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Terms, Definitions, and Notations

1. (unhighlighted) Relatively locked in, though nothing is finalized.
2. May change a little
3. Likely to have details change
4. Needs more thought
5. *FTKN* - Flow token, because it's easy to confuse with FPTKN, it's always *Italicized.*
6. FPTKN - Flow Property Token, because it's easy to confuse with *FTKN*, it's always underlined.
7. REH *[rey]* - Real Estate Holding entity
8. Underwriter - Entity which performs analysis on properties
9. DMLS - Distributed listings of properties.
10. DMLS Explorer - dApp for exploring the DMLS listings, REHs, UBIDs, and UPLANs.
11. UPLAN - Bid/budget created by an underwriter which analysis a property and creates a roadmap for a properties value add.
12. LUREH *[loo r][lure]* - A combination of the UPLAN plan and a REH who wishes to execute it, which investors can pledge too.
13. ERC-20 - a reference to a fungible token standard which lives piggybacks on the ethereum blockchain.
14. ERC-721 - a reference to a non-fungible token standard which piggybacks on the ethereum blockchain.
15. DApp *[dee ap]* - a web app with w3 integration to be able to explore blockchains

Abstract

Flow Token (FTKN) disrupts the entire real estate industry, replacing nearly every stage of the real estate process by decentralizing and tokenizing the funding, underwriting, and ownership of real estate properties. Flow Token also replaces the MLS [Distributed MLS or DMLS], and profit distribution.

FTKN fills several needs in the ecosystem:
1. Acts as a barrier to entry for legal entities, REH (Real Estate Holder), that wish to hold real estate on behalf of investors. In order to register as an REH, a legal entity must first poses REH Block Dependent FTKN Holding (See formula).
2. Acts as a ERC-20 ethereum based token for the ICO, which will cover development costs, and establish the first REH.
3. Acts as a barrier to entry for underwriters to register. In order to "bid" on the underwriting of a property, and report back with a rating, an underwriter must hold Underwriter Block Dependent FTKN Holding (See formula) and be blacklisted/whitelisted by REH. As well as meet a specific rating based on past analysis of properties by REH, and investors.
4. Acts as a barrier to entry for listing properties on the DMLS, the lister must hold 1 *FTKN* per property listed.
5. Acts as a currency for the trading of Flow Property Tokens (FPTKN) ERC-721 (non-fungible token standard)
   5.1. The FPTKN tokens will act as a distribution channel for cash flow from the property (in ethereum).
   5.2. There are 7 stages to each sale, which creates an FPTKN. With an automatic 1 of the created FPTKN automatically given to the Flow Foundation for the first 10 years. The generated token covers the foundation's ongoing commitment to provide vetting of REH and underwriters, as well as website/smart contract maintenance, dispute resolution, and rating systems.

Problems With Real Estate Investment

Unlocking unused capital

The average person is not invested in real estate, accepting primary residences. To enable people to begin investing in real estate, it's important to understand the issues the average person faces.

1. Complexity
    1.1. Real estate investing is complicated, and takes time and money to become skilled at.
2. Barriers to entry
    2.1. Even the 20% down (or 3.5% FHA) often required by banks can be very difficult for small investors to overcome.
    2.2. The knowledge required to find a market worth investing in is intimidating to the average investor.
3. Managing risk and liabilities intimidating to the average investor.

How can the Flow Token Platform can help

1. **Complexity:** The Flow Token platform transfers the complexity of the real estate investment process to Underwriters and REHs which, in turn, develop a reputation they must protect. An investor is free to dig into a listing as much as they desire, but should largely be able to trust the reputation of the REH and underwriter. The DMLS explorer will make the success of all involved parties easily understandable.
2. **Barriers to Entry:** the FPTKN are divisible by up to 1 trillion, so if an investor can access ether and the DMLS explorer*, they can invest in as little as a trillionth of a token, since each property will have a 10000 of tokens, an investor could buy as little 10 quadrillionth of a property. Which allows even the least well off amung us to begin investing in real estate.
3. **Risk and Liabilities:** Managing risk and liabilities are largely left up to the REH and checked by the underwriter. Removing the need for an average investor to understand them as well. Although, nothing is stopping the investor from doing their own due diligence, and the Flow Foundation/DMLS explorer will do as much as possible to enable the investor to research deals independently of the underwriter.

