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**Headwinds in the Heartland?
Hazard Planning Lessons from Six Inland Jurisdictions in the Southern Plains**

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The recent 20th anniversary of adoption of United States' Disaster Mitigation Act of 2000 (DMA) offers an occasion to reflect on the performance of the intergovernmental policy framework it created to incentivize local hazard mitigation planning. Researchers know little about the status of local hazard mitigation planning in oft-overlooked inland communities and they know little about high quality mitigation planning in the middle of the country. This study helps fill these gaps with a multi-state, six county comparative case study approach in the Southern Plains using data collected from evaluation of plan documents and interviews with key informants. Our three core findings are: 1) the hazard mitigation plans tend to be of low to mediocre quality; 2) the networks of hazard mitigation stakeholders vary widely in composition and leadership, some replicating emergency management networks suited to preparedness and response and some much better suited to the quite different demands of long-term mitigation work; and 3) the types of consultants and their roles also varied across the six cases, bringing expertise characteristic of narrow emergency management perspectives to more integrated expertise in long-range land use and infrastructure planning perspectives. Without the requirements of the DMA, it is difficult to imagine that thousands of communities would have dedicated millions of dollars and untold hours to develop mitigation plans. Yet, as our findings show, the DMA is likely in need of a major overhaul, in spite of recent efforts like the new FEMA Building Resilient Infrastructure and Communities program.

Keywords: Hazard mitigation, networks, consultants, plan evaluation.

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Headwinds in the Heartland? Hazard Planning Lessons from Six Inland Jurisdictions in the Southern Plains

The recent 20th anniversary of adoption of the United States' Disaster Mitigation Act of 2000 (DMA) spurs reflection on the performance of the intergovernmental policy framework it created. The DMA's greatest success may simply be the sheer amount of planning it catalyzed. All fifty states, thousands of counties, and even more Tribal nations, cities, and other jurisdictions have adopted mitigation plans (DHS DOI 2012). Each plan has been reviewed for compliance with FEMA regulations by state or federal officials (FEMA 2011). In turn, since the early 2000s millions of pages of new plans have documented hazard risks and articulated goals and actions to increase resilience. Our understanding of these plans and their impacts on reducing hazard risks remains uneven, though.

Plan evaluation studies provide insights about the quality of DMA-compliant plans. Most plans meet, but rarely exceed, FEMA requirements laid out in the Blue Book Crosswalk¹ (Tang et al. 2008; Lyles, Berke, and Smith 2014; Horney et al. 2017; Kim and Marcouiller 2018). Overall, mitigation plan quality is low to moderate. Plans tend to be more robust in terms of providing a factual basis about hazard risks than for providing information about how the plan will be used, implemented, and monitored for progress, whether in coastal areas (Tang et al. 2008; Lyles, Berke, and Smith 2014; Horney et al. 2017) or inland (Kim and Marcouiller 2018). Alarming, plans rarely focus on land use approaches to steer development and infrastructure out of hazardous areas, which is regarded as crucial for long-term risk reduction for most hazards (Burby 1998; Mileti 1999; Berke, Lyles, and Smith 2014), and pay cursory attention to issues of social vulnerability and inequity (Horney et al. 2013; Horney et al. 2015; Horney et al. 2017).

Scholars lack granular understanding of how local mitigation plans are made and used and, with what impact. A handful of case studies highlight factors meriting more attention in mitigation planning processes: the structures of the stakeholder networks, the experiences of the leaders of the planning processes, the roles of external consultants, and access to external resources (Godschalk, Brody, and Burby 2003; Lyles 2015; Olshanky and Johnson 2017; Berke et al. 2019; Lyles, Pennel, and Riley 2021). Most of what we know is based on studies in coastal communities in states like California, Florida, North Carolina, and Texas, while few studies investigate local mitigation planning in non-coastal states and communities (Godschalk et al. 1999; Meo, Ziebro, and Patton 2004; Lyles, Pennel, and Riley 2021).

Shifting the analytical lens to non-coastal areas of the country promises regionally specific practical benefits, but also broader theoretical and policy insights. In every region,

¹ What was called the Blue Book is now two separate documents, the Plan Review Guide (https://www.fema.gov/sites/default/files/2020-06/fema-local-mitigation-plan-review-guide_09_30_2011.pdf) and the Planning Handbook (https://www.fema.gov/sites/default/files/2020-06/fema-local-mitigation-planning-handbook_03-2013.pdf). Those two documents now supersede the Blue Book.

state and local officials need more specific knowledge about how to advance long-term risk reduction as billion-dollar disasters proliferate (National Climate Assessment 2018; NOAA 2021). In the midwestern and plains states of the ‘Heartland’ multiple factors converge to create a divergent planning context than in coastal areas. Lands in the Mississippi-Missouri River basin pose fewer physical constraints on land conversion to agricultural or suburban purpose than many coastal, mountainous, or desert regions; political cultures in ‘Red’ states tend to spurn regulation, especially limitations on private property rights; compared to coastal states facing escalating sea level rise and stronger hurricanes, and unprecedented wildfires region in dry, mountainous states, current climate impacts are somewhat subtle – and thus less psychologically salient. These factors interweave with broader scholarly debates about what drives policy innovation, policy learning, policy diffusion, policy mandates, and intergovernmental policy design (Burby and May 1997; Brody 2003; Sabatier and Wieble 2014). Additionally, examples of high performing communities in understudied regions can provide valuable region-specific insights for federal and state policy makers responsible for coordinating local mitigation planning, while also fostering policy learning and peer-to-peer connections between emergency managers, public works officials, planners, and consultants, who typically lead local mitigation efforts (Schwab 2010; Lyles, Berke, and Lyles 2015).

This article first reviews and synthesizes the relevant literature on plan evaluation, mandates, policy innovation and other theories that serve as the foundation for our research questions and tentative hypotheses. Then, we describe the research design and methods of data collection and analyses, which consists of a multi-state, six county comparative case study approach in the Southern Plains, drawing on evaluation of plan documents and interviews with key informants. Next, our findings section presents the results of our data analysis and the subsequent discussion section indicates how our findings inform and extend the existing knowledge base. Finally, we point to time-sensitive and wide-reaching choices that need to be made as the DMA heads into its third decade and, more importantly, as climate change increasingly become more impactful and undeniable.

DO MITIGATION PLANS MATTER? INSIGHTS FROM THE LITERATURE

Scholarship, policy, and practice in the late 1980s and 1990s set the stage for the current state of risk reduction policy in the United States. The United Nations identified the 1990s as the International Decade of Natural Disaster Reduction (United Nations 2021). As emphasized in the landmark *Disasters by Design* (1999), pre-disaster mitigation requires dramatic and emphatic shifts towards long-term sustainability as underlying aim of hazards management (Burby 1998; Mileti 1999). Moreover, the 1990s saw increased attention to the fact that for most natural hazards in the United States the deeply spatial dimensions of hazard exposure, vulnerability, and risk means that land use approaches steering development out of hazardous locations into safer locations must be a core focus of long-term risk reduction (Burby 1998.)

Mitigation Mismatches: Tensions in Long-Term Risk Reduction

“Plans do Matter” Burby declared in a study punctuating a decade of concerted efforts by planning scholars to identify if, how, and under what conditions plans matter (2003). Planning scholars tend to agree that “yes, plans do matter” but point to myriad ways of how they do so – by meeting mandate requirements, by organizing information, by fostering interaction among stakeholders, by serving as a reference document, by telling stories, and more” (Baer 1997; Hopkins 2000; Nelson and French 2002; Bunnell and Jepson 2011). When it comes to understanding the conditions under which plans can matter, there are deeper social science insights – tensions really – that merit attention.

First, hazard mitigation is a distributed public good wherein costs are usually immediate, tangible, and widely shared, but benefits are in the future, not clearly defined, and may or may not benefit a particular person. Investments in reducing future potential losses to infrastructure and private property, as well as minimizing social and economic disruptions, benefits the public broadly and in the future, as opposed to discrete constituencies in the short term (Cigler 1988; Burby and May 1997; Mileti 1999, Prater and Lindell 2000; Berke and Lyles 2013). The overwhelming majority of local communities are unlikely to experience frequent negative impacts from natural hazards (Burby and May 1997). Once impacts are scaled up to the state, and especially national level, there are negative impacts from hazard events nearly every month, if not every week (Burby and May 1997; Godschalk et al. 1999). This mismatch creates incentives for the federal and state governments to advance mitigation that typically far exceed the local incentives, which Burby termed the Local Government Paradox (Cigler 1988; Cigler 1999; Burby 2006).

