January/February 2021

American Planning Association
Planning Advisory Service
Creating Great Communities for All

PAS MEMO

Building Resilience Through Plan Integration

By Joseph DeAngelis, AICP, Johamary Peña, Alexsandra Gomez, Jaimie Masterson, AICP, and Philip Berke

Plans provide visions for the future and the structure for making that future possible. But many communities are awash in a sea of plans, ranging across topic areas and local geographies and over widely varying timelines and implementation schedules.

Conflicting policies across plans is especially problematic in the context of mitigating hazards and adapting to the impacts of climate change. A comprehensive plan that identifies a waterfront district for economic development may openly conflict with a recent climate adaptation plan that calls for long-term retreat due to sea level rise. Prioritizing funding for road infrastructure in this area could result in expensive roads that lack adaptations for sea level rise and create incentives for development in an area that should be undergoing coastal retreat. As this example illustrates, broken links between plans and tenuous connections to policy and decision making can have serious long-term impacts on a community.

For climate and hazard resilience, ensuring that plans result in complementary policies that build resilience in at-risk geographies is crucial to long-term community health and safety. Though planners and planning departments may not control or oversee all plans in a community, they can play a major role in identifying and minimizing potential conflicts.

This is easier said than done. Parsing local plans and understanding how they might conflict is a tall order. The sheer number of local plans may be daunting, they may address overlapping and ill-defined geographies, and their resulting actions and policies may be diffuse and difficult to quantify. These challenges are further heightened in resource-constrained communities that suffer from legacies of environmental injustice, racism, and inequality. How can planners ensure that the local network of plans is internally consistent and builds local resilience? How can this work be streamlined so that communities with significant constraints on funding, capacity, and resources can also engage in the work of plan alignment and integration?

The American Planning Association, through an ongoing research partnership with the University of North Carolina's Coastal Resilience Center (CRC), hopes to help answer these questions. This research primarily builds upon the Plan Integration for Resilience Scorecard (PIRS). Developed for the CRC by Phil Berke and Jaimie Masterson at Texas A&M University, this is an innovative method for understanding and assessing the internal consistency of local plans through spatial analysis as a way to improve community resilience (Figure 1).

This *PAS Memo* shares this work with planners to help them ensure their communities' plans are consistent and aligned. It identifies major challenges to creating consistent and aligned plans, and it describes the ways in which local collaboration and spatial analysis as outlined by the PIRS method can help streamline efforts to reduce vulnerability to hazards and climate change. Finally, it places the PIRS method within a framework for planning practice and outlines the utility of this method from visioning stages through plan making and implementation.

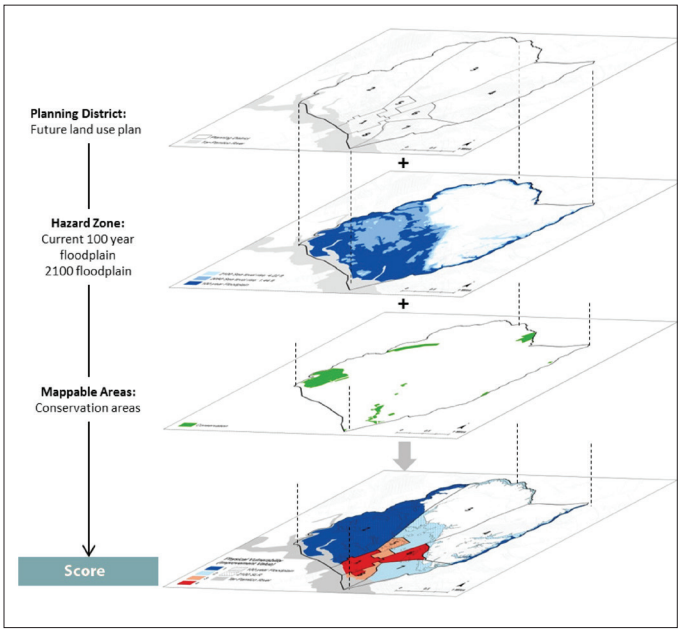

Figure 1. PIRS offers a multilayered spatial approach to integrating plans for community resilience. PIRS Guidebook.

Plan Integration and Climate Resilience

Plan integration is the process of harmonizing a network of plans to support a community priority, such as climate resilience. In practice, this process can be seen as the application of the consistency doctrine, which calls for consistency not just among different long-range plans, but also between long-range plans and local land-use regulation and code administration.

Identifying where and how plans (and policies) interact provides a better sense of how to minimize conflicts and improve outcomes on the ground. For example, a subarea plan may encourage development in an area that a local hazard mitigation plan identifies as a flood zone. Through the process of identifying these contradictory policies, communities can decide how to update the existing network of plans to coordinate priorities and establish clear connections for future plans. In theory, this helps to coordinate planning activities across scales and reduce instances of policies and programs working at odds.

The reality however, as revealed through a recent APA survey and series of interviews, is a bit more complex. The following is a summary of the major plan integration challenges and barriers in the context of climate resilience identified by survey respondents and interviewees.

