



BUILDING THE INFRASTRUCTURE OF TOMORROW AN ACTION GUIDE

INTRODUCTION

Confronted by dueling crises—the global COVID-19 pandemic, and the changing climate—the U.S. has entered the 2020s with brutally vivid examples of its infrastructural shortcomings. Be it overloaded hospital ICUs, flooded towns, or disconnected students, not only has it been made clear that America’s systems must confront a structural reckoning, but also, what Washington has typically considered ‘infrastructure’—and chosen to invest in as such over the last 70 years—needs a modern facelift. This radical update means that our infrastructure, from 5G networks to public transit, should be perceived as multidimensional in scope and purpose: physical, social, and digital.

The ‘Build Back Better’ agenda from the Biden-Harris Administration looks to funnel trillions of federal dollars into these diverse fields as the country recovers from the COVID-19 crisis and still faces many others, in turn an explicit recognition that ‘infrastructure’ is more than just concrete and steel. With the passage of the historic INVEST in America Act in November 2021, the spending debate has made its way into city halls and statehouses, which hold an outsized role in distributing billions of dollars to projects. Therefore, policymakers and practitioners at the state and local level undoubtedly need a new path forward, rather than a repeat of the past. In October 2020, the Siegel Family Endowment released a white paper entitled “[Infrastructure: Building the](#)

[World We Deserve](#),” which detailed what a 21st century approach to American infrastructure would look like. It lays down a new set of ground rules in an effort to create systems that are more resilient, equitable, and dynamic than ever before. With the Endowment’s support, Aspen Digital, a program of the Aspen Institute, outlined the challenges and opportunities that this approach would face.

Our recommendations can be broken down into three categories: *mindsets, metrics, and money*.

In the time since then, Aspen convened a roundtable for each recommendation, where the nation’s leading thinkers on infrastructure—from government, nonprofits, advocacy, planning, and research—discussed tangible actions that stakeholders could take to effectively modernize their approach to infrastructure spending to meet this window of opportunity. How these ideas are pitched to the public to garner support—an essential part of the process—was also explored. For the purposes of this paper, our research draws heavily on case studies and examples from an area of infrastructure that is one of the most widely experienced in our daily lives: transportation.

The result is what you’re about to read: a guidebook for traversing a new age of American infrastructure.

I. MINDSETS

‘Mindsets’ here are defined as the ruling orthodoxies in public-facing institutions that play a role in how services and structures are discussed and delivered. They are shaped by long-held laws or processes, not necessarily the well wishes or intentions of planners. The result is that, by and large, the way governments at all levels invest in infrastructure is still stuck in a time capsule from the 1950s and 60s, the last great age of federal spending. What is perceived as ‘infrastructure’ has largely been limited to physical, and within that, a proclivity for roadbuilding.

The Manual on Uniform Traffic Control Devices (MUTCD) is a telling example: the guidance, issued by the Federal Highway Administration (FHA) to local transportation departments, dictates what can and cannot be designed, installed, or used on America’s roads. Planners are then left with little leeway to innovate or experiment, as they must confine practice to guidelines that notoriously favor the automobile. MUTCD, first written in the 1930s and updated irregularly, has led to a national network of roads that are widely out of touch with our modern mobility needs.

Even though infrastructure touches upon every aspect of life, a narrow institutional definition limits the imagination regarding a more ‘whole-of-government’ approach to how it’s built and maintained. The term ‘silos,’ heard often in policy discussions, quickly comes to mind. Additionally, a lack of sustained funding, a historical culture of risk aversion, and institutional constraints mean that planners are often hesitant to pilot new concepts.

“What we need to do is to change the narrative from which the mindsets arise,” said Benjie de la Peña, the CEO of the Shared Use Mobility Center. “What is the marathon plan for changing our narratives and conversations about what should infrastructure do and be, in the face of the climate crisis and social justice?”

To develop 21st century infrastructure, the ways in which governments think about these systems need to change.



ACTION ITEM 1:

Adopt the governing practices from COVID-19 pilots.

When the COVID-19 pandemic hit, most municipalities in the U.S. entered into a state of emergency to allow for the governance processes that come with battling a global pandemic, like rapidly deploying personal protective equipment (PPE) and erecting makeshift ICU beds. Those orders also extended to other agencies, like capital construction and public realm design.

What resulted was a period of institutional innovation, using streamlined methods to deliver projects faster, or allowing businesses to bypass extensive permitting to set up outdoor dining or curbside pickup. To keep up with the changing dynamics of the virus, governments had to be able to respond rapidly. Planners said the result was reduced silos and greater responsiveness.

“During COVID, we actually demonstrated that we could advance transformative change very quickly,” said Jennifer Keesmaat, the former chief city planner of Toronto and founder of Markee Developments. “Of course, there’s risk in doing that, like how you define the public interest, for example. But we can advance change and do things that are not tied to big infrastructure spending that actually are fundamentally transformative.”



The ability to adopt this ethos “fail early, fail fast, and fail often”—more common in the private sector—should become the governing norm in the post-pandemic wake, as many cities and states discuss whether to make certain COVID-era innovations permanent.

