Aurora Driver Computes Trajectories; Confidence Governance Commits Them

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What the Driver Stack Provides

Aurora's Driver runs continuous prediction, planning, and motion control across a multi-second horizon. The Aurora Atlas stack incorporates Model Predictive Control variants, learned cost functions, and structured fallback behaviors. The result is a high-quality trajectory request feeding the vehicle's actuator interfaces — steering, brake, throttle, signaling.

The interface between the trajectory request and the actuator commit is conventional: the planner produces a target, the controller drives toward it, and an underlying ISO 26262 layer arrests the command if specified bounds are violated. The model is straight-line: plan → control → actuate, with safety as a binary gate.

Why Plan-Then-Commit Misses an Architectural Layer

The plan-then-commit model assumes the planner is the locus of decision-making and the actuator gate is the locus of safety. In adversarial, edge-case, and partial-failure conditions, neither assumption holds. The planner may produce a trajectory that is valid for the model it was trained on but exposed to inputs outside that

distribution. The safety gate may be tuned for a specific class of failure modes that the actual situation does not match.

The missing layer is the commit decision: given a trajectory request, the current operating context, the available authority, and the policy in force, how — if at all — should this trajectory be committed? Full commit, partial commit, staged commit with intermediate verification, advisory display only, deferred commit pending additional evidence. This is not the planner's question and not the safety gate's question; it is a third architectural layer.

How the Commit Layer Sits Above the Planner

Confidence-governed actuation consumes the trajectory request from any planner — Aurora's Driver, Waymo's Driver, an internally-developed stack, an integrated Mobileye RSS — and selects from eleven graduated modes based on composite admissibility. The selection considers credential authority, capability envelope, temporal scope, observed disposition of the operating environment, and the governance policy in force.

The architecture is planner-agnostic. Aurora's planner remains Aurora's. The commit layer is a separate primitive that the planner feeds and that downstream actuators receive. Different jurisdictions, different operating contexts, different fleet operators can configure the commit layer differently while running the same planner. Cross-jurisdictional fleet operation becomes a configuration question, not a re-engineering question.

What This Enables for Aurora's Trucking Deployment

Aurora's commercial trajectory targets long-haul autonomous trucking — the highest-revenue near-term L4 deployment. Trucking is a multi-jurisdiction problem: a route

from Texas to Pennsylvania crosses state DOT authorities, federal FMCSA regulations, port and yard authorities, and shipper contract terms. Each authority has a stake in the commit decisions made by trucks operating in its region.

When the commit layer is externalized through credentialed governance policy, each authority can configure the policy applicable to its territory. Aurora's planner remains the differentiator. The cross-jurisdiction execution alignment that current architectures require manual integration to achieve becomes structural. The patent positions the primitive that the multi-state trucking corridor will eventually need.