Skyral

Service Definition Document: Skyral Decision Support and Problem Solving as a Service for Mobility & Infrastructure

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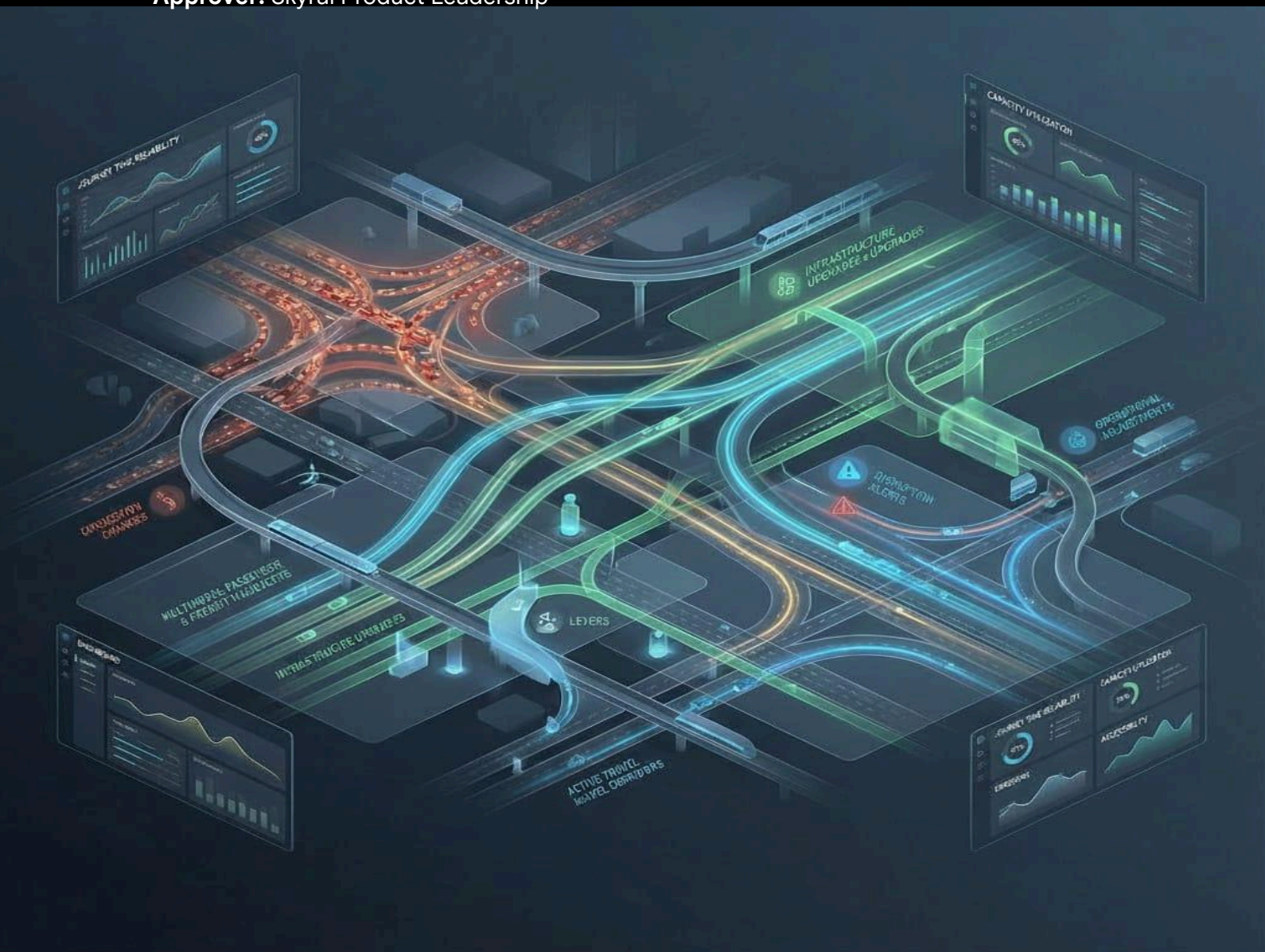