Lack of requirements and incentives. Although communities may be required to follow state and regional requirements for comprehensive, subarea, and functional plans, many lack requirements or incentives to encourage plan alignment and integration. Without explicit requirements or clear guidance on making plans consistent and aligned, any efforts to integrate plans may be scattershot or lack institutional support over the long term.

Complexity of network of plans. Plan integration challenges are compounded when there are multiple active plans in a community. This increases the number of variables to consider, resulting in heavier demands on staff time and resources to complete plan analysis. Plans adopted for the same areas but with varying scopes may reflect different priorities, different understandings of community hazards and climate risks, or incongruent community visions and goals.

Communication and collaboration. Having multiple active plans in a community translates to more groups of people working to develop, implement, and update them—often in distinct silos. For example, planning for emergency management, transit operation, and hazard mitigation may be done by staff working in different departments and focused on different planning horizons, with different resources at their disposal to tackle plan objectives. Differences in values and priorities can also cause challenges.

Staff capacity and financial support. Plan integration can be resource intensive. A dedicated plan integration team will need time and technical support to review relevant plans, which can detract from ongoing projects and other department priorities.

Climate and hazard data integration. Though communities may recognize the importance of planning for future climate conditions, it can be challenging to include conditions in future scenarios that may have adverse impacts on an area. Some of these conversations may be emotionally charged, especially when residents and stakeholders are asked to consider the impacts of a changing climate on places of personal value. Communicating and integrating this information across plans, goals, and policies adds another layer of complexity to the process.

Using the Plan Integration for Resilience Scorecard

How can planners and their communities begin to overcome these challenges? The Plan Integration for Resilience Scorecard (PIRS) may point a way forward by grounding the process of integrating and aligning plans in discrete local geographies. By better understanding the spatial impacts of plans, goals, and policies, communities can make better use of limited resources, funding, and capacity. Translating text and narrative into layers on a map can help to highlight the major sources of friction and discord across plans and bring them into alignment.

Planners and communities can use the PIRS method to achieve the following objectives:

- Identify conflicts within and among planning documents
- Systematically assess policies within plans
- Understand the spatial distribution of policies and their impacts
- Prioritize and strategize future plan updates and policy and program changes
- Make simple adjustments to existing policies and plans, embedding and weaving resiliency principles through existing processes and efforts
- Reduce hazard vulnerability at the neighborhood level
- Implement resiliency measures equitably across neighborhoods and geographies
- Track policy implementation status, measure success, or ensure accountability over time

The Plan Integration for Resilience Scorecard

In 2015, a team of researchers at Texas A&M University began development on the project that would ultimately become the Plan Integration for Resilience Scorecard (PIRS). With support from the Department of Homeland Security and the UNC Coastal Resilience Center, a team comprising Phil Berke, Jaimie Masterson, Matthew Malecha, and Siyu Yu sought to better understand how communities can improve their long-term resiliency outcomes by ensuring that their plans, codes, and policies were working in tandem.

The unique spatial approach identified as part of this project and piloted with various communities, was ultimately developed into the PIRS Guidebook, a step-by-step method for creating a scorecard to evaluate overall plan integration within a community. This *PAS Memo* summarizes the PIRS approach, though far more detailed guidance can be found in the guidebook.

There are three general steps in the PIRS method: creating the scorecard, conducting analysis, and advancing plan integration and resilience.

Creating the Scorecard

This first step includes reviewing plans, spatially defining the community of interest, and assigning policy scores.

The team begins by gathering up-to-date planning documents from local departments and agencies. For each planning document, the team identifies policies that have the potential to impact resilience. The PIRS Guidebook provides a simple three-point test for determining relevant policies: (1) presence of a policy tool, (2) presence of a mappable place-specific term, and (3) potential to reduce or increase vulnerability to hazards.

The team then defines the analysis site by mapping planning districts (e.g., U.S. Census Block Groups or existing neighborhoods) and delineating hazard zones (e.g., 100-year floodplain) within the community. Spatially combining these two layers results in a single District-Hazard Zone layer. There will be a separate District-Hazard Zone layer for each relevant hazard. The team also needs to map place-specific terms from the identified policies, such as critical facilities, conservation areas, or public housing.

The final aspect of creating the scorecard is assigning policy scores. The team qualitatively assesses each policy based on whether it exposes residents or structures to natural hazards: a score of -1 indicates negative impact, 0 indicates neutral impact, and +1 indicates positive impact (Figure 2). The team can use the "Not Applicable" option for policies that do not refer to the District-Hazard Zone that they are currently scoring. Higher total scores in a District-Hazard Zone indicate more policies aimed at decreasing vulnerability, while lower scores indicate more policies that increase vulnerability.

The scorecard will be the key tool used to identify how and where policies are in conflict. In the next step, the team will analyze the collective impact of these policy scores in each District-Hazard Zone through summary tables and maps.

Conducting the Analysis

The second step is analysis, including an optional but recommended assessment of physical and social vulnerability. The team creates tables to present the total value (sum of policy scores) for each district, hazard zone, and plan (Figure 3, p. 4). The table shows how different plans affect different areas in the community, as well as how effective individual plans are.

