

Tano Network Litepaper

Unlocking UTXO Assets in DeFi

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Executive Summary

Tano Network is building the first comprehensive protocol for bringing UTXO assets (Dogecoin, Litecoin, Cardano, etc.) into decentralized finance, with expansion potential to other assets requiring yield solutions. Through innovative dual-approach validation mechanisms and Liquid Staking Tokens (LSTs), Tano transforms previously dormant UTXO assets - which lack native staking capabilities - into yield-generating, composable DeFi primitives while maintaining strict 1:1 peg guarantees.

Our revolutionary approach combines custodial and non-custodial staking methods, creating an unprecedented security model that eliminates traditional bridging risks. Users can choose between immediate liquidity through our consortium-secured pools or complete self-custody through innovative timelock mechanisms with pre-authorized recovery transactions.

Unlike existing solutions that focus solely on Bitcoin or assets with native staking, Tano addresses the untapped market of alternative UTXO assets with established communities but zero yield opportunities. Our protocol enables seamless DeFi integration while maintaining the security guarantees users expect from their UTXO assets.

Tano's streamlined development roadmap delivers core functionality in 2025 with full advanced features by Q1 2026, creating immediate value for users and investors while establishing a sustainable revenue model through DeFi yield strategies.

1 The Problem

UTXO-based cryptocurrencies collectively represent hundreds of billions in market capitalization but remain largely excluded from modern DeFi ecosystems:

- **No Native Yield Opportunities:** UTXO assets like Dogecoin and Litecoin lack native staking mechanisms, leaving holders with no way to earn yield
- **Fragmented Liquidity:** UTXO assets exist in isolated ecosystems with minimal cross-chain composability
- **Security Concerns:** Current bridging solutions introduce significant centralization risks, attack vectors, and have suffered major exploits
- **Underutilized Capital:** Billions in UTXO assets sit completely idle with zero yield generation capability

- **Limited DeFi Integration:** Most UTXO assets cannot participate in lending, yield farming, or other DeFi activities

While significant innovation has occurred in the Bitcoin LST space, other UTXO assets have been completely overlooked despite their substantial communities and market caps. Current solutions like Babylon Protocol and Lombard face limitations: Babylon burns BTC on violations and can't issue fungible LSTs, while Lombard depends heavily on Babylon's infrastructure and inherits its risks.

2 The Tano Solution

Tano Network creates a revolutionary dual-approach protocol that enables UTXO asset holders to participate in DeFi and earn yield for the first time through both consortium-secured pools and innovative self-custody mechanisms, maintaining strict 1:1 pegging while eliminating traditional bridging risks.

2.1 Core Innovation: Dual-Approach Architecture

Tano's breakthrough innovation lies in combining two complementary approaches that work together to maintain perfect 1:1 backing:

1. **Consortium-Secured Approach:** Traditional mint/burn mechanism with advanced security through consortium validators and timelock protection
2. **Self-Custody Timelock Approach:** Revolutionary non-custodial method where users retain control while enabling LST issuance

2.2 Key Components

1. **tAssets:** Fungible Liquid Staking Tokens (LSTs) representing UTXO assets (tDOGE, tLTC, tADA, etc.) - making non-stakeable assets yield-generating
2. **Dual Security Framework:**
 - Consortium-secured pools with advanced validator selection
 - Self-custody timelock mechanism with pre-authorized recovery
3. **Advanced Peg Maintenance:** Mathematical balance between both approaches ensuring 1:1 peg stability
4. **DeFi Integration Layer:** Seamless connections to lending, trading, and yield platforms
5. **Automated Yield Strategies:** Diversified DeFi placements with optimal income generation
6. **User Experience Layer:** Simple "stake" button interface with complex backend automation

2.3 Revolutionary Features

- **Zero-Risk Self-Custody:** Users maintain control of their assets while earning DeFi yields
 - **Perfect Peg Maintenance:** Advanced mathematical model ensures 1:1 backing under all conditions
 - **Flexible Redemption:** Immediate small redemptions, queued large redemptions for security
 - **Multi-Asset Support:** Expandable to any native staking asset beyond UTXO chains
 - **Regulatory Compliance:** Protocol-first architecture with clear compliance boundaries
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3 Technical Architecture