1. About Skyral

Skyral is a UK-headquartered modelling, simulation and decision-support company. It helps governments, defence, city authorities and operators design, improve and protect complex mobility and infrastructure systems. Skyral builds digital twins (virtual models of a real system) and agent-based models (simulations of how many individual people, vehicles and assets behave and interact). These show how people, vehicles, freight, assets and infrastructure affect each other across road, rail, air, maritime and utility networks. AI is built into this work. It drives how simulated travellers and operators make decisions, helps calibrate models against real data and searches thousands of scenarios to find the options that perform best.

Customers use Skyral to:

- Test and optimise transport, logistics and infrastructure strategies before committing to investment or operational change.
- Reveal bottlenecks, resilience gaps and interdependencies across national and regional networks, including energy, telecoms and transport.
- Connect data, models and visualisations to expose the few critical levers (such as capacity, routes, assets, maintenance and demand management) that most affect performance, resilience and cost.
- Use AI-driven scenario search and optimisation to compare thousands of options and find the strongest plan within real-world constraints.

Skyral Core, Skyral's modelling and simulation platform, provides the tools to build, run and govern digital twins of networks and infrastructure as long-term decision-support capabilities.

2. Service Overview

Service name

Skyral Decision Support and Problem Solving as a Service – Mobility and Infrastructure

Purpose

Skyral Decision Support and Problem Solving as a Service for Mobility and Infrastructure gives organisations fast, focused insight into complex challenges across transport, logistics, infrastructure planning and operational resilience. It combines causal and probabilistic modelling (mapping what drives each outcome, and how likely different outcomes are), digital twins and AI-assisted analysis. This helps defence, government and infrastructure organisations prioritise the initiatives that will most improve the resilience and adaptability of national and regional networks.

It is designed to:

- Turn high-level concerns about congestion, resilience, bottlenecks or investment risk into a structured, decision-ready view.
- Produce a prioritised set of initiatives and levers to focus limited planning and capital on.
- Define a clear follow-on path into Skyral Modelling and Simulation Development as a Service or broader digital-twin programmes for mobility and infrastructure.

The service runs as a fixed-term, expert-led engagement grounded in Skyral's Simulation Scaffold Framework, adapted for transport, logistics and infrastructure contexts.

Typical duration and team

A standard engagement is one month of effort, delivered by:

- A mobility / infrastructure Subject Matter Expert (SME) with experience in transport planning, logistics or infrastructure strategy.
- An Applied Scientist specialising in modelling, simulation, analytics and AI methods.
- A Product Owner responsible for mapping outcomes into Skyral services, products and the customer's data and system landscape.

Longer or multi-phase engagements can be scoped for national-scale portfolios or multi-agency programmes.

3. Method and Activities

The service focuses on strategic uncertainties in mobility and infrastructure—such as supply-chain disruption, infrastructure interdependencies or operational resilience—where better predictive insight and scenario analysis would materially improve outcomes.

Core steps

1. **Clarify the mobility and infrastructure problem**
    - Establish a shared understanding of the core challenge (e.g. corridor congestion, port or hub resilience, multimodal connectivity, migration to new infrastructure, climate and disruption risk).
    - Capture desired outcomes and constraints: throughput, reliability, safety, resilience, cost, emissions, political and regulatory conditions.
2. **Map networks, interdependencies and levers**



- Disaggregate the problem using logic trees and causal structures spanning transport modes, logistics chains, critical infrastructure and demand patterns.
- Identify key levers such as route structures, hub and node locations, service frequencies, maintenance strategies, redundancy levels, priority rules, and contingency arrangements.
- Map interdependencies between transport, energy, telecoms and other infrastructure, including cross-border and multi-agency links where relevant.

