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What is Digital Public Infrastructure?

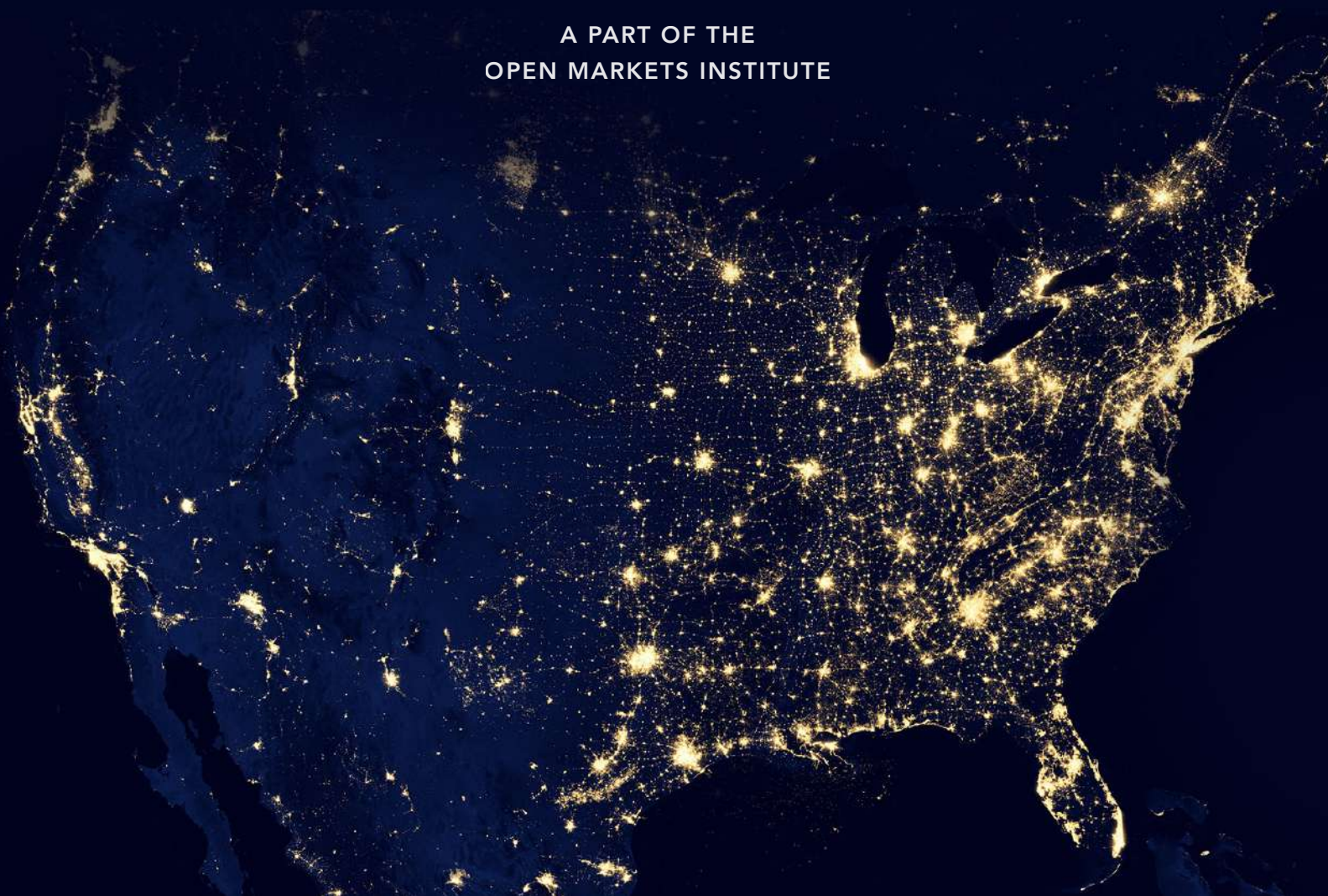
An essay, in the form of an FAQ, about the possibility
of digital social spaces built with taxpayer dollars

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Abstract

Societies operate on infrastructures: physical, digital, and social. At the intersection of digital and social infrastructures is a set of spaces that host critical conversations about civic, political, and social issues. At present, these spaces primarily are built and governed by large media companies who maintain them to collect user data and serve advertisements. What would happen if we built digital public infrastructures, digital social spaces built with taxpayer dollars with explicit civic goals? This article builds on a previous essay, [The Case for a Digital Public Infrastructure](#), to propose a roadmap to build a robust ecosystem of public service digital spaces, tools and resources. The essay includes discussions of interoperability, taxation, common tool sets and more.