Development Regulations	Planning District	Place Specific	Vulnerability	Policy Tool	01	02	03	04	05	06	07	08	**TOTAL (ALL PDs)**
Permitted Land Use													
[GOAL] Public facilities and publicly owned lands will be used at their highest and best use, except for those public lands that are in environmentally sensitive locations, where conservation should be the objective. (p. 47)	Current Hazard Zone	Yes	Yes	Yes		1				1			**2**
	Future Hazard Zone					1				1			**2**
Subdivision Regulation													
Strengthen controls on development within flood-prone and wetland areas by improving existing ordinances, such as the erosion and sediment control ordinance, zoning ordinance, subdivision ordinance, flood plain regulations and other development regulations. (p. 46)	Current Hazard Zone	Yes	Yes	Yes	1	1			1	1	1	1	**6**
	Future Hazard Zone				1	1	1		1	1	1	1	**7**
Zoning Overlays													
Consider creation of a Conservation Overlay Zoning District to help protect sensitive areas. (p. 42)	Current Hazard Zone	Yes	Yes	Yes		1				1			**2**
	Future Hazard Zone					1				1			**2**
Increase and bolster the number of key destinations near the downtown and waterfront to provide multiple components and uses catering to different audiences. (p. 38)	Current Hazard Zone	Yes	Yes	Yes	-1	-1					-1	-1	**-4**
	Future Hazard Zone				-1	-1					-1	-1	**-4**
Seek out opportunities to enhance downtown as a center of arts and cultural resources. Promote efforts to enhance the visibility and use of the historic Turnage Theater. (p44)	Current Hazard Zone	Yes	Yes	Yes	-1								**-1**
	Future Hazard Zone				-1								**-1**
Policy Category Total	Current Hazard Zone				**-1**	**2**	**0**	**0**	**1**	**3**	**0**	**0**	**5**
	Future Hazard Zone				**-1**	**2**	**1**	**0**	**1**	**3**	**0**	**0**	**6**

Figure 2. Portion of sample scorecard for Washington, North Carolina. PIRS Guidebook.

	Core Land Use (CAMA)		2023 Comprehensive		Hazard Mitigation		Parks & Recreation		*All Four Plans (Combined)*	
District (total score for all policies in district)	Current Hazard Zone	Future Hazard Zone	Current Hazard Zone	Future Hazard Zone	Current Hazard Zone	Future Hazard Zone	Current Hazard Zone	Future Hazard Zone	Current Hazard Zone	Future Hazard Zone
District 1 *(Downtown)*	-2	-6	-5	-5	10	2	0	0	**3**	**-9**
District 2	6	2	0	0	9	2	1	1	**16**	**5**
District 3	0	-2	-1	0	1	2	1	1	**1**	**1**
District 4	0	-1	0	0	3	2	1	1	**4**	**2**
District 5	0	-4	0	0	6	2	1	1	**7**	**-1**
District 6	6	0	2	2	11	2	0	0	**19**	**4**
District 7	5	-1	-2	-2	12	2	1	1	**16**	**0**
District 8	4	-2	-1	-1	10	0	1	1	**14**	**-2**
TOTAL	**19**	**-14**	**-7**	**-6**	**62**	**14**	**6**	**6**	**80**	**0**

Figure 3. Sum of policy scores for districts, hazard zones, and plans from the Washington, North Carolina, scorecard. PIRS Guidebook.

Similarly, the team creates policy score maps to visualize the total scores of individual plans, allowing teams to compare the effects of each plan for each District-Hazard Zone in a community and quickly identify conflicts between plans (Figure 4).

The team can create a single map to display composite scores from all plans; this allows them to see how much policy attention each District-Hazard Zone receives from the community's network of plans.

