Simplifai

G-Cloud 15 Service Definition

Simplifai AI Smart City Performance and Optimisation V1.0

Version 1.0

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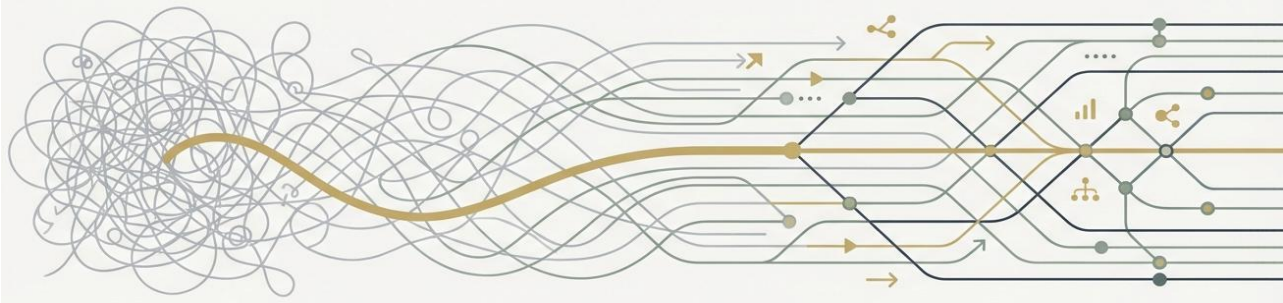
Simplifai

1 The Path to Intelligent Mobility: A Phased Digital Transformation Framework

SimplifAI Systems delivers a structured, phased consultancy framework designed to guide Authorities from initial digital readiness assessments to AI traffic optimisation and management. This approach moves beyond simple upgrades, creating a "digital twin" of the road network that serves as a single source of truth for assets, enables predictive analytics, and supports dynamic, real-time traffic management. By following this roadmap, authorities can unlock significant economic benefits, reduce congestion by up to 30%, and future-proof their networks for the next generation of mobility. Providing a service that not only optimises traffic but can also deliver greater bus reliability and optimise networks to address Smart City/Region initiatives.

Guiding Local Authorities from Analogue Operations to AI-Powered Optimisation.

Congestion, delay and pollution are not inevitabilities; they are design flaws. Simplifai outlines a structured, five stage methodology to transform your transport network. We provide a practical roadmap that turns the ambition of intelligent mobility into an operational reality, ensuring each stage of your digital transformation is practical, measurable and tailored to local conditions.



The Economic and Social Cost of Inaction is Mounting.

Annual Cost of Congestion - £11.0bn, annual cost of congestion to the UK economy [INRIX 2025]

Time Lost to Congestion - 59 hours, average time UK drivers lost to congestion in 2024 [INRIX 2025]

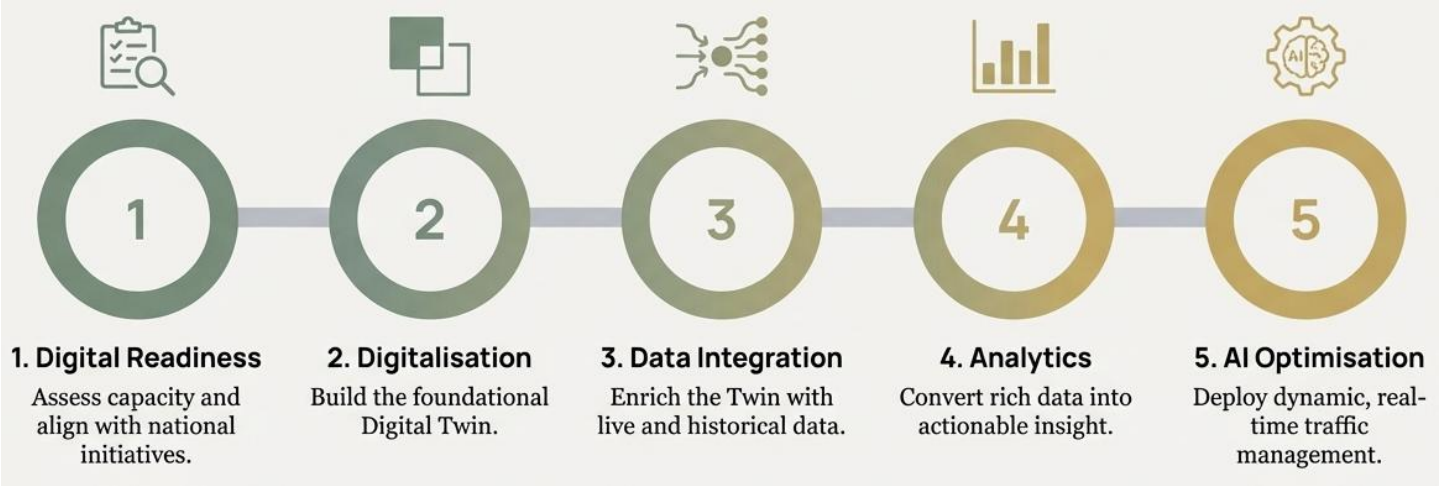
System Inefficiency, traditional traffic management systems are insufficient for today's complex, dynamic demands.

