



TDN Loyalty Program

Whitepaper

Powered by the TODA protocol



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## 1. Introduction

The TODA Note (TDN) is a  $2^{37}$  supply of a backstopped digital loyalty reward built on the TODA Protocol and is designed to offer global, long-term, stable, and real economy utility. It is meant particularly for the needs of general society, businesses, and the financially excluded populations of the world. While a large portion of TDN distribution is in the form of loyalty rewards it is meant to ultimately become broadly accepted as a means of exchange used for trade and commerce. Where market regulation is present, it is designed to support those types of stewardship and transparency requirements securely and efficiently.

TDN are not an investment and they are not meant to be purchased and held for speculative purposes. They are meant as a store of value, and a means of acquiring goods and services.

Global financial and regulatory friction, as well as intermediary and transaction fees all create blocks to market entry and increase value extraction which limits the full potential of merchants and consumers. As an example, the World Bank has identified a more than \$2.6 trillion credit gap for SMEs globally, and over 2 billion unbanked showing the scale of opportunity. In addition, the new centralized technology platforms that have reduced costs and made life easy over the last couple of decades have done so by further decreasing society's ownership of their own identity and assets. Sovereignty, privacy and security for people, businesses and governments have been traded away for convenience.

Through decentralisation there is a global opportunity to reverse this and move the needle on inclusion and economic growth. TDN owners have direct ownership control of their TDN that cannot be changed or taken by any third party, and TDN can be transacted and settled with anyone else in under a minute without transaction fees or other value extraction. TDN monetizes and enables builders, merchants and consumers, including those building platforms, products, services and solutions on the TODA Protocol. TDN provides a first common, practical way for people to experience the value of TODA, which can provide them meaningful ownership of all their digital assets and their identity.

TDN is built on the TODA Protocol, a ledgerless decentralized technology that provides **permissionless, secure and efficient** management for the **ownership** of any type of **digital asset**. TODA allows anyone to create new digital assets, which they then own, fully control and can prove their ownership of it locally, without consulting third parties for approval. They can

transfer the ownership in the same way like the ownership of physical assets, where you can use, sell, rent, loan or give away assets you own without third party interference. It is engineered to efficiently operate on low power mobile devices, and provides P2P one-way and two-way atomic swap transactions<sup>1</sup> in real time with final deterministic settlement for any volume of transactions in under a minute, requiring close to zero power or hardware. The TODA Protocol defines a distributed model of ownership which is not reliant on a replicated ledger. In doing so, it provides low-level infrastructure upon which a variety of ledgers or other decentralizes services can be defined. Its level of trust and efficiency eliminates transaction fees and other intermediary wasted effort including escrow, trade finance, insurance and reconciliation services. The TODA Protocol's efficiency means that it does not require 'gas' or a base token (e.g., bitcoin, ether, etc) to incentivize settlement of value on the protocol. The TODA protocol can also enable highly secure and efficient 'smart ecosystem' or 'smart asset' capability at massive scale by attaching simple rules or encumbrances around TODA files and file types. This is the TODA equivalent of the potential smart contract benefits being pursued in the blockchain world, but operates in a fundamentally more scalable way.

The TDN architecture includes a combination of technology, business, and regulatory design features, with the aim of creating long-term stability and usefulness.

- TDN is a specific file type on the Toda Protocol with its own characteristics and rules to promote utility and stability.
- There will be a total of  $2^{37}$  TDN files cryptographically generated, with a distribution period of about a decade to place the entire supply into the global market.
- TDN is designed to have three combined sources of value to support its utility as a medium of exchange: the underlying reserve backstop representing the liquidation or 'zero-velocity' value; a TODA protocol-powered open platform consumer price index value representing the aggregate utility value; and the TDN exchange value reflecting the exchange or market point of view.
- Any node or low power device taking part in distributed settlement work can have a very small probability of generating a net new TDN so that there is a slow but capped increase of the overall TDN supply over time.
- The management of distribution and investment is designed to maximise scale and diversity of commercial use cases.
- The main allocation of TDN is distributed through a loyalty plan, so any TODAQ enabled enterprise account or qualified TDN wallet, while being able to own or transact any digital asset, will also receive a small grant of TDN to start. All these accounts have the ability to earn more TDN by referring in other nodes and doing transactions.

- TDN is expected to be allocated for projects that are building TODA technology and market solutions.

The Strategic TODA Note Asset Reserve Foundation ('STAR') has the aim of stewarding distribution of the TODA Note (TDN) primarily through, but not limited to, a decentralized loyalty program approach; building over time and managing the underlying TDN asset reserve backstop; and promoting the real economy utility of TDN and growth of TODA based technologies, business solutions, markets and economies. STAR will be established as a not-for-profit Foundation with the role of generating and distributing TDN through its loyalty program structure, creating the asset reserve backstop, and promoting the establishment of a viable secondary market ecosystem. The permanent asset reserve backstop will be created over time, as a portion of the TDN being distributed into the market will be dedicated to build the reserve which intends to include, but not limited to, SDR currencies, land and commodity assets. In order to provide a strong start to the program, STAR also intends to raise funds to build an initial reserve backstop and operating capital base. Until STAR is to be established, TODAQ is responsible for managing the entire program.

STAR intends to have every TDN distributed into the market be covered by the reserve backstop, which functions as a minimum liquidation or digital store of value for each TDN in the event of market failure. STAR will set this backstop value based on market conditions, the size of the asset reserve and the number of deployed TDN and communicate the backstop amount to the market, with periodic third party auditing. STAR will also be responsible to promote the development of a TDN consumer price index and foster TDN integration into platforms and merchant payment networks. For these latter tasks, while STAR will be driving much of the initial work, any other market actor will be able to ultimately do the same as the TODA protocol is open sourced.

The core markets for TDN are individuals, businesses and organizations that are building solutions and conducting real-economy transactions on the TODA protocol. Approximately 75% of the TDN loyalty reward supply is directed towards its target market, 15% is allocated to build the catalyst and permanent asset reserve, and 10% of the TDN loyalty reward supply is set aside for founding ecosystem builders and shareholders.

The founding distribution partners include TODAQ - the TODA based sovtech company that allows everyone to become their own bank, TODA.Network - the Toda startup and JV accelerator, and TRIE (TODA Research Institute) - the Foundation to steward the TODA

protocol. The non-profit STAR Foundation will have a majority independent Board and intends to be fully established and active not later than the start of 2020. During 2019, initial TDN program responsibilities are intended to fall with TODAQ until the Foundation is fully set up. As one of the first in a new class of self-sovereignty tech or 'sovtech' companies, TODAQ's mission is to enable a new economy by restoring ownership of identity and assets for all as a human right.

