ZONING **PRACTICE** OCTOBER **2009**

AMERICAN PLANNING ASSOCIATION

ISSUE NUMBER 10

PRACTICE SAFE GROWTH AUDITS

10

Safe Growth Audits

By David R. Godschalk, FAICP

As communities grow and develop, they may become more vulnerable to natural hazards.

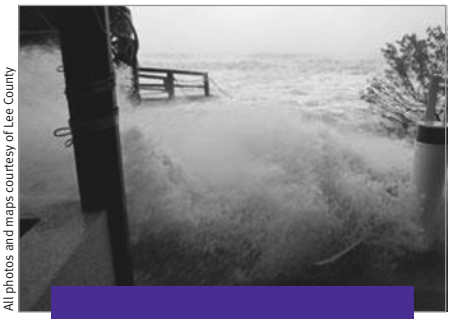
Expanding into more hazardous areas or redeveloping existing areas already subject to hazards can pose a threat to future community safety. This article proposes a technique—the *safe growth audit*—that can be used to evaluate the extent to which a jurisdiction is growing safely relative to the natural hazards it faces.

The purpose of the safe growth audit is to analyze the impacts of current policies, ordinances, and plans on community safety from hazard risks due to growth. It gives the community a comprehensive but concise evaluation of the positive and negative effects of its existing growth guidance framework on future hazard vulnerability. The audit report informs citizens and decision makers about important safety issues and highlights needed changes in policy and planning instruments.

Conducting a safe growth audit can help to prevent future growth conflicts. If the community and its elected officials understand how their zoning and subdivision ordinances allow growth in hazardous areas, they can revise these ordinances before property owners embark on risky projects. If they understand how their comprehensive plans fail to guide growth to safe locations, they can amend the plans. If they understand how their capital improvement programs encourage unsafe growth, they can change their utility provision policies.

WHAT IS SAFE GROWTH?

Safe growth is community-specific. Its definition depends upon the hazards and vulnerability of each jurisdiction. The community with half of its projected growth area located in a 100-year floodplain will have a different definition than the community whose vulnerability stems from the presence of an earthquake fault zone adjacent to its existing central business district.



All photos and maps courtesy of Lee County

Waves from the Gulf of Mexico batter the Diamond Head resort on Fort Myers Beach.

To define safe growth, consider its opposite—*unsafe growth*. Ask yourself if accommodating the expected 20-year population growth according to the existing future land-use plan is likely to put more people in harm's way. Will it result in more intense development in known hazard areas? Will current redevelopment policies increase the amount of property vulnerable to hazard risks? Will the implementation of the capital improvement program encourage unsafe development proposals by facilitating access to dangerous locations?

If the answer to these questions is yes, the jurisdiction could face an unsafe future. It needs to take a careful look at the impacts of growth plans and regulations and to consider revising them to take account of the safety of future growth—in short, it needs to conduct a safe growth audit.

SAFE GROWTH AND RESILIENCE

Safe growth is a significant factor in community *resilience*—the capacity to withstand shocks from hurricanes, floods, earthquakes, or other natural hazards without permanent harm. Built on safe growth principles, resilient communities are able to anticipate, weather, and recover from the impacts of natural hazards. Designed to be strong and flexible, they may bend, but they do not break. Their new development is guided away from high-hazard areas, and their vulnerable existing development is relocated to safe areas. Their buildings are constructed or retrofitted to meet hazard code standards. Their natural environment protective systems are maintained and conserved so as to be able to mitigate hazard damage. And their citizens, governments, and businesses are prepared with information about hazard vulnerability and disaster resources.

Resilience can sometimes be overlooked in the process of approving and building new development projects. Applying the safe growth audit principles ensures that the community is aware of the impacts of population and economic growth on its hazard vulnerability and is prepared to take action to address the related public safety issues. For example, would a proposed rezoning put more people at risk by allowing higher-density development in the 100-year floodplain? Or would a proposed bridge to a barrier island encourage growth in a high-hazard area? If so, is there an alternative plan or ordinance revision that would mitigate the risks?