* The biggest barrier to entry will shift from access to a large sum of money to gaining entry into the ethereum ecosystem. While this is not dead simple now, it is easy enough for most people to do. It will only get easier in the future.

Liquidity

A common problem with real estate investing is large portions of your net worth are tied to a property, which cannot be split. The current best option to quickly access funds would be a HELOC, which would still take weeks before cash is in hand.

How can the Flow Token Platform can help

Because the tokens associated with property ownership are owned in a distributed manner, and can be bought and sold freely at any time, an investor can liquify their share of a property in minutes. It's true that they are liquefying to ether, which must be exchanged to the currency of their choice, which can take time. However, liquefying to ether may be acceptable in most situations, as the access to the capital is provable, and through services like coinbase, take only a

few days to exchange for a currency suitable to them. This process will become faster as protocols like ripple and stellar mature.

Securing capital to purchase properties

Owning real estate has many benefits (Taxes, leveraging, stability). However, lenders rightfully want their cut in order to loan money to an investor, which eats into the investors profits, and adds significant risk to the investor. The investor must make enough to pay back the lender or lose the property.

How can the Flow Token Platform can help

Flow token replaces banks with investors, who do not expect a fixed percent back, but a share in the profits. Spreading the risk and reward among everyone reduces the damage to any single party, and allows property holders to buy property without risking foreclosures. Flow token also allows investors to reap the rewards of a discounted cash flowing property, while still allowing them to diversify. Diversification amongst the investors

The Flow Token Platform

Secure, traceable, and easy real estate investment

Flow Token (FTKN)

Flow Token disrupts the entire real estate industry, replacing nearly every stage of the real estate process by decentralizing and tokenizing the funding, underwriting, ownership of real estate properties, and replaces the MLS.

1. Acts as a barrier to entry for legal entities, REH (Real Estate Holder), that wish to hold real estate on behalf of investors. In order to register as an REH, a legal entity must first poses 10000.
2. Acts as a ERC-20 ethereum based token for the ICO, which will cover development costs, and establish the first REH.
3. Acts as a barrier to entry for underwriters to register. In order to "bid" on the underwriting of a property, and report back with a rating, an underwriter must hold Underwriter Block Dependent FTKN Holding (See formula) and be trusted by REHs.
4. Acts as a barrier to entry for listing properties on the DMLS, the lister must hold 1 *FTKN* per property listed.

Distributed Multiple Listing Service (DMLS)

The DMLS is a distributed listing service for people wishing to list properties.
The DMLS and DMLS explorer alone could be a very powerful, and valuable contribution to the real estate infrastructure.

DMLS Explorer

The DMLS explorer is a dApp which allows users to explore DMLS at each of the following stages:
1. Once a property is listed on the DMLS, underwriters can find and bid on them. See "UPLAN".
2. Once an underwriter has bid on a listing, investors can pledge to fund the underwriters analysis.
3. Once an underwriter has analyzed the listing and published the UPLAN, REH can endorse the UPLAN and create a LUREH.
4. Once a LUREH is funded, users can find it as part REH's and underwriters property history, including payment history, ROI, and documents related to the sale of the property.
5. Investors should also be able to explore the DMLS for information on underwriters and REH, as well as the injected (off chain) reputation and verification of underwriters and REH, as determined by the flow foundation.

Underwriters

Underwriters may go away as part of the platform. Underwriters may be just an over-complication. There is a benefit to having them as part of the system, but they are not enforceable in a meaningful way, and funding them creates a large barrier to entry for properties.

The underwriter is responsible for the analyzation of a listing, and projecting a budget to value add, as well as a timeline for a the listing to become ready.