Introduction

In mid-March 2020, life across much of the United States came to an abrupt halt. As the novel coronavirus spread across the nation, many workers began working from home. Business and leisure travelers canceled flights and hotel reservations. One set of infrastructures – airports; train stations; and the crowded roads that bring workers to offices in the city – suddenly went quiet, while another set found itself under new strains. The shipping and trucking industries that bring food from farms shifted deliveries from restaurants to grocery stores, as millions more meals were served at home each day.

One set of infrastructures was remarkably unaffected. Despite speculation that the internet might collapse under the load of videoconferences for everything from work meetings and cocktail hours to weddings and bar mitzvahs, the transition to virtual living has been remarkably smooth. Acknowledging both the realities of the pandemic and the preferences of their employees, several large U.S. companies have announced plans to allow remote work permanently and to decrease their office footprints.¹

The rapid shift from offline to online spaces in the wake of the pandemic paralleled a shift that's taken place around the world during the past decade: the shift of our social and civic lives into digital public spaces. High school

friends remain in touch with one another via Facebook rather than by exchanging letters. Some parents no longer send children clippings from local newspapers but forward chain emails instead. And while political lawn signs still sprout during election seasons, they are vastly outnumbered by the pieces of political news that we share on Twitter, Facebook, and YouTube ... and now on virtual campaign signs in Animal Crossing.²

While the shift from physical to virtual infrastructures has been surprisingly smooth, there are good reasons for concern about its long-term costs. As digital public spaces host more of our public lives, a wave of scholars and commentators are raising concerns about these spaces' effects on us as individuals and as a polis. Veterans of the tech industry warn us that these spaces are addictive and manipulate our emotions for the benefit of platforms and advertisers.³ Social scientists worry that interactions on these platforms may be increasing political polarization⁴ and spreading misinformation and disinformation,⁵ potentially damaging our ability to operate a functioning democracy. News providers warn us that by shifting advertising dollars from journalism to social networks, we risk losing critical oversight of government, businesses, and all other institutions.⁶ Before the pandemic drove us inside and online, we were experiencing a "techlash," a reconsideration of whether the benefits of living more of our lives online were worth the personal and social costs.

The social shifts brought about by the pandemic and the techlash give us an opportunity to consider the capabilities and vulnerabilities of our physical and digital infrastructures, especially those that host our civic and political interactions. The digital spaces in which we debate our future seem far from healthy. In the U.S., the coronavirus has spurred a wave of online conspiracy theories about masks, 5G cellphone signals, and lab-made viruses. President Trump used his vast Twitter platform to cast suspicion on the integrity of the 2020 election.

To put it simply, we need to imagine and build better digital public spaces that address the failures of our current infrastructures and actively work to create healthy and engaged civic discourse.

What is infrastructure?

Infrastructures are the technologies and systems necessary for society to function.

Without infrastructures, society doesn't operate well. Waffle House, an American restaurant chain famous for remaining open during natural disasters, offers an elegant illustration.⁷ When infrastructures are functioning normally, Waffle House offers a full menu. If electricity is interrupted, it offers a limited emergency menu. If water is interrupted, the menu is further restricted.⁸ Certain infrastructure failures force Waffle House to close entirely: If the propane gas supply is interrupted, then Waffle House can't cook anything, and it temporarily closes its doors.

Understanding where a restaurant would choose to open in the first place also helps illuminate infrastructures. Waffle House needs more than water, electricity, and propane to operate. It needs a public road network to bring customers to its doors. It depends on a network of trucking companies to deliver supplies to each restaurant and on the interstate highway system that allows those trucks to operate (and indirectly on the system of fuel stations that allows those trucks to run.) It needs telephone service to accept orders and so it can connect its credit card reader to a global card processing network (itself an infrastructure). Arguably, it needs some sort of public safety system – law enforcement or some sort of community safety service – to prevent people from stealing each other's hash browns.

Infrastructures are things we build so we can build other things.

