

The Lone Star Coastal National Recreation Area

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In September 2008, Hurricane Ike blew onto the Texas coast, causing over \$25 billion in damage and killing over a hundred persons. Although Ike was “only” a Category 2 storm, its surge tide flowed inland, almost reaching to elevation 20 feet in Chambers and Jefferson Counties, and flooding substantial lands as far east as Grand Isle, Louisiana. A map of the areas flooded by Ike and the elevation reached by the surge tide can be seen in figure 1.

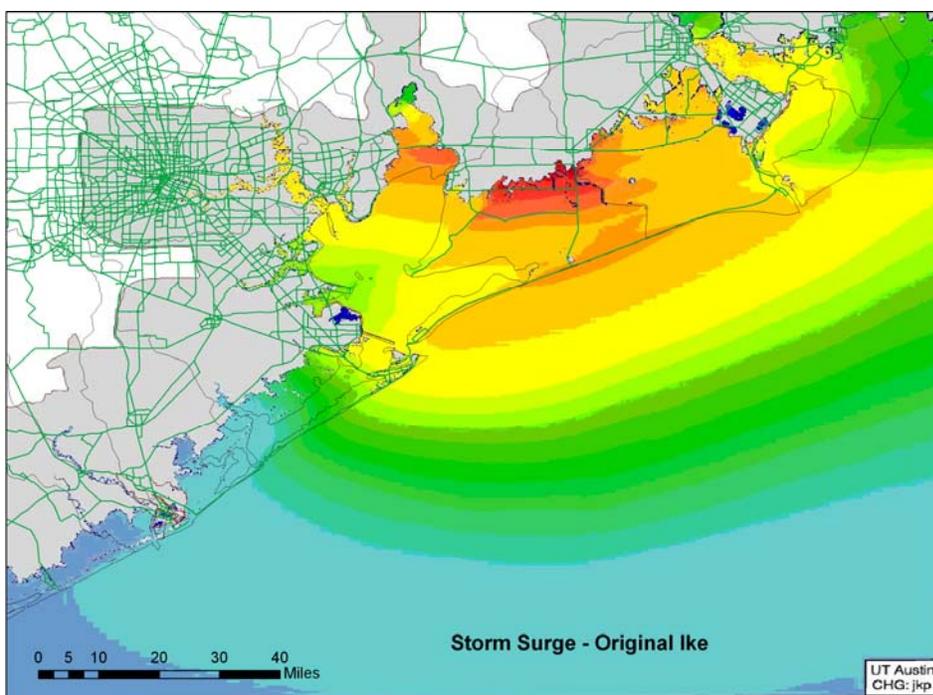


Figure 1. Storm Surge From Hurricane Ike. Red indicates surge reaching inshore to the 18-20 foot elevation range. Map prepared by Dr. Clint Dawson, University of Texas Austin.

Most of the Houston area was spared the brunt of Hurricane Ike because it made landfall across the southern tip of the Bolivar Peninsula. This landfall point meant that the “dirty side” of the storm pounded Chambers and Jefferson Counties to the east of landfall, with major damage to the Bolivar Peninsula as well as Galveston Island. But we in the greater Houston area were fortunate; if Ike had come ashore as originally predicted at San Luis Pass, it would have generated a surge approaching 20 feet in the Clear Lake and Houston Ship Channel areas of Galveston Bay. With such a landfall, the damage from Ike likely would have exceeded \$100 billion and could have killed thousands of people who did not

evacuate low lying areas on the western shoreline of Galveston Bay due to Ike being “only” a Category 2 storm.

After Ike, the Houston Endowment funded the Severe Storm Prediction, Education and Evacuation from Disaster (SSPEED) Center at Rice University to study “Lessons Learned From Hurricane Ike”. This research was undertaken under the direction of Dr. Phil Bedient and myself as co-directors of the SSPEED Center along with a blue ribbon group of researchers from Rice, the University of Houston, the University of Texas at Austin, Texas Southern University and Texas A&M University Galveston as well as from private companies such as SWA Architects, Walter P. Moore Engineers and Fugro, among others. To date, this research has been ongoing for four years and has yielded some interesting insights into our hurricane preparedness (or lack thereof) in the Houston-Galveston region.

