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Anchor Institutions as Adaptation Allies: promises and pitfalls of joint urban/military adaptation planning in U.S. cities

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ABSTRACT

U.S. cities have attempted to fill a leadership vacuum for climate action. But acting alone, cities face significant barriers to their capacity, so many seek additional resources through collaborations across sectors and levels of government. This study analyzes how cities leverage one particular kind of collaboration, urban/military adaptation planning. Case studies of urban/military collaborations in Norfolk, Virginia and San Diego, California reveal that military installations can serve as adaptation allies to surrounding communities. These collaborations are motivated by a recognition of social and infrastructural interdependence, but crucially, they are city-led, complicating expectations of exclusionary, authoritarian outcomes. Instead, they have provided pathways for increased resources for local adaptation and expanded regional cooperation. In addition, with urban/military relations shifting away from traditional defense dependency, bases serve as a form of anchor, or large, place-based institution. The military base is one of several overlooked anchors which, in addition to the traditional hospitals and universities, could be key allies. The current anchor model promotes community reinvestment in partnership with large institutions, but does not explicitly include adaptation. However, the anchor model is conceptualized to benefit the same marginalized communities disproportionately impacted by climate hazards, so this is a promising avenue for urban adaptation.

1. Introduction

As the federal government has wavered on climate action, cities have attempted to fill the vacuum and take on a leadership role (Romero-Lankao et al., 2018; Watts, 2017). Urban leaders across the U.S. have initiated climate plans and joined a proliferating array of prominent city networks. The common argument driving urban climate action has been that cities are both one of the greatest contributors to the problem of climate change and one of the greatest solutions (Bouteligier, 2013; Hallegatte & Corfee-Morlot, 2011; Johnson et al., 2015; Rosenzweig & Solecki, 2018). In the U.S., some major cities have had the hard and soft resources to pursue adaptation due to their centrality to financial flows and cultural and political heft (Bohland et al., 2018). For most cities, progress has been slow (Bierbaum et al., 2012; Homsy, 2018; Woodruff & Stults, 2016). Barriers to action have included a lack of resources to begin and sustain adaptation efforts, a lack of coordination across levels of government and sectors, and insufficient institutional capacity (Hughes, 2017; Hurlimann & March 2012; Mimura et al., 2014; Romero-Lankao, 2012). Even in the wake of extreme events, galvanizing planning and resources has been challenging. In Norfolk, Virginia, for example, the extreme rain and sustained flood levels of Nor'Ida in 2009 served as a wake up call, prompting national media attention and questions about whether the city could maintain its current urban form (Hamilton, 2012). This prompted municipal and regional leaders to embark on the long process of pursuing adaptation resources.

In the Hampton Roads region, where Norfolk forms the urban core, the changing climate not only endangers the social and physical integrity of communities but simultaneously threatens operational continuity at the pervasive local military installations (Union of Concerned Scientists, 2016). While climate security advocates bank on the notion that "the military is here to stay" (Sorkin, 2017), this merits further investigation, prompting the question of whether bases and communities will plan for climate impacts jointly or in isolation, and to what effect. The question gains significance because isolated military adaptation planning could harm communities. If bases were to downsize or relocate, the surrounding communities would be left to grapple with massive economic dislocation on top of the physical disruptions of climate change. If bases were to armor themselves and develop off-grid self-sufficiency, the

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surrounding communities might wither and retreat. Analysis of Norfolk and a related case study in San Diego, two cities with a large defense presence, indicate that communities and bases in these regions have recognized shared interests and begun working together to address shared risks.

This evidence of joint urban/military adaptation planning has significant implications given the extent of defense communities in the U.S (U.S. Department of Defense Office of Local Defense Community Cooperation, 2019). However, it also has implications beyond the defense domain. These cases help to establish that in spite of persistent risks of defense dependency, military bases can operate as a form of anchor institution. Anchors are large, place-based institutions, typically universities and hospitals, which play a significant role in the health and wealth of their communities (Harkavy et al., 2014; Taylor & Luter, 2013). Anchor advocates emphasize the value of community reinvestment to improve the lives of marginalized urban communities, but make few explicit links to adaptation. Elsewhere, the need for adaptation for those same marginalized communities has been well established (Anguelovski et al., 2016; Hughes & Hoffmann, 2020; Shi et al., 2016), making a strong argument for integrating adaptation goals into anchor priorities.

Against the backdrop of a fraught and evolving relationship between military installations and defense communities, this study interrogates the role of that relationship in cities confronted with the need to adapt, how that is shaping civil/military relations, and the potential for cities to leverage the presence of powerful place-based institutions for adaptation.

2. Literature Review: Civil/military relations, adaptation and anchor institutions

Narrowing the focus from an extensive field concerning civil/military relations, I examined how these relations have manifested in land use and the built environment. I drew from planning and geography literature to examine how defense has influenced cities and landscapes. I brought this into dialogue with one of the primary concerns in urban adaptation scholarship, that adaptation tends to protect elite interests. I also drew from anchor institution literature which examines how communities have attempted to leverage large institutions to promote well-being. Community/anchor relations provide an additional lens to ground the role of civil/military relations in the built environment.

2.1. Civil/military relations in the built environment

Several decades ago, urban historian Roger Lotchin proposed the "the martial metropolis" as a distinct urban entity and analytical category useful for illuminating urbanization processes (Lotchin, 1984). Defining characteristics of the martial metropolis included reliance on defense spending, suburbanization, formal and informal institutions with links to military services, and congressional representatives who specialize in securing military resources. Evidence from regions around the U.S. demonstrated that cities tended to partner with the military to secure resources (Lotchin, 1984). A more extensive study of California revealed that city boosters were successful in converting federal warfare dollars into urban welfare, namely jobs and higher education (Lotchin, 1992). The location of military installations has also been influenced by industry and government actors operating from the national to regional level (Markusen, 1991). Lotchin's work provided useful historical grounding for the relationship between cities and defense institutions, but lacked interrogation of who benefited and who was harmed.

Contemporaneous analysis provided this critical perspective, identifying "permanent war" as a feature of American life moving "society in increasingly authoritarian directions" a decade before the war on terror (Waterstone, 1992, p. 200). Military spending may have had some benefits, but increasingly pervasive militarism, prizing authority and hierarchy, manifested in local institutions and politics, detracting from any potential post-Cold War "peace dividend" (Waterstone, 1992). At the level of regional development politics, the military pitted localities against each other to extract maximum concessions, in a version of the territorial competitiveness that corporations also fomented (Brenner & Wachsmuth, 2012; Kirby, 1992). In the west, military land acquisition extended to millions of acres where the military has conducted training and tests; increased citizen participation might moderate this process (Loomis, 1993), though this would seem to overlook the political interests at multiple levels of government hinging on the economic benefits of military expansion.

