Bacon Protocol Whitepaper

by Allan Carroll and Karl Jacob

Why Bacon?

Almost everyone has heard the phrase "bring home the bacon," which roughly means to "earn the money that is needed to live". Our hope is this protocol will help consumers and homeowners around the world.

Introduction

Since about 1190, a mortgage has been the way for people to be able to afford to buy a home or piece of property. Housing is our most basic need and so it plays a very core role in economies around the world and a home bought with a mortgage is the easiest way most people can grow wealth. As a home's value grows over years, a mortgage makes it possible to use that wealth to send our kids to college, pay off debts, travel, and remodel our kitchens.

Mortgages have also been a cornerstone of our financial systems. Banks, insurance companies, and governments buy trillions of dollars of mortgages each year to make money in a safe way. For example, Wells Fargo currently owns $275 billion worth of mortgages generating over $8 billion a year in income with little risk.

The Bacon Protocol introduces a brand new type of decentralized mortgage loan. It makes mortgages cheaper, faster, and more flexible for homeowners and its native token, bHOME, is the first ever Stable+ Coin. bHOME can provide the stability and growth of a mortgage portfolio to the crypto community. At launch, the Bacon Protocol and bHOME only accept the same kinds of loans and homes that banks and governments buy to keep their money safe.

Mortgage Basics

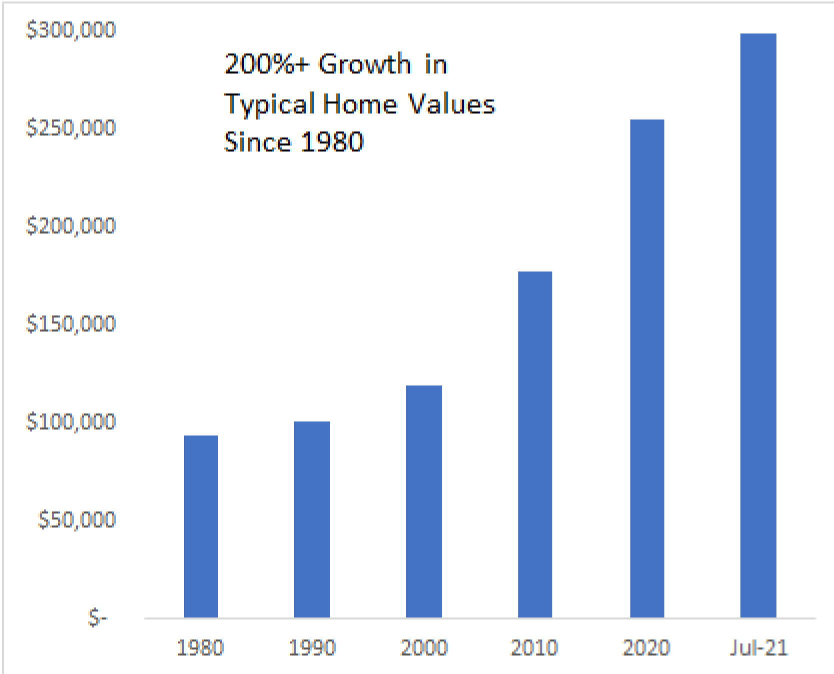
Mortgages on real homes in the US are the foundation of the benefits the Bacon Protocol provide. A mortgage is a loan secured by the value of a home. It's a promise to repay a certain amount of money, a little bit each month, to a bank or investor over many years or decades. It's also a promise to give the bank your home if you can't repay the debt.

Because a mortgage is secured by a home, it's rare for the lender to lose money. This protection makes interest rates for secured loans much lower for the borrower than unsecured loans like credit cards – usually 3-6% instead of 20-30% (source: Investopedia).

Secured loans are very desirable for lenders because there is far less risk of losing money. In the worst case, the lender can sell the house and use the money from the sale to repay the loan. This is why there are $2 trillion worth of mortgages purchased by banks, companies, and governments each year. In fact, the US government currently holds $2.38 trillion worth of mortgages.