Building an electric grid is not a goal in itself – a grid exists so that factories can power their machinery and make products, and so homeowners can watch television. Despite the fact that infrastructures are a means to an end, they are critical pieces of our economy, directly providing an estimated 14 million jobs in the U.S., almost 10% of the workforce.⁹ More important, though, is that the other 90% of jobs could not exist – or would be thoroughly transformed – without infrastructures.

Because infrastructures are the systems that support more visible systems, ***infrastructures are often invisible until they break.*** Urban water systems were rarely a major topic of news stories until lead poisoning in Flint, Michigan, brought a key environmental justice issue to national attention. An exception is in developing nations, where the presence of key infrastructures – improved sanitation or access to electricity, for example – serves as a sign of development.

Underdevelopment is defined in terms of the absence of these infrastructures. The U.N.'s Sustainable Development Goals include three goals directly related to physical infrastructures (6. Clean Water and Sanitation, 7. Affordable and Clean Energy, 11. Industry, Innovation and Infrastructure) and at least two related to social infrastructures (4. Quality Education, and 16. Peace, Justice and Strong Institutions.)¹⁰ One way of thinking about development is that **a developed nation is one where infrastructures function so well that they can usually be invisible.**

Infrastructures generate externalities, both positive and negative. When a road connects two cities, it has effects beyond allowing people to travel from one place to another. The land along the road becomes more valuable, as people use it to build gas stations, restaurants, billboards, etc. – in economic terms, we consider these things “positive externalities,” benefits that come indirectly from a project. We also experience negative externalities, such as increased pollution on the route. These externalities can be complex and difficult to predict, and debates about provisioning new infrastructures often focus on predictions of externalities.

Positive externalities often are widely distributed in society, accruing not just to those who've built the infrastructures, but to a wide range of other actors. Consider the road that creates commercial opportunities on the route between cities A and B. A likely externality of the road is that the land between A and B bordering the road becomes more valuable. A company that builds the road might not benefit from the increased land value, only from the tolls it could charge for users of the road. But a government could collect more taxes on the land bordering the road, because it has increased in value. And a society would likely benefit from the new connections between people in the two cities. Because it can be difficult to capture these positive externalities as a private firm, some infrastructures don't make sense as a private investment but can make good sense as a public investment.

In economic terms, infrastructures are “bulky,” which means they cost a great deal to build in the first place but have very low costs per additional user.

Infrastructures don't scale smoothly. It costs a great deal of money to build a power plant, but adding additional houses to the electric grid is comparatively cheap – until you need another plant to manage demand, in which case there's another massive investment. Because it's so costly to build infrastructures, they are often built by large, well-financed institutions – governments and big companies – rather than by small communities or startups.

Despite the fact that governments have mechanisms that allow them to fund infrastructure – taxation that can capture increased land value, bonds, and other debt to finance projects – infrastructures are often built by private actors. The railroad system that transformed America was built by private companies, though with massive grants of land from the federal government. Private enterprise largely built the infrastructure of the internet, though atop a phone system built by a government monopoly. Because many infrastructures are built to earn a profit, they often function as “club goods.”¹¹

Public goods, such as city streets, are nonexcludable; we cannot prevent anyone from using them. They are also nonrivalrous; your car’s presence doesn’t adversely affect my ability to use the road, at least until the point of congestion. Club goods, by contrast, are also nonrivalrous but are excludable. Consider the telephone system: My making a phone call does not limit your ability to make a call, at least not until the point when the system is overwhelmed. (In fact, my use of the system makes it more useful to you, as there are now more people you can call – we call this a network effect.) But if you don’t pay your phone bill, your phone provider can and will exclude you from the network.

Societies often regulate infrastructural club goods to ensure that they can be accessed by anyone who wants access. Telephone systems often include a “universal service” provision, under which system operators collect a fee from all users and use those fees to subsidize the provision of service in rural areas where building infrastructure is prohibitively expensive. These mechanisms attempt to deal with a common problem: **Markets don’t always provide the infrastructures we need.** There’s no guarantee that the free market will provide these services as private goods, even if a society benefits greatly from having these services. Instead, we provide them as public goods, using tax dollars to make them available to society as a whole, because we see widespread public benefit, or we use cross-subsidies and service provisions to provide key infrastructures to whomever needs them, using fees from cheaper users to subsidize more expensive ones.