This was the message of Aspen Digital’s [Fail Forward](#)

program, launched in February 2020, just before the world would see its most vivid real-life demonstration. The disruptions that the coming years will hold, from a tumultuous climate and rising automation to the threat of future pandemics and wealth inequality, will demand innovative approaches. Policymakers and practitioners must have the tools and power they need to roll out, adjust, and grow pilot projects at scale.

CASE STUDY IN CHANGE: Oakland's 'Slow Streets'

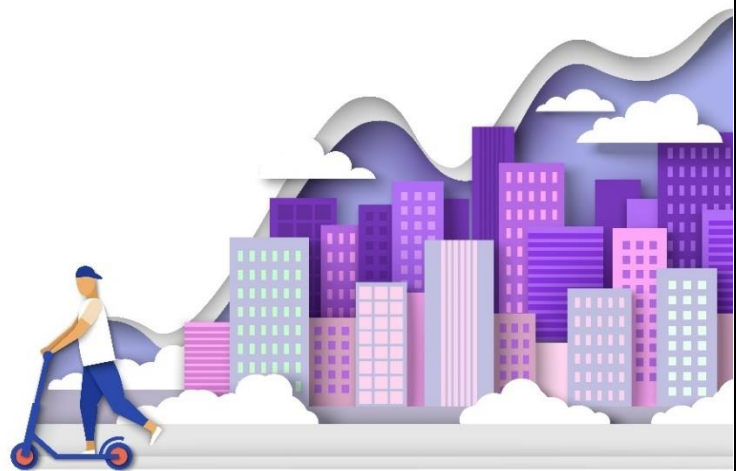
When social distancing became a way of life in March 2020, cities and towns looked to deploy measures that gave people ample room to walk or cycle. That brought newfound attention to streets, which make up the bulk of public space yet are overwhelmingly reserved for vehicular traffic. Pilot programs ensued: New York City had 'Open Streets;' Denver had 'Shared Streets;' and Oakland had 'Slow Streets.'

"Within the emergency team when we had no money, suddenly people had crazy ideas like, 'I guess we could just put up the Jersey barriers that we have in the stock room,'" said Warren Logan, then policy director of mobility and interagency relations in the Oakland Mayor's Office. "When governments rely on even the small pilots to sort of break open what else is possible, you start with perhaps 'I didn't know we could do that,' which means that 'maybe we can do that,' and then 'maybe we really can do this bigger thing.'"

In April 2020, Logan's [team launched 21 miles of Slow Streets](#) throughout Oakland. The next month, "Slow Streets: Essential Places" created safer passages to grocery stores and test sites. The program was not met with universal praise; wealthier communities were more likely to

embrace the program, while lower-income communities in East Oakland saw it as an intrusion. So, the team centralized their attention on the latter, and re-evaluated the ingredients: the signage, the design, and the narrative. Summer 2021 saw more tweaks and flexibility.

"We had an opportunity to reduce silos, to create a team almost like dodgeball in high school that says, 'I pick you not because you're on economic development, but because you're great at engaging with people and I need that skill set on the team,'" he said. "We were given the authority to actually do what needs to be done and the space to take on a level of risk that I don't think governments—especially not cities—are normally willing to take on and establish what failure might look like and then learn, build and iterate on that, I hope."



ACTION ITEM 2:

Make community engagement an ongoing process.

To create infrastructure that serves a multitude of needs in the future, communities must have substantial buy-in, seeing and believing that the projects work for them. Yet that implies overcoming historical legacies of distrust, especially amongst communities of color; too often, projects were a vision of the few, rather than the many. That means community engagement and co-design must be a long-term plan, not a one-off checked box.

“During the pandemic, something that we saw happen, more than ever, we had all of these different agencies, departments, and stakeholders coming together to try to address something like a pandemic and being really willing to listen to one another and adjust. My hope would be that that continues,” said transportation equity consultant Tamika Butler. Yet that mentality needs to stick. “We love to get together every few months and talk about what’s next, what’s changed, what’s new—but when we really look back on those conversations, we actually haven’t changed much outside of momentarily shifting.”



In most municipalities, some degree of community engagement is now mandated by law for public projects, a positive result that stems from years of advocacy to open up the gears of government and make decision-making more transparent. But typically, that engagement happens in the planning process; a project is conceived, presented, (perhaps) adjusted, and then delivered. That’s where the input ends.

But infrastructure investments are not singular projects that exist in a vacuum—they evolve along with societal needs and issues. Libraries are a telling example: as information became readily available through the internet, these institutions shifted from being repositories of books to also being centers for skills, services, and digital access. A similar shift will have to unfold across all levels of government, as we’re living 21st century lives using 20th century infrastructure.

In order to do that, government agencies and lawmakers should create sustainable community engagement blueprints that keep neighbors involved long before and long after a project is installed. That way, public officials can be ready to update infrastructure to meet this decade and the next, as policy debates shift direction. Finding out what's working now and what needs to change tomorrow helps to foster an inclusive environment where public infrastructure is seen as an investment, not a burden.

