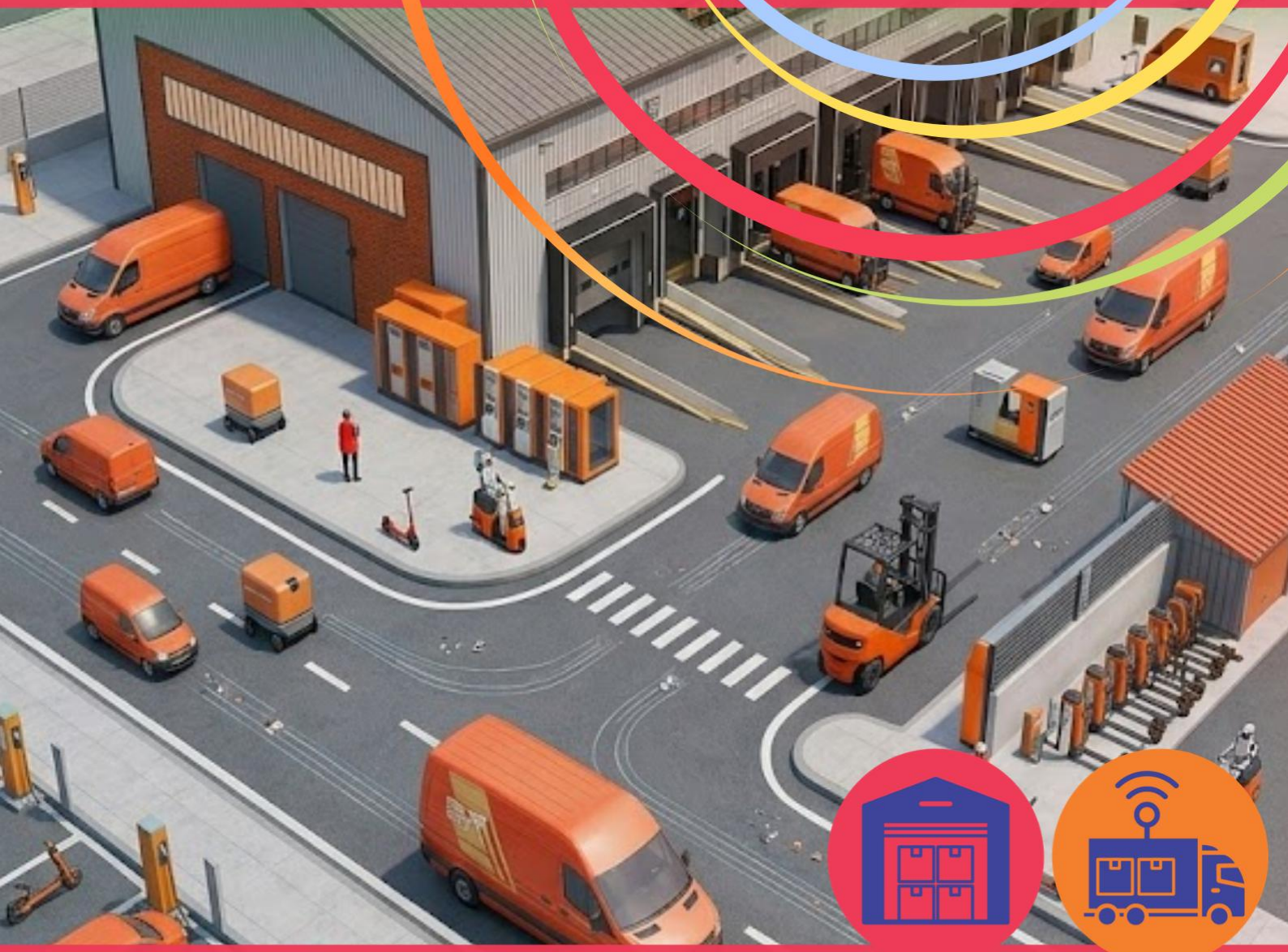
DISC

Data-driven and Dynamic Space Assets for physical internet led Urban Logistics and Planning



DISCO Policy Lessons

DISCOESTATE DISCOLLECTION

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Acronyms and abbreviations

A quick reference for the terms used throughout this brief.