3. **Define and refine KPIs and metrics**
    - Identify KPIs and metrics directly linked to key levers and objectives (e.g. journey time, reliability, on-time performance, throughput, capacity utilisation, resilience indices, emissions, operating cost).
    - Clarify how trade-offs will be judged (e.g. reliability vs cost, throughput vs emissions, redundancy vs capital, national resilience vs local convenience).
4. **Develop causal and probabilistic models**
    - Collaborating with key stakeholders, Skyral SMEs and applied scientists develop high-level causal and probabilistic models that map complex interdependencies across transport and logistics networks.
    - Represent how disruptions (e.g. asset failures, weather, strikes, regulatory changes, security events) propagate across modes and infrastructure, and how interventions might mitigate these effects.
    - Use AI-driven synthetic populations, whose daily routines adapt as conditions change, to show how travellers and freight respond to disruption and policy changes.
5. **Prioritise initiatives and levers**
    - Apply advanced heuristics, cleaving maps and quantitative reasoning to rank initiatives and levers by impact, feasibility, risk, dependencies and time-to-value.
    - Use digital-twin concepts and early scenario analysis to test the relative value of different options and focus effort on those that most improve resilience, performance and cost-effectiveness. Where the best plan must be chosen within constraints such as budget or capacity, Skyral can use optimisation methods such as mixed-integer linear programming (MILP), whose answers trace back to explicit objectives and constraints.
6. **Develop a practical work plan**
    - Convert the prioritised initiatives into a concrete work plan that can guide infrastructure programmes, transport strategies or operational optimisation work.
    - Define data needs (e.g. traffic flows, timetables, origin–destination data, asset registers, maintenance history, PMO plans), stakeholders, integration points and decision checkpoints.
7. **Frame follow-on digital-twin and simulation work**



- Define how a mobility or infrastructure digital twin should be scoped and built in follow-on phases, including key scenarios, experiments and decision-support use cases.
- Outline how Skyral's synthetic environments can support ongoing planning, "what-if" analysis, operational decision support and continuous optimisation.

4. Service Outputs

At the end of the engagement, the customer receives:

- **Network and infrastructure decision narrative**
  - A clear articulation of the mobility or infrastructure problem, context, constraints and desired outcomes.
  - A visual representation of key drivers, interdependencies and levers across transport networks, logistics chains and critical infrastructure.
- **Prioritised initiatives and levers**
  - A ranked list of interventions (e.g. network redesign options, hub investments, redundancy measures, timetable changes, maintenance strategies) with rationale and key assumptions.
  - Identification of the top initiatives and levers best suited for simulation and digital-twin development.
- **KPI and measurement framework**
  - Defined KPIs and metrics mapped directly to the prioritised levers and initiatives.
  - Commentary on how these indicators should be tracked and used in future scenario analysis and governance.
- **High-level causal / probabilistic model**
  - A high-level causal and probabilistic model of the mobility and infrastructure system, suitable as a scaffold for more detailed simulation and for engaging decision-makers.
- **Strategic roadmap and action plan**
  - A strategic roadmap and actionable plan that guides follow-on synthetic environment development, digital-twin build-out and integration with existing decision-support tools.

Outputs are delivered in accessible formats (e.g. slide pack, report and—where appropriate - simple interactive views) that can be used directly within infrastructure, transport and resilience governance forums. Where generative AI is used to help draft summaries, the text is grounded in model outputs and verified data, cites its evidence, and is checked by Skyral specialists before delivery.

5. Roles and Responsibilities

Skyral roles

Role	Description	Key responsibilities
SME	Mobility / infrastructure expert leading the engagement	Form the core project team; define the mobility/infrastructure problem; shape initiatives and levers; lead prioritisation and KPI design; co-create work plan.
Applied Scientist	Modelling, simulation and analytics specialist	Understand networks and initiatives; gather and analyse data; construct causal/probabilistic models; apply statistics and heuristics for prioritisation; assess modelling feasibility.
Product Owner	Owns service delivery and transition into Skyral services/products	Plan and manage the work; translate outcomes into Skyral services and products; define follow-on Modelling and Simulation Development as a Service scope.