“When thinking about how to move forward in a process that's really going to activate local governments, it's a partnership with the community that makes sure community leaders are not pushed aside,” said Jaime Love, the director of U.S. programs at the Institute for Sustainable Communities. “Because the government is viewed as the expert, but so are the communities. They know what's happening, they're closest to the problem, and they have solutions.”

ACTION ITEM 3:

Create shared, multi-agency goals around infrastructure.

If infrastructure is multidimensional by nature, it needs a multidimensional approach. Yet the ways in which these systems are funded remains largely in the realm of state and city Departments of Transportation (DOTs), reflecting an outmoded mindset that infrastructure is purely physical. That undercuts a more cohesive understanding of infrastructure's far-reaching aspects into our daily lives—and limits what's possible.

A street, for example, has traditionally served our mobility needs, but increasingly it is home to amenities like bioswales, cultural programming, outdoor dining, and fiber optics for 5G broadband, all of which fall under other agencies' jurisdictions. Yet still,

it is the local DOT that oversees and plans the street. With this historical influx of funds, the needs of tomorrow will require an interagency effort that brings all relevant players to the table.

Saying the government should coordinate more is easier said than done. It is a regular refrain of policy



reports and advocacy campaigns, but implementation fails to transpire. Agency decision-making processes and budget allocations are siloed, and a lack of enforcement mechanisms means coordination around infrastructure is no more than a gesture. This, of course, can lead to project delays later on.

But if towns, cities, and states are to deliver Washington's infrastructure ambitions, this can no longer be the governing reality. Funneling an unprecedented amount of federal funding through a siloed system will not only replicate the mistakes of the past but make taxpayer dollars less efficient and effective. Municipalities, big and small, must rethink how their decision-making processes are designed for infrastructure investment. This can happen through shared goals.

"It's not enough to just say, 'Oh, you should all collaborate.' You do really have to create those engines," said Jason Lally, the deputy chief data officer for the state of California. "We've called them things like innovation offices and all that, but I think we need to apply effort toward thinking about what that looks like in different organizational contexts, so that we can create those conditions. We can make it people's jobs to be thinking about how to pull people together to accomplish a common goal."

Creating shared institutional benchmarks for future planning that agencies must devise, and meet, would foster a multi-agency approach to infrastructure investment. It could also change the culture of how infrastructure is perceived by policymakers, which would have budgetary implications. Ideally, municipalities would create an 'Office of Infrastructure' or potential 'Deputy Mayor for Infrastructure' to oversee interagency communication and project management.

This must not be another layer of bureaucracy that hinders infrastructural delivery. Rather, the aim is innovative structures that best leverage the skills of agencies with the projects at hand.

"What's often missing in terms of mindset is a very clear ambition," said Bridget Marquis, the director of Reimagining the Civic Commons. "That's where you can really start to gel around cross-silo collaboration. You don't just collaborate to collaborate; you collaborate because there's something you're trying to achieve collectively, and collaboration is the only way you can achieve it."



II. METRICS

‘Metrics’ here are defined as the standards and criteria by which infrastructure investments are planned, funded, and delivered. Traditionally, measures of climate or equity have hardly factored into decision, making processes that prioritize cost minimization at the center of a project’s return on investment (ROI) analysis. The data is also usually collected and used by government agencies or lawmakers in what many residents may feel is an opaque manner.

In transportation, an obsession with ‘level of service’—or how well a facility is working from a driver’s perspective—ensures that infrastructure only meets demand for a specific usage, like cars, thereby excluding alternative usages like bikes, waste disposal, or electric and broadband cables. This legacy of prioritization ignores substantial portions of the public user base, helping to create a structurally racist and classist system in terms of who benefits and loses out. This disparity is seen everywhere, from the socioeconomic reliance placed on car ownership to the placement of polluting plants and factories near communities of color.



Take, for example, the proposed widening of Houston’s I-45 Interstate highway. Engineers collecting data on traffic flow may perceive the project as a solution to help ease traffic congestion around a growing metroplex. However, the plan failed to account for negative externalities: more carbon emissions and air pollution; the adverse impact on Black and Latino neighborhoods, who live most proximate to the road; and the prospect of induced demand, in which traffic levels actually do not

“We don't want to lock ourselves into a way of doing business or managing communities that's high carbon, inequitable, and inefficient.”” –Harriet Tregoning, NUMO

improve in the long run. Those downsides [prompted the federal government to pause](#) the project under the 1964 Civil Rights Act, citing discrimination.

Decisions like it could have immense implications for future federal planning, but also expose deeply held flaws in how projects are evaluated, which have lasting repercussions. “A big part of why this infrastructure conversation is so crucial right now is that infrastructure investments last a long time,” said Harriet Tregoning, the director of the New Urban Mobility Alliance (NUMO) at the World Resources Institute. “We don't want to lock ourselves into a way of doing business or managing communities that's high carbon, inequitable, and inefficient.”

To develop 21st century infrastructure, the ways by which policy players measure our existing and future systems needs to change.

ACTION ITEM 4:

Create and deploy metrics for equity and access.