The work undertaken by the SSPEED Center focused on understanding and predicting the impacts of major storms and upon proposing solutions to mitigate these impacts. Our work has been guided by key policy factors. First, the amount and extent of assistance that will be available from the Federal government is likely to be limited after the financial crisis of 2008 and subsequent calls for fiscal reform. Second, the newly proposed revisions to the Corps of Engineers *Principles and Standards*, which is co-authored by the President’s Council on Environmental Quality, emphasize non-structural flood mitigation alternatives and also emphasize the use and protection of ecological functions and services in flood mitigation design. In short, business as usual has been changed within the Federal flood abatement community.

In light of these precepts and our understanding of the potential for economic damage to the Houston economy, and therefore the region, and ecological damage to Galveston Bay, six areas have emerged from our research that are worthy of special attention for surge impact mitigation.

- (1) We have concluded the Houston Ship Channel needs to be protected from storm surge and that a gate structure could be constructed in the vicinity of the State Highway 146 Hartman Bridge that crosses the Houston Ship Channel near its outlet to Galveston Bay. We believe that this alternative could be funded by local bond funds at a cost in the vicinity of \$1 billion and would provide more than \$100 billion in economic benefits as well as saving the ecology of Galveston Bay from

hazardous materials and oil released by a surge from tanks in the refineries and chemical plants that line 20+ miles of the Houston Ship Channel.

- (2) We have determined that the Clear Lake area is extremely vulnerable, and that a structural alternative to protect this area is unlikely in the short term. Information is the key in this area that is extremely vulnerable to surge flooding. All new home buyers should be told about the vulnerability of their home to storm surges. We are working on a hurricane/flood warning, evacuation and re-entry system for this area. And we urge that a fund be set aside to be used in the event of serious surge flooding to buy out those who have lost everything.
- (3) We have determined that most of the flooding of the City of Galveston came from the “backside” of the island and that a levee system could be constructed that would connect the existing seawall around the city itself. This solution would leave the West End of Galveston Island unprotected. We have concluded that a structural solution to protect the West End is not feasible unless it provides much larger economic benefits than will be generated by protecting the West End development.
- (4) We believe that the existing levee systems of Texas City and Freeport have served us well in the past and should be upgraded and maintained. During Ike, storm waters reached the top of the Texas City levee. Both the Texas City and Freeport levees need to be increased in height and in some cases in the area protected.
- (5) We have proposed that a non-structural surge mitigation concept called the Lone Star Coastal National Recreation Area (LSCNRA) be developed for the low-lying, generally undeveloped areas of Chambers, Galveston, Brazoria and Matagorda Counties. The basic idea is to focus on development and enhancement of economic development that is flood resilient. The remainder of this paper is focused on the LSCNRA.
- (6) We have also proposed another non-structural, economically focused alternative called the Ecosystem Services Exchange. This alternative is distinct from the LSCNRA and involves creating a supplemental farm and ranch economy associated with restoring the ecosystem service value of natural coastal ecosystems and allowing for the buying and selling of these services. That alternative will be the subject of a subsequent paper.

Before discussing the LSCNRA, however, it is important to note that there is another surge mitigation concept that has been proposed to protect portions of Harris, Chambers, Galveston and Brazoria Counties, and it is called the “Ike Dike”. The Ike Dike is a levee system that would extend the length of Galveston Island and Bolivar Peninsula and would cross San Luis Pass and Bolivar Roads with a combination of levees and gate structures. This alternative would undoubtedly require federal funding as its cost would easily be well into the billions of dollars. However, the important point in the context of this presentation is the LSCNRA is compatible with the Ike Dike. These alternatives are not in competition. Given the structure of federal rules, something such as the LSCNRA would likely have to be developed in order for the Ike Dike to meet emerging Federal criteria which is linking structural and non-structural alternatives.

Genesis of the LSCNRA

The concept for the LSCNRA came from a review of the proposed *Principles and Standards* and from reading studies from New Orleans and Coastal Mississippi after Katrina. In this research, certain aspects caught our attention. In particular, Dr. Susan Rees of the Mobile District, the planner in charge of the Mississippi Coastal Improvements Program, stated at a conference at Rice University that in today’s regulatory climate, it was unlikely that a plan would be approved that was all structural. In other words, non-structural elements had to be designed from the inception. We at the SSPEED Center took that message to heart.