Natural hazard resilience is encouraged through principles incorporated into three types of local growth guidance instruments:

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About the Author
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- comprehensive plans, especially their land use, transportation, environmental management, and public safety elements;
- zoning and subdivision ordinances and other development regulations, including building and housing codes; and
- capital improvement programs and infrastructure policies for extending water and sewer lines and building public facilities, such as roads and bridges.

Resilience may also be encouraged through economic development strategies, sector or neighborhood plans, and other initiatives with hazard-related land-use implications. Finally, resilience is a goal of the Local Hazard Mitigation Plans required of state and federal governments by the Federal Emergency Management Agency (FEMA) under the Disaster Mitigation Act of 2000 as a condition of eligibility for federal hazard mitigation grants.

PRINCIPLES OF SAFE GROWTH

Safe growth is not a complicated concept. Citizens and decision makers readily understand and value the protection of public safety. Safe growth basics can be summarized in a few simple principles.

Create a Safe Growth Vision

The touchstone of a safe growth strategy is a vision of how the community intends to grow in a safe manner—a picture of a future community safe from natural hazards. Creating such a vision depends upon an inclusive community dialogue about hazard exposure and vulnerability, coupled with frank discussion about the ways in which growth is likely to increase risks. The discussion should acknowledge that public intervention may be necessary to mitigate risk, and should ask how existing plans, policies, and programs might be changed to accomplish such mitigation. In order to broaden public participation in the discussion, it could be held in conjunction with other community visioning processes, such as those held during comprehensive or strategic plan revisions.

Guide growth away from high-risk locations. The starting point for a safe growth analysis is mapping existing hazard areas. These high-risk locations—fault zones, flood zones, hurricane-prone areas, erosion zones, wildfire zones—point out where development should be discouraged or allowed only with special protections from building codes or other regulations. Any public actions that ignore their impacts on development in such high-risk locations should be identified as contributors to unsafe growth. Similarly, any public actions aimed at redevelopment in such locations should be scrutinized for their potential to increase risk.

Locate critical facilities outside high-risk zones. Critical facilities should be protected from hazard risks. Continued operation of water and sewer systems, roads and bridges, hospitals and medical facilities, power plants, and public safety facilities is critical to safe growth. Such facilities should be designed and sited

This flow of water across Upper Captiva Island was not there prior to Hurricane Charley. The southern eye wall of the hurricane created a temporary watery passage that essentially cut through the island. Boats could easily pass through it for weeks after the hurricane.

BASIC SAFE GROWTH AUDIT QUESTIONS

COMPREHENSIVE PLAN

Land Use

- Does the future land-use map clearly identify natural hazard areas?
- Do the land-use policies discourage development or redevelopment within natural hazard areas?
- Does the plan provide adequate space for expected future growth in areas located outside natural hazard areas?

Transportation

- Does the transportation plan limit access to hazard areas?
- Is transportation policy used to guide growth to safe locations?
- Are movement systems designed to function under disaster conditions (e.g., evacuation)?

Environmental Management

- Are environmental systems that protect development from hazards identified and mapped?
- Do environmental policies maintain and restore protective ecosystems?
- Do environmental policies provide incentives to development that is located outside protective ecosystems?

Public Safety

- Are the goals and policies of the comprehensive plan related to those of the FEMA Local Hazard Mitigation Plan?
- Is safety explicitly included in the plan's growth and development policies?
- Does the monitoring and implementation section of the plan cover safe growth objectives?

ZONING ORDINANCE

- Does the zoning ordinance conform to the comprehensive plan in terms of discouraging development or redevelopment within natural hazard areas?
- Does the ordinance contain natural hazard overlay zones that set conditions for land use within such zones?
- Do rezoning procedures recognize natural hazard areas as limits on zoning changes that allow greater intensity or density of use?
- Does the ordinance prohibit development within, or filling of, wetlands, floodways, and floodplains?