Second, the day-in and day-out relevance of long-term risk reduction through hazard mitigation is exceedingly low at the local level. Local residents and officials rarely care about or prioritize long-term risk reduction on a scale comparable with other issues perceived as more relevant and pressing, like traffic or school funding (Prater and Lindell 2000) In turn, engaging elected officials and the public in long-term mitigation planning is exceedingly challenging (Godschalk, Brody, and Burby 2003). Moreover, local governments typically are dominated by the interests of the *growth machine*, consisting of developers, builders, realtors, bankers, and others who profit from treating land as a commodity (Logan and Molotch 2007). In turn, considering changing or increasing regulation of land use for mitigation purposes is difficult to pursue (Prater and Lindell 2000; Berke, Lyles and Smith 2014; Lyles, Berke, and Smith 2014).

Third, when attention to hazard and disasters is high, during what Birkland refers to as windows of opportunity, it is during the immediate aftermath of a focusing event like a hurricane, flood, or tornado (Birkland 1997; 2006). The common psychological response to disasters – and the economic and political incentives to resume activity – create tremendous pressure to get back to *normal* (Birkland 1997; 2006; Smith and Wenger 2007; Smith 2012). Federal and state funding for recovery is rarely linked to more restrictive land

use regulations in hazardous areas, safer building codes, capital improvement plans, or other policies might prevent repeating the patterns of land use and infrastructure development that put property and people at risk in the first place. Climate experts refer to similar positive feedback cycles that amplify (as opposed to reduce) adverse consequences as maladaptation (Boswell, Seale, and Greve 2019).

Fourth, professional and disciplinary disconnects persist despite consistent calls for interdisciplinarity and collaboration. Emergency managers typically have administrative responsibility – from FEMA on down – but their training and expertise tends to trend heavily towards the preparedness and response activities typically in the realm of fire, police, and emergency response (Schwab 2010; Lyles 2015; NEMA 2020). This focus, which relies heavily on technical expertise and hierarchical logistical and organizational coordination, poorly fits with the inherently political nature of land use planning and distributed and unwieldy network of stakeholders who have interests in local and use. Meanwhile, as noted, planners have historically not had a professional focus or administrative responsibility for hazard mitigation (Schwab 2010). At the national level, there is no national planning agency equivalent to FEMA nor any national land use planning framework like the DMA. In turn, state approaches to coordinating land use planning vary widely in terms of legislative frameworks and administrative implementation.

The Policy Landscape of United States Hazard Mitigation in the 21st Century

For most of the last 40 years, the core federal emergency management legislation has been the Stafford Act of 1988. The Stafford Act provided steps forward in acknowledging that mitigation was crucial alongside the emergency management fields' historic focus on preparedness and response, and to a lesser degree recovery (Godschalk et al. 1999). But, it did so in a mostly state-focused and reactive way, with requirements to initiate mitigation planning coming in the post-disaster recovery phase when states and communities had limited bandwidth to address the root causes of negative disaster impacts (Godschalk et al. 1999).

During the 1990s, state level innovation in mitigation planning provided policy laboratories to inform a national mitigation planning framework. Scholars have identified a range of internal and external factors shaping policy innovation, and subsequent diffusion of innovations (Rabe 2004; O'Donovan 2012; Rogers, Singhal, and Quinlan 2014; O'Donovan 2017; Wachtendorf, Kendra, and DeYoung 2018.) Perhaps the most influential state-level laboratory for hazard mitigation pre-2000 was Florida (Deyle and Smith 1998; Smith, Lyles, and Berke 2013; Berke, Lyles, and Smith 2014). In spite of its reputation dating back to the 1920s as a free-for-all arena for developers (Grunwald 2006), Florida increased land use planning requirements through the 1970s and 1980s and innovated in the realm of hazard mitigation planning in the 1990s with the passage of requirements for

local mitigation strategies (LMSs) (Godschalk 1999). The LMSs, notably, tended to focus attention on establishing community-level coordination and agreement about needed capital projects in the pre-event period so that acquisition, allocation, and spending of post-disaster funds could be expedited (Smith, Lyles and Berke 2013).

Land use approaches, despite Florida's land use planning innovations in the 1970s and 80s, were not central to its approach to fostering local mitigation planning. Other states' policy frameworks for local mitigation planning were less established than Florida's, although other risk-prone states like California, Iowa, and North Carolina were making inroads as well (Godschalk et al. 1999). Additionally, until the end of the 1990s, there was little evidence that scholars or practitioners in the realm of land use planning saw hazard mitigation as a core function (Berke and French 1994; Kartez and Faupel 1994; Burby et al. 1999). Concurrent with the Second Hazards Assessment, this dynamic changed as a core group of prominent scholars gained traction in focusing attention on the importance of greater policy integration and collaboration in the realms of emergency management and land use (Burby et al. 1999; Godschalk et al. 1999).

The hazard mitigation policy and planning landscape in the United States changed dramatically with passage of the DMA. The DMA created an intergovernmental policy framework wherein the federal government provide the stick and the carrots to incentivize state and local planning (Berke, Smith, and Lyles 2012). The stick was the requirement for states and local governments to adopt a hazard mitigation plan compliant with requirements established by the FEMA or else risk losing eligibility for post-disaster hazard mitigation federal grant funds if and when a major disaster event occurred. The carrots consisted of access to the federal grant funds, as well as a major infusion of planning grant funds, technical resources from FEMA, and other forms of advice and non-financial support. In the DMA framework, states play a crucial lynchpin role in interpreting, administering, and supporting compliance with federal requirements for local mitigation planning (county, municipal and other sub-state units) (Berke, Smith, and Lyles 2012; Smith, Lyles, and Berke 2013). Multiple lines of evidence indicate that states vary widely in their policy contexts for planning in general (American Planning Association 2020) and for administration of DMA responsibilities in particular (Berke, Smith, and Lyles 2012; Smith, Lyles, and Berke 2013).

Meanwhile, state level support for land use planning was strongest in coastal states, especially those that leaned more Democratic politically and faced development pressures, such as California, Florida, Maryland, New Jersey, Oregon, and Washington (American Planning Association 2019). Most inland states, including those often referred to as 'Red States' because of the dominance of the Republican parties in statehouses and Congressional representation, require little or no local land use planning. A halting approach to land use regulation in favor of *developer's choice* approaches to growth characterize fast growing Sun Belt states like Texas and Arizona (Ross 2011).

DMA-COMPLIANT HAZARD MITIGATION 2000-2020

Plan Evaluation as a Research Approach

Numerous plan evaluation studies have investigated hazards planning. The broad spatial distribution of natural hazards means the topic is relevant for local communities regardless of size, location, political orientation, and other contextual factors (Berke and French 1994; Berke et al. 1996; Burby and May 1997). Moreover, there are few national planning laws. This legislative gap means that hazard mitigation planning under the DMA is one of the few types of planning conducted by nearly every local government.

Since the early 1990s, the empirical and conceptual literature on plan evaluation has evolved and grown into a substantial subfield (c.f. Berke and Godschalk 2009; Lyles and Steven 2014; Guyadeen and Seasons 2016; 2018). In 1997, Baer provided an invaluable conceptual framework for evaluating plans that noted the varied purpose (e.g. mandate compliance, professional education, aesthetic critique, academic research) and the myriad approaches for doing so (e.g. checklist appraisal, best practices identification, art review, systematic content analysis). Critiques of plan evaluation studies often arise from debates about the purpose of plans and continue into debates about data generation and analysis.

The main approach has been systematic comparative studies done by academics who employ a well-defined set of content analysis procedures (Berke and Godschalk 2009; Lyles and Stevens 2014). The consistency in approach dates back to studies in 1990s of attention to hazard risk reduction within local land use planning (Berke and French 1994) and continued into 2010s studies of DMA-compliant plans (Peacock et al. 2012; Horney et al. 2017). These studies have mostly focused on the plan document as the unit of analysis. In the realm of analyzing plan documents, most focus on some combination of core dimensions, or parts of the plans, such as the description of the process to create the plan, the factual basis describing the hazards faced, the goals, objectives, and actions in the plan, the amount of information provided on how the proposed actions will be implemented, and the framework provided for ongoing monitoring of progress towards achieving proposed goals and objectives (Berke and Godschalk 2009; Lyles and Stevens 2014; Guyadeen and Seasons 2016; 2018). Content analyzing individual plan documents, however, typically fails to a) capture rich detail about the process of developing the plan, b) situate the plan in a broader network of plans and processes, or c) provide insight on how the plan is used and implemented. Recent studies have responded to these limitations, including evaluating network features of plan documents (Berke et al. 2015; Lyles, Berke, and Overstreet 2017) and the day-in and day-out work done by networks of stakeholders (Woodruff 2018; Li et al. 2020; Hannibal, Woodruff and Malecha 2021).

