Project Team
Led by the Louisiana Office of Community Development (OCD) and the Foundation for Louisiana (FFL), the multidisciplinary Louisiana's Strategic Adaptations for Future Environments (LA SAFE) team developed strategies in concert with an extensive community engagement campaign to provide an integrated approach in the development of an adaptation strategy for coastal Louisiana.

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Disaster Recovery Unit, Lead Partner
Foundation for Louisiana, Partner

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Pan American Engineers, Project Management Support Services, Cost Estimating
UNO-CHART, Process Evaluation, Meeting Documentation, Demographic Analysis

Other Partners
Franklin Associates, JCW, NOVAC, Coastal Communities Consulting, Greater New Orleans, Inc., Coalition to Restore Coastal Louisiana, Restore or Retreat, Restore the Mississippi River Delta, National Wildlife Federation, Environmental Defense Fund, Lake Pontchartrain Basin Foundation, Gulf Restoration Network, Bayou Interfaith Shared Community Organizing, Lower 9th Ward Center for Sustainable Engagement & Development, Zion Travelers Cooperative Center
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LA SAFE MISSION

Working together for community resilience, economic prosperity, and a better quality of life for everyone in Louisiana.

LA SAFE GOALS

1. To generate parish-wide, community-driven adaptation strategies focused on opportunities for residents and stakeholders to proactively adapt and prepare for anticipated environmental changes over the next 10, 25, and 50 years.

2. To implement a catalytic project in each of the six parishes that demonstrates adaptive development practices that conform to current and future flood risks. Furthermore, LA SAFE is intended to identify and support development of resilience-building projects and practices that can serve as models for the entire region.

3. To create a statewide adaptation model that enhances long-term sustainability and resilience for all Louisiana parishes.

LA SAFE is a comprehensive strategy for community adaptation and resilience, concepts that may have different meanings to different people. For the purposes of this strategy, the following definitions will be used.

**Adaptation**

the process of modifying behavior to suit changing environmental conditions.

**Resilience**

the capacity of individuals, communities, and systems to survive, adapt, and grow no matter what kinds of chronic stresses and acute shocks they experience.
Executive Summary

The document that follows provides an overview of the LA SAFE program being developed in six Louisiana parishes facing increased flood risk associated with environmental changes. It then describes the process and products of the LA SAFE effort in St. Tammany Parish specifically. In addition to a vision for the future of the parish—and the goals, strategies, and actions identified to achieve that vision—these chapters also provide information that describes past, present, and likely future conditions in the parish, as well as an in-depth look at the activities and outputs of the community engagement process that has driven the development and prioritization of recommended adaptation strategies. Additional information on the background, research, analysis, planning process, and stakeholder engagement involved in the LA SAFE process can be found in the following chapters as well as in the LA SAFE Regional Adaptation Strategy.

The St. Tammany Parish Adaptation Strategy comprises—

Chapter 1: LA SAFE Program
Provides an overview of the scope of work and adaptation planning objectives designed to support LA SAFE’s mission to work together for community resilience, economic prosperity, and a better quality of life for everyone in Louisiana. This chapter includes an in-depth look at the community engagement process that took place over the course of five rounds of meetings conducted in the St. Tammany Parish communities of Slidell, Covington, and Mandeville. The resident input collected during this process identified shared concerns and hopes for the future, generated ideas for adaptation strategies, and helped determine priorities to guide planning and investment. Inclusive resident engagement has been and continues to be the driving force of LA SAFE.

Chapter 2: Hazards and Vulnerabilities
Provides detailed description of hazards such as land loss, subsidence, heavy precipitation, and storm surge that contribute to growing flood risk in St. Tammany Parish. Drawing upon Louisiana’s Coastal Protection and Restoration Authority (CPRA) storm surge modeling and FEMA floodplain data, this chapter defines characteristics of low-, moderate-, and high-risk flood zones as well as the impacts of socioeconomic vulnerabilities that amplify risk, such as poverty, aging, rising insurance costs, geographical shifts in population, and a shortage of affordable housing in the parish.

Chapter 3: Existing Conditions
Describes key features of St. Tammany Parish’s natural environment and the ways in which topographical features and natural assets have affected early settlement patterns and the subsequent development of housing stock, transportation infrastructure, and economic activity. This chapter also describes the heritage and major cultural traditions and assets found in the parish. A summary of the implications of growing flood risk for the parish’s assets in these categories—natural environment, housing, transportation, economy, and culture—as well as opportunities for preservation, growth, and investment lays the groundwork for the vision and strategies detailed in the next chapter.
Chapter 4: Vision and Strategies

Presents the vision for high-, moderate- and low-risk zones and strategies for adaptation developed for St. Tammany Parish by residents and community leaders working closely with planning and design experts throughout the LA SAFE engagement process. The strategies address five adaptation goals:

- Manage flooding and subsidence
- Direct growth to low-risk areas
- Improve mobility throughout the parish and region
- Strengthen and diversify local economies
- Retain local culture and enhance recreation opportunities

The strategies presented in this chapter include best practices for stormwater management, inclusive development and revitalization of key corridors in low-risk zones, expansion of transportation choices and implementation of Complete Streets, provision of education and job training programs, expansion of access to waterways, and enhancement of community assets for recreational and educational use. Each strategy is supported by actions and steps needed for implementation. Case studies are provided to document demonstrated success of key strategies.

Chapter 5: Realizing the Vision

Describes the six catalytic adaptation projects chosen by residents as priorities to be considered for LA SAFE funding. This chapter also describes the process for developing and evaluating the project proposals. Each project has been designed to demonstrate implementation of adaptation concepts that address the LA SAFE goals established by parish residents, build resilience for the parish, and deliver multiple benefits to the community. The six proposed projects include—

- French Branch Pond Connectivity
- Safe Haven Blue-Green Campus and Trails
- Northshore Launchpad
- Covington Green Block
- Bayou Liberty Park
- Village-in-the-Woods Prototype
Funded Project Description

Safe Haven Blue-Green Campus and Trails

Even in higher ground locations, natural systems must be maximized to retain stormwater in response to current and future flood risk. The Safe Haven Blue-Green Campus and Trails project is a Community Nonstructural Mitigation/Flood Risk Reduction and Public Services project that will enhance detention capabilities in a critical drainage area adjacent to Cane Bayou, protecting campus facilities from flood related damages; improving stormwater management on the campus; and providing increased green spaces. The project, located in Mandeville, will divert stormwater into existing forested land, illustrating how a multi-phase development with existing infrastructure in vulnerable environments can be repurposed to benefit surrounding areas. The project aims to catalyze development that integrates Safe Haven Campus and the essential services it provides into the surrounding community, with the ultimate goal of destigmatizing mental health and substance abuse programs and encouraging an inclusive culture in which Safe Haven’s critical services are better utilized.

All images in this strategy are credited to the LA SAFE team, unless otherwise noted.
Wetlands in St. Tammany Parish
One of the parish's natural assets is its marshes along the Lake Pontchartrain shoreline. Bayous and rivers weave through the eastern part of the parish.

Photo Credit: St. Tammany Parish Flickr
1 LA SAFE Program
Background and Mission

In efforts to plan for a vibrant and sustainable future for our state, addressing growing flood risk will be a primary concern for Louisiana communities. Climate scientists agree that warming temperatures are likely to result in more frequent flooding that occurs with increased intensity. These impacts will be compounded by the effects of human activities that accelerate erosion and subsidence along the coast.

Over the years, Louisiana residents have responded to flood risk in various ways: first, by settling on higher ground along the rivers and bayous, then by building levees, and eventually by restoring wetlands. During the next 50 years, Louisiana is projected to lose more land along its coast than it can rebuild, even if restoration efforts are completed as currently planned.¹ As delta land continues to subside and erode, sea level rise is expected to accelerate. With less wetland buffer, the state’s coastal regions face increased storm surge and flood risk that will impact families and communities in ways large and small, acute and chronic.

Louisiana communities must develop and implement risk reduction strategies that include mitigation, adaptation, and structural measures. Increasing flood risk is already causing socioeconomic and demographic repercussions. Due to the combined effects of man-made and natural land loss as well as sea level rise, people are moving from flood-prone areas to higher ground seeking safety. In lower-risk areas to which people are moving, tax bases are growing, but the infrastructure is overburdened. Communities in areas most at risk are losing population and facing declining median household incomes. These trends are likely to continue as risk increases.

Fifty years from now, high-ground, low-risk areas will be even more scarce. How parishes and municipalities develop this land will influence the region’s population capacity, cost of living, economic opportunities, and quality of life. Some of the high-risk areas are where much of the region’s economic activity takes place. Planning for the future of these areas where our working coast is located is as important as planning for low-risk areas where populations are expected to grow.

The challenge is greater than coastal restoration. CPRA’s projections indicate that land is being lost faster than it can be built.² This understanding means that, just as people have done throughout human history, Louisianans must plan to adapt to the changing landscape and environmental conditions.
Storm Surge
Storm surge from Hurricane Isaac on the north shore of Lake Pontchartrain near the Causeway.
Photo Credit: FEMA/Charles Powell; Lake Pontchartrain Causeway Police/Lt. Conrad H. Franz

Hurricane Damage
Home elevation following Hurricane Isaac flooding in Madisonville.
Photo Credit: FEMA/Mike Moore
An Opportunity for New Solutions

To help address these complex issues in a holistic manner, the National Disaster Resilience Competition (NDRC), sponsored by the U.S. Department of Housing and Urban Development (HUD) and the Rockefeller Foundation, awarded funding for LA SAFE—Louisiana’s Strategic Adaptations for Future Environments. The LA SAFE program supported an inclusive public process to identify adaptation strategies and is providing funding for at least one catalytic project in each parish.

The LA SAFE planning process focused on six parishes heavily impacted by Hurricane Isaac in 2012: **Jefferson, Lafourche, Plaquemines, St. John the Baptist, St. Tammany, and Terrebonne**—as well as the region as a whole. Four of the LA SAFE parishes—Jefferson, Plaquemines, St. John the Baptist, and St. Tammany—are eligible to receive investments anywhere in the parish because they meet HUD’s Community Development Block Grant – Disaster Recovery (CDBG-DR) requirements. In Lafourche and Terrebonne Parishes, only certain parts of the parish meet those requirements.

To receive funding, a locale must meet threshold requirements in the three categories of most
LA SAFE seeks a balance between natural forces and smart growth, where communities learn to adapt to risk by building with nature and living with water.

impacted, distressed, and unmet recovery needs as a result of a “Qualifying Disaster”—in this case, Hurricane Isaac.

While ongoing efforts such as the 2017 Coastal Master Plan strive to reduce risk to populations from storm surge flooding via large restoration and protection projects, LA SAFE recognizes that the environmental challenges facing the region cannot be solved by engineering alone. Through policies, programs, and projects, LA SAFE offers a set of community-driven strategies designed to provide a holistic approach to reducing long-term risk and increasing Louisiana’s ability to prepare for and recover from disasters and other disruptions.

The adaptation strategies in LA SAFE’s regional and parish plans integrate stormwater management, housing and development, transportation, education, economy and jobs, and culture and recreation to provide community benefits that improve quality of life while mitigating flood risk. Through intensive public engagement and technical review processes, the Louisiana Office of Community Development (OCD) has identified at least one catalytic LA SAFE project to receive funding in each parish.
Community-Driven Planning

Community engagement is central to the LA SAFE planning process. **LA SAFE engaged 352 residents and community leaders in St. Tammany Parish over the course of five rounds of meetings.** Meetings were held in Slidell, Covington, and Mandeville.

The LA SAFE team worked with these stakeholders to document and evaluate existing conditions in the parish, analyze risk, identify shared goals, and develop a vision for the future. The goals that residents set evolved into policies, programs, and six catalytic projects that address community needs stemming from environmental degradation and increasing flood risk. Specifically, residents established goals and values during the Round 1 meetings, identified areas of opportunity in Round 2 meetings, developed a vision in Round 3 meetings, identified potential projects in Round 4 meetings, and ranked project preferences in Round 5 meetings.

This collaboration was informed from start to finish by the best available data about future environmental conditions, best planning practices, and quality design expertise. The team also worked closely with residents to ensure that the strategies in the plan are closely aligned with the parish’s culture and values.

The LA SAFE strategy that follows makes specific recommendations about how St. Tammany Parish might adapt to future conditions. Some of these recommendations come from existing parish plans, some from local stakeholders, and some from the expertise of the team’s planners and designers. All have been vetted and prioritized by the parish’s residents and community leaders. The recommendations that rose to the top draw from multiple disciplines and provide benefits across categories and risk areas.

**Synthesizing Perspectives**

Early in the meeting process, LA SAFE presented this framework for decision-making, which seeks the common ground among Community Vision, Current & Future Environmental Conditions, and Best Planning Practices.
Engaging the Community
Left: At Meeting 1, residents comment on sticky notes on changes and challenges they have observed.
Right: A resident at Meeting 5 evaluates one of six catalytic projects.

“A strong environment is a strong community.”
—St. Tammany Resident

LEAD the Coast
Participants of Foundation for Louisiana’s (FFL) LEAD (Leadership, Education, Advocacy, and Development) the Coast program served as table hosts and facilitators during the LA SAFE meetings. As coastal residents themselves, these table hosts had a personal understanding of the issues that impact their fellow community members. The LEAD the Coast Program provided them with additional coastal education and facilitation training. These table hosts helped to connect the LA SAFE project team with issues on the ground throughout the engagement process.

