

RESEARCH REPORT

Around the Block

The Present and Future of Blockchain and Crypto in US States and Cities

Luisa Godinez-Puig
February 2023

Thomas Brosy

Gabriella Garriga



ABOUT THE URBAN INSTITUTE

The nonprofit Urban Institute is a leading research organization dedicated to developing evidence-based insights that improve people's lives and strengthen communities. For 50 years, Urban has been the trusted source for rigorous analysis of complex social and economic issues; strategic advice to policymakers, philanthropists, and practitioners; and new, promising ideas that expand opportunities for all. Our work inspires effective decisions that advance fairness and enhance the well-being of people and places.

Contents

Acknowledgments	iv
Executive Summary	v
Introduction	1
Background	3
What Are the Differences between Digital Currencies and Blockchain Technologies?	3
How Does a Transaction Take Place on the Blockchain?	4
Overview of the Study	6
Findings	8
The Outlook of Local Blockchain Laws and Initiatives	8
State Laws	8
County and City Initiatives	15
Lessons Learned from Local Pilots	18
Incorporating Equity into Local Blockchain and Crypto Initiatives	28
For Any Crypto or Blockchain Initiative, Governments Should Clearly Define What Equity Will Comprise, Then Set Specific Community Outcomes for Racial Equity	30
Planners Should Identify Stakeholders and Their Incentives, and Involve Specific Communities in the Design Phase	30
Government Staff and the Public Both Should Clearly Understand the State- and National-level Crypto and Blockchain Regulatory Landscape.	31
Cities Should Determine the Benefits and Burdens of Crypto and Promote Improvements While Minimizing Harm.	31
Conclusion	33
Appendix A	34
Appendix B	36
Notes	38
References	42
About the Authors	44
Statement of Independence	45

Acknowledgments

This report was funded by the 2022 Fleishman Innovation Fund, established by Urban’s Board of Trustees. We are grateful to them and to all our funders, who make it possible for Urban to advance its mission.

The views expressed are those of the authors and should not be attributed to the Urban Institute, its trustees, or its funders. Funders do not determine research findings or the insights and recommendations of Urban experts. Further information on the Urban Institute’s funding principles is available at <https://www.urban.org/about/our-funding>.

The authors thank John Buhl, Tracy Gordon, Donald Marron, Paul Odu, Kim Rueben from the Urban Institute, and Tonantzin Carmona from the Brookings Institution for their support. We also thank the judging committee from the Fleishman Innovation Fund—Kim Leary, Donald Marron, Todd Greene, and Faith Mitchell—for their support.

Executive Summary

Cryptocurrency and blockchain technologies offer potential for improving local governance but may require new regulatory oversight especially in a time of increasing volatility. In this brief, we offer insights on how states and local governments are using these technologies based on (1) a database we assembled of state laws and local initiatives in these areas and (2) interviews we conducted with local officials. Our research sheds light on the goals behind state and local cryptocurrency policies and lessons so far from ongoing pilots. Lastly, we note important equity considerations for local governments to incorporate into their blockchain and crypto policies.

Introduction

Since 2010, cryptocurrencies have exploded in popularity with mainstream investors. During 2022, however, they experienced stratospheric rises in value and then declines, as a series of leading cryptocurrency exchanges, lenders, and projects ran into financial trouble. Most notably, in November 2022, FTX, one of the largest crypto¹ exchanges that allow users to trade digital assets, filed for bankruptcy amid allegations of fraud and corporate malfeasance. Although the underlying technology, blockchain, did not fail, the situation nonetheless sparked great speculation in certain circles about the future of the technology and its associated tokens.¹ Debate continues about whether this is the end of crypto in the mainstream or just a hiccup along the road to its maturity.²

In March 2022, President Biden signed an executive order calling for more research and stronger legal frameworks on cryptocurrencies.³ Members of the House created the Congressional Blockchain Caucus in 2016, and various crypto bills were proposed in 2022. However, despite several bipartisan efforts, to date only regulatory agencies have issued guidance on digital assets in the United States. Despite several bipartisan efforts, Congress has passed only limited legislation on the use of crypto⁴ and its tax implications.⁵

Meanwhile, state and local governments have acted.⁶ Some cities and states exempt cryptocurrencies from licensing regulations or accept crypto for government payments; others encourage or discourage crypto mining or use blockchain to keep records or for voting. For example, a private company issued locality-specific tokens to Miami⁷ and New York;⁸ Miami decided to transfer \$5.25 million⁹ in proceeds from its token to the city coffers early in 2022. Colorado's governor offers a plan to accept cryptocurrencies for state tax payments and transactions.¹⁰ Local governments using blockchain include Reno, which in September 2022 launched the first city-run blockchain platform in the United States—the Biggest Little Blockchain, playing on the city's nickname—to record properties of historic significance.¹¹

Several states and localities have enacted crypto initiatives because they perceive an economic opportunity for their jurisdictions; others have embraced the use of cryptocurrencies and blockchain technology for various projects. However, many are skeptical of the long-term or transformative potential of blockchain technologies.¹² And while supporters of blockchain in general highlight its

¹ *Cryptocurrencies* (or *crypto* for short herein) are digital currencies that often use distributed ledger technology and not controlled by any government or authority. *Blockchain*, the computer code underpinning cryptocurrencies, is a way of verifiably recording digital information by using multiple units or locations.

potential for delivering more transparent, equal, and efficient public services,¹³ others note equity concerns because people of color are reported as being more likely to invest in cryptocurrencies (Carmona 2022).

Understanding the equity consequences of blockchain and crypto initiatives for local governments is crucial given the many anecdotal narratives surrounding crypto and its potential for communities of color: as a tool to remove financial gatekeepers for communities of color or as a medium to build wealth for example (Carmona 2022).

In this report, we investigate the potential benefits and challenges of enacting blockchain and crypto policies at the state and local levels. Our analysis of state laws and initiatives to date shows that most states have passed at least one type of blockchain or crypto law and many states started regulating these technologies as early as 2013. However, our research on local initiatives shows that uses of blockchain technologies are still in their infancy, requiring much development before local governments can scale up their many applications. Many pilots are nevertheless under way, and various local commissions are studying the potentials of these technologies.

Our findings suggest the scope and goals of these local initiatives vary widely, with some focusing on the capabilities of the technology itself and others exploring the potential of cryptocurrencies as sources of finance for local governments and its citizens. Even then, governments face a series of similar challenges when implementing initiatives.

Importantly, only a few governments have started to consider the equity implications of these initiatives. Moreover, cities still operate in regulatory vacuums, particularly at the federal level, with very little guidance on how to protect their residents.

Background

What Are the Differences between Digital Currencies and Blockchain Technologies?

There is currently a national debate surrounding the exact definition of cryptocurrencies (Walsh 2021). Generally speaking, a **cryptocurrency** is a digital currency² that uses distributed ledger technology (DLT) and that is not controlled by any government or authority. DLT is an infrastructure that allows access, validation and record keeping across a network of multiple locations.¹⁴

In 2008, a person or team using the name Satoshi Nakamoto published a white paper about blockchain and Bitcoin, which has become the most famous and utilized cryptocurrency.¹⁵¹⁶ A Bitcoin worth roughly \$1 in 2011 was worth about \$60,000 in November 2022.¹⁷ Bitcoins are “mined” by using computing power to solve complex mathematical questions. However, the number of Bitcoins is intentionally limited to 21 million, and mining new coins becomes more complex and costly in computing power as the number of mining participants increases.¹⁸

Soon after Bitcoin became popular, other cryptocurrencies and blockchain platforms started appearing, such as Ethereum, now the second-largest cryptocurrency by market valuation. Some of these coins have limited supply, but not all. The mainstream rise of crypto started around 2014, and in 2018 its sky-high valuations drew much attention, including from governments. For example, that year the United Nations started a large research project to evaluate the use of blockchain by cities around the world (United Nations University 2020).

Blockchain is the technology behind cryptocurrencies. In its most basic form, it is a way of digitally recording information by using DLT. It relies on a peer-to-peer computer network, a publicly distributed ledger made of “blocks,” which can be thought of as packets of information containing transaction data.¹⁹ The DLT exists across a network where every transaction is recorded with a publicly available key. This characteristic makes blockchain transactions nearly impossible to hack or change. Most of the world’s data are stored on centralized servers in warehouses and administered privately by companies or governments. Data on the blockchain, however, are distributed across an entire network of private computers in which anyone can participate. Each networked computer can be used to access a copy of

² A *digital currency* is a form of money that only exists electronically.

the records. Blockchain participants acquire a unique address only accessible via a second, private key. Each transaction is recorded on the blockchain, creating transparency and a clear chain of custody.

Although blockchain rose to fame for its application to cryptocurrency, it has many uses beyond that. For example, some proponents have suggested that the technology can be used to verify contracts and store personal records, such as electronic IDs or the storing of medical records.

The characteristics of blockchain technologies, although attractive for certain applications, can also raise privacy concerns; also, their widespread application is still nascent. Methods to apply blockchain consistently and with ease are still under development. Another major concern is the high energy use associated with crypto mining.²⁰ As transactions generally are distributed through the entire network, they can consume a higher amount of energy compared to those occurring on a simple, centralized database. Blockchain developers are experimenting with and applying new ways to avoid this heavy demand.²¹

How Does a Transaction Take Place on the Blockchain?

To illustrate how a transaction on the blockchain works, assume Carla wants to send \$20 to Pedro. She can use a private bank or another financial intermediary. A third party (e.g., a bank) would verify the transaction, deduct the money from Carla's account, and put it into Pedro's account. If Carla tried to send a digital money file³ to Pedro, he could download the file and transfer \$20 to his account. But much like any electronic document, without a financial intermediary validating the transaction, Carla may accidentally or intentionally send the same file to another person. Only the first person to use the file would be able to pocket the money.

Blockchain offers an alternative peer-to-peer payment system that addresses this double-spending problem without the need of an intermediary. Both Pedro and Carla would have a digital wallet to store cryptocurrency. When Carla sends Pedro \$20, the transaction is publicly recorded across the decentralized network and validated independently by network participants. Once the transaction has been validated, it is stacked with other transactions to create a new "block" on the network. Anybody can see that the transaction between two wallets has taken place. However, although transactions are transparent, wallets ownership is pseudonymous and nobody on the network necessarily knows that these wallets belong to Carla and Pedro; they only see the wallet's address.

³ This refers to any form of payment that takes place in a purely electronic form.

How is the transaction validated and the wallet protected? Each wallet has two keys, one private, one public. Carla, Pedro, and every other participant have a unique key required to access each wallet. If Carla loses her key, and assuming she was its only holder, neither she nor anybody else will be able to access the wallet again. The second key is a public key attached to each wallet. When Carla sends Pedro \$20, the transaction uses Pedro's public key to verify it, and only Pedro can read and accept the transaction by matching it to his private key. All these steps are generated by software; all Carla can do is click the Send button. In other words, there is no need for a third-party verifier to securely complete the transaction.

This example focuses on currency transactions, but the same technology, as noted earlier, could theoretically be applied to any type of specific information that is recorded online.

Overview of the Study

Our goal was to analyze how state and local governments are using crypto and blockchain technology in the US. Specifically, we sought to answer three questions:

1. What is the landscape of state-level blockchain and crypto laws in the US?
2. How are local governments using crypto and blockchain technologies?
3. Are state and local governments thinking of the equity implications related to governmental use or regulation of these innovations?

