FLARESIGNAL

FLSG DEVELOPMENT ROADMAP

From ecosystem intelligence platform to autonomous machine-access protocol

ROADMAP / TECHNICAL DEVELOPMENT STATE v0.6

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Roadmap principle
No artificial launch dates. Every FLSG phase opens only after the product, security, legal and funding gates before it are satisfied.

STARTED WITH	WHERE WE ARE	WHAT COMES NEXT
Independent FLR/SGB ecosystem intelligence	**Site completion / launch-readiness audit**	**Prove paid machine intelligence before FLSG**

ORIGINS

1. Where FlareSignal Started

FlareSignal began as an independent intelligence platform for the Flare and Songbird ecosystems. The project was built product-first: create trustworthy, useful intelligence surfaces before adding any token or machine-access economy.

Foundation built before FLSG

- Equal FLR/SGB ecosystem coverage with XRPFi, Firelight/FIRE and third-party protocol context.
- A storage-transparent canonical truth boundary - FS_Data_Core - so public pages, Pro tools and machine interfaces consume the same underlying truth.
- Public intelligence across Network, Economy, XRPFi, Wallet + Market, Burn, Capital Flow, Events, Yield and FIRE.
- Eleven Sig-Metric families for execution, liquidity, policy transmission, capital character, demand persistence, distribution, utility, concentration, protocol flows, derivatives and composite regimes.
- Professional charting/workstation surfaces and a consistent Signal Lens / intelligence presentation system.
- Machine interfaces via REST/OpenAPI, MCP and A2A, with machine product definitions, metering, entitlement and idempotency foundations.

The important sequencing decision
FLSG was not the starting point. The intelligence platform, data architecture and machine-product surface came first. The token is proposed only because the existing product creates a specific machine-access use case.

Completion & launch-readiness milestones already locked

Surface	State	Version	What was closed
Home	**LOCKED**	v0.5.262	Final public landing baseline
Network family	**LOCKED**	v0.5.320	FLR/SGB intelligence, shard and 3D navigation
Intelligence Overview	**LOCKED**	v0.5.323	Overview surface complete
Event Intelligence	**LOCKED**	v0.5.324	Permanent event archive/outcomes
Live Intelligence	**LOCKED**	v0.5.325	Live signal/capital-event semantics
Data	**LOCKED**	v0.5.327	Coverage and freshness logic
Economy / Utilisation	**LOCKED**	v0.5.328	Canonical current/history handling

CURRENT POSITION

2. Current Technical State

FLSG remains a research architecture downstream of an operating FlareSignal intelligence stack. Current execution is focused on production convergence of the canonical platform and proof of autonomous paid machine commerce before protocol implementation is frozen.

PROGRAM LAYER	STATE	TECHNICAL SCOPE	GATE CONDITION
Canonical intelligence stack	COMPLETE	FS_Data_Core, public/Pro intelligence, Sig-Metrics and machine interfaces	Independent product substrate exists without FLSG
Production convergence	ACTIVE	Source authority, freshness, retained history, component parity and release certification	Production baseline can be frozen for commerce activation
Machine commerce substrate	PRODUCTION GATE	PayChain + machine products + Base Sepolia x402 proof complete; Base mainnet USDC canary pending	Production Base settlement and delivery proof closes Phase 2
FLSG protocol specification	ARCHITECTURE DEFINED	Monetary kernel, SIGNAL locks, custody/security boundaries, burn model and Flare-native trust architecture defined	Implementation freeze awaits Phase 2 evidence and final gated parameters
Coston2 immutable kernel	FUTURE GATE	Minimal token/access/escrow/burn/liquidity contracts on Flare testnet	Protocol lifecycle proven before external assurance

Architecture decisions already defined

- FlareSignal / FLSG identity on Flare with FLR retained as gas and network utility.
- Fixed 1,000,000,000 genesis supply direction with no future mint path, rebase, transfer tax or truth governance.
- SIGNAL economic-lock model with immutable customer principal, explicit beneficiary integrity and no admin withdrawal path.
- Flare-native trust preference: FTSOv2, FDC, FXRP/FAssets, Smart Accounts and official contract registries before bespoke infrastructure.
- PayChain payment substrate and a data-minimised ordinary account boundary of email + password only.
- Invariant-first security, deterministic agent transaction policy, reproducible deployment and future cryptographic agility.

PROGRAM BOUNDARY

Architecture research can advance in parallel. Solidity implementation remains gated by production machine-commerce evidence, the remaining specification-freeze parameters, external security assurance, funding and legal review.