Photo Credit: Foundation for Louisiana
Parish Meeting Activities
At Meeting 1, residents describe the changes they are experiencing.

What Does Change Mean to You?
The first activity, pictured above, asked residents to describe changes and challenges they’ve seen over the past 50 years. This activity included a map that depicts current and future land loss as well as population shifts that occurred between 2000 and 2010.

Adaptation Goals
The second activity focused on what residents value about St. Tammany Parish and what they see as future goals.
Round 1 Meetings

In the first round of meetings, residents identified challenges, values, and goals that set the course for the rest of the engagement process. To accomplish this, residents participated in two group activities that asked them to describe the changes they have seen within their community, what they value about their community, and what they would like their community to look like in the future.

In the first activity, “What Does Change Mean to You?,” St. Tammany Parish residents reviewed a map of future flood risk in the parish and described how they have been affected by changes to the environment, economy, and population during the past 50 years.

The second activity, “Adaptation Goals,” asked residents to share their goals and values in the following categories: Community & Culture, Economy & Jobs, and Environment & Sustainability. Residents were also asked to identify current strengths and future opportunities in these categories as well as what they would like to preserve in their communities.

Meeting Location Preference
To ensure that subsequent engagement meetings were held in locations that would be accessible and convenient to the greatest number of people, residents were asked to suggest towns and potential meeting venues. These are shown to the right on the Activity 1 map, with the size of the orange circles corresponding to the number of nominations each town received. The Round 2 meeting locations were based on this resident input.

“A lot of people like that the community is small and that a lot of people are close to nature.”
—St. Tammany Resident, Round 1 Meeting

“We have to also still be able to welcome people who come here from the southern part of the state.”
—St. Tammany Resident, Round 1 Meeting
Round 1 Meeting Outcomes
In the first activity, residents described a parish struggling with deforestation and flooding, population shifts, and increasing cost of living and insurance. Residents also described home values declining, costs increasing, and continued land loss. Resident comments were compiled and categorized as challenges.

Responses from the second activity described what residents value in the parish and their goals for the future of their community. These were organized as strengths and opportunities, respectively. Residents emphasized quality of life and access to water and green spaces, followed by education opportunities, traditions and culture, and the seafood and water economies.

Among the opportunities most discussed were better land and water management, economic diversification, and transportation.

“Our table seemed to focus most on the environmental changes that we all experienced, specifically East St. Tammany. It boils down to there is more water. My wife is always talking about how high the water is, and you never used to see this.”
—St. Tammany Parish Resident, Round 1 Meeting

Activity 1: “What Does Change Mean to You?”
Residents described changes and challenges that they’ve witnessed in the past decades on sticky notes.

Activity 2: “Adaptation Goals”
Residents described what they value in the parish and what their future goals are.
At Meeting 1, 93 residents wrote 482 responses to the activity prompts that LA SAFE organized into challenges, strengths, and opportunities. Resident comments were grouped and evaluated by frequency. The list below summarizes the most-discussed topics at the meeting in order of frequency of mention.

**Challenges**
1. Deforestation and flooding
2. Population loss, growth, and movement
3. Increasing cost of living and insurance
4. Home values declining and cost increasing
5. Continued land loss and dying ecosystem

**Strengths**
1. Quality of life
2. Access to water and green spaces
3. Good location
4. Education opportunities
5. Traditions and culture
6. Seafood and water economies

**Opportunities**
1. Land and water management
2. Diversify and develop economy
3. Transportation
4. Regulations and policy
5. Protection and restoration
6. Recreation and youth programs
7. Preserve community stability
8. Plan and build for water
9. Create public water and green space
Round 2 Meetings

The second round of LA SAFE meetings in St. Tammany Parish were held in Slidell, Covington, and Mandeville. Each of these meetings was inclusive of nearby areas and focused on the unique issues particular to these communities.

Residents used question cards and maps to describe short-, medium-, and long-term goals for their communities. The question cards reflected the nine major topics that emerged from Meeting 1 across all six parishes. Residents sat in small groups around an elevation map of their community that highlighted future high-ground areas. The top of their table sheet showed land loss and flood risk over time, from 50 years past to 50 years into the future. With these future conditions in mind, residents chose one topic in each of the three categories (see right) that they deemed the most relevant to the future of their community. They were then asked to indicate areas or locations on their map where current issues exist and to propose solutions in the 10-, 25-, and 50-year time frames.

“Now we’re into sprawl. Think of the traffic. There was an accident last week and all of those connecting roads were packed.”
—St. Tammany Resident, Round 2 Meeting

Table Sheet

Table sheet from the Slidell meeting.
“Right now, young people trying to buy houses are out of the market. Young people can’t afford new homes.”
—St. Tammany Parish Resident, Round 2 Meeting

Round 2
Top: Residents at Round 2 discuss one of the questions.

Left: Residents discuss questions read from the Environment & Sustainability card.

Right: A table sheet on which notes related to Economy & Jobs are written in blue, and Community & Culture are in orange.
Round 2 Meeting Outcomes
The summaries below describe the most prevalent discussions at each of the three meetings in Round 2. In addition to documenting the conversations, the LA SAFE team collected the notes and comments that residents had written on these maps. The map on the right provides a summary of the compiled comments.

**Slidell**
Residents at the Slidell meeting focused on water and the natural environment, calling for increased access for recreational purposes, flood risk mitigation, and increased promotion of assets such as bayous and streams. They also wanted to see future development guided by requirements for protecting natural assets and restrictions on floodplain development. Specific suggestions included government buyouts for floodplain properties and prioritization of adaptive re-use over new development.

**Covington**
Residents at the Covington meeting identified traffic congestion and inadequate infrastructure as primary concerns, calling for public transit, sidewalk improvements, and bike lanes. Economic concerns were also expressed. In order to create more jobs, residents suggested the parish should develop strategies to create green jobs, attract advanced manufacturing companies, build more medical facilities, and provide skills training for aides to the elderly. Residents also emphasized nature as a valued asset in their community. They suggested more oversight of new development and increasing educational features of and multimodal connectivity to green spaces in the parish.

**Mandeville**
Mandeville residents’ primary concern was with infrastructure such as streets, drainage, and sewage that they view as unsustainable for the current population. They would like to see greater availability of public transit and increased restrictions on building practices. Resident also identified natural areas including the shoreline as important assets that drive ecotourism in Mandeville. In order to support this industry, they would like to see improved connections among existing parks and trails, reduced pollution in and along waterways, and support for environmental organizations with capacity to manage these efforts. Residents would like to see future economic development focused on renewable energy and coastal restoration.

Maps of Meeting 2 Locations
St. Tammany Parish Meeting 2 maps show elevation, wetlands, and future land loss to illustrate future areas of high ground.
Sources: CPRA Flood Risk Medium Scenario Modeling Data 2017; For all basemap data see References
CROWD-SOURCED LAND USE MAP

This map compiles all the drawings and notes that residents placed on their activity maps. This indicates the types of interventions they envision across the parish. The colors of the icons correlate to the type of intervention suggested.

Sources: For all basemap data see References

Legend

**ECONOMY & JOBS**
- General Economic Investment
- Industry/ Economic Investment
- Housing & Development
- Job Centers
- Seafood Industry

**ENVIRONMENT & SUSTAINABILITY**
- Parks & Nature Trails
- Bike Trail
- Multimodal Transportation
- Traffic Problem

**COMMUNITY & CULTURE**
- Cultural Assets
- Schools & Educational Assets
- Groceries & Amenities
- Recreational Fishing & Ecotourism

**FLOOD RISK REDUCTION**
- Flood Protection
- Rainwater Retention Area/Nature Preserve
- Flooding Problem

**TYPE OF ICON**
- Asset/area to be protected
- Potential new/improved asset
Round 3 Meetings

During Round 3, residents completed three activities. The first consisted of a set of polling questions about the strategies LA SAFE should pursue in the parish. Residents responded using clickers, and the results were captured and displayed in real time. For the second activity, residents rated their level of agreement with vision statements for three typological risk levels in the parish. In the third activity, residents responded to program, policy, and project strategies that were based on resident input provided during previous meetings.

Round 3 Meeting Outcomes

When residents were asked what they believed to be the most important issue for the future of St. Tammany Parish, the majority said regulating development in the floodplain. Forty percent of St. Tammany meeting participants want job opportunities in alternative energy to be expanded. When asked about stormwater management, more than 35% of residents believe there should be requirements to implement stormwater retention strategies in new development. Almost as many residents want to see more investment in and incentives for green infrastructure, such as rain gardens, green roofs, and bioswales.

Activity 1 Responses

Q7: Which types of job opportunities would you like to see expanded in your parish?

- Alternative energy
- Commerce
- Healthcare
- Warehousing and distribution
- Aquaculture and agriculture
- Tourism
- Other

Q8: Which of the following is the most important in envisioning a future in St. Tammany Parish?

- Regulate development in the floodplain
- Limit wetland development
- Alleviate traffic congestion
- Increase green spaces and recreation
- Provide more affordable housing options
- Other

Q10: To improve stormwater management, the parish should do which of the following?

- Require new development to implement stormwater retention strategies
- Invest in and incentivize green infrastructure
- Slow down development
- Invest in pumping and lift station
- Other

The Round 3 meeting was held at the Lakeshore High School.
In the second activity, the LA SAFE team presented a vision for the parish based on resident input received at previous meetings and future flood risk data. The vision that the team presented was organized into five planning categories and three risk levels: high-risk, moderate-risk, and low-risk. Residents evaluated the vision for each risk level using their clickers. More than 90% strongly agreed, agreed, or slightly agreed with the vision for each risk level. These vision drawings and the text displayed at the meeting are shown on the right.

More than 90% of Meeting 3 participants agreed with the visions presented at each risk level.

### Visions Presented at Round 3
The images below are the PowerPoint slides and description summaries of the visions that residents responded to using their clickers.

#### Low-Risk Vision
- **What we expect over 50 years:**
  - Minimal flood risk
  - Economic growth
  - Population increase
- **Vision**
  Denser residential and commercial development, increased transportation options, improved stormwater management, and more green space.

#### Moderate-Risk Vision
- **What we expect over 50 years:**
  - Land loss in surrounding areas
  - Moderate local flood risk
  - Not much change in population
- **Vision**
  Protected harbors, clustered elevated housing and amenities, recreational spaces, elevated evacuation routes, and increased transportation options.

#### High-Risk Vision
- **What we expect over 50 years:**
  - Land loss
  - High flood risk
  - Decline in population
- **Vision**
  Expand recreational and ecotourism industries, elevated evacuation routes, and improved infrastructure to support the seafood industry and coastal workers.

#### Activity 2 Responses

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Slightly Agree</th>
<th>Neutral</th>
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<td>50%</td>
<td>60%</td>
</tr>
</tbody>
</table>

Legend:
- Low-Risk Vision
- Moderate-Risk Vision
- High-Risk Vision
Meeting 3 Activity
Residents choose strategies they like and dislike.

Activity 3 focused on the range of projects, programs, and policies that LA SAFE could implement. Each table group evaluated 16 – 20 strategies within three of the five planning categories. Residents discussed the strategies shown and used green and red stickers to identify strategies they liked and disliked.

The list to the right shows the highest-rated strategies from each planning category organized within subcategories. Strategies within each subcategory are listed by popularity. Strategies that received high scores are represented by darker colors and are listed below each subcategory. Less popular strategies are represented in the lighter color and are not individually listed.

The results from this activity illustrate the strategies that St. Tammany Parish residents at the meeting were most interested in. After the meeting, the LA SAFE team used these results to begin forming projects, programs, and policies that honor resident preferences.

Top Strategies from Activity Three
The following categories emerged as a result of resident feedback from Meetings 1 and 2 and were introduced as an organizational framework in Meeting 3.