Current traffic management, often reliant on fixed strategies, can no longer address the growing complex issues facing our road networks. The economic burden is clear, impacting productivity, air quality and public wellbeing. A new approach is required – one that moves beyond guesswork to create advanced network management at a lower cost and in a fraction of the current timescale.

Vision

Our vision is to create an intelligent, connected transport system that eliminates congestion, enhances safety and drives economic growth across the UK.

1.1 Our Phased Transformation Framework: A Deliberate Path to Digitalisation



Each stage builds logically on the previous one, forming a complete and de-risked digitalisation journey. This structured methodology ensures that investment delivers compounding value, moving from foundational assessment to full operational intelligence.

1.1.1 Stage 1: Digital Readiness

The foundational stage of the transformation focuses on assessing a Local Authority's capacity to adopt and integrate modern technologies into their transport infrastructure.

This involves a comprehensive audit of existing road assets, digital systems, and organisational capabilities against future requirements for national Digital Roads initiatives and Connected and Autonomous Vehicles (CAVs). Digital readiness goes beyond simply deploying tools; it identifies critical gaps in skills and infrastructure to ensure that the transition from paper-based or static systems to dynamic platforms is viable. This stage is essential for aligning local transport planning with UK Government policy, ensuring that the authority is strategically positioned for funding and capable of supporting a functional digital twin.

1.1.2 Stage 2: Digitalisation

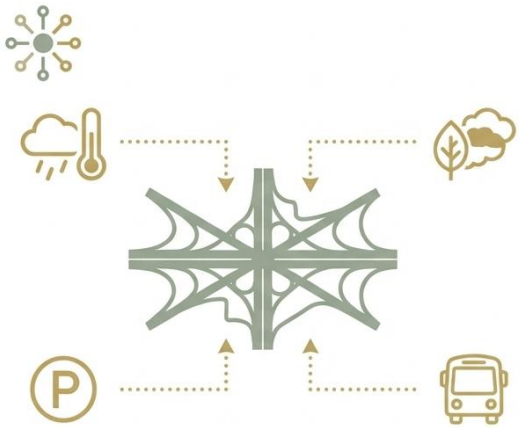
Once readiness is established, the next phase involves the construction of a functional digital twin of the road network.

This process requires consolidating disparate asset data—such as lane assignments, traffic signal plans, and project data—into a unified, machine-readable format. Because different vendors and users may describe the same assets differently, this stage focuses on harmonising these variations to create a "single source of truth". By establishing structured mapping and a reliable data environment, authorities create an accurate, scalable representation of the physical network that is interoperable and capable of supporting advanced computation.

1.1.3 Stage 3: Data Sources Integration

With the digital twin established, the framework moves to enriching this digital foundation by integrating diverse live and historical datasets.

This stage involves identifying, gathering, and harmonising relevant data flows—including weather conditions, pollution levels, car park occupancy, public transport feeds, and historical traffic patterns—and connecting them via APIs where necessary. By layering this information onto the digital twin, the system evolves from a static map into a dynamic, interactive tool capable of reflecting real-world conditions in real time. This integration is critical for transforming the system into a predictive tool that allows authorities to forecast trends and prepare for events or roadworks months in advance.