However, the value of defense as an economic base has been ambiguous. This economic foundation has tempered recessions, but "defense dependency" has often lead to slowdowns in productivity, worker displacement and increased income inequality (Markusen, 1985, 1989). Where there have been benefits, they have been highly uneven across regions, concentrating in the "gunbelt" (Gauchat et al., 2011). As defense facilities have downsized or closed, many defense dependent regions have struggled with conversion and diversification due to a lack of economic development capacity and an inability to build coalitions across jurisdictions and sectors (Hill & Markusen, 2013; Oden et al., 2003). Conversely, in regions where military spending has persisted, installation-related employment and spending has raised the standard of living in surrounding communities even when accounting for the effects of other local institutions (Drucker & Doussard, 2014; Harmon et al., 2014; Hultquist & Petras, 2012; Poppert & Herzog, 2003).

In spite of Lotchin's attempt to give life to a distinct analytical lens, the martial metropolis has only received intermittent attention, and generally not under that label. However, a vein of urban planning literature has addressed the persistent military influence in urbanization processes. Throughout, questions persist about the balance of decision-making power between civilian and military authorities. Historically, Cold War defense intellectuals and urban planners translated cybernetics technologies to the problem of urban renewal, shaping urban analysis through a national security agenda. Though this approach failed to resolve the "urban crisis" of the 1960s, the legacy of these techniques has been resurgent in the post-9/11 "homeland security" era, portending expansion of security planning (Light, 2003, 2004). The "new military urbanism" in which surveillance and control technologies increasingly permeate domestic and public space has enacted the perpetual emergency of "the war on terror" (Coaffee et al., 2009; Giroux, 2004; Gold & Revill, 2000; Graham, 2010, 2012). Harnessing this security rationale, federal pre-emption of local land use planning has intensified in the post-9/11 "state of exception" (Agamben, 2005; Geisler & Kay, 2016). Through regulatory reform and critical infrastructure protection programs, unelected federal officials have exerted control over land use where previously states and governments had decision-making authority (Geisler & Kay, 2016). Cities have included military officials in land use decisions while states have advised deference to military uses (Santicola, 2006). As a result, "the de facto military easement spreads over the landscape" (Geisler & Kay, 2016).

This has not only been apparent in large swathes of land adjacent to the border, but in cities, where security zones demarcated by bollards, moats and surveillance have become a measurable land use that infringes on public space (M. Davis, 1990; Németh & Hollander, 2010). In addition, the Department of Defense has formally provided surplus equipment to police forces, giving rise to excessive militarization in urban policing with little oversight (Dansky, 2016; Hidek, 2011). A sweeping critique of "hijacking sustainability" implicates not only gated communities, but also corporate greenwashing, Hollywood posturing, and military greening (Parr, 2009). A "neo-security movement" has arguably superseded neoliberalism as security has come to define public and private life (Chaturvedi & Doyle, 2015).

However, there have been some exceptions to these critiques of securitization. The "distributed preparedness" strategy for decentalized security planning initially developed during the Cold War has become an enduring feature of Department of Homeland Security policy; designed

to preserve local sovereignty, this created grounds for an "alternative politics of security" (Collier & Lakoff, 2008). This ability to preserve local decision-making authority has also emerged in recent urban/military "compatible use planning" with a paradigm shift away from managerial approaches to collaborative planning and an emphasis on reaching compromise (Clanahan, 2021). Scholars of militarized environments and military environmentalism also offer a more nuanced view. Militarized landscapes have too often been analyzed from within staunch pro- and anti-military camps, with scholars either defending "khaki conservation" or condemning the military as a vehicle for capitalist destruction of the environment (Cohn, 1996; Hooks, 2005; Pearson, 2012; Woodward, 2001). The risk of "greenwashing" and the tendency for conservation to obscure an unpleasant past remain, but in some cases military officials have engaged with the contested histories of defense sites (Coates et al., 2011).

Critical military studies, which understands military practices to be socially constructed and politically contested, is concerned with landscapes of remembrance and contamination as well as "landscapes of construction where military priorities shape emergent urban forms" (Woodward, 2014, p. 43). As an accountable public institution, the military has been an important object of analysis. "To be critical requires us to be engaged in critique, rather than to be dismissive" (Woodward et al., 2020, p. 506). Researchers can engage in a relationship of "critical friendship," adopting both reflexivity and a critical stance, while being open to the possibility that these institutions can change (Woodward et al., 2020, p. 507). Because the military is not a monolith, analysis benefits from nuanced investigation of its effects (J. S. Davis, 2007). In a nation with outsize military spending, this stance of "critical friendship" could arguably be even more essential.

2.2. Urban adaptation and anchor institutions

Scholarship on adaptation in the built environment has been preoccupied with the risk of "premium ecological enclaves" as the latest form of exclusionary urbanism (M. Davis, 1990; Ellin, 1997; Hodson & Marvin, 2009, 2010b). In this analysis, eco-districts and eco-cities insulate elites from environmental risk while leaving others vulnerable (Hodson & Marvin, 2010a; Steele et al., 2012; Whitehead, 2013). As place-based elites support a pro-growth agenda, vulnerable populations have historically been left behind (Fainstein, 2011). This has been exacerbated in a changing climate: low-income, marginalized communities have often been the most vulnerable to climate impacts given histories of displacement to risk-prone land (Hoffman et al., 2020; Katz, 2021). Urban land use planning for adaptation has tended to further displace poor communities and prioritize the needs of elites, often resulting in climate gentrification (Anguelovski et al., 2016; Keenan et al., 2018; Shokry et al., 2020; Teicher, 2018). Shifting vulnerability to other populations in this manner is one form of maladaptation (Juhola et al., 2016).

While some coastal cities facing sea level rise have been proactive, over 300 cities with more than 100,000 people have not undertaken significant adaptation (Plastrik et al., 2017). New York City alone is such an outlier that in a systematic global assessment of adaptation, it contributed over half of the initiatives in North America (Araos et al., 2016). With its growth imperative, New York is emblematic of the "resilience machine," in which coalitions mobilize to protect a city's financial resources (Bohland et al., 2018; Logan & Molotch, 2007; Molotch, 1976). Some cities with legacies of disinvestment and racial inequality have been responding with proactive adaptation planning that foregrounds justice, but integrating justice in response to structural disadvantages is still limited (Chu & Cannon, 2021; Hughes, 2020; Hughes & Hoffmann, 2020). In the numerous smaller cities with little or declining growth and a lack of planning capacity, there has been a corresponding lack of adaptation activity, exacerbating inequities between cities (Homsy, 2018; Moser et al., 2017; Shi et al., 2016).