To answer these questions, we first built a legal database tracking state laws and initiatives related to blockchain technologies and cryptocurrencies. We focused on collecting proposed bills, opinion letters/guidance, executive orders, and laws. We started by compiling initiatives from three existing databases (NCSL,²² Bloomberg Law,²³ and Carlton Fields²⁴), then complemented our search by looking at state legislature websites. For each proposed bill, we included the text of the proposed law and produced a summary of it, the year it was introduced, its sponsors, and when the law was passed (if it did). We then conducted a search for relevant news articles for each state on the use of crypto or blockchain. Last, we classified all passed laws into various categories.

We devised a coding scheme to compare laws across states and to provide insights on which states (1) explicitly regulated cryptocurrency, (2) explicitly regulated blockchain, (3) have created a study committee to explore the potential of blockchain and cryptocurrency, (4) allow payments in cryptocurrency, and (5) provide incentives to blockchain and cryptocurrency companies. More details on our classification method are available in appendix A. A matrix that shows which states have at least one law in each category can be found in appendix B.

Second, we collected a list of local (city and county) blockchain and crypto initiatives across the US. We started by searching for any initiative passed or considered in the 50 largest US cities, then complemented this search by looking online for other local initiatives at the county and local levels. We classified these initiatives into two types: (1) whether they used the technology itself and (2) whether the project was crypto focused. We also derived a series of subcategories based on the goals of each initiative.

Third, we conducted semi-structured, in-depth interviews with 24 public officials from nine cities, one county, and two states. We complemented our conversations via two interviews with crypto experts and one interview with a developer. We identified interviewees by creating a list of local

governments that had enacted a crypto or blockchain pilot in the last five years. The interviews took place between August and November 2022. In our conversations, we discussed

- specific policies the local government had enacted,
- implementation status and common challenges in the implementation effort,
- goals of the policies,
- whether the policies incorporated an equity lens,
- the overall opinion of participants about the regulatory state of blockchain technologies and cryptocurrencies in their states, and
- perceptions on the future of these innovations for local governments.

Because most of these pilots are still in early stages, and to preserve confidentiality, we do not include identifiable information for the people we interviewed.

Lastly, we analyzed 11 reports from state-level study committees on the potential of blockchain and cryptocurrencies for local governments. States represented were California, Colorado, Florida, Illinois (2017 and 2018), Kentucky, New Jersey, North Carolina, Texas, Vermont and West Virginia.

Our study has two important limitations. First, although we believe our database includes most proposed bills and laws passed in the last five years, the rapidly moving legal landscape around these technologies and the difficulty of analyzing all session laws in each state means that the database is not comprehensive. Importantly, we built the database through September 2022, so measures enacted after that date were not included. Second, we were only able to interview officials in 10 local governments and 2 state governments. Most of these governments were in early implementation or design phases of the pilots, meaning that it is still too early to fully gauge the effects of these policies.

Findings

The Outlook of Local Blockchain Laws and Initiatives

State Laws

The decentralized nature of blockchain technologies and cryptocurrencies presents challenges for regulators. As with other technologies, crypto and blockchain are often not restricted to only one geographical area, making it hard to establish which entity has jurisdiction. Also, when enacting guidelines, regulators need to reconcile two seemingly contradictory aims: protecting consumers and encouraging innovation. Members of the House created the Congressional Blockchain Caucus in 2016, and various crypto bills were proposed in 2022. However, to date only regulatory agencies have issued guidance on digital assets in the United States.

Meanwhile, states have started crafting their own laws, guidance, and opinion letters.⁴ Most states have passed at least one type of blockchain/crypto law in the categories we studied. Since February 2022 we recorded 18 opinion letters, executive rules, and the like; 149 proposed bills; and 166 laws related to crypto or blockchain. Many states have included virtual currencies under existing money-transmitter rules, and other have passed specific virtual currency laws, such as how crypto should be treated for tax purposes. Some states have shown broader interest in regulating blockchain technology overall. However, the laws vary widely both in goals and scope.

Here, we provide a broad summary of what these laws look like in US states. Importantly, our goal was to take stock of the legislative landscape and track laws that directly or indirectly relate to cryptocurrencies or blockchain. We did not track whether states are friendly to cryptocurrencies or blockchain but rather the engagement of lawmakers around these technologies. Nor did we specifically analyze whether the laws promote or set boundaries on the technology, just whether they are indeed regulating the technology in some way. Other databases may show state crypto/blockchain friendliness, and although these may correlate with our work, friendliness and regulation/legislation do not necessarily equate.

⁴ Opinion letters are issued by government agencies to explain how a particular law is to be enforced or understood.

Figure 2 shows that at least 28 states have started enacting policies for blockchain technologies in some aspect. Here we include any law that generally mentions blockchain technologies. Because the applications of blockchain technologies are wide ranging, the scope of passed laws varies greatly. For example, Arizona preempts⁵ counties from restricting people who want to mine crypto in their residences.²⁶ California has an executive order to create a transparent and friendly business environment for companies developing blockchain technologies.²⁷ Delaware allows corporations to use blockchain technologies to create and maintain corporate records.²⁸ Last, a New York State law imposed a two-year moratorium on proof-of-work cryptocurrency mining, meaning that unless companies use 100 percent renewable energy for mining, they will lose their permits.²⁹

States have also started to include virtual currencies explicitly and implicitly in their laws. Explicit laws mention virtual currencies directly; implicit laws don't mention virtual currencies but can be interpreted to include them. For example, North Carolina has a broad encompassing definition that implicitly includes virtual currencies in their definition of monetary value: "A medium of exchange, whether or not redeemable in money."³⁰

We found that 44 states have laws that explicitly mention virtual currencies (figure 2). Here we include any laws that mention cryptocurrencies or virtual currencies. State laws have tended to mention crypto in three different ways: by (1) including it in their definition of money, (2) creating a specific definition of virtual currency, or (3) including it in the definition of *money transmitter*. One important point: each of these approaches can have different effects (e.g., can change whether a trader needs to acquire a license when handling crypto). For example, some states, such as Connecticut, have developed a definition of virtual currencies that means any type of digital unit that is used as a medium of exchange, is a form of digitally stored value, or is incorporated into payments-system technology.³¹

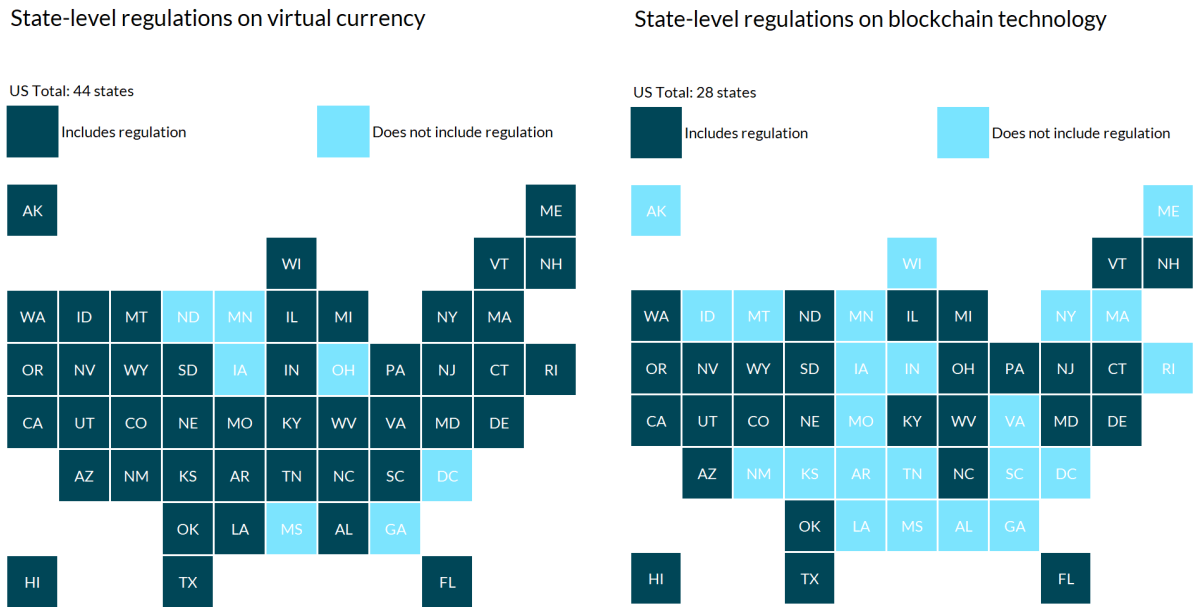
North Carolina, on the other hand, includes virtual currencies in their definition of *money transmitter*: "to engage in the business of any of the following: [. . .] This includes maintaining control of virtual currency on behalf of others." Other states incorporate cryptocurrencies into their definitions of money; Missouri defines *money* as "currency and coin of the United States or of any other country, crypto currency, travelers' checks, personal checks, bank checks, bank wires and money orders."³²

Still other states explicitly exclude virtual currencies from their definitions. For instance, Utah's definition of money transmission specifically excludes blockchain tokens.³³ Further, whereas some

⁵ A *preemption law* is a law that allows upper levels of government (in this case, of a state) to restrict or prevent lower-level governments (in this case, counties) from regulating a specific policy field (here, restrictions on crypto mining).

states do not include virtual currencies in the definition section, they do explicitly refer to them in other laws. Oregon does not explicitly include crypto in its money and payments definitions but does prohibit any payments to the state government using cryptocurrencies.³⁴

FIGURE 2
States That Expressly Regulate Blockchain Technology and Crypto



URBAN INSTITUTE

Source: Author’s database.

Notes: Regulations in the first map include laws, executive orders, agency letters, and guidance that mention virtual currencies, cryptocurrencies, and digital currencies. The second map does not include laws regulating cryptocurrencies but rather the technology itself and its development. Regulations in this case include laws, executive orders, agency letters, and guidance that mention blockchain technologies in general.