In order to identify non-structural elements, our project team scoured the various documents that had been developed post-Ike. Among these was the *Bolivar Blueprint*, a document prepared by a committee of citizen volunteers that was published by Galveston County with funding provided by the Federal Emergency Management Agency (FEMA). This document identified that one major goal was to develop an economy associated with the “backside” of the peninsula, including day-use recreation. The backside of Bolivar is low-lying, primarily marshland and low prairie adjacent to Gulf Intracoastal Waterway (GIWW). This expressed goal caught our attention and helped focus our thinking on various ideas.

At about the same time, the Green Think Tank Committee of a local non-governmental organization – Houston Wilderness – was evaluating the ecological

diversity of the Houston area and exploring how this diversity could be better used and integrated to the benefit of Houston citizens and businesses. Building upon the analysis of ecological diversity of the Houston region contained in the *Houston Atlas of Biodiversity* that had been commissioned by Houston Wilderness, Elizabeth Winston Jones and I wrote a document titled *A Strategy for Realizing the Economic Value of the Ecological Capital of the Greater Houston Region*. In this document, the concept of surge flood storage as an ecological service was introduced, along with other types of ecological services provided by natural systems of our region. This ecological service of surge flood storage certainly fits within the concept of non-structural flood control and within the expressed goals of the proposed *Principles and Standards*.

As the SSPEED Center work progressed, our project team first became focused upon the idea of some type of park designation for the Bolivar Peninsula. The ferry to Bolivar offers a unique amenity, and the bird-watching on the Peninsula is world famous, with venues such as Bolivar Flats and Smith Woods and Boy Scout Woods in High Island that are owned and operated by the Houston Audubon Society and open to the public. We undertook an extensive review of the concept of national seashores, but decided that given the acrimony in Texas over the *Severance* case involving open beaches and the fact that National Seashores involve extensive federal ownership, we decided not to focus upon the beach but instead focused upon the lower lying land areas. For all of these reasons, we began to explore the economic possibilities of *Spartina, Patens* and freshwater wetlands and adjacent prairies.

From the outset, we knew that birding and kayaking were potential interest areas. In addition to the birding opportunities of Bolivar, Brazoria County was home to both the Freeport and San Bernard Christmas Bird Counts that routinely rank among the top ten in the United States, and Matagorda County is home to the Mad Island count that routinely is number one in the United States. That is noteworthy – three of the top ten bird counts in the country were found in our study area, with the number one count often tallying upwards of 230 species in a single day. Additionally, the Columbia Bottomland forest of Brazoria and Matagorda County provides habitat that is used by over 24 million migrating neo-tropical songbirds in the spring. In fact, so many songbirds migrate through this area that one can follow them on radar.

One of the reasons for the large bird count numbers is the biological diversity within the upper and middle Texas coast. For example, there is a mixture of barrier islands, fresh, brackish and saltwater wetlands, double canopy floodplain forests, flooded swamps and adjacent prairie as well as the estuaries with their oyster reefs, submerged seagrass flats and salt flats and the open Gulf. And from a kayaking standpoint, the shallow water marshes and tidal streams and rivers provide some of the most interesting kayaking available on the Texas coast, not to mention hunting and fishing. In short, this section of the Texas coast contains an excellent cross-section of biological diversity and outdoor recreation opportunities.

There is certainly economic value in outdoor recreation. Our research revealed that over 66 million persons participate in wildlife viewing activities in the United States each year. Over 60 million bicycle, 56 million hike, 45 million camp and 24 million paddle. Birdwatchers in the United States spend over \$36 billion each year. It was the opinion of our research team that while our region attracts some of this economic activity, we do not enjoy as much usage as our natural resources could and should support. And in reviewing the structure of the outdoor recreation and tourism economy on the upper and middle Texas coast, it quickly became clear that we do not have infrastructure that is supportive of integrated and efficient use and marketing of these wonderful natural resources.

As part of our SSPEED Center team, we contracted with former Deputy Secretary of Interior Lynn Scarlett to assist us in better understanding what types of national park concepts might be applicable on the Texas coast. We recognized that from an economic development standpoint, the infrastructure provided by the National Park System is quite important and helpful, such as being on a web site proximate to major destinations such as the Everglades and Golden Gate National Recreation Area as well as other well known areas. Ms. Scarlett produced a concept paper that identified various types of alternative institutional structures for landscape-scale park and recreation solutions and helped us develop the structure that began to emerge as the LSCNRA.