Term	What it means
DISCO	Data-driven and Dynamic Space and Assets for Physical Internet-led Urban Logistics and Planning, the Horizon Europe project behind this brief (Grant Agreement No. 101103954)
DISCOESTATE	The DISCO innovation covered in this brief, for turning underused buildings and public spaces into shared, multi-tenant logistics space
DISCOLLECTION	The companion DISCO data layer that publishes standardised building-availability, occupancy and contract data from DISCOESTATE deployments
Living Lab	A real-world city site where a DISCO innovation was piloted (Starring) or adapted and tested (Twinning)
PI	Physical Internet, the interoperable-logistics principle underpinning DISCO: shared infrastructure, resource pooling and modal shift
Warehouse-as-a-Service (WaaS)	A platform that lets several operators book shared storage and handling capacity instead of each holding their own
UFDS	Urban Freight Data Space, the DISCO platform for sharing standardised freight and building-availability data
RFID	Radio-frequency identification, a tag-based technology used here for automated vehicle access
API	Application programming interface, a standard way for two computer systems to exchange data automatically
SULP	Sustainable Urban Logistics Plan
SUMP	Sustainable Urban Mobility Plan

1. What is DISCOESTATE?

Turning underused and part-time buildings into shared, multi-tenant logistics space.

DISCOESTATE treats underused buildings and public spaces as potential logistics hubs. The idea is to transform spaces that stand empty, or are used only part of the time, such as exhibition centres, municipal markets and public buildings, into shared, multi-tenant facilities serving last-mile delivery.

It enables three things at once: reusing existing infrastructure instead of building new, sharing that space across several operators, and using it flexibly over time, so a building serves logistics only when it is not needed for its primary purpose. This supports the space-efficiency and land-use ambitions of the EU Urban Mobility Framework and of Sustainable Urban Logistics Plans.

What it could look like in practice

- A part-time venue, such as an exhibition centre, hosts logistics operations during the periods between events.
- A digital platform tracks the real-time availability and occupancy of pavilions, halls, shops and offices.
- Electronic signatures and standardised data models let building owners and logistics tenants finalise agreements quickly and securely.
- Access infrastructure such as barriers, cameras and vehicle tags enables secure, round-the-clock operation.
- Congested depots relocate out of the historic core, reducing freight pressure on sensitive central streets.

Paired with DISCOLLECTION

Building availability, occupancy and contract data are managed through a shared platform connected to the Urban Freight Data Space.

A standardised building classification, covering space type, availability windows, access constraints and utility connections, makes capacity discoverable and bookable across the city, rather than each building being known only to the tenant already using it.

2. Where DISCOESTATE was demonstrated

DISCOESTATE was demonstrated most fully in Thessaloniki, where the focus was on digital trust, collaboration and infrastructure as the route to unlocking shared building capacity. In Valencia, DISCOESTATE became a crisis-adaptation measure, repurposed at short notice after an extreme weather event in October 2024. Both followed the DISCOESTATE generalised transition path, introduced in Section 4.



Figure 1: TIF HELEXPO, the Thessaloniki exhibition centre where a relocated courier depot now operates alongside scheduled events.

What each Living Lab tried

Each profile below brings together, for one Living Lab at a time, the approach it took, the data it fed back into DISCOLLECTION, and its headline result.

Thessaloniki *Starring*

APPROACH An exhibition centre (TIF HELEXPO) hosted a relocated courier depot as a round-the-clock logistics hub, operating between scheduled events.

DATA SHARED Building availability and contracts managed through a connected platform.

KEY RESULT A courier depot relocated into a part-time exhibition centre with genuine round-the-clock operation, enabled by digital contracting.

Valencia *Twinning (crisis)*

APPROACH Repurposed warehouse space was used for emergency logistics after the 2024 floods, rather than as a planned pilot.

DATA SHARED Crisis data exposing the need for pre-designated flexible space.

KEY RESULT The repurposed warehouse supported a crisis response that outperformed conventional logistics by 40 percent.

Thessaloniki tested a planned, long-term version of DISCOESTATE by relocating a courier depot into an exhibition centre (TIF HELEXPO) for use outside peak event periods. Valencia's contribution was unplanned: when the 2024

floods hit, three underused spaces were pressed into service as emergency consolidation hubs. Together they show what the same idea looks like under very different time pressures.

- **Thessaloniki —** upgraded its warehouse-matching platform (Ware M&O) with electronic-signature capability, standardised the underlying data model, and formalised a business agreement between the venue (TIF HELEXPO) and the courier (ACS) covering responsibilities and cost-sharing. A second operator, FM Logistic, was able to connect its own warehouse management system to the same platform.
- **Thessaloniki —** also made physical upgrades to support round-the-clock access: articulated barriers, access cameras, a reprogrammed ticketing system and RFID vehicle tags.
- **Valencia —** kept its approach simple out of necessity: an unused fruit and vegetable warehouse in Alcàsser was turned into a distribution base, chosen for its location near the crisis zone, paired with a web portal where affected residents could request supplies by category and location.