Customer responsibilities

- Provide access to relevant transport, infrastructure, logistics, planning, resilience and data stakeholders.
- Share existing strategies, network designs, PMO plans, performance data and models where appropriate.
- Confirm regulatory, information-governance and security constraints early.
- Participate in workshops, reviews and prioritisation sessions; agree scope boundaries, timelines and decision processes.

6. Service Features and Benefits for Mobility and Infrastructure

Key features

- Whole-system problem definition across transport, logistics and critical infrastructure.
- Causal and probabilistic mapping of network behaviour and interdependencies.
- KPI and measurement framework design linked to performance, resilience and cost.



- Evidence-based prioritisation of initiatives and levers using advanced heuristics.
- High-level decision model and strategic roadmap into digital-twin and simulation work.
- AI-driven synthetic populations and scenario search to test options at scale.

Key benefits

- **Faster clarity**: Move quickly from generic concerns about congestion, resilience or investment risk to a precise, shared picture of what drives system behaviour.
- **Better targeting of capital and effort**: Focus investment, policy and operational energy on the initiatives and levers that most improve performance and resilience.
- **Decision-ready digital-twin scope**: Enter mobility and infrastructure digital-twin projects with a well-framed, prioritised scope, reducing rework and delivery risk.
- **Explainable and defensible**: Use transparent causal and probabilistic models, and AI that is explainable by design, to support business cases, regulatory engagement and public accountability.
- **Continuous improvement foundation**: Establish a structured path into ongoing simulation-driven planning and operational decision support for mobility and infrastructure systems.

7. Dependencies and prerequisites (including customer responsibilities)

This service depends on access to sufficient mobility, infrastructure and operational context to build a meaningful decision narrative and work plan.

Key prerequisites (customer side):

- Access to relevant stakeholders across transport planning, infrastructure strategy, logistics, resilience, operations, finance and data/IT, including decision-makers for scope and prioritisation sign-off.
- Provision of current and target-state information on transport and infrastructure systems, such as: key corridors and routes, hubs and terminals, multimodal interchanges, critical assets, strategic programmes and planned infrastructure changes.
- Provision of representative performance, demand and cost data where available: traffic and passenger flows, origin–destination data, timetables and schedules, reliability and disruption records, asset condition and maintenance history, and high-level capex/opex drivers.



- Early confirmation of regulatory, information-governance and security constraints, especially where data is sensitive (e.g. defence logistics, national infrastructure, safety-critical assets or commercially confidential flows).
- Where underlying tools or data sources are immature or unavailable, Skyral will use proxy data, synthetic demand and disruption profiles or partial models to proceed, with limitations clearly flagged in the decision narrative and work plan.

8. Onboarding and implementation approach

Onboarding is structured as a short, time-boxed engagement that quickly moves from system understanding to decision-ready outputs for mobility and infrastructure.

Indicative approach:

- Initiation and scoping
    - Confirm the mobility/infrastructure questions (e.g. corridor congestion, port resilience, multimodal connectivity, climate or disruption risk) and success criteria (e.g. journey time, throughput, resilience, emissions).
    - Agree core corridors, regions or systems in scope, stakeholder set, cadence of sessions, data access and approvals.
- Discovery and data gathering
    - Run structured workshops with transport, infrastructure, logistics and resilience teams to map networks, interdependencies, initiatives, risks and hypotheses using Skyral's Simulation Scaffold Framework.
    - Ingest and review available artefacts: strategies, transport plans, infrastructure blueprints, PMO plans, performance summaries, disruption/incident logs and relevant models.
- Modelling and prioritisation
    - Construct high-level causal and probabilistic models representing how people, vehicles, freight and infrastructure interact, and how disruptions propagate across modes and critical infrastructure.
    - Apply heuristics and quantitative reasoning to rank initiatives and levers by impact, feasibility, risk, dependencies and time-to-value.
- Playback and refinement
    - Test interim narratives, initiative lists and KPI framework with stakeholders; refine assumptions, levers and scenarios based on feedback.
- Final outputs and transition
    - Deliver the decision narrative, prioritised initiatives, KPI framework, high-level model and roadmap, including clear options for follow-on Skyral Modelling and Simulation Development as a Service or broader mobility/infrastructure digital-twin programmes.

