

Good Housing Policy is Good Climate Policy



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Climate-aligned cities are essential to climate mitigation and adaptation

The U.S. Housing Underproduction and broader housing affordability crises intersect with the global climate crisis. Stabilizing the climate and avoiding more than 1.5-2°C (2.7-3.6°F) of warming requires limiting cumulative carbon pollution (IPCC, 2022). It is insufficient to aim for a midcentury net zero emissions target, enabled by a future fleet of zero-emission devices. Supporting metropolitan regions to build equitable, efficient, all-electric—and just plain more—housing in walkable and urban neighborhoods is critical to meeting our climate commitments.

In the U.S., the transportation sector is the largest source of climate pollution, dominated by passenger cars and trucks (EPA, 2019). Nearly a century of law and policy have privileged car use over other social goals, necessitating long car trips for most households just to complete daily activities (Shill, 2020; Mangan et al., 2020). As a result, the U.S. produces about one-third of global

light-duty vehicle emissions, far above its population share (4%) or even its emissions share in other sectors (11%).* In addition to direct tailpipe emissions, car-oriented communities exacerbate other emissions sources across all sectors: petroleum extraction and refining; vehicle manufacturing; building energy use; materials, manufacturing, and construction emissions “embodied” in buildings and infrastructure; and the destruction of natural land carbon sinks by sprawling urban land-use.*

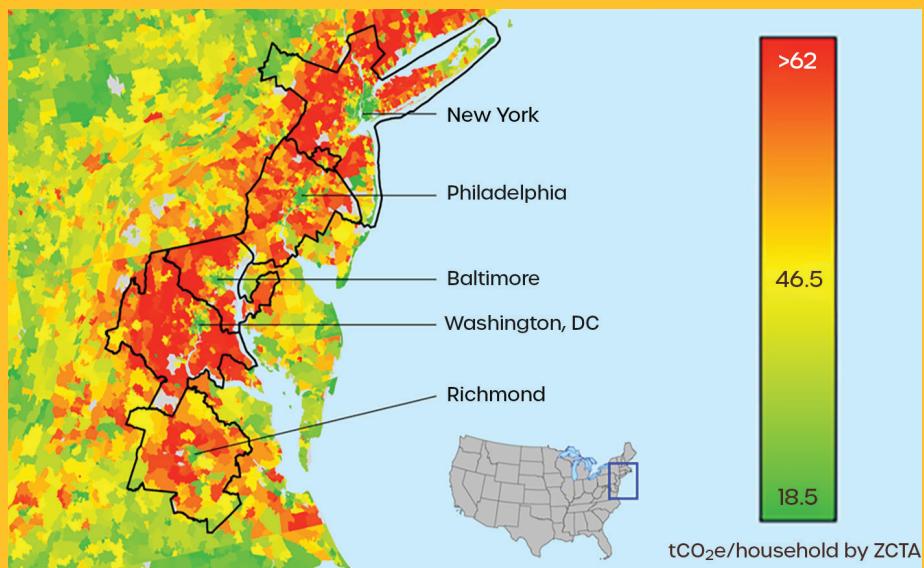
A strategy focused solely on changing what cars we drive is incomplete (Alarfaj et al., 2020; Milovanoff et al., 2020). We must also reduce how much we drive by building compact cities and shifting from single-occupancy vehicles to public transport, active transportation, and shared vehicles (ITDP 2021). Compact cities are complementary to vehicle electrification, reducing the number, size, and range of electric vehicles needed and leaving room for carbon-intensive industrial sectors to decarbonize over time (IEA, 2021).* RMI estimates that in the U.S., we need to deploy 70 million EVs and

reduce vehicle miles traveled (VMT) per capita 20% below 2019 levels by 2030 to be consistent with global warming of 1.5°C (Teplin et al., 2021).

In its recent report on climate mitigation, the Intergovernmental Panel on Climate Change (IPCC) highlighted the opportunity for compact cities to contribute to emission reductions, finding that better urban planning could reduce emissions by 23-26% (2022). One of the most fundamental climate strategies is the avoidance of “carbon lock-in” by preventing addition of new long-lived, carbon-intensive equipment and infrastructure—from fossil-fueled vehicles and buildings, to highways that disperse homes from each other and destinations (Seto et al., 2016).