What made the implementations successful

- **Thessaloniki —** electronic signatures acted as the trust mechanism that finalised a complex public-private agreement; the resulting infrastructure investment then enabled genuine 24/7 operation, moving the courier depot out of the congested centre.
- **Thessaloniki —** proved a working Warehouse-as-a-Service model, with dynamic availability data flowing between the platform and both the venue's building-management system and the second operator's own system, fully interoperable with the Urban Freight Data Space.
- **Valencia —** the Alcàsser hub outperformed every other emergency facility by more than 40 percent in service capacity, supplied food and sanitary items to 1,500 families, and proved the model does not depend on purpose-built infrastructure, attracting international interest beyond the EU.

Challenges faced by DISCO living labs

- **Thessaloniki —** reconciling round-the-clock logistics access with exhibition-venue opening hours, ongoing renovations and restricted vehicle access required extra investment and caused delays.
- **Thessaloniki —** aligning the building-management system with the logistics platform exposed mismatched data formats and protocols, requiring iterative testing.
- **Thessaloniki —** reaching final agreement between the venue and the courier took several rounds of negotiation, particularly over space and price, even though both partners had aligned on the concept early on.
- **Valencia —** the crisis response was limited by the absence of any pre-designated flexible space or structural integration before the emergency hit.

Standardisation lessons

- Classify buildings by space type, dimensions, availability windows, access constraints and utility connections, so capacity can be compared and booked consistently across a city.
- Agree a common API protocol for real-time availability data across platforms, rather than letting each building report in its own format.
- Treat physical infrastructure requirements, such as loading-dock access, electrical capacity and vehicle clearance, as site-specific; these are unlikely to standardise in the way data formats can.

3. Results and policy fit

DISCOESTATE showed that the main barriers to sharing building space are not technical. They are negotiation, round-the-clock access to infrastructure, and aligning data models between partners who have never had to share a platform before. In Thessaloniki, a digital platform with electronic signatures became the decisive trust mechanism that turned a difficult public-private negotiation into a working operational arrangement, letting a busy courier depot move out of the historic core.

Because every building is different, standardisation should target a common building-classification scheme and shared availability interfaces, rather than physical design, which has to stay site-specific. Valencia's experience adds a further point: flexible buildings are resilience assets too, and are most valuable precisely when conventional infrastructure is disrupted. The key result for each Living Lab is set out in its profile in Section 2.

Best-suited policy and regulatory targets

DISCOESTATE speaks most directly to policy and regulatory targets concerning land use, public-asset management, logistics-space provision and resilience.

Framework or instrument	How DISCOESTATE contributes
Sustainable Urban Logistics and Mobility Plans	Provides a method for allocating and sharing logistics space, and for relocating depots out of sensitive areas.
EU Urban Mobility Framework	Advances efficient use of urban space and reduced freight pressure in city centres.
Spatial planning and land-use policy	Supports time-based and shared use of existing buildings instead of new construction.
Public-asset management and procurement	Enables anchor tenancy and fair-value use of public buildings as logistics capacity.
Data standards / resilience planning	Promotes common building-classification interfaces for discoverable space, and designates flexible public buildings as dual-use logistics and crisis assets.

DISCOESTATE is most powerful where land-use policy, public-asset management and digital availability standards combine, letting cities unlock hidden building capacity and keep it ready for both everyday logistics and crisis response.

4. Recommended first steps

Policy goes hand in hand with planning and implementation at every step. The DISCOESTATE Generalised Transition Path sets out a recommended, seven-step route for a city to follow, from inventorying its existing supply to agreeing a lasting business model. The policy lessons on the next page explain what tends to decide whether that sequence holds once a pilot is over.