SUBDIVISION REGULATIONS

- Do the subdivision regulations restrict the subdivision of land within or adjacent to natural hazard areas?
- Do the regulations provide for conservation subdivisions or cluster subdivisions in order to conserve environmental resources?
- Do the regulations allow density transfers where hazard areas exist?

CAPITAL IMPROVEMENT PROGRAM AND INFRASTRUCTURE POLICIES

- Does the capital improvement program limit expenditures on projects that would encourage development in areas vulnerable to natural hazards?
- Do infrastructure policies limit extension of existing facilities and services that would encourage development in areas vulnerable to natural hazards?
- Does the capital improvement program provide funding for hazard mitigation projects identified in the FEMA Mitigation Plan?

OTHER

- Do small area or corridor plans recognize the need to avoid or mitigate natural hazards?
- Does the building code contain provisions to strengthen or elevate construction to withstand hazard forces?
- Do economic development or redevelopment strategies include provisions for mitigating natural hazards?
- Is there an adopted evacuation and shelter plan to deal with emergencies from natural hazards?

to avoid or minimize hazard exposure. Some states, such as Florida, prohibit the siting of new critical facilities in high-hazard coastal zones. Critical facilities in high-hazard zones not only pose a danger to their own operation, but also can encourage other development in hazardous locations, such as subdivisions that rely on central sewage disposal plants or barrier island resorts that rely on new bridge connections.

Preserve protective ecosystems. Natural ecosystems are effective defenses against unsafe growth practices. Removing vegetation from steep slopes for new buildings decreases the soil's ability to resist erosion and damaging mud slides. Bulldozing mangroves for new beachfront projects decreases the ability of natural systems to absorb the impacts of floodwaters. Reclaiming riverine marshes for agriculture increases the impact of future floods on downstream cities. Natural ecosystems represent valuable green infrastructure that should be preserved and restored during safe growth.

Retrofit buildings and facilities at risk in redeveloping areas. Much future urban growth is likely to occur by redeveloping existing areas. In many cases, the buildings in such areas were built prior to adoption of new building codes with higher safety standards. Often these areas also are located within hazard zones, as in the case of small beachfront communities. For them to accommodate higher densities and intensities of future development, their existing structures and facilities should be strengthened or elevated during the redevelopment process.

Develop knowledgeable community leaders and networks. Safe growth depends upon the knowledge and actions of all community stakeholders, including nongovernmental institutions and social networks. Governments alone cannot ensure safe growth. Thus a safe growth audit needs to look at the connections among community stakeholder groups, how they share knowledge about hazards and disaster response, and how they make decisions relative to growth. The goal is to ensure that community networks are strong and knowledgeable, and that community leaders are prepared to make safe decisions concerning growth both before and after disasters.

Monitor and update safe growth programs and plans. Safe growth is a moving target. Like all programs and plans, safe growth activities need to be revisited on a regular ba-

sis to ensure that they are up-to-date and working as intended. Natural hazard and vulnerability conditions can change over time as new information becomes available from updated analyses and as the result of learning from new disasters. Growth conditions also change as new development trends emerge and new projections are made. Safe growth audits should be revised on a regular basis to ensure their continued validity.

CONDUCTING A SAFE GROWTH AUDIT

The process of conducting a safe growth audit is similar to that of preparing a comprehensive plan, in that it requires public participation to generate the overall safe growth vision and to gain consensus on the findings and recommendations. However, it differs in the amount of research and analysis required to identify the key contributors to safe growth and to determine their strengths and weaknesses.

To ensure adequate public involvement, it is useful to create a safe growth steering committee made up of representatives of affected interests. This committee can offer guidance throughout the process, including the step of creating a safe growth vision for the community. For that purpose, a community safe growth workshop could be held or safe growth visioning could be piggybacked onto a comprehensive plan or strategic plan visioning workshop. Information and reports could be posted on the local government website. The important thing is to ensure an ongoing community safe growth forum, including disseminating information, receiving feedback, and developing potential safe growth champions.