The team uses tables and maps to analyze the cumulative

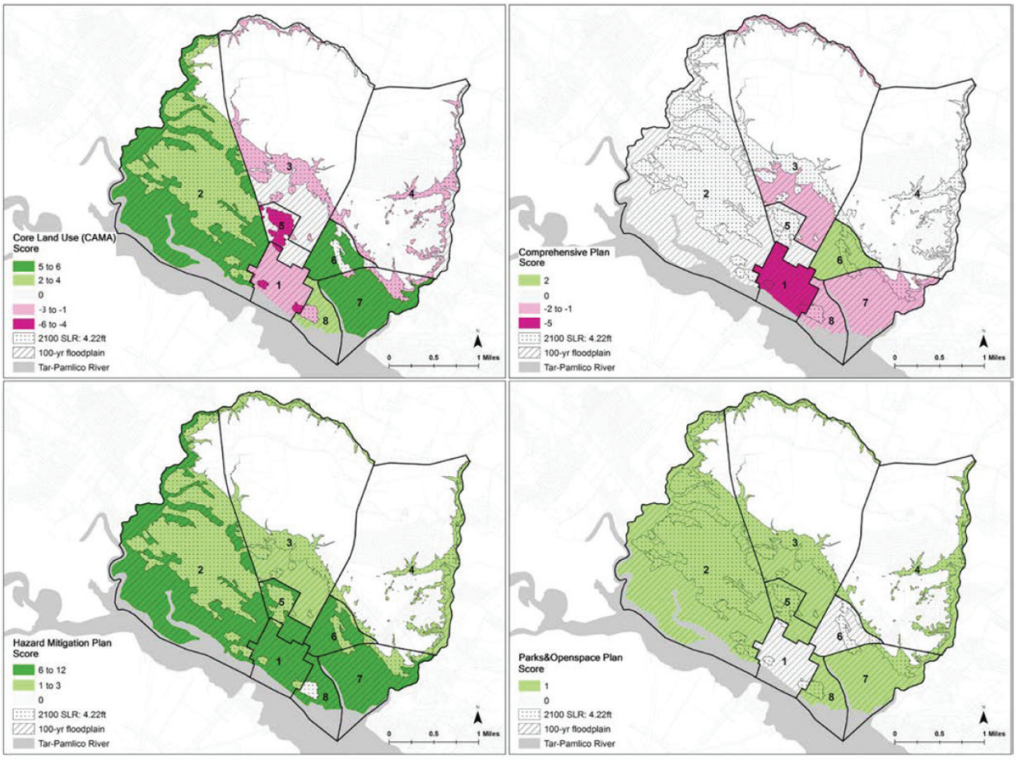

Figure 4. Four policy score maps from Washington, North Carolina, allow for quick comparisons among different planning documents; higher scores indicate more policies aimed at decreasing vulnerability. PIRS Guidebook.

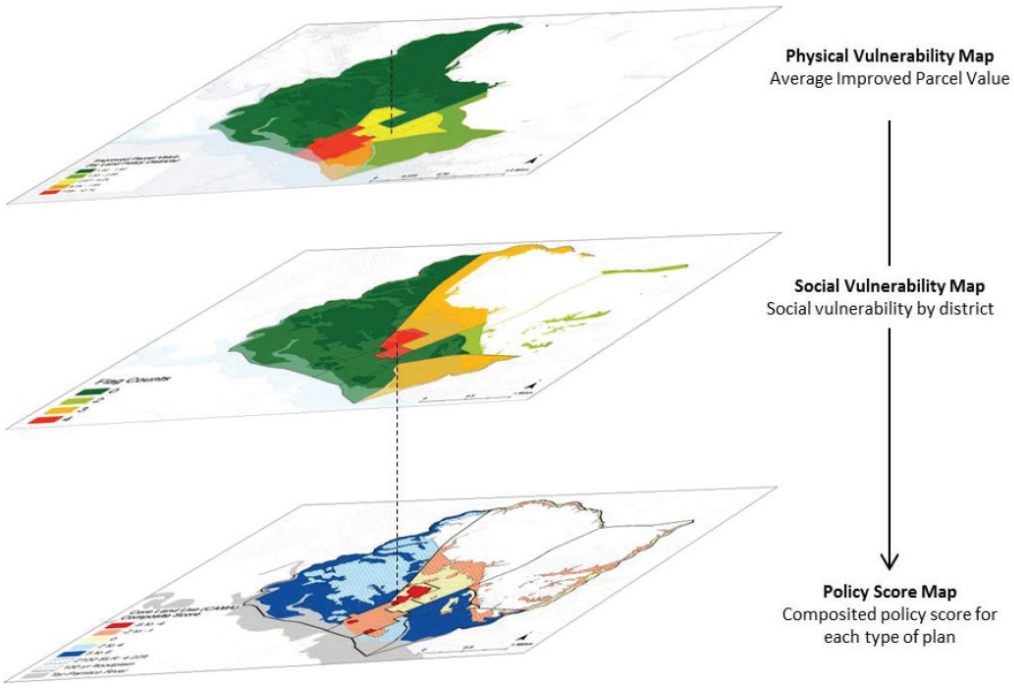

Figure 5. Overlaying social and physical vulnerability can allow local staff to see if plans equitably support resilience across neighborhoods or instead exacerbate vulnerability. PIRS Guidebook.

effect of individual policies in each District-Hazard Zone. It is important to note that the tables and maps will not allow the team to differentiate between areas with total lack of policy attention (i.e., many neutral scores) and areas with high amounts of conflicts (i.e., equal number of positive and negative scores). These insights are available through reviewing the scorecard created in the first step of the process.

The team can use the analysis conducted in this second step to guide prioritization of future policy attention, as well as exposing disparities in the number of plan policies addressing different district hazard zones.

In addition to policy score maps, PIRS may also include an assessment of physical and social vulnerability in each District-Hazard Zone. Social and physical vulnerability assessments allow the team to explore local context and explain why disparities in policy attention exist.

If teams elect to complete these assessments, then they can use these physical and social vulnerability maps as an overlay for the policy maps to visualize the intersections of high vulnerability and negative or low policy attention (Figure 5). This step can be crucial in communities, neighborhoods, and geographies that have suffered from institutionalized racism, neglect, and environmental injustice.