**STORMWATER MANAGEMENT**

**Improved Water Management Policies and Programs**
- Debris removal from inland waterways
- Improved parish drainage system
- Cross-parish stormwater management strategy
- Create a full-time drain maintenance department
- Plant cypress trees to break up storm surge
- Programs for citizens to assist with canal maintenance and tree planting
- State or local alternative to National Flood Insurance Programs

**Green Development**
- Parks designed to temporarily hold stormwater
- Pervious paving
- Community gardens and planting programs
- Drainage requirements for new developments

**Green Streets**
- Incentivize green streets
- Bioswales

**HOUSING AND DEVELOPMENT**

**Denser Development**
- Medium-density housing (two – three stories)
- Walkable, commercial town center
- High-density, mixed-use zoning along target corridors
- Increased affordable housing options

**Home Elevation**
- Policies to encourage resilient, elevated housing development
- Raised and protected neighborhoods

**Program to Restore Abandoned Property to Natural Condition**

**Preserve American Indian Sites**

**Alternative Development**
TRANSPORTATION

Biking and Walking Paths
- Complete Streets
- Expand bike infrastructure
- Hike and bike nature trails
- Increase bike lane connectivity
- Increase walkability and sustainable streetscape

Upgrade Transportation Infrastructure
- Improved evacuation routes
- Traffic signal optimization
- Elevate key transportation and evacuation routes
- Elevated multimodal roadways
- Additional transportation corridors

Increase Public and Commercial Transportation Options
- Commuter and regional rail
- Expand and coordinate bus transportation
- Improve public transportation across parish lines

CULTURE AND RECREATION

Youth Activities
- Playgrounds that teach about living with water
- Public recreation and sports facilities
- Support culturally focused camps and after-school programs
- Hands-on environmental curriculum and field trips

Water-Based Recreation
- Improve river quality and access
- Lakefront access
- Public boat docks

Community Spaces
- Farmers’ and seafood market

EDUCATION, ECONOMY, AND JOBS

Improve Education
- Add environmental/coastal management to K – 12 curriculum
- Satellite education facilities

Increase Tourism
- Ecotourism attractions
- Tourism center
- Ecotourism jobs

Create Jobs
- Job opportunities in renewable energy
- Business incubator to help residents start new businesses

Job Training
- Coastal restoration construction jobs and training
- Job training programs

Support Commercial Fishing
- Certify, label, and promote authentic Louisiana seafood

“One thing we don’t have a lot of is parks that hold stormwater... Our water drains so fast off the parks unless you have a big storm.”
—St. Tammany Parish Resident, Round 3 Meeting
Round 4 Meetings

The purpose of the Round 4 meetings was to introduce and collect input on draft project proposals that were developed based on previous community input. Responses to these materials would then be used to refine the multitude of recommendations from the Round 3 meeting into six final project proposals to be presented and evaluated in Round 5.

For the Round 4 meetings, the LA SAFE team engaged parish officials and stakeholders at two roundtable discussions followed by community open houses at the same venues. The meetings were held in Covington on Oct. 24, 2017 and in Slidell on Oct. 26. These events provided opportunities for the LA SAFE team to receive feedback on the vision statements and possible adaptation strategies from parish staff, residents, and other stakeholders.

Roundtable Discussions

At the roundtable discussions, the LA SAFE team met with parish government leaders and staff as well as Northshore Healthcare Alliance and Lake Pontchartrain Basin Foundation representatives. Attendees reviewed and responded to the LA SAFE vision for St. Tammany Parish created through public input and to different types of adaptation strategies—including projects, programs, and policies—that can support community goals and existing plans. Participants reviewed several example strategies. From an implementation perspective, they discussed the strategies’ feasibility, maintenance costs, and related issues. The discussions helped the LA SAFE team understand existing parish efforts and challenges and how LA SAFE strategies can support and complement work already being done.

“When one person [lays] concrete [in] their yard, it’s one thing but when several do, it’s a problem. And how do we communicate that?”
—St. Tammany Parish Official, Round 4 Meeting

“I would also add that we need to have an educational component. How aware are the citizens?”
—St. Tammany Parish Official, Round 4 Meeting
EXISTING EFFORTS MAP

The LA SAFE team researched and compiled recommended projects from all of the St. Tammany Parish plans. This exercise revealed the existing efforts already underway. LA SAFE can leverage existing projects, avoid duplication, and narrow down the most effective interventions.

Sources: For all basemap data see References
Mapped Projections
A resident reviews the flood risk map at the Open House meeting.

Potential Project Boards
At the Round 4 meetings, six project concept ideas were displayed on boards.

Resident Feedback
Residents asked questions about the potential projects and gave feedback on sticky notes.
Public Open Houses
Following the roundtable discussions, the meeting rooms were opened to the public to discuss the same content with residents. Informational boards positioned around the room summarized LA SAFE background information, the LA SAFE vision for St. Tammany Parish, an existing efforts map, and draft project concepts. LA SAFE team members discussed the material one-on-one with residents and answered questions. Residents left comments and notes on the draft project boards.

Round 4 Meeting Outcomes
The parish roundtable meetings focused on stormwater management, parks and green space, and housing elevation and density. One major concern discussed among stakeholder meeting representatives was public buy-in. They suggested that any potential project be in a key area, be highly visible, and have multi-use functionality. Public awareness and education for difficult topics, such as flooding, was also discussed. Participants were also intent on tackling stormwater management on a regional scale to be sure there are no gaps across communities. Stakeholders reinforced the value of elevated homes, green ponds, beautification, recreation, and green space.

At the open houses, the Safe Haven Blue-Green Campus and Trails project received the most positive reactions from St. Tammany residents, who cited the benefits of green building practices, greenbelt development, and behavioral health assistance. Most meeting participants expressed support for green development in the parish.

“Tammany Trace is not accessible from my neighborhood. My kids and I love to use it, but it is a 20-minute drive to access it.”
—St. Tammany Resident, Round 4 Meeting

“Everyone right now feels like they’re in some potential of flood risk. They do need some awareness of the impact for new development.”
—St. Tammany Parish Official, Round 4 Meeting
Round 5 Meetings

In the final round of St. Tammany Parish meetings, residents gathered on Dec. 12, 2017 at the Slidell Municipal Auditorium to evaluate the culmination of planning work that took place during the year. Information boards around the room and a video loop summarized the results from previous meetings, presented flooding and land loss information, and proposed a future vision for the parish that included physical interventions and policy recommendations.

The meeting’s central purpose was for residents to evaluate and rank six catalytic projects that were developed in response to resident input collected during the previous four rounds of meetings. Each project is designed to provide multiple community benefits and support long-term sustainability. The project boards provided detailed descriptions, concept drawings, and example images along with information on estimated cost, location, area, and potential partners to give residents an idea of what implementation of each project would entail. St. Tammany Parish residents commented on each project and participated in a poll to rank their preferences.

The flooding and subsidence board shown at the meeting. This board was one of 12 informational boards that communicated the process and goals of LA SAFE.
Polling Process
At the meeting, residents were given six tokens: two gold tokens worth two points each, two green tokens worth one point each, and two blue tokens worth no points. Residents were instructed to place one token in each of six tubes that represented the six projects. At the end of the night, paper covers were removed from the tubes, revealing their contents. The color composition of each tube indicated the relative popularity of each of the projects, with gold being most popular and blue least popular. After the reveal, all points were counted. A board at the polling station explained how the public preference polling contributes to the larger selection criteria.

Knowing that some geographic bias was inevitable, LA SAFE also promoted an online version of the poll for three weeks following the meeting. In all, 224 St. Tammany Parish residents cast their preferences.

Participation Across the Parish
The map shows the geographic distribution of meeting attendees and online poll participants. The circle size and number correspond to number of participants from each zip code.

Resident Participation by Zip Code
70458—32 responses  70447—15 responses
70433—26 responses  70435—14 responses
70460—23 responses  70448—14 responses
70461—20 responses  70420—10 responses
70471—19 responses  Others—25 responses
Round 5 Meeting Outcomes
Below is a summary of each of the six catalytic projects meeting participants were invited to review. See the full project proposals in Chapter 5.

A: FRENCH BRANCH POND CONNECTIVITY
This proposal adds recreational and educational amenities to the French Branch Pond stormwater retention project, including a walking/biking path, floodable boardwalks, and a new trail under I-10 connecting to the City of Slidell’s existing trail.

B: SAFE HAVEN BLUE-GREEN CAMPUS AND TRAILS
This project will divert stormwater into existing forested land within critical drainage areas. This project will demonstrate how to develop near these sensitive areas to minimize exposure to severe, repetitive flood events.

C: NORTHSHORE LAUNCHPAD
This proposal will program and construct a business incubator and accelerator, supporting new businesses in alternative energy, construction, coastal restoration, and digital manufacturing. The building will house shared working space and a makerspace with equipment and tools. An accelerator program will partner entrepreneurs with mentors in their fields to help them start and grow their businesses.

D: COVINGTON GREEN BLOCK
This proposal develops a water garden and green street along S. Jefferson Ave. in Covington that will help address street flooding issues and provide safe access to a planned multi-use trail in the area. The project’s close proximity to William Pitcher Junior High School will enable it to be an educational asset to students and the public.

E: BAYOU LIBERTY PARK
This proposal transforms a parish-owned parcel of land next to a Walmart into a stormwater detention space with trail and blueway connections to the Tammany Trace. The resulting park will incorporate a promenade, trails, and waterways and could be used to educate the public on the benefits of stormwater management.

F: VILLAGE-IN-THE-WOODS PROTOTYPE
This proposal will invest in a “village-in-the-woods” development prototype, which includes nodes of walkable, higher-density, mixed-use neighborhoods, surrounded by natural areas and connected by trails and roads. This land use strategy preserves natural areas for stormwater management and recreational uses.
Poll Results
The meeting poll results, shown below, directly impacted the pilot project selection process, weighted at 20% in the overall project score. St. Tammany Parish residents most preferred the Safe Haven Blue-Green Campus and Trails project, followed by the Northshore Launchpad.

A. 231 points
“Reasonable cost to an already existing project space. Area beautification and increased sense of community. More trail space!“

B. 299 points
“Major impact and long-term need in whole parish, on whole community. Has to happen!“

C. 276 points
“We need coworking space for creative/technological stimulation. A must for nurturing growth and expansion!“

D. 164 points
“Anything that gets us on our feet walking or bicycling gets my vote. If this gets built, hopefully it could be an example other neighborhoods can follow.“

E. 220 points
“Bayous are everywhere yet we have so little public access. This is great use [of the] environment, [making] play space to promote physical activity, health promotion, and learning.”

F. 157 points
“Let’s leave it natural. Let’s develop abandoned property... Let’s build stores in multiple levels—go vertical instead of urban sprawl.”

—St. Tammany Parish resident comments on the catalytic projects
Marsh Deterioration
As saltwater pushes farther into brackish and freshwater marshes, it causes the deterioration of the marsh habitat and shoreline erosion, such as the area around the Tchefuncte River Lighthouse, near Madisonville, at the junction of the Tchefuncte River and Lake Pontchartrain.
2 Hazards and Vulnerabilities
RESIDENT OBSERVATIONS
Resident observations from Round 2 of community meetings, held in Slidell, Mandeville, and Covington in St. Tammany Parish.
Sources: For all basemap data see References

Due to its geographic location, St. Tammany Parish is susceptible to the impacts of tropical storms and riverine flooding. Effects of these two significant hazards include storm surge, heavy precipitation, and shoreline erosion—all of which are connected and have a collective impact that increases flood risk in the parish.

Asset
Things such as buildings and infrastructure, natural features, cultural artifacts and traditions, knowledge, social bonds, systems and networks—whether tangible or intangible—that are deemed to be of value to an individual, organization, or community.

Risk
Exposure to the possibility of experiencing negative consequences that may arise when hazards interact with vulnerable people, property, areas, or environments.

Hazard
Any substance, phenomenon, or situation that has the potential to cause disruption or damage to people, their property, their services, and/or their environment.

Vulnerability
Constraints of an economic, social, physical, or geographic nature that increase exposure to risk and/or reduce the ability to prepare for and cope with the impacts of disasters and disruptions.

Legend
- Land
- Wetlands
- Water
- Non-Federal Levee
- CPRA Proposed Levee
- Parish Boundary
- St. Benedict
- Goodbee
- Covington
- Madisonville
- Lewisburg
- Folsom
- Parish Boundary
- Lake Pontchartrain Causeway
- Lake Pontchartrain Causeway
- LA 22
- I-12
- LA 25
- US 190
- I-10
- N
- N
Repeated flooding

Lake Pontchartrain

Abita Springs

Bush

Lacombe

Pearl River

Talisheek

Waldheim

Sun

I-12

I-10

US 11

US 90

US 190

LA 36

LA 435

LA 21

LA 41

I-59

I-10
Land Loss

St. Tammany Parish is located in the Lake Pontchartrain Basin. Formed during the Pleistocene period, the most recent Ice Age when glaciers covered large parts of the Earth, the parish’s northern landmass is on terraces. Within the last 10,000 years and since the formation of the Lake Pontchartrain Basin, sediment deposits built up the land from the Pearl, Bogue Chitto, and Tchefuncte Rivers. Thus, the northern parts of St. Tammany are up to 25 feet above sea level while the land on the rivers’ floodplains and shorelines are at or near sea level. Over the next 50 years, the parish is expected to face minimal wetland loss; however, the parish’s coastal marshes and swamps are vulnerable to erosion and land loss from sea level rise, storm surge and subsidence. Their conservation should be prioritized.³

Legend

- Mississippi River
- Existing Delta
- New Land Built
- Land Lost
- Water

Sources: Adapted from The Times-Picayune|nola.com graphic from historic data based on Frazier, 1967, and The Delta Cycle and Land Change Area in Louisiana Coastal Plain, 2014; Adapted from Changing Course, Baird Team graphic
From 2010 – 2016, Louisiana lost land at a rate equal to a football field every 100 minutes.⁴

LAND LOSS MAPS
Land change along the Louisiana coast from 50 years ago to today and CPRA’s predicted land loss, gained, and maintained under the Medium Environmental Scenario over the next 50 years as an outcome of implementing 2017 Coastal Master Plan projects.

