Autonomous systems under public authority

Agentic Terminal

The decision that a charge or a move is within its authority, made before the money moves, so the refund, the fine, and the dispute do not happen.

BOYD COHEN · OBSERVER PROTOCOL · SEPTEMBER 2026 · PRE-PUBLICATION, FOR CONVERSATION

> **Every passage, trip, and charge a machine makes in a regulated public space is a decision. Today nothing checks that authority before the action, and the operator pays for every wrong answer afterwards.**

A free-flow gantry reads a plate, classifies the vehicle, applies a tariff, and posts a charge. A dispatch system releases a personal delivery device onto a sidewalk. In both cases the operator's system acts first and the question of whether the action was within the operator's authority is answered later, by a customer-service queue, an audit, or a court. Brazil now prices that gap in law: an improper toll charge is refunded at double within seven calendar days, by the concessionaire. US cities price it per violation. Insurers price it in the policy.

The problem is not "AI." It is delegation: a machine acting or paying under authority granted earlier. Autonomy raises the stakes, but the gap exists today with a human-driven car at a gantry.

WHAT THE OPERATOR PAYS FOR A WRONG DECISION, TODAY

WHERE	WHAT IT COSTS	SOURCE AND WINDOW
Brazil, free-flow tolling	An improper charge is refunded at double within 7 calendar days by the concessionaire; detection and system failures are the concessionaire's loss at 100%	Resolução ANTT 6.079/2026 art. 63-G; 19º Termo Aditivo to the RioSP concession, cl. 5.3, June 2026
Brazil, free-flow tolling	1,324,797 free-flow non-payment fines cancelled between 29 Apr and 24 Aug 2026 after the underlying tariff was regularized, about 35% of the 3.8 million such fines issued nationally to 2 Sep 2026	Ministério dos Transportes, 24 Aug 2026; Valor, 2 Sep 2026, citing the ministry
United States, tolling	82,847 customers potentially charged more than once for a single trip on Maryland Transportation Authority facilities, 13 Apr 2021 to 30 Jan 2022, about USD 645,000; 62 of 65 sampled confirmed	Maryland Office of Legislative Audits, MDTA special review
United States, sidewalk devices	USD 500 to 10,000 per violation (Chicago); suspension, revocation, or a reduction in permitted devices (Los Angeles); USD 500 minimum unauthorized, USD 1,000 minimum while suspended (Pennsylvania)	O2022-2365 §3; LAMC §71.30; PennDOT Publication 955 §3.7 (restating 75 Pa.C.S. §8521)

Every row above is priced after the action; a determination in front of it holds or refuses the charge before the money moves.

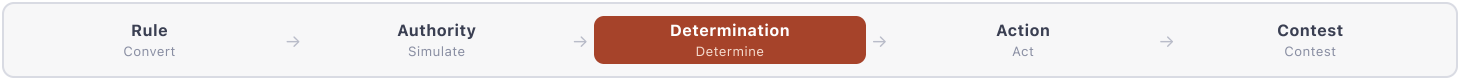
WHAT WE DO

In card payments, an authorization decision sits in front of every settlement, and the decision itself is priced: US networks charge about two cents per authorization request, approved or declined (Visa and Mastercard network fees as published in a US payment processor's fee schedule, retrieved September 2026). Nothing equivalent sits in front of a toll charge, a per-trip fee, a curb reservation, or a sidewalk dispatch.

Observer Protocol is that authorization step for machines acting under public rule. Before the operator's own system posts the charge or releases the move, it receives allow, refuse, or undetermined against the operator's delegated authority and the public floor, with the clauses checked.

We do not control the machine. We determine whether an action is within its authority, and the operator's own systems enforce that determination before the machine moves or pays.

Where the rule does not settle the answer, we say so instead of picking one, so the operator is never exposed on a reading the regulator did not make. Every determination can be re-derived by the driver, the concessionaire, the city, or the regulator on their own machine, without the operator and without us.



WHERE IT SITS

We do not touch the vehicle's control loop. Braking, steering, and obstacle handling are the operator's safety stack and the safety-case world, and we stay out of both. The layer sits at points the operator's own software already controls:

1. Before it pays. Toll charge, fare, curb fee, charging session. The gantry's read, the classification, the tariff, the exemption, and the account state are inputs; the determination sits between them and the charge, where authorization sits in card payments. In Brazil this is the point where a wrong charge becomes a double refund in seven days.