Synopsis of Hazard Mitigation Plan Evaluations

Extant research shows the strengths and limitations of the DMA approach. Multiple studies indicate that the quality of DMA-compliant local plans is moderate to low overall

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(Peacock et al. 2012; Berke, Lyles, and Smith 2014; Lyles, Berke, and Smith 2014). Which aspects of plans are strongest has varied across studies, but in general the plans have:

- comparatively good detail on scientific characteristics of hazards facing a community;
- solid documentation of the planning processes, although the documentation often indicates that participation include a narrow array of stakeholders and little public engagement;
- well-framed goals to reduce risk;
- little detail about the existing capacity and commitment for mitigation in the community;
- laundry lists of proposed actions with little attention to the details of implementation;
- very limited portfolios of land use actions most suited to long-term risk reduction, instead focusing on more traditional emergency management activities that assist with preparedness and response more narrowly;
- and very limited attention to critical issues like reducing social inequity and addressing the exacerbation of hazard risks in a changing climate.

Many of the factors shown to increase the quality of mitigation planning are difficult to adjust, especially in the short term and with limited resources. For instance, previous experience with major disasters increases attention to hazard policy (Birkland 1997; 2006), but waiting for big events is not a good strategy for advancing change. Generally speaking, larger communities have larger planning capacities, with especially small cities and counties lacking the staff to dedicate to planning efforts. Likewise, wealthier communities tend to have higher capacity per capita to plan, but in our distributed governmental system, approaches like regional tax base sharing to equalize capacity are rare.

One of the few influential factors that is easily manipulable in the near term is the state approach to shape local mitigation, wherein states can focus attention on and provide support for land use regulation and similar approaches, instead of narrower, project-based focus on preparedness and recovery (Berke, Lyles, Smith 2014). Another manipulable factor is diversifying the network of stakeholders engaged in the process, which likely increases local commitment (Burby 2003; Lyles 2015). However, as noted, there is not a strong tradition of collaboration between emergency managers, land use planners and other core professions.

Additionally, a very large portion of mitigation plans are developed by private consultants. The role of consultants in planning receives insufficient attention (Loh and Norton 2013, 2015), but their use in hazard mitigation plans is widespread. Consultants working on a time-censored and budget-limited contact have an incentive to develop plans that can easily be modified to fit numerous locations. In turn, formulaic aspects of plans, such as describing a conventional planning process, detailing characteristics of natural

hazards of concern, and statements of broad goals, likely are strong in consultant-driven plans. Meanwhile, aspects of plans that require highly localized information, such as existing capacities and commitments and clarity about how actions will be implemented, and deep consideration of controversial issues, such as if and how to regulate development or where to buy out properties, are weak. As climate change gains traction as a motivation to engage in long-range risk reduction planning, it stands to reason that climate scientists and emergency managers need to be close collaborators. However, connections between these two professions are historically weak and often non-existent (Kartez and Faupel 1994; Lyles, Berke and Smith 2014; Lyles 2015).

Nonetheless, we also know that there are shining examples of hazard mitigation innovation in unlikely politically conservative places like southeastern North Carolina (Lyles 2015.) In the Southern Plains region, Tulsa, Oklahoma, an oil and gas town recently targeted by then-President Trump for a political rally because of its deep conservatism, is renowned for having gone from the most flood-prone city in the nation in the 1970s to a national leader in flood mitigation by the mid-1990s (Meo and Zieber 2002; Meo, Zieber, and Patton 2002; Patton 2009; Patton and Kline 2009). Key factors in these success stories include established factors like prior experience with major disaster events and high capacity for planning – generated from internal wealth or external assistance. In the few in-depth case studies, the special sauce, as it were, appears to be patterns of strong and sustained relationships within a core group of mitigation *champions* in the local network of stakeholders (Lyles 2015; Lyles, Pennel, and Riley 2021).

This review of the literature led us to the following research questions.

1. How does the quality of local hazard mitigation planning efforts in an inland region vary?
2. How do local hazard mitigation planning networks vary in terms of membership, structure, and activities?
3. How do local communities vary in the use and influence of consultants to assist with mitigation planning?

RESEARCH DESIGN AND METHODOLOGY

We employed a comparative case study research design to answer our research questions. Cases were selected to enable us to probe the relative influence of multiple factors, including state policy and planning context, population size, and prior experience with mitigation innovation. We use content analysis of plan documents and semi-structured interviews with key officials involved in local mitigation and land use planning to collect novel data sets. Our analytical approach included systematic comparison of plan contents, thematic analysis of interviews, and triangulation of core dynamics in the cases. For each case, we used a mixed-methods approach to data collection and analysis to triangulate the findings and implications for each of our research questions (Yin 2017).

Case Selection: State Level

Our comparative case study design included six cases in four states (Yin 2017). Our first-level selection criteria focused on non-coastal states and sought states a) with high exposure to natural hazards and climate change and b) lacking both traditions of strong planning and current policies advancing local planning, especially for long-term risk reduction. Historically, state and local planning have been strongest in states like California, Florida, Hawaii, New Jersey, and, Oregon (Schwab 2011). Since 2000, some traditional leaders like Florida have weakened their planning frameworks, while other states like Nevada and Virginia have strengthened planning requirements. Current state requirements for local land use planning are strongest on the coasts, emerging in the Mountain West, and generally weak or non-existent between the Appalachians and Rockies. Similarly, all 16 states requiring a natural hazards element in local comprehensive plans are located on a coast or in the Mountain West.

We selected four states in the Southern Plains region for our study: Arkansas, Kansas, Oklahoma, and Texas. All four states face myriad natural hazards: severe storms and tornadoes, floods, winter storms, droughts and more. The National Climate Assessment highlights the Southern Plains region as being vulnerable to “some of the most diverse and extreme weather hazards on the planet” (National Climate Assessment 2018). Climate change will only exacerbate these hazards as patterns of precipitation and temperature become more variable, with tendencies towards more extremes.² Politically, each has been a conservative and libertarian-leaning ‘red state’ over the last 8 to 10 years. Each state is on the weak end of the spectrum of planning policy context. Oklahoma requires cities and counties to have land use plans, but is permissive in terms of the content expected. The other three states do not require local land use plans, although each state has requirements that trigger if a community develops a land use plan. None of the four states require hazards to be integrated throughout plans, attention to climate change, or a focus on resilience.

Case Selection: Local Level

Our second level of selection criteria was at the unit of analysis for each case: the county. We sought counties with one principal city and that were large enough to plausibly have a robust planning infrastructure (population 50,000 to 500,000), but not so large as to be idiosyncratic in the context of the region or nation, as would be the case with a county like Dallas, TX. We selected matched pairs of non-coastal counties to enable comparisons of counties with similar populations in different states, aiming to include at least one known high performing county.

² For the purposes of our study, Texas’ exposure to hurricanes, coastal storms, and sea level rise are not relevant because of our non-coastal focus.

As noted, the City of Tulsa OK has a multi-decade reputation as a national leader in hazard risk reduction, particular in the realm of floodplain management (Meo and Zeiber 2002; Meo, Zieber, and Patton 2004; Patton 2009; Patton and Kline 2009) It was one of the first cities in the country to join the Community Rating System of the National Flood Insurance Program³ in 1991 and after years as one of eight jurisdictions in the country to have a 2 rating, it recently became on the second 1 rated community nationwide. Tulsa functions as a high-performance comparative benchmark. Based on discussions with professional contacts in the region, we also anticipated that Payne County, OK might be a regional standout in this realm. The City of Stillwater in Payne County has a CRS rating of 7, also having joined the program in 1991. Benton County (AR) and the City of Bentonville both have 8, with Bentonville joining the program in 1992 and Benton County in 2005. None of the other counties or cities in our sample participate in the CRS program, suggesting lower capacity or commitment to mitigation.

Demographic information about the cities and their counties are shown in Table 1 (US Census 2019). The case counties break into three pairs. Tulsa County, OK and Sedgwick County, KS are the two largest counties both located on the Arkansas River. The counties have very similar Median Household Incomes, Poverty Rates, and proportion of the County with Bachelor’s Degrees or higher and the core city in each county, Tulsa and Wichita respectively, is associated with oil and gas industries. Benton County, AR, and McLennan County, TX are the mid-sized counties with very similar populations. Benton County, home to the City of Bentonville and the headquarters of Walmart, is wealthier than McLennan County, home to the City of Waco and Baylor University. The smallest group consists of Payne County, OK and Potter County, TX. Payne County, home to the City of Stillwater and Oklahoma State University and not surprisingly has a much higher proportion of college graduates than Potter County, home to the City of Amarillo but not a major research university. In addition, the population-size pairings that cross state contexts, an additional reason for selecting this set of counties is the potential comparison offered between Payne County and McLennan County because of the presence of Oklahoma State University and Baylor University.