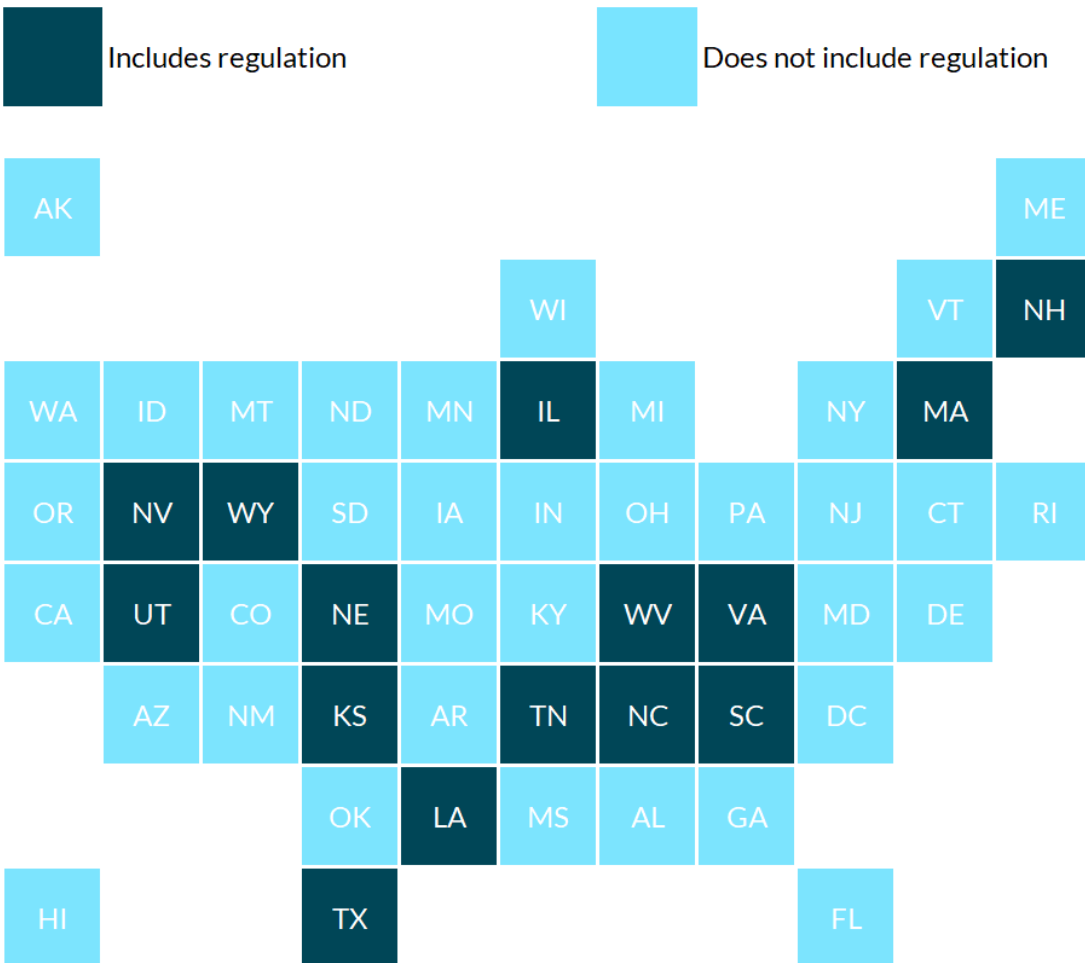
Fifteen states give special licensing exemptions for crypto, typically using two different approaches (figure 3). The first is when the law defines virtual currency or includes virtual currencies in the definition of money or money transmission, and explicitly includes various exemptions. For example, North Carolina’s definition of money transmission mentions virtual currency, and the provision in the law on licensing exempts an express agent of the payee when paid in cryptocurrencies.³⁵

Second, when the law does not explicitly regulate virtual currency, it lists explicit exemptions to licensing requirements. South Carolina does not explicitly mention virtual currencies in its money and payments definitions, but the office of the attorney general issued an order establishing an exemption

for virtual currency ATMs when they do not act as a third party and only facilitate a sale or purchase of virtual currency.³⁶

FIGURE 3
States That Exempt Licenses for Virtual Currency Handling

US Total: 15 states



URBAN INSTITUTE

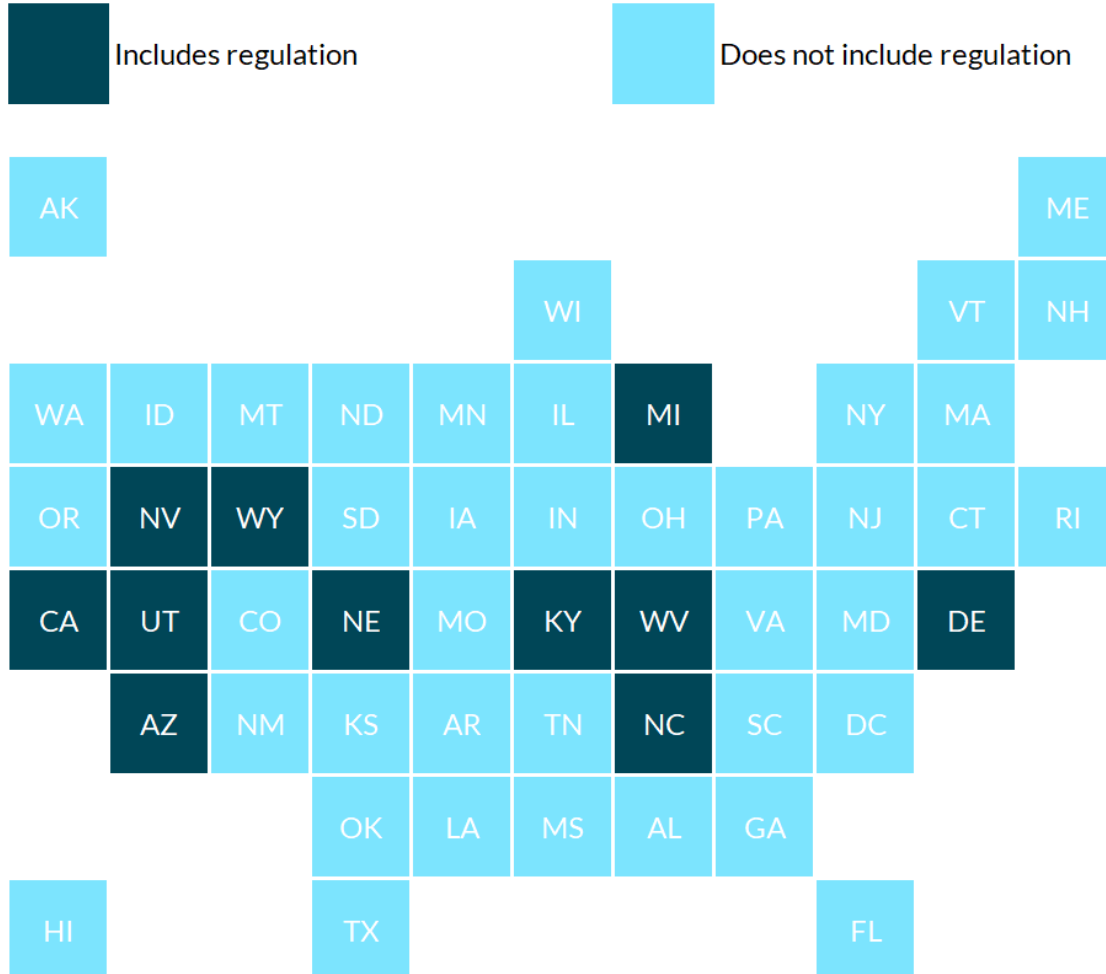
Source: Author's database.

Notes: We include laws, executive orders, agency letters, and guidance that mention any exemptions for virtual currency handling.

FIGURE 4

States That Provide Incentives or Benefits for Business Development Related to Blockchain Technology

US Total: 11 states



URBAN INSTITUTE

Source: Author's database.

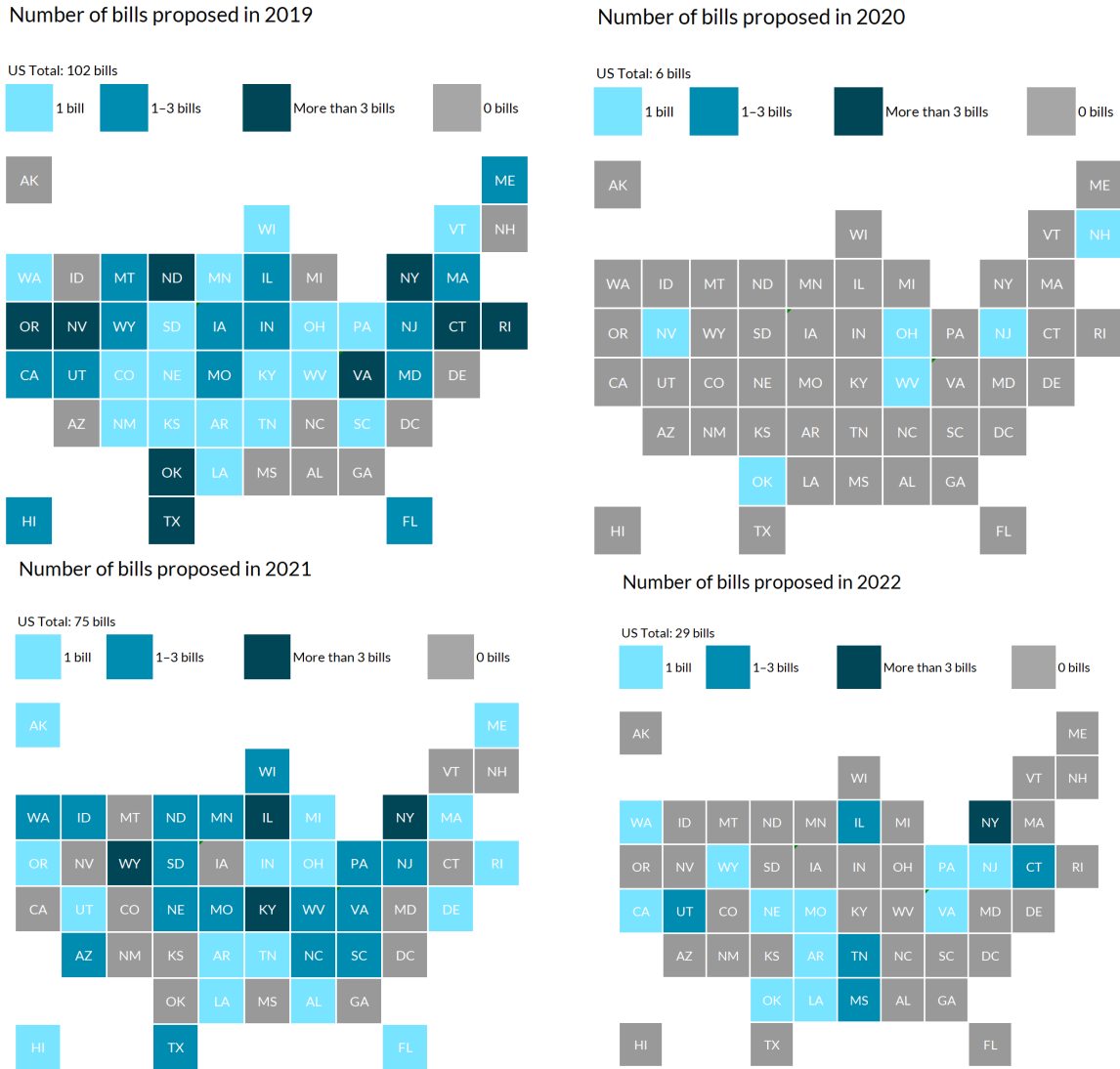
Notes: We include laws, executive orders, agency letters, and guidance that mention any incentives or benefits for business development related to blockchain or cryptocurrency.

We also determined that at least 11 states want to position themselves as business friendly to blockchain and crypto companies by offering incentives (figure 4). For example, Kentucky provides energy and tax breaks for crypto miners.³⁷

Last, our search indicates that Colorado, Missouri, and Utah have started to allow citizens to pay for public services, taxes, or fees with cryptocurrencies.³⁸

Before 2019, only 16 states had introduced crypto/blockchain proposals. However, the following years saw a surge in blockchain and crypto bills, except 2020 (likely because of the COVID-19 pandemic). Although many of these bills failed, mapping them provides an overview of the regulatory appetite across states, as well as the lack of support for their passage in certain cases. Certain states stand out for their volume of proposed bills, but none are particularly prevalent over time (figure 5). Also note it is not specific to cryptos or blockchain technology for far more bills to be proposed than to be passed during a legislative session.

FIGURE 5
Cryptocurrency and Blockchain Bills Proposed in 2019–22



URBAN INSTITUTE

Source: Author's database.

Notes: For the number of bills proposed in 2022, data were collected through September 2022.