Mortgages are especially profitable for banks. They make money by lending out the money their customers keep in their checking and savings accounts . For example, a bank takes deposits from people like you and uses your money to purchase mortgages. Those mortgages will earn around 3.0% in interest at 2021 rates. The bank only shares 0.25% or less of that interest to you. They keep the other 2.75% interest for themselves as profit. That means that Wells Fargo, who holds almost $275 billion in mortgages, will earn over $8 billion each year from *your money* deposited in their accounts.

The U.S. housing market has been consistent over many centuries and has grown over 200% since 1980. The few country-wide disruptions have been short-lived and seen housing prices surpass their previous highs quickly. People always need a place to live. Historically low mortgage rates in the past 20 years also show how desirable these loans are to the market.



Source: US Census Data and Zillow Home Value Index

What if we could put the power of mortgages into the hands of anyone who can buy crypto and use that power to vastly reduce the cost and increase the ease at which someone can purchase or refinance a house?

Bacon Protocol

The Bacon Protocol brings the same power and value that mortgages give banks, financial institutions and governments to *anyone who can buy cryptocurrency*. No matter where you live, you can purchase the bHOME coin and enjoy the stability of mortgages backed by real homes and receive benefits from interest payments on those mortgages.

The Bacon Protocol is a decentralized mortgage lending protocol built using smart contracts on the Ethereum blockchain. Anyone with a crypto wallet can lend money and earn interest and most importantly, see exactly which homes they are lending against. Anyone with a home that meets the protocol's criteria can create an NFT and use it as collateral to borrow USDC.

The Bacon Protocol has several important pieces:

- **Pans** — smart contracts that pool funds, mint the bHome coin and fund loans that match the Pan's criteria.
- **bHOME —** the first of many expected Bacon-based Stable+ Coins.
- **Eggs** — NFTs that hold information about the home and represent real value in the home
- **BACON** — a governance token that controls the parameters and structure of the protocol

To make the Bacon Protocol powerful and flexible, we broke apart a traditional mortgage and separated it into two pieces that normally are tightly connected:

1. The right to claim part of the value of a house, called a lien
2. A loan secured by that lien and an agreement to repay the loan

Separating these two makes it possible to keep the connection to real-world legal contracts incredibly small and simple. Everything beyond that small real-world interaction moves onto the blockchain as smart contracts that are open, predictable, and, most valuably, decentralized and composable. A decentralized group of Originators are incentivized by the protocol to handle the small real-world relationships. The amount of trust required of any one, off-chain party is minimized.

Pans

Pans are the core smart contract for lending to the borrower and minting Bacon tokens.

At launch, there is only one Pan. This Pan mints bHOME and will accept any Eggs meeting the the Fannie Mae and Freddie Mac Conforming Loan guidelines. These include requirements about the loan amounts, home value, borrower credit, borrower income, and all state and federal regulations. Over time, the protocol may add new Pans that target specific kinds of homes. Bacon Protocol Governance will vote on whether to create new Pans and which Pans to include or exclude from the protocol. These guidelines are read from an on-chain oracle and enforced by the bHOME Pan when the Egg is staked to create a loan.

Like in trad-fi, bHOME holders may be interested in buying and holding coins backed by specific kinds of homes or homeowners. The Bacon Protocol uses Pans to mint Stable+ tokens. bHOME is the first Pan-minted token. Governance will be responsible for proposing and voting on new Pans and their criteria for lending. For example, a new Pan could be created, bBOSTON, that is backed only by homes in the city of Boston. Or, a bJUMBO token could be created back only by homes that are worth more than $1 million.

When a liquidity provider deposits USDC in the Pan, the Pan mints its corresponding Stable+ token, like bHOME, in exchange. A bHOME holder can also withdraw USDC in exchange for their bHOME. The exchange rate between the two is based on the ratio between USDC already in the Pan and the amount of outstanding bHOME.