On the military side, adaptation has also been uneven. Since the Cold War, the U.S. military has pursued various greening policies, but that effort has been patchwork at best (Durant, 2007). Given the military's "carbon bootprint," even comprehensive greening would be insufficient to achieve global emissions goals (Bigger et al., 2021). However, adaptation has become more prominent in military plans and policies, as the notion of climate change as a "threat multiplier" has become mainstream in security circles (CNA Military Advisory Board, 2014; Diez et al., 2016; Teicher, 2022). Even so, climate security researchers have overestimated the extent to which the Department of Defense views climate change as a risk and integrates it into policy (Burnett & Mach, 2021). Despite public reports and plans, climate planning has been limited and uneven, partially because these reports have often responded to requests from Congress or other political exigencies. Increasing the impact of adaptation in military decision-making would benefit from co-production of actionable climate science, integrated scenario planning and risk assessment, and the development of civil/military partnerships (Briggs, 2012; Burnett & Mach, 2021; Department of Defense, 2021; Garfin et al., 2021).

Seeking to extract benefits from elite enclaves, scholars and advocates have used the concept of "anchor institution" for over two decades to capture the notion that large, place-based institutions could make a positive contribution to the health, wealth and well-being of their local communities. As the federal government has increasingly devolved responsibility for local welfare, anchors could be a critical partner in rebuilding social infrastructure and fostering local economic transformation through community reinvestment (Birch et al., 2013; Harkavy et al., 2014). Anchors have several key characteristics, first and foremost spatial immobility. Institutions may be rooted in place by concrete factors such as long-term capital investment, extensive land ownership and a specific place-based mission, as well as less tangible factors such as relationships to customers and employees, institutional identity, and tradition. (Fulbright-Anderson et al., 2001; M. Harris & Holley, 2016; Taylor & Luter, 2013; Webber & Karlstrom, 2009). Anchors have exerted a significant influence across the urban landscape. In the U.S., in two-thirds of the 100 largest cities, anchors were the largest employer (Initiative for a Competitive Inner City, 2011). Accordingly, the scale of the institution matters in relation to the regional or community context (The Netter Center for Community Partnerships, 2008). An additional characteristic is that anchors are typically non-profits, though some have questioned whether a social purpose mission must be central to the institution (M. Harris & Holley, 2016) and others have argued for including private corporations (Birch et al., 2013). Anchor literature has tended to focus on narrow empirical evaluations, so more theoretical development elaborating the role of anchors in urban development would be useful (M. Harris & Holley, 2016).

Universities have been the primary locus for anchor debates. As part of a shift "from enclave to anchor institution," several large urban universities have helped to build collective capacity in partnership with surrounding communities since the 1990s (J. T. Harris & Pickron-Davis, 2013; Perry et al., 2009). Advocates have proposed a transformative role for anchors through a culture of community engagement, but many engaged universities have enlisted a more traditional model of community outreach and revitalization through housing or commercial investment (Ehlenz, 2018). Even so, university anchors have had a moderating influence on housing markets (Ehlenz, 2019). A "shared value" or "enlightened self-interest" model could engender a more sustainable, long-term relationship between anchor and community (M. E. Porter & Kramer, 2011). However, the notion that universities can be partners in revitalizing surrounding communities is tempered by a troubled record. Historically, universities have been active proponents of urban renewal, fighting a "war on blight" that destroyed surrounding neighborhoods (Carriere, 2011; Taylor et al., 2018). Even under the enlightened self-interest model universities have "plundered" cities, hiking housing prices and suppressing wages for service workers, partly as a result of their tax-exempt status and entrepreneurial orientation (Baldwin, 2018, 2021). The anchor concept can serve as a cover for

gentrification, with universities ignoring the market dynamics that harm lower-income neighborhoods. Arguably, town/gown relations have been as damaging as the "defense dependency" common to urban/military relations. Responding to this troubled history, scholars have called for a new version of university engagement predicated on transforming the physical environment and housing structure of communities through resident-driven, comprehensive planning (Luter & Taylor, 2020; Taylor et al., 2018).

While universities have received the most attention as anchors, hospitals have also been analysed for their anchor role. Hospitals have increasingly committed to addressing social determinants of health rather than a simple medical model of disease; this extends to most elements of well-being including housing, income and the physical environment (Franz et al., 2019; Koh et al., 2020; National Academies of Sciences Engineering and Medicine, 2017; Zuckerman, 2013). In one case, the City of Baltimore took the lead with a standalone anchor plan to channel resources from an anchor hospital toward community development, suggesting that anchor contributions can be more effectively city-led (Sherman & Doussard, 2019). Federal policy supportive of community/hospital collaborations can also be leveraged to ensure that medical anchors are delivering on the community benefit requirements of their tax exempt status (Sherman & Doussard, 2019). Redressing previous harms, hospitals can play a proactive role in improving health equity by measuring progress against community benefits indicators that span economic development, community building, education, and a healthy environment (Koh et al., 2020; The Democracy Collaborative, 2013). University and hospital anchors have the potential for an elevated collective impact through partnerships in which education, healthcare, faith-based institutions and even some corporations play complementary roles within an "anchor collaborative" (Initiative for a Competitive Inner City, 2011; J. Porter et al., 2019).

In the anchor literature, military installations have only been mentioned in passing (Birch, 2016; The Netter Center for Community Partnerships, 2008). Like other anchors, military bases exert substantial economic influence at the scale of the urban region, with direct and indirect spending providing benefits to surrounding communities (Drucker & Doussard, 2014; Harmon et al., 2014; Hultquist & Petras, 2012; Poppert & Herzog, 2003). In 15 urban regions, direct defense spending on military and civilian personnel has exceeded $1 billion annually with spending on contracts frequently coming in at over twice that amount (U.S. Department of Defense Office of Local Defense Community Cooperation, 2019). Like universities and hospital systems, the base/community relationship has an impact at a national scale given that defense communities extend to all 50 states.

Anchor institutions have almost exclusively been studied and leveraged for their role in community economic development, but in the adaptation field, there is some emerging recognition that anchors have a role to play. A review of adaptation capacities for cities suggests that "in some cities, anchor institutions such as hospitals and universities … have recognized the importance of developing their own adaptation approach and are collaborating with cities (Plastrik et al., 2017, p. 13)." While this role in adaptation remains to be elaborated, sustainability practices have formed part of the anchor model. Environmental sustainability has been considered an aspect of community wealth-building and anchor metrics have recommended evaluating progress on environmental stewardship including emissions tracking and sustainability reporting (Dubb et al., 2013; The Democracy Collaborative, 2013). Research on multi-sectoral partnerships for adaptation has also touched on the roles of higher education and healthcare. In the health sector, these partnerships have been recognized as necessary, though further research and capacity development are required (Banwell et al., 2018; Bowen & Ebi, 2015). Similarly, universities have provided support for collaborative adaptation planning while helping to increase the legitimacy of adaptation (Gruber et al., 2017). These institutions have in effect been integrating adaptation into the anchor relationship.

Increasing securitization of urban environments presents a risk, but this risk is complicated by the history of defense dollars being converted into social welfare. Military installations may breed defense dependency, but they are also powerful, place-based institutions that surrounding communities may leverage. Adaptation itself risks creating enclaves, but existing enclaves may shift toward becoming anchor institutions with the promises and pitfalls that model brings.