3.1 Consortium-Secured Approach

3.1.1 Enhanced Security Model

Unlike traditional bridges that store all funds in hot wallets, Tano implements a sophisticated security model:

1. Consortium Validators:

- Carefully selected high-quality validators with proven track records
- Multi-signature requirements with threshold security
- Economic incentives aligned through TANO token staking requirements

2. Timelock Protection:

- Majority of pool funds stored in native timelock scripts
- Only small amounts kept liquid for immediate redemptions
- Attack mitigation through time-delayed large withdrawals

3. Redemption Queue System:

- Immediate redemption for small amounts (< 1% of pool)
- Queued redemption for large amounts with timelock unlocking
- Dynamic processing based on pool liquidity levels

3.1.2 Pool Liquidity Management

The consortium pool maintains optimal liquidity through:

$$L_{optimal} = \alpha \cdot TVL + \beta \cdot \sqrt{daily_volume} + \gamma \cdot volatility_factor$$

Where:

- $L_{optimal}$ is the target liquid pool size
- TVL is the total value locked in the protocol
- α, β, γ are dynamic coefficients based on market conditions

3.2 Self-Custody Timelock Approach

3.2.1 Revolutionary Non-Custodial Mechanism

Tano’s breakthrough innovation enables LST issuance while users maintain custody:

1. Dual Transaction Signing:

- Transaction 1: Timelock transaction (3, 6, or 12 months)
- Transaction 2: Pre-authorized recovery transaction
- Assets remain in user’s wallet throughout the process

2. LST Issuance:

- Protocol mints tAssets upon timelock verification
- All tAssets are fungible regardless of lock duration
- 1:1 backing guaranteed through pre-authorized recovery

3. Recovery Mechanism:

- Users return tAssets before timelock expiry to unlock funds
- If tAssets not returned, protocol executes pre-authorized transaction
- Recovered funds maintain 1:1 backing for outstanding tAssets

3.2.2 Automatic Relock Options

Users can optionally sign additional transactions for automatic relocking:

- **Auto-Relock Transactions:** Prevent accidental expiry through automatic renewal
- **Diversified Placement:** Automatic distribution across optimal DeFi strategies
- **Yield Optimization:** Protocol management ensures maximum returns

3.3 Peg Maintenance Mathematical Model

The protocol maintains perfect 1:1 peg through advanced mathematical balancing:

$$Peg_{stability} = \frac{Assets_{consortium} + Assets_{timelocked}}{tAssets_{outstanding}} = 1.0$$

3.3.1 Dynamic Rebalancing

$$R_{factor} = \frac{Redemption_{pressure}}{Liquidity_{available}} \cdot Time_{factor}$$

When $R_{factor} > 1$:

- Activate timelock unlocking procedures
- Increase redemption queue processing
- Adjust fees to incentivize liquidity provision

3.4 Yield Generation Architecture

3.4.1 DeFi Strategy Integration

Tano implements sophisticated yield optimization:

1. **Strategy Selection:**

- Partnership with premium DeFi protocols
- Risk-adjusted return optimization
- Diversification across multiple strategies

2. **Yield Calculation:**

$$Y_{user} = Y_{base} \cdot (1 - f_{protocol}) \cdot (1 - f_{tano_discount})$$

Where:

- Y_{base} is the base yield from DeFi strategies
- $f_{protocol}$ is the protocol fee (5-10%)
- $f_{tano_discount}$ is the discount for TANO token holders

3. **Revenue Conversion:**

- Yield earned in various tokens (stablecoins, governance tokens)
- Automatic conversion to native assets through DEX integration
- Continuous rebalancing of consortium pools

