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From Policy Failures to Implementation Setbacks in Urban Freight Governance: Evidence from Rome and a Governance and Engagement Toolkit

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Abstract

Urban freight transport (UFT) is increasingly addressed through Sustainable Urban Mobility and Logistics Plans, yet many cities still face a persistent design-implementation gap. Measures that appear coherent in strategic documents become contested, delayed, unevenly enforced, or repeatedly revised once translated into regulation and delivery. This paper reframes implementation instability as a sequence of policy setbacks rather than as a binary success-failure outcome. Using Rome as an in-depth case, it traces how setbacks emerge along the strategic-tactical-operational chain as governance constraints, engagement discontinuities, and acceptability conditions accumulate. The empirical strategy combines a mechanism-oriented scoping synthesis, a document-led reconstruction of the institutional setting, an expert interview, and a within-case comparison across three policy families: urban consolidation centres, freight-oriented limited traffic zones, and micro-hubs. Findings show that stability differs by level. Strategic measures are exposed to viability and participation thresholds that prolong pre-implementation; tactical access regulation destabilises when rule complexity collides with scarce kerbside space and limited observability, prompting derogations and credibility loss; operational-interface measures drift when siting, responsibilities, and data routines are not closed early. The paper derives a modular governance-and-engagement toolkit specifying minimum implementability conditions, change control, and early-warning signals to reduce avoidable setbacks while remaining adaptable to context.

Keywords: Urban freight transport; Policy setbacks; Policy implementation; Implementation governance; Stakeholder engagement; Policy acceptability; Limited Traffic Zones (freight LTZ); Micro-hubs; Urban consolidation centres; Rome

1 Introduction

UFT is now a recurring object of strategic planning in large European cities through SUMPs and related logistics programmes, yet a persistent design-implementation gap remains. Measures that appear coherent in plans often become contested, delayed, repeatedly revised, or unevenly enforced once they are translated into regulation and delivery. Rome offers a visible illustration of this pattern. The debate on the city's Green Zone (Fascia Verde) shows how a measure grounded in an environmental rationale can still trigger mobilisation, postponements, and recalibration before an implementable regime is stabilised (Confcommercio Rome, 2022; Corriere della Sera, 2023; Roma Capitale, 2023; Roma Capitale, 2024; Regione Lazio, 2024).

The paper uses the term policy failures only in the introduction to signal that the empirical problem concerns whether planning and implementation generate the minimum conditions for feasible, credible, and defensible delivery. The analysis does not evaluate failure through final impacts, which would require comparable performance indicators, counterfactuals, and a longer outcome horizon. Instead, it treats the dependent variable as policy setbacks, understood as observable discontinuities along the strategic-tactical-operational chain, such as delays, redesigns, derogations, discontinuation risks, and uneven enforcement (Pressman & Wildavsky, 1973; Lipsky, 1980; Matland, 1995).

The analytical premise is that policies travel through distinct planning and delivery levels. Strategic planning defines direction and public value, tactical planning translates intent into programme architecture and decision rules, and operational planning begins when authorities activate routines such as permitting, monitoring, enforcement, and day-to-day coordination. In UFT, these levels matter because many measures depend on scarce kerbside space, heterogeneous delivery profiles, and multi-actor coordination. A measure that is plausible at the strategic level can become fragile tactically if rules are too complex to communicate and enforce, and it can stall operationally if responsibilities, data routines, and operating arrangements remain unresolved.

To explain why setbacks emerge, the paper focuses on four elements that recur across the UFT and

implementation literature: policy families, governance arrangements, stakeholder engagement, and acceptability. It then addresses three research questions: which engagement characteristics are associated with more acceptable policy decisions (RQ1); which elements of implementation governance help contain resistance and frictions during execution (RQ2); and what benefits follow from institutionalising stakeholder engagement across the strategic, tactical, and operational levels of planning (RQ3).

Empirically, the paper uses Rome as an embedded case and compares three policy families positioned at different points of the chain: urban consolidation and distribution centres at the strategic end, freight-oriented LTZ regulation at the tactical level, and micro-hubs at the operational interface. Methodologically, it combines a targeted scoping review, a document-led case study, a semi-structured expert interview, and a structured within-case comparison. Analytically, the paper explains implementation instability as a multi-level translation problem; practically, it derives a governance-and-engagement toolkit designed to force early closure on implementability conditions, maintain credible feedback loops, and reduce ad hoc exception handling. The remainder of the paper follows this sequence from methodology and literature benchmark to Rome case reconstruction, comparative analysis, toolkit, and conclusions.

2 Methodology

This study adopts a multi-component qualitative design with four linked elements. It combines a mechanism-oriented scoping review, an explanatory embedded case study of Rome's UFT governance, semi-structured expert interviews, and a structured within-case comparative policy analysis. Together, these components support a mechanism-based explanation of policy setbacks. Setbacks are operationalised as delays, rapid redesigns, derogations, discontinuations, and uneven enforcement across the strategic, tactical, and operational levels of UFT governance.

The distinction between strategic, tactical, and operational levels structures data extraction and interpretation. Strategic planning specifies long-term direction, problem framing, and intended public value. Tactical planning translates strategic intent into programme architecture. It also defines regulatory choices, responsibilities, and delivery sequences. Operational implementation concerns street-level routines and capacities. It covers pilots, authorisations, monitoring, enforcement, and the governance of scarce kerbside space. Treating setbacks as a multilevel phenomenon avoids binary success–failure endpoints. It instead reconstructs how setbacks emerge across the policy life cycle through institutional constraints, coordination burdens, administrative capacity limits, and stakeholder conflict. This approach aligns with classic implementation scholarship that links outcomes to ambiguity and conflict, street-level delivery practices, and inter-organisational coordination pressures (Pressman & Wildavsky, 1973; Lipsky, 1980; Matland, 1995).

Rome is treated as a critical, information-rich case. Policy intent on UFT has remained visible over time. Translation into enforceable rules and stable operational routines has, however, been uneven across policy families. The design is embedded. It operationalises the strategic-tactical-operational chain through three UFT policy families that occupy distinct points along the continuum. UCC are analysed at the strategic level. Freight-oriented LTZs are analysed at the tactical level. Micro-hubs are analysed at the operational interface. The purpose is not to rank instruments. It is to explain why implementation stability differs across policy families within the same institutional setting.

To avoid concept slippage, governance, engagement, and acceptability are treated as distinct constructs. Governance denotes the allocation of responsibilities, coordination arrangements, enforcement capacity, and decision-grade information routines that enable translation from plans to rules and routines. Engagement denotes documented participatory devices with identifiable outputs, such as consultation rounds, technical tables, hearings, and written observations. It is assessed through timing, inclusion, continuity, and feedback transparency (Rowe & Frewer, 2000; Reed, 2008). Acceptability denotes attitudinal and political support towards a measure. It is always referenced to a specific actor group. Compliance denotes observed behavioural responses to rules and operational arrangements. It is not used as a synonym for acceptability. These definitions ensure that claims about setbacks link to traceable empirical indicators rather than broad labels.