## THE TODA ECOSYSTEM

Provides direction to TODAQ to distribute TDN globally & enables the global market to build sovtech specific solutions, as well as to create a secure, transparent and efficient TDN market

**STAR**

*Strategic TODA Note Asset Reserve Foundation distributing TODA Note (TDN), a digital asset designed to accelerate commerce on TODA, and managing the reserve backstop*

**TRIE** Toda Research Institute

*TODA Research Institute Stewarding research and develop the open-source TODA Protocol & higher layer decentralized technologies*

Provides an open source community for other entities to participate as members

Develop TODA protocol implementation and handover open source portion to TRIE

Provide TODA-as-a-serve (TaaS) platform, digital asset services, finance and insurance products and services for people, businesses and governments

**TODA**

*First sovtech (Self-Sovereignty Tech) company. Enabling a new economy by restoring ownership and control of identity and assets for all as a human right. Power trade for people, business and government.*

**TODA**

*Seeding start-up companies and creating joint ventures to promote TODA Protocol adoption*

Domain specific experiments, solutions, B.AI projects and protocols on TODA for the global market

In the early stages STAR will focus on enterprises, financial institutions, smart cities and sharing economies and their surrounding supply and distribution chains in order to access the largest populations and markets that can benefit from the TODA protocol's trust and efficiency.

TDN will be primarily distributed through, but not limited to, a mechanism similar to a universal loyalty program where TODA-based nodes, while being able to own any type of digital asset, will also receive a small grant of TDN as a loyalty reward. As each node does work to execute and settle commercial transactions, add additional nodes to the protocol ecosystem, or provide CPI unit price reporting, it will accrue further TDN rewards. TODA-based nodes (wallets) will also be available for download to mobile devices, and on activation can also receive TDN distribution so SMEs and individuals can receive TDN direct and not require the enterprise distribution route. Most starting enterprises and merchants entering the TODA ecosystem can see TDN as an enhancement or addition to their usual transaction currencies, so TDN can be

used alongside real currency and corporate loyalty programs to pay for goods and services. TDN can be available to be used for real-economy production and trade in goods and services from inception through established enterprise companies. With a reach of millions of consumers, these efforts are expected to drive adoption. In addition to these commercial use cases, TDN's purpose is also to power innovation and research on the TODA protocol, including funding TODA Research Institute (TRIE) and innovation work. To achieve this scope, STAR has a founding network of for-profit and not-for-profit partners to distribute TDN.

The STAR mission will be implemented over multiple phases over the next decade, with the initial focus on getting the first backstop and distributions in place through enterprise partners, and listing TDN across currency and commodity exchanges

The STAR team and advisory board includes experts in cryptography, cybersecurity, blockchain, capital markets, monetary, actuarial, and economics, as well as business leaders from a wide spectrum of primary through tertiary economic sectors to form a cross disciplinary team. Their geographic coverage and domain depth also spans the Americas, Europe, Africa, the Middle East and Asia.



## 2. Vision

With TDN, STAR intends to provide a global example of a backstopped digital loyalty reward that offers global, long-term real economy utility to serve the needs of general society, businesses, and the financially excluded populations of the world. The  $2^{37}$  TDN that will be distributed into the global market will be an accelerator to the growth of the TODA-based economy, by enabling merchants and consumers operating on the TODA protocol to produce and trade more goods and services.

In order to promote global, long-term utility, the TODA Note must meet three standards. Its utility should allow it to be used for any transactions from purchasing necessities like a coffee or haircut to more sophisticated corporate and capital markets transactions. TDN owners should perceive TDN as a useful digital asset over the long-term. Finally, its design should allow it to securely satisfy global KYC, AML, CFT, securities, taxation and monetary regulatory compliance requirements.

## 3. Values

Liberty and accountability

- Liberty for all, but always tightly coupled to cost, accountability and responsibility.

Meaningful ownership of digital assets

- Preservation of value for people, businesses, markets and countries.

Efficiency that scales globally

- Non-extractive, local transactions interoperating on a global protocol.

Privacy, security and longevity by design

- Build and execute to defend the rights of the next generation

Every human should have individual self-sovereignty, while the nation state is the atomic unit of collective sovereignty. Both must be enabled.

## 4. The TODA Protocol

The TODA Protocol provides **secure** and **efficient** management for the **ownership** of **digital assets**.

### Description

**Security** is the heart of TODA: the entire protocol is designed around security first, which starts with decentralization and is further enhanced by TODA's stateless architecture. All decentralized architectures provide resilience against determined adversaries, and a purely functional system that doesn't need to maintain state over time can go further by providing resilience against concentration of power effects. Everything built on top of TODA can take advantage of this same security model, enjoying the benefits of reduced trust factors and the subsequent reduction of friction.

**Efficiency** comes in many forms. Consider the computational efficiency of a single transaction: any transaction on any ledger will have at least a linear computational cost in the size of that system. Scaling the system (for example, the amount of available hashing power in the case of a Proof-of-Work based ledger) will not increase the transaction throughput of the system; it will instead only increase the computational cost of each transaction.

Computational cost serves as a lower bound on the total economic cost of a single transaction, which in the case of a traditional ledger is paid partly in transaction fees and partly through the mining of new currency. Ultimately, of course, these costs must be borne by the users of the system. This means transactions on a ledger are inherently expensive, and become more so as the popularity of that particular ledger increases.

This is a trap, and the only way out is to move transactions off the ledger, allowing the per-transaction cost to scale independently. TODA does this not by building a pocket universe on top of a ledger, which would trap all the transactions inside it, but rather by providing a layer that exists beneath all ledgers: a unified framework for transactions that is independent of any ledger, and provides exactly the minimal set of functionality necessary to fulfill transactions without a ledger.

This turns out to also be the maximal set of functionality compatible with TODA's cost dynamics, in which transactions are carried out at uniform computational cost by all participants in the system. This in turn necessitates that the total per-transaction cost be low enough to be borne by participants on low-powered mobile devices, to prevent excluding them from acting within the network. It requires not only low constant factors, but also asymptotic computational complexity less than directly proportional to the size of the system.

Given such a system, confidentiality is a direct result of designing for efficiency and security. The security model is synonymous with decentralization, and the efficiency model requires fully distributing the work across the network. In fact, for true efficiency only a tiny percentage of the nodes on the network should even know a transaction occurred, and they should know as little about it as possible. This means the sender and receiver do 99.99% of the work of this transaction, the few nodes that know this transaction occurred know none of the details, and the rest of the network has no knowledge that it even happened.

The end result is a system that can scale up the number of transactions with the number of users almost indefinitely, while sharing the work of maintaining the system evenly throughout the user base, providing an economically efficient transaction layer upon which higher-order decentralized protocols can be built.

**Ownership** of digital assets has historically been expressed as a row in a database or ledger. This leads to an ownership model that lacks the ability to move assets between systems. It also adds intermediaries in the transaction path: to interact with the asset, the owner must send a request to the asset manager, who may eventually process it. To move money that is in a bank, one must talk to the bankers. To move money that is in a ledger, one must talk to the miners. But to move money that is in one's pocket does not require an intermediary. TODA provides an ownership model similar to that of cash, where the business of transacting is between sender and receiver, and does not require third party mediation to maintain the uniqueness of assets.