Equity has long been one of the most overlooked aspects of infrastructure planning. Ensuring that all citizens have equitable access to the same resources and opportunities needed to live a prosperous life has been stymied by governing systems and processes that have perpetuated divided outcomes. The gaps today are all too prevalent in our built environment, and that will not change unless the goalposts do.

As it stands, evaluations of infrastructure projects are often focused on the performance on a narrow set of shorter-term outcomes. Transit planning is notorious for this: until recently, commute times have been the primary measure behind new metro systems, bus routes, and roads. In turn, an economic emphasis instills systems that favor wealthier white-collar commuters during typical ‘peak’ hours, rather than poorer riders on the periphery who may not use transit in the same way or at the same hours—yet rely on its reliability much more. The result is an uneven landscape of service for different trips and demographics.

Equitable outcomes must be part of future evaluation, and so planners should look to include ‘access’ as a tool of measurement. What can citizens access through this new infrastructure investment, and who can access them? So, for example, instead of solely jobs, will a new bus route maximize the number of people who can better access schooling, fresh food, medical care, or other social services? Adding a multidimensional layer to project evaluation will better ensure that investments serve a much greater portfolio of needs and populations than what came before.

Hana Creger, a senior program manager at the Greenlining Institute, cites the [Mobility Equity Framework](#) the organization created as an example. The first step is conducting a community mobility needs assessment that encourages residents to brainstorm potential mobility projects. The variety of projects are analyzed using a subset of at least twelve equity indicators that the community chooses, including access to mobility and access to economic opportunities. Then the community ultimately votes on which mobility projects to implement.

“You can plug in any mobility option or infrastructure investments into this framework—whether it's EV car sharing, public transit, biking—and see which produces the greatest equity outcomes, but in a way that is guided by community needs and power,” said Creger. “The framework really aims to kind of democratize transportation planning and decision-making.”

ACTION ITEM 5:

Include the climate impact on future generations in cost-benefit analyses.

Since the 1960s, environmental quality, or how a project affects the surrounding area, has been the key climate-related measure of infrastructure projects. Yet while significant, these evaluations leave out the severe toll a project could have for many years to come on planetary health, notably the prospect of carbon dioxide emissions. A state may judge that a power plant is ecologically sound for nearby residents, but it tends to overlook that the plant itself uses carbon-burning fossil fuels.



Facing a climate crisis, this metric needs to change. A project’s carbon impact on the environment must be included earlier in the scoping phase when project evaluators conduct a cost-benefit analysis (CBA) before pitching to policymakers. Metric tons of carbon emitted—between now and in the coming decades—should be translated into a price tag since it is a cost on the future generations who will have to face the consequences of allowing those emissions into the air.

“One way to think about infrastructure is to understand risk, in addition to data models and analytics for understanding what makes an investment better than others, particularly from a climate or holistic perspective,” said Greg Lindsay, the director of applied research at NewCities. “The Securities and Exchange Commission (SEC) is asking, ‘How do we do a better job of understanding climate risks in financial or real estate portfolios?’ It seems like we also need this as part of our understanding of infrastructure.”

Like New York’s [Climate Leadership and Community Protection Act](#), projects should be evaluated on carbon *reduction*, not further emission. If infrastructure systems either rely on renewable energies or help phase out the use of fossil fuels, then the evaluated price tag should come down. Conversely, if it enables the same fossil-fuel burning patterns without any attempts at recourse, then the price tag should go up.

As it stands, there is reasonable concern that the infrastructure packages will continue to utilize funding formulas for projects that will prolong our addiction to fossil fuels. That is why creating a standardized system of measuring climate impact is of urgent necessity. Doing so will help prioritize ‘shovel-worthy’ projects that are either net-zero, or help cities and states get there.

ACTION ITEM 6:

Encourage community-driven data.

The collection and use of data offers the potential to shed light on the performance of our infrastructure; conversely, the collection and use of data may also cause unintentional harm. How data is collected, who does the collecting, what is communicated about its collection and use, and how the data shows up in decisions that are made for constituents all have a bearing on its success or failure. And after years of mistrust built from extractive data practices and subsequent ill-advised planning decisions, many communities—especially Black and Latino communities—react to government-provided figures with skepticism and doubt. This moment of reinvestment can be a restart.

“We have to look at who holds the ability and power to actually create those metrics and do the analysis itself,” –
Kyle Wagenschutz,
PeopleforBikes

Having citizens directly involved in data collection processes, both before and after a project is delivered, offers a multitude of benefits to planners. First, it could

encourage buy-in from local residents, who may see firsthand the need for a certain project. And secondly, data collection from communities helps inform what projects or metrics should be tracked; rather than using data to justify a policy or program defined by people outside of the community, local officials can use community data to identify what policies or programs should be identified in the first place.

For example, if neighbors play a role in documenting the speed of traffic along a certain thoroughfare, it could help in pitching a project to install ‘traffic calming’ measures, like speed bumps, cameras, and bike lanes, later on. The project would be perceived as something that the community helped design, rather than an invasive plot from outsiders. This has particular implications for communities of color, where projects like this are met with concerns around gentrification and displacement. (This will be more explored in the final section.)