4 Competitive Landscape

Tano offers distinct advantages over existing solutions:

| Solution | Asset Custody | Peg Stability | Stabil-ity | Yield Source | Risk Model | Asset Scope |
|---------------------|-------------------|-------------------|------------|-----------------|---------------------|-----------------|
| Tano Network | Dual Approach | Perfect 1:1 | | DeFi Strategies | Innovative Recovery | All UTXO Assets |
| Babylon Protocol | Full Custody | N/A (No LST) | (No) | Validation | Asset Burning | Bitcoin Only |
| Lombard | Babylon-Dependent | Babylon-Dependent | | Babylon-Based | Babylon Risks | Bitcoin Only |
| Traditional Bridges | Full Custody | Variable | | None | High Exploit Risk | Selected Assets |
| CEX Staking | Full Custody | N/A | | Limited | Regulatory Risk | Major Assets |

Table 1: Competitive analysis of UTXO asset solutions

Tano's unique advantages:

1. **Superior Security Model:** Pre-authorized recovery eliminates asset burning while maintaining perfect backing

2. **Comprehensive Asset Support:** Expandable to all native staking assets, not limited to Bitcoin
 3. **Fungible LST Issuance:** Unlike Babylon, Tano creates fully fungible tokens regardless of timelock duration
 4. **Flexible Custody Options:** Users choose between consortium security and self-custody
 5. **Sustainable Revenue Model:** DeFi yield strategies provide continuous revenue streams
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5 Revenue Model & Economics

5.1 Primary Revenue Streams

1. **DeFi Yield Strategies (Primary):**
 - 5-15% fee on yields generated from DeFi integrations
 - Partnerships with premium yield protocols
 - Automated yield optimization and conversion
2. **Service Fees:**
 - Early exit fees for timelock users (0.5-2%)
 - Premium strategy access fees
 - Expedited redemption fees
3. **Protocol Integrations:**
 - Revenue sharing with DeFi protocols
 - White-label solutions for institutions
 - API access for third-party developers

5.2 Yield Distribution Model

$$Revenue_{distribution} = \sum_{i=1}^n (Y_i \cdot f_{protocol} \cdot V_i)$$

Where:

- Y_i is the yield rate from strategy i
- $f_{protocol}$ is the protocol fee rate
- V_i is the volume in strategy i

5.3 TANO Token Utility & Value Proposition

The TANO token serves multiple critical functions:

- **Fee Discounts:** Holders receive reduced protocol fees based on staking tiers
- **Governance Rights:** Voting on protocol parameters, strategy selection, and asset additions
- **Validator Requirements:** Consortium validators must stake significant TANO amounts
- **Premium Access:** Exclusive access to high-yield strategies and insurance programs
- **Point Conversion:** Timelock points can be converted to TANO tokens

5.3.1 TANO Staking Tiers

| Tier | TANO Required | Fee Discount | Benefits |
|----------|----------------|--------------|--|
| Bronze | 1,000 TANO | 10% | Basic fee reduction |
| Silver | 10,000 TANO | 25% | Priority support, advanced strategies |
| Gold | 100,000 TANO | 50% | Insurance programs, early access |
| Platinum | 1,000,000 TANO | 75% | Governance participation, validator benefits |

Table 2: TANO token staking tiers and benefits

5.4 Tokenomics

5.4.1 Token Distribution (Total Supply: 1,000,000,000 TANO)

| Allocation | Percentage | Amount | Purpose |
|-----------------------|------------|--------|--|
| Investors | 25% | 250M | Funding development and growth |
| Team & Advisors | 20% | 200M | Long-term incentive alignment |
| Protocol Treasury | 20% | 200M | Development and sustainability |
| Community Rewards | 20% | 200M | User points, staking rewards, airdrops |
| Ecosystem Development | 15% | 150M | Partnerships, integrations, grants |

Table 3: TANO token distribution

5.4.2 Vesting Structure

6 User Experience & Automation

6.1 Simplified User Interface

Despite the sophisticated backend architecture, Tano prioritizes user experience:

| Allocation | Vesting Period | Structure |
|---------------|---------------------------------|---------------------------|
| Pre-seed/Seed | 12-month cliff, 24-month linear | Long-term alignment |
| Private Sale | 6-month cliff, 18-month linear | Gradual release |
| Public Sale | 25% at TGE, 6-month linear | Immediate liquidity |
| Team | 12-month cliff, 36-month linear | Long-term commitment |
| Community | Performance-based, 48-month | Usage-driven distribution |