From the outset, our research and the proposal for the LSCNRA was grounded in the reality of Texas. In order for a landscape-scale park concept to be feasible in Texas, property rights have to be protected, the acquisition of new lands by the federal government minimized and new federal expenditures kept to an absolute minimum. Ms. Scarlett identified several examples of innovative

federal-state-local partnerships that have been used in the past by the Department of Interior for both wildlife refuge and parkland concepts. Out of this work, the concept of a partnership-based National Recreation Area, using the models from Boston Harbor Islands and Santa Monica, California, emerged as the most applicable to our Texas coastal area.

Consistent with the overall purposes of the SSPEED Center work, the LSCNRA is proposed as, among other things, a non-structural surge mitigation activity. The basic idea is to develop a recreation and natural resource-oriented economy that can survive inundation. It is “economy” as a flood mitigation alternative. In other words, the coast would not suffer economic harm from flooding if flooding were designed into and compatible with the structure of the economy. In this manner, surge flood resilience is inherent in the LSCNRA.

Based on a survey of past storm surge throughout the states bordering the Gulf of Mexico, Hal Needham of Louisiana State University determined that the expected 100 year storm surge in the mid and upper Texas coast is about 20 feet at the coastline (and higher up the bays). To this end, the goal of the LSCNRA is to at least include land areas lying below the 20 foot contour. As can be seen on Figure 2, this area generally lies south of State Highway 35 in Matagorda, Brazoria and Galveston Counties and south of IH 10 in Chambers County.



Figure 2. Twenty foot contour line with protected lands. Prepared for SSPEED Center by Megan Weintraut.

Implementation of Lone Star Coastal National Recreation Area

Efforts to implement the LSCNRA are underway in early 2013, due primarily to the support of two key community leaders. Former Secretary of State James Baker, an avid outdoorsman, has embraced the concept of the LSCNRA from the beginning as has Houston businessman and historic conservation expert John Nau. The two of them are leading the effort to make the LSCNRA a reality, along with co-chair Doug McLeod of the Moody Foundation of Galveston. In support of these efforts, two major committees have been formed – a steering committee and a partner’s committee. The membership of these various committees can be seen in Appendix A and B. As of early 2013, these entities are moving forward with the realization of the LSCNRA in conjunction with the National Parks Conservation Association (NPCA), a non-governmental organization that was formed over a century ago to support the National Park system. This effort is primarily led by Suzanne Dixon and Victoria Herrin of the NPCA staff, along with Elizabeth Winston Jones and Cullen Geiselman.

The LSCNRA is conceived as a partnership between the federal government and the State of Texas, local governmental entities, non-governmental organizations and the private sector and is proposed initially to be comprised of properties currently in protected status. This would include lands owned by U.S. Fish and Wildlife Service and the U.S. Army Corps of Engineers, the Texas Parks and Wildlife Department, county and city government park departments, Houston Audubon Society, the Nature Conservancy of Texas, Scenic Galveston, Galveston Bay Foundation, Galveston Historical Foundation, Ducks Unlimited and other non-profit organizations. The existing protected lands and historic resources are also shown in figure 2. Over time, the hope is that private landowners will become engaged in the LSCNRA and will agree to participate in various creative ways. However, the creation mandate is clear - there is to be no new regulation proposed for non-participating landowners. All involvement in the LSCNRA is voluntary and on an “opt-in” basis.

The management structure of the LSCNRA is a key element. The LSCNRA is proposed to be administered through a “network” governance concept. As such, the recreation area will be assembled from the properties already owned by these various entities (as shown on Figure 2). By agreement, these properties will operated as a cohesive recreational unit but ownership and jurisdiction of these

properties would remain in the current owners. The National Park Service will likely use one or more of these sites as a base of operations and/or administration, given the precedent in Boston Harbor Islands that the NPS could spend their money on land owned by others. There is no proposal to purchase additional land with federal funds.

The governance of the LSCNRA will be by agreement among the partners who will be authorized to develop a plan that will set forth the principles for management of the recreation area. A conceptual diagram of the partnership model is shown in Figure 3. This concept for governing a national park has been implemented successfully in the past by the National Park Service in Boston Harbor Islands NRA and Santa Monica Mountains NRA, as well in other similar applications by the United States Fish and Wildlife Service.