The workflow for an underwriter would be as follows:

1. Purchase enough FTKN to be eligible to bid on listings
2. Search through the DMLS for stage 1 listings
3. Create a UBID on a listing, which includes:
    3.1. Cost, in Ether, to create a UPLAN
    3.2. What the UPLAN will include. EG Neighborhood Research, physical inspection, etc...
    3.3. Any misc details

Underwriter Bids (UBID) and Plans (UPLAN)

An underwriter can bid to analyze a property listed on the DMLS, which is now associated with the listing as a UBID. As part of the UBID creation process, the underwriter negotiates a price, and legal contract that the property lister must accept before the UBID is created. If the UBID eventually leads to a sale, the accepted price is no longer negotiable. The underwriter is responsible to propose and enter a legal contract with the property lister, that is published to the blockchain, to this effect. At this stage, the underwriters reputation is on the line to ensure that the property lister is on the up and up. Multiple failed listed UBIDS will reflect poorly upon the underwriter, especially if it gets the LUREH stage and falls through due to poor underwriting. In this scenario, the REH is likely to never accept bids from this underwriter, and warn other REH about them as well. The Flow Foundation will provide standard contracts and a legal framework for this process.

Investors can browse UBIDS on DMLS and pledge ether toward property analysis. When an underwriters UBID has enough pledged to it, they can execute the UBID. When the underwriter executes a UBID, they are paid the pledged ether in exchange for analyzing the listing they bid on. The components of the analysis on the property should be listed as part of the bid. A typical analysis might include

1. Neighborhood research
2. Property Vetting (potentially pay a local inspector to inspect the house)
3. Title checks

When the analysis is complete, the underwriter should project value adds for property and estimate an investment total that would be necessary to maximize the investments, a general timeline for how long improvements to the property should take, and an overall score for how sound the investment is. Once this bid complete, the bid is promoted to a UPLAN, and REHs can endorse them to create a FPTKN offering.

An underwriters previous bids will be easily explorable in the DMLS explorer, to help establish a reputation for the underwriter.

Registering as an underwriter

An underwriter must hold Underwriter Block Dependent FTKN Holding (See formula), in order to be eligible to make bids on properties that are listed on the DMLS.

Flow Property Token (FPTKN)

Flow Property Tokens [FPTKN] ERC-721 (non-fungible tokens) are tokens which are specific to individual properties. When a property yields a dividend, it is distributed proportionally among the properties token holders as ethereum. A FPTKN is a smart contract which is very similar to an ICO, but is specific to a property.

FPTKN's are created when a UPLAN is endorsed by an REH, see stage 3 of "Executing a sale", at this stage it is called a LUREH.

LUREH

A LUREH is a smart contract, and evolves into the FPTKN when a REH executes it. It will dictate the identity of the ERC-721 with the format: <ListingId>.<underwriter ID>.<REH ID>.

For example: If the listing id is 1234, the underwriter id is 17, and the REH id is 2, the LUREH would be 1234.17.2, which would distinguish the unique token identity to the property, UPLAN plan, and holding company.

Investors will be able to use the flow explorer to look through the list of available LUREH which they can invest in.

An REH executes it's LUREH by simply by executing the accept function on the smart contract for the minted FPTKN. This function gives the REH all invested ETH, and makes the REH legally liable to carry out the UPLAN to the best of its ability. As well as the responsibility to manage the tokens lifecycle and publish all legal documents to the blockchain that are involved in the sale.

Investors

Anyone with access to ether can become an investor. Investors will start by browsing LUREHS in the DMLS explorer. When an investor decides to pledge eth to a LUREH, the simply send ether to that smart contract. If the LUREH is executed, and the FPTKN is created, the investor gets a proportional amount of the FPTKN with respect to the amount of ether pledged.

The Listing smart contract then holds the ether in escrow, allowing the investor to pledge the same ether to several LUREHS on the listing. Once ether is pledged, it cannot be revoked for X days.

The investor can then kick back and receive payments from the REH managing the property, or sell the FPTKN via the the DMLS Explorer trading app.

Real Estate Holding Entity (REH)

REHs are legal entities that hold real estate on behalf of investors. The REHs are the interface between the blockchain and physical property. As such, they can add legal stipulations and extra details about how they operate the interface.

For example, the REH could limit the LUREH to a whitelist of addresses (in case they want to enforce an accredited investors only framework). Or, a limit to how many addresses can pledge. Wherein, the highest X pledging investors are accepted. An REH potentially provide custom contract code for it's property listings, Which would be highlighted on the DMLS explorer, and reviewed by the Flow Foundation.

It is the responsibility of the REH to ensure that it is compliant with local laws. The Flow Foundation will provide as much assistance as possible through it's legal frameworks. However, the REH is ultimately legally responsible for its actions.

