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Councilmember Ben Bartlett
City of Berkeley, District 3

ACTION CALENDAR
May 1, 2018

To: Honorable Mayor and Members of the City Council

From: Councilmember Ben Bartlett

Subject: Berkeley Microbond Blockchain Initiative – Pilot Project

RECOMMENDATION

Refer to the City Manager to implement a Pilot Project for the Berkeley Microbond Blockchain Initiative. The specific Pilot Project should be selected by the Berkeley City Council at the April 24, 2018 meeting.

BACKGROUND

The Berkeley Microbond Blockchain Initiative seeks to allow community members in Berkeley to invest directly in the public projects they care about. The Project intends to achieve this goal through crowdfunded municipal microbonds secured by a blockchain-based system. This builds off of Berkeley's legacy of innovative financing, including Property Assessed Clean Energy (PACE).

Crowdfunding Municipal Microbonds

Municipal bonds (also known as "muni bonds" or "munis") are debt securities issued by governmental entities to fund day-to-day obligations and to finance capital projects. Muni bonds are a way for cities, states, and other government entities to fund projects that are vital for communities, such as schools, roads, and parks.

Historically, in the 19th and early 20th centuries, muni bonds were more accessible, and were purchased by local people investing in their own communities. For instance, in the 1930s, San Francisco's Golden Gate Bridge was financed by muni bonds purchased mostly by the public, who used their homes, farms, and businesses as collateral.[1]

[1] Richards, Sam. "How the Golden Gate Bridge Was Built: A Muni Bond Success Story." *Neighborly,* Neighborly, 6 Nov. 2015, neighborly.com/learn/how-the-golden-gate-bridge-was-built/.

Today, however, regular people are far removed from the muni bond market. The $3.7 trillion muni market lacks transparency, involves a slew of fee-collecting middle men, is controlled by Wall Street, and excludes small investors.

Municipalities and other governmental entities sell their bonds to bank underwriters (such as Goldman Sachs and Wells Fargo). The underwriters then resell the bonds to brokers and big institutions. Bonds can go through many intermediaries before reaching an end investor. Each time a bond changes hands, its price may be marked up. Bond dealers are not required to disclose their fees, charges, or markups.

"A 2012 report by the Government Accountability Office concluded that smaller investors were likely to pay higher prices to buy, and receive lower returns when they sell. The Securities Litigation and Consulting Group, a consulting firm, estimates the cost of excessive markups to small investors at $1 billion a year."[2]

Research by the Haas Institute for a Fair and Inclusive Society suggests that "municipal bond issuers face upwards of $4 billion of issuance costs annually. This represents taxpayer and ratepayer money diverted from infrastructure development and service provision to a variety of financial industry interests."[3]

Typically, muni bonds have a minimum denomination[4] of $5,000, because of the enormous expense associated with issuing bonds. Some issuers even impose higher denominations (most commonly $100,000). This makes it impossible for most small investors to purchase muni bonds.

By combining civic crowdfunding with municipal "microbonds," we can democratize public financing in Berkeley and create tangible benefits for our community.

A "microbond" or a "minibond" are terms for a municipal bond that is offered in smaller, more affordable increments. Essentially, a bond with a lower minimum denomination. By crowdfunding microbonds, cities and other governmental entities can cut out unnecessary middlemen and markups, by selling bonds directly to investors at lower costs. The lower costs can increase access for small investors. This simplified process can also increase transparency.

A few other cities have already had success with crowdfunding microbonds, most notably the City of Cambridge and the City of Denver.

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[2] Cortese, Amy. "Putting the Public Back in Public Finance." *The New York Times,* The New York Times, 10 July 2015, www.nytimes.com/2015/07/12/business/mutfund/putting-the-public-back-in-public-finance.html.

[3] Joffe, Marc. "Doubly Bound: The Costs of Issuing Municipal Bonds." *Haas Institute*, Haas Institute for a Fair and Inclusive Society, 1 Apr. 1970, haasinstitute.berkeley.edu/doubly-bound-costs-issuing-municipal-bonds.

[4] A minimum denomination is the smallest increment you can buy a bond.

In February 2017, the City of Cambridge first offered $2 million of microbonds with a minimum denomination of $1,000. The bonds funded city-wide capital projects including school building renovations, municipal facility upgrades, and street improvements. The City of Cambridge received national recognition for this bond offering, including winning a 2017 Deal of the Year award by The Bond Buyer.[5] Cambridge issued a second microbond offering in February 2018.

In 2014, the City of Denver offered $12 million of microbonds with a minimum denomination of $500. The bonds sold out in just one hour and were used to fund the maintenance of roads and civic buildings.[6]

In summary, we believe that crowdfunding muni microbonds can achieve the following benefits:

- **Increase Accessibility.** For most municipal bond investments, investors need to invest $5,000 or more. We want to lower this cost so that everyone can be able to invest in and improve communities. Moreover, this is an equity issue. Muni bonds are a considerable financial investment opportunity for wealth building that is currently only accessible to mutual funds and high net worth individuals. We believe that it is our civic responsibility to ensure that everyone can invest in their community and share in the upside.

- **Increase Transparency.** By selling bonds directly to investors, we simplify the process of bond issuance by cutting out unknown middlemen and markups. Investors can see exactly where their money is going, and the exact impact their funds will have on our community.

- **Increase Flexibility.** Because of the expense associated with bond issuance, government entities generally only issue large bonds (such as our $100 million T1 bond to improve City infrastructure). By cutting costs and removing middlemen, we can increase flexibility in the targeting of projects, allowing us to issue bonds for smaller projects, such as a fire truck or one homeless facility.