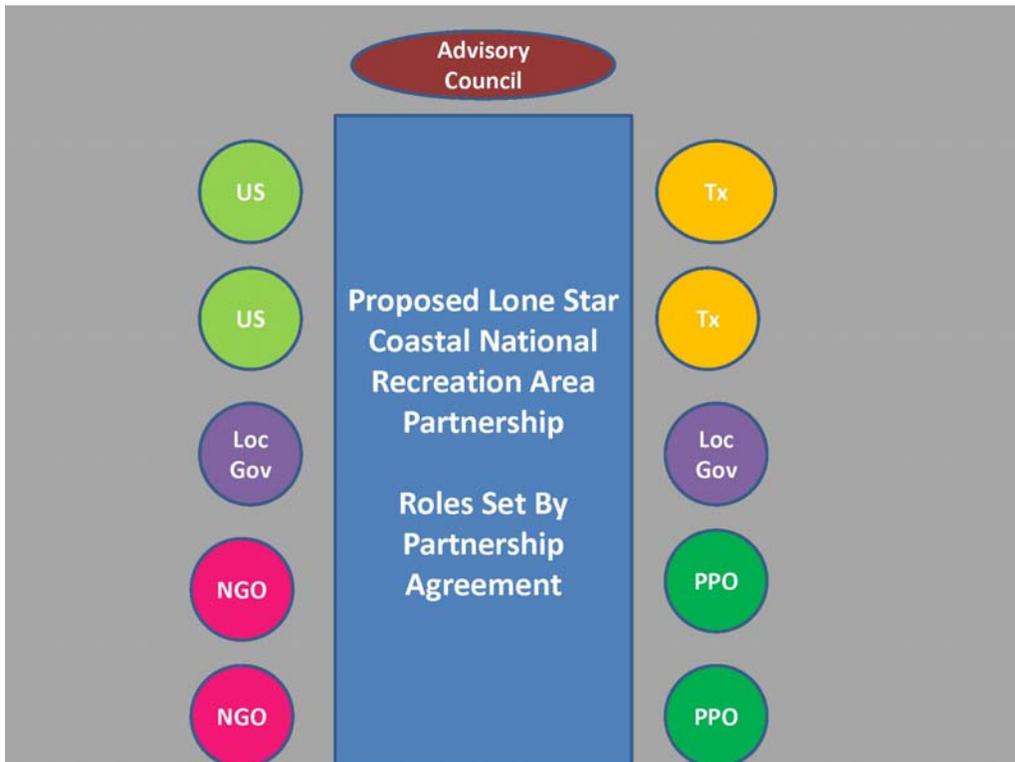


Figure 3. Proposed “Network” governance model for LSCNRA. The number and type of entities shown conceptual; the exact governance proposal is yet to be determined.

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The existence of this “network” governance model is extremely important because it may be the only way that a National Recreation Area could come into existence on the Texas coast, given the State’s concern about the reach of the federal government and its desire to protect private property rights. With such

concerns in mind, the LSCNRA has been designed to support local initiative, property rights, and fiscal responsibility.

An important question that has been raised is “why should this area be designated as a National Recreation Area”? Research has shown that a connection with the National Park System is extremely important from a marketing and “branding” standpoint, relative to the initial goal of developing a new economy that is flood resilient. Visitation to units of the National Park System is substantial. A member of the SSPEED Center team, Tom Colbert of the University of Houston Architecture School, compiled the attached comparison of the usage of various elements of the National Park System.

Annual Visitors

Source: Stynes, Daniel J. "National Park Visitor Spending and Payroll Impacts 2008"

