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Image Source: Delivery of solar panels to remote areas in May 2019. Image by the courtesy of Solar Libre Porto Rico, <https://www.facebook.com/solarlibrecmrc/photos/1532318613571380> Note: We apologize for the low image quality.





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### Infrastructure, From Product to Process: For an expansive recovery, use an expansive definition of infrastructure

The release of President Biden's infrastructure plan to bolster the United States' economic recovery from the COVID pandemic set off a flurry of controversy and partisan debate—what constitutes infrastructure? The inclusion of social spending, most notably childcare, challenged the idea that the term infrastructure applied exclusively to construction projects like roads, bridges, and railways. More broadly, the debate has called into question whether the purpose of infrastructure spending is solely economic growth. Viewing recovery spending as a tradeoff between economic growth and improving social equity is not only misguided but may lead to another missed opportunity for a far-reaching, just recovery. Instead, policy makers should adopt a broader idea of infrastructure that, first, recognizes the contributions of social infrastructure to economic growth, and second, views infrastructure not solely as products but as ongoing processes.

This debate around what is and is not infrastructure is hardly new, but actually one that's been happening since the term's first appearance in the English language just over a century ago when it referred to the construction work conducted prior to laying railway tracks—not even the tracks themselves, which were superstructure. By the 1950s the term was entering wider use and already generating disputes about its meaning, or lack thereof, with the New York Times publishing articles on the new government jargon, or “gobbledygook”, and the United States secretary of state referring to the term's appearance as “baffling.”<sup>1</sup>

However, to point to this lack of consistent historical meaning of infrastructure is not to imply that the term isn't useful, as early critics argued, but the opposite. The term's malleability has allowed it to evolve to meet the needs of people and government at the time, and it should continue to do so. At this current juncture, that means recognizing the ways COVID-19 has exposed how social infrastructures have impacted various groups' ability to both contribute to, and benefit from, the economy. Policymakers have tended to view infrastructure as the physical structures that enable commerce—utilities, public works, transportation, etc.<sup>2</sup> What we've seen during COVID-19 though is that women in the workforce were impacted disproportionately than men, often as a result of the increased burden of unpaid care, such as childcare. This is a social issue, but also an economic one—it's estimated that COVID's impacts on women's employment will lower global GDP by \$1 trillion by 2030,

whereas taking action and improving gender equity could boost GDP by \$13 trillion.<sup>3</sup> The pandemic has illustrated how human services like childcare are not a luxury but a vital infrastructure, and the economy requires these services to function just as much as it relies on roads, rails and broadband.

Over the past decade, there's been a rapid evolution in infrastructure policy to include nature-based or "green" infrastructure, like parks and conservation areas, as a response not only to the risks of climate change but also a recognition of the wider benefits they provide, including economic ones. Yet, policymakers have often been slower and more reluctant to expand infrastructure to include, or give priority to, more of the human elements that contribute to the economy. This is despite growing evidence to the contrary. For example, a 2020 working paper from the United States Federal Reserve found that increasing college tuition grants for low-income students by 1 percent of a city's income raises income by 2.4 percent over the next two years, with the multiplier effect being higher during times of recession.<sup>4</sup>

Even for traditional built infrastructure spending, there's an opportunity to maximize social benefits by thinking of infrastructure not as a product, but a process. From early planning, design, and procurement to later ongoing maintenance, the human components of built infrastructure offer ways to target groups to increase equity and spread

economic benefits. In what others have referred to as "infrastructures for distribution," infrastructure decisions should focus not just on growth, but how the benefits of that growth can meet those most in need.<sup>5</sup>

One example of using the process of infrastructure, rather than just the end product, as an opportunity to improve equity as well as bolster long-term economic prospects is Solar Libre in Puerto Rico. Solar Libre is an initiative founded in the aftermath of Hurricane Maria to install community solar micro-grids across the island. These solar installations reduce energy costs, lower carbon emissions, and provide a lifeline during times of disaster when the larger grid fails. However, Solar Libre also provides intense apprenticeships where students complete training and become NABCEP certified professional installers in less than one year. Solar Libre's "brigades" of experts and trainees have now completed installations at one hundred and eighty sites across the island. Thus far, over eighty percent of the graduates have been women, whereas within the solar energy industry women account for only around thirty-two percent of the labor force. By incorporating job training into the process of installing solar energy systems, Solar Libre provides economic opportunities, builds the long-term capacity of the island through creating local technical experts, and improves gender equity in the workforce.

Considering growing evidence of a "K-shaped" economic recovery from COVID-19, where the wealthiest household

have seen their assets grow while the poorest continue to struggle, there are valuable lessons from the response to the 2008 global recession. While infrastructure was a central part of the recovery package in the United States, spending failed to target the underserved, leading to a situation where low-income and black households saw their wealth decimated by the recession and never fully recover, even a decade later. Likewise, few countries included green investments as a significant part of their recovery spending in 2008<sup>6</sup>, a trend that analysts are already seeing in COVID-19 recovery proposals<sup>7</sup>.

The magnitude of COVID-19's economic impact has been broad, with cascading shocks across sectors. The interdependencies exposed by COVID-19 should be responded to with a view of infrastructure that recognizes and fully supports the human elements that underpin built infrastructure, especially those who have historically been underserved and left behind. Already, Biden's infrastructure package has been drastically pared down both in size and scope as part of bipartisan negotiations. The bipartisan plan largely constitutes funding for roads, bridges, and broadband. The social elements are not abandoned but deferred to a later bill. As the United States is the lead partner in the G7 Build Back Better World (B3W) initiative for infrastructure investment in low- and middle-income countries, the result of the debate may have far reaching repercussions. For a broad economic recovery that benefits everyone, policymakers cannot afford to limit infrastruc-

ture packages to roads and bridges. Instead, an expansive understanding of infrastructure that recognizes interdependencies and equity throughout the process, not just the end product, can make this recovery an opportunity to make the economy stronger, more robust, and resilient.

1. Carse, Ashley (2017) "Keyword: Infrastructure: How a humble French engineering term shaped the modern world." In *Infrastructures and Social Complexity: A companion*. Eds. Penny Harvey, Casper Bruun Jensen, and Atsuro Morita.
2. See for example World Bank (1994). *World Development Report 1994: Infrastructure for Development*. New York: Oxford University Press.
3. <https://www.mckinsey.com/featured-insights/future-of-work/covid-19-and-gender-equality-counteracting-the-regressive-effects>
4. De Ridder, M., Hannon, S., and Pfajfar, D. (2020). "The Multiplier Effect of Education Expenditure." *Finance and Economics Discussion Series*, Divisions of Research & Statistics and Monetary Affairs, Federal Reserve Board. Washington, D.C.
5. See Cohen (2020)
6. Barbier (2010)
7. Vivid Economics (2020)