Registering as a REH

In order to register as an REH, a legal entity must first poses REH Block Dependent FTKN Holding (See formula) of all *FTKN*. Which will be listed on multiple exchanges, and purchasable in rounds from the Flow Foundation, until the flow foundation runs out. Once the legal entity has enough *FTKN*, they can execute a function on the FTKN smart contract

which adds their public address (and any additional details) to the blockchain.

The proof of FTKN ownership is the is the only technical, on chain barrier to entry for the registering as an REH, however, off chain measures can be taken to discourage a malicious REH. Counter measures Include blacklisting on the DMLS explorer and a negative off chain reputation given by the Flow Foundation. It is possible for a competing DMLS explorers to be created which do not implement these countermeasures, in which case it would be up to users to use the explorer they find to be the most inline with their goals.

Legal Requirements for an REH

Technically the only barrier to become an REH is to hold enough *FTKN* and register, however, the DMLS explorer will, by default, filter out REHs who have not proven their identity, and capacity to act as the role of REH.

TODO: Legal Framework development by the Flow Foundation

Listing Details for an REH

Once an entity controls REH Block Dependent FTKN Holding (See formula) of *FTKN*, they will be able to successfully call the listREH method on the smart contract. The list REH method will assign the token holder an ID, and capture contact details.

Endorsing a UPLAN

Once an underwriters UPLAN is successfully listed on the DMLS, REH's can endorse them. Which initiates the FPTKN, which has balances pre-allocated to those who funded the underwriters work. While the token is created, it doesn't mean that it will ever be finalized. During this stage the token is listed on the DMLS, and referred called a LUREH. Investors can now pledge money to the LUREH. There is no reason an underwriter can't also be a REH. However, such a relationship should be declared. The Flow Foundation maybe be able to catch these relationships during the verification process, if the REH and underwriter both choose to seek endorsement by the flow foundation.

In addition to endorsing the plan, the REH must specify details in regards to property cash flow, and how the details for the sale of the property.
For example, Token holders are entitled to 95% of the sale price, after a 1% fee for USD to ETH conversion and after deductions of closing costs. Token holders are entitled to 45% of all profits made as a result of the REHs control of the property.

Accepting a LUREH

Once a REH is confident there is enough pledged to a LUREH, the REH can accept the LUREH smart contract. Which transfers the pledged amounts to the REH. Accepting the LUREH, should legally bind the REH to execute the UPLAN associated with the LUREH (remember, a LUREH is a unique combination of the listing, UPLAN, and REH). Accepting the LUREH also cancels all other LUREHs associated with the listing, as the transfer of the specified sale amount (by the UPLAN) must be the final event which legalizes the sale of a property. The seller should have signed a contract with the underwriter, that legally binds the property to any REH which sends them the specified ether, in combination with the agreed UPLAN.

Legal and ethical requirements for Flow Foundations Approval

TODO

Backlash for performing poorly.

Because all property holdings, contracts, and payments are publicly available on the blockchain, a statically analyzable track record for an REH is possible. The DMLS explorer can make the REH's track record clear to potential investors at any time, and show relevant statistics while investors are making decisions about a LUREH.

Executing a Sale

Each sale has 4 parties:

1. The Seller - initiates the process by listing the property on the DLMS
2. The underwriter - Analyzes, and budgets a listing, providing a budget and outline for value adds.
3. The REH - Entity who legally purchases, owns, and maintains the property.
4. The Investors - People who fund the purchase of the property in exchange for property specific FPTKN.

Stages

There are 7 stages to each sale, which creates an FPTKN. With an automatic 1 of the created FPTKN automatically given to the Flow Foundation for the first 10 years. The generated token covers the foundation's ongoing commitment to provide vetting of REH and underwriters, as well as website/smart contract maintenance, dispute resolution, and rating systems.