Sources: CPRA Land Loss Modeling Data 2017 for a Medium Scenario; For all basemap data see References

Legend
- Land Lost/Open Water
- Land Maintained
- Land Gained
- Wetlands
- Land
- Non-Federal Levee
- CPRA Proposed Levee
- Parish Boundary
Flood Risk

Flood risk is a product of the climate, geography, and socioeconomic profile of St. Tammany Parish. As a coastal parish in a humid subtropical climate, St. Tammany Parish is susceptible to tropical storms and the storm surge and precipitation they bring, all of which pose significant flood risk. St. Tammany Parish also has high rates of annual precipitation and must manage stormwater to reduce flood risk. Sea level rise, increasing severity and frequency of weather, and storm surge continue to erode land, reshaping St. Tammany Parish’s shoreline and increasing flood risk in areas previously considered safe from flooding. Poverty, limited access to jobs and training, and an aging population are socioeconomic vulnerabilities that exacerbate the magnitude of threat presented by these risks. Furthermore, St. Tammany Parish currently manages water through a series of drainage canals, shoreline barriers, and retention features, which may not be able to adequately manage future flood risks. Flood risks threaten the economies, infrastructure, populations, and the irreplaceable culture of St. Tammany Parish.

Precipitation

Precipitation in St. Tammany Parish primarily takes the form of rain, although hail has occurred occasionally with severe weather systems. The current precipitation rate for St. Tammany Parish is approximately 64 inches per year. In 2016, St. Tammany experienced two major flood events, both due to heavy rainfall. In the future, more intense downpours in shorter time periods are expected to occur more frequently. As a result, flood risk from precipitation is increasing because current stormwater management infrastructure and practices were not designed for these more intense precipitation patterns.

Storm Surge

Storm surge is an increase in water height caused by strong winds, often associated with a hurricane that produces vertical circulation below the water surface and elevates the water height. When a storm approaches land and encounters shallower water, the water accumulates to a greater height. Combined with sea level rise, the impacts of storm surge are felt farther inland, affecting communities that were once protected by surrounding wetlands.
St. Tammany Parish may experience up to $2 billion future economic damages due to storm surge-based flooding.\(^6\)

CPRA’s modeling data for a Medium Environmental Scenario is based on a 100-year storm with a 1\% probability of forming in a given year.
Low Risk
Minimal storm surge flood risk projected and outside the current 100-year floodplain

Areas that currently have development opportunities to receive populations and economic activity from more flood-prone areas.

Moderate Risk
>0 – 6’ projected storm surge flood depths or within the current 100-year floodplain

Areas conducive to maintaining current population levels and economic trends provided such communities orient future development and mitigation activities in alignment with future flood risk projections.

FLOOD RISK ZONES
Risk scenarios are based on CPRA’s 50-year flood depth projections under a Medium Environmental scenario and FEMA’s proposed DFIRM floodplain data.
Sources: CPRA Flood Risk Medium Scenario Modeling Data 2017; FEMA Preliminary DFIRM 100-year floodplain data for St. Tammany Parish 2008; For all basemap data see References
LA SAFE seeks to mitigate the threat of growing flood risk by encouraging smarter development patterns in lower-risk areas.

High Risk
>6’ projected storm surge flood depths

Areas that can expect to experience population decline and economic losses, up to and including full community-scale resettlement, as environmental conditions deteriorate and repetitive severe flood events take place.

Legend

- Land
- Wetlands
- Water
- Non-Federal Levee
- CPRA Proposed Levee
- Parish Boundary
COMBINED FLOOD RISK ZONES
Sources: CPRA Flood Risk Medium Scenario Modeling Data 2017; FEMA Preliminary DFIRM 100-year floodplain data for St. Tammany Parish 2008; For all basemap data see References

CPRA + NFIP FIRM

The map shows 2067 flood risk from storm surge for a medium scenario or a 100-year storm.

Additionally, areas within levees and in a 100-year floodplain are shown as a moderate-risk zone, as these zones flood during heavy rainfall.

Legend

Low Risk
Minimal storm surge flood risk projected and outside the current 100-year floodplain

Moderate Risk
>0 – 6’ projected storm surge flood depths or within the current 100-year floodplain

High Risk
>6’ projected storm surge flood depths

- Non-Federal Levee
- CPRA Proposed Levee
- Parish Boundary
Elevation

Most of St. Tammany Parish is significantly above sea level; however, some of the parish’s communities have been developed below sea level, in reclaimed wetlands near the Pearl River Delta in Slidell.
As organic soils are drained of water, their contents “oxidize,” or decompose and shrink. The areas with the highest percentage of organic material in their soils typically have the highest potential for subsidence. Water levels in these areas need to be maintained at higher levels to avoid subsidence-related damage to buildings and infrastructure.

**Structural protection worsens subsidence unless internal water detention is prioritized.**

**Legend**

- **Highly Organic Soils**
  - High Subsidence Potential

- **High Plasticity Silt and Clay Soils**
  - Shrink and Swell Potential

- **Low Plasticity Silt and Clay Soils**
  - Lower Shrink and Swell Potential

Delta soils are like a sponge. Organic soils are only stable when they are full of water. When they dry out, they shrink.

**Source:** Web Soil Survey produced by National Cooperative Soil Survey, USDA Natural Resources Conservation Service 2015 – 2016; For all basemap data see References
The map shows population density in the three risk zones.

Sources: CPRA Flood Risk Medium Scenario Modeling Data 2017; FEMA Preliminary DFIRM 100-year floodplain data for St. Tammany Parish 2008; Data prepared by ESRI, sourced from U.S. Census Bureau, Census 2010 Summary File 1; For all basemap data see References.

Legend
- Land
- Wetlands
- Water
- Non-Federal Levee
- CPRA Proposed Levee
- Parish Boundary

“The biggest change has been development. The development to the areas to the east or south of the parish...in areas that should not have been developed but that were developed anyway...the point is that there was a large increase in population in the mid-1960s.”

—St. Tammany Parish Resident
Social Vulnerability

Vulnerability is more than just exposure to hazards such as storm surge, heavy precipitation, and subsidence. Vulnerability is caused by conditions including poverty, racial or cultural marginalization, geographic isolation, illness, disability, or a variety of other afflictions—that may impede a person or community’s ability to prepare for or cope with a shock or stress. For example, while a storm surge may be the physical cause of damage and harm to a community, a range of economic, cultural, social, and political factors also affect the degree to which an individual or community is negatively impacted by that event. Understanding vulnerability means understanding the amount of damage an event can potentially inflict as well as understanding the resources and strategies available to the affected population for recovery, preparation, mitigation, and adaptation. In order to effectively plan for and adapt to risks, the types and magnitude of vulnerability must be understood and taken into account.

Income and Poverty

Poverty is a key factor that increases vulnerability to environmental hazards and stresses. Lower-income households have fewer resources to dedicate to preparing for and recovering from an adverse event. Their economic livelihoods are also more likely to be disrupted by an environmental shock or stress, as their jobs may offer little protection against employment disruptions. People living in poverty are also more likely to live in high-risk areas with greater degrees of exposure to those risks. They are less likely to be insured against disasters or other adverse events, and they have fewer resources available with which to protect or replace their assets. Often individuals in poverty also do not have adequate access to information about adaptation options. The lack of access to resources presents additional challenges for these families who are often unable to move to new locations, secure new jobs, or to adapt to change in high-risk areas.

Estimates from the U.S. Census Bureau’s 2016 American Community Survey show approximately 11.1% of the population in St. Tammany Parish living below the poverty line. This rate is lower than the state of Louisiana (19.7%), the Gulf Coast region (17.1%) and the United States (15.1%). The percentage of individuals below poverty in St. Tammany Parish has risen 1.4% since the 2000 census. According to the U.S. Department of Housing and Urban Development, 28.8% of St. Tammany Parish households were characterized as “low- and moderate-income” in 2014.

⚠️ Implications for Risk

Individuals and families with lower incomes and little or no savings are more vulnerable to any number of flood- or disaster-related impacts, including healthcare or injury-related costs, direct property damage, damages to their vehicles, interruptions to transportation infrastructure or transit services, effects on employers, and interruptions to schools or childcare. Any of these can be the last straw that pushes a vulnerable household into economic crisis.
Homeownership and Cost of Housing

In 2016, 77.1% of non-vacant housing units in St. Tammany Parish were owner-occupied and 22.9% were renter-occupied, compared to 80.5% owner occupancy and 19.5% renter occupancy in 2000. In 2016, the median gross rent in St. Tammany Parish was $998, compared to $800 statewide in Louisiana.

In 2016, approximately 53% of renters in St. Tammany Parish were rent burdened, spending at least 30% of their household income on rent, and 25% of renters in St. Tammany Parish were severely rent burdened, spending at least 50% of their household income on rent. This is an increase from 2000 when 40% of renters were rent burdened and 19% were severely rent burdened. Cost-burdened households have fewer resources to dedicate to preparations and adaptation measures that would make them more resilient to future hazards.

Insurance Affordability

Adequate insurance coverage is a critical hedge against the potential cost of disasters, and anyone who owns property in a hazard-prone area should invest in both a home- or property-owner’s policy as well as flood insurance. In the wake of a disaster, property that is underinsured or lacks appropriate coverage places greater burdens on the owner’s own financial reserves and on public sector disaster recovery efforts.

However, both homeowner’s policies and flood insurance are becoming increasingly expensive and therefore increasingly difficult for households and businesses to afford. During the past decade, the cost of homeowner’s insurance has risen 50% nationwide. Within Louisiana, rates increased 67% from 2004 – 2015, and in the coastal zone, the increase was even higher at 85%. Between 2004 and 2015, the average homeowner’s insurance premium in St. Tammany Parish increased 150 – 175%, rising to more than $1,750 in 2015. This represents approximately 3 – 4% of household income for St. Tammany Parish residents. Rising premiums mean households have fewer resources to devote to efforts to reduce risk or to cover other expenses, resulting in increased vulnerability.

In 2017, the cost of National Flood Insurance Program (NFIP) policies rose an average of 6% nationwide. Increases can be much higher but are capped at 18% for any individual policy. Information regarding increases
in 2017 flood insurance premiums in St. Tammany Parish was unavailable. While these increases are intended to bring premiums up to actuarial rates that reflect true flood risk, one unintended consequence is that some policyholders are dropping their coverage, and fewer homeowners are purchasing new policies. Nationally, there has been a 10% decrease in the number of policies since 2012 when legislative changes were made to the NFIP. As of 2013, the parish had 3,392 repetitive loss and severe repetitive loss properties, 1,198 of which were not insured. The rising costs of flood insurance, combined with diminishing property values in high-risk areas, drains residents’ net worth and makes relocation financially impossible for many.

**Aging Population**

The physical, economic, and social vulnerabilities associated with aging—especially when layered with poverty, lack of insurance, and other factors—pose additional challenges for many older adults attempting to prepare for and recover from disasters, including floods. Since 1980, the median age of the parish’s residents has increased by 11.5 years.

An aging population has unique needs that must be considered when assessing vulnerability. Older residents are more likely to have mobility issues that make evacuation in the event of a storm more difficult for them. Older residents are also more likely to be on fixed incomes, which can make rising insurance costs and recovery efforts a significant financial burden.

"Insurance premiums have gone up, and the increase in population has caused stresses on our infrastructure."
—St. Tammany Parish Resident
POPULATION CHANGES
2000 – 2010
Between 2000 and 2010, many parts of the parish have seen a population increase.
Source: Data prepared by ESRI, sourced from U.S. Census Bureau, Census 2000 Summary File 1 and Census 2010 Summary File 1; For all basemap data see References

1 in 4 coastal residents have thought about moving

4 in 10 know friends and neighbors who have left

Source: Survey by National Association of Realtors and Center for Planning Excellence, 2013
Population Movement

In 2013, the National Association of Realtors and the Center for Planning Excellence conducted a survey of Louisiana’s Coastal Management Zone and found that 25% of coastal residents have thought about moving from their current home, and 40% know friends or neighbors who moved due to persistent challenges associated with living in the coastal areas, including the cost of flood insurance and potential flood damage.\(^{31}\)

St. Tammany Parish is no exception to this trend. Since 1970, the parish’s population has nearly quadrupled, increasing by more than 385%.\(^{32,33}\) Between 2000 and 2010 alone, the overall parish population increased 22%. The strongest population growth occurred in Madisonville, where the population grew by 111%. Abita Springs and Folsom experienced population growths of 25% and 23%, respectively, Pearl River and Lacombe saw a 17% population increase. Eden Isle and Mandeville’s population grew by 14% and 13%, respectively, Slidell’s population increased by 3%, and Covington’s grew 1%.\(^{34,35}\) This positive population growth can largely be attributed to evacuees from Hurricane Katrina in 2005. It appears that while population increased in existing communities, those with more land available grew the most. Incorporated and unincorporated places in St. Tammany Parish are all receiving communities, and the rapid population growth has in many instances overwhelmed the capacity of infrastructure, services, and cultural identity.

Implications for Risk

It makes sense that individuals, families, and businesses are choosing to relocate in response to the perception or reality of increasing risk in a given location. However, these shifts in population and economic activity can result in economic and infrastructure hardships for those who are relocating as well as the communities that they left behind and those to which they move. People will continue to move to St. Tammany Parish. The goal of this LA SAFE plan is to consider these movements in a strategic framework that can mitigate rising risks where possible, allowing people to remain in place or leverage the push and pull forces that lead to population relocation in order to maximize the positive impacts of relocation for all parties.