“There's money in the American Rescue Plan for ‘community navigators,’ and there is an opportunity right now to engage and prioritize community,” said Jennifer Bradley, a senior fellow at the Kresge Foundation, “both as sources of what we need to measure, but also as the people who are out conducting and doing the surveys and measurement themselves.”

Furthermore, as regular users, neighbors can capture data that planners, who are infrequent visitors, may miss. The result will be a project better borne out of the numbers, which could lead to fewer issues or needs for adjustment once it's delivered. It also offers opportunities for city or town officials to swap notes with and discuss what citizens found, a key touchpoint for trust-building and collaboration.



“We have to look at who holds the ability and power to actually create those metrics and do the analysis itself,” said Kyle Wagenschutz, the vice president of local innovation at PeopleForBikes. “In addition to identifying what the metrics are, we also have to create the systems to democratize the ability for any community to perform those metrics and analysis. Whether that's a well-funded city government or local community group, we have to have tools to do that.”

CASE STUDY IN CHANGE:

Memphis Fights Blight

Like many other cities, Memphis, Tennessee, has a blight problem. Thousands of properties lie abandoned, draining the city and communities of potential revenue and residents. The localized effects of blight are well documented, from the environmental to the economic. But approaches to address this persistent issue often lack larger coordination or vision.

So, Memphis took a different approach. In 2015, the city formed the Memphis Blight Elimination Charter, which provided the framework for community collaboration. Neighborhood advocates knew the reported 12,000 blighted properties in the region were an underestimate, but the city did not have a way to count. Communities on the ground, through representative nonprofits, were invited to create the data themselves.

They make up the [Blight Elimination Steering Team's Data Committee](#), which looks to standardize the methods by which blight is regularly documented throughout the city by public and private actors. The members then made that data accessible, so lawmakers and practitioners can detect trends and differentiations of blight. By making that data a usable asset, communities are encouraged to participate in the decision-making process.

"When we had people out doing a windshield survey of their own neighborhoods, the number one comment you heard from that was not, 'Oh, Memphis has terrible blight and here's what we need to do about it,'" said Justin Entzminger, the executive director of Innovate Memphis. "What you heard was, 'I didn't know all of the complexities around what it takes to help a neighborhood, whether that's solid waste code enforcement, street maintenance, bike, and transit infrastructure.'"

Since then, the city has created a 'blight dashboard,' which tracks the indicators mentioned. (Innovate Memphis helped found this program.) Neighborhood reports are now issued, and a pilot program was launched to concoct mitigation strategies. And community-generated data led policymakers to the top ten property offenders in the city, which resulted in a tangible plan to resolve their issues.

"I learned a lot, the participants learned a lot, and the knowledge gained empowered people to have productive conversations with other neighborhood leaders and elected officials around the issues the neighborhoods were seeing," Entzminger added.

III. MONEY

Just as our concept of infrastructure is stuck in the past, so are the ways in which we invest in it. By and large, municipalities are constrained in their ability to raise revenue for, and deliver, infrastructure—a major hurdle in achieving sustainable and equitable development going forward.



The delivery methods, like the design-bid-build and lowest bidder models, were regulated by laws adopted in a different era. While the provisions may have made sense then, they no longer fit the realities of infrastructure-building today; we no longer want our infrastructure to merely go to the lowest bidder, especially when overruns and maintenance costs later on in the project cancel out any savings, but rather to have the most positive impact on a wider set of social and ecological outcomes over the full lifecycle of an asset. Moreover, these legacy mechanisms constrain America from taking advantage of innovative mechanisms proven successful in other countries.

On the revenue side, cities and towns may know their community infrastructure needs best but are limited in their ability to pay for them. At the local level, the most common form of raising revenue for infrastructure investments is through taxes, whether on income, property, or sales. Notable, too—especially in small towns—is the problematic reliance on police traffic stops as a fiscal funding mechanism. Both are emblematic of a broken process: reliance on taxes ties infrastructure quality to wealth; and local traffic infringements, of course, raise concerns of perverse incentives and discrimination.

Furthermore, America has a maintenance problem. Due to municipal finance laws, capital projects for local infrastructure are usually paid for through bonds, which are based on projections of tax revenues, while maintenance is paid through expense funding, or the actual taxes imposed. That is why the U.S. has developed a habit of building shiny new projects first and finding out how to pay for them later: it's more politically palatable to issue bonds than raise taxes. Since Washington has delegated most infrastructural responsibilities to local actors, that has created a fractured landscape.

Year after year, the American Society of Civil Engineers' (ASCE) [report card](#) on the country's physical infrastructure is widely cited (and critiqued) but repeatedly ignored. This lack of investment in repair is felt most acutely at the local level; [ASCE reports](#) that the expected impact for every American household will be an average annual loss of more than \$3,300 through 2039. With the collective challenges we face, that needs to change.

The time is now for a new path forward on financing infrastructure.

ACTION ITEM 7: **Legalize new methods of infrastructure delivery.**

Typically, the statehouse decides the delivery mechanisms and bylaws for infrastructure projects. This centralized system has honorable intentions: it was meant to be a check of power on local officials, who state lawmakers were worried would profit off of public works. A prime example is the low-bid system: in many states, local municipalities are mandated to go with “the lowest responsible bidder” for a project, a measure put in place to shield projects from cronyism.