Nearly all digital assets today are locked in corporate silos, with the ownership of these assets expressed as rows in a database. Those assets are owned by whoever controls that database. The corporation may allow a user to make use of that asset, but that privilege is granted at the corporation's discretion, and can be removed at any time. If the corporation ceases to exist, or their servers are compromised, or the database becomes corrupted, or a policy change deprecates that asset, then it is ripped away from its presumed owner, the user. In this world only corporations own assets, users merely rent them.

TODA allows anyone to create new digital assets, which they then own and fully control. There are no intermediaries in this process. There is no need to acquire someone else's permission. No one else is even aware this has happened. A user who has created such an asset can prove their ownership of it locally, without consulting third parties for approval, and they can transfer the ownership in the same way. In this new model the ownership of digital assets works like the ownership of physical assets, where you can use, sell, rent, loan or give away assets you own without third party interference.

**Digital assets** come in a wide variety of forms, including certifications, attestations, identity, rewards points, game items, currency, and digital representations of physical assets. Each of these have different characteristics and require different rules for their lifecycle management, but all digital assets should carry their own history, metadata, and proofs of correctness and completeness, which provide immutability, attestability and opt-in auditability.

## TODA Primer Paper & Comparison Chart

The most up to date online copies of the TODA Protocol Primer paper and summary chart can be found at [www.todaqfinance.net](http://www.todaqfinance.net).

## TODA Protocol R&D

The TODA Protocol will be released as open source in stages throughout 2019 and 2020 and will be stewarded by the TODA Research Institute ('TRIE') Foundation. During this period, research and development of the protocol is intended to expand from being solely privately driven (e.g., TODAQ) to creating a global network of university research hubs, private sector, public sector institutions and the broader decentralized research and practitioner community.

## 5. TDN origins

In early 2016, Toufi Saliba and Dann Toliver, as the primary co-authors of the TODA Protocol, put together the proto-version of the TODA Protocol design, and shortly thereafter brought together the first technical and business community to foster its further development and use in the world. It took a full year of further research and design before, in the spring of 2017, the first working software implementation of the TODA Protocol was created and the first file generation, transaction and settlement occurred in Toronto. TODAQ and TODA.Network emerged around that time as the primary early stage ventures to build the technology, first products and services and global community. During this initial year the TDN had been an embedded part of the TODA Protocol's design as an integral settlement token or 'gas', but the TODA Protocol's efficiency led to its removal in that capacity.

During the following year, many businesses and communities from Asia to the Americas joined the TODA ecosystem and multiple product-market fit efforts occurred concurrently with the core protocol research and development. These simultaneous streams of effort provided cross-benefits as there was an early and continuous feedback loop from the market about what did, and did not, provide value within the Protocol. The development of a true disruptive technology opened new possibilities not previously considered possible at scale in the global market. The TDN asset also found a new role given market demand for a utility reward driver and it evolved into an optional value added benefit for every TODA account, with owners being given the choice of how to use it. In the spring of 2018, the redesigned TDN was used on a mobile app by multiple participants to provide payments for manicure services at local Toronto merchant, with one of the transactions transmitted and settled in under a minute to the merchant by the TDN payer, while enroute in a plane 40,000 feet over Asia. TODA's 'pizza' moment had arrived.

Many of the advances of the TODA protocol during this period expanded the number of value added uses cases for TODA and with it, the channels and use for TDN as well. The ability to fractionate TODA files as an example, meant that one could usefully track ownership of commercial goods along their entire value chain from source to manufacture to distribution and final sale and consumption. Since its first transaction in Toronto one year ago, the capabilities of the underlying TODA platform, as well as the size and diversity of the TDN market, has grown by several orders of magnitude. TDN should be useful, whether for purchasing coffee, commodities or a company and in 2019 STAR will be looking to have these done and more.

## 6. TDN Design and supply management

The purpose of the TODA Note (TDN) is to provide a secure, useful and efficient digital store of value that will accelerate the growth of the TODA ecosystem and development of commercial solutions, products and services built on TODA. Over the long-term, TDN should also be a trusted digital utility for trade and commerce, particularly for cross-border business. TODA Notes are designed to have utility over multiple generations. In order to achieve these aims the TDN file has been designed to have specific characteristics.

### Design Characteristics

TODA Notes (TDN) are designed with the following major characteristics:

- A primary supply of exactly  $2^{37}$  TDN files will be produced through cryptographic generation
- Incremental TDN are created and distributed through the decentralized consensus process at a controlled rate that is capped.
- The TDN file type can be upgraded by STAR so that holders of old-generation TDN files can trade those in for newer generation of TDN at a 1:1 ratio. Older generation TDN files will always be backstopped and usable.
- As STAR creates TDN file types, certain guarantees are added at the level of the TODA protocol itself. These cryptographic guarantees are baked into the proof structure and apply equally to everyone, including STAR. They are permanent and can never be violated.
- These cryptographic guarantees include limiting the addresses that can create new TDN file types, as well as the addresses that can create new TDN. They also include deprecating of older TDN file types, which then can no longer be used to create TDN. Changes to a TDN file type can never impact existing files of that type: once a file is created, its relationship with its file type is finished.
- The strong cryptographic guarantees combine with TODA's proofs of correctness and completeness to allow STAR to be completely transparent about the creation of new TDN. Any decisions STAR makes regarding the deployment of TDN are visible to the market.
- TDN files can be subdivided into base fractions of an original TDN. Subdivisions occur through a fractionating process where a TDN file, as an example, splits into 10 TDN

'deci-files' each with the same payload characteristics and proof of ownership history of the original. TDN files will be able to subdivide enough times to retain their utility value.

- Each TDN file contains
  - TDN serial number
  - Address of creation
  - Time of creation
  - TDN file type
- Every TDN file points to a common TDN file type which contains
  - TDN file type generation number
  - TDN creation rules
  - TDN restrictions
- TDN file type design and modifications are stewarded by STAR
- The abbreviation for TODA Note is 'TDN' and the symbol is the combined 'TQ' trademark
- Each TDN file distributed into the market has an underlying minimum backstop value, with the overall asset reserve stewarded by the STAR

## TDN Supply

The initial generation of the TDN supply is cryptographically fixed to  $2^{37}$  TDN and will take approximately one decade or longer to fully distribute into the global market. In order to counteract TDN supply loss or value reduction (e.g., mobile wallet lost and keys and files not backed up by owner), as well as ensure long-term utility, each TODA node (wallet) will have a small probability of generating a new TDN. This decentralized TDN generation is intended to be decentrally and deterministically fixed to a low (1-2%) percentage of the deployed TDN supply.

STAR will be responsible to define the TDN file type characteristics and rules; generate, store and send TDN for market distribution; as well as manage the underlying asset reserve backstop relative as TDN is deployed to the market. How it works:

- Every file type in TODA has a list of encumbrances that dictate how files of that type can be created. A new file of type X must contain valid proof that it was created according to a type X encumbrances.
- The simplest encumbrance is: any number of files of this type may be created by address *ABC*.