Building on these ambiguities, this research into urban/military adaptation is guided by the following questions: When municipal and military leaders collaborate on adaptation, what are the motivating factors? What is the form of collaboration and what are the programmatic outcomes of this collaboration? Finally, what are the governance implications for urban regions with a substantial military presence?

3. Methods

3.1. A relational case study

This research was undertaken through a relational case study (Burawoy, 1998; Creswell & Poth, 2017; Flyvbjerg, 2006; Yin, 2013) of urban/military collaborations for adaptation planning in Hampton Roads, Virginia and San Diego, California. This was situated in the context of the larger climate security policy community centered in DC. This is the network of security experts, many of them retired defense personnel, who have developed security policy through a climate lens. Norfolk serves as a paradigmatic case, selected for its ability to establish a framework for the domain and San Diego serves as a related case to test whether Norfolk is an exception (Flyvbjerg, 2006). The relational view between these cases and the climate security community emphasizes that these nodes of urban/military activity are inherently interconnected, thereby shaping and influencing each other. At the same time, each one provides a distinct vantage point from which to analyze this entangled phenomenon (Goh, 2019; Peck & Theodore, 2012). This case study construction offers a basis for theorizing urban/military collaborations which could be further tested in additional cases.

Fieldwork in Washington, DC, Hampton Roads, and San Diego involved engaging with local communities of practice to trace the evolution of influential norms, policies and practices. Data was collected through semi-structured interviews of local government, non-profit, academic, and military decision-makers (n = 97) and participant observation at conferences and meetings. The majority of the interviews were conducted in person, recorded, transcribed and coded. Interview responses and participant observation were triangulated with content analysis of policy documents and plans. A discourse analysis process attending to discourses, subject positions and practices, also drawing from rhetorical analysis, informed the coding and synthesis of emerging findings (Hajer & Versteeg, 2005; Hall, 1997; Sharp & Richardson, 2001; Willig, 2013). All of the research was conducted through publicly available material. No Freedom of Information Act requests were submitted because a respondent advised that these could be viewed as adversarial and therefore close doors. That material would provide additional insights into the degree to which adaptation impacts decision-making processes in a defense context (Burnett & Mach, 2021).

3.2. Case Selection

With Norfolk already serving as a "canary in the coalmine," it was the clear paradigmatic case (Gillis, 2016; Goodell, 2015). Examining other cases with overlapping risks to defense installations and communities, San Diego emerged as sufficiently similar to serve as a related case based on size and number of defense installations, defense contribution to the regional economy, level of flood risk, and existence of urban/military planning collaborations.

3.2.1 Hampton Roads

The Hampton Roads region at the mouth of the Chesapeake Bay is home to the largest naval base in the world, Naval Station Norfolk, as

well as fifteen additional defense installations. Defense spending has played a significant role in the regional economy, directly and indirectly accounting for approximately 40% of regional GDP (Clary & Grootendorst, 2013).

The mid-Atlantic region has been a hot spot for sea level rise, and Norfolk has already experienced "nuisance flooding" which has affected everyday life and military operations (Sweet & Marra, 2016). The main connection between the base and the city of Norfolk, Hampton Boulevard, is regularly flooded, undermining operational continuity (Union of Concerned Scientists, 2016). Municipal and defense stakeholders have undertaken several joint planning processes including a Department of Defense Climate Change Preparedness and Resilience Regional Pilot from 2014 to 2016 (Office of the Under Secretary of Defense Acquisition Technology and Logistics, 2014; Steinhilber et al., 2016), and Joint Land Use Studies coordinated by the Hampton Roads Planning District Commission (HRPDC) from 2017 to 2019 (HRPDC, 2016).

3.2.2 San Diego

Like Hampton Roads, San Diego County is home to a major agglomeration of defense installations. Naval Base San Diego is the largest on the West Coast. Defense spending in San Diego has played a significant role at 22% of regional GDP, second in the country (San Diego Economic Development Corporation, 2016; SDMAC, 2016; U.S. Department of Defense & Office of Economic Adjustment, 2015).

On average, the East and Gulf Coasts of the United States have been undergoing higher rates of sea level rise than the West Coast. However, the southern California Coast has had a comparatively high rate of sea level rise for the West Coast (Griggs et al., 2017). San Diego has experienced nuisance flooding in streets up to several miles inland during "King Tides" as well as extensive road closures during major precipitation events. Scientists have considered this level of flooding, which is currently rare, as a harbinger of sea level rise to come (National Ocean Service et al., 2015).

In San Diego, urban/military collaboration has been more limited than in Hampton Roads. Regional institutions such as the San Diego Association of Governments (SANDAG) and the San Diego Regional Climate Collaborative have facilitated some minor collaboration. The only substantive collaboration occurred with a 2018 Memorandum of Agreement (MOA) between the Unified Port of San Diego and the Navy to work cooperatively on sea level rise planning.

4. Results: Urban/military adaptation

4.1. The historic context of urban/military development politics

Analyzing recent urban/military collaborations for adaptation requires understanding how the larger context of regional urban/military development politics has evolved over time. In both the Hampton Roads and San Diego regions, installations and communities shared a historical development trajectory. In neither case did federal defense officials determine base location through comprehensive, strategic analysis; instead, local boosters actively lobbied the federal government for bases as an economic development strategy (Logan & Molotch, 2007; Molotch, 1976). On the cusp of U.S. entry into WWI, Naval construction boomed, so local property owners, business leaders and politicians targeted that largesse. In San Diego, voters approved donating large tracts of public land to the Navy in exchange for a commitment to build bases (Shragge, 2002). In Norfolk, local leaders successfully advocated for a naval base to redevelop the fallow grounds of the 1907 Jamestown Exposition (Curtin, 1967; Silver, 1984). Subsequently during World War I, Norfolk underwrote a suite of infrastructure modernization at the Navy's behest. During the build up to World War II, some investment flowed in the other direction with the Navy building a housing development outside the fenceline (Silver, 1984).