Research and analysis entail systematic review of public documents as well as interviews of knowledgeable informants. The key documents are the comprehensive plan, zoning and subdivision ordinances, and the capital improvement program, along with policy statements concerning infrastructure provision. Records and statistics describing development review approvals will also be useful to see how the plans, ordinances, and policy statements are actually being implemented. Interviews with zoning administrators, building inspectors, and utility officials also will shed light on implementation, as well as on the existence of unwritten policies and their impacts.

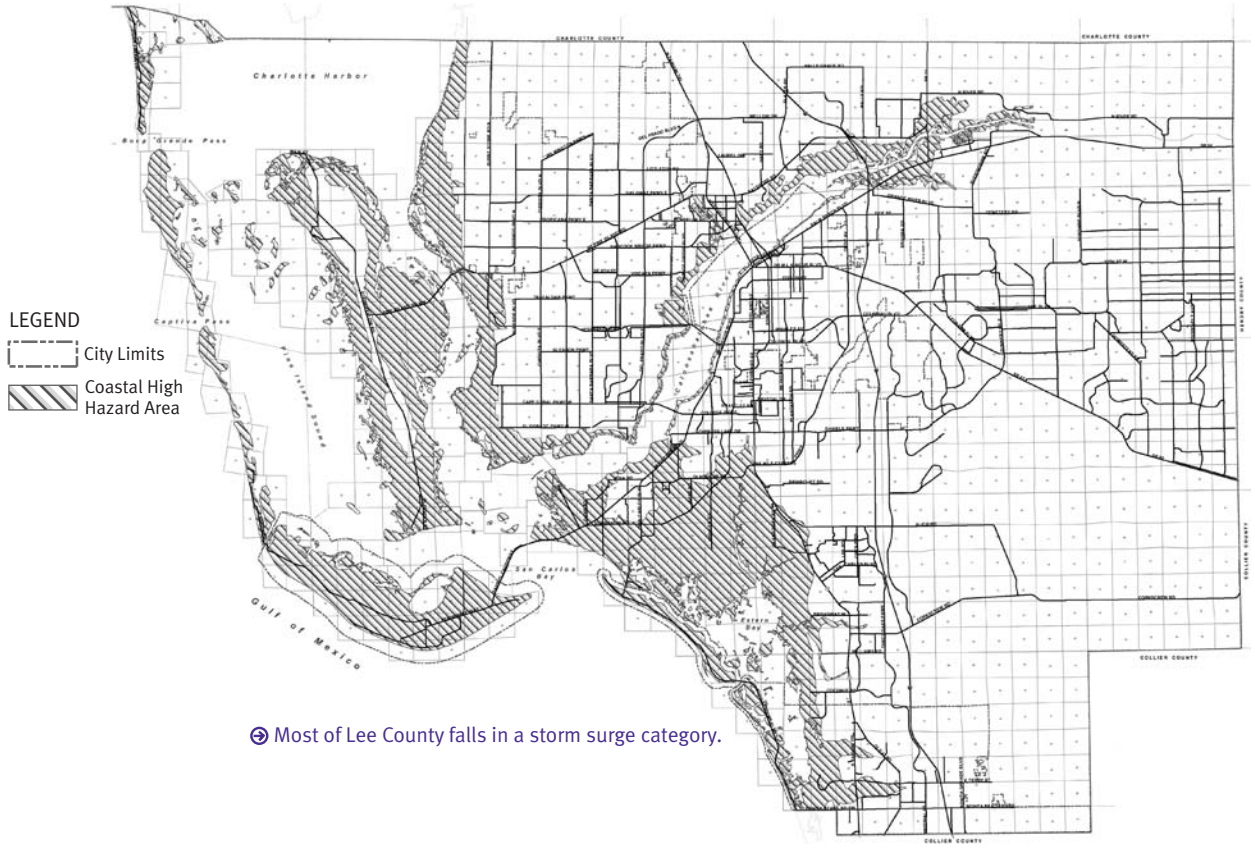
Questions asked during research and analysis seek to discover what is in the community growth policies package and how it affects public safety. Each community will have an individual package, depending on its growth and hazards situation. However, it is possible to spell out a basic set of safe growth audit questions that should apply in most jurisdictions (see sidebar).