- More complex encumbrance recipes are possible: a file of this type may be created when a TODA node's role in consensus is less than a threshold. This means that sometimes a user of the system will be able to create a new file of that type, and this new file type can function as an incentive to the gardeners (consensus builders).
- The threshold can be a function that involves the number of nodes in consensus, which happens on a fixed time interval. This gives us the ability to tightly constrain the number of new files that can be created this way over a given time period.
- Taken together, these encumbrance recipe types allow creating a fixed amount of TDN over a period of time as well as a small amount of ongoing file creation that provides a mitigation against any value or supply reduction.

## Market Verification & Transparency

All TDN detailed design specifications and cryptographic proofs to verify both compliance with the supply limit and to be able to verify any single TDN's authenticity will be broadcast publicly to allow any person or entity to independently verify and validate any TDN that is presented to them.



## 7. TDN Target Market

The target market for TDN is any person of business that is looking for greater security and efficiency in the production and trade of goods and services and where TODA provides a good fit to solve that need.

### Market Segments

#### **Geographies**

All global regions are being targeted with a first focus on major markets in Asia, Africa and Europe, with primary hub countries within each region. While anyone will be able to download wallet(s) and acquire and use TDN, hub markets will receive more effort and investment enabled by STAR to develop circular TODA powered economies. Factors to prioritize initial hub countries include but are not limited to: market size and population; presence of and commitment to a long-term national digital strategy; level of technology and mobile intensity; ease of doing business and stability; corruption index; presence of enterprise, finance, public sector partners. Select thematic markets will also be chosen that cut across multiple countries (e.g., community fanbase for sports, e-sports; cross-border supply chains; international space industry projects). STAR will manage and may adjust the prioritization plan based on market conditions and other factors.

- East Asia and Pacific (e.g., South Korea, Singapore)
- Sub-saharan Africa (e.g., Nigeria, Kenya, Angola, Sierra Leone)
- Europe and Central Asia (e.g., UK, Romania, Georgia)
- Middle East and North Africa (e.g., UAE)
- South East Asia (e.g., Thailand)
- North America
- Latin America and Caribbean

#### **Economic Sectors**

Sectors targeted for TDN cover the full spectrum:

- Resources
- Energy and Environment

- Utility and Power
- Infrastructure
- Transportation and logistics
- Telecom
- High tech
- Space
- Healthcare
- Education
- Retail
- Media
- Sports and esports
- Finance and Insurance
- Public Sector
- Non-profit

## Technological Cycle

The TDN target market concurrently also aims to cover the full spectrum of technological change if considering the Schumpeter model which has three parts: invention (*conception of new ideas and technologies*), innovation (*conversion of inventions into marketable commercial products*) and diffusion (*scale products and services throughout the market*). The 75% of the TDN supply that is allocated for direct market distribution is intended to be roughly allocated as follows (STAR may adjust this allocation based on market and other factors):

- Invention (~10% to 15% of TDN market supply). TDN will directly be allocated to TODA protocol technical research, decentralized economics research, TODA based research and innovation to put ledger based protocols on TODA.
- Innovation (~5% to 10% of TDN market supply).
  - **Commercial and Industrial Projects**. STAR will also promote the establishment of TDN powered fund raising for new companies or projects building TODA based commercial solutions (e.g., records management, edtech, sports, space)

### Diffusion (75% to 85% of TDN market supply)

- **Enterprise channels**. STAR will promote enterprise adoption through the deployment of an enterprise partner TDN rewards program which will allow the enterprise and its customer market to earn preferential rewards when they refer

in more TODA enabled accounts as well as use TDN to purchase goods and services.

- **Emerging and Frontier markets.** Non-correlated channels for markets that are more decentralised or fragmented where TDN can address a significant market challenge around trust, efficiency or financial access (e.g, migrant / refugee populations, digital media content creators).

## Building a circular TDN economy

In order to achieve a TDN network lock-in effect, real economy utility will be necessarily broad in order to have TDN flowing ultimately in as many closed loop pathways as possible. As an example:

- A consumer acquires TDN and uses the TDN to purchase a manicure at a local shop
- The manicure shop uses the TDN to pay their website developer
- The website developer converts the TDN with a beer coin on TODA underwritten by a pint of beer
- The beer company uses the TDN to pay suppliers overseas for inventory
- The supplier exchanges the TDN with their available 'cash for points' platform and the TDN is acquired in the trade by a mobile device manufacturer
- The mobile device manufacturer then makes the TDN available in a starting device account of a new phone purchased by consumers in the original market

As real economy transactions expand, STAR will look to fund project(s) with TDN to promote the creation of a TDN consumer price index for the benefit of the market.

TDN should also be useful for the smallest to largest transactions, whether purchasing bread or a cup of coffee to major purchases including large land or corporate acquisitions. Utility cases should apply across OECD and emerging market economies where there is a regulatory status for TDN use.

## Circulation Solution and allocations

The majority of the TDN supply is to be directed to market use:

- ~75% is intended to be allocated to real economy market channels including:
  - Initial enterprise partner markets where TDN becomes a primary or supplementary loyalty program

- Initial frontier / emerging market allocations where any individual or business can onboard a TDN wallet, earn TDN through the loyalty program logic or acquire additional TDN through an exchange
- ~ 15% is intended to be used to build the TDN reserve backstop which will consist of primarily SDR currencies initially but weight more towards land, commodities and other durable tangible assets over time
- 10% is the founding shareholder loyalty reward allocation will be distributed over time to align incentives. 2.5% of founding shareholder allocation will be distributed for every 1 billion TDN distributed into the market, so a total of 40 billion TDN must be distributed before founding shareholders receive all of their allocation.

TODAQ will initially act as primary distributor on direction from STAR to the market and also do the initial work to set up secondary markets and merchant payment networks with a focus on providing useful exchangeability for enterprise businesses, SMEs and their customers,

## Loyalty Distribution to Enterprise and Frontier market channels

In this first phase of TDN deployment numerous enterprise companies, businesses, communities and frontier market channels have been included to make up the initial distribution channels. STAR will also provide matching TDN commitments alongside private and public sector funding and investment in TODA enabled solution development, covering the following themes:

- TDN contributions to innovation and commercialisation of TODA enabled solutions. Provide matching TDN commitments to growth investments for academic, private and public sector research; small and medium businesses; intellectual property (IP) development; and other innovation and commercialisation oriented projects including decentralised economics research and policy.
- Public sector innovation. TDN matching commitment allocations for projects creating TODA enabled regulatory and government solutions.
- Charitable support. TDN funding allocation for building charitable causes
- TDN will also support operating expenses for R&D, design, build and development, deployment and education and communication costs for TODA enabled technology and solutions

The first TDN wallet from TODAQ will be available shortly for mobile devices allowing anyone to be on TODA or own TDN. STAR and TODAQ are supporting other companies, entities and developers to develop on TODA including other TDN supporting solutions.

## Reserve Backstop allocation

The reserve backstop will be built over time and is intended to be composed of a diversified, durable and stable set of assets including but not limited to SDR currencies, commodities, land and select intangible assets. The STAR program will work with multiple sources and markets to achieve this.