Since the early phase of supplication, the municipal/military relationship has developed through varying degrees of accommodation, concession, and disregard. With defense as a long-term economic strategy, the relationship has at times been fraught with tension; this was especially clear when the Base Realignment and Closure (BRAC) process influenced infrastructure and land use decisions. In the most recent round of post-Cold War streamlining in 2005, the BRAC Commission recommended closure of the main naval air station in Virginia Beach. The city council had eagerly approved development for decades, often with the tacit consent of the navy; by the 2000s, much of that development was encroaching on naval air space and crash zones. The BRAC Commission condemned these conditions, asserting that "without strong support from state and city governments to eliminate current and arrest future encroachment … the military value … will be unacceptably degraded (BRAC Commission, 2005, p. Q-94)." While most land use law falls under local jurisdiction, in 2003, Congress authorized the federal government to limit development and use of property that was incompatible with the mission of an adjacent military installation.[2] As a result, the commission made numerous enforceable requests of the Commonwealth of Virginia, the City of Virginia Beach, and neighboring Chesapeake. This included funding a program to condemn and purchase incompatible use properties, enacting zoning controls for discretionary development, and evaluating rezoning of undeveloped properties. In response, Virginia Beach ultimately downzoned approximately a third of the land within municipal boundaries and acquired property to prevent future high-density development (City of Virginia Beach, 2015). This was a major concession, relegating large swathes of private property to accommodating defense uses to the maximum extent possible. This drastic land use change also undermined Seatack, one of the oldest Black communities in the U.S. As residential property there was rezoned for industrial and commercial uses, the remaining homes were devalued, threatening the future viability of the community (Skelton, 2017).

As a result of the BRAC threat, mayors in Hampton Roads formed a new regional organization to represent their collective interests. The Hampton Roads Military and Federal Facilities Alliance (HRMFFA) played "both offense and defense" according to the organization's leadership. They have made every effort to retain the existing military presence and attract further investment to support regional growth, advocating for local and federal policy to serve military needs in domains including schools, transportation and housing. In San Diego, which over time has become less defense dependent than Hampton Roads, the Chamber of Commerce has shifted away from prioritizing military needs. When the Chamber supported using part of a Marine base for a new airport, military advocates within the Chamber departed and formed a new organization. The goal of the San Diego Military Affairs Council (SDMAC) was "to be able to take positions in support of the military quickly" according to one of the founding members. SDMAC has promoted the military as an engine of economic growth and, in the context of local development pressure, has sought to protect the military mission from competing civilian interests.

Since 2005, a future BRAC round has remained a lingering threat in Hampton Roads, influencing local and regional decision-making. When military stakeholders argued that traffic congestion compromised operational readiness, the regional transportation planning organization (HRTPO) leapt to address those concerns because, as a transportation engineer expressed: "our board, they certainly don't want to lose the military." Bearing out this position, the HRTPO created a Military Transportation Needs Study in spite of many competing priorities (Hampton Roads Transportation Planning Organization, 2011). A statement to the HRTPO board from a former commanding officer in the region exemplified the stance that public infrastructure and institutions should serve Navy interests: "we will continue to encourage local, state and regional efforts to identify solutions that reduce congestion for military commuters … and enhance safety and quality of life for the

[2] Congress authorized this in the 2003 National Defense Authorization Act, 10 U.S. Code Sec. 2684a.

100,000 + military, civilian and contract personnel that support the Navy mission." Even when addressing safety and quality of life, there was no attempt to couch the statement in civilian needs. The deficiencies identified in this study were subsequently given significant weight in identifying regional transportation project priorities (Hampton Roads Transportation Planning Organization, 2011, 2018).

4.2. Motivations for joint urban/military adaptation planning

In Hampton Roads, Hurricane Isabel in 2003 served as a first "wake-up call" with record flooding and widespread property damage across municipalities and installations. In 2009, the storm Nor'Ida caused prolonged flooding, galvanizing local attention and a national spotlight. Senior city staff from both Norfolk and Virginia Beach related that locals came to grips with persistent flooding as they experienced the reality that city streets were passable by kayak rather than by car. Hampton Boulevard, the main route between Naval Station Norfolk and the City of Norfolk, became notorious for flooding that impeded access between the city and the base. In media accounts and government reports, this challenge became emblematic of shared risks (Montgomery, 2014).

With this increasing awareness, municipal staff also found a shift in the tenor of the community/military relationship, in spite of some persistent tensions due to the BRAC threat. While the base remained an economic engine for the city, it also became clear that people affiliated with the base were dependent on the city in their daily lives. As the Norfolk Planning Director commented, "The navy while it has its base, that base is part of a larger community. And since most of those sailors don't live on that base, that community is a part of everything they need to be aware of … in terms of resilience and preparation for both shocks and stresses… We are joined at the hip in many ways. And the navy is really beginning to figure that out.".

While comments about interdependence might be expected from city staff dedicated to preserving the region's livelihood, comments from local military leadership reflected that shoring up interconnected infrastructure was more expedient for them than developing isolated systems. A former captain at one of the installations confirmed the base's mutual interest: "even if you were going to wall off the base and make it impervious to sea level rise, it's ultimately not going to solve the problem, it really has to be something jointly, the community and the navy base solve together. Utilities generally come from off base, all these kind of things." A former commanding officer in naval engineering with experience in both regions noted, "If the people can't come to work because their home is underwater, or threatened by fire or the road infrastructure system isn't working or the base has great backup power everywhere it needs it, but the rest of the region is black, [it] doesn't work. It's a collective thing." This shift has been part of a wider recognition in the defense community. An experienced defense planner recounted that after 9/11, the move toward "open bases" with fences limited to high security areas abruptly ended and the fences went back up. In the late 2000s, some security experts proposed further islanding bases to achieve resilience (Defense Science Board Task Force on DoD Energy Strategy, 2008). However, a security expert who had worked in the DoD noted that this approach was ultimately rejected on pragmatic grounds because of the pervasive infrastructural and social connections between bases and communities.

In Norfolk, interdependence was a widespread motivating factor for collaboration, but in San Diego, collaboration hinged on the more limited notion of achieving consistency in planning. According to a previous director of The San Diego Foundation's Environment Program, the military was "part of the ecosystem of government." For all of the actors involved, including cities, the port, the airport and the military, facing the impacts of climate change together required "consistent analysis across the board." Similarly, a former senior officer in the San Diego region underscored that the Navy's resilience planning would need to be coordinated with the port to be effective because they were the two largest owners of bayfront property.

4.3. The form and programmatic outcomes of urban/military collaborations

Military personnel from officers to civilian bureaucrats have recognized interdependence, but they have not tended to approach city staff to act on it. Unlike the base realignment and transportation planning processes which were clearly driven by military needs, in adaptation planning, cities are driving the collaboration. A Navy planner made this directionality clear, "The City of Norfolk makes sure that the Navy stays engaged in the issue because it's a major planning issue for them." Another Navy planner confirmed this, noting that installation personnel realized, "the community's going to do stuff with or without us. It's so much better if we can come up with solutions that work for everybody." Similarly, in San Diego, a port commissioner instigated collaboration on the premise that the Navy was a potential ally that "elevated the urgency" of sea level rise planning. In both Hampton Roads and San Diego, joint planning has been city-led. Civilian authorities have included military installations not only because they have common interests, but as an avenue to harnessing extra capacity and additional resources.