The Pan also acts as the lender to borrowers holding Eggs. A borrower that has an Egg can stake their Egg into a Pan in exchange for a loan of USDC. The borrower then pays the interest and principal on the loan over time by sending USDC to the Pan. When no principal remains on the loan, the borrower can unstake the Egg. They can also choose to leave it in the Pan and withdraw and repay USDC as they wish as long. The borrower is not able to take any action that would cause their loan or Egg to go outside the parameters the Pan requires.

bHOME, the First Stable+ Coin

We call bHOME a **Stable+ Coin**. A Stable+ Coin is a cryptocurrency that stays close in value to other currencies and can grow in value over time. It's stable because it's backed by the value of real homes in the US. It can grow in value as loans are repaid over time and the interest payments into the bHOME contract.

bHOME is the token minted by the first Pan in the protocol. The mortgages in the bHOME Pan will all meet the Fannie Mae and Freddie Mac Conforming Loan guidelines. These include requirements about the loan amounts, home value, borrower credit, borrower income, and all state and federal regulations. These are the basic criteria from Fannie Mae that will be used by the first bHOME mortgages:

Borrower FICO Score	640+
Borrower Debt to Income Ratio	< 45%
Egg Value to Home Value Ratio	< 75%

Maximum Egg Value	$ 548,250

Eggs

Eggs are ERC-721 NFTs that represent a lien on a specific house for a specific dollar amount.

One Egg might represent a $10,000 lien on 123 Main St, Springfield, IL 62702. That Egg gives the holder the right to $10,000 from the sale of 123 Main St, Springfield, IL 62702. That right can only be used if the owner of the house fails to make payments on any loans backed by the Egg. For example, they might have staked the Egg in the Bacon Protocol and, in return, borrowed $10,000 USDC. If they fail to pay back the $10,000, the Originator can liquidate the Egg through foreclosure and return the $10,000 to the protocol.

When a homeowner wishes to remove the lien from their property, they simply send a free and clear Egg back to the Originator. This is done by paying back the full amount borrowed. The issuing contract will signal the Originator to remove the lien from the public record. Oracles will be setup to watch the county lien records and report them to the blockchain to increase trust.

The Egg token contains basic data about the lien and the house. We only include data that is already on the public record at the county courthouse to balance the Egg owner’s privacy with the stability that the data provides. Note that the Egg does not include the owner’s name or any credit or other financial data.

The included data is:

- House address
- Amount of the lien
- Value of any liens that are “senior” to the Egg at the time it was created
- An image of the house

This data is specifically chosen to let protocols that use Eggs determine the value of the Egg. The house address makes it possible to use an oracle to determine the specifications of the house like its current estimated value. That value and the value of the senior liens makes it possible to calculate the Egg’s LTV (lien-to-value) and the total LTV (loan-to-value) of all loans on the house. These ratios are important to any protocols using Eggs that rely on maintaining strict collateralization ratios to maintain stability.

Originators

Eggs are minted by a variety of Originators that are incentivized to act in the protocol's interest. Originators are regulated and licensed organizations that are elected by the community to provide this service. Today these organizations are regulated and licensed by states they operate in and the federal government to make mortgages and record liens in the state the home is located in. Originators are subject to reviews and audits on a regular basis. Many Originators will help service the Protocol.

Before minting an Egg, an Originator must:

1. Show that the house is worth enough to cover the value of the Egg.
2. Check that the person they are minting the Egg for is the rightful owner of the house.
3. Sign a Deed of Trust agreement with the owner to create a lien.
4. Record the lien on the public record with the county the house is in.

Once the lien is recorded, the Originator transfers the Egg to the owner, who is then free to use the Egg as they wish in any protocol that uses Eggs. Most borrowers will immediately use the Egg to borrow USDC from a Pan. Eggs will not be limited to use in the Bacon Protocol and other protocols may also be interested in accepting Eggs as collateral.

Over the life of the Egg, the Originator is also responsible for ensuring that the owner maintains the house. The Deed of Trust requires the owner to maintain the house such that if it needed to be sold to pay off the lien, it would be valuable enough to do so. The owner agrees to keep the house in decent condition, to insure it properly, and to pay all taxes.

The trust the protocol places in the Originator to create, maintain, and, if necessary, enforce the lien is the only necessary connection to the real world. Our intent is to keep the real-world integration very small and strictly limited to Eggs. Doing this provides all the flexibility of the blockchain ecosystem to homeowners and limits the number of places blockchain participants have to place trust in an off-chain agent. The originator is highly incentivized in the real world to maintain this trust. If it was discovered by a state or federal agency this trust had been broken the originator would have its licenses revoked, pay hefty fines and lose the ability to conduct business in that state or states.