## Initial Channels and representative historical and committed future transactions

To date, a few hundred million TDN in accrued obligations have been expended since inception with examples of the kind of channels and uses indicated in the Appendices. Appendix A provides a sectoral breakdown of companies and communities currently working with and in the process of launching projects on the TODA protocol and provides a snapshot of the breadth and diversity of the TDN market and market potential. The initiatives are in various stages of execution that cover the range from active projects to agreed commitments that will be launched after the official TDN program release. In addition a representative list of historical and committed future TDN transactions has been included in Appendix B. Ultimately, every individual powered with TODA will decide for themselves what digital assets they wish to own and transact, but the addressable market already numbers in the hundreds of millions of people.

## 8. Strategic TDN Asset Reserve Foundation ('STAR')

### Establishment of a non-profit foundation

The policy, generation, and distribution of TDN as well as management of the underlying reserve backstop is best governed by a non-profit foundation for the benefit of the entire market. During Q4 2019 the STAR Foundation will be set up and it will then assume responsibility for the TDN program and will have TODAQ and other stakeholders execute specific tasks. Until the foundation is set up, TODAQ is to be responsible for the program.

### Purpose of reserve backstop

Starting in the first year of TDN loyalty reward program, a reserve backstop will be concurrently built to provide an underlying minimum value or "zero velocity" value to TDN loyalty reward. The purpose of the reserve backstop is to enhance sustainable long-term market confidence in TDN as a digital store of value carrying real economy utility for commercial and industrial transactions.

### Reserve backstop asset strategy

The reserve backstop will be built continuously over time, by STAR bartering TDN for desired assets in order to create a diversified and stable reserve backstop.

The first TDN listing on exchanges will be initiated in 2019 and is expected to increase the utility value of the TDN and offer a further exchangeability feature for the TODA ecosystem and the TDN holders. To provide sufficient TDN liquidity in the market and enhance the quality of the permanent backstop reserve, STAR also intends to allocate a certain amount of TDN as a reserve supply for both exchanges and OTC secondary markets to better serve businesses and consumers. All of the funds sourced by the TDN reserve supply, less market fees, will be transferred into the permanent backstop reserve.

The Permanent Asset Reserve Program will also include a continuous long-term reserve plan. For any further TDN deployed into the market other than the reserve supply, approximately one tenth of the entire TDN deployment will be allocated for barter for assets to go into the permanent backstop.

## Adjusting reserve backstop asset mix

The reserve backstop will have a higher weight of fiat currencies in the beginning, however over time STAR intends to consider a more diversified basket of assets including, but not limited to, metals, commodities, land and select intangible assets. A portion of these assets will be yield producing and STAR will look to have that yield allocated to incrementally growing the backstop after the allocated TDN has been put into the market and to have a capped portion of the yield pay operating expenses in perpetuity. STAR intends to implement risk management procedures, using reliable capital market tools to monitor the TDN exposure and ensure the quality of the backstop reserve.

## STAR reacquiring TDN

STAR might from time to time, through its policy, direct its execution agents like TODAQ to reacquire TDN in order to optimize the volume of deployed TDN in the market to promote greater stability and market confidence. Generally though, STAR will lean more towards enabling individuals, businesses, public sector and regulatory bodies with greater ownership management, as well as stewardship and transparency tools so the market can regulate itself according to their own jurisdictional priorities. STAR may amend and revise its reacquisition policy from time to time.

STAR will look to monitor the TDN deployment across all market segments. If, in STAR's sole opinion, any of TDN distribution channels require deployment volumes to be adjusted, STAR will reserve the right to adjust TDN deployment volume and rates.

## Reporting and transparency

STAR will look to actively risk manage TDN deployment and asset reserve backstop in order to ensure the market has a healthy long term utility. Part of this active management means that the market requires timely, accurate and verifiable data on the state of the asset reserve backstop and TDN deployment channels so STAR will provide ongoing data and regular published reports for the benefit of the entire market.

## STAR Foundation

STAR will be established as a not-for-profit Foundation in the Cayman Islands within the first year of the TDN Program rollout with a mandate of generating and distributing the primary TDN supply and maintaining the permanent reserve backstop. STAR's purpose will be to work over the long-term to support the development of TODA enabled capabilities around TDN value discovery and transparency, decentralized exchanges and markets, KYC/AML capabilities, taxation tools and other solutions that promote stable and long-term utility. STAR will be responsible for policy, strategy and major decisions around this mandate and provide direction to TODAQ for execution. STAR intends to initiate the TDN distribution and the rewards program in Q3 of 2019.

## STAR Foundation assets

The STAR Foundation assets will comprise, but not be limited to, the initial TDN supply, the reserve backstop, and all relevant intellectual property and other resources and assets required to carry out its mission, as well as any other TODA files and underwritten digital assets from future projects.

## Distributing TDN

As TDN files are decentralized assets that grant its owners immutable ownership, control and liberty to transact TDN as they wish, STAR can only *influence* the market indirectly by managing TDN primary deployment; adjusting the size and composition of the reserve backstop, and developing and promoting the use of tools that support efficient market self regulation. STAR will not be responsible or accountable for TDN transactions completed by free market participants and all participants will act on their own behalf without any interference from STAR.

STAR will contract TODAQ and other agents from time to time for the distribution of TDN. Each of these entities will be in charge of deploying a predetermined allocation of TDN which is subject to change by STAR's TDN deployment schedule. Based on the projected demand and velocity of TDN, STAR will control volume and speed of TDN deployment.

Enterprise distribution will focus on business and consumers meeting STAR's applicable KYC, AML, CFT, securities compliance requirements. STAR intends to monitor each deployment



channel and will look to adjust the TDN numbers and terms accordingly to optimise ecosystem growth, level of use and real utility value.

STAR intends that the TDN supply flow into the real economy where each unique participant will get a small grant of TDN reward to start with. Under this loyalty program, each participant will have potential to earn more TDN reward through referring more people into the TODA ecosystems and performing goods and services transactions.

TDN also has potential to accelerate the growth of SMEs as well as enable the under-banked populations in the emerging markets to enter the economy. It should be noted that the International Finance Corporation and McKinsey & Company measured the global SME credit gap at greater than \$4 trillion, and the population of global unbanked clients is greater than 2 billion people. Consequently, while the starting TDN supply is significant, it is still scarce compared to the mentioned target markets' demand. Consequently STAR intends to direct TODAQ to create channels over time allowing anyone to acquire hold or create TODA enabled mobile wallets that can own and transact TDN to provide access to the underbanked, SMEs and other populations that might not have the ability or desire to access TDN through cooperating enterprise markets.

STAR prioritize efforts to ensure that any activities done by STAR will comply with the securities, taxation and monetary regulations of any relevant market. TODAQ, any other third parties under direction of STAR, and in-house experts in STAR will also work together to implement secure and efficient ways of integrating TODA and TDN into the fabric of regulated commercial markets. During this STAR will look to transparently communicate any decisions made for TDN policy and actions.