ILLUSTRATIVE APPLICATION

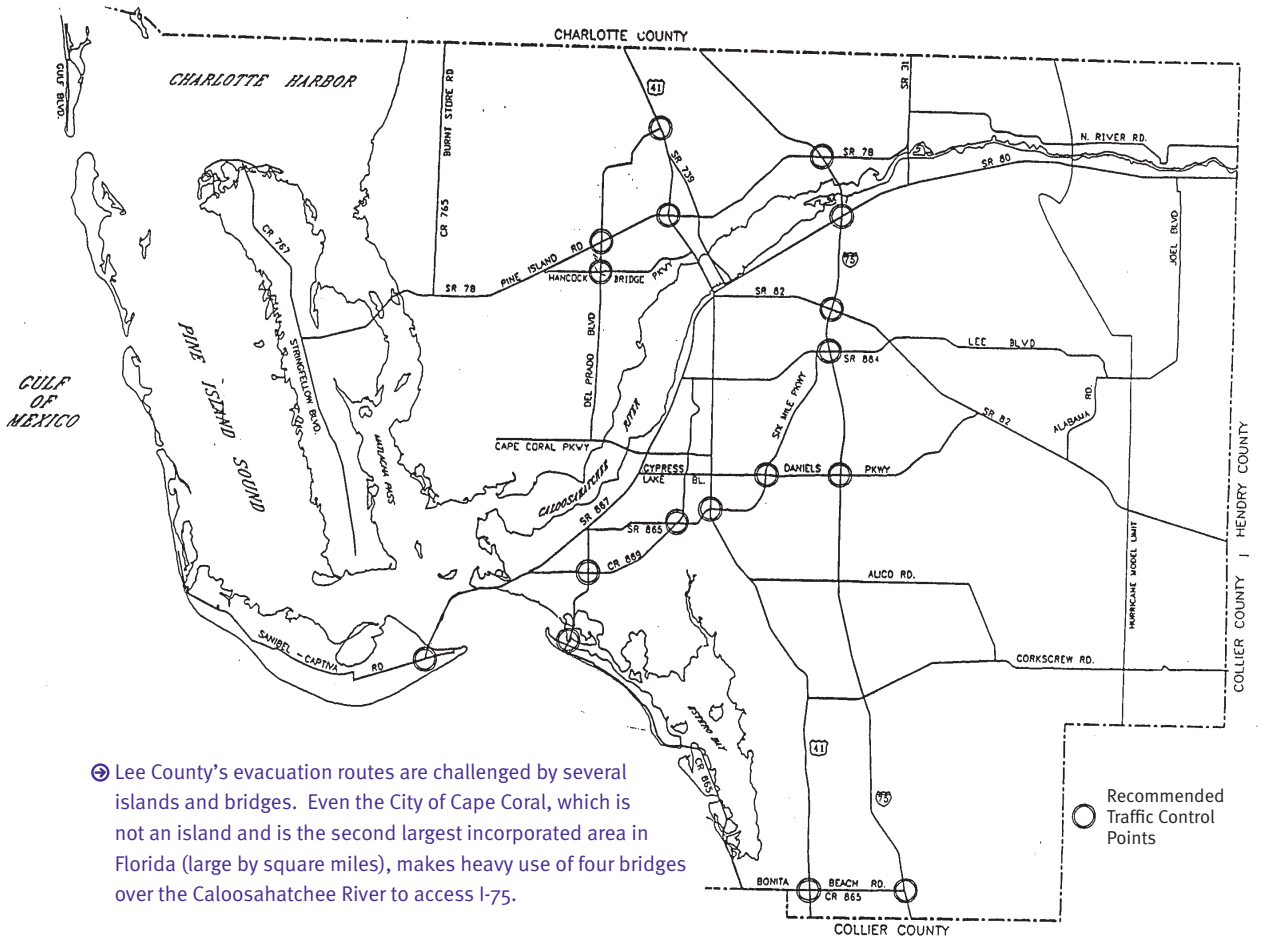
The safe growth audit is a *proposed* technique to improve safety from natural hazards during urban growth and development. There are no actual applications yet. However, it is possible to illustrate how such an audit might work by imagining it being applied in an existing situation where community growth faces significant hazards, such as a Florida coastal county.