Fees

Originators are incentivized by fees they earn for the two functions they provide: minting Eggs and servicing loans. The Protocol also earns fees on each mint and servicing payment for serving as a platform. The Originator's share is sent to their wallet. The Protocol's share is kept in the smart contract for use by the Protocol as directed by the DAO.

When an Egg is used to take out a loan from a Pan, the Originator is given bHOME worth 0.5% of the amount of the loan and the Protocol is given bHOME worth 0.5%. When the Originator services a loan and sends a payment to the Pan, they are given 0.5 percentage point of the interest and the Protocol is also given 0.5 percentage points.

For example, an Originator creates a $100k Egg on a $1M home. Then, the homeowner uses the Egg to get a 100k USDC loan at 3% interest from the bHOME Pan. When that loan is created, the Originator and Protocol are each sent $500 worth of bHOME. When that borrower makes a monthly payment of $250 (3% APR is .25% per month), the Originator and the Protocol are each sent $41.66 worth of bHOME. All 250 USDC from the payment are kept in the Pan and the value of the bHOME token increases accordingly.

Smart Loans

The Bacon Protocol allows a homeowner to exchange a lien on a home for an NFT representing a part of the value of their home that they can use as collateral broadly across DeFi. Most of the time, the NFT will be used as collateral in a loan from the Bacon Protocol soon after the NFT is minted.

Here's how this would work for people who own a home.

1. You decide you would like to get some cash out of your home and sign up for a Smart Loan.
2. You enter your name and address.
3. An approved Servicer such as LoanSnap calculates how much your home is worth and finds any existing loans on your home.
4. LoanSnap shows the value in your home and lets you decide how much you want to borrow.
5. As quickly as one or two days later, you sign the Smart Loan agreement.
6. LoanSnap mints an NFT, called an Egg, and sends it to you.
7. You put your Egg in a Pan in return for USDC and in the future other cryptocurrencies
8. You make payments back to the Bacon Protocol which will initially be handled by the company servicing your loan. You can pay as little as just the interest due or as much as you want with no penalties.

Your house becomes part of the group of houses that back bHOME and you get dollars deposited into your account.

In future versions you can get bHOME coins or cash, but for now you get cash that you can use for whatever you want just like a mortgage from a Bank. The difference is that you get to choose how fast you pay the money back.

This has two main advantages over a traditional mortgage:

1. The rate will be lower which means your payments will be lower
2. You no longer have to refinance your home to get more money. You can just sign a new Smart Loan agreement to increase your credit line up to 75% of the value of your home.

bHOME requires a lien (a promise guaranteed by your house), but you get cash which you can repay as fast or as slow as you'd like as long as you make the monthly interest payments. Best of all, the loans can be refinanced at the press of a button. When rates go down, the borrower can see that their monthly payment can be lower and choose to pay off the existing loan with a new one at the lower prevailing rate.