The PIRS Guidebook explains several techniques and processes for assessing physical and social vulnerability. It also provides a list of relevant social vulnerability tools and data sources that can help in this analysis.

When measuring resilience, it is important to account for the natural terrain and built environment (buildings, structures, and infrastructure) in a community; generally, local staff analyzes these factors to evaluate physical vulnerability. One example of high *physical vulnerability* is a neighborhood with flood-susceptible housing stock located in the 100-year floodplain.

Social vulnerability is a characteristic of community members who are prevented from accessing resources or opportunities to prepare for, withstand, and recover from a natural hazard event. An individual would be considered socially vulnerable if they do not have communication networks that can warn them about impending disasters and advise them on how to prepare; the material conditions to prepare for and withstand the event; or the financial security and local support system necessary to recover (both psychologically and materially) after the event. Historically disadvantaged specific populations, such as racial and ethnic groups, have a higher likelihood of being socially vulnerable.

While many communities have developed forms of resilience independently despite these barriers, it is still necessary for local organizations and agencies to ensure policies uplift and complement their resiliency instead of exacerbating vulnerability at the neighborhood level.

Advancing Plan Integration and Resilience

The third and final step in the PIRS process requires updating plans with improved policies to resolve conflicts and presenting results to local officials and stakeholders. Planners must also communicate results to residents and be transparent about past shortcomings.

Communities can use their scorecard and vulnerability analysis results to adjust, expand, add, or remove policies in conflict. This step begins with prioritization of policy "cool spots"—areas within the community that lack targeted policies—and vulnerability "hot spots," or areas within the community that have large populations of underserved residents or vulnerable

PIRS in Practice

To translate the PIRS method to practice, the PIRS team (Phil Berke, Jaimie Masterson, Matthew Malecha, and Siyu Yu) convened an advisory committee of experts in the fields of planning, emergency management, floodplain management, and community development. With the help of APA's Hazard Mitigation and Disaster Recovery Division, the team put out a solicitation to apply and test the tool with communities. Three cities responded, all of which had previously experienced losses to natural disasters or were actively pursuing long-term resilience and adaptation efforts.

Norfolk, Virginia

Norfolk is a coastal city on the Chesapeake Bay that is experiencing more frequent flooding because of sea level rise and storm surge flooding. Changes in ocean currents and land subsidence have exacerbated the impacts of sea level rise, resulting in high-tide flooding without rain events.

The city has adopted plans, including the climate adaptation plan *Norfolk Vision 2100*, that identify strategies to adapt to changing conditions. Norfolk piloted PIRS to improve community resilience and reduce vulnerability to coastal hazards.

After assembling a team, plan evaluators strategically selected plans to ensure that the analysis process was not overly time-consuming. Sixteen identified plans were narrowed down to six based on three criteria: intersection with hazard zones, relevance of the plan, and integration in the latest comprehensive plan. By applying these criteria, the evaluation team was able to focus on those plans with the greatest impact on community vulnerability to hazards: the city's comprehensive plan, the regional hazard mitigation plan, a shoreline plan, a resilience plan, and two small area plans. For communities dealing with large networks of plans and limited time, funding, or capacity to perform a full analysis of them, this approach is recommended.

The team used census tracts located in the hazards area to define the analysis site and to aggregate areas with similar environmental, social, and economic conditions. Findings highlighted gaps in hazard vulnerability, disproportionate impacts in underserved communities, and a need for more specific strategies to address climate resilience.

Since undertaking its plan integration review process, Norfolk has adopted policy amendments to address gaps, adopted a new zoning ordinance that accounts for differences in resilience, and secured external funding to reduce vulnerability to flooding in underserved communities. One outcome is the Norfolk Resiliency Park, which will restore water systems, increase community connectivity by providing amenities, and address spatial inequities and disproportionate impacts of flooding.

Future steps include incorporating information from the scorecard in the next comprehensive plan update and connecting previously separate efforts, including hazard mitigation planning and resiliency strategy development, within a more integrated process.

Nashua, New Hampshire

Nashua is a small New England city of about 90,000 residents. Its location at the confluence of the Merrimack and Nashua rivers makes it susceptible to riverine flooding. To address this recurrent risk, the city has begun championing community resilience.

A growing list of resilience initiatives galvanized local staff into investigating how to prioritize vulnerable neighborhoods, be proactive in mitigating natural hazards, and coordinate efforts between departments. For the city's PIRS effort, a core team of nine staff from various municipal agencies, led by the Office of Emergency Management, worked closely with the Resilient Nashua Initiative, a coalition representing local stakeholders.

A noteworthy aspect of the Nashua team's experience was their use of familiar tools alongside PIRS. This synergetic approach brought together PIRS methodology with three additional resources:

- The National Institute of Standards and Technology (NIST) Community Resilience Planning Guide aided Nashua in identifying critical facilities and essential services vital during and after natural hazard events.
- Federal Emergency Management Agency (FEMA) Hazus, a nationally applicable GIS-based software, allowed Nashua to access FEMA data and complete a local risk assessment.
- Resilience Dialogues, an assistance program of the American Society of Adaptation Professionals that facilitates online community discussions about climate change, helped Nashua integrate climate science, subject matter advice, and community voices into its conversations about resilience.