9. Configuration, customisation and integration

This service is primarily a consulting and decision-support engagement, configured around the customer's specific mobility, logistics and infrastructure context.

Configuration and customisation:

- Tailoring of workshops, problem decomposition and logic trees to the customer's domains (e.g. urban mobility, national corridors, defence logistics, port/airport systems, utilities interdependencies) and current programmes.
- Custom definition of KPIs, levers and scenarios aligned with the organisation's policy goals, operational model, resilience targets and regulatory environment (e.g. emissions, accessibility, journey time, supply-chain reliability).
- Adaptation of high-level models to reflect customer-specific network designs, operational rules (e.g. priority regimes, timetabling, service patterns), contingency plans and cross-infrastructure dependencies.

Integration (lightweight in this service):

- Use of existing artefacts and exports from planning tools, GIS, transport modelling tools, asset management and PMO systems as inputs (e.g. shapefiles, schedules, asset lists, CSV extracts, summary reports), without requiring deep system integration.
- Optional definition, as part of the roadmap, of how future Skyral digital-twin deployments would integrate with existing decision-support tooling, data lakes, GIS platforms and control systems to support ongoing planning and operational decision support.

10. Service levels and performance (including availability targets)

As a time-boxed professional service rather than a 24×7 operational platform, service levels focus on delivery quality, responsiveness and agreed milestones.

Delivery cadence

- Milestones for discovery, interim findings, draft outputs and final deliverables agreed at kick-off and tracked against the one-month (or multi-phase) timeline.
- Responsiveness during the engagement
- Target response to project-related queries within the next UK business day during agreed working hours, with priority given to items that could delay workshops or governance decisions.
- Turnaround for major document/model revisions agreed upfront (for example 3–5 UK business days), dependent on the scale of change and timely customer feedback.

For any Skyral platform components temporarily used (e.g. to host interactive mobility or infrastructure scenario views), operational characteristics will follow the underlying Skyral Core and SPORE practices in secure cloud or data-centre environments, but formal numerical availability SLAs are normally attached to ongoing managed services, not this shaping engagement.

11. Support model and service desk (hours, channels, response/resolve targets)

Support is delivered by the named Skyral engagement team (SME, Applied Scientist and Product Owner), not a generic helpdesk. The team works through agreed channels, such as email, collaboration tools and scheduled workshops, during UK business hours, with the response targets set out in Section 10.

12. Security model and accreditations (including any ISO, Cyber Essentials, data protection)

Skyral's approach to security is built around secure-by-design engineering, cloud-neutral deployment via SPORE, and formal certifications.

Security model:

- Support for deployment into secure cloud, on-premises data centres and sovereign or air-gapped environments, with consistent operational, monitoring and governance controls through Skyral's SPORE layer.
- Role-based access and governance mechanisms across Skyral Core components (Content Catalogue, Scenario Service, Orchestrator, Data Plane, Lens) to ensure that models, scenarios and outputs are controlled, auditable and appropriately segmented.
- Design and operation aligned to data-protection and information-assurance principles relevant to defence, national security and regulated sectors.

Accreditations and standards (certificates available on request):

- Cyber Essentials and Cyber Essentials Plus – Skyral holds both certifications.
- ISO 9001:2015 – Skyral holds certification for quality management (certificate 258084, British Assessment Bureau, valid until 20 June 2027).
- ISO/IEC 27001:2022 – Skyral holds certification for information security management (certificate 258484, British Assessment Bureau, valid until 20 June 2027).

Data protection:

- Customer data used in this service is limited to what is necessary for analysis and scenario framing, with anonymisation, aggregation or synthetic agents used where appropriate. For example, passenger-flow modelling can use synthetic populations (simulated travellers with realistic routines) instead of personal data about real people.
- Any processing of personal data follows applicable UK data-protection legislation, with roles and responsibilities defined in the underlying contract or data-processing agreement.
- Skyral's use of AI is governed by its AI Business Purpose Policy, which covers approved tools, risk assessment, data protection impact assessments, bias monitoring and human verification of AI-generated content.