1.1.4 Stage 4: Analytics

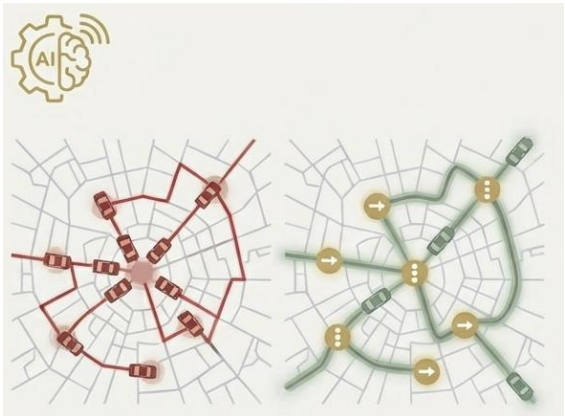
The fourth stage transforms the integrated data into actionable insight through advanced analytics.

By visualising traffic performance and flow, authorities can diagnose recurring inefficiencies, detect immediate issues, and measure the specific impact of interventions over time. This platform supports evidence-based decision-making, allowing planners to prioritise infrastructure improvements and validate schemes effectively. Whether for short-term operational adjustments or long-term strategic planning, this stage provides the intelligence required to optimise resources and prove the value of investments.

1.1.5 Stage 5: AI Traffic Optimisation

The final stage of the transformation is the deployment of patented AI optimisation to manage traffic dynamically.

Leveraging the digital twin and real-time data flows, the AI system acts as a "planner," adjusting signal timings instantly to anticipate congestion and adapt to changing demand. This approach allows for the proactive management of capacity—such as preconfiguring signals for major sporting events or emergency route diversions—rather than reacting after gridlock occurs. Deployments of this technology have demonstrated flow improvements of between 5% and 30%, reducing delays and emissions while turning digital infrastructure into truly intelligent infrastructure.



1.2 Proven Results: Tangible Economic and Performance Outcomes

Simplifai's patented (GB 2598661) Artificial Intelligence (AI) traffic management service integrates with Intelligent Traffic Management systems and data to deliver goal centred management and optimisation of road networks.

- £180,799 annual savings on Anlaby Road, demonstrating an economic cost-benefit return within 12 months.
- 16.89% AN peak traffic flow improvement an Anlaby Road, achieved despite a 40% increase in traffic due to nearby roadworks.
- 68% maximum reduction in traffic delays during a major MUSE concert, with an estimated annual saving of £62,500 if replicated for all events.
- From 1 Hour to <15 Minutes reduction in bus journey delays during a 16 day emergency bridge closure, showcasing rapid contingency planning.

Our Technology in Action: Diverse Applications, Validated Outcomes

Corridor Improvement

Case: Hull City Council – Anlaby Road

Challenge: Managing peak hour congestion on a key arterial route, exacerbated by nearby roadworks.

Solution: Deployed AI-optimised traffic signal plans that adapted to a 40% increase in traffic, significantly improving bus reliability and overall flow.

Emergency Response

Case: Hull City Council – Drypool Bridge

Challenge: A 16-day emergency bridge closure causing massive bus diversions and network disruption.

Solution: The pre-configured system rapidly produced and implemented contingency plans, maintaining network performance and minimising public disruption.

Major Event Management

Case: Kirklees Council – Muse Concert

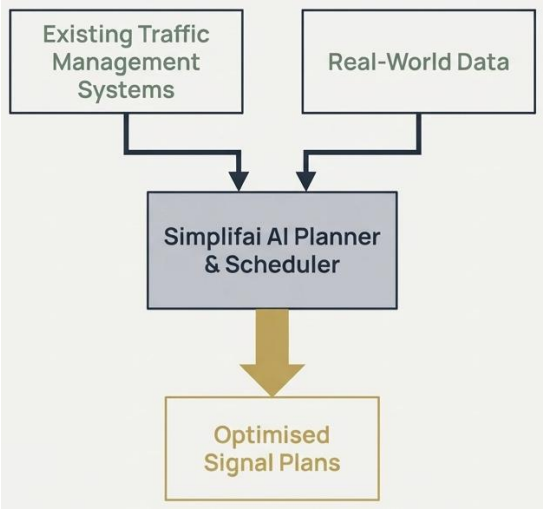
Challenge: Managing high-volume, short-term traffic for a major stadium event.