1. List on the DMLS
2. Invest in Underwriting stage. A registered underwriter can accept *Eth* in exchange for analysis and inspection of a property. This buys tokens at a 300% rate. Though this is high risk because the deal may never happen. The underwriter creates a value add budget, and estimate (UPLAN).
3. Investment stage. REH endorses a UPLAN and a Kickstarter style investment is opened based on the combination of UPLAN and REH, called the LUREH offering. Investors pledge (put ether into a smart contract), for a minimum of 4 days before it can be revoked. The pledge can be applied to the same property with different LUREH, as only one LUREH can be executed.
4. Execution of Purchase. Wherein the REH buys a property on behalf of investors, which can be executed as soon as the REH is comfortable with the total amount pledged to the LUREH.
5. REH value adds to property based on recommendations from the underwriter, and budget based on underwriting. The REH is responsible to make the property profitable, or open another round of funding which yields less tokens per ETH than the original round of funding, subject to approval by vote of current token holders.
6. Property Maintenance stage. The REH is responsible for property maintenance and finding tenants for a property. X% of all cashflow must be distributed back to FPTKN holders, as stated in the LUREH bid to execute on the property.
7. Selling of property: Once a property is sold, the entirety of the sale must be redistributed to the FPTKN holders and the FPTKN tokens are then burned. Proof of sale documents must be provided.
   Below is a flow chart for a single sale of a property.

Flow chart for the sale of a property
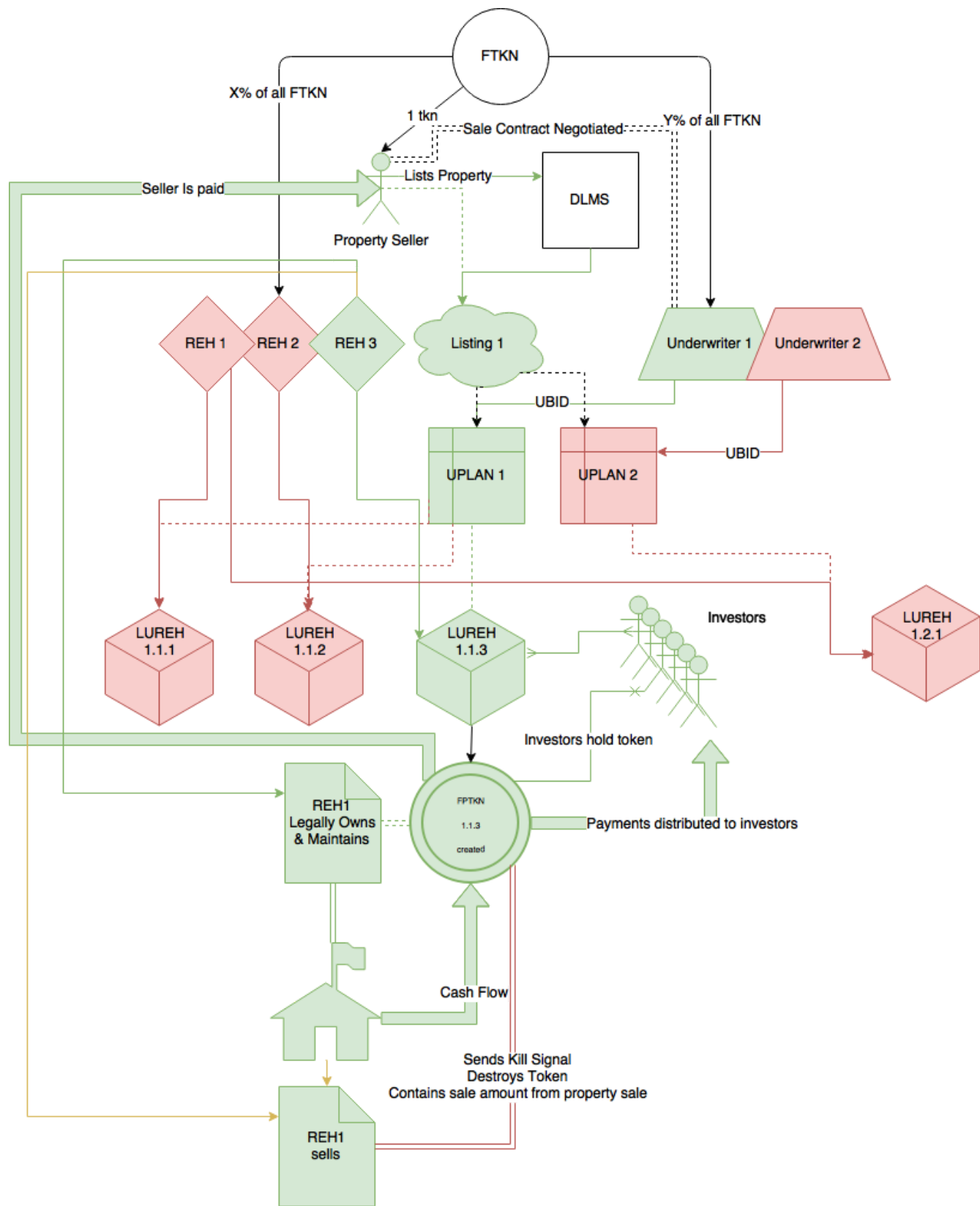
WIP: ICO Details