Increase in Development

The north shore of the lake has seen an increase in development over recent decades. This increase in impervious surfaces leads to increased flood risk.\(^{36}\)

Map Credits: Google Earth
3 Existing Conditions

Natural Assets
St. Tammany Parish’s natural assets include rivers, bayous, forests, and the Lake Pontchartrain shoreline.

Photo Credit: St. Tammany Parish Flickr
Natural Environment

Natural Assets

St. Tammany Parish is located on the eastern border of the Mississippi Delta, in the Lake Pontchartrain Basin, and north of Lake Pontchartrain. It comprises marshes in the southern parts that make up the Lake Pontchartrain shoreline, and bayous and rivers woven through the eastern side of the parish. About 25% of St. Tammany Parish’s area is water. The parish is primarily rural with an active timber industry; however, urban growth is altering this land use. St. Tammany Parish has seven municipalities and two census-designated places, all of which have seen tremendous population growth in the last three decades. Several smaller cities and towns are found along Lake Pontchartrain’s shores; larger cities and communities are located on the parish’s natural ridges. The parish’s waterways, state parks, and shoreline provide recreational, agriculture/aquaculture, and economic opportunities. However, the low topography and watery landscape of the parish also leave it heavily exposed to floods of all types.

Nature and Recreation

Top: The Tammany Trace is a former railroad corridor that was converted to a pedestrian and bicycling trail. The trail connects Covington, Abita Springs, Mandeville, Lacombe, and Slidell.  
*Photo Credit: St. Tammany Parish Flickr*

Middle Left: A sign points to various recreational amenities within Fontainebleau State Park.  
*Photo Credit: St. Tammany Parish Flickr*

Middle Right: Fontainebleau State Park beach area is a popular summer attraction.  
*Photo Credit: St. Tammany Parish Flickr*

Bottom: Abita Creek Flatwoods Preserve.  
*Photo Credit: St. Tammany Parish Flickr*
More than 25% of the parish is water and wetlands, with marshes in the southern and eastern areas.
Housing and Development

In a planning context, “development” refers to the way in which residential and commercial structures, transportation facilities, stormwater management infrastructure, public amenities, and services are designed, located, expanded, and spatially organized and networked. Planning and zoning are tools communities can use to help ensure that development results in low-risk, affordable housing stock, efficient transportation systems, access to jobs and services, and economic sustainability while preserving natural and cultural assets and supporting a high quality of life.

Historical Settlement and Development Patterns

The natural landscape has heavily influenced past and current development patterns in St. Tammany Parish. Before European settlers arrived in present-day St. Tammany Parish, the Acolapissa people lived in the area, and the tribe later joined the Houma when French settlers drove them out of the Pearl River region. Other tribes who lived there include the Choctaw and Tchefuncte. The area was attractive to settlers for its clear spring-fed creeks, rivers, and mild climate. Historic development patterns using the gridiron plan can be observed in the cities of Abita Springs, Covington, Mandeville, and Madisonville, where streets are perpendicular to each other and settlement is concentrated.
In the early 19th century, tourists came by steamboat, going north across Lake Pontchartrain, on a five-hour journey. Many were New Orleans residents who went to vacation, escape the city’s summer heat, enjoy the small-town life, and appreciate the area’s flora and fauna. To accommodate the visitors, many hotels, tourist attractions, and related services were developed. A lighthouse was built near Madisonville to help guide vessels from Lake Pontchartrain to the Tchefuncte River entrance. In the later part of the 19th century, the railroad from New Orleans to Meridian, MS prompted the founding of Slidell. Within six years, the East Louisiana Railroad was completed, which connected New Orleans to Slidell, Lacombe, Mandeville, Abita Springs, and Covington.

To provide another connection between New Orleans and the Northshore, the first bridge across Lake Pontchartrain was built in the early 20th century. It was constructed near Eden Isle and became part of what is now US 11. In 1956, the Lake Pontchartrain Causeway opened to connect the Northshore communities to New Orleans. In the late 1960s, I-12 opened, connecting I-10 to I-59 and running parallel to US 190 and along the Northshore through St. Tammany Parish, serving as a bypass for I-10 in New Orleans.

Since the early 19th century, commercial and residential development has flourished on the Northshore. The thriving tourist economy brought many to this area. A well-established timber industry in the parish’s northern region contributed to a healthy and steady economy, further benefiting the parish’s population and increasing infrastructure investments.

“Slidell has come up tremendously. I mean, including the businesses and the malls and subdivisions [that] are coming out of it. It’s blown up.”
—St. Tammany Parish Resident

**Connecting New Orleans to the Northshore**
The Lake Pontchartrain Causeway, 23.8 miles long and believed to be the longest continuous bridge over water, connects New Orleans to Mandeville.
LAND USE PER RISK ZONE

To provide decision makers with the best data to inform future development, LA SAFE has represented projected risk onto a map of the parish’s current land use. In St. Tammany Parish, development concentrated along the shores of Lake Pontchartrain and even today, the growth zone boundary is indicated for the area between the shores of Lake Pontchartrain to approximately 15 miles inland. As sea levels rise, shoreline erosion continues, and development occurs, this area will continue to be at high flood risk.

Source: Louisiana Speaks Regional Plan and Louisiana Recovery Authority, 2007; St. Tammany Parish Government Department of Planning and Development; For all basemap data see References

Legend
- Land
- Wetlands
- Water
- Non-Federal Levee
- CPRA Proposed Levee
- Parish Boundary

“They need to build in the city. Those town homes they put in the heart of the city were a good thing.”

—St. Tammany Parish Resident
Current Development Patterns

Present-day infrastructure investments continue to be concentrated along Lake Pontchartrain’s shorelines. The significant influx of residents and subsequent development demands following Hurricane Katrina put enormous development pressure on the area. As a result, existing communities such as Madisonville, Folsom, and Abita Springs have grown significantly. Within the parish, four critical highways—I-10, I-12, I-55, and I-59—provide national access to the region. Corporate headquarters of Chevron Gulfcoast and other major companies are located here. Because many people live on the Northshore but work in New Orleans, traffic congestion is a major issue. To better guide development and growth, the parish is currently updating its ordinances and is in the process of finalizing a unified development code to be adopted in 2018.

Existing commercial and office development is concentrated along the I-12 corridor, on other major roads, and in adjacent communities.

St. Tammany Parish’s area is comprised of 25% water and 75% land. Although land loss is not a significant hazard in the parish, shoreline erosion and development are increasing flood risk from both rivers and storm surge. To decrease flood risk, stormwater management best practices such as green infrastructure are encouraged, and regulations for elevating structures and no-fill elevation exist. Nevertheless, almost 6,000 structures are at flood risk from storm surge. These structures are located along Lake Pontchartrain’s shorelines where current storm surge heights are estimated between seven to nine feet, and future storm surge is expected to exceed 13 feet. The Northshore area—which includes Madisonville, Mandeville, and the southeastern part of the parish—is expected to see significantly higher storm surges and the most severe land loss over the next 50 years. These areas are currently growing the fastest.

Implications for Risk

Development decisions made today about where to locate buildings, roads, homes and businesses will affect the parish well into the future. The New Directions 2025 – St. Tammany Parish Comprehensive Plan calls for future development that generally follows historical development patterns. At the same time, the 2017 Coastal Master Plan anticipates that storm surge will significantly increase over the next 50 years if no actions are taken. In order to minimize economic damages from storm surge while accommodating projected population growth, St. Tammany will need to concentrate assets, encourage greater density in future development, and build structures in a way that reduces damage from flooding.
Transportation

“We have a major transit disconnect, and we don’t have a transit system.”
—St. Tammany Parish Resident

St. Tammany Parish is an automobile-centered suburb on Lake Pontchartrain’s northshore. For many years, the parish functioned as a rural bedroom community to New Orleans; however, with the addition of the Lake Pontchartrain Causeway and the I-10 Twin Span Bridge, population has steadily increased, gradually urbanizing the parish. Despite significant population and economic growth, St. Tammany Parish does not have an official fixed-route public transportation system. According to the 2016 American Community Survey 5-Year estimates, 96% of both owner-occupied housing units and renter households had at least one vehicle available; 65% of households had at least two vehicles available.40

Presently, STAR Transit (St. Tammany Area Transportation) is the sole public transportation option for parish residents. A non-emergency, demand-response system, STAR Transit provides curb to curb service on a call-in, first come, first served basis—transporting passengers to and between destinations. STAR offers rural transportation Monday through Friday from 6:00 a.m. to 6:00 p.m. and urban transportation Monday through Saturday from 6:00 a.m. to 6:00 p.m. For parish residents age 60 and older, transportation is free Monday through Friday from 7:00 a.m. to 2:30 p.m. The seniors’ service is managed by St. Tammany Parish Government in partnership with the Council on Aging St. Tammany (COAST). Seniors pay half-price fares when using the system at other times.
TRANSPORTATION INFRASTRUCTURE

The map shows the parish’s major transportation infrastructure, including roadways, navigation canals, the airport, and Amtrak station. Evacuation routes are highlighted.

Sources: Research and Innovative Technology Administration’s Bureau of Transportation Statistics (RITA/BTS) and National Transportation Atlas Databases (NTAD) 2006; OpenStreetMap 2017; For all basemap data see References

"It would be great to have a high-speed alternative connecting St. Tammany to New Orleans—need something more than the Causeway."

—St. Tammany Parish Resident
Two interstates, I-59 and I-12 traverse St. Tammany Parish. I-59 runs north to south for 11.48 miles in east St. Tammany; I-12 runs east to west in southern St. Tammany. I-12 connects the parish’s densest areas—Slidell, Covington, and Mandeville—and is the main thoroughfare through the parish. As a result, I-12 experiences significant traffic congestion on a daily basis.

“It’s hard to get to Walmart in Covington. I-12 is bumper to bumper...”
—St. Tammany Parish Resident

St. Tammany Parish has installed nine park-and-ride lots to date to help abate traffic woes. Commuting residents who choose to rideshare can park at the lot and carpool, helping reduce the volume of cars on roads, especially during morning and afternoon peak hours. Locations of the park-and-rides are:

- Abita Springs
- Lacombe
- Centerpoint
- Koop Drive
- Mandeville
- Carollo Trailhead
- North Boulevard
- Oak Harbor
- Highway 41

St. Tammany also has a regional airport with a 3,000-foot runway.

Implications for Risk

Transportation infrastructure may be impacted by floods in two main ways: short-term submersion and long-term damage from water, scour, or salt. Short- or long-term loss of transportation infrastructure can have serious impacts on everything from evacuation and repopulation, disaster recovery and logistics, and economic health—both sector-specific and broad-based. Mitigation, such as elevation, flood proofing, and relocation, can dramatically reduce transportation infrastructure vulnerabilities. In many cases, properly designed transportation infrastructure can double as mitigation in itself, providing retention and detention facilities, drainage, or spillway capacity. Roads can also exacerbate flood conditions by cutting off natural drainage channels, causing water to pool. Bridges have been and will continue to be impacted by tropical storms. Because future storms are predicted to increase in strength, considerations regarding how to mitigate damage to the Causeway and other bridges in the parish must be made.
St. Tammany Parish Trails
The parish has many trails, including the Tammany Trace.
*Photo Credit: St. Tammany Parish Flickr*

Tammany Trace
The Tammany Trace is a bicycle and pedestrian pathway that connects Covington, Abita Springs, Mandeville, Lacombe, and Slidell.
*Photo Credit: St. Tammany Parish Flickr*

Amtrak Station
The Slidell Amtrak Station was built in 1913 and is on the National Register of Historic Places. As of 2018, the station and rail line are still in use.
*Photo Credit: Google Maps Street View*
Economy

St. Tammany’s economy includes more than 8,300 establishments. The leading industries within the parish by gross regional product (GRP) are government (10.9% of GRP), manufacturing (10.5%), and wholesale trade (9.6%). Meanwhile, its biggest employers by industry are government (15,566), retail trade (13,964), and healthcare and social assistance (12,983). Individually, four of the five biggest employers in the parish are in the healthcare sector.

As the parish continues to grow, there will be a continued need for workforce development. Local leaders have identified the need for skilled workers in the construction, maritime, and energy sectors. While most of these positions will require training beyond a high school education, many are accessible by completing a training course or two-year degree. As demonstrated by comments during the public meetings, residents may not be aware of these opportunities. The LA SAFE process also included outreach to industries in these sectors, and common concerns that emerged included workforce development, career readiness and awareness, land use policy, and flood risk. These concerns and economic goals were further echoed in other parishes across the LA SAFE region, reflected in the regional and parish plans outlining the need to sustain core employers while also diversifying economic assets.
JOB CENTERS
The majority of the parish’s job centers are located on high ground. Growing employment sectors include healthcare and retail.

Sources: U.S. Census Bureau, Center for Economic Studies, 2014; Infogroup published under U.S. Department of Labor guidance; For all basemap data see References

Legend
Job per Census Block Group
- 0 - 50
- 50 - 100
- 100 - 200
- 200 - 500
- 500 - 1000
Water
Wetlands
Parish Boundary

The Tap Room at the Abita Brewery
Photo Credit: Louisiana Office of Tourism
Healthcare and Social Services

The healthcare and social services industry is a major employer in the parish. There are more than 960 businesses employing more than 12,900 people and generating nearly $890 million in revenue. Retail is concentrated in the Covington-Madisonville-Mandeville triangle, including Art on Columbia in downtown Covington (pictured).