While we are used to thinking of physical and economic infrastructures – roads, power grids, credit card processing systems – **key social institutions are also infrastructures.** Public schools, health systems (in almost all advanced nations except the U.S.), justice systems (including courts, police, and public safety systems), parks, and public spaces are all social infrastructures that allow societies to function. As with other infrastructures, they generate positive and negative externalities (we may want all children in society to be schooled but may not want to live next to the schoolyard), they often function invisibly until we need them, they are expensive to build and don’t scale smoothly, and they often operate as public goods because we cannot rely on markets to build and maintain them.

What is digital infrastructure?

Like other infrastructures, digital public infrastructures are the tools and systems required to make digital life function. They include the wiring and circuitry of the internet (maintained mostly by for-profit telecom companies), institutions such as the domain name system (a fascinating hodgepodge of for-profit domain name registrars and nonprofit institutions such as ICANN and IANA), and the software that keeps the internet running (primarily open-source software, sometimes developed and maintained by volunteers).

In addition to the wiring and software that make the bits flow, digital infrastructure likely includes tools we all need to use to make digital spaces accessible and usable. Search and discovery systems such as Google and Bing can be understood as digital infrastructures, as can marketplaces for apps, such as the Android and iTunes stores. Web browsers such as Chrome (commercial) and Firefox (nonprofit) are infrastructural, as well.

The basic rules of infrastructure apply to digital infrastructures, too. We build internet backbones not because that's fun, but because they allow people to watch cat videos. Most people ignore basic infrastructures such as DNS systems and internet peering arrangements until something breaks. Externalities from the internet have included massive transfers of revenue from traditional businesses to new ones, establishment of a radically participatory public sphere, and the upending of norms about how we work, socialize, and interact. (The jury is out as to whether these are positive or negative externalities.) Digital infrastructures are bulky – it's hard to build an internet service provider or a search engine, though adding individual users is easy to do.

Digital infrastructures can be offered as public goods or club goods, and despite the incredible profitability of many internet businesses, digital infrastructures often don't recover their costs in many markets. Facebook is widely used in many developing nations, including those where a local advertising economy cannot cover the costs of providing services for users. Facebook could exclude users from the service, deciding not to operate in that country; instead, it's chosen to accept losses in the hopes of building a long-term user base. At the same time, it would be very difficult for a competitor to start a successful social network in Nigeria, where Facebook is very popular but far from profitable. Facebook can survive its losses in Nigeria through cross subsidy, using revenues in the U.S. and Europe to expand market share in Nigeria, while a local startup could not.

Invoking Facebook takes us to the last parallel with traditional infrastructures: Digital infrastructures can be social as well as economic or technical. Facebook has served as a near universal directory for people on the internet and has provided semipublic spaces to interact with those people. Facebook is not the end in itself – connection with the people we care about is the end, and Facebook is the infrastructure that makes it possible.

What are digital public infrastructures?

Digital public infrastructures are the infrastructures that let us engage in public and civic life in digital spaces. For the most part, ***our digital infrastructures are only accidentally public infrastructures*** – Facebook was designed not to enable citizenship but to display ads to users. ***We should aspire toward a set of tools that are intentionally digital public infrastructures***, spaces that operate with norms and affordances designed around a set of civic values. They are explicitly designed to inform us about issues in our community and our world. They are structured to connect us to people we agree with and people we disagree with, and encourage dialogues that challenge our understandings of issues rather than simply reinforcing our perceptions. Interacting in these spaces ideally would make us better friends, better neighbors, and better citizens. Needless to say, we have a lot of work to do in moving from the digital public infrastructures we currently have toward the ones we need.

During the past two decades, as the internet has reshaped multiple aspects of our lives, many of our conversations have moved online to spaces such as Facebook, Twitter, and YouTube. There are a lot of good aspects to this shift: It's far easier to maintain friendships over long distances thanks to these tools, for example. But these tools aren't always conducive to healthy conversations about politics or social issues. They may increase political polarization and ideological isolation or lead some users toward extremism. (And they may not. These spaces are very challenging to study, and much of what we "know" about the effects of social media are anecdotes, not the result of scholarly consensus.)

The vast majority of our digital public infrastructures, as of 2020, are run by large for-profit corporations that make their money from advertising. Specifically, they take part in what Shoshana Zuboff calls "surveillance capitalism": Their value comes from monitoring consumer behavior in order to sell consumer attention to advertisers. The more information that corporations get us to share about our lives and our interests, the more our attention is worth to them.