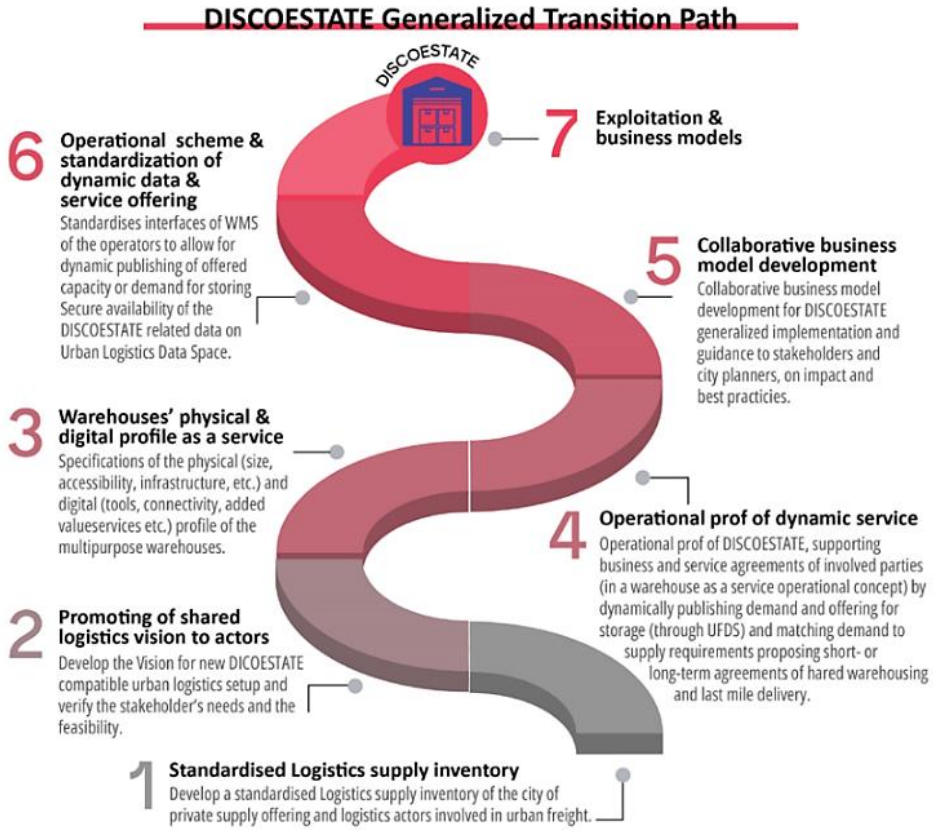

Figure 2: Generalised transition path for dynamic building-space management — see DISCO deliverable D2.1 for full detail.

Step	What it involves
1. Standardised logistics-supply inventory	Develop a standardised inventory of the city's private logistics supply and the actors already involved in urban freight.
2. Promote a shared logistics vision to building owners and operators	Develop the vision for a new, DISCOESTATE-compatible urban logistics setup, and verify stakeholder needs and feasibility before committing further.
3. Profile warehouses as a physical and digital service	Specify the physical profile (size, accessibility, infrastructure) and digital profile (tools, connectivity, added-value services) of candidate multipurpose warehouses.
4. Prove the operational concept of dynamic service	Support the business and service agreements a warehouse-as-a-service model needs, publishing live demand and available storage through the UFDS and matching the two together through short or long-term agreements.
5. Develop a collaborative business model	Develop a collaborative business model for DISCOESTATE's wider roll-out, with guidance for stakeholders and city planners on impact and best practice.

6. Standardise the operational scheme and data offering	Standardise the interfaces of operators' warehouse-management systems so offered capacity and demand for storage can be published dynamically, and secure the availability of DISCOESTATE data in the city's logistics data space.
7. Define exploitation and business models	Settle the long-term exploitation and business models that will keep the service running once the initial demonstration ends.

Practical tips for getting started

- Start with a building that already has a willing, single counterpart (one venue, one courier) before attempting a multi-operator marketplace; Thessaloniki added its second operator only once the first agreement was working.
- Treat the negotiation between building owner and logistics tenant as the main project risk, not the technology; budget time for several rounds, even where both sides agree on the concept early.
- Design round-the-clock access (barriers, cameras, vehicle tags) into the agreement from the start, since reconciling logistics hours with a venue's own opening hours is harder to retrofit later.
- Keep a shortlist of pre-designated flexible spaces ready before a crisis, not after; Valencia's response was limited precisely because no such shortlist existed when the floods hit.

5. Policy lessons

The transition pathway sets out how a city can move from first scoping to a working shared building. The lessons below, drawn from DISCO's policy dialogues across all four DISCO-X innovations, explain what tends to decide whether that pathway holds once the pilot is over, for a city considering whether and how to proceed.