Indeed, the longest-lived infrastructure of all is the design of cities and street networks. Yet, a century of exclusionary and low-density planning rules in the U.S. have mandated carbon-intensive communities irrespective of market demands (Wegmann, 2019; Manville et al., 2019). We can avoid further carbon lock-in

Figure 1: Average household carbon footprint in the Eastern United States (tons CO₂e/household by zip code tabulation area)



Source: UC Berkeley Coolclimate Network.

*For additional literature review and methodology details, see the online technical supplement available at: www.upforgrowth.org/underproduction

by reforming these regulations to enable developing infill housing in walkable cities and towns, simultaneously improving access to sustainable transportation modes and focusing new growth in compact and low-VMT communities.

In addition to being a carbon mitigation strategy, climate-aligned housing supports climate resilience. Avoiding new development in areas at high risk for climate hazards like floods, heat waves, and wildfires is increasingly an area of concern for developers, financial lenders, home insurers, and policymakers (Schuetz, 2022). Even more than the material makeup of buildings, the arrangement of buildings and roads in compact areas is critical for reducing susceptibility to wildfires (Greenbelt, 2021). It also makes cities easier to defend when wildfires do occur (Headwaters Economics, 2015). Some city governments have even aligned their land-use and fire management plans to guide infill development into higher-density and less vulnerable neighborhoods to help deter wildfire sparks and spread (C40 Knowledge Community, 2020).

Most critically, while policies like urban growth boundaries can help prevent encroachment into the wildland-urban interface, waterfronts, and other areas vulnerable to extreme climate events, they are only truly effective and politically viable if tied to increased infill housing production (Amos, Dave [City Beautiful], 2022). Achieving more infill housing alleviates the need to build in greenfield or hazardous areas that may be superficially cheaper to develop when implicit subsidies and externalities are

not accounted for. The role of limited supply in pricing out lower-income households from environmentally healthy and climate-resilient neighborhoods is an under-emphasized component of serving frontline communities experiencing the “first and worst” consequences of the climate crisis.

The climate benefits of infill housing are frequently missed

Despite the large climate mitigation benefits of compact and infill housing, housing policy is frequently ignored in climate planning (Subin, 2020). The climate pathways models (Williams et al., 2021) used to map out carbon neutral futures typically focus on how quickly today's fossil-powered appliances, vehicles, and industries can be transitioned to clean energy. Separating emissions sources into sectors, however, makes it challenging to represent cross-sector opportunities such as compact and infill housing. Lacking urban planning and regional transportation modules, the climate pathways models have difficulty representing fundamental changes to today's energy consumption and development patterns.

The most glaring analytical deficiency in climate planning models is the sole use of local emissions metrics for most local climate plans (IPCC, 2022). These show limited benefit for co-locating jobs and housing and for efficient use of materials. Worse, they show the wrong sign of change when population is added to cities with lower average emissions than where growth would otherwise have occurred. Building more housing in compact cities

tends to make global emissions go down. However, city emissions will go up using conventional accounting. One of the few studies which accounted for this spatial mismatch found that urban infill housing was the most potent action available under local policy for many California cities (Jones et al., 2018).

National technical potential for greenhouse gas benefits from climate-aligned housing

Jones and Kammen (2014) developed a per household carbon emissions dataset, allocating regional vehicle travel and upstream emissions sources such as fuel production and building materials back to households. We used this dataset to extrapolate a rough “technical potential” (i.e., prior to considering economic or political constraints) for housing policy to reduce U.S. climate pollution over the next decade. This is intended to be commensurate with similar estimates for other measures like building and vehicle electrification.

Jones and Kammen (2014) found a consistent pattern around the U.S.: low-emitting urban cores surrounded by higher-emitting suburbs (Figure 1). The biggest reason for this difference is the lower car dependence of urban cores. We illustrate the clear relationship between population density and VMT (Figure 2). People in the densest neighborhoods drive 70% less than average.