Automated Market Maker

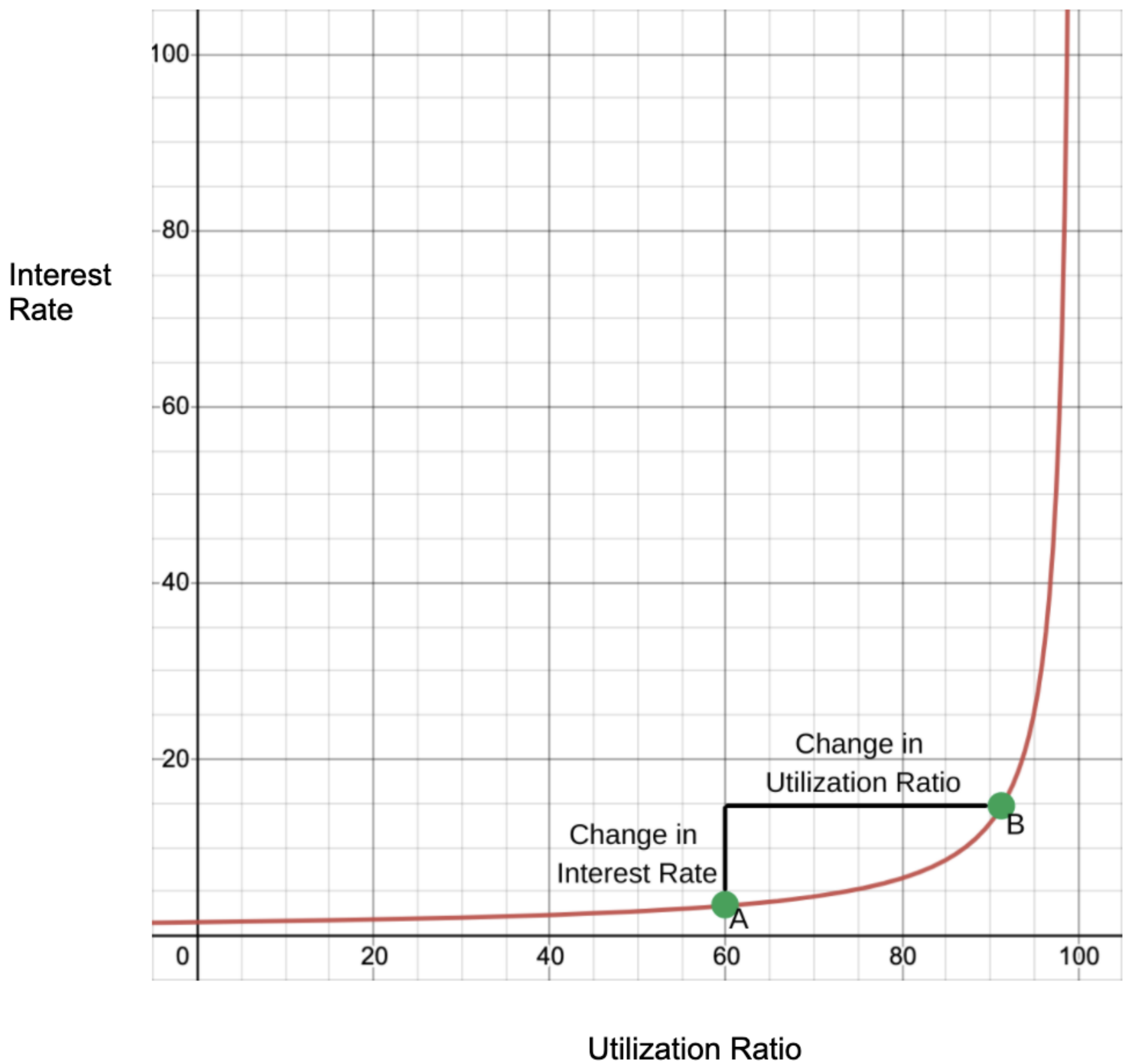
The Bacon Protocol uses an Automated Market Maker (AMM) to decide the interest rates borrowers will pay and that bHOME holders will earn. This is similar to the AMM system used in many decentralized exchanges today. The Bacon AMM creates a simple supply-demand curve to incentivize borrowers and liquidity providers to participate in the system when needed.

The main driver of interest rates the AMM gives borrowers is the amount of liquidity waiting in the Pan to be lent out. The size of the loan is also taken into account. Larger loans use more liquidity so they are given at higher interest rates.

When there is lots of excess liquidity, the AMM moves rates lower down the curve to entice borrowers into the protocol. Those borrowers will stake their Eggs in the Pan and borrow USDC, which reduces the liquidity.

When there is little liquidity in the contract, the AMM moves rates higher up the curve and loans are made at higher interest rates to borrowers. As the rates of new loans increase, the average rate for loans in the Pan increases. This higher interest rate will make holding the token and providing liquidity more attractive. This will lead liquidity providers to deposit USDC in exchange for bHOME, which increases liquidity in the protocol and brings rates back down.

Rates will naturally find a balancing point that indicates the current price for liquidity and borrowing.



Handling Borrower Defaults

A borrower defaults on a loan if they fail to pay the minimum monthly loan payment. Most people prioritize the payment on their living space and most valuable asset. However, it does and will happen that a borrower fails to repay their loan. Historically, the delinquency rate has been around 2% (https://fred.stlouisfed.org/series/DRSFRMACBS). Because the mortgages stabilizing bHOME are secured loans, the value of the house is available to make the related Pan whole if the borrowers aren't able to catch up on their payments.