Collaboration in Hampton Roads has resulted in several joint planning processes. In an Intergovernmental Pilot Project (2014–2016) spearheaded by local adaptation advocates and ultimately sanctioned by the White House, local, regional, state, and federal stakeholders convened to create a framework for whole-of-government adaptation planning.[3] Navy representatives formed a large part of the federal presence, with stakeholders from the Air Force, Coast Guard, Army Corps, DHS, DoE and DoT also involved. This process laid the groundwork for two joint land use studies (JLUS) in the region to plan for sea level rise impacts. This planning tool administered by the Office of Local Defense Community Cooperation (OLDCC)[4] conventionally funds municipalities and bases to remedy civilian encroachment on military land. In this novel application, the purpose was to "assess the impacts of sea level rise and flooding on areas of mutual interest to the military installations and municipal participants" (HRPDC, 2016). In other words, sea level rise presented a common encroachment threat.

In the San Diego region, regional climate collaboration has been well-established, but military stakeholders have been involved in an ad hoc fashion. In the San Diego Regional Climate Collaborative, military representatives have simply attended adaptation conversations. In the region's metropolitan planning agency, SANDAG, the Shoreline Working Group has included municipal and navy stakeholders and has built on a foundation of beach nourishment programs to address wider adaptation concerns. The one exception to this ad hoc consultation has been a Memorandum of Agreement (MOA) between the Unified Port of San Diego and Navy to work cooperatively on sea level rise. While the Port is not a municipality, in many ways it functions as one, with jurisdiction over land use regulations spanning commercial, industrial, and recreational uses along the entire waterfront of the San Diego Bay. The Port's regular master plans serve as a functional equivalent to the municipal local coastal plans required by the California Coastal Commission. The MOA established that the partners would "jointly plan for and leverage resources to address sea level rise," emphasizing information-sharing and collaboration on adaptation policies and measures.

Beyond the immediate examples of the Joint Land Use Study Program which provided access to federal planning grants and the MOA which provided a framework for planning, other programs provide

[3] The Hampton Roads Intergovernmental Pilot Project was one of three pilot projects, each one representing a military department. The Hampton Roads IPP served as the Navy project, the Air Force conducted a pilot in Mountain Home, Idaho and the Army conducted theirs at three sites of the Michigan National Guard.

[4] The Office of Local Defense Community Cooperation was previously called the Office of Economic Adjustment during the period of fieldwork.

potential resources for joint adaptation planning. In San Diego, the Port and Navy had built a working relationship around environmental issues through a decades long process of developing an Integrated Natural Resource Management Plan (INRMP), a process which is required at all installations with significant natural resources. Another longstanding military/civilian program, Readiness and Environmental Protection Integration (REPI), has a history of being leveraged in partnerships between the DoD and The Nature Conservancy to create conservation easements; it is increasingly seen as a viable adaptation tool with a recent project in Ventura County serving as a potential model for bases and communities around the country (Wittenberg, 2016).

In addition, municipalities have access to the Defense Access Roads (DAR) program which was recently amended to cover impacts to off-base infrastructure that compromise readiness (AFC staff, 2018). This program funds improvements to roads disrupted by climate impacts; the chronic flooding on Hampton Boulevard between Norfolk and the navy base is a paradigmatic example of this (Montgomery, 2014). The Defense Community Infrastructure Program (DCIP) extends beyond roads to address "deficiencies in community infrastructure, supportive of a military installation" (U.S. Department of Defense Office of Local Defense Community Cooperation, 2021). This includes transportation, schools, hospitals, emergency facilities, electricity, gas, water, and wastewater, potentially encompassing many aspects of joint resilience. In 2021, the second year of grants, the program awarded funds to shoreline protection and flood risk management projects (Office of Local Defense Community Cooperation, 2022). Taken together, the JLUS, INRMP, and REPI programs create capacity for joint adaptation planning which could be utilized, while the DAR and DCIP offer emerging capacity yet to be fully realized. These will need to be examined critically for the extent to which they provide community adaptation benefits, but the potential for joint adaptation exists.

4.4. Governance implications of urban/miliary adaptation

The Norfolk/Virgina Beach JLUS recommended regional coordination as a next step, outlining specific strategies. These include protocols for city and Navy staff to share information on flood risk, advocating to Congress for funding for the Defense Community Infrastructure Program (DCIP) and amending state codes to require mandatory disclosure of flood risk for all real estate transactions, including rentals (Hampton Roads Planning District Commission, 2019, pp. 6–7). However, the planning process itself had already spurred expanded regional cooperation. In Norfolk, cooperation occurred through simple physical adjacency as well as direction from the Office of Local Defense Community Cooperation (OLDCC) which managed the process. According to regional planners, some municipal leaders balked at a region-wide process which might be dominated by the larger cities, so it was divided into several projects, each involving a pair of neighboring municipalities and adjacent installations with the intent that the plans would ultimately be coordinated. For Norfolk and Virginia Beach, cooperation represented a notable departure given the history of white flight from the urban core to suburban Virginia Beach, ensuing annexation controversies, and current development conflicts (Littlejohn & Ford, 2012; Pascale, 2016; Temple, 1972). As they are the two largest cities in the region, with one bringing more technical and financial capacity, and the other more innovative planning, their collaboration could be generative.

In San Diego, the MOA between the Port and the Navy made no mention of municipalities, but after it was announced, several municipalities sought their own MOAs with the Navy. This was administratively infeasible, so a Navy biologist encouraged representatives of the five bayfront municipalities to join the resulting sea level rise planning meetings because they had "the power to take action" which other stakeholders lacked. He concluded that the greatest benefit of the MOA was creating a shared foundation and providing the impetus to institutionalize multi-jurisdictional coordination.

Even with expanded cooperation, major questions remain about the extent to which community interests will be served. Close examination of the Norfolk/Virginia Beach Joint Land Use Study (JLUS) reveals some of the tensions between community and military interests. The language framing the JLUS focuses on impacts to the Navy mission, noting that it "redefines locality and state priorities" according to impacts of flooding "on the facilities and infrastructure in the community that directly support the Navy" (Hampton Roads Planning District Commission, 2019, p. ES-1). The JLUS outlines the far-reaching challenges that this comprises, including military commuting, access to community facilities and services, stormwater management, maintaining utilities, and inter-jurisdictional coordination. While the first point has a clear and heavy emphasis on military needs, the second encompasses community needs, noting that "floodproofing assets … will provide minimal benefit to the greater community if large numbers of residents are unable to access the facility" (Hampton Roads Planning District Commission, 2019, p. ES-3). This suggests a broad interpretation of "facilities and infrastructure in the community that directly support the Navy," potentially allowing for significant consideration of community interests. At the same time, the criteria for ranking priority projects heavily favored installation and personnel readiness, so community interests did not receive the weight implied by the framing.