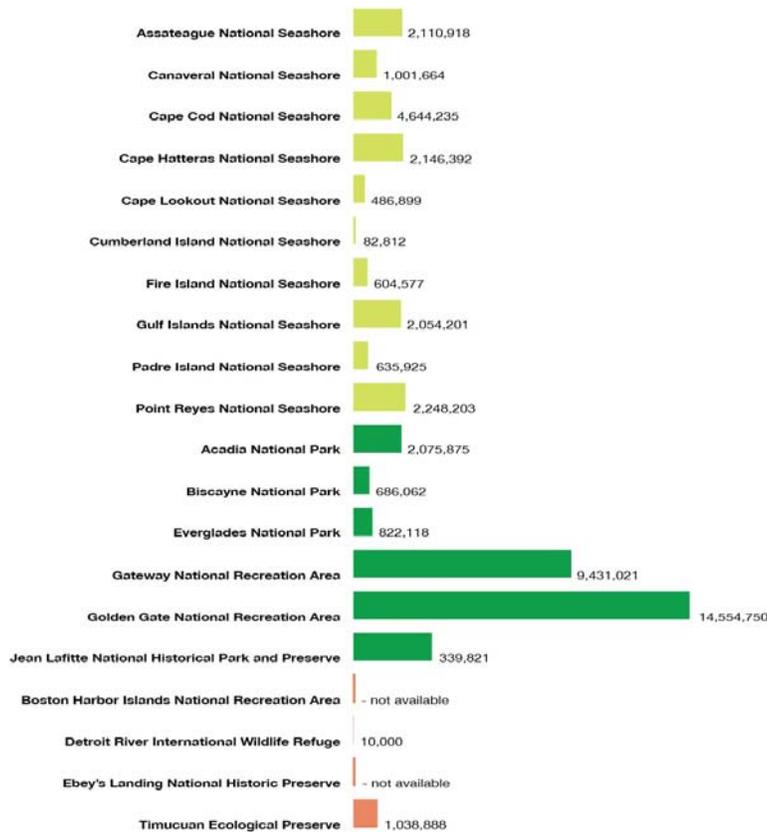


Figure 4: Annual Visitors at Various National Parks and Recreation Areas. Compiled by Tom Colbert, U of H Architecture School

To determine the desirability and effectiveness of creating a unit of the National Park System on the Texas coast, a study titled *Opportunity Knocks* was funded by the National Parks Conservation Association in association with the SSPEED Center. According to this study, ten years after formation of the LSCNRA:

1. coastal tourism within the LSCNRA counties will increase by 1.5 million visitors;
2. over 5000 new jobs will be created;
3. personal income will increase by \$69 million;
4. \$192 million increase will be expected in local sales.

In short, the creation and implementation of the LSCNRA will underpin the development of a robust tourism sector – one that is compatible with flooding.

A key corollary to the creation of the LSCNRA is the establishment of a non-governmental organization dedicated to the support of the LSCNRA. This non-profit will, among other things, raise money for the operation of the LSCNRA. This is extremely important because there is little to no additional federal money for the creation and operation of a new element of the National Park System. If created, the LSCNRA will rely heavily upon local funding and minimize the need for federal funding. In particular, there will be reliance upon the local business and philanthropic sectors for support.

Creating the LSCNRA

The creation of the LSCNRA is complex and requires the participation of many citizens as well as elected officials. Among other things, the criteria of the National Park Service for creation of a unit of the National Park System must be met and ultimately action must be taken by the U.S. Congress to create the LSCNRA. To this end, the project team under the leadership of Sec. Baker and John Nau has been working to show that the proposed LSCNRA demonstrates these qualities and to develop the infrastructure to support formation.

In order to create a unit of the National Park System, such a proposed unit must be determined to contain resources of national significance and to be both suitable and feasible for inclusion within the National Park System. To this end, Bob McIntosh, a former official with the National Park Service's Northeast Regional Office, has been retained by SSPEED Center to assist in the development

of a document that addresses these questions of potential eligibility. From the standpoint of national significance, the ecological diversity and bird resources of the project area are noteworthy. Many of the tracts within the proposed LSCNRA are known throughout the world as key bird-watching destinations, and many additional sites exist within large expanses of private lands that are largely unknown to the bird-watching community. Additionally, historic resources abound in the City of Galveston and surrounding rural areas, offering an additional aspect of national significance.

As to suitability and feasibility, this inquiry will be addressed by the identification of a governance concept that meets the federal requirements as well as the requirements of the State of Texas. To this end, the “network” concept appears to meet both requirements, offering flexibility in the ownership and management arrangements yet providing cohesion in accord with nationally-accepted models from other parts of the United States. And although the proposed LSCNRA covers a large area, it can be managed and accessed from several key entry points. A diagram illustrating general accessibility and potential arrangement of access points within the proposed LSCNRA is shown in figure 5.