Table 1. Case Study Demographic Characteristics

Jurisdiction	Population	Median Household Income	Poverty Rate	Bachelor's Degree or Higher	CRS Score
Tulsa County, OK (Tulsa)	646,419	\$55,517	15.0%	31.8%	2 (City of Tulsa)
Sedgwick County, KS (Wichita)	513,375	\$56,524	13.7%	30.9%	Does not participate
Benton County, AR (Bentonville)	265,759	\$66,362	9.4%	33.4%	8 (County and City)
McLennan County, TX (Waco)	251,089	\$49,778	19.2%	24.2%	Does not participate
Potter County, TX (Amarillo)	119,674	\$42,528	20.4%	14.9%	Does not participate
Payne County, OK (Stillwater)	81,815	\$41,603	26.8%	37.4%	7 (City of Stillwater)

Pop, Median Household Income, Pv Rate, Bachelors: US Census, 2019 ACS Estimates; CRS Scores: FEMA 2021)

Data: Plan Collection and Analysis

We followed the methods to review relevant plan documents detailed by Berke and Godschalk (2009) and Lyles and Stevens (2014). We began by collecting the adopted Disaster Mitigation Act of 2000-compliant hazard mitigation plans and the adopted county or city comprehensive land use plan for each case location, primarily from the local governments' websites. Plan titles, dates, and other metadata are noted in Table 2.

Table 2. Plan Document Information

Jurisdiction	Plans Evaluated: Name, Date, Author, Pages
Tulsa County, OK (Tulsa)	Tulsa County Multi-Jurisdictional Multi-Hazard Mitigation Plan Update-2015, 2015, INCOG: Indian Nations Council of Governments, 253 pages City of Tulsa Multi-Hazard Mitigation Plan Update – 2014, 2014, Flanagan & Associates, LLC (Consulting Firm), 1000 pages City of Tulsa: All Hazard Mitigation Plan, 2019, Meshek & Associates (Consulting Firm), 207 pages Tulsa Comprehensive Plan, 2016, PLANiTULSA, 314 pages
Sedgwick County, KS (Wichita)	South-Central Kansas (Homeland Security Region G) Multi-Hazard, Multi-Jurisdictional Mitigation Plan, 2015, Blue Umbrella (Consulting Firm), 1037 pages Community Investments Plan ... a framework for the future 2015-2035: A New Comprehensive Plan for Wichita-Sedgwick County, 2015, Wichita-Sedgwick County Metropolitan Area Planning Department, 48 pages
Benton County, AR (Bentonville)	Benton County Hazard Mitigation Plan, 2014, Bold Planning (Consulting Firm), 206 pages Bentonville Community Plan: A Plan for A New American Town, 2018, Houseal Lavigne (Consulting Firm), 192 pages
McLennan County, TX (Waco)	The McLennan County Hazard Mitigation Plan, 2013, McLennan County Office of Emergency Management and Larner Consulting, 378 pages The City Plan: Waco Comprehensive plan, 2016, City of Waco with numerous consulting firms noted as contributing to related plans, 128 pages
Potter County, TX (Amarillo)	Potter/Randall County Mitigation Action Plan, 2015, Amarillo/Potter/Randall County Hazard Mitigation Action Team, 358 pages Amarillo Comprehensive Plan, 2010, City of Amarillo and Kendig Keast Collaborative (Planning Consultants) and Parkhill, Smith & Cooper (Engineering Consultants) 243 pages
Payne County, OK (Stillwater)	Stillwater & Stillwater Public Schools 2015 Multi-Jurisdictional Multi-Hazard Mitigation Plan Update, 2015, Flanagan & Associates, LLC (Consulting Firm), 533 pages City of Stillwater C* Plan: Comprehensive Plan 2030, 2013, City of Stillwater Development Services Division, 120 pages.

*One proxy for innovation in hazard mitigation is participation in the Community Rating System program of the National Flood Insurance Program (FEMA 2021). Local jurisdictions are rated from 1 to 10 (1 is best) with ratings based on an intricate system of points based on the breadth and depth of approaches to flood risk reduction taken by the community. Higher ratings result in lower insurance premiums for residents in those communities. Of the 20 communities that have earned a 4 or better, 16 are in a coastal state bordering the Atlantic or Pacific Oceans or the Gulf of Mexico. More specifically, just 1 of the 20 with a 4 or better is located between the Mississippi River and the Rocky Mountains, as are less than 10% of the 161 communities that have ratings of 5.

We developed a plan quality coding protocol that replicates items used in previous analysis of hazard-related plans, extending back to early work on hazard-related plan quality by Berke, Godschalk, and colleagues (Berke et al. 1996; Godschalk et al. 1999), and used it to evaluate DMA plan quality (Lyles, Berke, and Smith 2014). The protocol items addressed five categories of plan content: 1) Participation in plan development; 2) Integration with other plans; 3) Actions included in plan; 4) Overarching themes in the plan; and 5) Readability and accessibility of the plan document. Of particular interest are the sub-categories of *actions*, which includes land use regulations, acquisition and elevation of properties, and other long-term risk reduction approaches. All items, organized by categories, are shown in Appendix 1. We did not have the resources to employ full double-coding of all plans, which does introduce a limitation in terms of coding reliability.

As a result, we do not employ advanced statistical analyses or extrapolate broadly based on the specific items found (or not) in a plan.

Data: Interviews with Key Officials

We conducted semi-structured interviews with public officials who have responsibility for mitigation planning to corroborate and extend our plan analysis findings.³ An interview protocol was developed, including questions related to four themes, along with follow-up prompts to be used with interviewees as the interview allowed, as shown in Appendix 2. Themes included: the interviewee’s role in local hazard mitigation planning, the network of stakeholders and how it has evolved over time, champions in the network, if and how the network of plans form a cohesive whole, and related issues of climate change, equity, and justice.

The sample of officials we sought to interview in each county consisted of individuals serving central roles in the development and implementation of hazard mitigation plans. We identified these individuals through the plan documents, as well as through emails and phone calls with the emergency management and planning departments. We conducted seven interviews with eleven total individuals in late 2018 and early 2019. Table 3 indicates the positions of the interviewees in each county. We discuss the implications of the limited responses by some officials we sought to interview in the findings and discussion. The interview discussions ranged from 30 to 90 minutes and were recorded and transcribed. We then systematically coded each interview for the key themes noted above, as well as to identify any emergent themes that were not anticipated prior to the interviews.

Table 3. Interviewee Information

County, State	Position, Agency, Role
Tulsa, Oklahoma	Principal Planner, Flanagan & Associates, LLC, Consultant who led 2014 City Hazard Mitigation Planning and prominent ‘champion’ of mitigation since 1970s Retired multiple positions, previously with US Army Corps of Engineers, City of Tulsa, Tulsa Partners, etc., Prominent ‘champion’ through 40+ years involvement in hazard mitigation Retired City Planner/Attorney, Previously with City of Tulsa, one of ‘champions’ especially active in 1970 and 80s Planning Department Manager, Meshek & Associates, Consultant who led 2019 City Hazard Mitigation Planning Director, Disaster Resilience Network, Local non-profit involved in community engagement
Benton, Arkansas	Comprehensive Planning Manager, City of Bentonville, Not personally involved in hazard mitigation planning process Note: No response from Emergency Manager or other officials
Payne, Oklahoma	Director, City of Stillwater Emergency Management, Co-led hazard mitigation planning process Assistant City Manager/Urban Planner, City of Stillwater, Co-led hazard mitigation planning process
Potter, Texas	Emergency Management Regional Services Director, Panhandle Regional Planning Commission, Co-led hazard mitigation planning process Regional Emergency Management Planning Program Coordinator, Panhandle Regional Planning Commission, Co-led hazard mitigation planning process
McLennan, Texas	Emergency Management Coordinator, City of Waco and McLennan County, Responsible for Updating Hazard Mitigation Plan
Sedgwick, Kansas	No response from any emergency management or planning officials

³ All interview elements were approved by the appropriate Institutional Review Board for human subject research.

Analysis: Case Study Summaries

Using the plan content analysis data and interviews, we constructed comparative case studies. We focused on three main topics in the case summaries: 1) the quality of the mitigation plans, particularly in the areas of the land use approaches with mitigation benefits included in the plans and evidence of the integration of the plans in the broader network of local plans. We also assessed 2) the composition and leadership of the land use and mitigation planning networks, paying particular attention to evidence of collaboration between emergency managers, engineers, and planners. And, 3) we probed the role of consultants in the planning processes, paying particular attention to the type of expertise and local connections of the consulting firms. For each case we developed a detailed stand-alone summary. Those summaries are available in an online supplement. Here, we present the findings that cut across the cases and brief snapshots of each case that serve to provide tangible detail about the cross-cutting findings.