13. Data management (location, retention, backup, restore, portability)

Data used in this service typically includes: transport and logistics flows, infrastructure layouts, timetables, asset registers, performance and disruption summaries, programme plans and derived modelling artefacts.

Location:

- Skyral can operate in the cloud, on-premises or sovereign environments using SPORE, enabling deployment of modelling and decision-support components in regions or infrastructures that align with customer and regulatory requirements.
- For this one-month engagement, data and artefacts are usually stored in Skyral's secure collaboration and modelling environments, or in customer-hosted repositories where preferred.

Retention and backup:

- Working data and artefacts (models, narratives, roadmaps) are retained for at least the duration of the engagement plus an agreed period (e.g. 6–12 months) to support follow-on work, unless customer policies require earlier deletion.
- Underlying platforms used by Skyral provide standard backup and resilience capabilities for the environments in which they are deployed; recovery time objectives (RTO/RPO) are normally defined at the platform or managed-service level rather than for this shaping service.

Portability and export:

- Final outputs (documents, diagrams, models at appropriate granularity) are provided in commonly used formats (e.g. Office formats, PDFs, and where



possible, model exports or structured configuration/parameter sets) to facilitate reuse by the customer and partners.
- On request, Skyral will support reasonable data export and documentation of model structures to aid internalisation or third-party uptake, subject to licensing and IP terms.

14. Business continuity and disaster recovery approach

- For this service, business continuity focuses on ensuring the engagement can proceed and deliver its outputs despite issues affecting personnel, tools or hosting environments.
- Formal DR metrics (RTO/RPO) and continuity obligations are normally associated with ongoing managed services, and would be detailed in platform-level or enterprise agreements rather than this shaping engagement.

15. Service usage limits and constraints

This is a scoped, time-boxed decision-support engagement rather than an open-ended modelling service.

Typical limits and constraints:

- Duration: standard engagement of approximately one month of effort, with scope sized accordingly; larger or multi-phase engagements require explicit scoping.
- Breadth vs depth: emphasis on high-value problem framing, causal/probabilistic modelling and prioritisation, not on building fully detailed, production-grade digital twins across every part of the network.
- Model fidelity: models are intentionally high-level scaffolds suitable for decision-support and roadmap definition; fine-grained engineering models are delivered in subsequent Skyral Modelling and Simulation Development as a Service or digital-twin programmes.
- Data availability: where data is limited or incomplete, outputs may include caveats and clearly labelled assumptions; this may constrain the robustness of quantitative conclusions.

16. Pricing model and units (linking to framework pricing rules)

The pricing model for this service is a fixed-scope, time-boxed engagement, with options to extend into further phases through follow-on engagements (such as Skyral Synthetic Development Services).

Core structure:

- Core one-month engagement priced as a fixed-price package based on defined deliverables (decision narrative, prioritised initiatives, KPI framework, high-level model, roadmap) and agreed stakeholder footprint.
- Extensions or additional phases (e.g. extra domain deep-dives, expanded stakeholder scope, additional scenario families) priced either as additional fixed-price work packages or time-and-materials under the relevant framework rate card.
- Any subsequent Skyral Modelling and Simulation Development as a Service or digital-twin deployment would be priced separately, reflecting model build effort, platform usage and, where relevant, managed-service components.
- Exact pricing, units (e.g. person-days, work packages) and linkage to framework pricing rules are defined in the commercial schedule.

17. Change management (how changes to scope or volumes are handled)

Change management is designed to protect outcome quality while accommodating evolving questions in complex mobility and infrastructure programmes.

- Initial scoping defines: in-scope geographies, modes and infrastructures; priority questions; stakeholder groups; indicative datasets; and planned workshops/playbacks.
- Material changes (e.g. adding additional cities, networks or agencies; introducing significant new questions; or requiring deeper technical integration with operational systems) trigger a joint impact assessment on timelines, effort and deliverables.
- Minor adjustments (e.g. refining KPIs, adjusting prioritisation criteria, adding closely related scenarios) are handled within the existing scope where feasible, with impacts recorded in an engagement log.
- Larger changes require a formal change note or contract variation, which may introduce additional work packages, adjusted timelines and revised commercial terms (price, units, or rate-card usage).