## Active management against market risks

STAR will prioritize establishment of safeguards to prevent and mitigate any market disturbing speculative attacks that would run against the interest of TDN owners and of a well functioning market. The STAR policy will likely consist of, but not be limited to,

- investing in the ongoing decentralization design, build and execution of the TODA Protocol so every mobile device becomes a fully functioning stand alone node;
- building a global community with expertise around theory, design and management of the decentralized digital economy;

- pushing maximum scale and diversity of the market and reserve backstop to increase resilience;
- enabling training, education and enablement of the market with a focus on both empowering individuals and practitioner functions that ensure market health (e.g., legal, accounting, audit, cyber, regulatory); and
- reducing market information asymmetry and promoting cross communication and collaboration between communities, including establishment of relevant standards to enable interoperability and efficient cooperation

## Mandate during market failure scenarios

In order to ensure transparency and market confidence, STAR will actively communicate in case of any technical or market failure events. The governance any failures will be objectively defined and an independent third party (to include an independent third party to provide flexibility if an Auditor does not have the capability) will audit the event, communication and resolution procedure.

## Failure event process

In the event that STAR declares the “market failure” scenario, all owners of TDN meeting compliance requirements shall become eligible to trade in their TDN for the minimum reserve backstop amount during a specified TDN Liquidation Exchange Period. In order to declare a “market failure” scenario there, an independent third party will be tasked to audit and confirm the specific conditions and provide a published report.

The management of a potential market failure will have set progressive steps generally typified by the following process:

- If a major market failure or breach occurs and confirmed by the appointed independent third party, STAR will stop further TDN distribution into the market, and a ‘cure period’ will be put in place for a defined period of time (e.g. 60 days) to correct the fault
- If the failure condition has been addressed the cure period will be lifted and TDN distribution will continue
- If the failure condition is not fixed and confirmed by the appointed independent third party, then the process will proceed to the next stage of appointing an external administrator(s)

- Once external administrator(s) are selected by STAR, the process will proceed to the TDN Liquidation Exchange Period

The liquidation exchange period for TDN reward holders will be limited to 90 consecutive days after the appointment of the external administrator(s). Once the TDN reward has been circulating in the market and accepted on regulated exchanges for 365 consecutive days, STAR will revisit the TDN Liquidation Exchange Period and potentially look to lengthen it. Once passed the liquidation exchange period, STAR will consider refusing any TDN liquidation requests.

It is important to note that TDN holders must pass relevant KYC, AML, CFT and other relevant compliance standards that may be in place prior to being eligible to trade their TDN for the equivalent reserve backstop value, as well as the TDN holder not holding any accountability for the market failure event. TDN reward holders will be responsible for their own processing costs and fees when transferring their TDN for the equivalent minimum backstop reserve value. Once the aggregate exchange requests have been received and the necessary KYC, AML and CFT checks have been completed, a third party auditor will audit the details of the proposed settlement and provide a report to the STAR Foundation Board, which will also be published for the market and the liquidation of the reserve backstop will proceed.

It is also important to note that STAR's internal mandate and obligation to its custodian, auditor and administrator entities to make the reserve backstop available to TDN holders in the event of a future contingent trigger event will expire completely. TDN holders must make any requests regarding TDN and clearly deliver the request(s) with a methodology determined by STAR within the TDN Liquidation Exchange Period. STAR will not take any responsibility toward disregarded exchange requests due to unclear communication, misunderstanding by TDN holders, and delays caused by request delivery process.

If there is any remaining portion of backstop reserve after the TDN Liquidation Exchange Period, the reserve will be allocated to, but not limited to, redeeming the investment from the catalyst backstop investor(s). If there is any remainder of the backstop reserve after the TDN liquidation and the redemption of the catalyst backstop portion, the amount will be used to support the open source ecosystem of TODA protocol and remained under the control of STAR. The previously existing TDN holders and other stakeholders will not have any rights on the remaining backstop reserve.

## Establishment of secondary markets

Healthy secondary markets are necessary for the effective functioning of TDN primary commercial, industrial and utility based markets. Starting in Q3, listing TDN on Centralised Exchanges (CEX) will be a priority, as well as listing on and supporting the creation of Decentralized Exchanges (DEX). The initial priority will be on exchanges that serve markets and trading pairs that provide utility to the enterprise, small business and individual TDN owners and users.

After putting in place basic exchange functionality, STAR will be working with exchanges over 2019 to introduce protocol capability and security enhancements, including the TODA atomic swap, which removes the necessity for a float for TODA enabled two way trades.

STAR will also look to grow a healthy OTC market for the TDN. First by initially entering into selected strategic token swaps with TODAQ industrial and commercial partners that have their own utility tokens for their respective markets. This will increase the utility of both the utility tokens and TDN, as well as supporting cross border trade and interoperability between siloed organisational markets.

## Open platform TDN CPI

The reserve backstop provides an indication of 'zero velocity' value and an exchange ecosystem also to provide a trading market value indicator. The most important value indicator of TDN however is its real market utility value, namely what are merchants and consumers agreeing on with respect to TDN value with every goods and service transaction. Typically legacy centralised economies and fiat currencies use consumer price indices with standard basket of goods and services to periodically track this aggregated value over time.

For TDN, STAR will promote the development of an Open Platform CPI to provide the market near real time information on the most important TDN value indicator. The Open Platform CPI aims to examine the weighted average of a selected basket of goods and services purchased with TDN across the TODA ecosystem to measure the real economy usages and the spot rate of its utility value.

## Beyond TDN - decentralized governance, settlements & identity

TDN has very few constraints (e.g., supply limit, which accounts have authority to define the TDN file type or generate new TDN) and apart from those is a completely unencumbered digital loyalty reward. At the protocol level, anyone can own and transact TDN with anyone else.

Looking beyond TDN, anything can be represented by a TODA file whether intangible or tangible, and once that happens the TODA digital assets are expected to behave with greater utility with respect to durability, portability, divisibility, uniformity, and limited supply. With TODA, recall this is because data can have uniqueness and value, which means it's not about monetizing data, the data is money. While TDN is relatively unencumbered, putting fiat money or tangible assets like land, commodities, metals and financial instruments on TODA means that comes with the need to properly steward those assets. The ability to own and transact national resources without checks and balances and governance is not optimal. Adjusting laws to account for decentralized technologies like TODA is one way to address this but is likely to be both inefficient and ineffective on its own. Smart contracts is another possible approach but runs into security, efficiency, scalability effectiveness challenges and is not an answer for the majority of these kinds of requirements. Fortunately, the TODA protocol allows for enablement of smart assets and a smart ecosystem which allows for efficient, secure decentralized governance at scale, as every digital asset and file type can be designed with rules and encumbrances to dictate its market behaviour. STAR's mandate is to promote the development of these capabilities as an integral part of a decentralised digital economy in collaboration with the TODA Research Institute ('TRIE'), and its academic and research, public sector and private sector partners.