THREE CORE FINDINGS: PLANS, NETWORKS, AND CONSULTANTS

Our findings align with prior research and extend our knowledge about local mitigation planning. We describe three overarching trends and provide brief snapshots of each case community. After presenting these findings, we synthesize the apparent relationships between the plan evaluation and the analysis of the stakeholder networks and consultants.

First, as expected, the hazard mitigation plans tend to be of low to mediocre quality, even when on-the-ground mitigation efforts in a county or city are robust or even excellent. Each of the mitigation plans tend to be very technical and wordy, making them onerous to read. The formulaic nature of the plans typical of DMA-compliant plans was common in these case counties, just as much for the plan focusing just on the City of Tulsa (2014) or the 11-county Regional Plan that includes Sedgwick County; both plans are over 1,000 pages! Integration of land use approaches to steer development into safer locations and integration with other planning initiatives tends to be cursory at best. Similarly, the comprehensive land use plans tend to give limited attention to long-term risk reduction from natural hazards, thereby failing to make the vital linkage between patterns of development and risk reduction. Fortunately, the interviewees we spoke with were well aware of these limitations and, in some cases are initiating changes, at least within the bounds imposed by their local political context. For instance, during the late 2010s and early 2020s, a goal of updates of the mitigation plans in both Tulsa and Payne County/Stillwater was to greatly reduce the length and increase the readability and usability of the plans.

Second, the networks of hazard mitigation stakeholders vary widely in composition and leadership, some replicating emergency management networks suited to preparedness and response and some much better suited to the quite different demands of long-term

mitigation work. In half the cases, Benton County/Bentonville, McLennan County/Waco, and Sedgwick County/Wichita, the network of local stakeholders deeply engaged with mitigation planning was relatively small, consisting mainly of emergency management officials. These characteristics make the networks vulnerable to turnover in roles that might offer the person filling the position opportunities to become a local mitigation champion. They also result in the network lacking planners who typically bring more expertise in collaborative planning processes and land use regulation.

In the other three cases, the structure of the network and the leadership varied. In Potter County/Amarillo (TX), the Panhandle Regional Planning Commission (PRPC) led the planning process and wrote the plan. The PRPC officials who did so brought considerable experience in community development planning and public engagement. In Payne County/Stillwater the emergency management coordinator and assistant city manager, who previously led the planning unit, co-lead mitigation efforts and have worked closely together for more than a decade. In Tulsa County/City of Tulsa, the network of stakeholders is extensive, dating back to the 1970s when Tulsa began its transition to becoming a national leader in flood mitigation (Meo, Zieber, and Patton 2004; Lyles, Pennel, and Riley 2021). Consistent with previous studies, we found that engineers and planners, not emergency managers, typically led long-term risk reduction. Moreover, in the late 1990s, Tulsa Partners formed as a non-profit organization specifically focused on local community engagement around hazard risk reduction, a novel innovation rarely if ever matched elsewhere in the country. Over time, Tulsa Partners has evolved to have a statewide focus, changing its name to Disaster Resilience Network.

Third, the types of consultants and their roles also varied across the six cases, bringing expertise characteristic of narrow emergency management perspectives to more integrated expertise in long-range land use and infrastructure planning perspectives. Four of the six communities used consultants to manage the planning process and write the plan. Of these four, two used a local consultant with deep roots in the region and a reputation for understanding the connections between land use and hazard mitigation. Payne County/Stillwater and the City of Tulsa used Flanagan and Associates, which is the firm of Ron Flanagan, a former local planner who has more than forty years of experience in the Tulsa area. Flanagan has been recognized locally and nationally as a flood mitigation expert and champion alongside a few other key officials whose hazard mitigation work in Tulsa extended from the 1970s well into the 2000s. Notably, the interviewees in Tulsa and Stillwater both indicated that they found the massive plans that Flanagan's firm developed to be too long and inaccessible. For its 2019 plan update, the City of Tulsa employed Meshek and Associates, a woman-led engineering and planning firm to lead the planning process. The lead consultant on the plan previously served as the state hazard mitigation officer for the Oklahoma Department of Emergency Management, giving her a broad perspective on the relative strengths and weaknesses of mitigation planning within and beyond the state. She also is already becoming known as a national leader in mitigation

effort, including for recognizing the role of relationship building across professional disciplines including land use planning.

Meanwhile, Benton County/Bentonville hired Bold Solutions, a firm based in Tennessee that brings expertise in software for emergency operations planning, continuity of operations planning, and business continuity planning, in addition to hazard mitigation planning (BOLD Planning 2021). This portfolio differs markedly from that of Flanagan and Associates and Meshek and Associates as it is traditionally in the realm of emergency management that focuses on preparedness and response, rather than long-term risk reduction. Likewise, the Sedgwick County/Wichita plan was developed by Blue Umbrella Solutions, which works in the same domain as Bold Solutions. In fact, the individual identified in the plan as representing Blue Umbrella Solutions appears to have later moved to work for Bold Solutions (BOLD Solutions 2021). In the Potter County/Amarillo, a regional planning commission filled the consultant roles. As a regional planning commission, the organization brings an inherently regional and integrative perspective that covers an array of issues including transportation, land use and hazards. Finally, in McLennan County/Waco the now-retired Emergency Management Coordinator worked with a consultant to develop the plan. While information about the consultant is not available, the plan itself notes that community made a conscious departure from its prior involvement in a multi-county regional planning process led by a regional planning commission to be able to focus attention locally.

INDIVIDUAL CASE SNAPSHOTS

Tulsa (County and City)

In many ways Tulsa, especially the City, meets the criteria for a national leader in long-term hazard risk reduction. A long-standing, broad network of officials and members of the public have advanced myriad policies and projects to reduce development in the floodplain, preserve natural mitigation features, and engage the public. The 2014 version of its hazard mitigation plan is of moderate quality in the sense that it provides exhaustive detail about past and current mitigation actions, but the plan is poorly integrated with other planning initiatives and is, at over 1,000 pages, far from reader-friendly. Notably, the 2019 version of the plan is much shorter, but still aligns with a traditional plan style of an information repository more so than a living document to engage the public or be used regularly in decision-making processes. Even the 2019 plan, though, fails to meaningfully engage with the broader network of local planning effort over the last 10 years, including mayor-driven sustainability planning in the early 2010s, resilience planning in the late 2010s (driven by a different mayor and the support of the Rockefeller Foundation out of New York), or comprehensive land use planning. As such, Tulsa's mitigation planning appears to have plateaued in the mid 2000s. Moreover, the relationships between hazard vulnerability and historic and continued inequity along racial and economic lines is ignored

and attention to climate change is limited. These topics will be especially challenging for Tulsa to engage given its history of racial violence and the city's identity as a politically conservative oil and gas industry hub.

Sedgwick County and Wichita

For all its similarities to Tulsa, Sedgwick County/Wichita presents little evidence that it has matched Tulsa's progress in the realm of hazard mitigation. The formulaic, technical 1,000-plus page mitigation plan covers 11 counties and dozens of municipalities and school district. The plan clearly is based on a plug-and-play template that Blue Umbrella Solutions used for numerous other regions of Kansas. Between the emergency manager dominated locally involvement and the emergency operations focus of the consulting firm, it is not surprising that integration with other local plans and land use planning are limited.

Benton County and Bentonville

Similar to Sedgwick County and Wichita, Benton County and Bentonville have generated FEMA-compliant low to moderate quality mitigation plans typical of other areas of the country. Evidence of integration of hazard mitigation and land use planning is essentially absent, both in terms of connections made in the plan documents or between the officials involved in the planning processes. The decision to use an out-of-state consulting firm with a focus on emergency operations planning also likely shaped the narrowness of the plan. Meanwhile, the comprehensive land use plan follows a boosterish model that aims to tell the story of why Bentonville is a great place to move a business or family to, rather than a forum for addressing problems like hazard risks, inequity, or downsides of sprawling development patterns. As is true with the other communities, there is little evidence of meaningful consideration of issues of sustainability, resilience, justice, or climate change. Our findings are unsurprising given the state political context and the local presence of the international headquarters of Walmart, a corporation whose business model typifies auto-oriented sprawling, developer's choice land use patterns. Yet, Benton County and Bentonville have participated in the CRS program for more than a decade, demonstrating a commitment to flood risk reduction. Also, Bentonville and the surrounding area are experiencing explosive population growth and have become a travel and retirement destination with a world class art museum, an elite network of on and off-road cycling trails, and a thriving downtown. These trends, including the commensurate increase in college-education population, might be expected to increase the salience of quality of life and equity issues.