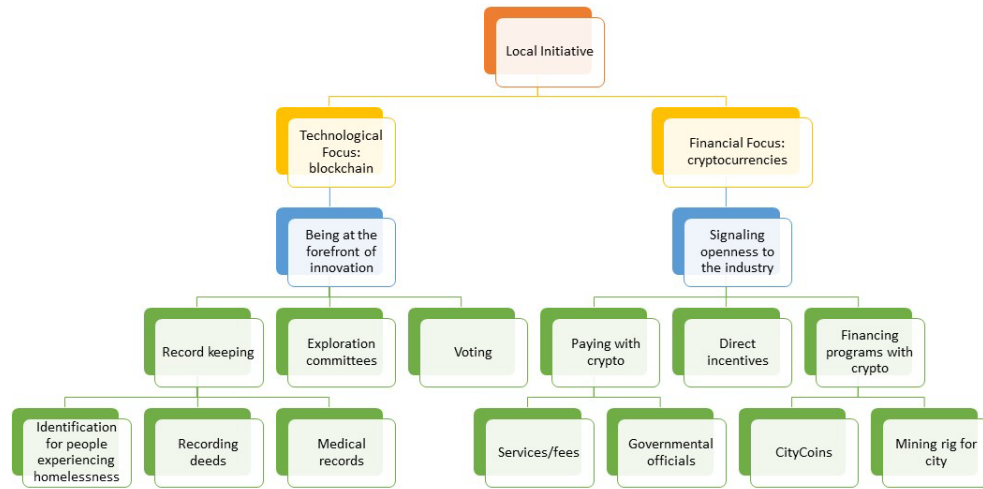
County and City Initiatives

Local governments have launched increasing numbers of blockchain and crypto initiatives. We classify the focus of these initiatives along two main dimensions: technological and financial (figure 6). Those using blockchain or crypto with a technological focus often have the main goal of creating innovative

government services and operations. For users with a financial focus, the main goal likely is promoting economic development or signaling openness to the new industry.

FIGURE 6

Local Blockchain and Crypto Initiatives by Intended Goal



URBAN INSTITUTE

Local blockchain-technological initiatives have had three main uses: record keeping, exploratory studies, and voting. Various county and city governments have created exploratory commissions to research the benefits and risks of blockchain. For example, Austin created a group to explore the benefits of blockchain for the city, as well as its potential to alleviate inequities in accessing public services.³⁹

Thus far, local governments appear most interested in the record-keeping capabilities of blockchain technologies, including recording deeds and all types of licenses (see box 1), both from transparency and user-friendliness perspectives. For example, New York City was exploring this use to prevent deed fraud in land sales.⁴⁰

BOX 1

Blockchain Initiative: Austin's MyPass Initiative Case Study

- **When?** In 2018, the city of Austin partnered with Dell Medical School at the University of Texas at Austin to pilot the creation of a digital identity wallet. The wallet would use blockchain technology and include personal and medical information and court records for individuals facing housing insecurity.
- **Why?** To consolidate the identity of people experiencing homelessness, and to help reduce the number of barriers these communities face when lacking ready access to identifying information. Blockchain platforms offers the possibility of streamlining record-keeping systems used across service agencies, such as shelters, hospitals, or court.
- **How?** Focus groups of people experiencing homelessness were conducted to pilot the initiative, and a hackathon was held for developers and volunteers to craft solutions and test the efficiency of the technology. Austin also hired a private company to develop the pilot.

Results of the Pilot

- People experiencing homelessness and care organizations were able to use the platform easily.
- The study identified issues related to security of data shares, user experience, and adoption and organizational preparedness from care organizations.
- Limitations included user adoption, cost-effectiveness, scalability, and regulatory frameworks.

Source: Baird, Sarah. 2019. "Fail-Safe Keeping of Personal Records." *Stanford Social Innovation Review* 17 (3): 9–10; Khurshid, Anjum. 2019. "Austin's MyPass Initiative: A Pilot Study of Using Blockchain Technology for the Homeless." *Journal of Medical Internet Research*, 22 (6).

Beyond record keeping, some local pilots are exploring the use of blockchain for voting. Although the technology is still new, proponents highlight the security and transparency that the blockchain process offers (GAO 2022). For instance, West Virginia led a voting experiment for the 2018 general election using blockchain technology for US citizens living overseas; this technology has since been scaled up for use in several other elections (Moore and Sawhney 2019). However, other studies have identified a host of risks related to the use of blockchain for voting and an MIT audit identify security concerns⁴¹ related to the West Virginia voting experiment⁴².

A recurring theme for enacting local crypto policies was signaling openness to the industry. This goal was most common among projects with a financial focus. However, even cities exploring the capabilities of the technology acknowledged in our interviews that part of their motivation was to signal to entrepreneurs and blockchain companies that they are business and innovation friendly.

So far, two cities (Miami and New York) have been issued their own crypto token by a private company⁴³ (see box 2). Other cities have started mining Bitcoin or other cryptocurrencies with their own mining rigs,⁶ often because low energy prices in their states make it profitable. For example, Fort Worth, Texas, is piloting a mining rig to test whether it could eventually become a source of income for the city.⁴⁴ Other local governments are considering investing in crypto directly to finance specific programs. Interestingly, not all cities look upon crypto positively, and a few have banned mining operations in their jurisdiction.⁴⁵ However, results have also varied in terms of profitability for various municipalities depending on a host of variables, including having access to cheap electricity⁴⁶ or the high volatility associated with cryptocurrencies.⁴⁷

Cities are also exploring how to allow citizens to pay for government services with crypto. For this, they typically contract with a private company that exchanges crypto against US dollars, as most cities are legally not allowed to accept cryptocurrencies directly. Chandler, Arizona, is allowing its residents to pay utility bills with crypto.⁴⁸ Similarly, some cities⁴⁹ have offered to pay governmental officials directly in crypto. For instance, New York City mayor Eric Adams announced that he would accept his first three paychecks in Ethereum and Bitcoin.⁵⁰

Last, several cities have explored creating specific incentives for technology companies to relocate. These incentives include contracts to provide government services, specific tax incentives, and low energy costs. Columbus, Ohio recently offered tax incentives for a Bitcoin-focused financial services company to relocate to its city.⁵¹

Lessons Learned from Local Pilots

Through qualitative interviews, we were able to get in-depth knowledge on projects local governments are piloting, implementing, and envisioning. Although we observed similar challenges around implementations across local governments, initiatives varied widely in goals and scope.

Figure 7 presents a word cloud generated from the conversations with interview participants, depicting the frequency with which participants referenced each word. The words *blockchain*, *technology*, *cities*, *crypto*, *states*, *Miami*, and *regulations* share top spots, and the words *implementation*, *innovation*, *create*, *development*, and *needs* are also prominent. They reveal the largest themes discussed in our interviews and the three main lessons our participants highlighted:

⁶ A mining rig is a computer or set of computers used or customized for cryptocurrency mining.

BOX 2

Crypto Initiative: CityCoins Case Study

How Does It Work?

CityCoins were initially launched by a private company (CityCoins), but private citizens who are interested also can mine the coin. When a city's coin is launched, anyone can compete to mine it. Once mining has started, 70 percent of the rewards are distributed to people in the form of a different crypto token, Stacks, and eventually as Bitcoin rewards. The other 30 percent are sent to the city's custodied reserve wallet, if it decides to claim the funds. The mayor of a city also may access the wallet and convert the Stacks token into US dollars to use as government revenues.

Which Cities Have City Coins?

Miami was the first city to have a coin launched by CityCoins. In September 2021, Mayor Francis Suarez tweeted that the city commissioners had voted to accept the funds raised through MiamiCoin,¹ which were then valued at \$4.3 million and later increased to \$5.25 million. The mayor announced the money would be used to fund a rental assistance project for residents experiencing high rent hikes.²

CityCoins also issued New York City a token, but the city has not yet accepted transfers, likely because the value is not high.³

Other cities^{4 5} signaled interest in the coin early on but stopped pursuing the project soon after. However, it is important to note that the Miami and New York arrangements are not partnerships, as the initiatives were entirely conducted by the private company.

How Has the Value of the Coin Fluctuated?

The values of both MiamiCoin and New York Coin decreased significantly between December 15, 2021 and December 15, 2022, by about 94.28 and 80.98 percent respectively.⁶

¹ Mayor Francis Suarez (@FrancisSuarez), "Miami votes to accept the \$5M+ (and growing!) gift contribution from @mineCityCoins ✓," Twitter, September 17, 2021, 3:55 p.m., <https://twitter.com/FrancisSuarez/status/1438230032464420867>.

² Gian. M. Volpicelli, "MiamiCoin Is Crashing, but It Won't Go Away," *Wired*, April 29, 2022, <https://www.wired.com/story/miami-crypto-miamicoin/>.

³ CityCoins, "NYCCoin," accessed December 14, 2022, <https://www.citycoins.co/nyccoin>.

⁴ Noah Zucker, "Philly-branded cryptocurrency being considered as vehicle to fund civic projects," *Philly Voice*, February 12, 2022, <https://www.phillyvoice.com/philly-cryptocurrency-citycoins-municipal-funding/>.

⁵ Coinbase, "NewYorkCityCoinNYC," accessed December 14, 2022, <https://www.coinbase.com/price/newyorkcoin>.

⁶ Coinbase, "MiamiCoin MIA," accessed December 14, 2022, <https://www.coinbase.com/price/miamicoin>.

BLOCKCHAIN AND CRYPTO INITIATIVES RESPOND TO DIFFERENT GOALS, SO SEPARATING THESE TWO TYPES OF INITIATIVES IS KEY

From the start of our conversations, participants explicitly distinguished between crypto and blockchain technologies, and their applications (all blue blockquotes are from interview participants).

I pull a strong curtain between blockchain as a tool and blockchain as crypto.

The Colorado Council for the Advancement of Blockchain Technology Use suggested that the unclear distinction between tokens (cryptocurrencies) and blockchain technology at large can confuse policymakers (CCABTU 2019). One of their recommendations is to clarify the difference through the passage of the Colorado Digital Token Act, introduced in January 2019, in which, legislators created some exemptions from licensing requirements for people dealing with virtual currencies.

Participants told us that blockchain technologies would allow local governments to deliver better services to constituents, particularly for accessible and safe record keeping. Many of these participants' governments had invested in blockchain pilots as a way to experiment with innovation and to be at the forefront of technological change.

Besides the security aspect of blockchain it's both a highly secure and easy to navigate digital environment. It can create a one-stop shop for constituents. It creates a single presence for people to be able to interact with the government.

For cryptocurrencies, participants talked about attracting new business, taking a customer service approach to government, offering a way of financing projects, and providing financial relief to constituents.

I've mentioned previously all of the economic benefits, including high-paying jobs and millions of dollars in economic development, that have derived from our push to build an inclusive and tech-driven ecosystem.

However, participants identified highly different goals for each initiative, some broad, others specific. Certain government officials highlighted that their main goal was to learn more about the potential and risks of blockchain technologies. Others told us that they wanted to use the technology for managing databases in more secure ways, influencing economic outcomes, educating the public, funding equity projects, and making current procedures more efficient.

We have made sure that each and every innovator feels welcome, so they realize that local officials here take pride in embracing technology and pushing forward an agenda that creates an ecosystem that is inclusive, diverse, and tech-friendly—and ultimately reach our goals of building an economy that works for everyone.

