime means the time CitySwift's platform is available for buyer use during 9am to 5.30pm (BST) calculated as a percentage over a 3-month period beginning on the contract start date.

- CitySwift will aim to keep any interruptions in providing the services to a minimum. However, CitySwift may need to schedule and perform maintenance to keep the services working smoothly, correct any errors or implement software updates. Sometimes, this may only take 30 minutes or less to complete.
- To ensure the buyer can prepare for any potential interruptions, CitySwift will provide the buyer with written notice:
    - at least 5 business days in advance for any maintenance,
    - at least 3 business days in advance for maintenance occurring outside of normal business hours

CitySwift offers multiple support channels to support buyer's use of the services:

- Email Support: The buyer can send their queries or concerns to their dedicated Account Manager and Customer Success Manager
- Live Chat Support: The CitySwift platform features a live chat option, allowing the buyer to interact directly with the CitySwift team.
- Phone Support: The buyer can call their Customer Success Manager or Account Manager for immediate assistance during business hours.

- Knowledge Base & FAQs: CitySwift maintains a knowledge base and frequently asked questions section on its website to provide immediate answers to common questions.

CitySwift's Customer Success team are available from Monday to Friday 0900-1700.

The web chat is accessible within our platform 24/7 and you will get an automated response which directs users to articles on our help centre. During Monday to Friday 0900-1700 you will receive support via web chat from a person.

Financial recompense model for not meeting service levels

Provision of the service

Customer Responsibilities

In order to provide the services the buyer will need to provide some or all of the required datasets for Automatic Vehicle Location, Ticketing, TransXchange, Siri Vehicle Monitoring - Live Feed, and complete the steps required (including regular updates to data). Details of the datasets and steps required are outlined in the Onboarding section of this document.

Our experience

Case Studies

CitySwift has delivered exceptional results for both public authorities and private operators, from improved punctuality to higher levels of passenger satisfaction,

and cost savings to increased efficiency. Here's some highlights of the value delivered to our clients through using CitySwift:

- Transport for Wales has a holistic view of network data across all of the bus operators in Wales for the first time, setting the authority up with the vital insights needed to franchise the Welsh network
- National Express Buses increased punctuality by 17% and decreased late running by 18%
- Oxfordshire County Council use CitySwift with Oxford Bus Company and Stagecoach to monitor the impact of congestion easing measures, tracking progress towards a 10% improvement in 'bus productivity'
- Go Ahead's East Yorkshire Buses achieved a 14% increase in on-time performance across autumn schedules
- Blackpool Transport generated a £605k return-on-investment between cost savings and attracting BSIP funding