## 9. Roadmap

Over the course of the next year, STAR intends to oversee the launch of the TDN into multiple jurisdictions alongside its corporate and community partners; enabling set up of secondary markets for TDN and building the reserve backstop; while concurrently promoting the development of knowledge, solutions and capabilities that protect and enhance the TODA ecosystem and TDN market. Key milestones in this journey are indicated below:

- Q1 2016:
  - TODA Protocol proto-design completed by Toufi Saliba, Dann Toliver and co-designers as part of TodaCorp
- Q2 2016:
  - Addition of co-founders and partners to develop business opportunities and digital economy design alongside core protocol and technology development
- Q2 2017:
  - TODAQ established and first software implementation of the TODA Protocol begins
- Q3 2017:
  - First file transaction and settlement on TODA and first design for STAR and TDN completed
- Q3 2017:
  - Accrued TDN obligations start to cover labour, rent and other operating and service expenses
- Q2 2018:
  - First commercial transactions using TDN with the manicure moment in Toronto
- Q4 2018:
  - TODAQ's TODA Protocol TaaS platform ('TODA-as-a-service') launched with REST APIs allows anyone to build and manage accounts, assets and transactions on TODA
  - 1st TODA enabled retail enterprise contract signed TDN integrated as a decentralized loyalty reward program
  - the first half dozen strategic investors and partners back TODAQ and TDN loyalty program coming from sectors covering: retail, energy and environment, education, pharmaceuticals, infrastructure and finance

- Q1 2019:
  - TODAQ's TODA Protocol TaaS platform ('TODA-as-a-service') augmented to handle millions of nodes and trillions of digital assets.
  - 1st supply chain shipment on TODA protocol between Europe and Middle East
  - 1st TODAQ developer lab and hackathon in Silicon valley, multiple teams successfully build solutions on TODA protocol, accrued TDN obligations as prizes
- Q2 2019:
  - 2nd TODAQ developer lab and hackathon in Cambridge with partner Cambridge Blockchain Hub
  - First dozen enterprise agreements reached to deployed TODA based solutions into multiple industries
  - TDN wallet enters alpha trials in preparation for Q3 launch
  - Over 50 international channels added for TDN distribution covering dozens of countries, B2B and B2C companies to underbanked communities
  - TaaS Platform launches first TODA Protocol enabled smart file encumbrances and rules
- Q3 2019:
  - Planning for TDN official launch and IEO listing on first exchange
  - TODAQ TDN wallet to be available for mobile devices
  - TaaS Platform to enable TODA Protocol based file fractionalization
  - 1st announcement on academic partnership to expand TODA Protocol and decentralised internet R&D and decentralised digital economy research
  - Select city and establish first TODA community hub to bring R&D, development, industry and public sector practitioners together
- Q4 2019:
  - Establish STAR Foundation and transition TDN stewardship fully to STAR from TODAQ
  - TaaS planning to launch TODA Protocol enabled atomic swaps
  - R&D projects on enhancement of settlement / consensus process and design and trialing of network logic for fully functional mobile device based nodes
  - Plan to have over half a dozen enterprise projects running end to end and TDN secondary market and exchange coverage in all major regions
- 2020
  - Rollout next implementations of TODA Protocol with full node decentralisation functionality

- Expand to millions of TODA nodes
- Transition base TODA Protocol technology fully to TRIE Foundation and make open source



## 10. Leadership

### Core team

#### **Toufi Saliba**

Serial technopreneur, track record in algorithms, machine learning and cryptography dating back to 2001. In parallel to his crypto life, Toufi built & sold IP that ended up at Google, HP and his last AI startup became an Intel company. Beyond being a Co-Author of the TODA Protocol, Toufi is also the Global ACM Chair Practitioners Board CC, an invited speaker at WIC, UN, ITU, AiForGood a board member & advisor to several tech ventures, organizations such as FSR and F500 companies.

#### **Dann Toliver**

Dann cut his teeth building mission critical systems for NASA and Fortune 500 companies. He creates solutions in problem spaces like distributed systems, programming language semantics and databases, and oversees the development and innovation at TODA. Dann is also a co-author of the TODA protocol.

#### **Hassan Khan**

Hassan Khan is co-founder and CEO of TODAQ, and co-founder and Chair of Quantius Inc. a fintech lender to growing knowledge based SMEs . He was previously a senior officer in the Canadian Army, and also worked as a consultant in McKinsey & Company, serving F500 clients across finance and the knowledge based sectors, typically around growth in emerging markets. He is the primary co-author for the STAR Program, TDN, and TODA digital economy architecture.

#### **Adam Gravitis**

Adam is an experienced CTO having led technology development and engineering growth at several bleeding-edge startups in Canada. He was previously VP Engineering at Upverter, a yCombinator-backed company where he led the expansion of a real-time collaborative schematic capture and PCB layout suite. He co-founded Algo Anywhere, a cloud-based machine learning company, whose novel, distributed Latent Dirichlet Allocation-based approach to recommendations was acquired by Toronto-based 500px in 2012. He went on to serve as CTO at 500px, leading the development of both mobile and web-based products. Other efforts he's led include Xperscore, a corporate expertise identification service, as well as a cloud-based GPU-accelerated computing suite.

Adam graduated from Engineering Science at the University of Toronto and remains heavily involved in the commercialization of research. In his spare time he obsesses over how to improve programming languages and software development in general.

**Bill Beller**

Bill has two decades of experience in investment banking, holding various executive positions in London, Frankfurt and Moscow. He has been heading departments for both equity and derivatives trading for major investment banks including names like Citigroup, Unicredit, and Sberbank. His geographic trading focus has been emerging economies such as, Middle East, Africa, CEE countries and previously Western Europe. Since leaving the investment banking world he has gotten actively involved in blockchain project and digital asset markets. He has been running managed accounts and provided advisory services to corporations and HNI clients.

**Sungsoo Park**

Sung has 8+ years of experience in strategy consulting and PEF industry at globally recognized firms, where he practiced and executed vital projects including digital transformation, process improvement, corporate business strategy development, cross-border expansion and M&A deals.

Sung joined TODAQ in 2018 as Managing Director - overseeing the corporate strategy. His mission is to create strategic partnerships with both public and private sectors, and drive development for scalable platform and solution products using the TODA Protocol.

**Charlie H. Shin**

Charlie's full career has been managing in Product Development(including research, design and manufacturing), Retail and Trade(global B2B and B2C markets), and Consulting(management and financial) in his 19 years of experience from Taiwan Government, LG Electronics, Iriver, Freudenberg, etc.

He is a motivator and optimist within common sense spectrum and graduated from the Boilermakers.

**Logan (Jihoon) Lee**

Logan's experience spans a wide range of economic and actuarial applications including pension, property and casualty pricing, dynamic financial analysis, and econometric analysis. He completed two master's in economics and actuarial science and developed his entrepreneur spirit by participating in various industries including energy research, career consulting, and financial industries for 5 years. After completing his second master's in actuarial science from the University of Waterloo, he built his actuarial career by working at various companies including Morneau Shepell and Intact Financial Corporation (formerly ING Canada) providing pension consulting and P&C insurance pricing services respectively. Logan is one of the key contributors to many aspects of actuarial and risk management services especially in designing the TODA Note ecosystem.