Table 4: TANO token vesting schedules

1. One-Click Staking:

- Simple "Stake" button for basic users
- Automatic optimal strategy selection
- Guided transaction signing process

2. Advanced Options:

- Manual strategy selection for experienced users
- Custom timelock periods
- Risk preference settings

3. Automated Management:

- Automatic yield optimization
- Timely LST redemption before expiry
- Emergency notifications and safeguards

6.2 Risk Mitigation for Users

- **Expiry Protection:** Multiple notification systems and automatic relock options
- **Emergency Procedures:** Clear processes for fund recovery in edge cases
- **Insurance Options:** Optional coverage for premium TANO holders
- **Gradual Onboarding:** Tutorial system for new users

7 Market Opportunity

7.1 Target Asset Universe

7.2 Addressable Market

1. **Primary Market (UTXO Assets):** \$80B+ in dormant assets with zero native yield
2. **Secondary Market (Other Assets):** \$50B+ in underutilized assets with limited DeFi access
3. **Total Addressable Market:** \$130B+ with significant expansion potential

| Asset | Market Cap* | Type | Current Yield | Launch Phase |
|-----------------|-------------|---------|--------------------------|-------------------|
| Dogecoin | \$26.05B | UTXO | No Native Staking | Phase 1 (Q3 2025) |
| Litecoin | \$6.19B | UTXO | No Native Staking | Phase 1 (Q3 2025) |
| Cardano | \$24.68B | UTXO | Native Staking Available | Phase 2 (Q4 2025) |
| Bitcoin Cash | \$7.8B | UTXO | No Native Staking | Phase 2 (Q1 2026) |
| Other UTXO | \$15B+ | UTXO | Mostly None | Phase 3 (Q2 2026) |
| Non-UTXO Assets | \$50B+ | Various | Mixed | Future Phases |

Table 5: Target UTXO assets with expansion potential (*Market caps as of Q2 2025)

7.3 User Segments

1. Retail Holders:

- Long-term holders seeking yield without custody transfer
- Community-focused investors wanting additional utility
- Risk-averse users preferring self-custody options

2. Institutional Participants:

- Family offices with large native asset holdings
- Treasury management requiring compliant yield solutions
- Hedge funds seeking uncorrelated yield strategies

3. DeFi Protocols:

- Lending platforms needing diverse collateral types
- DEXs expanding trading pair offerings
- Yield aggregators seeking new asset classes

8 Development Roadmap

Tano's development roadmap is designed for rapid delivery and immediate market impact:

8.1 Q2 2025 (Foundation)

- Core team expansion and architecture finalization
- Consortium validator recruitment and vetting
- Pre-seed funding completion
- Strategic DeFi protocol partnerships
- Initial smart contract development

8.2 Q3 2025 (Launch Phase)

- **July:** Testnet launch with Dogecoin support
- **August:** Litecoin integration and consortium testing
- **August:** Comprehensive security audits
- **September:** Mainnet deployment (Consortium approach)
- **September:** First DeFi strategy integrations (3-5 protocols)
- **September:** Seed funding round

8.3 Q4 2025 (Expansion Phase)

- **October:** Cardano and XRP integration development
- **November:** Self-custody timelock testnet launch
- **November:** Advanced yield strategy partnerships (10+ protocols)
- **December:** Full self-custody mechanism testing
- **December:** Private token sale preparation

8.4 Q1 2026 (Full Deployment)

- **January:** Self-custody timelock mainnet launch
- **February:** Multi-asset support (5+ native staking assets)
- **February:** Advanced automation and UX improvements
- **March:** Token Generation Event (TGE)
- **March:** Full ecosystem launch (20+ DeFi integrations)

8.5 Q2 2026 (Governance & Advanced Features)

- DAO governance implementation
- Insurance program launch
- Institutional solutions and white-label offerings
- Advanced yield optimization algorithms
- Cross-chain expansion planning