The process known as ‘design-bid-build’ is the normative mechanism used to deliver infrastructure in America. A design firm scopes out a project, which is then put out to a public bid, and the “lowest responsible bidder” is awarded the contract to build it. But the product of that process is a system unfit for the pace and demand of today’s world. These practices notoriously lead to subpar project quality due to inexperienced contractors and a lack of coordination, resulting in delays and stretched timelines. Measures once meant to protect the public purse have ended up costing it even more—a worrying scenario considering that new influxes of federal funds will go through these same mechanisms.

Communities need the freedom to experiment with new ways of delivering infrastructure that look to address these shortfalls. In recent years, for example, states have made progress legalizing ‘design-build,’ an approach where a designer and contractor collaborate on a scope from a project’s onset, rather than too late in the process. While experts say the method may not be opportune for small-scale fixes, studies have shown that design-build, when used internationally,

[delivers](#) public infrastructure in a manner faster and more cost-effective than traditional methods.

“The federal government should incentivize the state and local infrastructure asset owners to use these new tools that are really proven around the world to generate more revenue and realize better management,” said Richard Geddes, the director of Cornell University’s infrastructure program. “In the contract, you can require the private partner to adopt proven technologies in what’s called ‘future proofing.’”

Due to varying rules, not all 50 states have design-build (Iowa and North Dakota are notably missing), nor use it for all public projects. In several states, including New York and New Jersey, design-build is [limited](#) to a certain set of projects, and cities often have to ask the statehouse for permission to use it.

Any major federal investment in infrastructure should be attached with leeway for public bodies to pilot innovative delivery mechanisms, like design-build, so dollars go farther than before. Otherwise, future infrastructure investment may be held hostage to a system that could constrain its full potential.

ACTION ITEM 8:

[Allow municipalities to experiment with new revenue schemes.](#)

Cities and towns are limited in the revenue they’re allowed to generate. Measures usually either have to be approved at the statehouse, often by elected officials who do not represent the area, or put through a ballot referendum, a process that can be both cost-prohibitive and time-consuming.

Take, for example, New York City’s idea for congestion pricing. When former Mayor Michael Bloomberg proposed the idea in 2008—which would charge drivers to enter Manhattan’s central business district, as a means to improve air quality and fund mass transit improvements—it was opposed, and ultimately doomed, by state lawmakers. The measure was approved over a decade later, but only when a newly elected class of state lawmakers with a transit system in crisis presented and ultimately passed it.

Similar encounters regularly unfold between local leaders and statehouses. But systems built around power politics have proven inept at meeting modern demands. Apolitical funding streams, like those found through land value capture, allow for

long-term planning that both promotes growth and ensures public benefit with private development. In addition to property taxes, localities should be given the jurisdiction to test-pilot other schemes, like impact fees on developers, property co-development for rail operators, and community infrastructure levies.

In Pennsylvania, the state is [bundling](#) together 500 bridge projects into one project, which opens up new funding streams through private-public partnerships. “They were able to utilize a bunch of different sources to complete a lot of similar bridges in one way and then they're looking at some others in a different way, with more of a value capture tolling approach,” said one infrastructure expert. “It's those really great approaches to looking at your whole portfolio and changing that mindset to viewing your infrastructure as an asset.”

While state and federal funds supplement public works, there needs to be a serious effort from the ground up to allow localities to better control their own financial destiny. In doing so, infrastructure spending today will go even further tomorrow.

CASE STUDY OF CHANGE:

Co-Locating Public Housing & Libraries in Chicago

Like other infrastructure, the funding for municipal libraries is often constrained by political realities and a lack of long-term planning. In turn, libraries have a long history of relying on philanthropy for capital funds—certainly not sustainable at a time when libraries have become crucial spaces of social infrastructure.

In Chicago, former Mayor Rahm Emanuel took a unique approach. During his term, his administration pioneered the concept of co-locating public housing development atop libraries. At a time of housing

shortages, three sites opened in 2019, and more could follow. Other cities have adopted the same practice.

At its surface, the pairing is obvious: new public housing units are added to the market; residents can access all the tools and resources libraries offer; and the community gets a new anchor institution. But perhaps most notable here is the funding strategy: by co-locating public housing, the City of Chicago was able to unlock federal dollars to help build the libraries, which made development more accessible.

ACTION ITEM 9:

Bundle long-term maintenance into overall project cost.

Going forward, maintenance must no longer be an afterthought. The investments in infrastructure we make today have to be able to last tomorrow. That means reforming how cities and towns approach infrastructure funding.

“With funding from the infrastructure bill, any project needs to be attached with how that jurisdiction is going to maintain it,” said Tommy Wells, the director of the Department of Energy and Environment in Washington D.C. “Because we know that the voices that are the least heard are the ones, for example, that do not get their tree boxes replanted, which is why the tree canopy is so poor in poorer parts of America.”

When a project is put out to scope, municipal finance laws must be amended to ensure that a long-term maintenance plan, pegged to inflation, be bundled into the upfront project cost. That has two significant benefits.