Solution: The AI tool accurately forecasted traffic flows (99.64% accuracy) and optimised signal timings, dramatically reducing congestion and delays.

1.3 Service details

Simplifai Systems is a scalable solution that provides network operators with the option to optimise outcomes for a defined problem or goal across a geographic area or a given region or an urban centre. The solution is implemented according to the size of the authority or to deliver Smart City functions at a number of locations.

The problem or goals may be, for example, improving congestion (recurrent and non-recurrent) and air quality, optimising for events and roadworks, managing incidents, implementing policy prioritisation and/or improving bus reliability.



Technology: a patented (GB 2598661) model-based Automated Planning and Scheduling System.

ITS Expertise: team comprises industry leading specialists with deep Intelligent Transport Systems (ITS) knowledge, coupled with strategic consultancy capabilities.

Development: AI specialists at Simplifai and the University of Huddersfield supporting the creation and continual improvement of the Service.

Function: augments and enhances existing traffic management systems – no costly investment in additional roadside infrastructure is required. It uses existing data to create dynamic models and iterate timing plans in response to real-world conditions.

Approach: views the environment as an interconnected network, evaluating the area-wide impact of every strategic decision.

1.4 Features

1. Patented AI goal centred traffic control optimisation and management tool.
2. Integrates and uses data from ITS and DfT BODS systems.
3. Dashboards analyse and visualise network performance constraints.
4. Patented digital model simulator informs AI application planner platform.
5. Generate and implement AI optimised traffic signal plans in minutes!
6. Optimise network performance to address non-recurrent and complex events.
7. Identify and manage Public Transport hot-spots and service reliability issues.
8. Address complex sites, events, incidents, roadworks and journey time reliability.
9. Rolling horizon forecasting and cooperative vehicle traffic signal data provision.
10. Secure, multi cloud hosted platform enabling scalable deployment.

1.5 Benefits

1. Achieves proven economic cost-benefit return within 12 months.
2. Provides network performance insights through data analysis and visualisation.
3. Reduces network issues related to queuing, journey times and congestion.
4. Delivers improved network reliability with automated optimiser activation.
5. Maximises existing infrastructure value with 8–30% performance gains.
6. Enhances Public Transport reliability through interventions and prioritises active travel.
7. Delivers environmental benefits via improved air quality and lower emissions.
8. Identifies performance and calibration issues to validate targeted interventions.
9. Validates CRSTS and BSIP schemes before, during and after interventions.
10. Supports regional economic growth, inclusion, sustainability and wellbeing.

2 Optional Features

2.1 Third party data integrations

The Simplifai System includes the import and exporting of data in standard data types in typical ways used for the management of data for IoT devices.

However, there may be from time to time particular forms of data required that do not use standard methods of data transmission or standard forms of data. To incorporate these forms of data there may be a requirement to create a new form of input or output adaptor. This option includes the cost of the creation of bespoke adaptors for specialist types of new or legacy data types.

2.2 Public transport reliability

The system uses the DfT bus open data service (BODS) data and any other locally available data on public transport, e.g. ticketing, location and SIRI feeds, that are available in real time or near real time to identify locations and hot spots where buses are delayed and recommend strategies for addressing the delays caused by traffic signal timing issues. A primary goal being to have buses only stopping at bus stops and not stopping at traffic signals.

This function provides an automated analysis of the data and the provision of a set of recommended strategies to address identified and occurring problems.

2.3 Event and disruptions management

The service can be applied to the management of traffic before and after an event – sporting, leisure and/or entertainment. These events often create large volumes of traffic and movement for short periods of time that slowly adapting systems are not designed to manage.