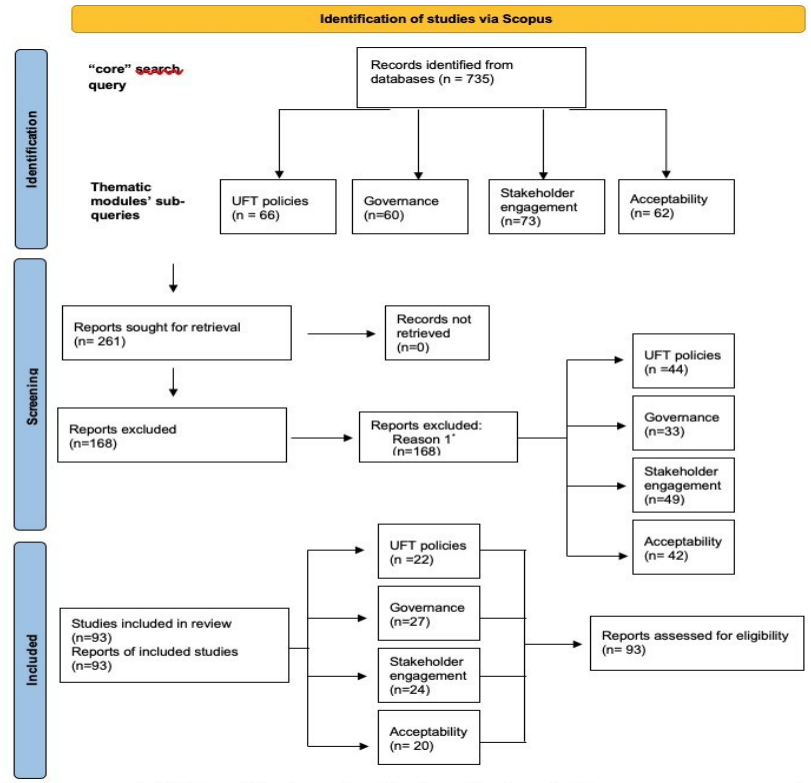
2.1 *Scoping review protocol*

The scoping review maps and organises recent peer-reviewed research that explains why UFT initiatives progress, stall, or destabilise as they move from strategic intent to tactical regulation and operational delivery. A scoping approach is suitable because UFT governance scholarship spans multiple disciplines and uses heterogeneous concepts, mechanisms, and units of analysis. The review therefore prioritises evidence mapping and mechanism-oriented conceptual synthesis rather than effect-size estimation. It consolidates explanations that are later assessed against within-case evidence.

Searches are conducted in Scopus to capture coverage across transport and social science journals. The review includes English-language peer-reviewed journal articles published between 2019 and 2025. It retains records indexed in the Social Sciences subject area. This focus prioritises governance and political-process contributions over predominantly technical optimisation studies. The search strategy combines a core query on UFT and sustainable urban logistics planning with four thematic modules aligned with the scoping structure. These modules cover UFT policy instruments, governance, stakeholder engagement, and acceptability. Records retrieved across modules are pooled and deduplicated prior to screening.

Study selection relies on manual screening in two stages. The first stage screens titles and abstracts. The second stage screens full text where needed. Papers are excluded when they do not address at least one focal area in sufficient depth to support a mechanism-based account of implementation trajectories. This criterion requires an explicit account of how and why initiatives translate, or fail to translate, across strategic, tactical, and operational stages. Screening also excludes studies that focus primarily on a single technical solution without engaging planning, governance, or implementation processes. For retained studies, the synthesis applies within-lens thematic clustering. It groups recurring causal claims, enabling conditions, and constraint patterns into mechanism clusters that represent common sources of implementation instability. Figure 1 illustrates the PRISMA flow.

Figure 1. PRISMA flow



*Papers were excluded if they did not examine at least one focal area (policies, governance, engagement, acceptability) in sufficient depth to support a mechanism-based account of implementation trajectories; that is, to explain how and why initiatives translate – or fail to translate – across strategic, tactical, and operational stages.

2.2 Applied case study analysis, expert interview, and within-case comparison

The empirical core is an explanatory, embedded single-case study that reconstructs mechanisms generating setbacks when UFT strategies translate into tactical rules and operational routines. Case study logic fits the research questions because the analysis targets how and why governance dynamics unfold over time. It treats sequences, institutional constraints, and actor interactions as constitutive of outcomes. It also assumes configurational causality rather than average-effect relationships (George & Bennett, 2005; Yin, 2018). The embedded structure supports systematic tracing of whether drivers of delay and disruption persist, or vary, across policy families located at different implementation levels.

The case study is document-led. Plans, regulatory acts, consultation outputs, and implementation materials function as primary empirical sources rather than background context, consistent with qualitative document analysis (Bowen, 2009; Prior, 2003). Document analysis supports traceability because it specifies the chain of commitments from strategy to rule design and, where available, to delivery routines. The document corpus is inventoried and versioned to maintain a transparent audit trail. Each document is coded using a standardised extraction grid that records the policy family and the targeted implementation level. It also records formal competences and responsibilities, the stated delivery sequence, dependencies on enabling infrastructure or services, and provisions for monitoring and enforcement. The grid additionally captures documentary traces of engagement and acceptability, including consultation formats, attendance or actor categories, published responses to feedback, and publicly stated controversies. This procedure separates empirical traces from interpretation and supports consistency across documents.

Mechanism reconstruction relies on within-case sequencing and process-oriented inference consistent with process-tracing logics. The analysis first reconstructs the intended pathway implied by strategic and tactical texts. It then identifies where subsequent acts, revisions, or implementation artefacts deviate from that pathway. It finally links observed deviations to plausible governance, engagement, and acceptability mechanisms (Beach & Pedersen, 2019). The aim is not to attribute setbacks to a single cause. It is to identify configurations of enabling conditions that remain under-specified or unsupported when policies shift from intent to enforceable routines.

A semi-structured expert interview complements documentary reconstruction where institutional sources specify intended pathways yet do not fully account for delay, contestation, redesign, or uneven enforceability at the operational interface. The interview follows an expert-interview logic. The interviewee is treated as a knowledgeable representative of the governance system. The interview therefore provides access to procedural constraints, coordination bottlenecks, and interpretive frames relevant to the three policy families. The interview guide mirrors the four focal areas used in the scoping synthesis and in the document analysis, so that coding remains comparable across sources. The interview is recorded and transcribed with informed consent.

Qualitative analysis applies a structured, framework-based approach across both documents and interview materials. A shared coding frame reflects the four focal areas. It records setback forms, their timing along the translation chain, and the governance, engagement, and acceptability conditions linked to those forms. Framework-based analysis supports systematic comparison and reduces the risk that interview accounts displace documentary evidence where documents exist. It also enables expert testimony to clarify ambiguities and explain informal routines that documents rarely capture (Gale et al., 2013; Schreier, 2012).

The final step integrates the preceding components through a structured within-case comparison of the three policy families embedded in the Rome case. The comparison tests the proposition that implementation instability is not driven primarily by the technical nature of the measure. It is instead driven by recurring governance weaknesses and engagement discontinuities that manifest differently across implementation levels. The analysis adopts a most-similar design. It holds the urban and institutional context constant while varying the policy family and its position along the strategic-tactical-operational chain. This design strengthens inference on common drivers and supports identification of level-specific constraints (Yin, 2018). Findings are synthesised in an analytical matrix linking each policy family to dominant setback types, the stages where setbacks concentrate, and the governance and engagement conditions that best explain observed outcomes. The scoping synthesis functions as an analytical benchmark. It provides mechanism clusters against which within-case evidence is assessed.

Across components, credibility is strengthened through triangulation across literature, documents, and expert testimony. It is also supported by analytic triangulation enabled by the shared coding frame. Dependability is supported by standardised extraction and coding procedures and by an explicit audit trail that records search decisions, corpus updates, and coding choices. Ethical safeguards include informed consent for interview recording and transcription and secure handling of interview materials. Where required for publication, potentially sensitive operational details are minimised without altering analytical claims.

3 Scoping review

Section 3 presents a scoping review that maps and organises recent research on why UFT initiatives progress, stall, or fail as they move from strategic intent to tactical regulation and operational delivery. The review supports

evidence mapping and conceptual synthesis rather than effect size estimation. It frames setbacks as design and implementation gaps that arise from governance constraints, engagement dynamics, and acceptability conditions. A structured Scopus search underpins the review and targets peer-reviewed English language journal articles published between 2019 and 2025 in the social sciences domain. Section 3 synthesises the results into an analytical framework that guides the subsequent empirical phases of the study.