Act as an ERC-20 ethereum based token for the ICO, which will cover development costs, and establish the first REH. Details TBD

The Flow Foundation

Responsibilities of the Foundation

The Flow Foundation is the entity backing the development of the Flow Token, the DMLS, and the DMLS explorer. It will act as the a legal Sherpa to help protect investors from malicious listings, REHs, or underwriters.

The Flow Foundation will have no on chain competitive advantages, other than a very small piece of every FPKTN for the first X years, so that it is legally entitled to act on behalf of investors in the case of a malicious REH.

Roles In the Ecosystem

The Flow Foundation fills many roles in the ecosystem:
1. Development and maintenance of FTKN, DMLS, and the DMLS Explorer
2. Off chain Verification and Rating of REH, and underwriters
3. Legal watchdog of REH, underwriters, listers, and investors.
4. Act as a lobbyist on behalf of the FTKN platform to various governments.

Competing in an open ecosystem

A competing foundation can, and will, create a competing DMLS explorer which would attempt to monetize or commercialize some of the functions of the Flow Foundation. The competition must not be discouraged, and should be seen as a sign of the ecosystem maturing. The DMLS explorer should be open sourced. The Flow foundation will provide community support and implement requested features. As well as offer an API for the verifications and statistics of listings. It's possible that a competing explorer will eventually overtake the Flow Foundation explorer, however, by virtue of being the default, the Flow Foundation will have a significant edge in maintaining the dominant explorer. If a competing explorer is able to displace the Flow Foundation, it should be seen as a huge success for the ecosystem, the community, and Flow Token.

Team Members

1. Eric Wooley, Solidity (ETH) and Web Developer
   ericwooley@gmail.com

Project Architecture and Timeline

Stage	On Chain Dev	Off Chain Dev	Marketing	Legal
1	White Paper	Marketing Website	Explainer videos, interactive white paper Interviews / podcasts	Develop partnerships Create Flow Foundation Fundraise for PRE-ICO marketing and legal fees
2	FTKN ICO	Website	Large Push before ICO	Research Legal Frameworks
3	DMLS Smart Contracts 1. Listing 2. Underwriter 3. REH 4. LUREH 5. Profit Distribution 6. Property Sale	DMLS Explorer 1. API/Admin 2. Consumer Facing Front End 3. Smart Contract Integration	Minimal Marketing Dev Updates Social Media	Create/publish legal frameworks for REH/Underwriters to utilize in the US (Selected states)
4	Beta Testing Bugs bugs bus!	Beta Testing Bugs bugs bugs!	Ramp Up Marketing	Create/Publish for more/all states in the US
5	Go Live Support custom use cases, advise, provide contract support	Go Live Implement more off chain features	Heavy Marketing	Expand legal to handle disputes, pursue malicious actors Expand Legal Frameworks outside the us.

Marketing Strategies

Open Source Reputation

The DMLS will be disjointed from Flow Token, but controlled by the Flow Foundation. It will be built as a distributed replacement for craigslist. With extra features in the real estate section, specifically to integrate into the flow token.

The DMLS will serve as a gateway to Real Token, as well as an advertising platform for the ICO.

The DMLS will be open sourced in modules, each module advertising the DMLS and the ICO to developers. For example, there will need to be a QUAD Tree implemented in Solidity for efficient distance lookups. There are no such published libraries for this data structure at the time of this writing. Another module can be built on that, which will be a Distance Lookup Tree. Effectively a branded and optimized implementation of the Quad Tree for distance lookups.

Open sourcing and promoting these modules will help the Flow Foundation earn a positive reputation among the crypto developers community.