Cities' exploratory commissions have also found various potential use cases. In California, a 2020 report (California's Blockchain Working Group 2020) evaluated a series of blockchain applications: including its use for health records, supply chain structures, property management platforms, utilities and natural resources management platforms, use in finance/payments/commercial businesses, use for civic participation, and its use for education and workforce record keeping.

The Florida Blockchain Task Force (FBTF 2019) also acknowledged and defined the difference between several types of blockchain technologies, including financial technology (aka *fintech*), cryptocurrency, public and private blockchains, smart contracts, DLT, and consensus algorithms.

GOVERNMENTS FACE COMMON CHALLENGES AND OPPORTUNITIES WHEN IMPLEMENTING BLOCKCHAIN AND CRYPTOCURRENCY INITIATIVES

The general skepticism around crypto has added to government's initial reluctance to adopt new initiatives and has made the implementation of pilots more complicated. The blockchain exploratory

report of the Vermont State Archives and Records Administration (VSARA 2019) uplifted the need to get the public on board with the technology before it can be scaled up by government agencies.

Major difficulty is to get everyone on board in the government.

There is a strong skepticism about crypto, understandably. This is not going to work until the interest grows among the public.

Several participants alluded to the infancy of the technology, implying that a lot of development and logistical work is still needed before any of these pilots could be scaled up. Even when pilots are promising, the issue of scaling up the use of the technology beyond specific applications in local governments was a recurring theme as well.

The web3 [a new iteration of the World Wide Web that incorporates blockchain technologies] companies are still pitching ideas but there's no scaling or implementation and they're pivoting to Environmental, Social, and Governance for transparency and auditability.

Some participants mentioned the practical challenges that must be addressed, such as the need to have large mining facilities, the cost of the electricity they use, or the requirement of hiring third-party providers to transfer cryptocurrencies into dollars. Others referenced the highly volatile environment, sometimes expressing great concerns for equity (see also the section titled “Incorporating Equity into Local Blockchain and Crypto Initiatives”). Most participants acknowledged the complications related to the lack of laws at the national and state levels.

There's no evidence that crypto is good for financial inclusion.

It's one thing if somebody (especially somebody of means) [were] to take some of their superfluous income and invest privately on their own—it's another thing for someone who might earn a more modest wage [to] think to themselves "oh the govt set this up for me, I'm going to take advantage of this" and then wonder why it doesn't do well or worse why their investment bottoms out.

Implementing crypto initiatives is not currently a feasible option legally. Beyond other practical challenges.

Right now the crypto market is like the Wild West, not backed by the government, no standard means of transaction.

Projects using blockchain technology also faced unique barriers. Although the technology is touted as a way to improve data safety, local government officials have concerns about potential privacy consequences of keeping records in the blockchain. Cost concerns also came up in different conversations. More than a couple of participants mentioned that other technologies were able to provide the same capabilities at lower costs. Similarly, the report by Vermont's State Archives and Records Administration (VSARA 2019) argues that one major challenge there in applying blockchain to public record keeping is that their current systems are not designed for blockchain.

It was expensive, and they weren't truly ready to take on the task as a company.

In many cases there are other techs that can do digital ledger faster and safer and cheaper.

Our participants pointed out several challenges with blockchain implementation, many of which are highlighted in detail in various state reports. California's Blockchain Working Group, for example,

suggests implementing a decision-tree approach to help policymakers determine if blockchain is the correct solution to a given problem. Considerations the group cites include regulation, whether a permanent record is warranted, and enhancing trust among participants. The California panel also described the difficulties of scalability, educating the public, and aligning governance standards across businesses.

The North Carolina Blockchain Initiative report (NCBI 2020) details four steps that the state could take to foster blockchain growth:

- passing pragmatic legislation, including incorporating blockchain and smart-contract taxonomy into the state code, and acknowledging informally that previous law can be used to legally enforce smart contracts, electronic signatures, and electronic recording
- using crypto initiatives to promote investment and innovation
- creating regulatory amendments to promote blockchain innovation in the state, and planning for future initiatives

Among the blockchain issues CCABTU (2019) notes are that (1) banking regulation/money transmission rules for crypto are not legally clear, (2) banking with cryptocurrency is hard to track, and (3) issues with trust and custody persist.

The Illinois Blockchain and Distributed Ledger Task Force (IBDLTF 2018) identified several characteristics of blockchain technology that can aid governance, including reconciliation, data integrity, and improving both resilience and security in transactional systems. The task force argues that processes such as forensic analysis and legal discovery could be conducted more efficiently with blockchain technology because of these characteristics. However, it also identifies a series of challenges that replicate what we heard in our conversations. These include the high energy consumption of mining, the hard scalability of projects, and interoperability between blockchain structures, among other technology and privacy concerns.

The Commonwealth of Kentucky Blockchain Working Group (CKBWG 2020) also identified many recommendations for exploring blockchain technology use in their state, but again warned of numerous challenges similar to those we heard in our interviews. Interestingly, the task force named regulation as a potential hurdle for blockchain technology, saying it could impede innovation.

New Jersey has identified ways in which lack of cryptocurrency regulation specifically has left their residents vulnerable to schemes and illicit activity regarding Bitcoin ATMs (New Jersey Commission of Investigation 2019). Bitcoin ATMs are machines that look like regular, regulated ATMs but allow

customers to withdraw and deposit cryptocurrency. Because these machines are not regulated in the state, fraudulent activities involving them have not been reported, according to the report.

THERE IS A LONG WAY TO GO FOR BLOCKCHAIN

A recurring theme in all conversations was that most initiatives were still at the pilot stage and designed for smaller-scale projects. The impression most interviewees gave was that they were still exploring possibilities and assessing scalability.

We are trying something small and manageable that's easy to implement: bicycle registration, parks, and recreation department with reservations/booking or building permits (from multi-story homes to new water heater—quick over-the-counter permits.

In some conversations, participants shared that these projects had started because developers had approached city governments. In other cases, they told us that high-level policymakers had specifically requested pilots.

I got a call that said the mayor's going to make a blockchain resolution so you're going to be the point person on it.

We were approached by a local attorney as well as a consultant. I met with the two of them to talk about the potential of blockchain. I didn't know anything about it but knew it was coming. We are always behind the curve, so we thought it was an interesting conversation.

Still, most participants were excited about the potential of using blockchain or incorporating crypto initiatives, even when they were not sure about how or when these initiatives could be fully implemented.

Last Friday I was at an educational session on the use of crypto for tax payments. There is a slow uptake, some concerns with regards to issues of identification. But we need to recognize that it is on the horizon. Aside from volatility we need to be smart. For example, we should not conflate it with blockchain technology. There is a potential for blockchain technology in various parts of the government. Even that has not been fully explored.

In a few cases, projects had a special focus on equity. Some participants thought about them as mechanisms to address equity concerns in their jurisdictions. Others talked about the equity implications of enacting these initiatives.

The more barriers you can remove the better, using tech you can remove barriers to give equal/equitable access to more and more people.

It is crucial to always have in mind equity and inclusivity when pushing forward policies related to technology. Our administration has always focused on the education side of the equation.

The Colorado Blockchain Council names several realms in which it believes blockchain will make significant changes, including currency, commodities, digital assets, lending, secondary markets, advertising identity, and government identity (CCABTU 2019). In advertising identity, for example, the council notes that users of social media platforms can control their personal data with more precision, deciding which companies can have access as they see fit. For lending, the council highlights that some lending platforms are starting to use blockchain to loan borrowers US dollars from their cryptocurrency and other digital assets.

The final report of the Texas Work Group on Blockchain Matters (TWGBM 2022) identified educational initiatives related to blockchain technology as promising, including creating more robust privacy protections for student data, and investing in grants for higher education and online education systems to offer classes regarding blockchain.

Incorporating Equity into Local Blockchain and Crypto Initiatives

Several mayors have spoken publicly about the transformative power of blockchain and crypto in helping eliminate inequities. At the 2022 US Conference of Mayors meeting, participants discussed the potential of crypto initiatives to influence people with low incomes, particularly people of color. There, Miami mayor Francis Suarez suggested that crypto was a great mechanism to help underserved communities.⁵² In other contexts, mayors have suggested Bitcoin could help bridge the wealth gap.⁵³

In turn, cities have explored equity-focused crypto/blockchain ideas and assessed the benefits and challenges of these initiatives for different communities. For instance, Philadelphia briefly considered creating a cryptocurrency with CityCoins to fund housing and digital literacy projects.⁵⁴ Still, equity implications largely have been an ancillary consideration for local governments, and few cities have taken a thorough equity approach when piloting blockchain or crypto initiatives.

Several surveys suggest that people of color invest, trade, and use cryptocurrencies at relatively high rates. For instance, a 2022 Pew Research Center survey found that Asian (22 percent), Hispanic (22 percent), and Black (20 percent) respondents were more likely than white ones (13 percent) to have invested in crypto (Faverio and Massarat 2022). A survey from the National Opinion Research Center (NORC) at the University of Chicago also found that 44 percent of Americans using or trading crypto are people of color.⁵⁵ The 2022 Schwab Black Investor Survey concluded that 25 percent of all Black Americans owned cryptocurrencies, with a rate of 38 percent for Black Americans under 40.⁵⁶ Age also determines who invests in crypto. According to the Pew survey, 31 percent of those ages 18 through 29, and 21 percent of those ages 30 through 49, invest in crypto, compared to only 8 percent of those ages 50 through 64 (Faverio and Massarat 2022). NORC likewise found that the average trader is under 40 and lacks a college degree.⁵⁷

The overrepresentation of people of color in this space is likely related to various public narratives surrounding crypto. Eliminating traditional financial middle parties can aid communities of color in removing gatekeepers and reduce the need for face-to-face interactions to access financial services. The hope of crypto advocates is that under this system, unbanked communities might more easily access financial services (Carmona 2022). Other anecdotal accounts reference the prospects of crypto for wealth building and (in the case of cities) supplementing local revenues.⁵⁸ These aspirations have not yet materialized, however, and the precipitous 2022 fall in valuation of many crypto tokens sheds doubt on their equity potential. Meanwhile, the crypto world remains highly unequal: research has shown that

the volatile environment and the lack of regulations may be creating a situation of “predatory inclusion” for communities of color (Carmona 2022).

An additional equity concern is the potential effect of crypto and blockchain on the environment. Crypto mining can be very energy intensive; a White House factsheet found that mining can use “considerable amounts of electricity usage, which can result in greenhouse gas emissions”, and impose “additional pollution, noise and other local impacts” to communities.⁵⁹ This is not true for many cryptocurrencies, such as Ethereum and United States Dollar Coin (or USDC, the “stablecoin” pegged to the US dollar predominantly built upon Ethereum) but is an important consideration for evaluating specific crypto and blockchain uses. Research suggests that considering the equity and environmental implications of local crypto and blockchain initiatives is crucial, particularly when such plans may harm neighborhoods with communities of color (The White House 2022).

Local governments are starting to incorporate equity tools to assess policies, initiatives, and programs across their departments. For example, the Seattle Race and Social Justice Initiative created a racial equity toolkit (which government agencies are starting to use) for the development, evaluation, and implementation of any local policy or program.⁶⁰ But many jurisdictions have no infrastructure in place to implement or apply an equity lens to new initiatives.

Research on the different ways in which equity can be incorporated into local governance, as performed on the results of pilots in cities across the US, has highlighted a series of important lessons. Among these, cities have had to (1) define what equity looks like for their specific jurisdiction, (2) create a specific infrastructure at the individual and departmental levels, and (3) ensure sustainability over time (Jacob 2020).