Including all emissions sources, our analysis of Jones and Kammen (2014) data shows that a family at a particular income level will emit ~5 to 15 fewer tons CO₂e/year when living in a denser urban neighborhood (Figure 3).*

The ongoing demand for new housing will stack onto the cumulative 3.8 million home shortage estimated by this report, providing an important opportunity for building housing in the right places—perhaps upwards of 14 million homes over the next decade.* Multiplying the per household emissions savings by this number of homes suggests a technical potential of roughly 100-200 million tons of CO₂e/year avoidable after 10 years if we build housing in the right places.

Figure 2: Relative vehicle miles traveled per capita in U.S. to national average by household density bin (dots reflect minimum of bin ranges).



Source: RMI analysis of National Household Travel Survey data.

Figure 3: Year 2013 household greenhouse gas footprint vs. household income, by U.S. zip code. Dot size is proportional to zip code population.



Source: RMI analysis of UC Berkeley Coolclimate Network data.

The upper end of this range is roughly equal to the emissions reduction potential of phasing out all gas appliance sales by 2030, or of all U.S. states adopting California's target of 100% of vehicle sales being zero emission passenger vehicles by 2035 (Orvis & Mahajan, 2021). Yet, building and vehicle electrification have received much more attention in climate policy. Note that the technical potential is just the benefit from location efficiency; combining with complementary approaches to build efficient, all-electric housing with low carbon materials would stack onto these benefits.

Building on momentum for equitable housing and climate policy

The fact that [good] housing policy is climate policy is beginning to be recognized by some U.S. cities such as San Diego (City of San Diego, 2021). Overall, however, that compact and urban infill housing is key to reducing climate pollution is often overlooked in climate policy. For already walkable communities, it can be the most impactful emissions reduction measure available to local policymakers. At a national scale, its near-term potential could be as high as building or vehicle electrification. Local climate action plans must include the benefits of pro-housing land-use strategies and move away from drawing rigid boundaries around their jurisdictions that disregard linkages to regional emissions.

Additional focus is needed to investigate the relationship between environmental

and equity-oriented housing reforms. Is there a tradeoff between maximizing VMT reduction and maximizing housing affordability and equity? Environmentally motivated housing reforms have conventionally focused on narrow approaches such as transit-oriented development (i.e., higher density within close walking distance of frequent transit). However, narrow upzoning of individual sites or corridors raises several equity concerns (Phillips, 2020). Upzoning has sometimes been focused in low-income areas and communities of color with less political power than other communities, funneling unmet market demand into a small area and risking exacerbation of displacement and gentrification (Phillips et al., 2021). It has also concentrated multifamily housing along polluted and noisy arterial roads (Grabar, 2021).

At the same time, policy momentum is growing for broader upzoning to allow “missing middle housing” (Parolek, 2020). Cities from Sacramento to Charlotte, and states from California to Maine, are reforming zoning to widely legalize accessory dwelling units and small multi-family housing, while clearing away barriers such as discretionary review and mandatory parking minimums. Beyond the equity benefits of adding more diverse housing types to exclusionary communities, new economic research contends that we will only achieve broad housing affordability by upzoning large land areas within cities (Phillips, 2022).

Up for Growth’s A Better Foundation framework makes progress to address

these concerns. It prioritizes areas for infill housing that are walkable, job-rich, and transit-adjacent while encompassing much larger land areas. To fully address Housing Underproduction, we will need to employ a full range of strategies to reduce car dependence (Yudkin et al., 2021), while at the same time adding housing to the suburbs (Grant et al., 2020). We will need to complement housing supply with “stability” and “subsidy” approaches to fully solve the housing affordability crisis (Phillips, 2020).

But as the rest of this report shows and Figure 3 highlights, there are many high-income, low-emissions neighborhoods where affordable infill housing could be built if exclusionary zoning regulations and more of the same development patterns are rejected. This is not only an opportunity to reduce the emissions driving climate change. By building affordable housing in higher-income, lower-emissions neighborhoods, we can increase access to opportunity, create economically vibrant communities, and build resiliency to the impacts of climate change as well.

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