Nashua's experience highlights the importance of integrating effective tools, familiar resources, and the typical planning context into the PIRS process. Using a collaborative approach is crucial to ensuring planning is done efficiently and that tasks (such as team formation, goal setting, and data collection) are not duplicated. Leveraging natural redundancies in planning allows for collaborative completion of common steps when it is productive and relevant to do so. In addition, collaboration often means there is more capacity and resources available to undertake tasks in a holistic manner.

Rockport, Texas

In 2017, the city of Rockport, located on the Gulf Coast of Texas, experienced significant and widespread impacts from Hurricane Harvey. Nearly half of the total land area of the city was inundated by floodwaters; 90 percent of homes were damaged, and 30 percent were destroyed entirely. These numbers highlight Rockport's highly exposed geography and illustrate the significant future challenges posed by climate change, sea level rise, and more powerful and frequent storms.

During a complex and arduous post-storm recovery process, Rockport used PIRS to assess how well its plans were integrated. Given the city's limited financial and staff capacity, Rockport recognized the need for significant technical assistance to supplement the work of the PIRS team. The city

sought and received grant funding for a part-time expert from the Texas Sea Grant to oversee the time-consuming and complex process of evaluating the network of local plans. By identifying the need for planning assistance early in the process and seeking outside funding to make up for capacity issues, Rockport demonstrated a pragmatic approach to overcoming the staff and funding constraints that might have otherwise been a barrier to plan integration efforts.

Additionally, the city was in the midst of a new comprehensive planning process and saw an opportunity for better alignment with existing plans, including Aransas County's recently adopted long-term recovery plan. The results from PIRS allowed for easy policy adjustments within the new comprehensive plan. To better articulate and visualize plan integration, the comprehensive plan added two significant features: call-out boxes throughout the text that highlight how the recommendations coordinate and align with other plans, and a "plan integration" column in the implementation table that makes clear how policies are related to other community initiatives.

infrastructure. If the areas with the least capability of withstanding a disaster are the most likely to experience disaster impacts, this indicates policy-vulnerability mismatch. These are the areas where planners and officials should begin resolving conflicts and targeting future resiliency policies. The PIRS Guidebook explores approaches to address policy conflicts and offers examples of policy adjustments.

A PIRS analysis and the resulting policy maps and tables give local staff a way to help decision makers visualize the effects of future actions—or the consequences of not acting. The sidebar on pp. 6–7 offers examples of how three communities used the PIRS process: Norfolk, Virginia; Nashua, New Hampshire; and Rockport, Texas.

PIRS in the Planning Framework

Aligning and integrating plans should go well beyond the plan-making process itself. The PIRS method can be useful in development review, code revision, visioning, and goal setting, along with the traditional stages of creating plans. *PAS QuickNotes 31*, "The Five Strategic Points of Intervention" (Klein 2013), offers a framework for understanding the role of planners at the local level and is also helpful in assessing the ways in which PIRS can be deployed in all aspects of a planner's work.

Long-range community visioning and goal setting. Aligning these activities across related departments can prevent high-level plan conflicts, especially at the outset of a planning process. The lines of communication between departments and agencies developed through the PIRS process can support this effort. Plans, goals, and policies that are already well aligned can provide a strong foundation for the visioning and goal-setting stages. Similarly, conflicts between plans that have been identified through the PIRS method can, in an effort to resolve these conflicts, serve to kick off early long-range visioning.

Plan making. This process is central to the work of planners and planning departments. Here, the utility of plan integration generally, and PIRS specifically, is clear. Plans that are consistent with other plans and whose policies are complementary rather than contradictory will lead to better long-term outcomes. The policy and vulnerability maps developed through the PIRS method can serve as a visual record of not only existing climate and hazard vulnerabilities, but also the existing slate of policies that play a role in on-the-ground conditions at the neighborhood level. This can greatly assist in defining and establishing existing conditions early on in the planning process and serve as a strong foundation for future recommendations and actions. Through the PIRS method, local staff can identify points of conflict within the plan-making process itself and through necessary plan updates. These conflicts can be resolved before the completion of a plan or plan update, allowing for policies and other implementation mechanisms to emerge from an integrated, aligned, and consistent body of work.

Standards, policies, and incentives. These can be among the most concrete actions emerging from a planning process and are crucial to long-term plan implementation. Ensuring that the policies and actions recommended or established by the plan are complementary across the local landscape of regulations and incentives is especially important within the climate, hazards, and resilience context. Standards and guidelines that conflict with future realities of sea level rise or precipitation projections pose a danger to the community. The PIRS method can be helpful in examining existing and proposed policies, standards, and incentives, and can identify a path forward for resolving conflicts and contradictions that may lead to significant future vulnerabilities.