These pilots have shown that incorporating equity can succeed in both top-down and bottom-up approaches. Preliminary evaluation of equity pilots suggests that implementing equity is a long process that requires eliminating individual, institutional, and structural racism (Jacob 2020; What Works Cities 2022; Yearby et al. 2021). These findings could help pave the way for including equity concerns in blockchain and crypto efforts, even in cities that have not yet implemented a whole-of-government equity approach.

Although creating a comprehensive crypto-equity toolkit is beyond the scope of this study, our findings suggest that local governments designing, piloting, or implementing crypto blockchain initiatives should incorporate the following considerations.

For Any Crypto or Blockchain Initiative, Governments Should Clearly Define What Equity Will Comprise, Then Set Specific Community Outcomes for Racial Equity

Previous work on incorporating equity into policies has found that developing a shared vision/statement, in conjunction with key stakeholders, of what equity looks like in each jurisdiction is crucial for establishing priorities for implementing a project (Jacob 2020). Each project also should include a list of specific desired community outcomes (e.g., areas of opportunity) that it must achieve. In the case of crypto initiatives, an example could be bridging the racial wealth gap by allowing communities of color access to crypto investment opportunities. In this example, governments should map out all possible outcomes related to promoting investing in crypto.

Our interview results show that equity definitions remain vague and uncertain. Without a defining vision of equity goals, local governments will have difficulty tracing the equity effects of their policies, including any harms produced by blockchain and crypto policies.

Planners Should Identify Stakeholders and Their Incentives, and Involve Specific Communities in the Design Phase

When enacting blockchain/crypto initiatives, policymakers should promote innovation while protecting consumers. Because these policies are typically designed and implemented in collaboration with or entirely by private companies, cities need to establish competitive processes for selecting developers. These initiatives should be born in consultation with residents that will ultimately be impacted. Our findings suggest that this has not always been the case in cities across the US. To address this, cities ought to ensure their states' regulatory landscape requires alignment of developer incentives with both consumer protection and equity targets.

Planners should make a concerted effort to identify which communities these policies will most benefit and burden. For example, if the city builds a city token and incentivizes investment from its citizens, it should evaluate any possible impact to communities and identify their racial demographics. In addition, potential users will need to be made aware of the volatility associated with these activities, particularly since crypto and crypto-related products are often targets for fraud, scams and hacks (CFPB 2022).

Policymakers also should include community members and other relevant stakeholders during the design phase, to include their lived experiences, expertise, and concerns. In the city token example,

planners should incorporate feedback on how the policy could affect communities at risk and what should be done to avoid further burdens.

Last, local governments, in conjunction with research institutions, should craft data collection methods to map how different communities are now affected by these policies. Our research found that developers' needs receive the most attention in these initiatives; planners must work harder to include other important stakeholders.

Government Staff and the Public Both Should Clearly Understand the State- and National-level Crypto and Blockchain Regulatory Landscape.

Local governments should work with statehouses to devise comprehensive legal frameworks that allow them to reconcile promoting innovation with protecting consumers. Regulations should establish clear definitions for different processes and products while setting boundaries to promote equitable community outcomes in their applications.

Governments also should inform the public about the potential risks of crypto initiatives and involve constituents in these processes. In the case of the city token, planners should host informational sessions that explain the many risks associated with crypto investment and provide a clear understanding of the coin's purpose and uses. Another example is that if city employees are paid with crypto, they should be made fully aware of the volatility associated with those tokens.

Our findings suggest that, as with equity definitions, the regulatory landscape of these technologies likewise remains uncertain, and more databases should be built that depict the playing field upon which local governments may act. More importantly, our research shows that there is still much misinformation about the differences between blockchain and crypto initiatives, as well as the risks and potentials of the technology, both within governments and among the public.

Cities Should Determine the Benefits and Burdens of Crypto and Promote Improvements While Minimizing Harm.

During the design, piloting, and implementation phases, cities should incorporate feedback from stakeholders, data from expected outcomes, and knowledge on the regulatory status of crypto. This process is important for determining benefits and burdens, as well as for aligning initiatives with expected racial equity outcomes. Our findings suggest special emphasis should be placed on the following areas:

- analyzing the environmental effects of mining, including determining which communities are most harmed by environmental impact because of their location or energy generation, or from possible impacts of higher energy costs
- studying whether blockchain technologies offer a superior benefit over other technologies, including a cost-benefit analysis of available technological options⁶¹
- focusing on whether crypto/blockchain policies improve the overall selected outcome for all communities, whether racial gaps have been reduced, or if a community has been harmed by the policy (Jacob 2022)

Conclusion

Several local governments have started experimenting with blockchain technologies and cryptocurrency initiatives. The scope and goals of these initiatives vary widely among cities. Government initiatives focused on incorporating blockchain technologies are strongly distinct from those that incorporate cryptocurrencies. Blockchain initiatives in the first category include various forms of record keeping or even pilots for making voting easier and more secure. Crypto initiatives, by contrast, involve coining city-specific tokens, allowing payments with crypto, and mining cryptocurrencies as funding sources.

The regulatory framework under which these projects are born is vital for promoting local innovation, but more importantly for protecting consumers and citizens amid a budding industry. Because federal regulatory actions have been limited, states have started implementing policies that differ radically.

In-depth interviews with local officials, developers, and researchers indicate that it is crucial to distinguish blockchain initiatives from crypto policies. Governmental officials and the public must grasp how these technological and (more specifically) financial innovations differ, to better understand how to promote or restrain their use. Governments face numerous challenges when implementing these technologies, including a lack of regulatory framework at the national and state levels and deep skepticism from government officials and the public. Blockchain and crypto initiatives are still in their infancy; scaling up such projects will be a long process that will require more information and development before the true potential of each technology can be appreciated.

Last, local governments must consider the equity effects of implementing blockchain crypto initiatives. We have provided a few key considerations for cities to integrate, including defining concepts and expected outcomes; involving stakeholders; and correctly aligning incentives, promoting clear laws, and analyzing benefits and burdens on specific communities.

Appendix A

We crafted a coding scheme to classify state laws, bills, and guidance letters regarding blockchain and cryptocurrency. First, we categorized laws that explicitly mentioned blockchain or crypto. For instance, one category included laws that recognized the use of blockchain for smart contracts or listed cryptocurrencies under the definition of assets, such as Nevada bill SB164, which proposed recognition of virtual currencies as a form of intangible personal property for taxation. Another category included laws that would give a specific advantage to firms involved in blockchain or cryptocurrencies. These include new regulatory frameworks, like Utah bill HB378, which proposed a regulatory sandbox for firms in financial technology to “temporarily test innovative financial products or services on a limited basis without otherwise being licensed or authorized to act under the laws of the state.” Still another determined whether a state had specific laws on crypto and money transmission. We also identified states that had created a study committee to explore the potential of blockchain and crypto. We coded each law according to the following categories:

At least one regulation regarding virtual currency.

The text explicitly mentions or includes virtual currency, cryptocurrency, virtual money, digital assets/money, or electronic cash. We particularly noted whether the state specifically defines virtual currency or includes virtual currencies in its definitions of money and money transmission. For example, Alabama specifies that “monetary value means a medium of exchange, including virtual or fiat currencies, whether or not redeemable in money.”⁶²

At least one regulation regarding blockchain technology.

The text explicitly mentions blockchain technology or DLT. This includes any mention not only of cryptocurrencies but also of any other type of blockchain regulation.

At least one regulation regarding a study committee for cryptocurrency or blockchain.

The state has created a commission to study the benefits, effects, and potential of blockchain technologies in general cryptocurrencies and cryptocurrency applications.

At least one regulation that allows payments in cryptocurrency.

The text explicitly allows payment of taxes or fees for public services with cryptocurrencies. For example, Colorado has allowed citizens to pay their taxes with crypto since 2022.

At least one regulation that provides incentives for blockchain developers.

The state provides specific incentives or benefits for companies to develop blockchain technology crypto businesses in their state. States and cities have a long history of creating specific incentives and signaling their business friendliness to certain industries, and crypto and blockchain technologies are no exception. Incentives include regulatory sandboxes, low energy costs, specific tax incentives, and contracts with local governments.

At least one regulation that exempts licenses for blockchain companies.

The text explicitly or implicitly grants licensing exemptions. Banking is regulated at the federal and state level. Similarly, businesses providing payments and money transfer services (money transmitters) are regulated in all states except Montana. Several states started exempting digital currencies from licensing requirements or provided a different legal framework for money-transmitter services that deal with crypto.

Appendix B

State/District	At Least One Regulation Regarding Virtual Currency	At Least One Regulation Regarding Blockchain Technology	At Least One Regulation Regarding a Study Committee for Cryptocurrency or Blockchain	At Least One Regulation That Allows Payments in Cryptocurrency	At Least One Regulation That Provides Incentives for Blockchain Developers	At Least One Regulation that Exempts Licenses for Blockchain Companies
Alabama	✓					
Alaska	✓					
Arizona	✓	✓	✓		✓	
Arkansas	✓					
California	✓	✓	✓		✓	
Colorado	✓	✓	✓	✓		
Connecticut	✓	✓	✓			
District of Columbia						
Delaware	✓	✓			✓	
Florida	✓	✓	✓			
Georgia						
Hawaii	✓	✓	✓			
Idaho	✓					
Illinois	✓	✓	✓			
Indiana	✓					
Iowa						
Kansas	✓					✓
Kentucky	✓	✓	✓		✓	
Louisiana	✓					✓
Maine	✓					
Maryland	✓	✓	✓			
Massachusetts	✓					✓
Michigan	✓	✓			✓	
Minnesota						
Mississippi						
Missouri	✓			✓		
Montana	✓					
Nebraska	✓	✓			✓	✓

State/District	At Least One Regulation Regarding Virtual Currency	At Least One Regulation Regarding Blockchain Technology	At Least One Regulation Regarding a Study Committee for Cryptocurrency or Blockchain	At Least One Regulation That Allows Payments in Cryptocurrency	At Least One Regulation That Provides Incentives for Blockchain Developers	At Least One Regulation that Exempts Licenses for Blockchain Companies
Nevada	✓	✓			✓	✓
New Hampshire	✓	✓	✓			✓
New Jersey	✓	✓	✓			
New Mexico	✓					
New York	✓		✓			
North Carolina	✓	✓	✓		✓	✓
North Dakota		✓	✓			
Ohio		✓				
Oklahoma	✓	✓				
Oregon	✓	✓	✓			
Pennsylvania	✓	✓				
Rhode Island	✓					
South Carolina	✓					✓
South Dakota	✓	✓				
Tennessee	✓					✓
Texas	✓	✓	✓			✓
Utah	✓	✓	✓	✓	✓	✓
Vermont	✓	✓				
Virginia	✓					✓
Washington	✓	✓	✓			
West Virginia	✓	✓			✓	✓
Wisconsin	✓					
Wyoming	✓	✓	✓		✓	✓

Note: This includes all passed laws, executive orders, opinion letters, etc.