The Bacon Protocol's goal is always to balance the needs of the bHOME holders with the rights and needs of the borrowers. In cases where the protocol must liquidate to maintain stability, the Bacon Protocol will keep the borrower's Egg and recoup the lost value when either the borrower sells the home or the servicer sells the home through foreclosure. The dollars from the sale are converted to USDC and repaid using the emergency repay method on the Pan contract.

BACON

The Bacon Protocol will have a corresponding governance token, BACON. Over time, as the Bacon Protocol and its community grow, control and governance of the protocol will be decentralized. Voting by the BACON token holders will drive all major policy decisions.

Governance through BACON may have control of these parts of the protocol or other rights and responsibilities that the creators and community decide:

1. Creation of new Pans
2. Adjustment of AMM parameters
3. Allocation of liquidity incentives
4. Usage of treasury funds

Early bHOME liquidity providers will be given BACON as a reward for helping to bootstrap the protocol. That group that receives BACON for their participation in the protocol will form the core of the community and decentralized governance.

Other utility functions are being considered for BACON. These include access to broader data for large holders and the ability to propose the creation of new Pans.

Tokenomics

BACON will also be made available to the various protocol participants for their contributions. During the first 5 years, 100 million tokens will be minted and distributed.

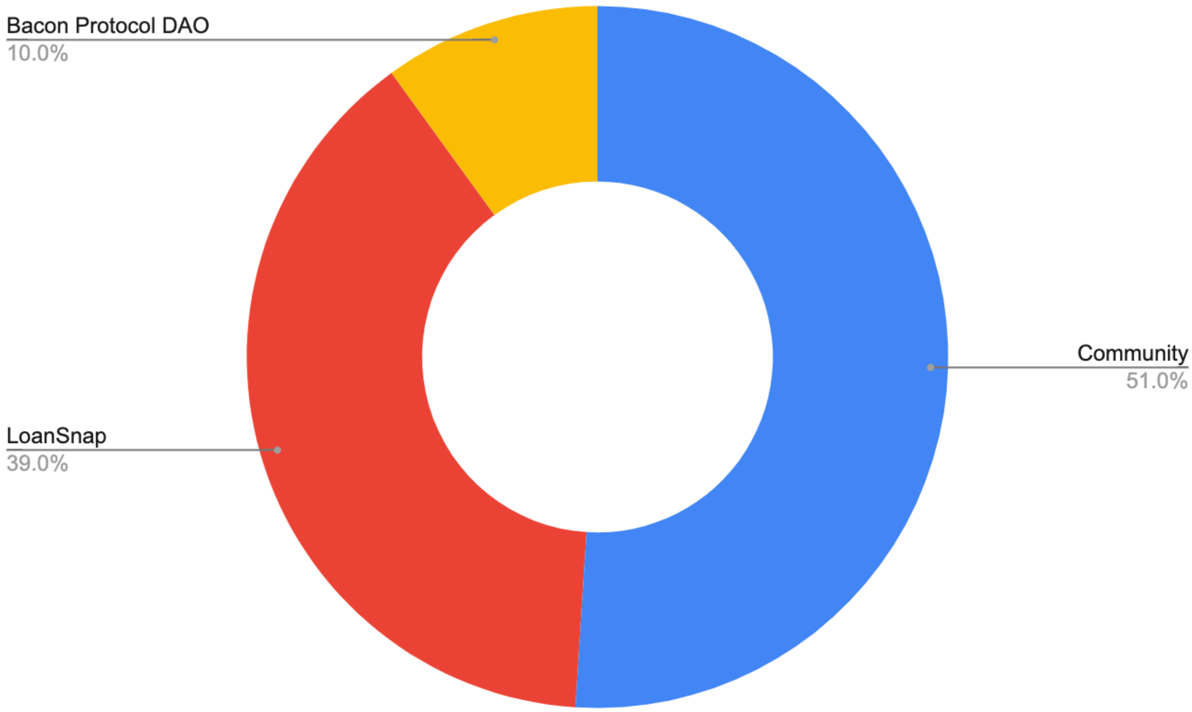
A DAO will be established and funded that will be responsible for the long term care and maintenance of the protocol. All BACON participants are given a token unlock schedule to ensure that BACON holders are users or liquidity providers with a long term commitment to the growth and success of the overall Protocol. Tokens distributed to the LoanSnap investors and contributors will be minted and distributed on a 4 year vesting schedule with quarterly release.