To keep the synthesis traceable and policy relevant, Section 3 adopts four complementary lenses. Section 3.1 clusters evidence by UFT policy families, focusing on the instruments cities deploy and on how effects depend on translation across levels. Section 3.2 examines governance mechanisms that enable or constrain implementation, including responsibility allocation, coordination, capacity, multi-level alignment, monitoring, and enforcement. Section 3.3 focuses on stakeholder engagement as an implementation mechanism that shapes feasibility, commitment, and learning across stages. Section 3.4 consolidates acceptability insights as a condition that can stabilise, or destabilise, regulation and day-to-day delivery practices. Together, these strands provide the literature-based scaffolding used later to interpret Rome's trajectories and to derive the transferable governance and engagement toolkit.

3.1 UFT policies

UFT policy in the reviewed literature takes the form of policy families whose effects depend on how a strategic concept becomes tactical regulation and, ultimately, operational delivery practice (de Bok et al., 2022; van Heeswijk et al., 2020). The studies seldom present linear solution-to-outcome chains. They instead show that policy impacts emerge from interactions among regulatory constraints, firm decision-making, and last-mile operating conditions, which creates predictable points where design intent diverges from implementation realities (Friedrich & Elbert, 2022; van Heeswijk et al., 2019). This framing matters for a scoping review on design-implementation gaps because it places many setbacks inside the translation across levels, not only in final outcomes (Amaya et al., 2020; van Heeswijk et al., 2020).

A first cluster links consolidation-based approaches, especially UCCs and the broader reconfiguration of logistics nodes and interfaces, with last-mile redesign through micro-hubs or micro-depots, cargo bikes, LEFVs, and mixed fleets (Montwiłł et al., 2021; van Heeswijk et al., 2019; Ceccato & Gastaldi, 2023; Milenković et al., 2024). Modelling and empirical studies present UCCs as tools to cut freight vehicle activity in dense areas through upstream consolidation, yet outcomes depend less on technical feasibility than on adoption dynamics, participation thresholds, and long-term business-model viability (Mepparambath et al., 2021; van Heeswijk et al., 2019). Retailer-focused evidence indicates that a technically plausible UCC can still fail when it offers no clear service advantage over incumbent logistics service providers, while participation can rise when restrictions and rising costs prompt firms to revisit established delivery practices (Akgün et al., 2024). Mepparambath et al. (2021) identify a "critical level of participation" for consolidation to reduce freight trips in a retail district and show diminishing marginal benefits as consolidation intensifies, so partial adoption can miss strategic expectations; van Heeswijk et al. (2019) similarly report large environmental gains in simulation alongside financial fragility in practice, and link revenue stability to early carrier commitments and value-added services. Last-mile reconfiguration studies extend the same design-implementation gap by tying effectiveness to local operating conditions and enabling frameworks (Ceccato & Gastaldi, 2023; Milenković et al., 2024). Ceccato & Gastaldi (2023) find that micro-depot cargo-bike distribution can perform well under specific assumptions, but uncertainty in operational parameters can overturn the ranking of alternatives. In a historic urban environment, Milenković et al. (2024) propose a holistic approach that connects business model development, fleet mix selection, and micro-hub location and routing with assessment of the policy framework and additional legal instruments, and treat enabling regulation as a prerequisite for uptake. Fleet transition appears as a connected theme: a mixed configuration combining eco-friendly vans and cargo bikes can balance stakeholder objectives within freight-consolidation policies, yet heterogeneous stakeholder views can still complicate implementation (Aljohani & Thompson, 2019). At a broader appraisal level, multi-criteria decision-making combined with social cost-benefit analysis prioritises restrictive regulatory measures, alternative modes, and operational optimisation of UCC concepts, reinforcing that implementation often turns on how policy packages are compared, justified, and sequenced (Veličković et al., 2025; Aljohani & Thompson, 2019).

A second cluster operates mainly at the tactical level through pricing and charging instruments that reshape access costs and the attractiveness of transhipment and consolidation (Friedrich & Elbert, 2022; Juvvala & Sarmah, 2021). Friedrich & Elbert (2022) show that city toll schemes can support UCC use and reduce truck entries, while also producing heterogeneous effects. UCC use becomes less cost-attractive for operations with larger delivery quantities per stop because transhipment fees accumulate over time. In an EV-support context, Juvvala & Sarmah (2021) incorporate zone entry fees and emission costs into an evaluation of policy options and conclude that purchase subsidies and zone entry fees act as significant levers for EV adoption in city logistics. These studies position pricing as a key translation tool between strategy and operations, while showing how design

choices can distribute impacts unevenly across delivery profiles, a precursor to later implementation frictions (Friedrich & Elbert, 2022; Veličković et al., 2025).

A third cluster covers access and emissions regulation, such as LEZ and ZEZ approaches, that condition who can enter where, with which vehicle, and under which constraints (Ceccato & Gastaldi, 2023; de Bok et al., 2022). In Padova, Ceccato & Gastaldi (2023) describe low-emission zone restrictions as a catalyst that shifts last-mile practices toward cargo bikes and micro-depots. That case illustrates a typical strategic-tactical-operational chain in which strategic sustainability goals translate into tactical access constraints that reshape operational fleet and facility choices. Agent-based evidence nevertheless shows that behavioural responses can generate trade-offs that policy narratives do not always anticipate. de Bok et al. (2022) show that introducing UCCs in a zero-emission zoning context can increase regional vehicle-kilometres travelled while improving delivery efficiency, which indicates that aggregate indicators can move in different directions depending on system boundaries and behavioural adaptation. This pattern helps explain why implementation debates often focus on what counts as success and how policy packages redistribute costs, kilometres, and operational effort, topics addressed more explicitly in the following subsections (de Bok et al., 2022; van Heeswijk et al., 2020).

A fourth cluster concerns time-related instruments, including delivery time windows, off-hour delivery, and other delivery-period constraints, which often appear alongside access regulation and consolidation strategies (Kodera et al., 2025; Mepparambath et al., 2021). Mepparambath et al. (2021) discuss delivery time restrictions, truck size restrictions, and UCCs as common responses to congestion and parking scarcity, suggesting that time rules often serve as the tactical mechanism through which strategic intentions become operational in dense districts. Kodera et al. (2025) stress behavioural realism and argue that the design and evaluation of off-hours delivery requires understanding delivery-time distributions and their determinants. Time-related rules can therefore shift delivery patterns and operational requirements across actors, and they can underperform when they conflict with observed time-choice behaviour or receiver constraints (Amaya et al., 2020; Kodera et al., 2025).

Across these clusters, the reviewed literature depicts UFT policy as an interdependent, multi-level pathway in which mismatches between strategic intent, tactical instruments, and operational feasibility plausibly generate implementation setbacks (Friedrich & Elbert, 2022; Milenković et al., 2024). In detail, the literature clusters around five main themes. (i) Network and operational reconfiguration strategies combine consolidation and logistics-node approaches (e.g., UCCs/ILCs) with last-mile redesign (e.g., micro-hubs, cargo bikes, LEFVs, mixed fleets), and hinge on reaching adoption thresholds, ensuring business-model viability, and securing locally enabling conditions that allow operational routines to stabilise (Mepparambath et al., 2021; van Heeswijk et al., 2019; Ceccato & Gastaldi, 2023; Milenković et al., 2024). (ii) Pricing and charging instruments steer access and transhipment choices while producing heterogeneous impacts across delivery profiles (Friedrich & Elbert, 2022; Juvvala & Sarmah, 2021). (iii) Access and emissions regulation restructures feasible fleets and can generate system-level trade-offs (Ceccato & Gastaldi, 2023; de Bok et al., 2022). (iv) Time-related rules often act as tactical translation mechanisms, but depend on behavioural realism and receiver constraints (Kodera et al., 2025; Mepparambath et al., 2021).

3.2 Governance

Across the reviewed studies, governance functions less as a background condition and more as the practical infrastructure that enables, or constrains, the translation of UFT intentions from strategic design into tactical regulation and, ultimately, operational delivery. Several contributions treat urban logistics as a domain long dominated by private actors, yet sustainability ambitions and rising delivery activity increasingly push public authorities to frame logistics as a public concern that requires active steering, coordination, and rule-setting (Rosales & Haarstad, 2023). In this framing, design-implementation gaps do not only signal weak outcomes; they also reflect process failures that arise when governance arrangements fail to stabilise objectives, allocate responsibilities, and sustain implementation capacity across the policy cycle (Fossheim & Andersen, 2022; Peters & Reisch, 2025).