First, it ascertains that a pool of money will always be available for repairs, instead of the current system, where if projects break down sooner and then governments have to quickly scrounge up funds. Paying for infrastructure without considering long-term maintenance costs provides an incomplete picture, thus hindering strategic planning. Secondly, bundling maintenance into project costs allows localities to garner public and private investment with a concrete price tag, which promotes more accurate accounting of the resources available to spend.

Local planners and policymakers cannot recreate the vulnerable systems of the past by leaving maintenance on the backburner. With a historic investment in infrastructure, America must solve its maintenance problem, or else projects will follow the same cycle of decay that we see today.



IV. IMPLEMENTATION: PERSUADING THE PUBLIC

With revamped focuses on mindsets, metrics, and money, municipalities of all sizes can begin to forge a vision for 21st century American infrastructure. But public works must inevitably face their namesake—the public. Buy-in can make or break a project.

The history of community engagement for infrastructure planning is a pendulum swing between too little and too much. In the past, the neighborhoods most affected by projects—often low-income communities of color—were routinely ignored in deliberations, creating the inequitable landscape we see today. But in an effort to address those grievances, many towns, cities, and states have erected systems that allow non-representative bodies to speak on behalf of entire communities.

Local planners will not harness the potential of historic infrastructure investment if they're unable to pitch the public coherently and convincingly on the shared benefits of the future. That only comes with a rewrite of the rules of engagement.

ACTION ITEM 10: **Localize the language.**

When discussions of equity and infrastructure arise, a story well told is one of bike lanes. For years, Black and Latino neighborhoods have viewed the construction of safe cycling infrastructure as a veiled threat of gentrification—a sign, like a new Starbucks branch, that their community is at the precipice of undesired change. And for good



reason: due to constituencies with more time and money to organize, bike lane construction has typically served wealthier, white populations, even though cycling culture has long been an integral part of low-income communities. But what this story should point out is not to abandon cycling infrastructure; bike lanes undoubtedly promote usage, which is a necessary antidote to our crises of climate and health—especially in low-income communities, where the effects from air pollution and traffic violence are disproportionate. Rather, this story indicates that there were shortcomings in

the way the planners and local officials fail to adequately communicate the benefits that cycling infrastructure might have on those affected communities, framed around things they care about and the language they speak.

When officials at the Los Angeles County Metropolitan Transportation Authority, or Metro, were rallying support for Measure M, a sales tax measure to fund transit infrastructure in Los Angeles, Seleta Reynolds, the general manager of the Los Angeles DOT, which helped in the effort, said the team learned two things.

“You couldn't go tell people that we were building trains to solve climate change; you had to tell them that we were building trains to fix traffic,” she said. “They also found that there was tremendous support when you went to people and said this sales tax measure is going to be evergreen. We are not going to come back to you again in the future and ask you for more money for this.” (In 2016, 72 percent of residents [voted yes](#).)

A strategic tool is the deployment of ‘credible messengers,’ or community members who residents may trust more than a bureaucrat. Local leaders can help planners find the right language when approaching a controversial topic; protected bike lanes, for example, could be pitched as a boon for delivery couriers as much as it is for young families with children, all looking to evade congestion that nobody enjoys.

By diversifying staff and engaging with community members, public officials must learn how a town or neighborhood interacts with infrastructure, a valuable asset to how a project is pitched. In rural communities, for example, it may be detrimental for planners to use the language of ‘placemaking’ as residents may be unaware and confused by what that exactly means. Rather, planners should look to adopt localized terms that translate infrastructural benefits in a compelling narrative and format.



“As we were working on these water systems throughout the West, we have found that the language we use makes a big difference,” said Julie Davies O’Shea, the executive director of the Farmers Conservation Alliance. “We’re working with many landowners who may not describe the effects they are experiencing as climate change. But many landowners often talk about similar challenges and are often planning

similar solutions as environmental groups—just through a different form of language and approach to the conversation.”

Adopting localized language that does not sound like governmental sound bites but instead addresses the community members’ concerns will go a long way in repairing the credibility gap that neighborhoods have with their elected bodies. And, in turn, help ease a key roadblock in infrastructure investment.

CASE STUDY OF CHANGE: Toronto’s King Street Transit Priority Corridor

The streets are a common arena for the thorniest debates over infrastructure, and in Toronto, one unfolded over King Street, one of the busiest surface transit corridors in North America. In 2017, the City Council approved a pilot initiative that would ban the through traffic of private automobiles on a corridor where the popular streetcar was most heavily used.

Jennifer Keesmaat, the former chief city planner of Toronto, said that the mayor, John Tory, was hesitant at first. “He said to us, ‘Make this something that the public supports,’” she recalled, “‘Give me metrics and measurements that are going to ensure that I don’t look like a fool when talking about this.’”

In an effort to evade public backlash, particularly from drivers, the planners settled on a theme of efficiency. At the time, planners calculated that cars used 64 percent of the street, but only moved 16 percent of people. Banning through traffic, they argued, would rapidly speed up travel times for the

other 84 percent—the clear majority—at little cost.