McLennan County and Waco

McLennan County and Waco generally fit the FEMA-compliant mitigation planning type, with a few glimmers of change on the horizon. While the hazard mitigation plan is a

formulaic technical document unlikely to engage the public or be useful in ongoing decision making, it has been down-scaled from being part of a multi-county regional document to have a more detailed county-level focus, a distinct approach from that taken in Sedgwick County. In terms of the evidence of thinking outside the emergency management silo, we found little evidence of inter-personal connections between emergency managers and planners or the plans they are responsible for. Yet, the mitigation plan and the land use plan both included provisions aimed at fostering development in locations other than floodplain. The need to maintain participation in the National Flood Insurance Program was clearly on the minds of the plans' authors, even if there has not been local participation in CRS. And, change is clearly underway as the current emergency management coordinator is a recent graduate of a public administration program and has already started to foster local connections between the emergency management community and public health officials. Public administration is another professional realm of vital expertise and perspectives sorely lacking in most mitigation planning processes.

Potter County and Amarillo

Our findings for Potter County and Amarillo indicate moderate-quality hazard mitigation planning efforts led by Panhandle Regional Planning Commission (PRPC) officials. Notably, the mitigation plan was developed in-house by the PRPC officials, whose backgrounds are in public administration and the non-profit sector rather than emergency management. They filled the role of consultants in terms of managing the process, but in contrast to out-of-town or even out-of-state consultants, their perspective is inherently local, as is their network of connections. The interviewees emphasized the importance of relationship building and long-range perspectives in their work. While the integration of land use approaches into hazard mitigation is not ground-breaking, it is more robust than might be expected in one of the more conservative parts of Texas where meat packing and military manufacturing are pillars of the economy.

Payne County and Stillwater

Payne County and Stillwater, the smallest case in our sample, also exhibit moderate-quality hazard mitigation planning, appearing to be second to Tulsa in its overall robustness. As with each other case, the 2015 mitigation plan is a long, highly technical document. The Flanagan and Associates consulting team clearly used the same format for the Stillwater plan as the Tulsa plan, though the plan is roughly half the length, in line with Stillwater being a much smaller community. Although the city land use plan is a vague, it does acknowledge hazard risks as an issue of major concern locally. Perhaps most notable is the close relationship between the local emergency management and planning leaders, based on working together for a decade and a half. Together they talked of their aim to

transform and integrate mitigation and land use planning in the next round of plan updates, similar to the thinking in Tulsa. However, subsequent to our interviews, the planner departed Stillwater for personal reasons, highlighting the challenge of turnover in public service professions.

DISCUSSION: IS THE DMA DESIGNED FOR MEDIOCRE MITIGATION PLANNING?

The insights provided by the six cases reinforce and extend the cumulative findings of hazard mitigation planning research over the last 10 years. In short, evidence mounts that the current planning framework for long-term natural hazard risk reduction is mismatched to the problems at hand. In each of our cases, plan documents leave lots to be desired, even when on-the-ground efforts are robust. Who is at the table in mitigation planning processes – or not at the table – appears to shape the process and the outcomes. Unfortunately, the current constraints on mitigation planning may be insurmountable as long as mitigation is understood and tackled primarily through the realm of emergency management, which has a long history of success in preparedness and response efforts but less so in mitigation and recovery.

Our findings indicate underperformance on the most promising approach to long-term risk reduction: more sustainable land use and infrastructure decisions to reduce exposure and vulnerability to hazard events (Burby 1998; Burby et al. 1999; Mileti 1999; Godschalk et al. 1999). Put simply, from the standpoint of professional training and responsibilities, mitigation fits with the domain of planners and engineers more so than emergency managers, although emergency managers and other professionals, as well as elected officials and stakeholders must be engaged as well (Schwab 2010). Not surprisingly, the plans in the communities with emergency management-dominated networks and consultants largely fail to incorporate land use perspectives in favor of logistical and operational approaches effective for preparedness and response. In short, hazard mitigation planning in McLennan County/Waco (TX), Benton County/Bentonville (AR) and Sedgwick County/Wichita (KS) meets FEMA requirements, but does little more, as is very common across the country (Lyles, Berke, Smith 2014, Kim and Marcouiller 2018). These emergency management-driven planning initiatives are poorly integrated with other local planning efforts and generally perform poorly in terms of public participation, both of which are tasks more typical of the daily work of planners.

It is perhaps surprising that the mitigation plans are generally mediocre in Potter County/Amarillo (TX), Payne County/Stillwater (OK), Tulsa County/City (OK), in spite of more planner involvement in the network and in the consulting team. The plan documents are massive, technical documents developed with low levels of public participation and characterized by virtually no inter-connection to other recent planning efforts. Unfortunately, the plans seem more likely to sit and collect virtual dust on a digital

shelf than hold the attention of local elected officials and the public and thus inform decision making. Prior research shows that more diverse engagement in mitigation efforts, especially the inclusion of land use planners, leads to plans that better consider issues of patterns of development and vulnerability to natural hazards risk (Burby 2003; Berke, Lyles, Smith 2014; Lyles 2015).

This missed opportunity is striking because Tulsa has a long and storied history of mitigation successes led by planners and emergency managers, with robust engagement of the broader public (Meo and Ziebro 2002; Meo, Zieber, and Patton 2004; Lyles, Pennel, Riley 2021). Likewise, just an hour or so down the Oklahoma Highway 51 Stillwater appears to be following the Tulsa model, in terms of a shared leadership approach that includes planners and in terms of consultants it hires. Stillwater following the lead of Tulsa, in part a function of dissemination of information but more a function of interpersonal relationships, fits with a diffusion of innovation model (White and Boswell 2007), although the diffusion would appear to be quite slow considering that many of Tulsa's major advances were decades ago. Meanwhile, in the Panhandle of Texas, the central involvement of the regional planning commission staff has resulted in more attention to land use perspectives in the mitigation plan than might be expected. Still though, the plan remains a technical document more than an instrument for shaping decision-making. And, the conservative political context of west Texas, like lots of other rural areas of the United States, limits the ability of even a high performing network of officials to link hazard mitigation to topics like climate change and social, economic, and racial inequity.

When coupled with existing scholarship on mitigation planning, we feel more and more compelled to interpret the DMA as incentivizing mediocrity in mitigation planning. On the one hand, mediocrity is better than nothing. Communities that might not engage in mitigation planning at all are essentially forced to develop a plan, which points to the value of higher government mandates for planning (Berke and French 1994; Burby and May et al. 1997). Planning scholarship increasingly recognizes that the process of crafting a plan can be as important or more so than the document that results (Innes and Booher 2010). A plan that few people help create will be a plan with few people committed to read, use, or implement.

Moreover, in a domain like hazard mitigation where inequity is a huge problem narrow involvement of professionals from just a few fields – fields like emergency management noted for its dominance by white, middle-aged males working in hierarchical organizations like the military, fire, and polices (Frank 2020; McKay 2021) – there is little opportunity to understand, much less address the underlying cause of social vulnerability to hazard risk. As our findings show the default approach of many emergency managers tasked with mitigation planning is to hire an outside emergency management-focused consultant with expertise tangential to the core challenges of mitigation. The emergency managers and consultants, who are less likely to have the skills and experience of deep public engagement, proceed to go through the motions of a public participation process. Basically,

because of the DMA thousands of communities now have mitigation plans, but miss many of the benefits of mitigation *planning*.

On the other hand, Tulsa, which already engages in innovation approaches to mitigation, and Stillwater, which is following Tulsa's lead, also generate mitigation plans that are mediocre. Even when these communities hire consultants with deep understanding and commitment to integration of land use and engineering approaches into hazard mitigation, the plans are only marginally better than run-of-the mill plans. The plans contain more attention to land use approaches to risk reduction, but that attention is lost in the morass of detail in the hundreds and thousand-plus page long plans. This dynamic may be a function of ensuring that a local mitigation plan checks all the boxes during FEMA review processes and remains compliant with each update, which is required every five years.

Mitigation plans do little to grapple with deeper social, economic, and political issues like racism, wealth inequity, and uneven access to local decision-making that drive social vulnerability. Maybe because FEMA requires little attention to the issue, but also because it is politically charged and emotionally difficult to address. As such, the formulaic structure of the DMA mandate coupled with the institutional influence of it being administered by state and federal emergency management agencies built mainly to support preparedness, response, and grant management may inhibit, rather than encourage, innovation. There is no clear regulatory and administrative mechanism for injecting cutting edge skills and tools of the planning field into mitigation planning. This finding aligns with literature on planning mandates and plan implementation that finds that a top-down and highly proscriptive mandate can result in the performance of compliance as an activity, but compliance does not guarantee high performance in terms of impact.