A first cluster indicates that institutional fragmentation, unclear mandates, misalignment across governance levels, and limited administrative capacity hinder the translation of UFT strategy into coherent regulation and reliable operational delivery. When urban logistics responsibilities remain dispersed across municipal functions and jurisdictions, coordination failures generate contested rules, inconsistent calibration, and uneven implementation, and actors call for clearer roles and stronger inter-municipal harmonisation to prevent divergent regimes from diluting policy intent (Rosales & Haarstad, 2023; Castillo et al., 2024). These problems intensify in dense city-centre contexts, where weak municipal procedures and limited technical support leave freight operations poorly controlled and allow persistent informal or illegal practices that erode the credibility of formal rules (Cruz-Daraviña & Bocarejo, 2021). Multi-level governance constraints further narrow municipal room for action: higher tiers shape legal authority, funding, standards, and monitoring expectations, so gaps in national frameworks, including weak alignment between guidance, legislation, and financing, limited audit and monitoring systems, and insufficient capacity-building, restrict the local ability to turn plans into enforceable

measures and operational support (Mladenović et al., 2022). Administrative, temporal, and political constraints also destabilise implementation. Limited communication and low trust among key actors delay decisions, complex approval processes and short electoral cycles interrupt projects, and procurement and land-acquisition procedures can delay or block investments, widening the gap between planned measures and practical feasibility (Jordová & Brůhová-Foltýnová, 2021).

A second cluster concerns cross-sector collaboration and public-private interaction as governance arrangements for producing implementable measures, with outcomes depending on how collaboration is designed and institutionalised. Evidence from Oslo shows that inclusiveness and interdependence shape participants' perceived power to influence policymaking. More inclusive collaborations and lower interdependence are associated with stronger perceived influence than exclusive, highly interdependent arrangements (Fossheim & Andersen, 2022). In metropolitan freight governance, stakeholders also express preferences for clear coordination roles, such as a unified spokesperson, and for intermediary functions that sustain alignment between public authorities and operators (Castillo et al., 2024). Freight Quality Partnerships illustrate the same logic. Institutionalised partnership formats can become part of city logistics governance, but they require sustained attention to perceived utility and awareness if they are to remain meaningful across diverse actor groups (Kijewska et al., 2021).

A third cluster focuses on spatial governance and the allocation of public space, which links institutional arrangements directly to operational delivery conditions. According to recent research, city-centre freight operations generate land-use conflict. Scarce and concentrated freight parking supply, weak control, and persistent illegal practices constrain delivery and undermine implementation. The same study argues that cooperation with private stakeholders and strong institutional structures can better align freight evaluation and operations with sustainable mobility policies. It calls for dedicated loading and unloading zones and logistic land alongside traffic management policies, framing spatial planning decisions as governance preconditions for workable operations (Cruz-Daraviña & Bocarejo, 2021). Work on e-commerce CDP networks similarly urges urban governments to facilitate multi-carrier solutions by providing supporting infrastructure and safeguarding dedicated spaces in urban plans, connecting strategic aims to land-use decisions that make operational models feasible (Beckers & Verhetsel, 2021). Freight curbside management research adds that institutionalisation can fail under land-use regulations and related regulatory constraints, marking the spatial-regulatory interface as a frequent point where measures struggle to stabilise (Palacios-Argüello et al., 2025).

A fourth cluster captures pilot governance and institutionalisation as a specific locus of implementation drift, where experimental interventions either translate into durable operating regimes or stall at the demonstration stage. Analyses of curbside pilot-to-policy transitions identify coercive, normative, and mimetic forces shaping institutionalisation. Reported success aligns with selecting high-demand zones and credibly demonstrating public benefits, while failure aligns with regulatory constraints, weak business models, and land-use regulations. Governance, therefore, needs adaptive rule-making, credible evaluation, and viable operational models if pilots are to become stable regulation and routine delivery practice (Palacios-Argüello et al., 2025). Procedural work on participatory spatial planning for urban logistics facilities also treats multi-actor processes as a means to manage conflict and build consensus around location decisions, reinforcing the view that institutional pathways shape the move from experimentation to durable implementation (Giuffrida et al., 2024).

Across the reviewed literature, governance is treated not as background context but as the practical infrastructure that determines whether UFT policies can move from strategic intent to tactical regulation and operational delivery. Implementation gaps often reflect governance failures before they reflect technical weaknesses: when responsibilities are fragmented, mandates unclear, coordination weak, and monitoring or enforcement underdeveloped, even well-designed measures struggle to stabilise over time (Rosales & Haarstad, 2023; Fossheim & Andersen, 2022; Peters & Reisch, 2025).

A first cluster concerns institutional fragmentation and multi-level misalignment. Urban logistics responsibilities are often dispersed across departments, agencies, and territorial levels, and these problems intensify where legal authority, funding, technical standards, and monitoring expectations are distributed across governance tiers or where administrative capacity is weak and political cycles interrupt continuity (Castillo et al., 2024; Mladenović et al., 2022; Jordová & Brůhová-Foltýnová, 2021). Under these conditions, policy intent may remain visible while implementation becomes delayed, recalibrated, or selectively applied.

A second cluster concerns collaboration and public-private coordination. Collaborative arrangements can support implementation when they clarify influence, mediation, and coordination roles, but weakly institutionalised arrangements risk becoming consultative arenas with limited capacity to stabilise decisions across implementation stages (Fossheim & Andersen, 2022; Castillo et al., 2024; Kijewska et al., 2021). A third cluster links governance directly to spatial and operational feasibility: dedicated space, land-use integration, and coherent curbside management are often prerequisites for workable delivery regimes, while their absence pushes formal rules toward informality, illegality, or repeated exception handling (Cruz-Daraviña & Bocarejo, 2021; Beckers & Verhetsel, 2021; Palacios-Argüello et al., 2025).

A fourth cluster concerns pilots, monitoring, and institutionalisation. Pilot projects can support learning, but they do not automatically generate stable implementation. They stall when regulatory constraints, weak business models, or land-use barriers prevent institutionalisation, and data systems improve implementation only when governance specifies responsibilities, access rules, and feedback pathways that allow evidence to inform adjustment (Palacios-Argüello et al., 2025; Dablanc & Adoue, 2025; Peters & Reisch, 2025). Taken together, the governance literature points to a recurring mechanism: setbacks arise when strategic intent is not matched by clear

mandates, coordination arenas, spatial-enforcement capacity, and feedback routines that can support rule maintenance and adaptation over time.

A final engagement cluster zooms in on goal alignment, incentives, and burden-sharing, understood as the practical conditions under which stakeholders participate and sustain behavioural change. Living-lab evidence links participation to goal alignment across supply-chain actors and management levels, and it shows that top-down translation from strategic to operational levels does not reliably create alignment. This work proposes strengthening the role of middle managers as boundary spanners to translate plans, identify bottlenecks, and support operational participation (Tolentino-Zondervan et al., 2021). In parallel, simulation-based work on receiver–carrier collaboration shows that coalition participation increases when collaboration mechanisms include cost-sharing and when cost savings transfer to collaborating actors, illustrating how incentives secure operational uptake, here for after-hour deliveries (Bean & Joubert, 2021). At a broader level, the city logistics synthesis argues that measures gain acceptance and ease implementation when they are "win-win" and do not require compensatory schemes, and that trust-building can support progression toward more innovative operational models (Bachofner et al., 2022). These contributions jointly highlight how engagement, incentives, and perceived fairness interact to stabilise implementation.