Paid Marketing

TODO

Guerilla Marketing

TODO

Marketing Targeted at Non Crypto Enthusiasts

TODO: We need a good marketing person

Legal Hurdles

KYC Laws

Because of KYC laws, we need to be as transparent as possible about who is investing in the tokens and what they are getting.

Real Estate Laws

There are plenty of real estate laws to look into yadadada

Investment classifications and laws (REG A, REG D, etc...)

Can we structure the token sale as a loan to the REH, which has repayment clauses based on cash flow instead of a timeline? Other structures that would allow for unlimited investors, or token holders? Can someone buy into a property, then resell their share in pieces?

Open Questions

1. Is FTKN inflationary or deflationary?
    a. Inflationary - how to distribute
2. Determining appropriate barriers to entry for listing on the DMLS, the Underwriter and REH registration

Pre ICO Funding

Initial Coin Offerings can be wildly successful, or fail miserably based on how well your coin is thought out, and how well it is marketed. In order to be successful, Flow Token proposes the following budget to prep for a successful ICO:

1. Marketing & Advertising: $200,000
    a. Interactive Whitepaper
    b. Explainer Videos
    c. Facebook/Twitter/Google Advertising
    d. Guerilla Marketing
    e. Social Media Management
    f. etc...
2. Developer Salary: $140,000
3. Real Estate Partner Salary: $140,000
4. Assistant/Project Manager Salary: $60,000 - $100,000
5. OutSourced Development Costs: $50,000
6. Legal Fees: $200,000
7. Expenses: $100,000
8. Unforeseen Costs/Reserve: $200,000

Total for 1 year of runway: $1,130,000

Flow Token is looking to raise the seed money at a $10,000,000 valuation against the Flow Foundation, and an additional 2% of all tokens generated by the ICO. The first REH will not be available as collateral for investment, however the 2% will be enough to create a REH on it's own.

To put the 2% of the tokens into perspective:
- A wildly success ICO is EOS, currently worth $8,522,000,000, holding 2% would be return $170,440,000
- A fairly successful ICO was the FUNFAIR Token, which is has a market cap of $410,410,201 at the time of this writing. Holding 2% of FUN would be worth $8,208,204.
- On the low end, a real estate based token named Propy is currently worth about $45,616,938, which would be worth $912,338.

It might seem strange to bring up Propy in a pitch, as it's 2% doesn't make back enough to cover the ROI. There are a few reasons to compare ourselves to Propy:
1. Propy is prime example of a successful ICO based on a token which doesn't really have much utility, and still raised tons of money. Propy is simply a platform for buying real estate with bitcoin, and record the transaction on a blockchain. Propy does not really address any problems with the current real estate investment infrastructure, and does not help bring new investors into the space, yet still has a market cap of over 45 million.
2. Flow Token is fundamentally different from Propy, in that it is very rich in utility. The Flow Token platform affords investment opportunities in real estate to billions of people who would otherwise be unable to invest. Not only is Flow Token a technical innovation which allows for new investors, but it also bypasses the high cost of entry into real estate investing. An individual with $2 could utilize Flow Token to invest in real estate. The Flow Token technology stack unlocks untold amounts of unused capital from millions of new investors.
3. The Flow Foundation will own a small amount of each real estate property token, per property sold for the first X years. If Flow Token is successful, the FPTKN portfolio alone could be worth much much more than the initial investment.

4. ICO's are high risk and high reward. Any potential investor should be aware of tokens like Propy, which are successful, but not super successful. If seeing a token like Propy makes you hesitate, this may not be the investment for you.

We are looking for investors who believe in the Flow Token plan, can advise on either the real estate, taxes, legal strategies, marketing and advertising, or the blockchain space. If you want to follow up, contact Eric Wooley <ericwooley@gmail.com>.

References

EOS - https://coinmarketcap.com/currencies/eos/
FUNFAIR - https://coinmarketcap.com/currencies/funfair/
Propy - https://propy.com/
ERC-20 - https://github.com/ethereum/eips/issues/20
ERC-721 - https://github.com/ethereum/eips/issues/721
dApp - https://ethereum.stackexchange.com/questions/383/what-is-a-dapp

Variables and Explanations

The Following variables are used in when generating the white paper. Most variables are used in multiple places. Following each variable is an explanation of how and why it was chosen.

tokens required to create REH: REH Block Dependent FTKN Holding (See formula)
The required number of REH tokens that are required to register an REH can be calculated by the following formula:

C = Blocks Created at ICO
B = Blocks Since ICO
R = REH inflation Rate

$$FLOOR(C/((B/10000)^R)/50)$$

Which yields the following results over time, where the "Max REH" is the total number that could possible register.