Development work and public investments. The remaining two strategic points of intervention pertain to direct actions that may or may not flow directly out of a planning process, but concern real interventions on the ground. In the context of development work, this casts planners in the starring role of reviewing development applications for consistency with local subdivision, zoning, and other development regulations. Planners may play a supporting role regarding public investments, perhaps as part of a team developing the local capital improvements plan. In both of these capacities, the PIRS method can help to identify conflicts within and between zoning regulations, subdivision codes, and infrastructure or public facilities plans. Additionally, the process of spatial analysis can be helpful in determining especially vulnerable neighborhoods or highlighting planning districts in need of significant public investments.

Action Steps for Planners

Getting started with plan integration generally, and the PIRS method specifically, can seem daunting. The following actions, adapted from broader plan integration guidance, outline poten-

tial roles for planners in starting local plan integration efforts and meaningfully contributing to the process (Randolph 2012).

Start small with a single project. Local planners may not have the authority to kick off a new initiative without significant staff, funding, or elected official buy-in. However, planners can take advantage of opportunities in their daily work to consider how local plans and codes are or are not in alignment. For example, is there a recent development application that is consistent with the local zoning, but in conflict with a climate adaptation plan? What other staff should get involved to resolve this specific issue? Is there any potential for using this as a jumping-off point for a broader discussion on aligning local plans with regulations? These are some of the questions planners can begin asking themselves and their colleagues as a way to begin broader plan integration work.

Capitalize on upcoming triggers, like the drafting of a new plan, plan update, or code revision. A new or ongoing process to develop a new plan or revise the zoning code is an excellent opportunity to attempt to introduce elements of the PIRS method to other involved staff. A comprehensive plan update or zoning code revision would presumably involve staff from many local departments, may include climate and hazards considerations, and would have to account for the existing planning and regulatory context. Consider how the PIRS method of assembling a team, defining the network of plans, and determining local geographies can be useful within the existing planning and plan-making process.

Facilitate internal and external collaborative processes, with a focus on bringing underrepresented groups to the table. Planners can encourage interdepartmental and interagency collaboration, as well as community member and stakeholder engagement, by identifying common goals and opportunities for improvement. The PIRS method can provide a structured environment for this collaboration and give stakeholders a tangible problem to solve.

Draft and apply policies and regulations that encourage plan integration and climate resilience. Planners should follow any adopted policies based on plan integration in order to create and maintain an integrated network of plans. Once updated plans are in place, planners can review proposed projects to ensure they are in accordance with the newly integrated plans. If climate resilience regulations exist, ensure that new planning projects are in compliance. By providing a method for integrating and aligning plans for local resilience, PIRS can function as a regular blueprint for maintaining a well-integrated, aligned, and consistent set of plans, policies, and regulations.

Advocate for plan integration and climate resilience. Encourage colleagues and partner departments to consider how their roles and responsibilities relate to hazard mitigation. Share benefits of plan integration with elected officials, local partners, and stakeholders to elevate plan integration and consider impacts on community.

Conclusion

Planners should play a central role in ensuring that local plans work in concert to build community resilience. Confronting these challenges requires plans to be meaningfully integrated and thoughtfully aligned. The Plan Integration for Resilience Scorecard (PIRS) provides a framework for this important work (Figure 6). PIRS offers planners and the communities they serve a roadmap for interdepartmental collaboration, plan assessment, and spatial analysis to build stronger plans capable of meeting resilience goals.

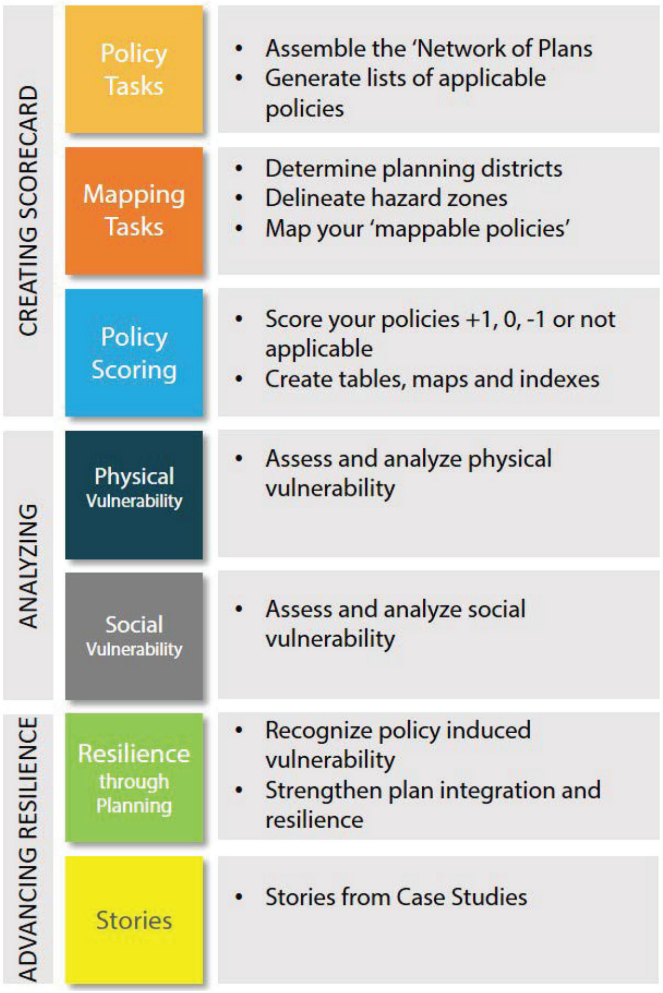

Figure 6. The PIRS framework: a tool to help planners integrate and align local plans for more resilient communities. PIRS Guidebook.