FULL SEQUENCE

3. Protocol Development Sequence

The programme advances by technical dependency and evidence. A phase does not open because time has elapsed; it opens when the preceding validation gate is satisfied.

PHASE 0
Canonical Intelligence & Payment Substrate
COMPLETE

PHASE 1
Production Readiness & Canonical Convergence
ACTIVE

PHASE 2
Machine Commerce & PayChain Proof
PRODUCTION GATE

PHASE 3
Protocol Specification Freeze
ARCH. DEFINED

PHASE 4
Coston2 Immutable Kernel
GATED

PHASE 5
Adversarial Validation & Reproducible Security
GATED

PHASE 6
External Assurance & Mainnet Genesis
GATED

PHASE 7
Market Bootstrap, Price Authority & SIGNAL Access
GATED

PHASE 8
Usage-Derived Burn Activation
GATED

PHASE 9
Cryptographic & Protocol Evolution
GATED

CURRENT EXECUTION FRONTIER

Phase 1 remains the active production-completion frontier. Phase 2 has a proven substrate and now waits on Base mainnet production settlement. Phase 3 architecture is defined; implementation freeze remains gated.

DETAILED ROADMAP

4. Technical Roadmap Detail

PHASE 0 - CANONICAL INTELLIGENCE & PAYMENT SUBSTRATE

COMPLETE

TECHNICAL OBJECTIVE

Establish the canonical FlareSignal data plane, machine interfaces and payment substrate independently of FLSG protocol economics.

PROTOCOL / INFRASTRUCTURE DELIVERABLES

- FS_Data_Core storage-transparent canonical truth boundary across public, Pro and machine consumers.
- Public/Pro intelligence, Sig-Metrics and retained-history surfaces backed by official/chain evidence.
- REST/OpenAPI, MCP and A2A machine interfaces with metering, entitlement and idempotency foundations.
- PayChain crypto-payment substrate with deterministic payment verification and purchase activation.
- Data-minimised ordinary account boundary: email + password only; no unnecessary identity profile.

VALIDATION GATE **Canonical intelligence, machine-access and payment infrastructure operate without any dependency on FLSG.**

CAPABILITY UNLOCKED Autonomous paid-machine commerce can be proven before token implementation.

PHASE 1 - PRODUCTION READINESS & CANONICAL CONVERGENCE

ACTIVE

TECHNICAL OBJECTIVE

Converge every production surface on the established truth architecture, retention semantics and shared component standards.

PROTOCOL / INFRASTRUCTURE DELIVERABLES

- Complete customer-surface source, freshness, history and canonical-owner verification.
- Prove live/cycling values consume shared canonical clocks wherever repeated.
- Close remaining responsive, light-mode and shared-component parity defects without redesigning locked surfaces.
- Enforce immediate-parent release scope, executable runtime safety and byte-level regression certification.
- Freeze a production-ready product baseline for the machine-commerce proof.

VALIDATION GATE **No known customer-facing truth, source, history or interface inconsistency remains in the production baseline.**

CAPABILITY UNLOCKED A stable FlareSignal product baseline becomes the substrate for paid autonomous consumption.

DETAILED ROADMAP

5. Technical Roadmap Detail

PHASE 2 - MACHINE COMMERCE & PAYCHAIN PROOF

PRODUCTION GATE

TECHNICAL OBJECTIVE

The machine-commerce substrate is already proven through PayChain and Base Sepolia. Production closure now depends on Base mainnet settlement credentials and a real-USDC canary.

EVIDENCE STATE / DELIVERABLES

VERIFIED - PayChain payment infrastructure with deterministic payment verification, signed receipt and entitlement activation.
VERIFIED - Machine discovery, OpenAPI, MCP, A2A, six product contracts, delegated execution, metering and idempotency foundations.
VERIFIED - x402 Base Sepolia canary: HTTP 402 challenge, signed retry, facilitator verification/settlement, receipt, entitlement, metering and audit linkage.
IN VALIDATION - Base mainnet production settlement configuration, payment destination, pricing/preflight and real-USDC canary.
GATED - Final production autonomous purchase, product delivery/output verification, settlement/refund, ledger and replay evidence.

VALIDATION GATE A real Base mainnet machine purchase settles in USDC and completes discovery, entitlement, product delivery, verification and durable accounting evidence end-to-end.

CAPABILITY UNLOCKED Measured production machine demand can become an evidence input to final FLSG service economics and implementation freeze.