Putting aside whether surveillance capitalism is an ethically defensible practice – a matter worth debating – it's likely that the economics of current digital public infrastructures lead toward incentives that aren't always good for us as citizens. These platforms benefit from highly emotional and controversial content, as drama usually attracts attention. The platforms try to moderate as little and as lightly as possible, to minimize the number of users they alienate and to minimize the costs of human labor. They keep score in terms of page views and ad clicks, not diversity of views or health of conversation.

These infrastructure providers have been very, very successful, absorbing their most dangerous competitors in the process, and their market power has scared away many other innovators from starting possible rivals. As a result, we are very well served in terms of social networks that stimulate and amuse us, and almost entirely unserved in terms of spaces that encourage civic participation or conversations with people we disagree with, or spaces for communities to debate their futures and come to decisions.

That we have found ways to use existing tools and platforms for civic uses does not obviate the need for digital public spaces with an intentional civic logic. That we can read in coffee shops or bookstores does not eliminate the need for libraries; that we walk and talk with friends in shopping malls does not eliminate the need for public parks.

Who should pay for digital public infrastructures?

All around the world, infrastructures are at least partially the responsibility of governments. Governments build streets, railroads, airports, sewers, and water lines, and individuals and companies benefit from these infrastructures, which are expensive to build but serve the entire society. In many countries, public services include publicly funded broadcasters, whose role is to provide citizens in a democracy with factual information that helps them make political decisions and amplifies voices from different parts of society.

Many of our digital infrastructures have been developed in two countries – the U.S. and China – that have unusual approaches to public goods. The U.S. spends far less on infrastructure than do most other wealthy nations, preferring to leave many infrastructure projects to the private sector. Unsurprisingly, U.S. DPI providers have been largely unregulated, have optimized for revenues over civic responsibilities, and have spread globally, becoming dominant in many other markets. China, by contrast, invests heavily in infrastructure and frequently

uses infrastructure as a political lever. Chinese DPI platforms are profitable but also heavily regulated, and they must carefully regulate speech in line with instructions from the Chinese government. While Chinese DPI is optimized for a particular vision of social and public good, it's not optimized for a democratic vision of public service.

Another model for public infrastructure comes from public media in the United States, a system that relies very heavily on donations and volunteer support. Wikimedia and the Internet Archive, two critical pieces of digital public infrastructure, operate on these models and serve as impressive examples of what can be accomplished through volunteerism and cooperation. Unfortunately, while the Wikimedia model has worked remarkably well for building a high-quality encyclopedia, many other wiki-cooperation projects have been less successful, and consistently building complex social infrastructures via volunteer labor remains an unsolved problem.

Much as they pay for physical infrastructures that markets do not provide, governments and taxpayers should pay for digital public infrastructures. In particular, countries with a strong investment in public media should be investing in novel, pro-civic digital public infrastructures, rather than depending on U.S. corporations to host their civic conversations.

Nobel Prize-winning economist Paul Romer suggests that governments should tax companies that engage in surveillant advertising as a way to discourage this business model.¹² In jurisdictions where it is legal to direct taxes toward a specific intervention, it makes sense to use revenues generated from a "Romer tax" to fund projects that would create pro-civic media platforms.

A tax on surveillant advertising could fund a new set of institutions that parallel those set up in the 1960s and 1970s to build public media in the United States. A "Corporation for Digital Public Infrastructure," a parallel of the Corporation for Public Broadcasting, could research and invest in academic research and nonprofit and for-profit experiments in creating digital spaces designed to help us understand our world and participate as citizens. The original Corporation for Public Broadcasting helped support projects such as the Children's Television Workshop, which researched learning through broadcast and ultimately created *Sesame Street*. We can imagine any number of projects that could result from carefully studying the strengths and weaknesses of civic and social life in digital spaces and building alternatives. Should Congress go further and ban surveillant advertising, it is worth considering whether the social benefits of investment in digital public infrastructures are worth taxpayer investment even without a new stream of funding.

What are the key components of digital public infrastructure?