- **Increase Speed.** This technology allows capital to be raised and deployed much more quickly than traditional approaches.

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[5] City of Cambridge. "Cambridge Wins 2017 Deal of the Year Award for Minibond Program." *City of Cambridge, MA*, City of Cambridge, MA, 27 Nov. 2017, www.cambridgema.gov/news/2017/11/cambridgewinsawardforminibondprogram.

[6] Murray, Jon. "Denver's $500 'Mini-Bonds' Sell out in First Hour, Raising $12 Million." *The Denver Post*, The Denver Post, 27 Apr. 2016, www.denverpost.com/2014/08/04/denvers-500-mini-bonds-sell-out-in-first-hour-raising-12-million/.

- **Build Community.** By offering these civic microbonds, we will be giving community members a chance to invest in our local community and to help shape our community for a brighter future.

Why Blockchain Technology?

The Berkeley Microbond Blockchain Initiative proposes to allow investors to purchase municipal microbonds secured by a blockchain-based, smart-contract system.

"[B]lockchain is an open, distributed ledger that can record transactions between…parties efficiently and in a verifiable and permanent way. The ledger itself can also be programmed to trigger transactions automatically."[7] On its most fundamental level, blockchain is a digital ledger, "a recordkeeping system that keeps track of any type of transaction."[8]

Blockchain has following valuable characteristics:

> **Reliability and Availability.** Blockchain involves a shared and continuously reconciled database, which is distributed among a wide circle of participants. "It has no single point of failure and is designed to be resilient in the face of outages or attacks. If any node in a network of participants fails, the others will continue to operate, maintaining the information's availability and reliability.
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> **Transparent.** Transactions on the blockchain are visible to its participants, increasing auditability and trust.
>
> **Immutable.** It is nearly impossible to make changes to a blockchain without detection, increasing confidence in the information it carries and reducing the opportunities for fraud.
>
> **Irrevocable.** It is possible to make transactions irrevocable, which can increase the accuracy of records and simplify back-office processes."[9]

Blockchain has the potential to improve public sector performance, particularly where existing practices are costly, slow, or unreliable. "[A]gencies in more than a dozen countries—including Canada, the United Kingdom, Brazil, China, and India—are running pilots, tests, and trials examining both the architecture's broad utility as a basis for

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[7] Iansiti, Marco, and Karim R. Lakhani. "The Truth About Blockchain." *Harvard Business Review*, Harvard Business Review, 6 Mar. 2018, hbr.org/2017/01/the-truth-about-blockchain.

[8] Carmichael, Sarah Green, and Karim Lakhani. "Blockchain - What You Need to Know." *Harvard Business Review*, Harvard Business Review, 15 June 2017, hbr.org/ideacast/2017/06/blockchain-what-you-need-to-know. Accessed 9 Apr. 2018.

[9] Muraskin, Craig, and David Schatsky. "Beyond Bitcoin." *Deloitte Insights*, 7 Dec. 2015, www2.deloitte.com/insights/us/en/focus/signals-for-strategists/trends-blockchain-bitcoin-security-transparency.html.

government service provision and procurement and developing individual blockchain-based applications for internal use."[10]

In the United Arab Emirates, "the government is exploring a wide range of use cases, including for business registration logistics, and central bank operations."[11]

In the United States, the state of Delaware, where many businesses are incorporated, launched a Delaware Blockchain Initiative. The initiative seeks to address operational and legal challenges facing corporations.[12]

"Elsewhere in the United States, several federal agencies—including the General Services Administration, the Department of Homeland Security, and the Health and Human Services Department—have announced blockchain programs. New York, Illinois, and Texas are among the states that are piloting and/or testing blockchain applications."[13]

Through the Berkeley Microbond Blockchain Initiative, we seek to bring the benefits of blockchain – security, efficiency, affordability, and speed – to our City's public financing. Blockchain will be used to record bonds and their transactions, including the ownership of every bond at any given time. As soon as bonds are issued, the blockchain ledger will keep track of everything in real-time.

The Pilot Project
The City of Berkeley should implement a pilot project, to be selected by the Berkeley City Council, for the Berkeley Microbond Blockchain Initiative. Potential options for pilot projects include funding a fire truck, funding prefabricated housing for the homeless, public art, and more.

FINANCIAL IMPLICATIONS
Staff time.

ENVIRONMENTAL SUSTAINABILITY
No adverse effects to the environment.

CONTACT

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[10] Muraskin, Craig, and David Schatsky. "Beyond Bitcoin." *Deloitte Insights*, 7 Dec. 2015, www2.deloitte.com/insights/us/en/focus/signals-for-strategists/trends-blockchain-bitcoin-security-transparency.html.

[11] Muraskin, Craig, and David Schatsky. "Beyond Bitcoin." *Deloitte Insights*, 7 Dec. 2015, www2.deloitte.com/insights/us/en/focus/signals-for-strategists/trends-blockchain-bitcoin-security-transparency.html.

[12] Say, My. "Why The Delaware Blockchain Initiative Matters To All Dealmakers." *Forbes*, Forbes Magazine, 20 Sept. 2017, www.forbes.com/sites/groupthink/2017/09/20/why-the-delaware-blockchain-initiative-matters-to-all-dealmakers/#35c27a9b7550.

[13] Muraskin, Craig, and David Schatsky. "Beyond Bitcoin." *Deloitte Insights*, 7 Dec. 2015, www2.deloitte.com/insights/us/en/focus/signals-for-strategists/trends-blockchain-bitcoin-security-transparency.html.

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