Photo Credit: Louisiana Office of Tourism

Manufacturing

The manufacturing industry is an important contributor to the parish’s economy, including more than 230 businesses, which employ more than 3,600 people. It generates revenue of more than $1 billion and is the second-largest contributor to parish’s GRP. The industry is predominantly located along the Mandeville-Covington corridor and in the Slidell area.

Photo Credit: Louisiana Office of Tourism
Top 5 Employers

1. St. Tammany Parish Hospital
   employs 1,611 people

2. Ochsner Medical Center-Northshore
   employs 1,359 people

3. Home Health of St. Tammany Hospice
   employs 1,000 people

4. Slidell Memorial Hospital
   employs 959 people

5. Textron Systems Marine & Land Systems
   employs 901 people

Implications for Risk
The facilities and infrastructure that support these industries are exposed to flood hazards the same as any other component of the built environment. When such facilities or assets are damaged or shut down by hazard events, they have ripple effects on the surrounding community. These effects may take the form of airborne or waterborne hazardous material releases, supply-chain interruptions, or economic disruptions that drag on household economies and can negatively impact community resilience. Over the longer term, significant impacts to key business sectors can also drive down tax revenues and thus undermine the fiscal stability of the parish, generate lawsuits and insurance claims that can adversely affect business confidence, and diminish the parish’s ability to retain and attract employers.

Critical Facilities in FEMA Floodplain
Critical facilities such as hospitals, roads, schools, and shelters play a central role in disaster response and recovery. In St. Tammany Parish, about 27% of critical facilities are within the floodplain.

Source: NOAA Coastal County Snapshots for St. Tammany Parish, Louisiana; based on USGS Structures Database
Economic Decline and Disruption

Increased storm surge flood risk on Lake Pontchartrain’s northshore and shoreline erosion have the potential to increase St. Tammany Parish’s economic vulnerability. Even with the full implementation of the 2017 Coastal Master Plan, CPRA estimates damage of $1 billion per year over the next 50 years. A portion of this damage will be to the parish’s infrastructure. Many of the parish’s largest employment sectors—retail, healthcare and social services, and accommodation and food services—depend on parish infrastructure for access. St. Tammany is the fifth most-populated parish in Louisiana and a significant contributor to the Greater New Orleans area economy, but even small storms and heavy rain events can cause flooding that disrupts economic activity. Large storms negatively affect smaller but growing industries such as recreation and tourism by impacting infrastructure and causing business closures. Development can increase the likelihood of such disruptions by, for example, increasing the cover of impervious surfaces that in turn increase flood risk—if future development does not account for this condition.

“There was never flooding in Eden Isle they said they never had flooding during hurricanes. And now they do. So, yeah, I can see seven feet in 50 years.”
—St. Tammany Parish Resident

⚠️ Implications for Risk

Many areas of St. Tammany Parish face flood risk from precipitation events. Nearly all residential and commercial developments in the parish are located along the north shore of Lake Pontchartrain. While this area has the largest concentration of population and economic activities, its stormwater management relies on natural drainage to Lake Pontchartrain. Storm surge, subsidence, and sea level rise also affect this area, contributing to nuisance flooding and reducing the effectiveness of drainage systems. In short, the area that boasts the most activity in the parish is the most susceptible to flooding, a risk that is increasing due to sea level rise, increased storm intensity, and shoreline erosion.
Economic Opportunities

Recent developments in St. Tammany Parish such as the Advanced Technology Center on the Northshore Technical Community Center campus create a vibrant economic climate. This particular addition expands the STEM (science, technology, engineering, and mathematics) campus the college opened in 2017 offering programs in biological sciences, maritime industry, information technology, and business. Additionally, Tamanend, a comprehensive mixed-use community located in St. Tammany Parish’s Northshore, is expanding and Stirling Properties is creating a retail town center in Slidell.

When polled at Meeting 3 about the types of job opportunities they would like to see expanded in the parish, participants recognized that St. Tammany Parish must continue to diversify its economy to retain its workforce and reduce commuters. In addition to building on existing industries—tourism, healthcare, and retail—there are three emerging industries that show promise for gaining a stronghold: alternative energy, ecotourism, and technology.

The parish has undeveloped areas available that could be suitable for alternative energy investments, such as windmills and solar farms. Investing in this industry will provide St. Tammany Parish the opportunity to be a leader in renewable energy production, reduce greenhouse gas emissions, and develop programs designed to prepare the workforce that would be needed to fill new jobs in the alternative energy sector.

Building on the long history of tourism in the parish, St. Tammany Parish can capitalize on the state parks, the Big Branch Marsh National Wildlife Refuge, the numerous water bodies, and other places of interest for ecotourism. Ecotourism—tourism that capitalizes on the natural beauty and resources of an environment—is an industry that can provide economic viability for areas with high flood risks.

St. Tammany Parish Government received a Digital Counties Survey Award because the parish “effectively and efficiently used computer technologies to serve their citizens, align with county priorities, streamline operations, achieve cost savings and demonstrated collaboration within and outside of county government” according to the National Association of Counties. To further support its local government and to advance related technologies, the parish could invest in the technology sector. Other technology industry investments could support transportation, ecotourism, and the renewable energy sector long term.

"It's important to go into green industries. Companies are looking for people educated in that area."

—St. Tammany Parish Resident
Parish Assets
During the community engagement process, parish residents identified the natural beauty, love for quality of life, community closeness, and safety as the parish’s cultural strengths.

Photo Credits: St. Tammany Parish Flickr
Heritage and Culture

Known as “l’autre côté du lac”—the other side of the lake—St. Tammany Parish became a destination point for affluent New Orleanians who traveled to the Northshore for fresh air, spring water, and a resort lifestyle during the 19th century. From the early 1940s to the late 1990s, the parish established several refuges and state parks, including the Bogue Chitto National Wildlife Refuge, the Big Branch Marsh National Wildlife Refuge, Fontainebleau State Park, and Fairview-Riverside State Park. These environmentally protected areas offer places for visitors and residents to enjoy the parish’s natural beauty.

Residents enjoy the relatively undeveloped suburban areas, which retain their small-town feel and intimacy with their neighbors. Multiple farmers’ markets, street festivals, and larger celebrations such as Mardi Gras parades and balls punctuate the yearly calendar. Desire for this lifestyle has brought about incredible growth in population.

The population increase has strained the once-easy relationship residents long enjoyed with their culture and recreational environment. Even 20 years ago, residents identified their values as they relate to the natural environment and recognized some of the tough decisions they would have to make. A survey of 500 St. Tammany Parish voters indicated that limiting commercial and residential growth, protecting fragile ecosystems, and implementing building requirements and standards were top priorities to safeguard the character and culture of the parish.

St. Tammany Parish is at a unique crossroads regarding its cultural identity. With abundant natural resources, green spaces, and wildlife habitats, the parish has a connection to its natural environment that more urbanized parishes do not experience.

However, faced with explosive growth and urbanization, St. Tammany Parish must make critical decisions on how to direct its future cultural and recreational assets now if it is to maintain its current identity.

“Things like...fairs are important to maintain small-town culture.”
—St. Tammany Parish Resident
4 Vision and Strategies
50-Year Vision
Building with Nature

With abundant high ground and natural assets, St. Tammany Parish becomes a receiving community where populations from higher risk areas migrate. In tandem with community input, LA SAFE envisions adaptation measures that respond to this rapid growth, including nature preservation at water edges to mitigate flood risk, limited and elevated development in the floodplain, and new growth corridors and town centers on higher ground.

Ecological Preservation and Floodplain Management
Water edges along the lake and river banks are most vulnerable to flooding.
- Environmental assets and natural buffers in floodplains and critical drainage areas are preserved and protected.
- Linear park zones along water edges allow controlled flooding and provide opportunities for recreational and educational activity.
- Existing critical infrastructure, homes, and businesses in the floodplain are elevated.
- New development in the floodplain is restricted.

Urban and Suburban Centers
Areas north and south of I-12 present opportunities for urban infill and suburban expansion.
- Denser, mixed-use development is encouraged on higher ground near transportation nodes.
- New development is restricted within the parish-defined growth boundary.
- Local economies are strengthened and diversified.
- Multimodal transit options link communities.

Integrated Stormwater Management
Resilient systems require a systemic approach to water management that considers land use, drainage systems, soils, and ecology.
- Stormwater management is incorporated in all new development and redevelopment projects.
- Engineered landscapes and streetscapes delay and store stormwater while providing amenities with multiple benefits to the community.
- Green infrastructure holds water upslope, as close to the source as possible.
- Smart retrofits use permeable materials to replace impervious surfaces.
50-YEAR ST. TAMMANY PARISH VISION

The St. John the Baptist Parish vision includes designing new growth corridors and centers, protecting public assets, establishing resilient neighborhoods, enhancing economic engines, and adapting to rising waters.

Toolkit of Interventions

- Nature Preservation in Riverine Floodplains
- Hardscape Retrofits and Consolidated Services in Town Centers
- Water Storage at Right-of-Way Intersections
- Village-in-the-Woods Prototype Development with Tammany Trace Connection
- Water Transportation

Legend

- Existing Transportation Routes
- CPRA Proposed Levee
- High Ground
- Low Ground (High Flood Risk)
- Salt/Brackish Water
Section Diagrams
The diagrams below show how development in the low-lying areas faces an increased risk from upstream development.
Pre-European Settlement—Natural Condition
Natural waterways include rivers and Lake Ponchartrain. Upland forests absorb rainfall, and floodplains adapt to inundation from water.

Current Condition
The increase in development amplifies the severity and speed of flood events. Impervious surfaces related to development have limited ability to absorb water during a storm event, whereas in a forested condition, the ground can absorb some of the rainfall. With impervious surfaces, more water flows more rapidly either off-site or into stormwater systems, putting strain on these systems. This strain intensifies as water moves downstream. An increase in upstream development leads to an increase in downstream flooding.

50-Year Vision—Slow, Store, Drain if Necessary
As St. Tammany Parish continues to develop in the future, the opportunity to address flood risk reduction is two-fold: adapting low-lying developments to increased flood risk and sea level rise and managing water strategically in upstream developments.
Enhance Economic Engines and Adapt to Rising Waters

Areas that can expect to experience population decline and economic losses, up to and including full community-scale resettlement, as environmental conditions deteriorate and repetitive severe flood events take place.

Design New Growth Corridors and Urban Centers

Low-risk areas have development opportunities to receive populations and economic activity from more flood-prone environments.

Moderate Risk

>0 – 6’ projected storm surge flood depths or within the current 100-year floodplain

Protect Assets and Establish Resilient Neighborhoods

Areas conducive to maintaining current population levels and economic trends, provided such communities orient future development and mitigation activities in alignment with future flood risk projections.

Low Risk

Minimal storm surge flood risk projected and outside the current 100-year floodplain

High Risk

>6’ projected storm surge flood depths

Photo Credit: St. Tammany Parish Flickr
50-Year Vision by Risk Level

Dealing with flood hazards and managing risk have always been part of life in St. Tammany Parish, and a great deal of work has been done in recent years to help the parish and the region continue to thrive amidst a changing environment and risk profile. The 017 Coastal Master Plan, along with St. Tammany Parish’s Natural Hazard Mitigation Plan, Stormwater Management Plan, and strong ordinances, are guiding investments in protection and nonstructural projects designed to address land loss and coastal erosion and reduce economic losses, which is essential to the future of Louisiana’s coastal communities.

LA SAFE has created an opportunity to build upon these plans and ongoing investments by putting community members and stakeholders at the forefront of the planning process. The LA SAFE team worked with them to develop a shared vision for the future of their parish and region; set priorities to inform a holistic approach to achieving resilience; and vet local, parish-wide, and regional solutions. This process enabled residents and local stakeholders to take on greater ownership of the strategies needed for their communities to successfully mitigate flood risk and adapt to future hazards. The following recommendations are the result of that community-driven process.

LA SAFE promotes new growth corridors and urban centers in low-risk areas, protects assets and establishes resilient neighborhoods in areas of moderate risk, and enhances economic engines and adapts to rising waters in high-risk areas.
LOW-RISK ZONE
Risk scenarios are based on CPRA’s 50-year flood depth projections under a Medium Environmental scenario and FEMA’s proposed DFIRM floodplain data.
Sources: CPRA Flood Risk Medium Scenario Modeling Data 2017; FEMA Preliminary DFIRM 100-year floodplain data for St. Tammany Parish 2008; For all basemap data see References

Low Risk
Minimal storm surge flood risk projected and outside the current 100-year floodplain

St. Tammany Parish’s Low-Risk Area occupies most of the parish but is intersected by many water bodies. Current characteristics of these areas include single-family residences on larger properties. Most of the low-risk area is rural and undeveloped. There are few to no public transportation options and traditional stormwater management facilities. Located on the natural terraces, the area is growing geographically toward the east and west, converting open land into subdivisions and connecting existing towns within the parish. Currently, there is minimal to no flood risk from storm surge in this area, although heavy downpours have been flooding streets.