There are numerous infrastructures that make up our contemporary digital life, and very few have been designed primarily for civic goals. We could imagine rebuilding internet service providers around the model of rural telephone collectives, encouraging users to get involved with governing decisions about their physical connections, rather than just being consumers. Similarly, we could examine almost every system on the contemporary internet and consider redesigning everything from search engines to advertising networks to collaboration tools (Google Docs, Slack, etc.) to telepresence tools such as Zoom.

Thankfully, we don't need to rebuild all these infrastructures to move to digital public spaces that operate on civic values rather than on models of surveillance capitalism. Infrastructure is often a mix of private and publicly provided, and infrastructures can meet civic ends while turning a profit. Addressing the serious civic shortcomings of a platform such as Facebook may not require us all to join community-based internet bandwidth collectives – but that's only if current approaches to net neutrality hold. If ISPs can prioritize traffic for one service over another, allowing Facebook to run faster than a startup community service, it becomes even harder to launch a rival social network. Building community broadband is part of the long-term health of digital public infrastructure, but it may not need to be the first step.

Instead, we should target systems that are already raising concerns about their real and potential civic and social harms.

Social Media Networks. Facebook, Twitter, Reddit, Instagram, YouTube, WhatsApp, and others are already experiencing a wave of critique because of their actions in spreading misinformation and disinformation about public health during the coronavirus pandemic and because of their possible actions in increasing political polarization and promoting extremism. Critics point out that these systems lack transparency about which content is permitted, how complaints and abuse are handled, and how content is promoted or demoted by algorithms. While some of the critiques of social media platforms verge on technopanics, there are real reasons to believe that we would be better as a society with tools whose owners and managers took their civic roles more seriously.

Discovery systems. Search engines such as Google have enormous social and political influence, shaping what we learn about the topics that we research.

Secrecy about how results are ranked – necessary to protect against spam and for-profit search engine “optimization” – makes it difficult to evaluate the fairness and equitability of existing search results. The opacity of search engine companies can make it impossible to challenge rankings and results that discriminate or harm the public as a whole. We need to consider strategies to design auditable search and discovery tools or build extensive programs to audit and monitor search engines from the outside.

Revenue systems. Many content creators find themselves becoming surveillance capitalists because they can’t find viable alternatives to earn a living from their content. Ad networks such as Google AdSense make it very easy to generate revenue from online content, but they subject users to behavioral tracking across the web. An easy-to-use system that targeted advertising based on the content of the page, rather than on the behavior of the user, would be a significant step to rein in surveillance capitalism. Similarly, systems such as Patreon and Kickstarter have pioneered fiscal models to support digital creators. But such systems take a significant cut of users’ earnings and don’t involve their users in the design and governance of their systems. New tools focused on subscription, federation (one subscription website could offer access to a network of other sites), micropayment, and nonsurveillant advertising are all promising areas for exploration and could help address economic threats to journalism and revitalize local journalism.

What would social media built around civic values rather than the logic of surveillance capitalism look like?

The power of networks such as Facebook and YouTube comes from their size – with billions of users, everyone knows their brand names and how to use them. Their size is a strength for advertisers, who see the possibility of reaching a subset of the entire world with a single ad buy. But their size makes true participatory governance difficult, if not impossible. A “community” of a billion people who have nothing in common but their use of a media platform is not a community in any meaningful sense. Building real communities that can design, moderate, and govern themselves in online communities requires that we get small.

Social networks designed around civic values are:

Decentralized and federated

Rather than building a single Facebook killer and hoping everyone migrates to a new platform, we need to build thousands of smaller communities, each with its own goals, rules, norms, and affordances. Communities designed for support and solidarity need different structures than those designed for encounter, diversity, and debate.

We can't expect users to download and learn separate tools to interact with each of these communities. A decentralized and federated social media space can be explored using a social media browser, a piece of software that aggregates feeds of information from each of the social networks, allows the user to control how they appear, and lets her post to any networks where she has appropriate permissions as a member. Gobo.social offers one example of what a social media browser could look like, but in the spirit of decentralization, we would hope for competitive browsers to take different approaches to aggregation and user control.

For this space to be navigable, users need to be able to join many networks with a lower barrier to entry. Single sign-on, as offered by Google or Facebook, provides an excellent user experience but furthers those large companies' ability to surveil users. Third-party authentication is one option, as is a client-based identification system like the one being implemented by planetary.social.