AI generated signal timings can be generated and implemented ahead of the event and can be triggered either manually, automatically at a set time or when a given threshold has been seen.

The authorities decide on the goals to be achieved for the management of the event, for example:

- Free flow traffic on main corridors near the event.
- Prioritisation of pedestrian movements immediately before and after an event.
- Co-ordination of strategies to enable emissions reduction.
- Time taken to clear car parks after an event.
- Prioritisation in relation to event and non-event traffic.

Once the priorities have been set by the authorities the AI system produces plans that can be deployed in either a predetermined sequence or plans that are triggered by data inputs

2.4 Rolling horizon forecasting

The rolling horizon forecast creates demand profiles and network constraint maps for up to 3 months in advance - or longer if related to a specific planned event. The data from the maps and demand profiles is then used to create a forecast of the likely outcome if no interventions are made using the Simplifai System. This forecast is then analysed to understand the issues, times and

location where plans need to be generated if the Authority is to achieve its road management and optimisation goals for bus reliability, journey time reliability and air quality management.

The system then creates the planned interventions and assesses the impact of those interventions. If the assessment enables the Authority to achieve its goal the plans are then programmed for implementation.

If after modelling the impact of the proposed plans the Authorities goals cannot be met, this is then highlighted to the Authority with details of the residual impact on the Authorities' goals. This then gives the Authority up to 3 months to plan a broader range of interventions to enable it to achieve its goals.

2.5 Optimised for air quality management and reducing carbon emissions

It is possible to design mechanisms to curb air pollution, such as congestion charging, electric and hybrid vehicles, and modal switch to public transport; however, these policies often take long periods of time to become effective. Simplifai provides solutions that can manage the air quality-related effects of traffic congestion in real-time at a local level, to reduce or redistribute pollutants through the control of traffic flow.

The air pollution levels in a particular location are usually determined by a combination of the level of emissions (based on traffic flow, speed and vehicle types) and the weather which determines if the pollution accumulates or disperses.

Simplifai can generate plans to reduce the level of emissions in particular locations for the times when the weather forecast predicts that the pollution will be accumulating rather than dispersing.

In locations that are declared air quality management areas (AQMAs) Simplifai can create signal timing plans to minimise the levels of emissions inside of the air quality management area. This could include the implementation of signal plans that could be communicated directly to the vehicles and drivers to encourage less stop-start and encourage steady slower speeds to reduce emissions.

2.6 Multi-modal transport

Simplifai addresses Multimodal transport issues by collecting data on all modes of transport and comparing the performance of single mode and multimodal journeys to understand the reliability issues across modes. Issues that can be investigated as part of the analytics are:

- Connectivity between buses, trams and trains.
- Bus and walk compared to drive, park and walk.
- Variability of connectivity due to time of day.
- Generation of strategies to improve connectivity and the measurement of the effectiveness of the strategies.

2.7 Modelling Network Safety with Vehicle Data

The vehicle fleet is becoming more connected over time. Vehicles now have a range of sensors to understand the environment around the vehicles. The improved data sharing between the public and private sectors can make a significant impact on the ways in which the road network is

managed and optimised. This module enables the integration of connected vehicle data into the day to day operation of the road network.

The sensors on vehicles detect a large array of data that is potentially useful to transport operators. This data is often commercially sensitive and is subject to privacy regulations. There are ways in which this data can be used to improve the safety and reliability of the road network. This includes:

- Detection of near misses – can be used to change the operation of traffic signals in periods when near misses become more frequent.
- Probe vehicle data to calculate journey times and turning movements on the network – this can be used to improve the accuracy of forecasting and reliability of the network.
- Detection of incidents – connected vehicles are often the first to know when an incident has occurred either by being involved or being impacted upon by the incident – data from connected vehicles can be used to improve incident detection to reduce the time to implement plans to mitigate the impact on detection.

2.8 Demand management and scenario planning

This module can be used in combination with the rolling horizon forecasting to create different types of plans for periods in the future when the normal operational strategies created by existing systems and Simplifai are insufficient to enable the Authority to achieve its goals.