Legend

- Land
- Wetlands
- Water
- Non-Federal Levee
- CPRA Proposed Levee
- Parish Boundary
50-Year Vision for Low-Risk Areas:
Design New Growth Corridors and Urban Centers

Lower-risk areas are projected to have economic growth, population increases, and minimal flood risk. The low-risk area vision is characterized by—

- Access and connectivity to recreational amenities
- Greater transportation options
- Improved stormwater and subsidence management
- More green spaces and preservation of natural areas
- Increased housing choices

When surveyed at Meeting 3, 57% of St. Tammany Parish participants strongly agreed, 23% agreed, and 11% slightly agreed with this vision for the future of low-risk areas. There was no disagreement, and 9% were neutral toward this vision.
Plan View of 50-Year Vision, Covington Area

Plan View of 50-Year Vision, Slidell Area

Legend

- Stormwater storage
- Potential development with green infrastructure
- Retrosfits with pervious paving and green infrastructure
- Complete green streets

- Urban Growth Boundary
- Tammany Trace
- Potential pedestrian network to link services and amenities
- Water-based transit
- Levee
- Existing park
- Existing school
- Existing civic institution
- Existing healthcare facility
- FEMA 100-Year floodplain
- Critical drainage area
- Wetlands

Sources: For all basemap data see References
Moderate Risk
>0 – 6’ projected storm surge flood depths or within the current 100-year floodplain

This area is currently in between the shorelines of Lake Pontchartrain and the natural terraces as well as along the existing rivers and streams in St. Tammany Parish. In the southern part of the parish, some of the moderate-risk areas are developed but concentrated geographically, such as the Eden Isle community and parts of Slidell. Here, restoration and protection projects are planned to reduce storm surge flood risk, which can reach up to 15 feet.

Legend

- Land
- Wetlands
- Water
- Non-Federal Levee
- CPRA Proposed Levee
- Parish Boundary
Perspective View of 50-Year Vision

- Ecotourism Jobs and Attractions
- Connectivity among Parks and Trails
- Rainwater Collection
- Retention Pond
- Farmers’ Seawood Market
- Community Center
- Healthcare Facilities
- Enhanced Evacuation Route
- Protected Natural Assets
- Hike and Bike Nature Trails
- Multi-modal Regional Transit
- Small Business Incubator
- Green/Blue Boulevard
- Bike Lanes
- Coastal Restoration/Clean Tech Workforce Training Facilities
- Pervious Paving
50-Year Vision for Moderate-Risk Areas: Protect Assets and Establish Resilient Neighborhoods

Moderate-risk areas are projected to have land loss in surrounding areas, moderate local flood risk, and minimal change in population. The moderate-risk vision is characterized by—

- Coordinated and carefully placed development
- Ecological preservation and restoration
- Nature-based stormwater management such as retention and protection of natural assets
- Improved transportation options
- Increased connectivity to recreational spaces and improved access to nature
- Denser, mixed-use developments

When surveyed at Meeting 3, 59% of St. Tammany Parish participants strongly agreed, 24% agreed, and 9% slightly agreed with this vision for the future of moderate-risk areas. 9% were neutral toward this vision, and there were none who disagreed.
**HIGH-RISK ZONE**

Risk scenarios are based on CPRA’s 50-year flood depth projections under a Medium Environmental scenario and FEMA’s proposed DFIRM floodplain data.

*Sources: CPRA Flood Risk Medium Scenario Modeling Data 2017; FEMA Preliminary DFIRM 100-year floodplain data for St. Tammany Parish 2008; For all basemap data see References*

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**High Risk**

>6’ projected storm surge flood depths

Most of these areas currently experience a high level of flood risk. As seas continue to rise and the Louisiana coastline continues to be negatively impacted, these areas will experience unsustainable levels of flood risk. Storm surge impacts are evident, and parish and state investments for shoreline protection and marsh restoration are focused in this region. There is hardly any development because this area consists of state parks and other protected natural lands, and it provides the access points for boats into Lake Pontchartrain. The communities of Eden Isle and Lewisburg are at significant flood risk from storm surge, now and in the future. Many homes are elevated 10+ feet.

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**Legend**

- **Land**
- **Wetlands**
- **Water**

- ······ Non-Federal Levee
- CPRA Proposed Levee
- Parish Boundary
50-Year Vision for High-Risk Areas:
Enhance Economic Engines and Adapt to Rising Waters

High-risk areas are projected to have continued land loss, high flood risk, and a decline in population. The high-risk area vision is characterized by—

- Repurposing of existing structures to meet demand for housing and commerce
- Minimized new development and elevated or floating homes
- Improved evacuation routes
- Alternative energy industry, ecotourism, and coastal restoration workforce training
- Public boat launches and fishing piers
- Access to natural assets, including recreational paths along canals and levees

When surveyed, 64% of St. Tammany Parish participants strongly agreed, 15% agreed, and 12% slightly agreed with this vision for the future of high-risk areas. Three percent slightly disagreed with this vision while 6% were neutral toward it.

Legend

- Water Management
- Education, Economy, and Jobs
- Housing and Development
- Culture and Recreation
- Transportation

Perspective View of 50-Year Vision
The moderate-risk vision presents a future with clustered elevated housing, integrated stormwater management, and access to recreation.
Plan View of 50-Year Vision, Slidell Area

Legend

- Wetlands Education Center, Recreational Fishing, Ecotourism
- Wetlands

Sources: For all basemap data see References

- Elevated Homes
- Elevated Roads without Impacting Hydrology
- Coastal Restoration Workforce Training Facilities
- Public Boat Launch
- Improved Evacuation Routes
- Public Boat Docks
- Commercial Fishing and Aquaculture
- Recreational Access to Water
Adaptation Goals and Strategies

This section includes background on each goal followed by a description of the strategy and specific actions needed to implement the strategy. Through the LA SAFE engagement process, parish residents, leaders, and stakeholders provided input to create these goals.

Goal 1: Manage Flooding and Subsidence
Implement water management strategies that are based on natural systems and address all scales, which include regional, parish, and community programs as well as initiatives targeted to individual property owners.

- Strategy 1: Retain and detain stormwater
- Strategy 2: Reduce impervious surfaces
- Strategy 3: Review and update stormwater policies and programs
- Strategy 4: Reduce the impact of storm surge

Goal 2: Direct Growth to Low-Risk Areas
Create safe, inclusive, and walkable communities with amenities that attract and retain residents of all ages.

- Strategy 1: Encourage focused, mixed-use development patterns to promote public health through walkable/bikeable neighborhoods
- Strategy 2: Create and maintain a diverse and resilient housing stock for people at all income levels

Goal 3: Improve Mobility Throughout the Parish and Region
Support a resilient transportation system that includes multiple modes of transportation and promotes the creation of walkable communities.

- Strategy 1: Alleviate congestion
- Strategy 2: Expand and diversify transportation options
- Strategy 3: Support Complete Streets to encourage a more bikeable, walkable environment and community connectivity
**Goal 4: Strengthen and Diversify Local Economies**

Integrate risk and adaptation practices into all levels of government and educational systems. Build a robust economy that diversifies the parish’s economic base, supports residents’ entrepreneurial spirit, and trains and retrains parish workers in emerging industries.

- **Strategy 1:** Expand the local workforce
- **Strategy 2:** Improve career ladders and links to workforce development
- **Strategy 3:** Retain existing business and develop new business opportunities throughout the parish

**Goal 5: Retain Local Culture and Enhance Recreation Opportunities**

Retain the parish’s culture and values—arts, music, food, and the appreciation of the land and water—as residents migrate to northern parts of the parish. Incorporate diverse recreation opportunities—from fishing, bird watching, and kayaking in higher-risk areas of the parish to more traditional parks and open spaces in the low-risk areas of the parish—to promote a healthy environment that allows residents to experience the parish’s natural beauty.

- **Strategy 1:** Protect and use river and lakefront amenities to their fullest
- **Strategy 2:** Develop a cohesive vision for recreation in the parish
- **Strategy 3:** Combine drainage and green space features with recreational and cultural components
Changing flood risks in the parish have further emphasized the need for effective stormwater management and thoughtful development. Many green infrastructure site-design practices can reduce the cost of infrastructure while maintaining or even increasing the value of the property.
GOAL 1  Manage Flooding and Subsidence

Strategy 1  Retain and detain stormwater
Action A:  Protect and restore shoreline habitats.
Action B:  Increase retention areas throughout the parish.
Action C:  Promote the use of shared detention areas to adjacent property owners.
Action D:  Retrofit detention areas to also manage water quality.
Action E:  Create an “Adopt-a-Ditch (or Bayou)” or “Maintain the Drain” program.

Strategy 2  Increase pervious surfaces
Action A:  Incorporate green infrastructure into development designs and drainage updates.
Incorporate green streets infrastructure and water management into road design.
Action B:  Expand green space requirements to also manage water.

Strategy 3  Review and update stormwater policies and programs
Action A:  Conduct an audit of all parish plans, regulations, and policies relevant to stormwater regulation and amend development codes to achieve consistency with stormwater management best practices across all departments.
Action B:  Develop a regional stormwater management plan.
Action C:  Continue to develop and update stormwater utilities that create fee-based services to help pay for green infrastructure flood risk reduction projects.
Action D:  Provide incentives for private developers to handle stormwater on site.

Strategy 4  Reduce the impact of storm surge
Action A:  Sufficiently elevate structures in moderate- and high-risk areas.
Action B:  Conserve and restore wetlands.
Wetland Park
Wetland parks divert and temporarily store water during heavy rain events, provide for natural habitat recovery, and offer a public space for education and recreation.

Strategy 1: Retain and detain stormwater

Green space is a significant component of the way of life for residents of St. Tammany Parish, and these abundant wetlands and green spaces serve as natural stormwater retention areas. Integrating green space components and smart stormwater management principles into low-risk areas would decrease potential flood damage, reduce infrastructure maintenance and repair costs, and improve the overall quality of life for residents of the parish.
Existing System

Pave
Pipe
Pump

Proposed System: Delay and Store Runoff

Delay
Hold water upslope to minimize flooding in low-lying areas.

Store
Increase water storage downslope to mitigate flooding and subsidence.

Drain When Necessary
Alleviate loads on pumping stations, which reduces energy use and cost.

Retain
the holding of stormwater permanently in basins, ponds, and cisterns. Retention basins allow stormwater to infiltrate the ground and for the collected stormwater to be repurposed for other uses such as irrigation.

Detain
the holding of stormwater temporarily in a swale, detention basin, or other features. Detention reduces peak discharge by allowing the slower and more controlled release of runoff and does not allow for the permanent pooling of water.
St. Tammany Parish’s shoreline features cypress forests and wetlands. These habitats provide protection from storm surge and serve as recreational areas for residents and tourists and, as such, are important natural assets to St. Tammany Parish. To protect these habitats, the parish should continue strategies such as limiting development in sensitive areas and exploring new stormwater management practices.

**Steps needed:**

- Identify areas to restrict use.
- Adopt ordinances to restrict development and protect shoreline habitats.
- Study drainage patterns and explore options to use protected areas for stormwater retention and storm surge buffer.

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**Marsh Habitat**

Marshes along Lake Ponchartrain’s shoreline are important habitats as well as defense against storm surge. 

*Photo Credit: St. Tammany Parish Flickr*
To reduce the demand on forced drainage during storm events, the parish should continue to identify strategically located areas that can serve as retention areas for stormwater. Special consideration should be given to providing retention areas and green infrastructure in economically disadvantaged areas. When not needed for retaining stormwater, the areas could also be sites for publicly accessible culture- and nature-based education and recreation. For example, the proposed French Branch Pond Connectivity and Safe Haven Blue-Green Campus and Trails have retention features for stormwater management and public space for education and recreation.

Steps needed:
- Map high flood-risk areas (on a parcel level), undeveloped and natural areas, and local hydrology and drainage patterns.
- Identify focus areas where undeveloped and natural areas can be used by developed areas to temporarily store runoff.
- Ensure that the stormwater management area remains undeveloped and continues its retention function.
- Evaluate the effectiveness of the Stormwater Management Program to ensure that stormwater quality and quantity are appropriate for the receiving ecosystem.
- Consider implementing an equitable stormwater management fee.

Wetland Park
Wetland parks can hold vast quantities of stormwater during heavy rains while providing valuable open space and recreational amenities.
When a site larger than one acre is developed, the applicable stormwater detention volume could be increased to allow adjacent development to channel stormwater runoff into this closed system. The parish should work with developers and adjacent property owners to identify opportunities to leverage detention areas to serve larger developed areas. In addition, commonly held detention areas need to be inspected regularly to ensure that channels into the detention and retention areas are clear of debris.

**Steps needed:**
- Allow shared detention areas in development codes.
- Identify potential sites for shared detention areas, including new development sites near existing development sites or near sites currently being planned for development.
- Identify a fee structure, including any incentives for installation of green infrastructure.
- Work with the development community and Louisiana Home Builders Association to educate them on the benefits of shared detention areas and promote their use.
- Review and update applicable drainage design manuals to include guidelines for shared detention areas.
- Outline maintenance standards and responsibilities to ensure proper functioning of detention areas.