Where Skyral Core is used, its governance tools record which models, content and scenarios are affected by a scope change, so the impact of each change can be traced.

18. Exit and offboarding (including data export and handover)

Exit and offboarding ensure that customers retain usable artefacts and insights to inform ongoing mobility and infrastructure programmes, with or without further Skyral involvement.:

- Provision of final deliverables in agreed formats, including decision narrative, visual driver/lever maps, prioritised initiatives, KPI framework, high-level model description and roadmap.
- Walkthrough session(s) to explain the outputs, underlying assumptions, and how they can be used to inform architecture, planning and operational decisions, as well as the path into digital-twin build-out.
- On request, export of relevant configuration or model artefacts (e.g. scenario definitions, parameter sets, simplified model structures) in documented form, to support internal teams or partner organisations.

Data and environment offboarding:

- Removal or anonymisation of customer-specific data from Skyral environments in line with contractual data-retention terms and any customer-specific security requirements.
- Termination of access for customer users to any temporary, Skyral-hosted interactive scenario views unless explicitly agreed as part of ongoing services

19. Key assumptions and exclusions

Key assumptions:

- The customer can provide timely access to relevant stakeholders and data to meet the one-month engagement timeframe.
- The primary goal is decision-support, strategy and prioritisation across mobility and infrastructure, rather than full production implementation or detailed engineering design of assets and control systems.
- Initial models and scenarios are used to compare options and highlight risks/trade-offs rather than to produce exact, line-rate predictions for every element of the network.

Key exclusions (unless explicitly added to scope):

- Full-scale, production-grade digital-twin implementation and ongoing integration with live operational systems (e.g. traffic management systems, railway control, port terminal operating systems), which are covered by



subsequent Skyral Modelling and Simulation Development as a Service and platform services
- Detailed vendor-specific configuration generation, low-level design artefacts or direct changes to production networks.
- Formal regulatory submissions or safety cases; Skyral's outputs can inform such work but do not replace formal assurance processes.

20. Related services and optional add-ons

Related Skyral services:

- Skyral Modelling and Simulation Development as a Service (Mobility & Infrastructure) – builds detailed digital twins and agent-based models of cities, corridors, ports, airports, logistics networks and interdependent infrastructures, aligned to the prioritised levers and scenarios from this engagement.
- Skyral Modelling and Simulation Development as a Service (Network Edition): builds detailed network digital twins and agent-based models aligned to the prioritised levers and scenarios identified in this engagement.
- Mission Planning & Decision Support services for defence and national security, using large-scale agent-based modelling to explore courses of action, logistics and resilience across multi-domain operations.
- Health Policy & Programme Strategy simulation services, applying similar techniques to patient flows, resource allocation and intervention strategies for health systems.

Optional add-ons to this specific service:

- Additional deep-dive modules on specific mobility or infrastructure domains (e.g. a single major corridor, port cluster, airport system, urban mass-transit network, or a specific supply chain), delivered either as extended discovery within this service or as Skyral Advisory/Modelling and Simulation Development phases depending on need.
- Rapid proof-of-concept digital-twin instances (for example, for a single city, corridor or logistics chain) using existing designs and synthetic or fused data to demonstrate interactive scenario analysis beyond the initial decision narrative, delivered via Skyral Core and Modelling and Simulation Development as a Service.
- Extended roadmap and business-case support, including structured inputs for investment programmes, funding bids and regulatory or policy submissions (for example, transport strategies, resilience plans or infrastructure business cases)
- AI opportunity review: identifying where AI and machine learning could strengthen the customer's network planning, forecasting and operational decision support, and how to govern its use.

21. Contact, account management and reporting

- E. enquiries@skyral.io
- W. www.skyral.io