2. Before it moves. The dispatch layer releases each mission or route only with a determination against the permit and the public floor. This is the point where a wrong move becomes a violation, a suspended permit, or a smaller fleet.

3. Where it may go. The zones, hours, and speed limits operators already implement by hand from their permits are compiled from the same register, so every constraint traces to the rule that created it.

4. When it is contested. A disputed charge or a reported violation is judged against what the machine was authorized to do at that moment.

A determination has two errors and they are not symmetric. A wrong allow is the refund, the fine, or the suspension. A wrong refuse is a lost passage or trip. In payments, wrongful declines cost 1.51% of e-commerce sales, more than fraud (Datos Insights, May 2024, from a 2023 survey of US and UK merchants). We report both error rates on every corpus: the reason this has to run at determination time, and not be reconstructed in an audit.

WHERE THE OPERATOR IS EXPOSED EVEN WHEN IT DOES EVERYTHING RIGHT

The clearest case is a runtime fact, not an ambiguity: under 19º TA cl. 5.2.1, an unpaid passage is 10% the concessionaire's loss if both notifications are on an auditable record at the time of notification, and 100% if they are not. On the BR-101 Rio-Santos corpus of 10,000 synthetic passages, 73 of 318 unpaid passages sit at 100% for want of that record, against 11 at 10%.

The rest is textual ambiguity, converted clause by clause from a national regulation, a concession contract, and two amendments:

OPEN POINT	WHERE THE TEXTS DISAGREE OR FALL SILENT	ON THE CORPUS
Whether the 1,66 weekend factor applies before or after the category multiplier	Contract cl. 19.3.6 against cl. 19.3.10 and 19.7.6; a category-4 truck on a Saturday is R$ 24,30 or R$ 24,40	936 of 10,000 passages held undetermined between two amounts
Amounts the contract's own arithmetic produces beyond two decimals	Anexo 12 exempts discounted amounts from rounding; no text settles the centavo	4,938 of 8,163 passages allowed, with the open centavo registered against the clause that leaves it unsettled

HOW IT WORKS: FOUR STEPS, THE SAME ONES BUILT FOR FINANCIAL REGULATION

STEP	WHAT IT DOES	WHAT THE OPERATOR'S SYSTEM GETS
Convert	Turn a written public rule (tolling regulation, concession contract, ordinance, permit, fare rule) into a versioned clause register. Each clause is determinate, undetermined (a standard the text does not settle), or ungrounded (a term nothing public defines). Ambiguities are registered, never quietly resolved.	The register with a source locator for every clause; a gaps file listing every document the rule depends on that is not public
Simulate	Run a synthetic population of passages, trips, or missions against the register and an operator's authority. See which actions can be decided, which cannot, and at what refusal rate.	The corpus, every figure with its denominator
Determine	In operation, evaluate each proposed charge or move against the operator's delegated authority and the public floor before it happens.	One determination per action, in front of the charge or the dispatch, in time for the operator's system to act on it
Contest	When a charge or a move is disputed, any party re-derives the determination offline and checks it against the register.	The verify command a driver, concessionaire, city, regulator, or insurer runs on their own machine

We do not claim our encoding is the law. We make the encoding explicit enough that the authority can disagree with it, clause by clause.

WHERE IT APPLIES

WEDGE	DOMAIN	THE PUBLIC RULE	WHO HOLDS THE AUTHORITY	WHERE THE LAYER SITS	WHAT A WRONG DECISION COSTS TODAY
Initial	Free-flow tolling and mobility payments	National regulation plus concession contract	Concessionaire; payment agent	Between the gantry read and the charge	Double refund in 7 days (Brazil); USD 50 per violation (New Jersey); duplicate-charge audits (Maryland)
Second	Sidewalk delivery devices	City ordinance plus permit conditions	Permittee (operator)	Dispatch; zones and hours	USD 500 to 10,000 per violation (Chicago); suspension or fleet reduction (Los Angeles); USD 1M to 5M insurance floors (DC)
Expansion	Curb, parking, and charging	Municipal code plus operator agreement	Fleet operator	The fee; the reservation	Some form of fee in 37 of the 39 large US cities with e-scooter programs in UIC's study of the 50 largest; per-ride fees of USD 0.05 to 0.25 where charged (UIC Government Finance Research Center)
Expansion	Automated road vehicles and robotaxis	AV framework plus deployment permit	Operator	Fare; route release; deployment scope	Permit conditions; insurer liability for automated driving with recourse against other liable parties (Automated and Electric Vehicles Act 2018 ss. 2 and 5, as amended by the Automated Vehicles Act 2024)
Expansion	Drones and BVLOS delivery	Aviation rules plus operating approval	Operator	Mission release; geofence	Denied airspace; proposed AUD 15 per flight authorization (Australia, 2026 consultation)
Expansion	Ports, airports, industrial zones	Facility rules plus contractor authorization	Contractor; facility operator	Mission release; zone entry	Contract penalties; access revocation

Same shape in every row: one public rule, one operator's delegated authority under it, one machine action, one determination in front of it.