Synthesising across the five engagement clusters, stakeholder engagement-related design-implementation gaps in UFT tend to arise under five recurring conditions. (i) Weak participation design and limited representation exclude relevant actors early, constrain the influence of inputs, and leave power imbalances in place, so ignored agreements can backfire and mistrust can reduce tolerance for unforeseen developments (Bjorgen et al., 2021). Limited awareness among affected publics can further narrow the problem frame that later regulation must operationalise (Tanco & Escuder, 2021). (ii) Engagement failures often reflect weak structure and continuity. Unstructured engagement leaves assumptions and trade-offs implicit and lets policies proceed without "cognitive consensus" on the decision problem or local operation, even though exchange can re-rank priorities and clarify constraints (Gatta et al., 2019; Knoppen et al., 2021). Partnership formats can still falter when interaction stays episodic and institutions fail to follow through, which undercuts the recurring, implementation-oriented role envisioned for Freight Quality Partnerships (Kijewska et al., 2021). (iii) Operational co-design and iterative learning can remain underdeveloped, even though pilot evidence links sustained cooperation across implementation stages to less miscommunication and shorter time-to-launch and shows that workshops and questionnaires can translate stakeholder needs into concrete operational and physical requirements (Gunes et al., 2024). Rapid rollout with limited adaptation time can also disrupt routines and generate workarounds, making co-learning necessary to identify fundamental improvements (Fraske & Bienzeisler, 2020). (iv) Incentive structures and goal alignment can remain insufficient, even though participation becomes more likely when sustainability goals align along the supply chain and across management levels, with middle managers acting as boundary spanners (Tolentino-Zondervan et al., 2021), when collaboration mechanisms allocate cost savings to participants and reduce reluctance through clearer benefits (Bean & Joubert, 2021), and when win-win measures build trust and ease implementation before more demanding operational models are pursued (Bachofner et al., 2022).

3.3 Acceptability

Acceptability in the reviewed UFT literature functions less as a downstream attitude and more as an implementation condition. It determines whether strategic intent translates into tactically specified rules and, in turn, into operational delivery practices. Across policy families, studies link setbacks to acceptability failures that arise at different points in the strategic-tactical-operational chain. Decision makers may select or avoid policies based on perceived legitimacy and political feasibility. Regulators may contest details or repeatedly recalibrate them to manage opposition. Implementers may depend on the willingness to comply and to change routines in day-to-day delivery. In this sense, the literature repeatedly treats acceptability as a prerequisite for successful implementation and sustainability, not as a secondary evaluation criterion (Akgün et al., 2019; Perera & Thompson, 2021)

A first cluster shows that acceptability varies across actor groups and firm types, so a single strategic intent yields different "acceptable" solutions once implementation forces concrete trade-offs. Studies distinguish citizens, carriers, and receivers, and separate micro and small enterprises from medium and large firms, which frames acceptability as a distribution of preferences shaped by perceived burdens and adaptive capacity rather than a single level of support. In Colombia, stakeholders agree on the value of allocating space for freight operations, but preferences diverge when space becomes scarce: citizens favour off-hour deliveries, while carriers and receivers oppose them because they anticipate higher costs and security risks (Amaya et al., 2020). In Poland, acceptability increases with enterprise size, and medium and large firms rate ICT-oriented solutions more positively than micro and small firms, which suggests that limited capacity to reorganise routines constrains what becomes acceptable (Matusiewicz et al., 2019). In Rome, stakeholders explicitly evaluate policy configurations, and preferences vary by category, so feasible design requires managing cross-group conflict rather than assuming uniform support (Gatta et al., 2019). Other research extends acceptability to innovation-oriented delivery models and technologies, where perceived risk and trust determine whether pilots scale into stable practice. Public support can remain conditional: willingness to pay may prioritise environmental gains over speed, and support for public investment can lag behind conceptual acceptance (Melo et al., 2023). For automated micro-vehicles, safety requirements dominate acceptance and adoption depends on infrastructure, regulation, and trust-building (Schomakers et al., 2024). For crowdshipping, trust shapes service choice through provider reputation and perceived damage risk, while participation on the platform side also depends on perceived fairness, since low fairness reduces trust and willingness to participate (Cebeci et al., 2023; Huang et al., 2020). Overall, strategic

endorsement can still translate into tactical dilution and operational non-adoption when heterogeneous preferences meet unmet conditions on trust, safety, and fair compensation (Amaya et al., 2020; Gatta et al., 2019; Matusiewicz et al., 2019; Cebeci et al., 2023; Huang et al., 2020; Melo et al., 2023; Schomakers et al., 2024).

A second cluster focuses on strategic-level legitimacy and political acceptability. It connects public acceptability to policy choice, highlights electoral accountability risks, and examines legitimacy-seeking through policy transfer and through framing and narratives. Akgün et al. argue that legitimacy matters for individual measures and for public authorities, and that public acceptability strongly influences policy choice. They illustrate this claim through contrasting public responses to congestion charging across cities, and through the argument that acceptability can increase with familiarity when citizens experience benefits before a vote (Akgün et al., 2019). Reigner and Brenac, from a critical perspective, emphasise how actors can legitimate transport policies through "noble causes" while framing them in depoliticised ways that stress individual responsibility and moral injunctions that dissolve objections, even as policies produce socially and spatially uneven effects (Reigner & Brenac, 2019). These findings imply two strategic-stage pathways to setbacks. Anticipated resistance and political exposure can lead decision makers to avoid or soften contentious measures. Depoliticised or moralised framings can suppress early contestation while shifting conflict into later stages, when enforcement and daily operations reveal uneven burdens (Akgün et al., 2019; Reigner & Brenac, 2019).

Across the reviewed literature, stakeholder engagement is treated as an implementation mechanism rather than as a procedural add-on. UFT interventions redistribute costs, space, time, and operational constraints across actors with different interests and capacities. Engagement therefore matters not only for legitimacy but also for feasibility: it shapes how strategic intent is translated into tactical rules and operational routines, and whether implementation frictions are surfaced early or deferred to later stages (Bjorgen et al., 2021; Knoppen et al., 2021).

A first cluster concerns participation design, representation, and timing. Weak inclusion, uneven representation, and limited influence over decisions can distort problem definition from the outset and reduce later tolerance for implementation burdens. Collaborative arenas often fall short of meaningful power-sharing, while relevant actor groups may remain underrepresented or enter too late to shape policy configuration effectively (Bjorgen et al., 2021; Farchi et al., 2023; Tanco & Escuder, 2021).

A second cluster frames engagement as structured decision support. Workshop-based and multi-actor methods improve implementation prospects when they make preferences, trade-offs, and local constraints explicit before policies harden into rules. The literature links this function to cognitive consensus: a shared understanding of the problem and of the conditions under which a measure may become workable. When such consensus is absent, assumptions remain implicit and tend to reappear as contestation or redesign during implementation (Knoppen et al., 2021; Gatta et al., 2019; Aljohani & Thompson, 2019; Semanjski & Gautama, 2019).

A third cluster concerns continuity, pilots, and operational co-design. Freight partnerships, co-created pathways, and living-lab approaches are useful only when interaction persists over time and is tied to practical outputs. Episodic consultation or weak follow-through leaves conflict unresolved, whereas recurring interaction, visible feedback, and trust-building help actors manage uncertainty and convert pilot learning into scalable routines (Kijewska et al., 2021; Paddeu et al., 2024; Gunes et al., 2024; Fraske & Bienzeisler, 2020). A final cluster highlights incentives, goal alignment, and burden-sharing: participation is more likely to remain stable when actors perceive clear benefits, fair cost allocation, and a credible pathway through which cooperation supports their own operational needs (Tolentino-Zondervan et al., 2021; Bean & Joubert, 2021; Bachofner et al., 2022). Together, these studies suggest that engagement reduces setbacks only when it generates decision-grade outputs, clarifies trade-offs, and links participation to credible governance and adaptation arrangements.

This section establishes the Rome baseline used for the within-case analysis. It reconstructs how urban freight measures are positioned along the strategic-tactical-operational chain and describes the setting through four lenses: UFT policies, governance, stakeholder engagement, and acceptability. The reconstruction is strictly evidence-led. Documentary sources are used to identify formal commitments, stated implementation pathways, and traceable participation outputs. Expert interview evidence is used to qualify translation constraints where public documents specify intent but do not evidence operational activation or stable delivery routines. The section therefore avoids treating plan adoption as proof of implementation and reports evidence gaps explicitly where the public corpus does not support stronger claims.