- **Trust, not technology, is the binding constraint.** Thessaloniki's agreement held together because electronic signatures gave both sides a verifiable trust mechanism, not because the building or the booking platform was sophisticated.
- **A neutral intermediary is not the same as a single operator.** DISCOESTATE's evidence points the same way as the other DISCO-X innovations: a single, designated coordinating role is essential for a shared building to work for more than one tenant, while handing that role to one commercial operator conflicts with the Physical Internet's shared-infrastructure principle. The two are reconciled once the intermediary is neutral, open to every logistics tenant, and kept separate from any one operator's commercial interest. The complexity is institutional, not conceptual: that intermediary still has to be funded, staffed and given a legal mandate, which is harder than simply picking a single contractor.
- **Municipalities work best as enablers, not operators.** Thessaloniki's city government navigated bureaucracy and brokered the agreement, but the venue and courier ran the operation; the city did not try to run the hub itself.
- **Financial sustainability is the weakest link.** The logistics rental-viability gap, where operators cannot pay commercial rates and owners cannot accept logistics yields unaided, is a financial barrier that no amount of governance innovation can close alone.
- **Pre-identify flexible space before a shock, not after.** Valencia's crisis response worked because existing capacity could be repurposed quickly; the lesson is to keep a standing shortlist of flexible buildings, not to wait for the next emergency to look for one.

The recommendations that follow turn these lessons into concrete action at each level of government.

6. Policy recommendations

DISCO held policy discussions with European cities to map the wider state of play beyond its own Living Labs. Two countries already have fully operational hub models that are ready to replicate elsewhere, and more than five others are actively exploring how to put spare space to use for logistics. Estonia is already repurposing circular-economy centres as logistics nodes, and France has taken a regulatory-inventory approach, listing unused public space so the city can decide how to adapt each site. Across every workshop table, three governance questions recurred: who is responsible for the building, known as ownership; who absorbs the cost gap between logistics and commercial rents, known as cost; and whether the city has a clear mandate to act at all, known as mandate.

No single level of government can close these gaps alone. European action can make the model recognisable and partly fund the viability gap; national governments hold the tax, planning and marketplace levers that make individual buildings worth converting; and city-level action remains essential to find the buildings, appoint a trusted intermediary, and strike the first agreement.

A. European Union level

Recognise building-reuse logistics space under EU space-efficiency frameworks

Warehouse-as-a-Service and other shared-building models advance the space-efficiency ambitions of the EU Urban Mobility Framework, but are not yet named as an eligible category in EU guidance. Formal recognition would let cities count building-reuse logistics space toward their space-efficiency and land-use commitments.

Co-fund the logistics rental-viability gap

Logistics operators cannot pay urban commercial real-estate rates, and real-estate owners cannot accept logistics yields without compensation. This gap is a financial barrier that governance innovation alone cannot bridge. An EU co-investment mechanism, feeding into the national bridging instruments described below, would let the model scale beyond cities able to absorb the gap through direct municipal investment.

Set a common EU building-classification and availability-data standard

DISCOESTATE's own standardisation lessons point to the same gap seen in other DISCO-X innovations: no common way yet exists to classify building type, availability windows, access constraints and utility connections, or to publish that data through a shared API. An EU-level standard would let the model replicate without bespoke data engineering in every new city.

B. National level

Create a national marketplace instrument for vacant logistics space

A digital marketplace that lets space owners list underused assets, and lets operators lease them on transparent terms, dissolves the information asymmetry at the heart of the problem. National digital-infrastructure ministries should fund and mandate open logistics-space marketplace platforms.

Reform planning codes to enable dual-use logistics zoning

National planning legislation should explicitly permit logistics hubs, parcel depots, micro-consolidation and EV charging to coexist with parking, commercial and light-industrial uses within the same planning footprint.

Introduce tax incentives for owners offering underused assets for logistics

The gap between logistics rental yields and urban real-estate rates is structural. National tax codes should introduce time-limited relief for owners who make underused assets available for designated logistics use under city-brokered agreements.

Mandate logistics-space assessment in housing and regeneration programmes

National regeneration guidelines should require an assessment of logistics-space potential before conversion approval, reserving a proportion of sites for mixed-use development that includes ground-floor logistics nodes.

C. City level

Publish an open inventory of underused public buildings

France's regulatory-inventory approach, listing all unused public space so the city can decide how to adapt each site, is a replicable first move. Both this and a more targeted approach require the same precondition: a clear city mandate to act.

Appoint a neutral intermediary between building owners and logistics operators

The most transferable lesson from DISCOESTATE is not the hub itself but the role of a designated intermediary sitting between the real-estate owner and the logistics operator. This body manages contracts, data standards and occupancy risk, making the arrangement viable for both sides.