Ridership soon [jumped](#) from 72,000 daily to 84,000. Private vehicle operators, on average, lost less than a minute during rush hour. In 2019, the pilot was made permanent, and now serves as a model that other cities have followed.

“By changing that language, we were able to change the narrative on the corner,” said Keesmaat. “This isn’t an efficient street, and we’re going to make it efficient.”



ACTION ITEM 11:

Make engagement as accessible as possible.

For planners and advocates, the concept of the community board is the oft cited emblem of engagement run amok. As a perceived pulse on a neighborhood's sentiments, advisory bodies hold significant sway over major land use, transportation, and other infrastructure-related decisions. Yet critics say that by design, they are not representative of the communities they represent.

One major barrier is access. Joining and remaining active on the board involves a significant time commitment, which poorer residents are less able to afford. Meetings are held at specific locations, usually after 9–5 work hours, making it difficult for families or late-night workers to attend. Activities may not be regularly publicized in the same spaces that neighbors frequent, or in the languages spoken.

“This process is tough for communities, particularly when people work around the clock and don't have the ability to attend a five o'clock meeting. They often volunteer and lack access to childcare and transportation,” said Christopher Tyson, the president and CEO of Build Baton Rouge. “Those of us who do this for a living are compensated when we attend these meetings. So, we have to recognize that the participation and engagement of neighborhood residents is labor that's valuable to the project and the broader community.”

Local policymakers and practitioners must look to expand the accessibility of engagement wherever possible. Promotion and outreach, of course, are steps in the right direction—virtual meetings during the pandemic helped as well. But planners should consider other potential obstacles inherent to the process. Ithaca, New York provides a good roadmap: in 2019, the City Council [approved](#) a pilot program that offers free childcare to those looking to attend community meetings. Kids can go to the second floor of City Hall for snacks and entertainment, while parents participate in meetings on the third.

Using [the 2020 Census outreach](#) as a model, which, in the middle of a pandemic, required coordination amidst a wide range of stakeholders, extensive efforts should be made to collect feedback from residents on why they do not attend meetings, or are unable to. That data would give lawmakers a much clearer portrait of how the community can truly be tapped for engagement.

ACTION ITEM 12:

Foster a new generation of public leaders and thinkers.



If government agencies at all levels and geographies of power—state, regional, urban, suburban, rural—are primarily expected to execute on infrastructure delivery nationwide, then the old ways of training for certain roles must be discarded along with other antiquated definitions and processes mentioned in this report. A new vision of infrastructure will demand a wholesale re-envisioning of how local planners and practitioners prepare for their jobs.

Local governments should consider the next decade of infrastructure spending as a once-in-a-generation opportunity for professional development, much akin to the 1950s, when historic investment bred a generation of highway engineers and regional planners. Governments stand at a similar junction now. A paradigm shift in thinking around infrastructure can inspire the

next generation of leaders to chart a different way forward than their forebears.

“If we're going to spend a trillion dollars, why not do some training and planning with some of that money? So, the folks at the Texas DOT are exposed to the folks who work for the City of Portland. And folks there are exposed to folks who are working in broadband in Natchez, Mississippi,” said Rick Cole, of the Congress for the New Urbanism. “So that there's a national conversation about these issues.”

MOVING FORWARD

Historic action from Washington promises to deliver a generational investment in the infrastructure that each and every American uses to build their daily lives.

As America recovers from a devastating global pandemic to then face a climate crisis that will threaten the livelihoods of huge swaths of the population, the next decade will be one of unprecedented challenges. Now, more than ever, the systems we put in place must be built to the task.

Major hurdles lie in the way. First, the collective mindset behind conceiving, managing, and investing in infrastructure must evolve. A narrow definition of infrastructure and risk-aversion constrains the ability of local governments to act. Much infrastructure vastly in need of modernization was built without significant community input, a long-standing ill that needs to be addressed. And the siloed approach by the government is outmoded for the modern, multidimensional complexities that infrastructure bears.

Secondly, how infrastructure is evaluated must change. Equity and climate concerns need to be part of any measurement, and data should be as community-driven as possible to create an inclusive decision-making process. Third, how infrastructure is funded must change. Localities should have the power to experiment with delivery mechanisms that have proven successful elsewhere and garner revenue through alternative methods. To solve the country's maintenance issue, long-term plans for repair should be involved in any project planning.



And finally, a new vision of infrastructure requires a different approach to engaging the public. Planners should look to ‘credible messengers’ and apply local language framed around local needs as part of any narrative-building, and community engagement should be made more accessible to underrepresented populations. Whoever will inherit this massive influx of spending should be trained and empowered to think differently than the planners of the past.

Thankfully, there are signs of progress abound. The COVID-19 pandemic provided a template for the sort of innovative, responsive governing needed for this next decade. The federal criteria for major infrastructure grants are shifting towards new measurements of equity and access. And local efforts are increasingly placing deepened community engagement front and center in policy talks.

This report builds on that work, with the hope that policymakers and practitioners will see this new era of infrastructure investment as a reset button—to address the mistakes of the past and build a brighter future.



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