Notes

- ¹ Emily Stewart. “Crypto Probably Isn’t Dead, but Should It Be?” *Vox*, November 29, 2022, <https://www.vox.com/the-goods/2022/11/23/23473340/crypto-ftx-sam-bankman-fried-contagion-bankruptcy-coinbase>.
- ² See endnote 1.
- ³ Joseph R. Biden, Jr., Executive Order 14067, “Ensuring Responsible Development of Digital Assets”, March 9, 2022, <https://www.whitehouse.gov/briefing-room/presidential-actions/2022/03/09/executive-order-on-ensuring-responsible-development-of-digital-assets/>.
- ⁴ Allyson Versprille. “Crypto Overhaul Fizzles in Congress, Leaving Industry and Investors in Limbo,” *Bloomberg*, October 5, 2022, <https://www.bloomberg.com/news/articles/2022-10-05/crypto-overhaul-fizzles-in-congress-leaving-industry-in-limbo>.
- ⁵ John Buhl, “Crypto Tax Challenges Just Keep Growing,” *TaxVox* (blog), Tax Policy Center, February 11, 2022, <https://www.taxpolicycenter.org/taxvox/crypto-tax-challenges-just-keep-growing>.
- ⁶ Scott Cohn, “These 10 States Are Leading America in Creating a Crypto Economy,” *CNBC*, July 18, 2022, <https://www.cnbc.com/2022/07/18/these-are-the-10-states-leading-americas-crypto-industry.html>.
- ⁷ Romaine Bostick, Taylor Riggs, and Caroline Hyde, “Miami Mayor Seeks Wider Crypto Use after Taking Pay in Bitcoin,” *Bloomberg*, December 3, 2021, <https://www.bloomberg.com/news/articles/2021-12-03/miami-mayor-seeks-wider-crypto-use-after-taking-pay-in-bitcoin>.
- ⁸ Elaine Chen and Paul Sweeney, “Eric Adams Aims to Make NYC Crypto-Friendly with Coin Similar to Miami’s,” *Bloomberg*, November 3, 2021, <https://www.bloomberg.com/news/articles/2021-11-03/mayor-elect-eric-adams-to-explore-nyc-coin-similar-to-miami-s>.
- ⁹ Jamie Redman, “City of Miami Gets \$5.25M Disbursement from Miamicoins as MIA Flounders 88% Lower Than Price High,” *Bitcoin.com*, February 10, 2022, <https://news.bitcoin.com/city-of-miami-gets-5-25m-disbursement-from-miamicoins-as-mia-flounders-88-lower-than-price-high/>.
- ¹⁰ Colorado Department of Revenue, “Cryptocurrency,” *Colorado Department of Revenue*, accessed December 16, 2022, <https://tax.colorado.gov/cryptocurrency>.
- ¹¹ City of Reno, “City of Reno Launches the Biggest Little Blockchain—First City-Run Blockchain Platform in the United States,” October 12, 2022, <https://www.reno.gov/Home/Components/News/News/20198/576>.
- ¹² Brookings, “A debate: Should crypto be regulated by the federal government?,” accessed December 21, 2022, <https://www.brookings.edu/events/a-debate-should-crypto-be-regulated-by-the-federal-government/>.
- ¹³ Melissa Goldin, “Reno, Nevada, joins cities using blockchain to improve record-keeping,” *SmartCitiesDive*, June 14, 2022, <https://www.smartcitiesdive.com/news/reno-nevada-smart-city-blockchain-record/625449/>.
- ¹⁴ Jake Frankenfield, “Distributed Ledger Technology (DLT): Definition and How It Works,” *Investopedia*, August 27, 2021, <https://www.investopedia.com/terms/d/distributed-ledger-technology-dlt.asp>.
- ¹⁵ Satoshi Nakamoto, “Bitcoin: A Peer-to-Peer Electronic Cash System,” October 31, 2008, <https://bitcoin.org/bitcoin.pdf>.
- ¹⁶ Adam Hayes, “Who Is Satoshi Nakamoto?” *Investopedia*, January 3, 2023, <https://www.investopedia.com/terms/s/satoshi-nakamoto.asp#:~:text=Satoshi%20Nakamoto%20is%20a%20pseudonym,not%20been%20heard%20from%20since>.

- ¹⁷ Dan Ashmore, "Bitcoin Price History 2009 to 2022," *Forbes*, October 11, 2022, <https://www.forbes.com/advisor/investing/cryptocurrency/bitcoin-price-history/>.
- ¹⁸ Madana Prathap, "Nearly 90% of all Bitcoin Has Already Been Mined—Here's How Its Limited Supply Has Driven Up Its Value," *Business Insider: India*, December 24, 2021, <https://www.businessinsider.in/investment/news/bitcoin-limited-supply-has-driven-up-its-value-nearly-90-percent-has-be/articleshow/85349471.cms>.
- ¹⁹ Stanford Online, "How Does Blockchain Work?" Stanford University, 2022, <https://online.stanford.edu/how-does-blockchain-work>.
- ²⁰ Jeremy Hinsdale, "Cryptocurrency's Dirty Secret: Energy Consumption," *State of the Planet* (blog), Columbia Climate School, May 4, 2022, <https://news.climate.columbia.edu/2022/05/04/cryptocurrency-energy/>.
- ²¹ David Yaffe-Bellany, "Bitcoin Miners Want to Recast Themselves as Eco-friendly," *New York Times*, March 22, 2022, <https://www.nytimes.com/2022/03/22/technology/bitcoin-miners-environment-crypto.html>.
- ²² Heather Morton, "Cryptocurrency 2021 Legislation," National Conference of State Legislatures, December 12, 2021, <https://www.ncsl.org/research/financial-services-and-commerce/cryptocurrency-2021-legislation.aspx>.
- ²³ Bloomberg Law, "Cryptocurrency Laws and Regulations by State," May 26, 2022, <https://pro.bloomberglaw.com/brief/cryptocurrency-laws-and-regulations-by-state/>.
- ²⁴ Carlton Fields, "Is Cryptocurrency Money? Depends on Your State," August 29, 2018, <https://www.carltonfields.com/insights/publications/2018/is-cryptocurrency-money-depends-on-your-state>.
- ²⁵ California Legislature, California Government Code § 11546.8 (2020), <https://law.justia.com/codes/california/2020/code-gov/title-2/division-3/part-1/chapter-5-6/section-11546-8/>.
- ²⁶ Arizona Legislature, House Bill 2602, Chapter 208/Statute § 11-269.22 (2018), <https://legiscan.com/AZ/bill/HB2602/2018>.
- ²⁷ California Legislature, Assembly Bill 147, Chapter 5 (2019), <https://legiscan.com/CA/text/AB147/2019>.
- ²⁸ Delaware Legislature, Senate Bill 69, Title 8 (2017), <https://legis.delaware.gov/BillDetail?legislationId=25730>.
- ²⁹ New York Legislature, Assembly Bill A7389C, Chapter 628 (2022), <https://www.nysenate.gov/legislation/bills/2021/A7389>.
- ³⁰ North Carolina Legislature, Article 16B, Money Transmitters Act, N.C.G.S. § 53-208.42(13)(b) (2021), https://www.ncleg.gov/EnactedLegislation/Statutes/HTML/ByArticle/Chapter_53/Article_16B.html.
- ³¹ Connecticut Legislature, Chapter 668, Nondepository Financial Institutions, Conn. Gen. Stat. § 36a-598(a)(iv) (2012). https://www.cga.ct.gov/current/pub/chap_668.htm#sec_36a-598.
- ³² North Carolina Legislature, Article 16B, Money Transmitters Act, N.C.G.S. § 53-208.42(13)(b), 2021, https://www.ncleg.gov/EnactedLegislation/Statutes/HTML/ByArticle/Chapter_53/Article_16B.html.
- ³³ Utah Legislature, Money Transmitter Act, Utah Code § 7-25-102(9)(b) (2021), <https://law.justia.com/codes/utah/2021/title-7/chapter-25/part-1/section-102/>.
- ³⁴ Oregon Legislature, Chapter 50 (2019), <https://olis.oregonlegislature.gov/liz/2019R1/Measures/Overview/HB2488>.
- ³⁵ North Carolina Legislature, Article 16B, Money Transmitters Act, N.C.G.S. § 53-208.42(13)(b) (2021), https://www.ncleg.gov/EnactedLegislation/Statutes/HTML/ByArticle/Chapter_53/Article_16B.html.

- ³⁶ South Carolina Legislature, Office of the Attorney General, “Order Number MSD-19003: Virtual Currency and Automated Machines,” 2019, <https://www.scag.gov/wp-content/uploads/2019/10/Bitcoin-ATM-Order-02085245xD2C78.pdf>.
- ³⁷ Kentucky Legislature, Chapter 141, “AN ACT Relating to Commercial Mining of Cryptocurrency,” 2021, <https://apps.legislature.ky.gov/record/21rs/sb255.html>.
- ³⁸ Colorado Department of Revenue, Taxation Division, “Cryptocurrency,” 2022, <https://tax.colorado.gov/cryptocurrency>; Missouri Legislature, 100th General Assembly, 1st Regular Session, “HB 1247: Requires the State and Political Subdivisions Thereof to Accept Virtual Currency as Legal Tender,” 2021, <https://house.mo.gov/BillContent.aspx?bill=HB1247&year=2019&code=R&style=new>; Utah Legislature, 2022 General Session, “H.B. 456: Digital User Asset Payment Amendments,” 63A-3-112, 2022, <https://le.utah.gov/~2022/bills/static/HB0456.html>.
- ³⁹ Danny Crichton, “Austin Is Piloting Blockchain to Improve Homeless Services,” *TechCrunch*, April 14, 2018, <https://techcrunch.com/2018/04/14/austin-is-piloting-blockchain-to-improve-homeless-services/>.
- ⁴⁰ Jamie Crawley, “New York City to Explore Blockchain for Preventing Deed Fraud in Land Sales,” *CoinDesk*, August 5, 2021, <https://www.coindesk.com/policy/2021/08/05/new-york-city-to-explore-blockchain-for-preventing-deed-fraud-in-land-sales/>.
- ⁴¹ Michael A. Specter, James Koppel, and Daniel Wietzner, “The Ballot is Busted Before the Blockchain,” *MIT*, August 12, 2020, https://internetpolicy.mit.edu/wp-content/uploads/2020/02/SecurityAnalysisOfVoatz_Public.pdf.
- ⁴² Yael Grouer, “What Really Happened With West Virginia’s Blockchain Voting Experiment?” *Slate*, July 11, 2019, <https://slate.com/technology/2019/07/west-virginia-blockchain-voting-voatz.html/>.
- ⁴³ Thalia Beaty, “Money for Nothing: Cities’ Crypto Push Draws Fans, Critics,” *APNews*, February 8, 2022, <https://apnews.com/article/cryptocurrency-business-new-york-miami-coin-f076e0e8b80adf74fdeebae9188e70>.
- ⁴⁴ MacKenzie Sigalos, “Fort Worth Is the First City in the U.S. to Mine Bitcoin, and Will Run Mining Rigs Out of City Hall,” *CNBC*, April 26, 2022, <https://www.cnn.com/2022/04/26/fort-worth-tx-the-first-city-in-the-us-to-mine-bitcoin.html>.
- ⁴⁵ Antonio Villas-Boas, “This US City Is the First to Ban the Mining of Cryptocurrencies,” *World Economic Forum*, March 19, 2018, <https://www.weforum.org/agenda/2018/03/for-the-first-time-a-us-city-has-banned-cryptocurrency-mining>.
- ⁴⁶ Pia Singh, “Bitcoin miners flocked to an upstate New York town for cheap energy — then it got complicated,” *CNBC*, June 24, 2021, <https://www.cnn.com/2021/06/24/bitcoin-miners-flocked-to-upstate-new-york-for-cheap-energy-then-it-got-complicated.html>.
- Lois Parshleyarchive, “How Bitcoin mining devastated this New York town,” *MIT Technology Review*, April 18, 2022, <https://www.technologyreview.com/2022/04/18/1049331/bitcoin-cryptocurrency-cryptomining-new-york/#:~:text=Now%20Plattsburgh%20is%20again%20accepting,a%20former%20Alcoa%20aluminum%20plant>.
- ⁴⁷ David Pan and Naureen S Malik, “Texas’s Crypto Mining Boom Is Starting to Look More Like a Bust,” *Bloomberg*, December 5, 2022, https://www.bloomberg.com/news/articles/2022-12-05/texas-s-crypto-mining-boom-is-starting-to-look-more-like-a-bust?cmpid=socialflow-twitter-business&utm_content=business&utm_campaign=socialflow-organic&utm_source=twitter&utm_medium=social&leadSource=uverify%20wall.