3.4 Rome's strategic-tactical-operational chain

Rome's case baseline can be reconstructed as a sequence that starts from a strategic plan, moves through a freight-specific tactical translation, and then approaches the operational interface where routines, sites, permits, monitoring, and enforcement must become concrete. This section uses that chain to position the Rome policy families along three planning levels, and to keep a clear boundary between formal commitments and evidence of activation.

At the strategic level, Rome's SUMP frames mobility as a long-horizon policy domain and explicitly treats monitoring, evaluation, and citizen involvement as constitutive principles of the planning approach. The plan defines a ten-year horizon and positions itself as a system-level instrument that coordinates with sectoral and spatial plans at both municipal and supra-municipal scales (Roma Capitale, 2019a). This strategic framing matters for urban freight because it sets objectives and constraints that later condition the feasibility of tactical rules, such as kerbside governance choices, access restrictions, and the compatibility between regulatory ambition and available monitoring capacity.

Strategic intent also becomes institutionally binding through formal approval. The Rome Capital City

Assembly adopted the SUMP through an assembly resolution that documents the approval pathway and records the prior administrative steps that brought the plan from proposal to adoption (Roma Capitale, 2022). The same resolution situates the plan within a regulated procedural trajectory and therefore establishes the institutional anchor against which subsequent delivery choices can be assessed. In this paper's logic, this approval is evidence of commitment at the strategic level. It is not, by itself, evidence that freight measures have been activated operationally.

The strategic level also includes a specific governance choice on how implementation should be monitored. The monitoring integration document, prepared as an integration of the SUMP's monitoring and ex post evaluation chapter and linked to the strategic environmental assessment requirements, consolidates the indicator architecture and specifies responsible entities and measurement frequency (Roma Capitale, 2021). Crucially, it records a methodological decision taken within a technical working table to avoid indicators derived from traffic simulation outputs because standardising calculation procedures across models and software tools is considered difficult to guarantee. This is not a technical footnote. It is a governance signal: it frames accountability around traceable data acquisition modes rather than model-dependent estimates, and it implicitly constrains the type of evidence that can credibly support policy calibration once measures move toward implementation (Roma Capitale, 2021).

At the tactical level, Rome translates the strategic frame into freight-specific objectives, measures, and implementation processes through a dedicated urban logistics action programme. The document is explicitly presented as "Actions for the Development of Urban Logistics in Implementation of the SUMP", dated November 2023, drafted for the Rome Capital City Department responsible for mobility and transport, and authored by the municipal mobility agency, Roma Servizi per la Mobilità, through its technical directorate (Roma Mobilità, 2023). The programme defines a portfolio of ten measures and specifies staged implementation logics, including sequencing and early actions that target enabling conditions such as the census of loading and unloading areas, structured dialogue with operators, and the identification of candidate micro-hub locations (Roma Mobilità, 2023). This instrument therefore functions as the main documentary bridge between strategic intent and deliverable configurations in the freight domain.

Across the reviewed literature, acceptability functions less as a downstream evaluation and more as a condition that shapes whether UFT measures can be translated into workable regulation and delivery practice. It affects policy choice, regulatory calibration, and willingness to comply or adapt routines once implementation begins. In this sense, acceptability is treated as a prerequisite for implementation stability rather than as a secondary assessment criterion (Akgün et al., 2019; Perera & Thompson, 2021).

A first cluster shows that acceptability varies sharply across actor groups, firm types, and operational roles. Citizens, carriers, receivers, and public authorities do not assess the same measure in the same way, and smaller firms often face adaptation constraints that make some solutions less acceptable than they appear at aggregate level. As a result, broad strategic support can fragment once measures become operationally concrete and burdens are distributed unevenly (Amaya et al., 2020; Matusiewicz et al., 2019; Gatta et al., 2019).

A second cluster concerns legitimacy and political feasibility at the strategic level. Acceptability influences which measures enter the policy mix, how they are framed, and whether authorities are willing to sustain them politically. Familiarity, sequencing, and public narratives matter: some measures become more acceptable when benefits are experienced before full endorsement, whereas depoliticised or moralised framings may suppress early conflict while shifting resistance to later implementation stages, when concrete burdens become more visible (Akgün et al., 2019; Reigner & Brenac, 2019).

A third cluster treats acceptability as a tactical problem of fairness, burden-sharing, and compensatory design, while a fourth concerns operational acceptability, namely the willingness of actors to comply and adapt day-to-day routines. Trust, perceived safety, power relations, and expectations of cooperation become central at this stage; measures that are acceptable in principle may still fail in practice if actors doubt others' cooperation, perceive operational risk, or face organisational resistance to changing established practices (Perera & Thompson, 2021; Gatta et al., 2019; Serrano et al., 2025; Brettmo & Browne, 2024).

A final cluster highlights the dynamic nature of acceptability. Pilot experiences, familiarity, visible public benefits, and trust-preserving institutional roles can strengthen support over time, but acceptability can also remain fragile or reversible if implementation generates unanticipated burdens or if learning is not translated into credible adjustments (Akgün et al., 2019; Lægran et al., 2023; Palacios-Argüello et al., 2025). Taken together, the literature suggests that implementation instability cannot be explained through technical design alone: it also depends on whether policy packages remain politically, socially, and operationally acceptable as they move from strategic framing into concrete rules and routines.

3.5 Why these three policy families

From a UFT policy perspective, the Rome baseline is anchored to a formal strategic plan and to a freight-specific tactical translation document. The municipal SUMP defines objectives, constraints, and an implementation logic over a ten-year horizon, and its approval act establishes an institutional commitment that can be traced against subsequent delivery choices (Roma Capitale, 2019; Roma Capitale, 2022). The freight action programme then specifies a ten-measure portfolio and provides the main documentary bridge from strategic intent to tactical configuration for urban logistics, including access regulation, proximity logistics spaces, and urban distribution centres (Roma Mobilità, 2023). This pairing is crucial for the paper because it makes it possible to separate what is formally intended at the strategic level from what is configured as a deliverable pathway at the tactical level, before any claim is made about operational activation.

From a governance perspective, the Rome baseline is characterised by a division of labour between political approval, municipal departmental responsibility, and a technical and coordination role performed by the municipal mobility agency. The plan documentation makes explicit a technical secretariat and interdepartmental coordination arrangements during plan formation, and the assembly resolution records the formal adoption pathway and the administrative steps that frame implementation as a regulated sequence rather than a discretionary set of actions (Roma Capitale, 2019; Roma Capitale, 2022). Governance also includes an explicit monitoring architecture. The monitoring integration document specifies indicator sources, responsible entities, and measurement frequency, and it records a methodological decision to avoid simulation-derived monitoring indicators because standardisation across tools and assumptions is not considered reliably guaranteeable (Roma Capitale, 2021). In the logic of this paper, this decision matters because it positions accountability around traceable data sources and therefore conditions how credible feedback loops can be built once freight measures approach calibration and enforcement.

From an engagement perspective, the documentary corpus provides two complementary layers of evidence. At municipal level, the SUMP documentation and approval pathway evidence that participation is part of plan formation and that observations were processed through formal steps (Roma Capitale, 2019; Roma Capitale, 2022). At metropolitan level, participation reporting is substantially more granular and therefore helps characterise participation devices and feedback procedures that surround the wider Rome governance setting. The metropolitan participation reports document nineteen events in February and March 2022 for the first phase, and they record that stakeholder meetings plus a public open-day event achieved an average attendance of forty-two participants per meeting (Roma Capitale, 2022a). The second phase report documents nine capacity-building meetings, seven listening meetings, and two assimilation meetings, for eighteen meetings in that phase, and it reports that the two phases together total thirty-seven meetings, with a mapped set of four hundred and forty-five subjects, eight hundred and seventy-eight contacts, and one thousand one hundred and ninety-two registrations (Roma Capitale, 2022b). A dedicated evaluation document then provides a traceable feedback loop by reporting that one hundred and eleven action proposals were received via formal registration, distributed across the metropolitan SUMP and its sectoral plans, including the sustainable logistics plan component, and then assessed through an explicit technical procedure (Roma Capitale, 2022c). This does not prove implementation effectiveness, but it does document engagement devices, timing, and the existence of a procedural translation mechanism from inputs to planning outputs.