Variable Name	Value	Blocks Since ICO	Years Since Launch	Max REH	% of tokens	Tokens Required
REH inflation Rate	2	131400	1	3	33.33%	333333.3333
ICO Generated	1,000,000.00	262800	2	13	7.69%	76923.07692
Initial % for REH	1	394200	3	31	3.23%	32258.06452
Tokens needed for REH	10000	657000	5	86	1.16%	11627.90698
blocks per Year	131400	1314000	10	345	0.29%	2898.55072
		3285000	25	2158	0.05%	463.39203

		6570000	50	8632	0.01%	115.84801
		13140000	100	34531	0.00%	28.95949

REH over time
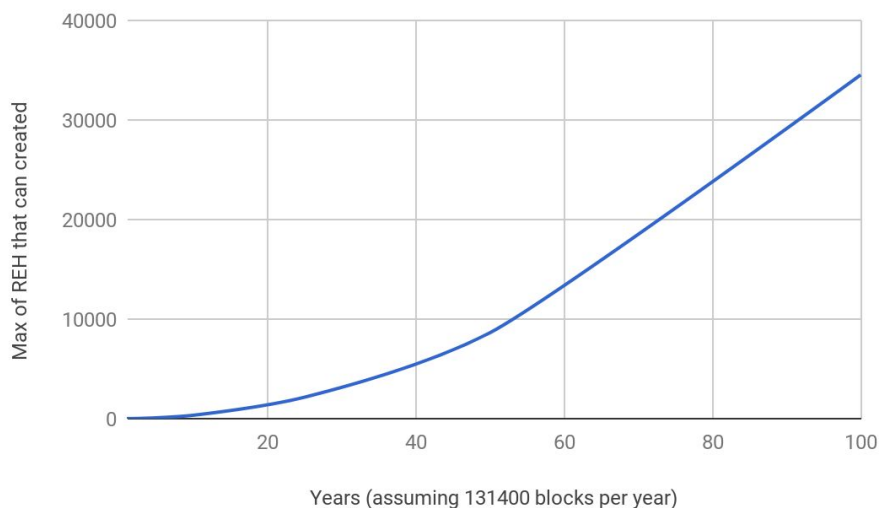
It's highly unlikely that the Max REH would ever be achieved, as Underwriters are also incentivised to hold tokens, and investors may choose to hold tokens as a store of value.

Flow Token is not inflationary, however, the barrier to entry for an REH registrations needs to be lowered over time. Since Flow Tokens will not be created, the barrier to entry must be dependant on time since the ICO. In this case, time is measured in blocks. The measurement of time may change before the release, because ethereum plans to implement sharding, and it is very hard to predict how sharding will affect block numbers and mining time. It's possible that we will switch back to time of last recorded block for the formula, instead of number of blocks.

tokens required to create underwriter: Underwriter Block Dependant FTKN Holding (See formula)
TODO: this will be very similar to the REH registration requirement formula

tokens given to foundation: 1
Giving some portion of the deed to the Flow Foundation is necessary for several reasons.

1. The Flow Foundation will depend on the revenue to further develop and support the ecosystem.
2. If the Flow Foundation has a stake in the property, it is able to spearhead any legal actions against any malicious REH or Underwriters.

years flow foundation gets tokens: 10
The Flow Foundation will be instrumental in protecting investors and stabilizing the platform in the early years. The tokens it gets, are it's only revenue source. After 10 years, giving a portion of a deed to the Flow Foundation will become optional. Opting in to the donation might be encourage by giving a higher rating on the DMLS.

tokens per deed: 10000
Arbitrary number at this point. Needs to be marketable, balancing value and tokens owned.

min pledge time: 4 days

4 days is a reasonable compromise between an investors need to be liquid with their capital, and a UPLAN pledge volatility. This could definitely use more thought.

date: 2018/03/21

Date of file white paper export.

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Version of the white paper