Plural in purpose

Why so many networks? Because there are so many communities and so many reasons for people to get together and interact. We recognize this difference in real-world public spaces. Pool halls, libraries, and churches are all public spaces, but they all have different purposes, norms, and affordances. It's hard to check out books in a pool hall and difficult to get a cold beer in most churches. Similarly, we expect different behaviors in these different spaces, and we are seeking different sorts of interactions.

Rather than offering a single set of "rules of the road" for a single platform that's forced to serve millions of different purposes, we need to design spaces with technical affordances and speech rules and norms appropriate to the purpose of a space. A space designed as a support group for victims of abuse will have different affordances and speech rules than a space designed for banter about sports. You choose the communities you want to be part of and, in process, the rules and norms that govern them.

This plurality of norms, rules, and affordances has implications for design. Rather than designing a single, customizable package of social network software, we need to design “Lego sets” of social network building blocks that can be configured to meet the needs of various communities. The social media browsers we build need to make clear the rules of the road for each community someone interacts with, offering reminders on which content and behavior work in which spaces. Furthermore, these tools have to support not just reading and posting but participating in the governance of online spaces.

Self-governing, self-moderating

Much as subreddits – topic-specific communities on Reddit – have their own moderators, determining and enforcing their own policies, communities in this model are self-governing and self-policing. Policies around appropriate behavior and speech are made by the communities; these communities can decide who gets a say in making those rules and who belongs to a community. Rather than outsourcing moderation to paid professionals in whichever countries can provide services most cheaply, removing content per the dictates of an opaque, unpublished rulebook, users take responsibility for debating which types of speech are appropriate for their communities and how rules and norms will be enforced.

Compatible with and complementary to existing networks

The goal in creating social media spaces with civic values is not to eliminate existing networks or platforms. Instead, the goals are to interoperate and to demonstrate that this is a better way to host certain kinds of conversations. (This implies “adversarial interoperability,” using Cory Doctorow’s term. We seek interoperability whether or not existing networks want to work with us.¹³)

Many new social networks have stumbled by demanding that everyone move to a new social platform, abandoning existing relationships. This is unrealistic – existing networks are incredibly “sticky” due to network effects. Building a system where people can continue existing relationships while exploring other ways to interact online allows networks to grow slowly, inviting people to spend less time on Facebook or Twitter and more time in different spaces with different rules.

Great! Where do I sign up?

Not so fast. Pieces of this infrastructure exist in early alpha and beta forms. Other pieces haven't been built yet. Realizing this vision of civic social networks requires, at minimum:

- Client software that's compatible with existing social networks as well as with these new networks. This, in turn, requires access to the APIs of existing social networks or a technical and legal strategy that allows access to posts on other social networks.
- A social network development kit, the Legos that let users build social networks with different technical affordances. Planetary.social might offer one model for this, while Solid, being developed by Tim Berners-Lee, could offer another option.
- Cross-cutting support services. This includes single sign-on, as discussed above, but might also require services needed to run social networks safely. All social networks should check imagery uploaded against a central index of child abuse imagery – a system to conduct these checks is an important precursor to releasing tools to create an explosion of social networks. (Asking Facebook to share the database it's already developed with new social networks is the sort of organizing that the Institute for Digital Public Infrastructure seeks to do.) It is possible that we would need similar services to check copyrighted materials to comply with copyright law, or to check content against the Global Internet Forum to Combat Terrorism database of extremist content. There are excellent arguments that GIFCT is opaque and serves as an overbroad and overpowerful blacklist,¹⁴ but it serves as one useful example of a cross-cutting infrastructure that will need to be built to support an expansion of social networks.
- Tools to help communities monitor and measure how well their communities meet their values. Projects such as Civic Signals, which is developing methods for identifying and amplifying civically healthy conversations, are one inspiration. Another is Nathan Matias's Citizens and Technology Lab, which helps Wikipedia and Reddit communities run experiments to improve governance of their communities.
- Most importantly, we need to find communities willing to experiment and demonstrate the value of these spaces and the different ways they can be governed. We should identify and work with communities that already meet in the physical world, as well as those that exist primarily in digital form. We should work with communities that benefit from exclusivity and closure

(a support group, for example) and those that seek to recruit many new users.

This is a nonexhaustive list of tools and systems that would be needed, shared in part to spark debate about what's necessary and desirable in building these digital public spaces. It's useful to brainstorm what might be necessary to build other digital public infrastructures. What's needed to build alternative search engines is going to be very different from what's needed to build telepresence, for instance.