CONCLUSION: DMA AT A CROSSROADS

At the 20th anniversary of the DMA, there is strong evidence of its effectiveness in catalyzing the development of lots of detailed plans that exemplify technical planning. It is difficult to imagine that thousands of communities would have dedicated millions of dollars and untold hours to develop mitigation plans were it not for the DMA requirements. As our findings show, however, the DMA is likely in need of a major overhaul if the aim is for plans to be used in decision-making situations. And although efforts like the new FEMA Building Resilient Infrastructure and Communities program are underway, federal policy makers should consider some hard questions as they consider the future of the DMA.

Are the requirements for obtaining DMA-compliance too low? Two areas where compliance under current standards is clearly not working: engagement of the public in long-range mitigation planning and utilization of land use approaches to risk reduction and engagement. This question, in turn, begs the question of whether hazard mitigation (and recovery) should be in the realm of emergency management? Hard as it may be to imagine

a different federal agency (or a new climate-centric agency) with lead responsibility for mitigation, it may be easier than changing the institutional cultures at FEMA and State EMAs, which excel at preparedness and response, as well as grants management. On a related note, do FEMA and State EMA interpretations of the DMA overly incentivize one-size-fits all, consultant-driven plans? External consultants bring many advantages to a planning process. At what point, though does a mitigation plan developed from a template with minimal adjustments to account for local conditions cease to be a local plan? Finally, what is the role of the DMA in climate changed world? Climate change is a day-in and day-out reality (IPCC 2021), not a prediction for the future as many still argued in the early 2000s. Moving forward, all climatic natural hazards must be planned for through the lens of a changing climate. At the time of writing, the major parties in the federal government debate the merits of major infrastructure and budget bills that could leverage the power of the federal purse to advance reductions in greenhouse gas emissions and proactive actions to catalyze climate adaptation. Will the DMA be an adaptable and valuable part of these efforts?

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Appendix: Case Summaries - For Online Supplement

Tulsa (County and City)

The City of Tulsa completed its fourth revision of its hazard mitigation plan during our data collection period, giving us the opportunity to analyze its 3rd plan update (2014) and 4th update (2019). The 2014 plan, at 1,000+ pages is a highly technical with exceptional levels of detail on policies and programs, as well as maps and other visual graphics. The plan development process was engineering-driven and included an impressive array of stakeholders, including not only planners, engineers, and emergency managers, but a broader swath of community. This breadth makes sense because the planning process was conducted by Flanagan and Associates, a flood management consulting led by Ron Flanagan who has more than 40 years involvement in flood risk reduction in Tulsa and is widely recognized as one of the champions of Tulsa's successes in reducing flood risks. Additionally, Tulsa Partners, the local risk reduction non-profit that arose out of Tulsa's involvement in the FEMA Project Impact in the late 1990s and 2000s, assisted with engaging the community. However, the depth of the engagement was shallow, without much indication of meaningful interaction among stakeholders. In line with the plan's length and the City's long tradition of flood mitigation, the plan contains information about an array of land use actions (8 of the 11 we searched for), as well as acquisition and elevation of at-risk properties, structural controls of floodwaters, preservation of wetlands, and building standards. When it comes to land use approaches, though, the focus was more on existing policies than major advances in policies or programs to regulate land use. Similarly, attention to the numerous other relevant local plans focused mainly on those plans existence rather than integration of the policies and programs across planning efforts. Also, the plan does not address climate change and attention to social equity and issues of justice are cursory at best.

At just over 100 pages, the 2019 plan differs dramatically in scale, although the scope of the content is generally the same, only with less detail. This planning process was conducted by Meshek and Associates, an engineering and planning consulting firm led by Janet Meshek who worked for the City of Tulsa in the 1980s and has since consulted extensively on flood-related projects in the region. The process itself included deeper engagement of a similarly broad array of stakeholders, using targeted workshop to increase interaction among participants. The dramatic reduction in length of the plan result in unsurprising reduction in detail on many aspects of Tulsa's existing risk reduction capacities. Like the 2015 plan, the land use-focused aspects of the plan are generally retrospective and the focus moving forward appears to be more in the realm of individual property protection and structural controls. The 2019 version gives slightly more attention to issues like sustainability, resilience, and climate change, but in general that attention is cursory.

Meanwhile, the Tulsa County hazard mitigation plan (2015) largely sits in isolation from the City of Tulsa hazard mitigation plans and aligns with the low to moderate quality mitigation plans found across the country. The plan is multi-jurisdictional, covering the rest of the jurisdictions in the county other than the City of Tulsa. It was developed by the Indian Nations Council of Government, the regional planning agency. Public engagement was limited and the 253-page plan is neither especially readable or integrated with other planning efforts. In terms of actions, the plan focuses mainly on emergency management activities more suited to preparedness and response than long-term risk reduction and does not address issues like sustainability, resilience or climate change.

Alongside these mitigation plans, the City of Tulsa has developed multiple relevant, though generally disconnected, plans in the last 10 years. In the late 2000s and early 2010s, Mayor Bartlett made sustainability a priority of his administration and his office led development of a sustainability plan. The plan fits the ‘go green to save green’ model of sustainability in which the emphasis is on environmentally-friendly actions that save money. Although the plan makes aspiration statements about social equity, it lacks meaningfully consideration of the racial, gender, class and other dimensions of inequity. Attention to hazards and long-term risk reduction are largely absent, as is attention to climate change. The 2016 PlaniTulsa process led to a comprehensive land use plan for the city. It, too, use sustainability from a framework but likewise fails to address inequity, long-term risk reduction from hazards, or climate change in substantial ways. Instead, the plan fits a growth-oriented booster model of planning that aims to promote development. Notably, the plan also fails to identify who led the planning process and wrote the plan, minimizing the ability to see if and how individuals and organizations do or do not connect with mitigation planning efforts. In late 2016, Mayor Bynum began his term and the focus shifted from sustainability to resilience as an organizing framework for planning. Tulsa participated in the now-defunct global 100 Resilient Cities program led by the non-profit Rockefeller Foundation. The resulting Resilient Tulsa plan is remarkable in many ways, especially in tackling Tulsa’s long history of racial and economic injustice head on. Attention to natural hazard risks is one of the major topics, alongside highly racially discriminatory issues like school-to-prison pipeline and economic exclusion, and climate change is mentioned. While Tulsa’s array of plans, including mitigation plans, are mentioned, there is little to no meaningful integration of goals or policies across plans.

All in all, the suite of plans in Tulsa, while holding tremendous potential to form a robust network of plans to promote long-term sustainability and resilience to natural hazards and other threats and stressors, largely fail to connect to each other. Moreover, it appears that the individuals and organizations involved in these processes may not be connected either, which constitutes a major missed opportunity.

Among the most striking insights from our interviews is simply the abundance of mitigation champions across multiple generations of stakeholders inside and outside of local government. The story of the network and its evolution goes far beyond the space

available here, but has been addressed elsewhere in detail. Key observations from those studies and our own interviews are that the network has long consisted of multiple closely-connected ‘champions’ who bridge different professional backgrounds (e.g. planning, engineering, journalism, etc.). Interestingly, in this network connections exist with emergency managers, but they tend to be focused on preparedness and response while the planners and engineers dominated mitigation efforts. As is true for the suite of plans, though, the network of individuals and organizations involved in hazard mitigation tend to have weak ties to people leading the sustainability, resilience, and land use planning. That is, the Tulsa network of champions has not necessarily evolved over time in line with the ways that conceptions of long-term risk reduction have evolved. The disconnects are most evident in the realm of addressing systemic inequity and climate change, although multiple interviewees expressed awareness of the need to make much more progress in these areas.

Sedgwick County and Wichita

Sedgwick County participated in a multi-county regional mitigation planning process led by an external consulting firm, as has been typical in Kansas. All evidence about the planning process suggests that the 1,000-page behemoth of a plan does little more than meet basic FEMA requirements. County emergency managers were involved, but there is little indication of public involvement and no evidence of collaboration between emergency managers and land use planners in Sedgwick County. The mitigation plan does mention Sedgwick County’s comprehensive plan and emergency operations plan and identifies a few floodplain-related actions such as stormwater systems and elevation and acquisition of properties vulnerable to flooding. The plan acknowledges the issues of social vulnerability and equity in cursory fashion.

While the regional mitigation plan is extremely long, the Wichita-Sedgwick County comprehensive plan is just 48 pages. In spite of its short length, the comprehensive plan has a confusing layout and is not especially readable. There are a few instances of acknowledging the importance of stormwater management. However, the comprehensive plan fails to address hazard mitigation or climate change, and aside from one mention of sustainable design, also fails to engage with issues like sustainability, resilience, equity or justice.