5. Discussion: From enclave to anchor

Extensive interviews with urban and military stakeholders revealed that joint urban/military adaptation planning derives momentum from recognizing and promoting interdependence. These processes tend to be city-led and also tend to spur additional collaboration. This suggests favorable conditions for municipal interests, but the power balance remains delicate. There is still a risk that these city-led processes could prioritize military needs rather than more inclusionary forms of adaptation. Nevertheless, these results complicate expectations that adaptation as shaped by urban growth coalitions will tend to produce enclaves, or exclusive protected zones (Bohland et al., 2018; Hodson & Marvin, 2010b; Steele et al., 2012; While & Whitehead, 2013). They also produce questions around the assumption that urban planning involving the military will tend toward authoritarian solutions (Graham, 2010, 2012; Kirby, 1992; Waterstone, 1992). Modifying the asymmetric power of the military in a defense dependency model (Drucker & Doussard, 2014; Markusen, 1989) suggests capacity for cities to leverage military bases as anchors institutions (Birch, 2016; Drucker & Doussard, 2014) and bring adaptation within the remit of the anchor role.

The cases studied here demonstrate how at the local and regional level, interdependence of supply chains, infrastructure and workforces moderate exclusionary urbanism (M. Davis, 1990; Hodson & Marvin, 2009, 2010a). However, this does raise questions around the scale of interdependence. Taken to an extreme, tying civil resilience to defense resources could result in defense communities and regions becoming exclusive protected spaces while other zones are sacrificed. This suggests that interdependence must be considered across scales. While infrastructural and social interdependence may be most visible at the local level, clearly they transcend many jurisdictional boundaries, with for example, electricity grids tied to multi-state networks. Even at a local level, there are risks that the areas where higher-ranking military personnel live would be given higher priority for flood management resources based on their value to the mission. This could create a self-reinforcing cycle in which military hierarchy is very directly imprinted on the surrounding built environment (Geisler & Kay, 2016; Waterstone, 1992). However, the way in which this might operate is not straightforward. For example, the Norfolk/Virginia Beach JLUS includes the recommendation that flood risk be disclosed in all real estate transactions, for both owners and renters. This could devalue lower value properties in what had historically been the floodplain, but it could also devalue highly attractive waterfront property.

Recognizing interdependence theoretically points the way toward

more inclusive forms of adaptation, but like much adaptation, could easily still reinforce the conventional socioeconomic divisions that exist outside the fenceline (Anguelovski et al., 2016; Teicher, 2018). However, these very divisions could instead become a guiding principle for collaborative adaptation. Given that the majority of workers on any base are in the lower ranks and lower pay scale, this presents an opportunity to prioritize the neighborhoods where they live in addition to the conventional focus on high-value infrastructure and property. Recent shifts in tone in urban/military collaborations suggest that municipal concessions and exclusionary adaptation are not a foregone conclusion (Clanahan, 2021). Consistent with this, the Norfolk/Virginia Beach JLUS acknowledges the range of community support required to maintain operation of public facilities, suggesting a wider responsibility to and from the community.

Joint planning goals of creating reliable utility networks and institutionalized cooperation suggest a baseline for adaptation in an environment lacking sustained federal commitment. This is hardly transformational; it remains incremental and instrumental, driven by the financial constraints of budget caps as much as a concern for a collective future. With the risks of entrenching existing interests, reinforcing historically determined inequities in land use and infrastructure, and shifting vulnerability in space, the potential for maladaptation is an ever-present concern (Anguelovski et al., 2016; Juhola et al., 2016; Keenan et al., 2018). However, given the paucity of adaptation planning in smaller cities lacking adaptation capacity, this enlightened self-interest model provides some groundwork to advance adaptation (Homsy, 2018; Plastrik et al., 2017; M. E. Porter & Kramer, 2011).

Community leaders, long at the mercy of defense restructuring, have also long been aware that bases rely on the communities around them. As climate impacts grow, military leaders have become more aware of this mutual relationship. As a result, the urban/military dynamic appears to be shifting toward productive cooperation (Clanahan, 2021; Lotchin, 1984; Silver, 1984). While military personnel may be amenable to establishing urban/military collaborations, they tend to be willing associates rather than instigators. In this sense, collaboration prospects are an opportunity for urban leaders to initiate and lead joint adaptation processes from which the military will also benefit. Extending the evidence from healthcare anchors, cities can leverage federal policy to open dialogue and capture the benefits of the anchor presence (Sherman & Doussard, 2019). City-led processes, even where they are inequitable and dominated by powerful interests, hold more potential to be responsive to diverse residents' needs. As suggested in these cases, these cities have the opportunity to purposefully enlist, manage and leverage military decision-makers as stakeholders, negotiating their values and priorities with the full range of decision-makers at the table. Where city governments themselves are complicit in foreclosing democratic decision-making, military interests may be used to serve that agenda as well. In municipal planning, whether or not it involves military stakeholders, democratic, participatory governance must be actively maintained.

Even with a city-led process, joint urban/military collaboration contains multiple risks. First, cities may operate from a defensive position, trying to forestall future threats, and as a result concede to military needs. Second, including military officials in land use decisions brings a risk of further federal pre-emption of local decision-making authority (Geisler & Kay, 2016; Santicola, 2006). In the case of Virginia Beach's downzoning in response to BRAC mandates, the city gave up control and development potential while also harming a historic Black community. In response to this risk of federal overreach, specific planning language concerning property risk, community facilities, and regional coordination suggest levers that local authorities can influence, if not control. Third, even if it is developed through a robust process, the growing presence of flood management infrastructure, especially in concrete rather than green form, risks ceding additional space to a new type of sprawling security zone (M. Davis, 1990; Németh & Hollander, 2010). This impact is highly visible at a smaller scale in cities where public space has been commandeered for bollards and surveillance cameras, but adaptation infrastructure has the potential to consume much larger swathes of land, much like border infrastructure.

Building on previous references, bases clearly fulfill the characteristics of anchor institutions (Birch, 2016; The Netter Center for Community Partnerships, 2008). First and foremost, they exemplify spatial immobility with their long-term stake in the local built environment. While the threat of sea level rise may portend some future mobility, naval bases must be located on the water, and fully developed coasts impede relocation. Adding to hard factors such as capital investment and soft factors such as relationships with employees, infrastructural and social interdependence demonstrate the difficulty of extricating an institution from a place (Fulbright-Anderson et al., 2001; Taylor & Luter, 2013; Webber & Karlstrom, 2009). Additionally, these bases exert influence at scale, with the joint planning processes catalyzing additional regional collaboration. This is surprising in the defense case, where the military might be expected to pit localities against each other (Gauchat et al., 2011; Hill & Markusen, 2013; Kirby, 1992). A form of this occurred during the BRAC era, however this seems to have shifted as adjacent municipalities and installations face shared climate risks. Serving as a catalyst for additional collaboration has not typically been a central aspect of the anchor model, but it is an additional strength (Initiative for a Competitive Inner City, 2011; J. Porter et al., 2019). Due to their spatial immobility and scale of influence, both within a given region and throughout the U.S., bases are powerful anchor institutions. The bases studied here also demonstrate how an institution fulfilling an anchor role, even when that role is not called out as such, can contribute to adaptation. This suggests the potential for adaptation to become part of the anchor model, while recognizing that much of this model remains aspirational and anchor institutions may not deliver on their current suite of goals.