WHY NOW

The rules that price the wrong answer are being written on a calendar. ANTT's free-flow interoperability sandbox is in public hearing on 8 October 2026 with contributions open to 23 October; the draft names identification, integrity, and traceability, with record and evidence duties on participants: duties of the kind a determination produces as a by-product. Singapore introduced a bill on 8 September creating a five-year sandbox for autonomous vehicles on public paths, to 30 September 2031. Chicago's device pilot expires 31 May 2027 without Council action.

WHAT RUNS TODAY

Before it pays, on a federal concession (September 2026). On BR-101 Rio-Santos under CONTRAN 1.013/2024, ANTT 6.079/2026, and the RioSP concession contract as amended by the 19º and 20º Termos Aditivos, converted clause by clause into 93 register entries (81 determinate, 9 undetermined, 3 ungrounded). 10,000 passages determined before the charge: 8,163 allowed with an amount and the clauses checked, 803 refused, 1,034 undetermined. A contest subset of 502 posted charges that depart from the rule: 431 refunded at double under art. 63-G, 29 undercharges with no refund, 42 undetermined; every determination re-derives from the register with zero mismatches. Public at riosp-freeflow.observerprotocol.org.

Before it moves, in a city (September 2026). Under Chicago's personal delivery device ordinance and its permit section as written, 0 of 10,000 synthetic trips can be shown to be authorized; under an illustrative permit file and three readings the city could adopt, 2,503 of 10,000 are authorized and 7,497 are refused, each refusal citing the clause. The ordinance converts to 54 register entries (34 determinate, 15 undetermined, 5 ungrounded); eight of the 54 decide whether a single trip is authorized, and public text alone lets a trip be evaluated on four. Public at chicago-pdd.observerprotocol.org.

Before it pays, in finance (2025 to 2026). We encoded a register of 104 clauses from a national fraud-loss framework with a bank design partner, and evaluated a synthetic corpus of 42,188 determinations, each in front of a payment act. Extensions to Singapore's agentic-finance framework contributed to the Monetary Authority's consultation in August.

STATED LIMITS

The live path in front of an operator's charge or dispatch is what the first engagement establishes. All three studies run in batch against synthetic populations. The Chicago permit file is illustrative and the refusal rate under it is a property of that file, not of any operator. The BR-101 corpus is calibrated to concession-level indicators from ANTT's own sandbox report, with its assumptions labeled; its counts describe the corpus, not traffic; the base tariff and index for the September 2026 revision are unpinned. The two mobility studies carry no signed output and are marked synthetic. A live determination needs operational inputs the public rule does not contain (the current permit, rate tables, exemptions, account state); in production the operator supplies them. Re-derivation proves the engine made this determination given this register; it does not prove the authority agrees with the encoding. Nothing here describes any operator's or concessionaire's operations, and nothing is a safety claim, a savings claim, or a proposal for new regulation.

WHAT WE ARE LOOKING FOR

1. A concessionaire proposing for the ANTT free-flow sandbox whose solution names a pre-charge determination as a component (the draft names integrated agents and bars only undue lock-in), or **a payment firm joining as an integrated agent** under its own admission (identification, integrity, and traceability; central-bank habilitation where required). Outcome: a determination in front of one real class of charge; the number of charges held or refused before posting, and the number that would have posted.

2. An operator willing to put one real permit or operating authorization through the layer. Outcome within one engagement: a determination before the machine moves on one real class of action; violations on that class measured against the permit.

3. A city or agency drafting rules for autonomous devices that wants the register, and the refusal rate it implies, before the vote.

4. An insurer or reinsurer underwriting autonomous operations that wants the determination, rather than the telemetry, as the underwriting input.

Agentic Terminal

Boyd Cohen

boyd@agenticterminal.io · +52 813 110 0227

observerprotocol.org · agenticterminal.io