From an acceptability perspective, the Rome baseline must distinguish between two types of evidence. One is research-based evidence that measures acceptability and shows that support is configuration-dependent, actor-specific, and sensitive to perceived feasibility and distributional impacts in freight regulation contexts. The other is procedural evidence that acceptability is addressed through structured co-design and option-building rather than measured as stable support. For micro-hubs, the public municipal corpus is typically more informative on intended sequencing than on routine acceptability under stable delivery conditions, so project-based material becomes relevant as procedural evidence. In the Rome setting, LOCUS provides documented traces of stakeholder interaction, governance option-building, and transferability reasoning for micro-hub configurations, which can be used to reconstruct how acceptability and feasibility concerns are surfaced and handled during design, without equating this to citywide institutionalisation (Roma Capitale, 2023; LOCUS Project, 2025a; LOCUS Project, 2025b; LOCUS Project, 2025c).

Taken together, the four lenses provide a controlled baseline for the case: formal policy intent and tactical translation are documentable; governance capacity is visible through role allocation and monitoring architecture; engagement can be traced through participation devices and feedback procedures, with metropolitan reporting offering the most detailed process evidence; and acceptability can be supported through literature and through documented co-design procedures, while remaining cautious about claims of operational stabilisation. This baseline is designed to feed directly into the expert interview evidence in Section 4.5 and, next, into the within-case comparison in Section 5, where differences in implementation stability can be explained rather than assumed.

3.6 Evidence gaps that matter for interpretation

A central feature of the Rome case is that the public corpus supports a robust reconstruction of strategic commitment and tactical intent, but it is uneven when the analysis approaches the operational interface. This unevenness is not a minor data issue. It conditions what can legitimately be claimed from documents alone and, therefore, how the paper can distinguish between plan adoption, rule specification, and delivery routines. For this reason, the case baseline treats gaps in the public corpus as part of the empirical setting and makes them explicit before moving to interview evidence and within-case comparison.

The first gap concerns operational activation and routine delivery. Strategic and tactical documents specify objectives, portfolios, and staged processes, but they do not systematically evidence whether specific freight measures have moved from definition to stable routines. In practice, operational activation would be evidenced through acts that allocate responsibilities for day-to-day management, procurement or contracting decisions, site-level authorisations, service-level specifications, and monitoring routines that operate as feedback loops. Where such evidence is not publicly available for a given policy family, this section does not infer implementation from the existence of a measure in the portfolio. Instead, it treats the measure as "formally intended and procedurally described" and defers claims on operational status to sources that can credibly speak to activation, notably the expert interview.

The second gap concerns enforcement and kerbside governance as operational systems rather than as regulatory intent. Freight-oriented access regimes and time windows become implementable only when

enforcement is credible and when scarce kerbside space is governed through coherent allocation and monitoring routines. Public planning and programme documents can support the reconstruction of intended rule packages and general constraints, but they rarely provide the operational detail that would allow the analysis to verify how enforcement is organised, which resources are deployed, how compliance is monitored, and how derogations are managed over time. This matters because, in an implementation-setbacks lens, the difference between a stable regime and an unstable one often hinges on the credibility and continuity of enforcement rather than on the formal wording of rules.

The third gap concerns business-model viability and participation commitments for strategic consolidation-centre approaches. A consolidation or distribution centre is structurally dependent on sustained uptake by carriers and receivers, which implies explicit operating models, governance arrangements, and participation commitments that go beyond strategic endorsement. Where public documentation does not evidence concrete operating propositions, contracting pathways, or binding participation arrangements, the case baseline cannot treat consolidation-centre measures as "implemented" even if they are present in the tactical portfolio. This gap is analytically relevant because it aligns with the paper's broader mechanism logic: strategic measures can remain in prolonged pre-implementation phases when viability and adoption thresholds are not met, but such claims must be grounded in evidence rather than assumed.

The fourth gap concerns how acceptability is documented in institutional sources versus how it is handled procedurally in project settings. For some measures, peer-reviewed work can provide evidence that acceptability is configuration-dependent, but institutional sources do not always provide systematic acceptability monitoring as part of implementation governance. In the micro-hub domain, LOCUS-type materials can evidence structured co-design, option-building, and transferability reasoning, but they do not automatically evidence stable acceptance under routine delivery conditions. This distinction is important for interpretation because it prevents the analysis from conflating "procedural attention to acceptability" with "measured and sustained acceptability" once distributional impacts and compliance burdens become concrete.

These evidence boundaries explain why the expert interview is not an optional add-on in the Rome case. It functions as a controlled complement to the documentary record, targeted at the translation constraints that documents alone do not fully evidence, especially at the tactical-to-operational interface. On this basis, the next subsection reports the expert account through the same four lenses used throughout the paper, so that documentary and interview evidence remain comparable and can later feed the within-case mechanism stress test in Section 5.

3.7 Expert interview evidence

The interview is used as a controlled complement to the documentary record at the tactical–operational interface, where public sources specify intent but do not fully evidence stable routines. Table 3 synthesises the main findings by analytical lens.

Table 3. Expert interview evidence synthesised by analytical lens.

Lens	Main interview evidence	Interpretive implication
UFT policies	Micro-hubs are treated as a priority but require closure on localisation, eligibility, and management. Freight LTZ revision is linked to kerbside monitoring and observability in the Tridente area.	Translation pressure concentrates where policy families approach concrete operating arrangements.
Governance	Binding rules harden through formal acts, while bottlenecks arise around technology dependence, evolving data routines, and high rule complexity across vehicle and activity profiles.	Implementation fragility depends on whether governance can stabilise monitorable parameters before final calibration.
Stakeholder engagement	Freight tables were reactivated and expanded iteratively. Engagement is described as proposal-oriented, compromise-based, and aimed at testing feasibility before formalisation.	Engagement functions as an implementation device only when it absorbs operational constraints early enough.
Acceptability	Support is segmented and conditional on feasibility, distributional impacts, and space scarcity. The practical aim is not full consensus but reduction of simultaneous dissatisfaction.	Acceptability is configuration-specific and co-determined by kerbside scarcity, delivery needs, and pedestrian priorities.

Taken together, the interview confirms that implementation pressure in Rome concentrates on space governance, data routines, rule complexity, and the sequencing of stakeholder involvement. These themes provide the bridge to the within-case comparison in Section 5.

3.8 Handoff to Section 5

This section establishes two things that the within-case analysis must hold together. First, the documentary record anchors Rome's freight policy domain in a strategic commitment and a tactical translation instrument that specifies measures and intended processes. Second, the same record remains uneven when the analysis approaches operational activation, especially for enforcement routines, kerbside management systems, and durable operating models. The baseline therefore treats gaps in the public corpus as part of the empirical setting rather than as noise, and it uses the interview evidence to qualify what documents alone cannot evidence.

Across the four lenses, the Rome baseline points to a consistent translation problem. Policies exist as portfolio statements and staged processes, but governance must still convert them into monitorable parameters, workable rule packages, and implementable routines. Engagement emerges as a necessary interface to surface feasibility constraints and broker compromise across heterogeneous actors. Acceptability does not operate as generic support. It varies with configuration details and with distributional impacts, and it becomes decisive where kerbside scarcity and enforcement credibility interact. The interview with Marco Surace confirms that these dimensions dominate the current operational agenda, because implementation pressure concentrates precisely on data routines, space governance, rule complexity, and the sequencing of stakeholder involvement (Roma Servizi per la Mobilità, personal communication, February 23, 2026).