An ongoing liquidity incentive will be provided to all USDC contributors. This incentive will be distributed pro-rata across all liquidity in the Pan at a rate of 5 tokens per block (~30k per day) during the first year. After the first year, the incentive will decay at a rate of 1% per week until the end of year 4 when it will target a 2% per year rate.

To give strong incentive to the earliest liquidity providers, an Early Liquidity Bonus will also be distributed pro-rata to the contributors of the first $100M USDC. The bonus will be about 10% of pool and will be distributed over the first year the protocol is live. It is expected that the bonus will also be 5 tokens per block (~30k per day).

An early liquidity provider in the first $100M would earn tokens from both the ongoing liquidity incentive and the bonus pool during the first year. That liquidity provider could earn up to 30k tokens per day from the bonus plus up to 30k tokens per day from the incentive, for up to 60k tokens per day.

Holder	**Percentage**	**Purpose**	**Unlock Schedule**
Community	51.00%	Liquidity incentives	Minted per-block over 4 years. Bonus to first $100M liquidity during first year. 2% inflation after year 4.
LoanSnap	39.00%	Investors & Team	Quarterly release over 4 years
Bacon Protocol DAO	10.00%	Held for future grants by the DAO	Quarterly release over 4 years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Community
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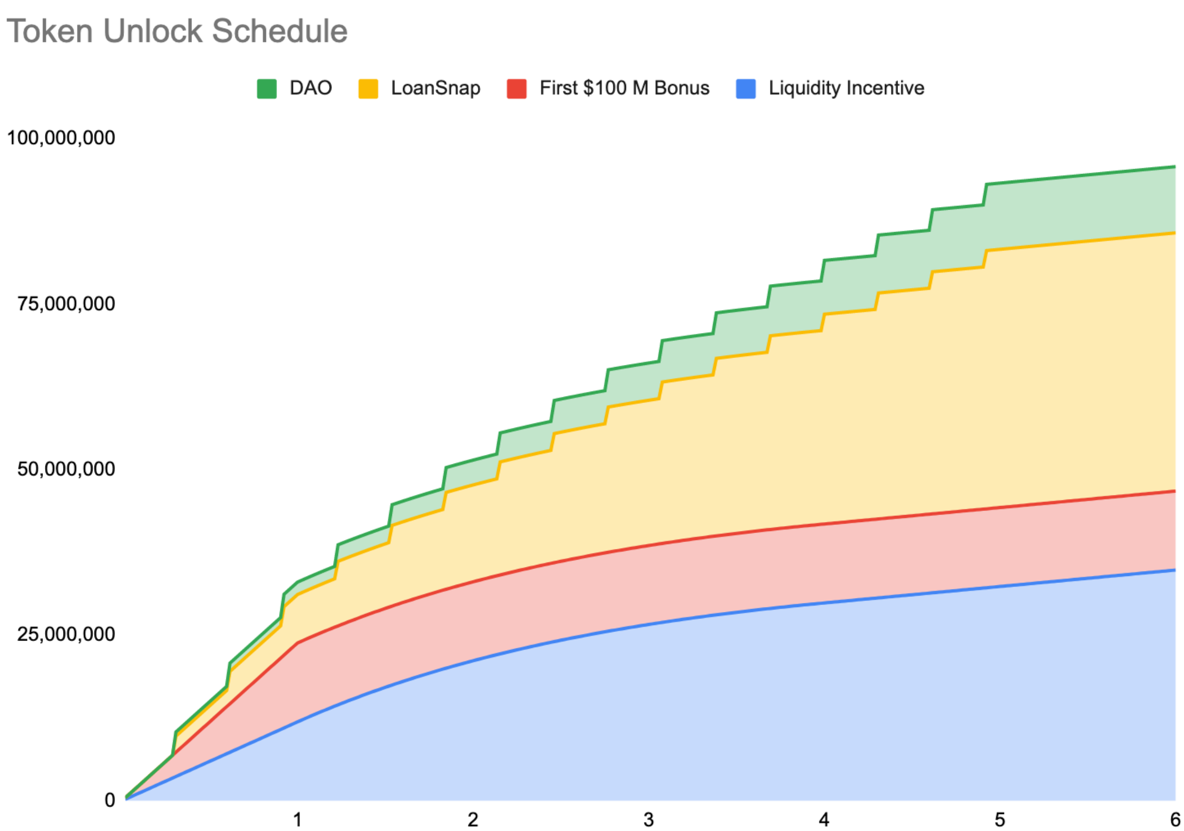
LoanSnap
39.0%