Note: Timeline dependent on funding milestones and market conditions

9 Risk Management & Security

9.1 Comprehensive Security Framework

1. Multi-Layer Security:

- Consortium validator economic incentives
- Timelock-based fund protection
- Pre-authorized transaction recovery
- Continuous monitoring and alerting

2. Smart Contract Security:

- Multiple independent audits
- Formal verification of critical components
- Phased deployment with testing periods
- Emergency pause mechanisms

3. Economic Security:

- Validator slashing conditions
- Insurance fund accumulation
- Liquidity buffer maintenance
- Stress testing scenarios

9.2 Risk Mitigation Formulas

9.2.1 Validator Security Score

$$S_v = w_1 \cdot U_v + w_2 \cdot P_v + w_3 \cdot R_v + w_4 \cdot TANO_{stake} - w_5 \cdot Risk_{factor}$$

Where:

- S_v is the validator security score
- U_v is uptime performance (0-1)
- P_v is transaction accuracy (0-1)
- R_v is response time metric (0-1)
- $TANO_{stake}$ is the normalized staking amount
- $Risk_{factor}$ includes penalty history and suspicious activity

9.2.2 Dynamic Liquidity Buffer

$$B_{required} = \max(B_{base}, \alpha \cdot \sqrt{TVL} + \beta \cdot Volatility_{7d} + \gamma \cdot Redemption_{trend})$$

Where:

- $B_{required}$ is the required liquidity buffer
- B_{base} is the minimum buffer (2% of TVL)

- TVL is total value locked
 - $Volatility_{7d}$ is 7-day volatility measure
 - $Redemption_{trend}$ is the redemption pressure indicator
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10 Regulatory Compliance

10.1 Protocol-First Regulatory Approach

Tano is designed with regulatory compliance as a foundational principle:

- **Decentralized Architecture:** No single point of control or custody
- **User-Controlled Assets:** Self-custody options maintain user ownership
- **Transparent Operations:** All protocol activities verifiable on-chain
- **Compliance Integration:** KYC/AML compatibility for regulated platforms

10.2 Jurisdictional Adaptability

- **Flexible Compliance:** Architecture adapts to different regulatory requirements
 - **Legal Documentation:** Comprehensive legal opinions and compliance guides
 - **Regulatory Monitoring:** Continuous assessment of evolving regulations
 - **Governance Parameters:** Protocol adjustments for compliance maintenance
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11 Team & Vision

Tano Network is built by a team with extensive experience in blockchain development, DeFi protocols, cryptography, and regulatory compliance. Our leadership combines deep technical expertise with business acumen and regulatory insights to deliver a comprehensive solution.

Our Vision: We envision a future where all native staking assets can participate in open financial systems with maximum security, utility, and user control. By starting with UTXO assets and expanding to the broader native staking ecosystem, we aim to unlock hundreds of billions in dormant value.

Our Mission: To create the most secure, user-friendly, and comprehensive protocol for bringing native staking assets into DeFi while maintaining the security guarantees and community values that make these ecosystems unique.

12 Conclusion

Tano Network represents a paradigm shift in cross-chain DeFi by introducing revolutionary security models that eliminate traditional bridging risks while maintaining perfect asset backing. Our dual-approach architecture provides users with unprecedented choice between consortium security and complete self-custody, all while ensuring seamless DeFi integration.

With a clear focus on UTXO assets that currently have zero native yield capabilities, Tano addresses a massive underserved market worth over \$130 billion. Our innovative timelock mechanisms, pre-authorized recovery transactions, and comprehensive yield strategies create a sustainable and secure foundation for long-term growth.

The combination of technical innovation, user-centric design, regulatory compliance, and strong tokenomics positions Tano as the premier protocol for UTXO assets in DeFi. Our streamlined development roadmap ensures rapid market entry while maintaining the highest security standards.

By solving the fundamental challenges of UTXO asset bridging, yield generation, and security, Tano Network will establish itself as the essential infrastructure connecting dormant UTXO assets to the broader DeFi ecosystem, creating unprecedented value for users, investors, and the entire blockchain community.

This litepaper presents the vision for Tano Network and is subject to evolution as the protocol develops. This document does not constitute financial advice or an investment solicitation.