**Advisors**



**Todd Gebhart**  
Chair,  
fmr V-Chair Intel Security



**Sheldon Inwentash**  
ThreeD Capital



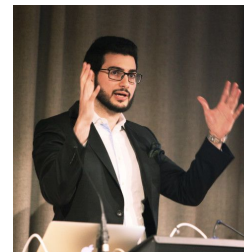
**Andre Christensen**  
Director, AdColony, Otello



**Asad Zafar**  
M&A Head, GEMS Education



**Henry Chung**  
MD, Draper Athena Fund



**Hazem Danny Al-Nakib**  
Partner, 7BC VC



**Rahul Nirula**  
CPO, Constellation Software



**Dr Bhume Bhumiratana**  
Consultant, SEC Thailand



**Geoffrey Shuhkraft**  
Advisor, Queensland Gov't



**Jamie Wilks**

## Managing Partner, House of Comms

### Appendix A - Snapshot of Representative initial TDN channels and markets

Region	Type	Sector	Population Size	Stage
Asia	Enterprise	Retail	1,000,000	Active
Global	Enterprise	Mobility / Industrial	50,000,000	Planned
Global	Enterprise	Education	1,000,000	Agreed
Middle East	Enterprise	Energy	10,000	Active
Europe	Enterprise	Infrastructure	10,000	Agreed
Africa	Enterprise	Healthcare	1,000,000	Planned
Asia	Enterprise	Retail	10,000,000	Planned
Asia	Enterprise	Healthcare	10,000,000	Planned
Africa	Enterprise	Resources	1,000,000	Planned
Americas	Enterprise	Mobility	1,000,000	Planned
Global	Media ecosystem	Media	10,000	Agreed
Asia	Media ecosystem	Media	10,000	Planned
Asia	Media ecosystem	Education	1,000,000	Planned
Global	Media ecosystem	Media	100,000,000	Planned
North America, EU	Portfolio ecosystem	PE / VC	500,000	Agreed
Global	Portfolio ecosystem	PE / VC	1,000,000	Agreed
Global	Portfolio ecosystem	PE / VC	10,000	Agreed
Global	Portfolio ecosystem	PE / VC	100,000	Agreed
Europe	Sports ecosystem	Sports	50,000	Active
Europe	Tech ecosystem	High tech	100,000	Planned
Americas	Enterprise	Real estate	10,000	Planned
Americas	Tech ecosystem	Incubator / accelerator	1,000	Active
Americas	SME	Retail	1,000	Active
Americas	Tech ecosystem	Incubator / accelerator	10,000	Active
Americas	SME	Real estate	10,000	Active
Europe	SME	Food & Beverage	10,000	Planned
Europe	Tech ecosystem	Incubator / accelerator	100,000	Agreed
Europe	Tech ecosystem	High tech	5,000	Agreed
Europe	Tech ecosystem	Incubator / accelerator	10,000	Agreed
Europe	Academic ecosystem	Education	1,000	Planned
Europe	Academic ecosystem	Education	5,000	Planned
Europe	Academic ecosystem	Education	10,000	Planned
Europe	Academic ecosystem	Education	10,000	Planned
Asia	Academic ecosystem	Education	10,000	Planned
Global	R&D ecosystem	High tech	10,000	Active
Americas	Tech ecosystem	Incubator / accelerator	1,000	Agreed
Global	Tech ecosystem	Incubator / accelerator	10,000	Active
Global	Tech ecosystem	Incubator / accelerator	10,000	Agreed
Global	Slums ecosystem	Smart cities	100,000	Planned
Americas	Migrant ecosystem	Migrant population	1,000,000	Planned
Global	Tech ecosystem	Developer community	2,000	Active
Europe	Space ecosystem	Space	10,000	Agreed
Europe	Migrant ecosystem	Migrant population	100,000	Planned
Americas	SME	Finance	100	Active
Americas	SME	Finance	100	Planned
Americas	SME	Reg tech	1,000	Planned
Americas	SME	Reg tech	1,000	Planned
Europe	SME	Reg tech	1,000	Planned
Europe	SME	Reg tech	100,000	Planned
Europe	SME	Reg tech	10,000	Planned
Global	Enterprise	Asset custodian	1,000,000	Planned
Global	SME	Asset custodian	10,000	Planned
Global	SME	Asset custodian	10,000	Planned
Global	Enterprise	Exchange	2,000,000	Agreed
Global	Enterprise	Exchange	2,000,000	Planned
Global	Enterprise	Exchange	2,000,000	Planned
Americas	SME	Exchange	250,000	Planned
Global	SME	Exchange	25,000	Agreed
Global	SME	Exchange	50,000	Agreed
Middle East	SME	Exchange	10,000	Planned
Europe	SME	Exchange	10,000	Agreed
Asia	Enterprise	Telecom	5,000,000	Planned
Asia	Enterprise	Retail	20,000,000	Planned
Global	Enterprise	IoT	100,000,000	Planned
Middle East	Enterprise	Diversified	100,000	Planned
Europe	Enterprise	Telecom	150,000,000	Planned
Global	Enterprise	Telecom	300,000,000	Planned
Global	Enterprise	Finance	10,000,000	Planned

## Appendix B - Example Significant TDN transactions

Examples of historical and future transactional commitments	
<p><b>Goods and services transactions</b></p>	<p><b>Legend</b></p> <p><b>Historical</b></p> <p>Future commitments</p> <p>Academic books and educational materials</p> <p>Rental payments</p> <p>Manicure/Pedicure services</p> <p>Labour and contractual services</p> <p>Food and beverages</p> <p>Professional legal services</p> <p>Software development and hackathon rewards</p> <p>Non prescription OTC medication</p> <p>Event sponsorship</p> <p>Sports tickets</p> <p>Tech subscription services</p> <p>Non-profit services</p>
<p><b>Token swaps to enable commercial trade</b></p>	<p>TDN swap with Coin of High Tech enterprise A, put Coin on TODA, put to use between trade of Enterprise A with other Commercial customer enterprises enabled by TODA</p> <p>TDN swap with token of food &amp; beverage company, put token on TODA, provide for consumers on TODA enabled apps to use for purchase of company's products</p>
<p><b>Innovation projects enabled by TODA and TDN</b></p>	<p>TODA Protocol R&amp;D in cooperation with Universities</p> <p>Self-sovereign digital identity projects (e.g., academic performance records, prescription record, athlete player passport)</p> <p>IoT decentralised digital asset vault</p> <p>Decentralised digital media platform</p> <p>Build asset platforms &amp; registries (e.g., space assets, commodities, land, IP)</p> <p>Acquisition and transformation of legacy platforms and registries</p> <p>Regulatory toolbox for tax &amp; duties, KYC/AML, and compliance oversight</p> <p>Tech, blockchain, AI ecosystem and community sponsorship</p>
<p><b>Reserve backstop formation</b></p>	<p>Commercial land</p> <p>Refined industrial commodities</p> <p>Proven reserves of raw metals</p> <p>Intangible digital assets</p>

N.B. Highlighted transactions were selected to show a sample range of utility. The full range of use will be determined locally by businesses, communities and individuals.



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