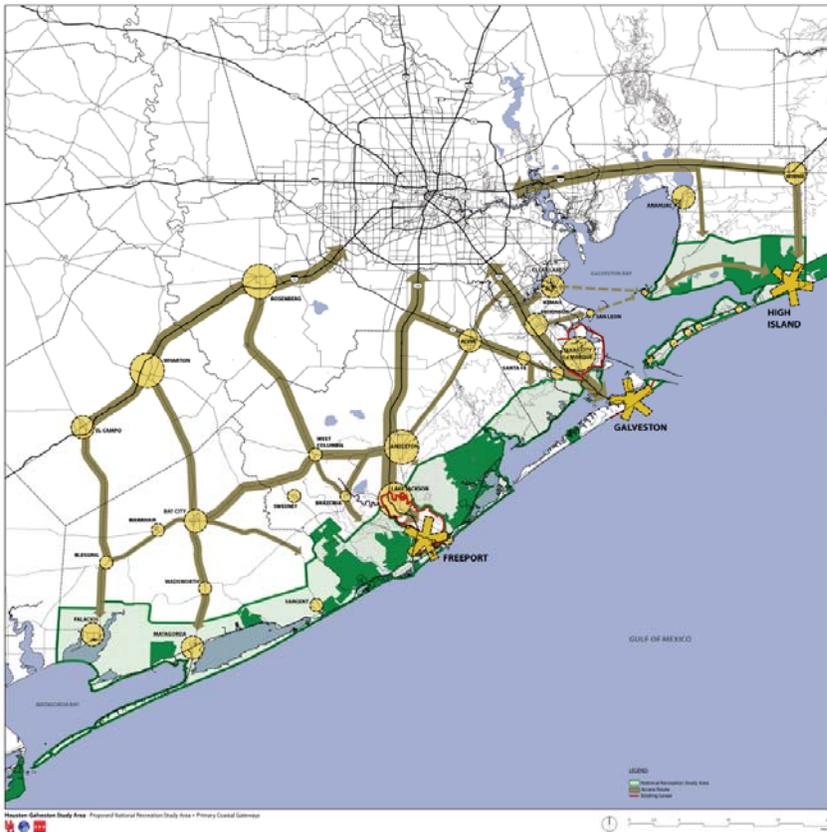


Figure 5. Road grid connecting into key access points within the proposed LSCNRA. Prepared for SSPEED Center by Tom Colbert and Kevin Shanley.

In addition to research, substantial work is being undertaken by several committees and sub-committees assembled under the leadership of Sec. Baker, John Nau and Doug McLeod. Both a Steering Committee and a Partners Committee have been formed. The Partners Committee is comprised of representatives of the landowning entities interested in participating in the LSCNRA or entities with a stake in cultural and historic, outdoor recreation and conservation issues implicit in the LSCNRA. The Steering Committee is comprised of business, non-profit and governmental leaders who are interested in assisting in the creation of this recreation area. Together, these committees have integrated to form sub-committees that are working to develop acceptable language for inclusion in legislation that will be necessary in order to create the LSCNRA. In addition, various governmental and NGO stakeholders are passing resolutions or issuing letters of intent to participate in the LSCNRA once it is formed.

The primary task of these integrated committees is to develop a conceptual structure for the LSCNRA that works for the Texas coast and then to translate that concept into enabling legislation to be taken to Congress. The model for this activity is the enabling legislation for the Boston Harbor Islands National Recreation Area. The key aspects of this legislation include the purpose of the NRA, its creation and boundaries, its authorization, its management structure and the partnership arrangement. The various subcommittees are developing their proposals which will be brought back to the entire group for discussion and hopefully consensus.

It is important to note that the Boston Harbor Islands NRA and the proposed LSCNRA are national recreation areas within a landscape with substantial pockets of development. The creation process must be mindful of these realities. For example, the Boston Islands Harbor enabling legislation specifically notes that nothing in this act shall interfere with the operation of Logan International Airport. Similarly, there are major industrial facilities that exist throughout the proposed LSCNRA. The enabling legislation must be clear that the creation of the LSCNRA does not affect the air quality status of the surrounding area. Additionally, the enabling legislation needs to be clear that the LSCNRA does not add any new regulation for any landowner who does not wish to participate in the LSCNRA.

These efforts are ongoing in 2013. These committees have completed their work, and this concept is now being introduced to elected officials by the various

volunteers such as Mr. Nau and Sec. Baker who are committed to making this alternative a reality.

Conclusion

The LSCNRA is an exciting idea that includes flood mitigation, land conservation, economic development and outdoor recreation. It is being designed with Texas concepts of private property and the federal government in mind. In many ways, it provides one approach that could emerge as key in the future of National Park System - to become a provider of important outdoor opportunities and enjoyment adjacent to major urban areas. And it may also become the future of the Texas coast.