A Florida Coastal County

Lee County is a Gulf Coast jurisdiction facing significant flooding and hurricane hazards. It has an extensive shoreline, and much of its land is low-lying and occupied by wetlands. Past development has fragmented aquatic systems, destroyed upland areas, and filled or drained freshwater, saltwater, and tidal wetlands. Freshwater and estuarine systems have been listed as "impaired" by the Florida Department of Environmental Protection. These natural systems are



Most of Lee County falls in a storm surge category.



Lee County's evacuation routes are challenged by several islands and bridges. Even the City of Cape Coral, which is not an island and is the second largest incorporated area in Florida (large by square miles), makes heavy use of four bridges over the Caloosahatchee River to access I-75.

the first line of defense against coastal flooding, storm surge, and drought.

The county had a 2007 population of 615,741, all of which is affected by hurricanes, tropical coastal storms, and tropical cyclone (wind) events. The Lee County vision projects a population increase to 979,000 permanent residents by 2030, with an additional 18 percent increase in seasonal residents. By that time, the urban area will be essentially built out, with the exception of one municipality and one large subdivision.

Lee County has consistently integrated its comprehensive plan (called the Lee Plan) and its hazard mitigation plan, the Unified Local Mitigation Strategy. Both contain the county's Future Land Use Map, and their goals and objectives are similar.

Examples of goals and objectives aimed at safe growth in the comprehensive plan include:

- To protect life and property in coastal high-hazard areas, new development on barrier islands will be limited to densities that meet required evacuation standards; new development requiring seawalls for protection from coastal erosion will not be permitted; and allowable densities for undeveloped areas in coastal high-hazard zones will be considered for reduction.
- To limit public expenditures in coastal high-hazard areas, expenditures in areas subject to destruction by hurricanes will be limited to necessary repairs, public safety needs, services to existing residents, recreation, and open space uses. New causeways to islands and bridges to undeveloped barrier islands are prohibited, except to achieve evacuation clearance time objectives.
- To mitigate hazards, all development regulations will be reviewed and revised to require reduction of vulnerability of future development in the FEMA A-Zone. Potential revisions include additional setbacks in critical erosion areas, conservation of dunes and vegetation, floodproofing of utilities, and structural wind resistance and floodplain management.

The Lee County Land Development Code governs development review and approval. It includes zoning districts and procedures. The code contains sections on hurricane preparedness, flood hazard reduction, environment and natural resources, and mangrove protection. It includes a wind-speed map showing areas subject to 110-, 120-, and 130-mile-per-hour winds. All development must be consistent with the Lee Plan's Future Land Use Map, which designates Non-Urban Areas (one- to 10-acre lots) and Environmentally Critical Areas (wetlands, 20-acre lots) that generally coincide with flood hazard areas.

According to the director of the Lee County Department of Community Development, implementation of county policies is carried out through zoning, building, and site plan review and permitting and development review. In the case of a development proposal that seeks to double the density on a coastal high-hazard area site but fails to meet the hazard mitigation intent of the plan, for example, a planning staff letter might state: "It is counter to the goal of protecting life and property from natural disasters and the objective of reduc-

ing allowable densities for undeveloped areas within coastal high-hazard areas."

This brief overview of documents and policies indicates that Lee County has made a solid start toward safe growth. Future growth proposals are carefully scrutinized to ensure conformity with extensive goals and policies. An in-depth audit would reveal the extent to which the Lee Plan and related government actions are effective over time in guiding development toward safe growth standards.