PHASE 3 - PROTOCOL SPECIFICATION FREEZE

ARCHITECTURE DEFINED / IMPLEMENTATION FREEZE GATED

ARCHITECTURE NOW DEFINED

VERIFIED - Monetary kernel: 1B fixed genesis supply, no future minting, FLR gas, no transfer tax/rebase and no governance over truth.
VERIFIED - SIGNAL Access: economic-value locks, 1/3/12-month terms, immutable principal/beneficiary semantics and tier framework.
VERIFIED - Critical contract boundary: FLSGToken, SIGNALAccessLock, AccessSchedule, MachineOrderEscrow and UsageBurnVault.
VERIFIED - Custody/security model: no admin principal path, negative emergency powers, deterministic transaction policy and immutable versioning.
VERIFIED - Dual-burn design: access burn plus later usage-derived burn, with activation gates.
VERIFIED - Flare-native trust model: FTSOv2, FDC, FAssets/FXRP, Smart Accounts and ContractRegistry; FCC/PQ remain future hardening.

IMPLEMENTATION FREEZE REMAINS GATED BY

Final machine-service capacity/packet economics from measured production demand; final settlement-asset policy after Base mainnet proof; final genesis/distribution/liquidity parameters after legal review; and exact Solidity state machines, events, errors and storage layout.

VALIDATION GATE No material implementation ambiguity remains after Phase 2 production evidence, legal/economic gates and exact contract state-machine specification are closed.

CAPABILITY UNLOCKED Coston2 Solidity implementation can begin against a fixed protocol specification rather than a research architecture.

DETAILED ROADMAP

6. Technical Roadmap Detail

PHASE 4 - COSTON2 IMMUTABLE KERNEL

FUTURE GATE

TECHNICAL OBJECTIVE

Implement the smallest security-critical FLSG protocol kernel on Flare Coston2 using audited primitives wherever possible.

PROTOCOL / INFRASTRUCTURE DELIVERABLES

- FLSGToken: fixed genesis supply and native burn with no owner monetary controls.
- SIGNALAccessLock: principal, expiry, beneficiary integrity and entitlement view with no admin principal path.
- AccessSchedule: epoch-based economic requirements that cannot alter existing locks.
- MachineOrderEscrow: deterministic funded -> fulfilled -> settled OR refunded state machine.
- UsageBurnVault, liquidity and vesting controls with narrow capabilities and no generic execution surface.

VALIDATION GATE **The complete protocol lifecycle executes on Coston2 with test assets while customer principal remains non-discretionary.**

CAPABILITY UNLOCKED The immutable kernel is concrete enough for adversarial security analysis and external review.

PHASE 5 - ADVERSARIAL VALIDATION & REPRODUCIBLE SECURITY

FUTURE GATE

TECHNICAL OBJECTIVE

Establish evidence that critical invariants survive hostile call sequences, malicious assets, compromised agents and build-chain failure.

PROTOCOL / INFRASTRUCTURE DELIVERABLES

- Stateful fuzzing across caller, amount, timing and transaction-sequence space.
- Mutation testing that intentionally weakens security checks and requires tests to detect the change.
- Property-directed AI red-team against monetary, custody, replay, burn-isolation and privacy invariants.
- Formal verification of highest-value invariants using independent methods where practical.
- Reproducible build/bytecode verification, security canary limits and data-minimisation validation.
- Pursue non-destructive external funding/grant routes for specialist assurance.

VALIDATION GATE **Critical invariants survive independent adversarial methods and reproducible deployment evidence is available.**

CAPABILITY UNLOCKED The protocol is eligible for professional audit/legal work without relying on internal confidence alone.

DETAILED ROADMAP

7. Technical Roadmap Detail

PHASE 6 - EXTERNAL ASSURANCE & MAINNET GENESIS

FUTURE GATE

TECHNICAL OBJECTIVE

Cross the Mainnet boundary only after independent security assurance, legal review and final genesis engineering.

PROTOCOL / INFRASTRUCTURE DELIVERABLES

- Independent smart-contract audit, remediation and remediation verification.
- UK legal/regulatory review of token distribution, burn, liquidity and machine-access structure.
- Final immutable genesis, treasury/founder vesting and purpose-bound security vaults.
- Public price-discovery mechanism subject to legal approval and anti-manipulation constraints.
- Protocol-owned liquidity deployment plus verified source, bytecode hashes and public authority matrix.

VALIDATION GATE **Mainnet contracts, launch mechanics and authority boundaries are independently reviewed, reproducible and legally approved.**

CAPABILITY UNLOCKED A defensible Mainnet genesis can occur without weakening custody or monetary invariants.