Make electronic signatures the default for shared-building agreements

Thessaloniki's experience shows that e-signature capability was the trust mechanism that finalised a complex public-private agreement. Cities should adopt the same approach as standard practice for any shared-building arrangement, rather than negotiating a bespoke legal process each time.

> *The logistics rental-viability gap is a financial barrier that governance innovation alone cannot bridge. A bridging subsidy, co-investment mechanism or tax instrument is needed at national level before the DISCOESTATE model can scale beyond cities willing to absorb the gap through direct municipal investment.*

7. Where can cities start? The Meta-Model Suite

DISCO has created a Meta-Model Suite: a set of interoperable decision-support tools developed across the DISCO project to let planners test urban logistics interventions before committing to physical investment or regulatory change.

For planners, this means the ability to run scenario comparisons that guide a city toward the DISCO innovation that suits its local context, together with a step-by-step transition guideline and advisory.

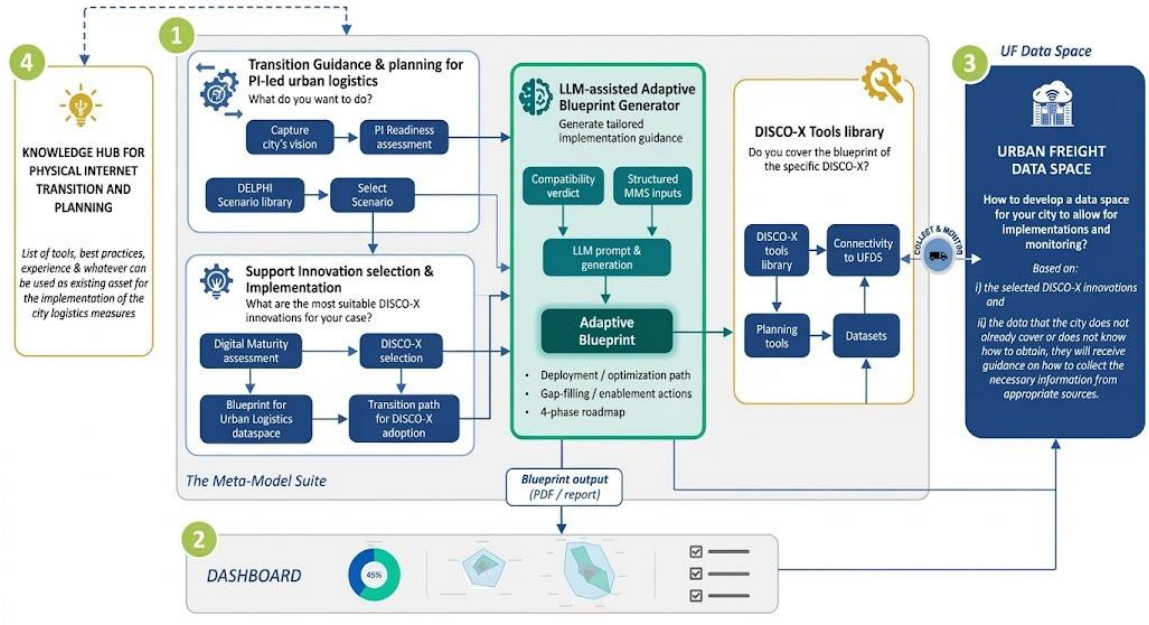

Figure 3: The Meta-Model Suite: from capturing a city's vision and readiness, through assisted blueprint generation, to a dashboard output connected to the Urban Freight Data Space.

In plain terms, the suite works in four linked parts:

- **Transition guidance and planning —** captures a city's vision and Physical Internet readiness, then helps select the most suitable scenario.
- **Adaptive blueprint generator —** an assisted tool that turns a city's inputs into a tailored implementation blueprint, complete with a deployment path, gap-filling actions and a four-phase roadmap.
- **DISCO-X tools library —** connects the blueprint to the specific planning tools, datasets and Urban Freight Data Space connectivity a city will need.
- **Knowledge hub —** a running list of tools, best practices and experience that cities can draw on when implementing any DISCO-X measure, including DISCOESTATE.

Because the underlying models share a common structure across partner cities, a planner in a new context can adapt parameters from a comparable DISCO deployment rather than starting from first principles, shortening the path from policy intent to a testable local plan.

Explore the step-by-step analysis and guided feedback at metamodelsuite.imet.gr/meta-model-suite

Scan to open the Meta-Model Suite

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