Planners are often asked to wear many hats. They are conveners, facilitators, analysts, and topic experts. They are called to work across interdepartmental boundaries and break down bureaucratic silos. They are also asked to help craft clear-eyed and achievable visions for the future. PIRS is one tool that can help to make this vital work possible.

About the Authors

Joseph DeAngelis, AICP, is a planner and research manager at the American Planning Association, where he focuses on climate adaptation, natural hazard risk, and community resilience. He holds a Master of Urban Planning degree from CUNY-Hunter College, where he researched post-Hurricane Sandy recovery and long-term community adaptation. He has worked for

the New York City Mayor's Office, the National Park Service, and as a resiliency planner with the New York City Department of City Planning. He is also the coeditor of *Zoning Practice*, a monthly APA publication focused on best practices and emerg-ing trends in local land-use and development regulation.

Johamary Peña is a research associate at the American Planning Association. She provides research support on projects related to environmental health, climate education, social equity, and community engagement. She contributes to organizational initiatives that focus on interdisciplinary collaboration, planner response to emerging issues, and member interest groups.

Alexsandra Gomez is a research associate at the American Planning Association. She supports sponsored and strategic research projects, contributes to Research KnowledgeBase collections, and writes for APA publications. She has a background in cultural geography and anthropology and applies these disciplines to planning research and practice. Her research interests include urban political ecology, geographies of power, and equitable community-led development.

Jaimie Hicks Masterson, AICP, is associate director of Texas Target Communities at Texas A&M University, a high-impact service-learning and engaged research program that works alongside low-capacity communities to plan for resilience. She is an author of *Planning for Community Resilience: A Handbook for Reducing Vulnerabilities to Disasters and Engaged Research for Community Resilience to Climate Change*.

Philip R. Berke is a research professor in the department of city and regional planning and director of the Center for Resilient Communities and Environment of the Institute for the Environment at University of North Carolina–Chapel Hill. He currently serves on the Resilient America Program of the National Academy of Science, Engineering and Medicine, and the National Science Foundation's Social Science Extreme Events Reconnaissance Platform.

This material is based upon work supported by the U.S. Department of Homeland Security under Federal Grant Award # 15STCRC000 01-05-00, Subaward # 5116103, and is free to all thanks to this financial support. The views and conclusions contained in this document are those of the authors and should not be interpreted as necessarily representing the official policies, either expressed or implied, of the U.S. Department of Homeland Security.

References and Resources

American Society of Adaptation Professionals and U.S. Global Change Research Program. n.d. "Resilience Dialogues."

Berke, Philip, Jaimie Masterson, Matthew Malecha, and Siyu Yu. Forthcoming. "Evaluation of Networks of Plans to Hazards and Climate Change: Application of Plan Integration for Resilience Scorecard in Nashua, NH."

———. Forthcoming. "Evaluation of Networks of Plans to Hazards and Climate Change: Application of Plan Integration for Resilience Scorecard in Norfolk, VA."

Berke, Philip, Galen Newman, Jaekyung Lee, Tabitha Combs, Carl Kolosna, and David Salvesen. 2015. "Evaluation of Networks of Plans and Vulnerability to Hazards and Climate Change: A Resilience Scorecard." *Journal of the American Planning Association* 81(4): 287–302.

Federal Emergency Management Agency (FEMA). n.d. "Hazus."

Gomez, Alexsandra. 2020. "Do Planners Know Plan Integration Can Improve Local Resilience?" *APA Blog*, December 18.

Klein, William. 2013. "The Five Strategic Points of Intervention." *PAS QuickNotes 31*.

Malecha, Matthew, Jaimie Masterson, Jeewasmi Thapa, Malini Roy, and Philip Berke. 2019. *Plan Integration for Resilience Scorecard Guidebook, Version 2.0*.

Masterson, Jaimie, Philip Berke, Matthew Malecha, Siyu Yu, Jaekyung Lee, and Jeewasmi Thapa. 2017. *Plan Integration for Resilience Scorecard Guidebook*.

Norfolk (City of), Virginia. 2018. "Ohio Creek Watershed Project: Norfolk Resilience Park."

Randolph, John. 2012. *Environmental Land Use Planning and Management, 2nd ed.* Washington, D.C.: Island Press.

U.S. Department of Commerce, National Institute of Standards and Technology. 2015. *Community Resilience Planning Guide for Buildings and Infrastructure Systems*.

PAS Memo is a bimonthly online publication of APA's Planning Advisory Service. Joel Albizo, FASAE, CAE, Chief Executive Officer; Petra Hurtado, PHD, Research Director; Ann F. Dillemuth, AICP, PAS Editor. Learn more at planning.org/pas.