PHASE 7 - MARKET BOOTSTRAP, PRICE AUTHORITY & SIGNAL ACCESS

FUTURE GATE

TECHNICAL OBJECTIVE

Establish sufficient market quality and decentralized price authority before economic-value-based machine locks are activated.

PROTOCOL / INFRASTRUCTURE DELIVERABLES

- Establish the canonical FLSG/FLR market with protocol-owned liquidity and transparent price discovery.
- Accumulate legitimate liquidity, trading history and manipulation-resistance evidence.
- Standard FTSOv2 FLSG/USD price authority established before SIGNAL Access activation
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- Enable Enhanced, Professional and Institutional immutable lock contracts under published schedules.

VALIDATION GATE **FLSG pricing is sufficiently robust and independently sourced for deterministic economic-value lock requirements.**

CAPABILITY UNLOCKED SIGNAL Access can become a production machine-capacity mechanism rather than a speculative token feature.

DETAILED ROADMAP

8. Technical Roadmap Detail

PHASE 8 - USAGE-DERIVED BURN ACTIVATION

FUTURE GATE

TECHNICAL OBJECTIVE

Activate revenue-funded FLSG destruction only after real paid usage and market liquidity prove the execution economics.

PROTOCOL / INFRASTRUCTURE DELIVERABLES

- Customer product pricing remains independent of the usage-burn mechanism
- no treasury return path.
- Use manipulation-resistant acquisition/burn execution with bounded market impact.
- Publish access-burn versus usage-burn accounting and execution evidence.
- Reassess economics prospectively without altering active locks or previously committed customer rights.

VALIDATION GATE **Measured machine revenue, legitimate liquidity and legal review justify activating the second burn engine.**

CAPABILITY UNLOCKED Protocol deflation becomes linked to actual FlareSignal machine consumption rather than transfer activity.

PHASE 9 - CRYPTOGRAPHIC & PROTOCOL EVOLUTION

FUTURE GATE

TECHNICAL OBJECTIVE

Adopt stronger Flare-native and cryptographic capabilities through explicit new versions without rewriting monetary history or active customer rights.

PROTOCOL / INFRASTRUCTURE DELIVERABLES

- Integrate Flare Confidential Compute where it materially reduces trust and is production-mature.
- Adopt Protocol Managed Wallet/native-account capabilities when their security model is production-ready.
- Introduce optional post-quantum protected high-value custody and recovery paths using standardized cryptography.
- Adopt future native Flare post-quantum/security primitives when mature and audited.
- Deploy new immutable contract versions rather than upgrading live customer-money contracts.

VALIDATION GATE **New capabilities preserve existing supply history, lock terms, beneficiaries and customer-property invariants.**

CAPABILITY UNLOCKED FLSG can evolve with Flare and cryptographic standards without making its monetary core mutable.

CONTROL FRAMEWORK

9. Non-Negotiable Gates Before Mainnet

These gates prevent schedule pressure, hype or funding constraints from weakening the architecture.

Gate	Required evidence	What it prevents
Product gate	FlareSignal site and production truth architecture complete	No token implementation used to distract from unfinished product
Commerce gate	Real paid machine intelligence proven end-to-end	FLSG utility rests on measured machine usage, not theory alone
Specification gate	Contracts, economics, roles and invariants frozen	No coding against moving economic requirements
Security gate	Fuzzing, mutation, AI red-team and formal verification complete	Critical properties tested by independent methods
Funding gate	External/non-destructive funding covers specialist work	No cheap private sale or founder liquidation to fund audits
Audit gate	Independent security audit remediated	No Mainnet customer-money contract before review
Legal gate	UK token/distribution/burn/liquidity structure reviewed	No public distribution before specialist sign-off
Liquidity gate	Sufficient legitimate quote-side liquidity exists	No forced launch into a manipulable thin market
Price authority gate	Robust FLSG reference pricing, preferably standard FTSOv2	No SIGNAL Access based on a weak invented oracle
Access gate	Existing locks immutable and principal inaccessible to admins	Customer property rights enforced by code, not promise

What the roadmap deliberately does not promise

- A token-launch date.
- A target market price or return.
- A CEX-listing timetable.
- A guaranteed Flare grant.
- A shortcut around audit or legal review.
- Activation of FCC, PMW or post-quantum features before the underlying technology is mature.

Mainnet readiness definition

FLSG reaches Mainnet only when it is the natural next layer of a completed FlareSignal product: real machine demand, proven payments, minimal audited contracts, non-custodial customer principal, robust Flare-native pricing/trust infrastructure and public on-chain transparency.