This could include the forecasting of the impact of the following measures:

- Changes to car park pricing.
- Changes to public transport pricing.
- Temporary changes to road layouts, signal phases and stages.
- Changes to restrictions on vehicle modes in particular locations.
- Public information campaigns around specific events or planned disruptions.

2.9 Optimisation of transport timetables

The Government's bus open data service is used for monitoring the locations of buses at regular intervals. One of the uses of this data is to generate timetables based on the actual movements of the buses.

These timetables can be used to compare the actual data to the timetable data to assess the reliability of buses at different locations at different times of the day.

The data can be used to generate timetables with a greater certainty of being achieved based on the real performance. This function could be combined with measures that reduce the overall journey time to produce timetables with more frequent and more reliable services based on the same number of buses being scheduled based on past performance.

2.10 Cooperative vehicle messaging

Simplifai are the UK agent for a global in-vehicle messaging service. This C-ITS service can connect traffic signal data into vehicles for GLOSA*, time to green messages and other forms of in-vehicle messaging (IVM) offering the ability to address the evolving demand for in-vehicle network information and provide speed advice information for road vehicles, freight and public transport.

The deployment of the Simplifai Service creates a configuration to the road network which enables the messages generated to be sent into vehicles.

Due to the technology involved in delivering green light information, there may be a need in some locations for the Authority to make available information from an existing Authority technology system to enable the service to be fully operational 24/7. The Simplifai contract does not include the cost of any enabling works to be undertaken by other technology providers should this be required to make the information available.

* *Green light optimal speed advice*

This Optional Feature is an additional purchase only Option.

3 Our Approach

3.1 Onboarding

An initial project onboarding meeting is held to confirm client objectives and agree the timescales for the project. The onboarding duration is typically six months covering Phases 1 to 4 (Digital Readiness, Digitalisation, Data Feeds and Analytics) and the initial set up of Phase 5 AI Optimisation. Higher Control Level Simplifai services may require longer onboarding durations due to the Client's more complex intelligent transport system requirements. These will be evaluated during initial Client discussions.

The programme Phases are as follows. Durations are indicative based on months from order placement:

- **Phase 1, Digital Readiness**: assess capacity and alignment with national initiatives. Indicative duration of 2 to 4 months.
- **Phase 2, Digitisation**: build the foundation digital twin. Indicative duration of 1 month.
- **Phase 3, Data Integration**: enrich the Twin with live and historical data. Indicative duration of 2 months.
- **Phase 4, Analytics**: convert rich data into actionable insight. Indicative duration of 3 months.
- **Phase 5, AI Optimisation**: deploy dynamic, real-time traffic management. Ongoing project duration.

Some phases may overlap, shortening the overall onboarding timeline. The detailed programme plan will be completed following the initial project onboarding meeting.

User training is provided in the form of hands-on training. During the training session, users are provided with details of system functionality and other aspects of the system as an end-user. Train-the-trainer training can also be provided, enabling clients to host their own training sessions.

3.2 Technical Requirements

Simplifai is provided as a cloud hosted system using a cloud platform provided, configured and supported by Simplifai Systems. The Simplifai Service is web-based and requires no specific software plugins to be delivered through browsers including **Microsoft Edge, Google Chrome, Mozilla Firefox and iOS Safari**.

Our hosting services are scalable, dependant on volume of data and client requirements (such as number of users). Hosting details are listed within the Simplifai Systems G Cloud Pricing Document.

3.3 Buyer Responsibilities

Simplifai Systems will require the following from clients to ensure a successful onboarding process and operation of the service:

- Details and user levels of Individuals using the service,
- Access to the relevant client data, data sources and data volumes where necessary to implement the service.

Note: the service is not intended to serve as an exclusive backup for content. Users are responsible for maintenance of additional backup copies of their data.

3.4 Offboarding process

As part of the offboarding process, we will delete all hosted data prior to decommissioning of the service. Client data can be transferred prior to decommissioning on request.

3.5 Service Support

Our service support includes:

- Telephone and email support to technical account manager.
- Automated system operation checks.
- Critical operating system updates.
- Full disaster recovery in the event of a system or database failure.