The anchor approach relies on leveraging the existing social mission of institutions which makes the institution's support for community well-being explicit (Birch et al., 2013; Harkavy et al., 2014). Similarly, including adaptation in the remit is most plausible when the institution has already internally committed to an adaptation agenda and translated that into policy (Gruber et al., 2017). In the military case, adaptation has been a concern in guiding documents (CNA Military Advisory Board, 2014; Department of Defense, 2021; U.S. Department of Defense, 2014) as well as binding legislative requirements stemming from the National Defense Authorization Act. Internal policy at the installation level as well as the service level means that it is already a recognized need, creating an opening for collaborations. Existing anchor partnerships which recognize sustainability as a component (Dubb et al., 2013; J. T. Harris & Pickron-Davis, 2013; Perry et al., 2009; Plastrik et al., 2017) provide a platform for extending this concern to adaptation. More significantly, the community benefits currently included in anchor models are targeted to the same marginalized communities which are disproportionately impacted by climate hazards (Birch et al., 2013; Harkavy et al., 2014; Hoffman et al., 2020; Katz, 2021). This model would be far more robust with adaptation as an integral consideration (Fig. 1).

6. Conclusion: Anchor institutions as adaptation allies

Military bases have long been understood to have a substantial imprint on urbanization processes. Recent scholarship largely suggests that this should be criticized for its role in securitizing urban space and furthering forms of exclusionary urbanism. These critiques are legitimate, but a more nuanced assessment leaves room for a productive relationship between bases and communities. In some cases, a shared interest in adaptation has engendered a shift in the urban/military relationship from a history of conflict, coercion and compliance to one of cooperation and collaboration. In Norfolk, defense dependency has shifted through a recognition of interdependence, while in San Diego, the relationship has evolved through the pursuit of consistency for

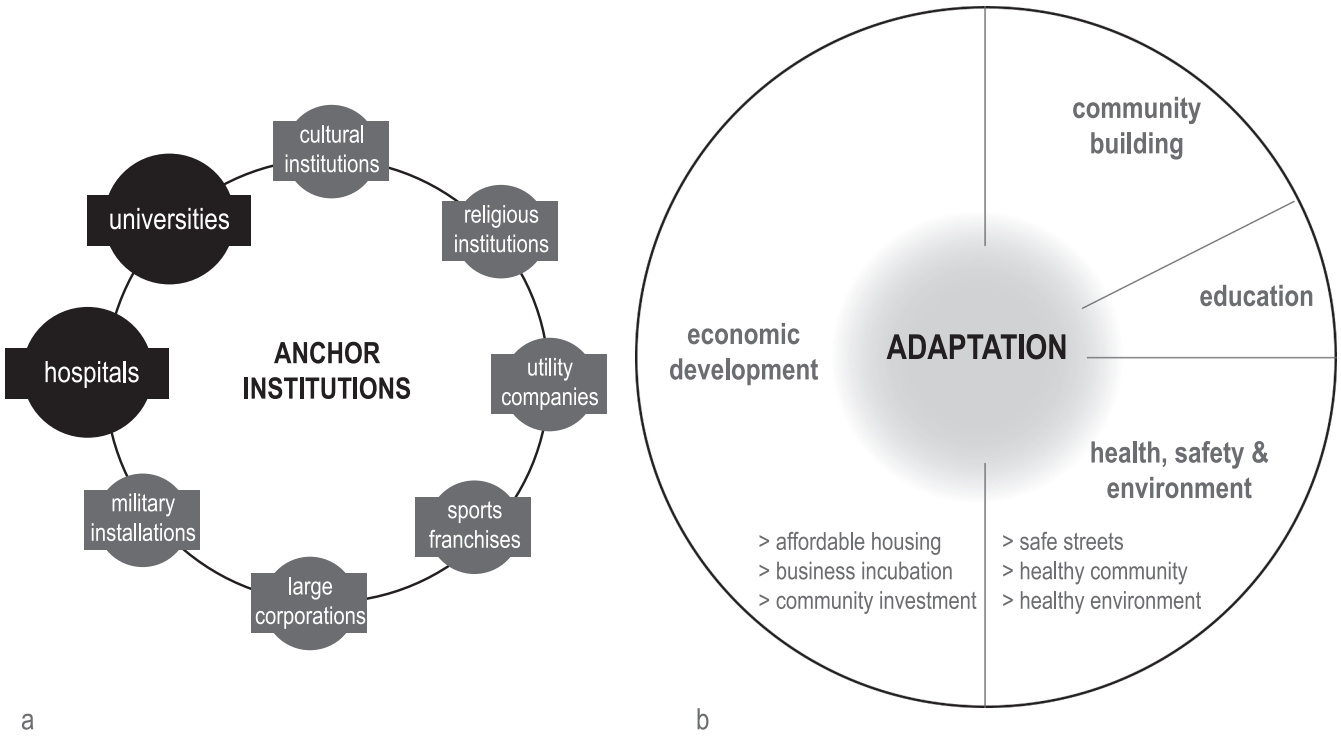

Fig. 1. A. The consistent emphasis on university and hospital anchors neglects the potential of other types, including military installations (Birch, 2016; The Netter Center for Community Partnerships, 2008). b. Many of the community benefits components of an anchor mission would be strengthened with adaptation integrated as a core concern (Koh et al., 2020; The Democracy Collaborative, 2013).

effective planning. In both cases, collaboration has been city-led and spurred additional cooperation.

This illuminates how military installations function as anchor institutions and can serve urban interests as a resource for advancing adaptation. Adaptation has not typically fallen on the anchor agenda, but as disproportionate climate impacts on marginalized communities become all too apparent, this will be an increasingly important component. Where anchors are able to catalyze community reinvestment, integrating adaptation would make the revitalization more robust. Not only military bases, but other anchor institutions ranging from universities and hospitals to utilities, can be productive partners for cities pursuing an adaptation agenda. However, even though the cases studied here defy some expectations of myopic self-preservation, that tendency may still be likely. Military installations have fraught histories with surrounding communities, and universities and hospitals have their own histories of displacement and disinvestment. These are the very issues that gave rise to the anchor movement in an attempt for communities to shift the role of these powerful institutions from one of economic extraction to economic benefit. Questions remain about benefits to local communities, and maladaptation remains a persistent risk of these forms of collaboration. However, these early indications warrant further investigation into the potential for such powerful institutions to serve as adaptation allies.

CRediT authorship contribution statement

Hannah M. Teicher: Conceptualization, Methodology, Investigation, Writing – original draft, Writing – review & editing, Visualization, Project administration.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

The data that has been used is confidential.

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Ethics Approval

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