Section 5 builds on this baseline through a structured within-case comparison of the three policy families positioned along the strategic-tactical-operational chain. It uses the scoping synthesis as an analytical benchmark and tests whether the mechanism clusters identified in the literature are sufficient to explain why implementation stability differs across consolidation-centre approaches, freight access regulation, and micro-hubs within the same institutional setting.

4 Comparative analysis

The within-case comparison positions Rome's three focal policy families at different points along the strategic–tactical–operational chain and uses the scoping synthesis as an analytical benchmark. Rather than ranking instruments, the comparison asks where implementation instability concentrates, which mechanisms dominate, and what minimum governance closures would be required to reduce recurring setbacks.

Table 4. Within-case comparison of Rome's three focal policy families.

Policy family	Implementation level	Dominant bottleneck	Typical setback form	Minimum closure priority
Urban consolidation/distribution centres	Strategic	Viability and uptake thresholds remain unresolved when operating models and participation commitments stay hypothetical.	Prolonged pre-implementation, repeated reframing, possible discontinuation.	Ownership of the service proposition, risk allocation, and credible participation logic.
Freight-oriented LTZs	Tactical	Rule complexity collides with scarce kerbside space, limited observability, and uneven enforcement capacity.	Calibration loops, redesign pressure, derogations, and credibility loss.	Workable rule architecture, explicit exception governance, and observable kerbside routines.
Micro-hubs	Operational interface	Siting, management responsibility, eligibility, and data routines are not closed early enough to support routine delivery.	Stalled activation, project-bounded pilots, limited scaling.	Binding decisions on site, access, management, service configuration, and pilot-to-standard data routines.

The comparison shows that the same city can generate distinct setback trajectories because each policy family concentrates risk at a different point of the translation chain. This is why the paper's practical contribution is not the identification of a single best instrument, but the specification of a toolkit that forces early closure on the conditions that repeatedly destabilise implementation.

5 Discussion

The Rome stress test shows that setbacks are not explained primarily by policy labels but by failures to close implementability gates as measures move from strategy to rules and routines. Across policy families, governance, engagement, and acceptability operate as bundled mechanisms that determine whether adaptation remains controlled or turns into visible instability.

5.1 What the within-case comparison shows beyond the Rome narrative

The within-case comparison adds two points. First, the same broad mechanism families produce different setback forms depending on where they enter the translation chain: viability-driven stalling for consolidation-centre approaches, calibration and credibility problems for freight LTZs, and incomplete configuration closure for micro-hubs. Second, these mechanisms operate as bundles rather than isolated drivers, so formally coherent measures can still remain fragile when observability, decision rights, operating responsibilities, or participation conditions are not sufficiently closed.

5.2 Why a toolkit becomes necessary

A toolkit becomes necessary because the recurring problem is not instrument selection but implementability closure. Across all three policy families, setbacks appear when key assumptions remain unresolved until late stages: that actors will participate at scale, that complex rules can be enforced consistently, or that facilities can function without defined operating models and decision rights. The toolkit is therefore conceived as a structured device for forcing early closure on the minimum conditions that reduce avoidable instability.

The "necessity" claim is therefore empirical and methodological. It is empirical because the within-case test identifies recurring gates whose absence is associated with instability. It is methodological because a mechanism-based explanation becomes actionable only if it can be translated into minimum procedural outputs that can be verified, audited, and updated over time. Without such a translation device, the explanation remains

descriptive: it can diagnose fragility after the fact but cannot specify what must be built into governance arrangements to reduce avoidable setbacks.

5.3 Toolkit logic: from mechanism bundles to minimum implementability conditions

The toolkit starts from a simple empirical claim: setbacks concentrate where translation leaves core conditions open. It therefore treats implementation as a sequence of closures rather than as a linear plan-to-delivery pipeline. Closure means that an administration can point to an owner, a decision, and a monitorable routine, rather than to an intention.

At the strategic level, the critical closure concerns viability and uptake thresholds. At the tactical level, it concerns rule architecture under scarce space and limited observability. At the operational interface, it concerns siting, management responsibility, eligibility, and data routines. Across levels, engagement matters only when it produces decision-grade outputs and visible feedback loops.

The toolkit is designed as a modular procedure for public decision-makers and delivery agencies moving from strategy to rules to routines. It does not prescribe a single model. Instead, it structures four connected functions: risk-point mapping, engagement standardisation, delivery-governance closure, and early-warning control.

Operationally, the toolkit is meant to run as a recurring governance routine in which a lead public owner and the technical delivery agency establish the process map, assign owners, define the minimum evidence baseline, and periodically review feedback and warning signals. This keeps adaptation within an authorised review cycle rather than leaving it to ad hoc renegotiation.

5.4 Transferability and boundary conditions

The toolkit claims transferability in an analytical rather than formulaic sense. It does not replicate Rome's institutional arrangements. It transfers a set of minimum implementability conditions that can travel where cities face comparable translation constraints, such as scarce kerbside space, fragmented responsibilities, or limited observability.

Transferability depends on administrative capacity, the role of delivery agencies, and the degree to which measures rely on voluntary participation. In all cases, what travels is not a single model but a disciplined way of closing decision rights, monitoring routines, change control, and participation conditions before instability becomes visible.

5.5 Limitations and research agenda

The study has three main limitations. First, the documentary corpus is uneven across policy families at the operational interface. Second, the expert interview provides privileged access to bottlenecks but still reflects a source-specific perspective. Third, the design is an embedded single-case study, which strengthens internal explanation but not statistical generalisability.

Future research should test the same mechanism bundles across additional metropolitan settings and combine documentary, interview, and where possible operational data such as permits, exemptions, curb-occupancy measures, or enforcement logs. The broader agenda is to evaluate not only impacts, but also whether policies closed minimum implementability conditions before stable effects were expected.

6 Conclusions

This paper reframed UFT implementation instability as a sequence of policy setbacks rather than as a binary success–failure outcome. Using Rome as an in-depth case, it showed how setbacks accumulate as strategic intent moves into tactical regulation and operational routines, and how governance constraints, engagement discontinuities, and acceptability conditions bundle differently across policy families.

For RQ1, the findings indicate that setbacks arise where translation bottlenecks remain unresolved, especially at the tactical–operational interface, where scarce-space governance, decision-grade baselines, and monitoring and enforcement routines become decisive. For RQ2, engagement matters less as an isolated variable than as an amplifier or stabiliser depending on whether it is episodic or institutionalised. For RQ3, the paper shows that structured engagement can reduce drift, strengthen acceptability pathways, and support faster corrective action by linking monitoring signals to authorised levers.

The paper's main transferable contribution is the governance-and-engagement toolkit. It does not prescribe a single best model for UFT measures. It specifies minimum process outputs and controls that support co-creation and implementation: risk-point mapping, minimum engagement standards, delivery-governance closure, and early-warning indicators. Transferability therefore concerns the portability of process standards and monitoring logic rather than any assumption of equivalent outcomes across cities.

The study remains limited by its single-case design and uneven documentary record, but it clarifies how implementability in UFT governance depends on the interaction between rule design, institutional capacity, stakeholder engagement, and acceptability. By treating setbacks as observable process discontinuities, it provides a more operational explanation of why widely adopted policy families stall or destabilise in practice.

List of acronyms

ANPR: Automatic Number Plate Recognition

CDP: Collection and Delivery Point

CDU: Urban Distribution Centre *(often used in Italy as "Centro di Distribuzione Urbana")*

EV: Electric Vehicle

ICT: Information and Communication Technology

ILC: Integrated Logistics Centre

LEFV: Light Electric Freight Vehicle

LEZ: Low-Emission Zone

LTZ: Limited Traffic Zone

OHD: Off-hour Deliveries

PRISMA: Preferred Reporting Items for Systematic Reviews and Meta-Analyses

SULP: Sustainable Urban Logistics Plan

SUMP: Sustainable Urban Mobility Plan

UCC: Urban Consolidation Centre

UFT: Urban Freight Transport

ZEZ: Zero-Emission Zone

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