And, as noted above, after repeated attempts to contact emergency management or land use officials to discuss hazard mitigation we received no response. Whether the lack of response indicates a lack of capacity to allocate time to talking with researchers, a lack of interest in research to improve hazard mitigation, unwillingness to be questioned about the lack-luster planning, or some other cannot be known.

Benton County and Bentonville

The Benton County Hazard Mitigation Plan is of low to moderate quality, in line with most plans nationally. The consulting firm led a planning process compliant with FEMA

requirements but lacking any substantial public engagement and the plan definitely reads like a template rather than a locally-grounded plan. Although local planning and emergency management officials were involved, there is little evidence of strong collaboration during the process nor shared responsibility for ongoing implementation. In terms of plan integration, the HMP acknowledges the state hazard mitigation plan, the emergency operations plan, and a growth management plan, but no other plans. Of the categories of actions we evaluated, property protection and structural controls were more prevalent than land use actions. Meanwhile, the plan mentions social vulnerability often but in superficial manner, mentions sustainability and resilience in passing, and fails to address climate change.

The Bentonville Comprehensive Plan, crafted by a different consulting firm than the HMP, is a well-illustrated, readable plan extolling the virtues of development in the city, consistent with boosterish approaches often promoted by local growth machines of realtors, developers, and home builders. The plan includes attention to land use regulations and includes integration with transportation, infrastructure and downtown plans. However, none of these aspects of the plan are connected to hazards, climate change, or long-term risk reduction. It mentions the existence of stormwater infrastructure and the need to preserve tree canopy. And, only in passing does it pay attention to sustainability, resilience, and issues of equity and justice.

In terms of information gained through the interview process, very little was added. In spite of repeated efforts to connect with officials involved in the mitigation planning process, no one responded. The only person available to be interviewed, the comprehensive planning manager, is not involved in hazard mitigation. This inability to reach hazard mitigation officials is instructive in and of itself, suggesting either a lack of interest or capacity to talk about long-term risk reduction in the county and city.

McLennan County and Waco

The McLennan County Hazard Mitigation Plan is not creative or attractive, but it is functional and readable overall. The plan was developed by a consultant with clear involvement of local emergency management officials, but no indication of any involvement of planning officials or meaningful public engagement. Although there is no evidence of collaboration between emergency managers and planners, the plan does include a few land use-related flood risk provisions, including density bonuses for conserving floodplains. These provisions are linked to the local desire to maintain eligibility in the National Flood Insurance Program. In terms of broader themes, sustainability is mentioned occasionally, social vulnerability and equity in passing, and climate change not at all.

The Waco comprehensive plan is functional but not innovative. The plan does include frequent framing of issues in terms of sustainability, with cursory attention to social equity and vulnerability. Minimal information is given about the process of developing the plan

aside from a list of local elected officials, staff, and five consulting firms. In turn, there is no evidence of collaboration between planners and emergency managers or engagement of the public with issues of long-term risk reduction. In line with the land use provisions in the hazard mitigation plan, the land use plan does link some of the land use actions to facilitating development while also using low-impact design features to manage stormwater and preserving wetland and riparian buffers.

In terms of interviews, we were able to speak with the Emergency Management Coordinator (EMC) who was relatively new in the position having recently graduated from a nearby university with a degree in public administration and replaced a long-time EMC. The interviewee shared that she had recently tried to broaden participation in mitigation efforts with mixed success. Emergency managers from all the cities in the county, most of whom work in fire and police units, and some public health and public works officials have gotten involved, but local planners have not. The interviewee indicated that there is not a recognizable mitigation ‘champion,’ though local emergency management officials and county administrators do take mitigation seriously. In line with these patterns of relationships (or lack thereof), mitigation planning efforts are not well integrated with land use planning efforts. And, not surprisingly for a county in central Texas, climate change has not been a prominent topic, although there is concern about how changes in weather will impact big events in the community. The interviewee did indicate that she views relationship-building as key for fostering preparedness and mitigation moving forward.

Potter County and Amarillo

Potter County’s mitigation plan, crafted by the Panhandle Regional Planning Commission, covers two counties (Potter and Randall) and is an informative and readable document, though not particularly creative or innovative. In terms of public engagement, the planning process followed all of the typical FEMA-required steps, but participation beyond local officials was minimal. Notably, the planning process involved not just local emergency management officials, but also public works officials and planners and that involvement included attending meetings together (an admittedly low bar, but one many mitigation planning processes fail to meet.) The plan likewise acknowledges the suite of related local land use and hazards-related plans, although in terms of actions the focus is on floodplain regulations and stormwater, without much attention to land use approaches to risk reduction. In line with this focus, emergency managers and public works officials share responsibility for implementing the actions, but planners are not indicated as partners in that work. In terms of broader themes, the language of sustainability and resilience, equity and justice are used in general terms, while there is no attention to climate change.

The Amarillo comprehensive plan, developed through a process involved in a consulting firm, is functional but not creative or innovative. While five public meeting took place, the plan does not provide much information about participation, either by local

officials or the public. As such, there is no evidence of collaboration between planners and emergency managers. The plan does include multiple land use actions with the potential to advance risk reduction, including density bonuses for preserving open space and cluster development, these actions are not linked to hazards. In terms of implementation, planners and public work officials share responsibility, but emergency managers are not part of the equation. In terms of broader themes, variants of sustainability are included, as is passing attention to equity, while attention to climate change is absent.

Our interviews revealed a local mitigation network coordinated by Panhandle Regional Planning Commission employees whose backgrounds emphasize public management and community engagement more so than traditional emergency management. Two PRPC officials led local planning processes and have ongoing responsibility for coordinating the broader array of emergency managers, administrators, and planners. One of the PRPC officials was trained as a public administrator and has more than 30 years of experience in the region including work in the realms of community development planning and emergency management. The other PRPC official had primary responsibility for writing the mitigation plan and has more than 15 years of hazards-related experience in the region. This person came to hazards work by way of working in the disaster non-profit arena before moving into emergency operations and hazard mitigation planning roles. They both emphasized the importance of relationship building, noting that it takes time to do so and that in spite of being a male-dominated network it is not characterized by more 'macho' interactions sometimes characteristic of the fire-police-emergency management realm.

Payne County and Stillwater

The City of Stillwater completed a revision of its hazard mitigation plan in 2015, led by the same consultant, Flanagan and Associates, as the City of Tulsa 2014 mitigation plan. Like the 2014 Tulsa plan, at 500+ pages it is a highly technical document with exceptional levels of detail on policies and programs, as well as maps and other visual graphics. The plan development process also tended to be engineering-driven, but with involvement of planners and emergency managers and especially strong involvement of public schools and the university. The assessment of existing capabilities is quite robust, including land use policies already adopted. But, aside from preserving riparian buffers along streams, most of the actions identified for future work fall into the realms of individual property protection and structural controls. Similarly, attention to the other relevant local plans focused mainly on those plans' existence rather than integration of the policies and programs across planning efforts. Also, the plan mentions sustainability and resilience and, in the context of heat wave, climate change, but attention to social equity and issues of justice are cursory at best.

The City of Stillwater's comprehensive land use plan, adopted in 2013 between versions of the hazard mitigation plan, was developed by the city development service

division rather than an outside consultant. The document is quite vague and, in general, not well connected to other plans, policies and programs. Somewhat paradoxically, though, the plan is notable because it actually does indicate that natural hazards like floods and tornadoes are critical issues for the city to consider. It includes a recommendation for more investigation of hazard risks the community faces.

Our interviews with the Stillwater emergency management director and assistant city manager revealed a strong pair of champions who understand the land use connections to long-term risk reduction. Both interviewees started with Stillwater in the early 2000s and have assumed more responsibilities in recent years as EM director and assistant city manager, with the latter trained as a planner and having served as director of development services for many years. The two have a close working relationship with each other and have worked closely with hazards and climate experts from Oklahoma State University and the University of Oklahoma. The interviewees have fostered a network of more than 60 stakeholders involved in mitigation-related planning, ranging from public school officials, university officials, developers, and more. They emphasized the importance of relationship building, especially with business interests. At the time of our interviews, Stillwater aimed to dramatically reduce the bulk and technical detail of the hazard mitigation plan developed by Flanagan and Associated in its next plan update, in line with how Tulsa focused on crafting a more accessible plan in its 2019 update. Additionally, the interviewees noted that the upcoming comprehensive planning process will be centered on sustainability and will draw heavily from the hazard mitigation plan to address hazards and climate risks.