



EMERGENCY MANAGEMENT USE CASE

Research Title:	The Plan Integration for Resilience Scorecard (PIRS)TM
Author(s):	Siyu Yu, Matthew Malecha, Jaimie Masterson
Description:	<p>Even in small communities, and particularly in large communities, there are a variety of local departments and agencies. Within those departments and agencies there are competing interests and priorities along with changes in elected officials and turnover of staff. Sometimes despite our best intentions, we find ourselves specializing in a particular area, so much so that we rarely interact with others in the complex web of city departments and agencies. Whether due to lack of resources or lack of time, communities can easily find themselves ‘siloeed’. For instance, a planning department may not consider hazards during development review or the emergency management office may not influence planning and development management. For a community to holistically think about resilience, hazards must be considered in every part of community visioning, planning, and development. This horizontal misalignment (across community-level departments) of planning initiatives pulls priorities and investments in different directions.</p> <p>Yet, in planning for hazards, all departments and their associated plans and projects should consider the long-term impacts of development. Some plans—such as land use plans, comprehensive plans, or general plans—point to policies and strategies based on administrative boundaries or cultural districts (e.g. Central Business District, downtown, or ‘the waterfront’). Other plans—such as hazard mitigation plans—develop policies and strategies based on hazard geographies (e.g. 100-year floodplain, 500-year floodplain, or other flood-prone areas).</p> <p>Our research across numerous communities shows that this siloeed effort of development and hazard planning leads to conflict that increases hazard risk and reduces community resilience. For example, a community’s EM may outline an area as a high risk for flooding while the economic development plan prioritizes that same area for business investment.</p> <p>To address this conflict, we developed the Plan Integration for Resilience Scorecard (PIRS)TM process, which uses a spatial evaluation method to determine how and where different plans in a community increase or reduce hazard risk. The PIRS is a validated method and tool that helps communities:</p> <ol style="list-style-type: none">4. Identify incongruities within their network of plans.5. Integrate and improve local plans in ways that reduce losses from hazard events.6. Provide a guidance framework when developing new plans or updating existing plans, so as to reduce future hazard exposure through smarter and more consistent policies. <p>We have the PIRS tool, a guidebook, and a training method that were developed from this research that local communities can access. We also are open to train-the-trainer programming.</p>
When Applied:	The Plan Integration for Resilience Scorecard is aligned with FEMA’s 2013 Local Mitigation Planning Handbook and is the next generation of FEMA’s 2015 Plan Integration: Linking Local Planning Efforts. The



	<p>PIRS is not meant to be used in isolation, but as a tool to better reveal plan alignment and conflict and to help prioritize wise decision-making and investments. The PIRS can and should be integrated into initiatives, funding opportunities, and other planning efforts your community may already be pursuing—ideally before a disaster occurs, but it can be used during post-disaster recovery planning.</p> <p>The PIRS would work well during CDBG-MIT and CDBG-DR programming, as well as FEMA Hazard Mitigation Planning grants.</p>
Who Applies:	<p>Local: EM, planning department, city/county manager, resilience office</p> <p>Regional: Council of Governments, FEMA Region 2</p>
Disaster Type:	<p>The PIRS has been tested in coastal locations prone to Flooding, Storm Surge, and Hurricanes.</p> <p>We are currently adapting it for Extreme Heat and Wildfires.</p>
Infrastructure Affected:	No
Industry Affected:	No
Where Applied:	Local jurisdictions that have authority for plan-making, e.g., municipalities and counties are most appropriate.
Agency Affected:	No
VOAD Affected:	No
Who/What Affected:	Benefits of successful implementation of the PIRS is reduced risk and improved policy alignment for areas that are at highest risk of hazards and areas where populations most in need are located (e.g., persons with access and functional needs, those without transportation, low-income, elderly, etc.)
How Affected:	When emergency managers and land use planners work alongside one another to develop mitigation plans, plans are more likely to include land use policies and other preventative approaches. Within the current guidance, FEMA recommends certain planning approaches and intergovernmental coordination to develop local hazard mitigation plans. A strong interdisciplinary connection between local planners and staff with place-based knowledge can increase the incorporation of land use policies into plans. In essence, communities that plan together are better equipped to handle a disaster when it strikes and are considered more resilient.
Timing of Application:	Ideally pre-disaster during mitigation planning. But it can also be (and has been) applied during disaster recovery.
Critical Points:	<p>The steps for implementing the PIRS are detailed in the PIRS Guidebook (2019) – see Additional Information. They include generally:</p> <ul style="list-style-type: none"> - Gather background information on the community, including all plan documents and existing population and disaster-related data. - Form a leadership team that represents different government departments to focus on policies, mapping, and engagement. - The mapping team members overlay all aspects of the community via a GIS mapping program. - The policy team members score all policies in existing plans as either increasing for reducing hazard exposure using the PIRS tool. - The leadership team develops maps of physical hazard risk and social vulnerability and reviews policies based on their location to determine “hot spots” of increased or reduced disaster need.