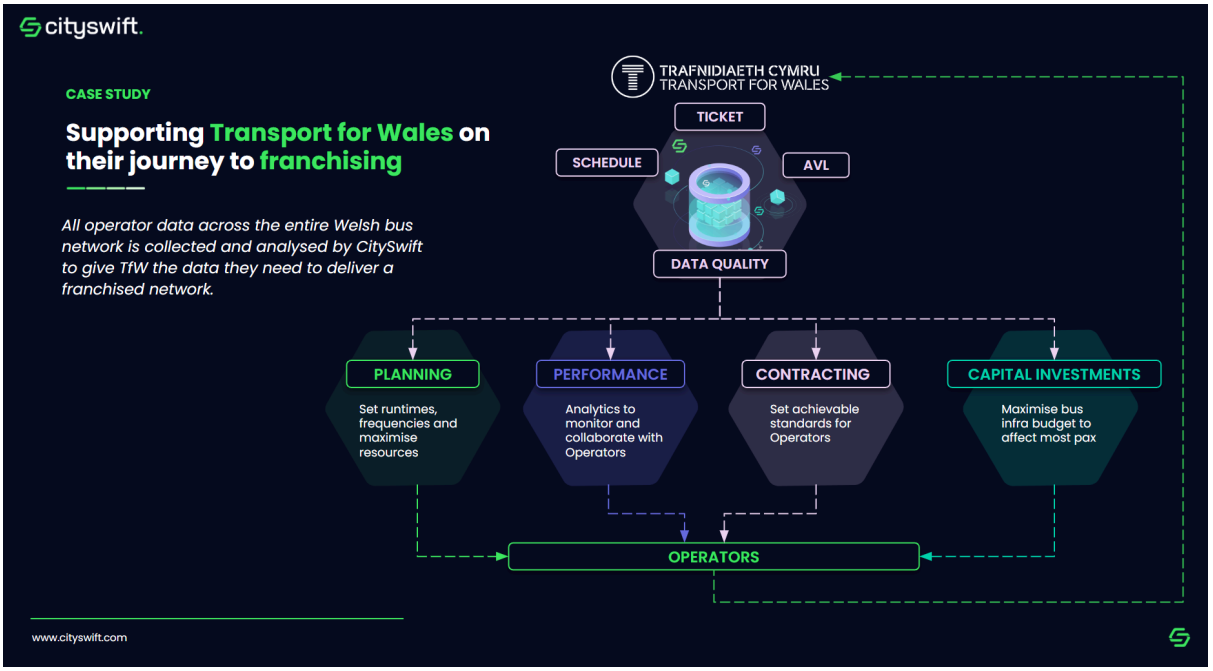


Fig 1. Transport For Wales Case Study Stakeholder Collaboration

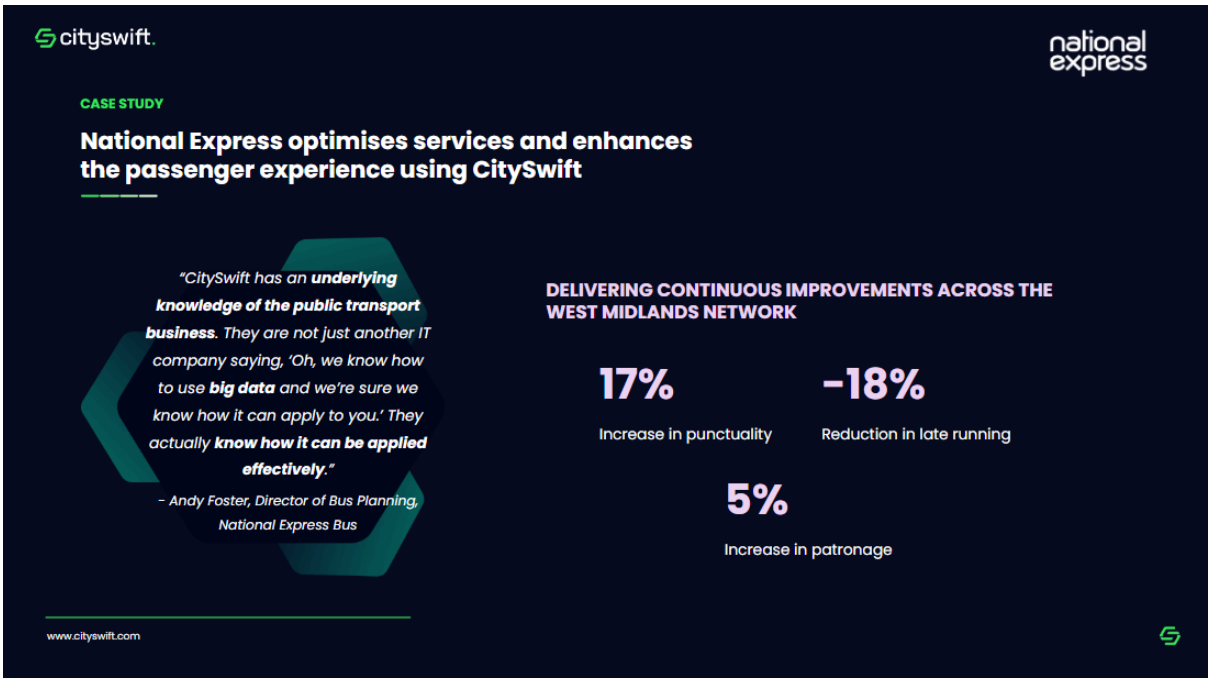


Fig 2. National Express Case Study Service Optimisation Results

Fig 3. Oxfordshire County Council Case Study Results

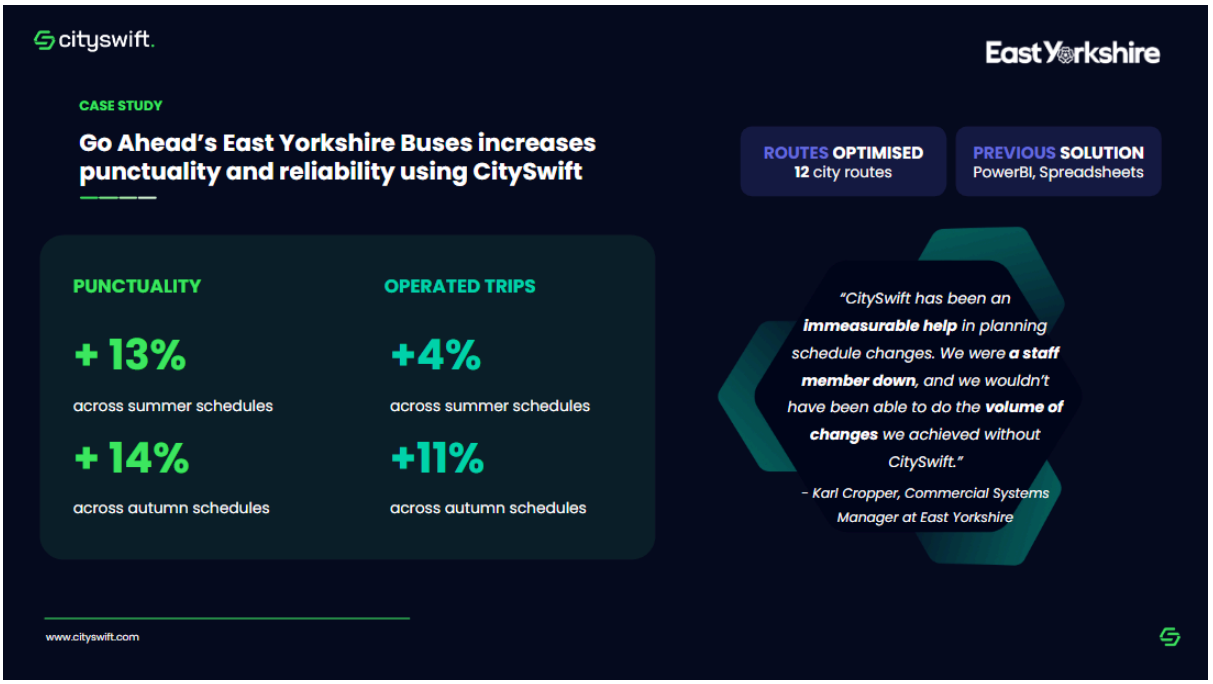


Fig 4. East Yorkshire Go-Ahead Case Study Results

Fig 5. Blackpool Transport Case Study Results

Clients

Our intelligent transport data platform is used by the world's most innovative public and private transport providers, with over 1 billion passenger journeys ingested, analysed and optimised by CitySwift annually. Notable clients include

Transport for Wales, Transport North East, Translink, Bus Éireann, Oxfordshire County Council, East Riding of Yorkshire Council, National Express, Oxford Bus Company and Blackpool Transport.

Fig 6. CitySwift Public and Private Clients

Contact Details

For further information on CitySwift, please contact: philip@cityswift.com