OK, so since this isn't ready yet, how do we build this?

Building a set of social networks optimized for civic goals requires innovation on four fronts at the same time. Taken as a whole, the tasks are daunting. Separated into pieces, they are less overwhelming.

These new networks require **technical innovation**, though less than one might think. Excellent federated social network software exists (Mastodon, for one) and early experiments in truly decentralized networks (planetary.social) are very promising. We've built a proof-of-concept social media aggregator and learned that the legal and design problems are at least as daunting as any technical challenges.

Creating an aggregator that's compatible with existing networks – something we believe is necessary to gain widespread adoption of these new networks – raises some **tricky legal questions**. Existing case law gives platforms some tools to block aggregation. There are no mandates that force platforms to give access to their APIs; while we might seek legislation to mandate access, interim adversarial interoperability strategies raise some likely conflicts with the Computer Fraud and Abuse Act. Developing legal protections for aggregation through legislation or strategic litigation while advancing policy strategies will be necessary to move forward with these projects.

We need **social science research tools and methods** to study and understand these new communities as they evolve. We have to do a better job than the existing platforms have done at understanding their positive and negative social impacts if we want to argue that we're building spaces better for individuals and society.

Finally, ***we need to imagine better futures***. We need to look beyond fixing existing broken social media networks and toward building spaces that operate in very different ways. This requires a conceptual shift, a belief that normal people, not genius entrepreneurs, can and should build and govern online public spaces. Weirdly, this may be the hardest of these four challenges – the problems facing existing social networks are dire enough to scare anyone off from working in this field. We need to understand that networks that operate on civic logics will have different – perhaps equally fearsome – problems to conquer. The inability of Facebook to take down misinformation and disinformation is the reason to take an alternative approach to building social networks, not to assume that any new network will become toxic.

Beyond imagining what's possible, ***we have to advocate for better futures***. Taxing surveillant advertising is an idea that's almost certain to be opposed by existing internet platforms. We will need to do more than joining and participating new civic spaces – we will need to fight for their existence.

Infrastructures create externalities.

What positive and negative externalities can we expect from civically focused digital public infrastructures?

One anticipated negative externality is that the web becomes harder to control. While current campaigns that pressure YouTube or Facebook to take down disinformation are sometimes successful, these efforts become more difficult when thousands of smaller platforms allow content that we may find offensive. Truly decentralized networks make it impossible to remove content, which could lead to nightmarish situations. More frightening is that toxic communities gain more control over the spaces they inhabit – a federated social media space means that far-right social networks like 8kun and gab.ai can create their own spaces online and govern them in the ways they please. However, federation means that other platforms can choose not to connect to those more toxic networks. The upside is that these toxic communities may have smaller reach and be less likely to spread extremist content beyond those who actively seek it.

One possible positive externality is a revitalization of small-d democracy. Robert Putnam has mourned the disappearance of local associations both because

they created a network of weak social ties and because they taught people how to participate in democratic governance. Participation in communities on existing social media platforms is infantilizing – the rules are entirely out of our control. Participation in civic spaces requires vastly more energy and participation, and it may be a major way in which people learn to flex their

Are you totally nuts?

Quite possibly. But I'm not alone.

Jimmy Wales, co-founder of Wikipedia, has turned his attentions toward building healthy, pro-civic social media with WikiTribune Social.¹⁵ Tim Berners-Lee, the inventor of the World Wide Web, has begun building Solid,¹⁶ a set of tools and protocols to build distributed applications much like the ones I describe here.

Governments are getting into the act, too. PublicSpaces¹⁷ brings together Dutch public broadcasters and cultural institutions in partnerships to build open source community tools that meet civic and cultural needs. The movement is young but growing.

What will seem crazy in a few years is the idea that we feared the civic implications of our digital tools but lacked the will to imagine and build better ones.

About The Author



[Ethan Zuckerman](#) is founding director of the Institute for Digital Public Infrastructure at the University of Massachusetts Amherst, formally starting his appointment in January 2021. The longtime director of the Center for Civic Media at MIT's Media Lab, he is also a co-founder of Global Voices Online and was a research fellow at Harvard's Berkman Center for Internet & Society for eight years. He is a graduate of Williams College.

About This Research

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Endnotes

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