Conclusions and Recommendations

A safe growth audit can provide an important bridge between plans and actions. By highlighting the overall impacts of the complete set of community plans and policies, the audit can point out gaps and counterproductive relationships.

Preparing such an audit requires a substantial commitment. Before starting, jurisdictions should consider whether they have the necessary interest in critically evaluating their existing tools and if they have the necessary resources to complete the task. Smaller places may be able to do the work with their planning staffs; larger places may need to consider hiring a consultant with expertise.

It is important to realize that the audit is a means to an end. Achieving true safe growth requires that the audit findings be acted upon. This has implications for the audit process and for the tone of its recommendations. The process should be inclusive, using a steering committee to bring stakeholders and decision makers to the table. The recommendations should be positive and diplomatic, crediting existing contributions and suggesting changes in a fashion that does not create opposition. They should include both short- and long-range actions.

Linking public safety and growth empowers advocates of hazard mitigation and helps to create new champions for safe growth. Once a community grasps the growth/safety connections and how they play out in myriad ways, it can make great progress in promoting development that protects people and property at the same time as it bolsters the economic bottom line.

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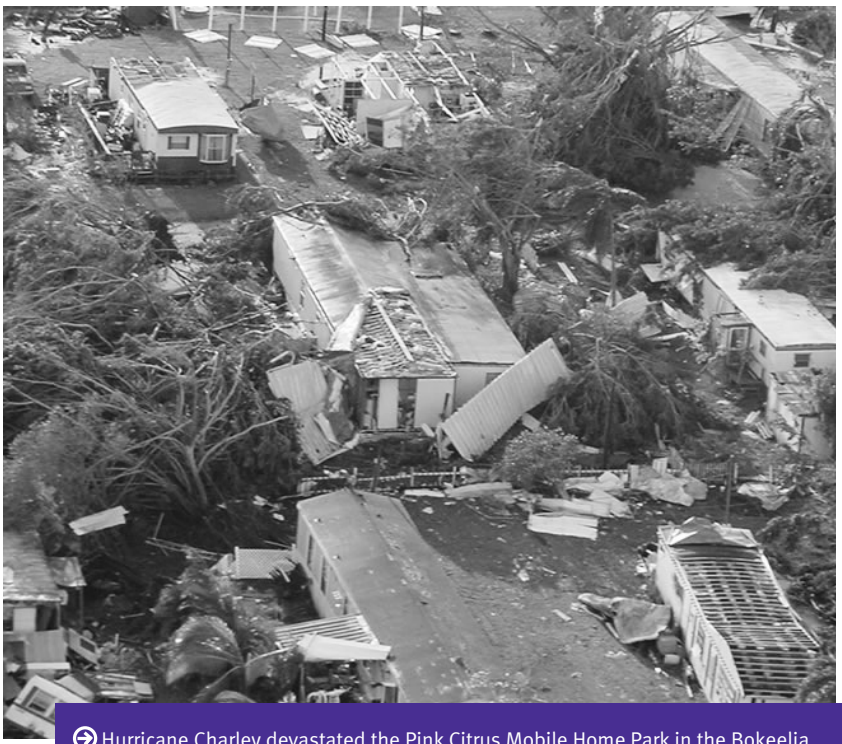

Hurricane Charley devastated the Pink Citrus Mobile Home Park in the Bokeelia area of Pine Island.

Cover photo: Hurricane route marker in Florida. © iStockphoto.com/Paul Giamou; design concept by Lisa Barton.

VOL. 26, NO. 10

Zoning Practice is a monthly publication of the American Planning Association. Subscriptions are available for $85 (U.S.) and $110 (foreign). W. Paul Farmer, FAICP, Executive Director; William R. Klein, AICP, Director of Research

Zoning Practice (ISSN 1548–0135) is produced at APA. Jim Schwab, AICP, and David Morley, AICP, Editors; Julie Von Bergen, Assistant Editor; Lisa Barton, Design and Production.

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DOES YOUR COMMUNITY HAVE A HAZARD MITIGATION PLAN?

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