Token Unlock Schedule
DAO
LoanSnap
First $100 M Bonus
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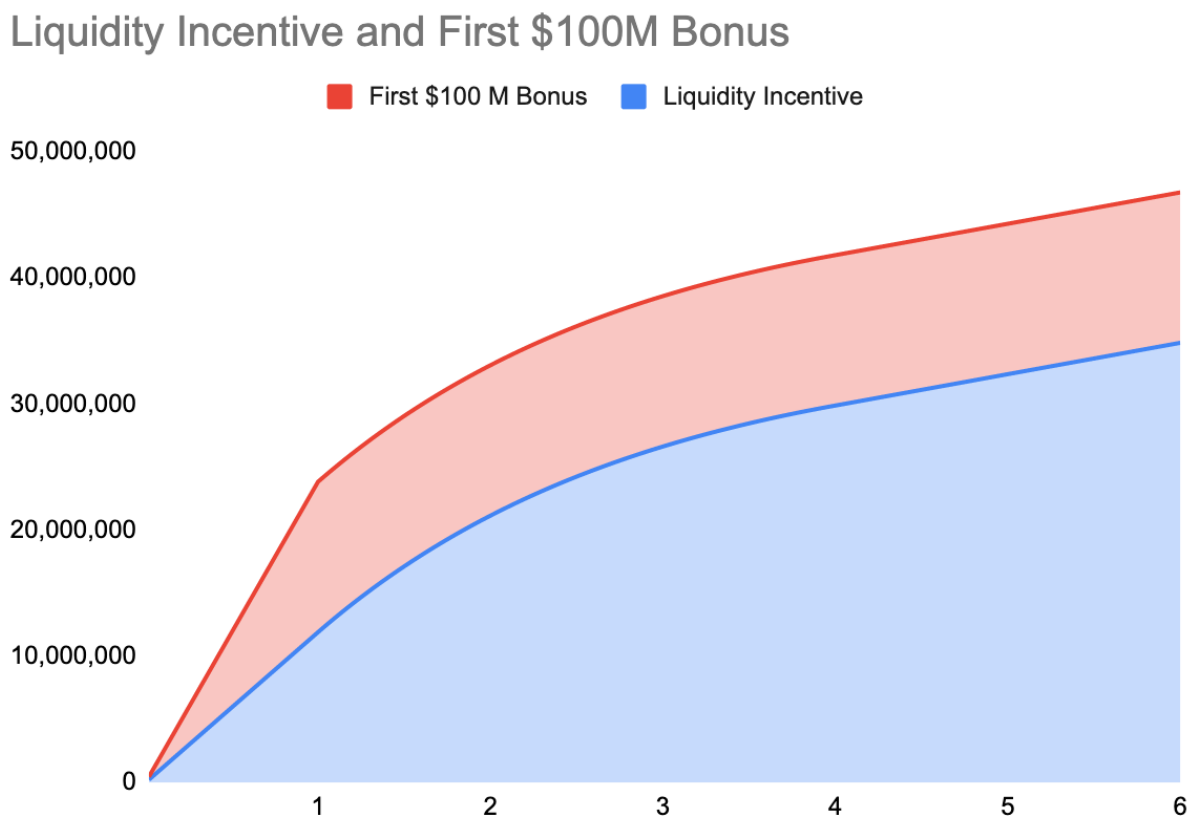

Team

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