- ⁴⁸ City of Chandler, “City of Chandler Accepts Cryptocurrency for Utility Payments,” *Chandler Arizona*, March 30, 2022, <https://www.chandleraz.gov/news-center/city-chandler-accepts-cryptocurrency-utility-payments>.
- ⁴⁹ Jack Kelly, “Sports Stars and Politicians Are Taking Their Pay in Bitcoin and Other Cryptocurrencies—Would You?” *Forbes*, January 30, 2022, <https://www.forbes.com/sites/jackkelly/2022/01/30/sports-stars-and-politicians-are-taking-their-pay-in-bitcoin-and-other-cryptocurrencies—would-you/>.
- ⁵⁰ New York City Office of the Mayor, “Mayor Adams to Receive First Paycheck in Cryptocurrency,” January 20, 2022, <https://www.nyc.gov/office-of-the-mayor/news/041-22/mayor-adams-receive-first-paycheck-cryptocurrency>.
- ⁵¹ Mark Williams, “Logistics, Bitcoin Companies Receive State Tax Incentives to Create 125 Jobs in Columbus,” *The Columbus Dispatch*, August 23, 2021, <https://www.dispatch.com/story/business/2021/08/23/logistics-bitcoin-company-create-125-jobs-columbus/8217706002/>.
- ⁵² Jennifer Kingson, “Mayors See Cryptocurrency as a Way to Address Income Inequality,” *AXIOS*, January 23, 2022, <https://www.axios.com/2022/01/21/mayors-see-cryptocurrency-as-a-way-to-address-income-inequality>.
- ⁵³ David Yaffe-Bellany, “The Rise of the Crypto Mayors,” *New York Times*, January 25, 2022, <https://www.nytimes.com/2022/01/25/business/crypto-mayors.html>.
- ⁵⁴ Noah Zucker, “Philly-Branded Cryptocurrency Being Considered as Vehicle to Fund Civic Projects,” *Philly Voice*, February 12, 2022, <https://www.phillyvoice.com/philly-cryptocurrency-citycoins-municipal-funding/>.
- ⁵⁵ NORC, “More Than One in Ten Americans Surveyed Invest in Cryptocurrencies,” July 22, 2021, <https://www.norc.org/NewsEventsPublications/PressReleases/Pages/more-than-one-in-ten-americans-surveyed-invest-in-cryptocurrencies.aspx>.
- ⁵⁶ Charles Schwab, “Ariel-Schwab Black Investor Survey (2022),” *Schwab Moneywise* (blog), 2022, <https://www.schwabmoneywise.com/tools-resources/ariel-schwab-survey-2022>.
- ⁵⁷ NORC, “More Than One in Ten Americans Surveyed Invest in Cryptocurrencies,” July 22, 2021, <https://www.norc.org/NewsEventsPublications/PressReleases/Pages/more-than-one-in-ten-americans-surveyed-invest-in-cryptocurrencies.aspx>.
- ⁵⁸ Dalvin Brown, “Crypto Tax: ‘MiamiCoin’ Has Made the City \$7 Million so Far, a Potential Game-Changer for Revenue Collection,” *Washington Post*, September 30, 2021, <https://www.washingtonpost.com/technology/2021/09/30/crypto-miamicoin/>.
- ⁵⁹ The White House, “FACT SHEET: Climate and Energy Implications of Crypto-Assets in the United States,” September 8, 2022, <https://www.whitehouse.gov/ostp/news-updates/2022/09/08/fact-sheet-climate-and-energy-implications-of-crypto-assets-in-the-united-states/>.
- ⁶⁰ Seattle Office for Civil Rights, “Racial Equity Toolkit,” accessed December 2, 2022, <https://www.seattle.gov/civilrights/what-we-do/race-and-social-justice-initiative/racial-equity-toolkit>.
- ⁶¹ Tonantzin Carmona, “Mayors: Cryptocurrency Won’t Solve Your Cities’ Problems,” *The Avenue* (blog), Brookings, March 22, 2022, <https://www.brookings.edu/blog/the-avenue/2022/03/22/mayors-cryptocurrency-wont-solve-your-cities-problems/>.
- ⁶² Alabama Securities Transmission, “The Alabama Monetary Transmission Act, §§ 8-7a-1 to 8-7a-27,” *Alabama Securities Transmission*, accessed December 15, 2022, https://asc.alabama.gov/Acts/Chapter%207A_SOC.aspx#Section%208-7A-2.

References

- California Blockchain Initiative. 2020. *Blockchain in California: A Roadmap*. Sacramento, CA: California Blockchain Initiative.
- California Blockchain Initiative. 2022. *Towards Responsible Innovation: An Interagency Web3, Crypto Asset, and Blockchain Progress Report to the Governor of California*. Sacramento, CA: California Blockchain Initiative.
- Carmona, Tonantzin. 2022. *Debunking the Narratives about Cryptocurrency and Financial Inclusion*. Washington, DC: Brookings.
- CCABTU (Colorado Council for the Advancement of Blockchain Technology Use). 2019. *Blockchain Council Report to the Community*. Denver: CCABTU.
- CFPB (Consumer Financial Protection Bureau). 2022. *Complaint Bulletin: An analysis of consumer complaints related to crypto-assets*. Washington, DC.
- CKBWG (Commonwealth of Kentucky Blockchain Working Group). 2020. *Blockchain Working Group Report*. Frankfort: Commonwealth of Kentucky Blockchain Working Group.
- Faverio, Michelle, and Navid Massarat. 2022. *46% of Americans Who Have Invested in Cryptocurrency Say It's Done Worse Than Expected*. Washington, DC: Pew Research Center.
- FBTF (Florida Blockchain Task Force). 2019. *Florida Blockchain Task Force Report*. Tallahassee: FBTF. https://www.myfloridacfo.com/docs-sf/cfos-executive-offices-libraries/cos-documents/bctf-final-report.pdf?sfvrsn=7ad59a99_2.
- Government Accountability Office (GAO). 2022. *Blockchain: Emerging Technology Offers Benefits for Some Applications but Faces Challenges*. Washington, DC.
- IBDLTF (Illinois Blockchain and Distributed Ledger Task Force). 2018. *Illinois Blockchain and Distributed Ledger Task Force Final Report to the General Assembly*. Springfield: IBDLTF.
- Jacob, Benoy. 2020. *Governing for Equity: Implementing an Equity Lens in Local Governments*. Washington, DC: International City/County Management Association.
- Moore, Larry, and Nimit Sawhney. 2019. *Under the Hood: The West Virginia Mobile Voting Pilot*. Boston: Voatz.
- New Jersey Commission of Investigation. 2021. *Bitcoin ATMs Scams, Suspicious Transactions and Questionable Practices at Cryptocurrency Kiosks*. Trenton: New Jersey Commission of Investigation.
- NCBI (North Carolina Blockchain Initiative). 2020. *North Carolina Blockchain Initiative Report*. Raleigh: NCBI.
- The White House. 2022. *Climate and Energy Implications of Crypto-Assets in the United States*. Washington, DC.
- TWGBM (Texas Work Group on Blockchain Matters). 2022. *Texas Work Group on Blockchain Matters Report*. Austin: TWGBM.
- United Nations University. 2020. *Blockchain for Smart Sustainable Cities*. Tokyo: United Nations University.
- VSARA (Vermont State Archives and Records Administration). 2019. *Blockchains for Public Recordkeeping & for Recording Land Records*. Montpelier: VSARA.
- Walsh, Angela. 2021. *Deconstructing 'Decentralization': Exploring the Core Claim of Crypto Systems*. Chapter in *Crypto Assets: Legal and Monetary Perspectives*. Oxford University Press.
- What Works Cities. 2022. *Charting an Equitable Future*. New York: What Works Cities.

Yearby, Ruqaiijah, Sidney D. Watson, Charysse Gibson, Crystal N. Lewis, Nicole Strombom, Katherine Stamatakis, and Keon L. Gilbert. 2021. *Governmental Use of Racial Equity Tools to Address Systemic Racism and the Social Determinants of Health*. St. Louis, MO: Institute for Healing Justice and Equity.

About the Authors

Luisa Godinez-Puig is an equity scholar working in three policy centers at Urban: the Tax Policy Center; the Center on Labor, Human Services, and Population; and the Office of Race & Equity Research. Before joining Urban, she worked as a doctoral fellow at the Initiative on Cities and the Center for Antiracist Research (both at Boston University), was a consultant for the City of Boston, and was a research consultant at the Inter-American Development Bank and the Organization of American States in Washington, DC. Her work has been published in *Urban Affairs Review*, *Public Health Reports*, and the *Journal of Ethnopolitics* and in the *Monkey Cage* blog of the *Washington Post*.

Luisa focuses on studying various instances of intersection between urban politics and race and ethnicity. This includes analyzing the politics and policy consequences behind government fragmentation from an equity perspective, studying local finance from a race and ethnicity lens, identifying data gaps and data collection deficiencies on race and ethnicity across policy areas, and studying various forms of political participation at the local level.

Luisa holds a doctorate and a master's degree in political science from Boston University, a master of laws degree from the University of Chicago, and a law degree (juris doctor equivalent) from Universidad Nacional Autónoma de México.

Thomas Brosy is a research associate in the Tax Policy Center, where he is involved in projects related to business and corporate taxation and state and local tax policy. His previous research looked at how state business taxes affect business dynamism and the impact of the Great Recession on local property taxes.

Thomas graduated from the University of Michigan with a PhD in economics. He previously attended the University of Lausanne, Switzerland, and University College London.

Gabriella Garriga is a research assistant in the Urban-Brookings Tax Policy Center, where she helps to create data-driven analyses of federal, state, and local tax codes. She graduated magna cum laude from Trinity University and holds a BA in economics and sociology.

Gabriella is passionate about research regarding economic policy's impact on housing development and education on a state and local level. Within these research areas, she is most interested in public finance's impact on vulnerable communities.

STATEMENT OF INDEPENDENCE

The Urban Institute strives to meet the highest standards of integrity and quality in its research and analyses and in the evidence-based policy recommendations offered by its researchers and experts. We believe that operating consistent with the values of independence, rigor, and transparency is essential to maintaining those standards. As an organization, the Urban Institute does not take positions on issues, but it does empower and support its experts in sharing their own evidence-based views and policy recommendations that have been shaped by scholarship. Funders do not determine our research findings or the insights and recommendations of our experts. Urban scholars and experts are expected to be objective and follow the evidence wherever it may lead.



500 L'Enfant Plaza SW
Washington, DC 20024

www.urban.org