	<ul style="list-style-type: none"> - Prepare communication stories to present information to other stakeholders. - Finally, update and amend existing plans to address problems highlighted by the PIRS evaluation.
What Benefit:	Communities we have worked with have used the results to update their existing or draft plans to better incorporate resilience and target areas of greatest need. Some have also used the results and perspective provided by the PIRS to update their ordinances and permitting processes. Finally, communities have leveraged the data and resulting plans to obtain additional funding to implement hazard mitigation or development activities (e.g. buy-outs, creation of parks that mitigate flooding).
Where Used:	<p>The PIRS has been used in:</p> <p>Nashua, NH Boston, MA Asbury Park, NJ Washington, NC Norfolk, VA Tampa, FL Pinellas County, FL Fort Lauderdale, FL Seattle, WA Rockport, TX Houston, TX League City, TX Bryan/College Station, TX Caldwell, TX Rio Grande City, TX Port of Corpus Christi, TX Rotterdam, Netherlands Nijmegen, Netherlands Dordrecht, Netherlands Tokyo, Japan Changsha, China</p>
Additional Research:	No
Additional Information:	<p>The PIRS Guidebook Version 2.0 is available here: Plan Integration for Resilience Scorecard™ Guidebook: <i>Spatially evaluating networks of plans to reduce hazard vulnerability</i> – Version 2.0</p> <p>The American Planning Association, in partnership with our TAMU-based team, is offering training on the PIRS. Learn to Use the Plan Integration for Resilience Scorecard (planning.org)</p> <p>And here: Building Resilience Through Plan Integration (planning.org)</p>
Expert Contact:	<p>Siyu Yu, PhD, AICP Hazard Reduction & Recovery Center Department of Landscape Architecture and Urban Planning Texas A&M University syu@arch.tamu.edu</p> <p>Matthew Malecha, PhD Hazard Reduction & Recovery Center Department of Landscape Architecture and Urban Planning Texas A&M University mmalecha@arch.tamu.edu</p>



Original Research:	<p>We have published numerous papers on the PIRS.</p> <ul style="list-style-type: none">• Plan Integration for Resilience Scorecard™ Guidebook: <i>Spatially evaluating networks of plans to reduce hazard vulnerability</i> – Version 2.0• The Influence of Plan Integration on Community Vulnerability and Ecological Resilience to Natural Hazards (tamu.edu)• Full article: Plan integration for resilience scorecard: evaluating networks of plans in six US coastal cities (tandfonline.com)• Planning to Exacerbate Flooding: Evaluating a Houston, Texas, Network of Plans in Place during Hurricane Harvey Using a Plan Integration for Resilience Scorecard (nsf.gov)• Plan evaluation for flood-resilient communities: The plan integration for resilience scorecard - ScienceDirect• Using a resilience scorecard to improve local planning for vulnerability to hazards and climate change: An application in two cities - ScienceDirect• Examining factors influencing plan integration for community resilience in six US coastal cities using Hierarchical Linear Modeling - ScienceDirect• Is flood resilience planning improving? A longitudinal analysis of networks of plans in Boston and Fort Lauderdale - ScienceDirect• Full article: Making Room for the River (tandfonline.com)• Full article: Integrating a resilience scorecard and landscape performance tools into a Geodesign process (tandfonline.com)• Plans that Disrupt Development: Equity Policies and Social Vulnerability in Six Coastal Cities - Philip Berke, Siyu Yu, Matt Malecha, John Cooper, 2019 (sagepub.com)• Integrated infrastructure-plan analysis for resilience enhancement of post-hazards access to critical facilities - ScienceDirect• Spatially evaluating a network of plans and flood vulnerability using a Plan Integration for Resilience Scorecard: A case study in Feijenoord District, Rotterdam, the Netherlands - ScienceDirect
What Risks:	None
Partner Agencies/Jurisdictions:	<p>The leadership team that implements the PIRS should include local EM and planning staff most importantly, but also other stakeholders involved in local jurisdiction planning efforts.</p> <p>External partners to engage include regional partners like EM and COG.</p> <p>State and national American Planning Association partners also are skilled in supporting implementation of PIRS.</p> <p>The Hazard Reduction & Recovery Center at TAMU developed the tool and has led numerous communities through the PIRS process.</p>
New Question:	None
New Question:	None
New Question:	None

Research with a Technology Component Should Respond to the Following Questions

Research Requested:	N/A
Why Better:	N/A



Reliability:	N/A
Support Needed:	N/A
Citizen Impact:	N/A
Training Required:	N/A
Public Accountability:	N/A

Please Note: Questions or suggestions regarding the Use Case Template may be directed to Dr. MacGregor Stephenson at the Texas Division of Emergency Management at macgregor.stephenson@tdem.texas.gov.