**Action C: Promote the use of shared detention areas to adjacent property owners.**

When pollution and debris contaminate water, habitats located downstream and in water bodies that receive runoff become unhealthy. Because most of the parish’s water drains into Lake Pontchartrain where shoreline erosion is an issue, water quality should be addressed so as not to contribute to habitat decline. Retention ponds could be retrofitted to ensure that water quality is improved. As such, the retention ponds can be used to both store stormwater and treat it before draining into Lake Pontchartrain.

**Steps needed:**
- Study water quality at receiving water bodies to determine where improvements need to be made.
- Retrofit retention ponds with vegetation and other augmentations to improve water quality.
- Develop a “channel” for treated water to be received where needed.
- Incorporate water quality requirements into standards for retention ponds.

**Action D: Retrofit retention areas to also manage water quality.**
Similar to the “Adopt-a-Bayou” program, which was established by the Legislature in 2007 (RS 30:2548), St. Tammany Parish—in partnership with neighborhood associations, nonprofits, academic institutions, and others—should expand their existing Public Works program where citizens can request removal of litter and other obstructive features that may hinder local stormwater conveyance. This program could also target private properties or neighborhood associations to help maintain nearby culverts, inlets, outlets, and other drainage infrastructure and further increase awareness and public participation in stormwater management, lessening the burden on parish staff to maintain drainage facilities.

**Steps needed:**

- Identify areas of greatest need for maintenance to ensure stormwater management conveyance.
- Identify and reach out to potential partners such as property owners, homeowner associations, businesses, and nonprofits to begin the engagement process.
- Develop program material, including what can and cannot be done by the adopting entity, when it should be done, and how it should be done. Include the intended outcomes and benefits of the program.
- Raise awareness of the program through marketing and recognition of the entities involved.

**Parish Waterways**

Maintaining rivers, bayous, and other waterways is important to ensure adequate drainage capacity.

*Photo Credit: St. Tammany Parish Flickr*

**Action E: Create an “Adopt-a-Ditch (or Bayou)” or “Maintain the Drain” program.**
Strategy 2: Reduce impervious surfaces

Shoreline erosion, greater frequency and severity of rain events, and infrastructure and subdivision development are already increasing St. Tammany Parish’s stormwater management burden. Flood risk can be reduced by increasing the amount of stormwater runoff captured on site and preventing it from entering the drainage system. Stormwater management best practices for managing stormwater on site include incorporating green infrastructure into development designs and implementing green space requirements.

Pervious Paving
Pervious pavers allow stormwater to be absorbed where it falls, reducing runoff into the drainage system.
To reduce the demand on the drainage system, the parish should consider requiring the incorporation of green infrastructure into all development as a means to handle stormwater runoff and control erosion.

Steps needed:
- Update ordinances to require property owners, including those below one acre, to manage stormwater on site and reduce runoff from their property.
- Update ordinances to reduce parking requirements; establish a maximum impervious surface for developments.
- Provide incentives or rewards for voluntary reduction of impervious surfaces.
- Require the use of pervious material where possible.
- Enforce ordinances to increase erosion controls during and after site development.
- Require integration of green infrastructure techniques into site design.
- Adopt a stormwater management impact fee to incentivize the use of green infrastructure.
- Work with neighborhood associations and other stakeholders to promote use of green infrastructure.

Proposed Development Pattern
The section diagram illustrates the idea of incorporating green infrastructure and adapting structures to increasing flood risk.
Green streets improve water quality and help reduce runoff into the stormwater system through integration of stormwater treatment techniques that use natural filtration processes and landscaping in street design. St. Tammany Parish should review its right-of-way, drainage patterns, and green infrastructure opportunities and incorporate green street concepts into the parish’s roadway conceptual planning, design, engineering, and development process.

**Steps needed:**

- Review right-of-way, drainage patterns, and green infrastructure opportunities.
- Incorporate green street concepts into the parish’s roadway conceptual planning, design, engineering, and development process.
- Incorporate green street infrastructure into right-of-way acquisition and roadway design decisions.
- Coordinate across departments to leverage ongoing capital improvements to include green infrastructure that will improve water quality, improve drainage, and control erosion.
- Prepare operation and maintenance plans.

**Action B: Incorporate green streets infrastructure and water management into road design.**

Green streets...
Green space requirements are already in place for residential developments, and their use could be expanded to also manage stormwater for the development. Strategically locating and designing green space to have multiple functions can benefit the residents and the parish by reducing drainage burdens, meeting retention/detention requirements, and reducing nuisance flooding.

**Steps needed:**
- Review subdivision development design standards for green space requirements.
- Update ordinances to incorporate and integrate stormwater management features into recreational green space.
- Encourage developers and residents to use on-site green space for stormwater management.
- Review drainage and detention/retention requirements and design developments to meet requirements using green space for stormwater management and retention.
- Apply green space/retention standards to commercial developments.

**Water Storage**

A two-acre retention pond was incorporated into Atlanta’s Historic Fourth Ward Park, a redeveloped brownfield along the Atlanta BeltLine.

*Photo Credit: Panam2014/Wikimedia Commons*
Strategy 3: Review and update stormwater policies and programs

St. Tammany Parish has been working to standardize and update policies and practices in its comprehensive development code. Proposed changes would affect zoning, drainage and flood control regulations, and building, health, and sanitation codes.

Space for Water
Existing parks and open spaces, vacant lots, and underutilized right-of-ways provide opportunities for safely storing water and enhancing the urban landscape.
To ensure all aspects of the Code of Ordinances are consistently supportive of stormwater management best practices, St. Tammany Parish should conduct an audit of the entire code, address any unintended consequences of current codes, and remove barriers to as well as encourage use of stormwater management best practices.

Steps needed:
• Meet with parish departments to identify how stormwater management relates to their work and missions, including any needs or barriers staff have observed, how the code is implemented “on the ground,” and any unintended consequences.
• Conduct an audit of the entire code and remove barriers to and encourage use of stormwater management best practices, and address any unintended consequences of current codes.
• Review results of the code audit with parish departments and the development community.
• Develop code amendments using best practices to address conflicts and needed updates, as identified in the code audit.
• Ensure that codes are equitable and do not overburden lower-income areas.
• Develop a mechanism to ensure that agencies and departments collaborate on implementing the revised codes and provide input/sign-off on the permitting process.
• Prepare and adopt amendments to city codes and department policies, as needed.

“As far as what we can look into the future, the most resounding component is protecting and preserving assets. Smart growth and planned development, not just development. We would like to see developments that are done purposefully. We want quality, not just stuff.”
—St. Tammany Parish Resident
To address watershed-related flood risk throughout the parish, St. Tammany Parish should partner with regional organizations and other parishes to prepare a regional stormwater management plan to serve as a guiding document for water management decisions in the floodplains. The plan should address floodplain management within the watershed, provide short- and long-term goals for managing water quantity and quality, and provide guidance on how to protect the watershed and its inhabitants.

**Steps needed:**
- Work with regional planning associations and relevant organizations to develop a watershed-based stormwater management plan and policies that apply across jurisdictional lines, especially those upstream and east of the parish.
- Assess current and planned programs and projects to ensure consistency with the 2017 Coastal Master Plan.
- Develop strategies to consider current and future flood risk in prioritizing allocation of resources.

The impacts of population growth—more development, fewer pervious surfaces, and more polluted runoff—are causing stormwater management programs to become increasingly expensive. To offset these costs and leverage infrastructure projects, local jurisdictions can develop a stormwater fee that supports stormwater management projects and practices that reduce flood risk. As capital improvements are made, the stormwater fee can also provide funding for incorporating green infrastructure features into other projects.

**Steps needed:**
- Require that all publicly funded capital projects capture and store at least 1.25 inches of rainfall in the first hour of a rain event.
- Encourage the use of captured stormwater for graywater use and establish safety guidelines for use of graywater.
- Continue to design new and retrofitted recreation areas with ample drainage and storage space, and use those recreation areas as a secondary tier of defense against neighborhood flooding.
- Develop a five-year benchmark for “Greened Acres” and offer competitive grant programs for the development of green infrastructure projects on private property.
Case Study: Philadelphia, PA

“Over the next 25 years, Philadelphia is committed to deploying the most comprehensive urban network of green infrastructure in the United States. Philadelphia’s Green City, Clean Waters plan, recently approved by state regulators, requires the retrofit of nearly 10,000 acres (at least one-third of the impervious area served by a combined sewer system) to manage runoff on-site; relies on green infrastructure for a majority of the required CSO reductions; calls for the investment of more public funds in green infrastructure (at least $1.67 billion) than in traditional gray approaches; and leverages substantial investments from the private sector, primarily through application of a one-inch retention standard for new development and redevelopment projects citywide. The city will fund its share of the costs with a stormwater fee based on impervious area, supplemented by state and federal grants as available. To encourage retrofits on private property beyond that required by the retention standard, the city offers incentives such as reduced stormwater fees, free design assistance and low-interest loans to owners of large impervious properties, a green roof tax credit, rain barrel giveaways, and expedited permit reviews. Philadelphia also has installed dozens of green infrastructure demonstration projects, has published a technical design manual, and is developing a maintenance manual.”

Image Credits: WRT Design
Handling stormwater on site reduces the amount of runoff entering the drainage system. The parish should develop incentive programs to encourage property owners to implement site-level features such as rain barrels, rain gardens, and bioswales as well as to replace impervious surfaces like concrete with gravel, permeable pavers, or other pervious materials. Incentives in the form of tax credits, stormwater fee discounts, and rebates can be used to offset the costs of implementation and reward measures taken to increase the amount of stormwater that can be handled on site.

**Steps needed:**
- Incentivize investment in stormwater management best practices on private property through grant and low-interest loan programs, tax rebates, and stormwater fee discounts.
- Provide outreach, education, and technical assistance to the public, planners, contractors, and local governments on best practices for stormwater management, green infrastructure and the current status of local stormwater management systems.

**Economic Incentives**
The Front Yard Initiative is an incentive program of The Urban Conservancy to encourage the removal of excessive paving. The program reimburses eligible homeowners per square foot of paving removed, up to 500 square feet.

*Image Credits: Front Yard Initiative*
Strategy 4: Reduce the impact of storm surge

Considering a future with increased flooding, it is important to use multiple layers of strategies to address risk. Decreasing direct economic damage to existing structures can be achieved through elevation. Addressing retention and detention needs and shoreline erosion are major opportunities for St. Tammany Parish to also provide recreational and educational benefits.
Storm surge can cause significant economic damage to infrastructure and residential and commercial structures. As these structures are built and redeveloped, they should be elevated to a height that ensures minimal damage from storm surge.

**Steps needed:**
- Review state flood risk disclosure requirements and update requirements that flood risk is disclosed during property transactions and that these requirements are enforced.
- Adopt a two-foot freeboard standard as well as no-fill standards for all development.
- Develop a parish flood map to show updated flood risk that documents parish-level flood-risk mitigation measures that have been taken and other features not reflected in the FEMA maps.

**Action A: Sufficiently elevate structures in moderate- and high-risk areas.**

**Elevated Structures**
Buildings elevated with pier-and-beam construction allow the water to flow underneath without harming the structure or neighboring structures.
Natural habitats such as wetlands and forests have been shown to attenuate storm surge. In addition to the levee protection system, the parish can further reduce storm surge impacts by restoring and creating marshlands and swamp forests along Lake Pontchartrain’s shores. This will serve to advance implementation of the Multiple Lines of Defense Strategy the state has incorporated into its coastal protection and restoration effort. An example of restoring and creating marshlands are the proposed Guste Island Aquatic Ecosystem Restoration and New Orleans Landbridge Shoreline Stabilization and Marsh Creation projects. The Guste Island project aims to restore more than 680 acres of marsh in the Madisonville area. This project will help reduce land loss and storm surge impacts for residents and businesses as well as protect St. Tammany’s infrastructure. The New Orleans East Landbridge project will restore and create marsh to provide storm surge protection for St. Tammany Parish and nearby parish residents, and it will protect the Bayou Sauvage National Wildlife Refuge, an important urban refuge with significant estuarine habitat.

Steps needed:
- Coordinate with the U.S. Army Corps of Engineers and CPRA to leverage ongoing protection and restoration efforts.
- Identify target areas and prioritize restoration projects that will provide the most benefit to ecosystems and communities over the long term.
- Continue to seek funding to fully protect the 680 acres of marsh identified in the Guste Island project.

**Wetlands as Protection**

Wetlands and swamps, such as that pictured below in the Big Branch Wildlife Area Refuge conservation area, provide protection against storm surge coming from Lake Pontchartrain.

*Photo Credit: Lake Pontchartrain Basin Foundation*
Growth pressure is expected to continue in St. Tammany Parish. Careful planning and strategic investment must direct this growth to appropriate locations within the parish, support a high quality of life, protect existing diverse communities, and maintain the parish’s character. Accommodating a range of housing types and encouraging mixed-use development where appropriate are important strategies to help manage growth.
GOAL 2    Direct Growth to Low-Risk Areas

Strategy 1   Encourage focused, mixed-use development patterns to promote public health through walkable/bikeable neighborhoods

Action A: Restrict development in high-risk areas.
Action B: Encourage higher-density, multi-generational, residential, and mixed-use developments.
Action C: Consider repurposing unused properties.
Action D: As growth occurs, maintain and enhance the parish’s existing diverse communities. Protect natural assets and guide development.

Strategy 2   Create and maintain a diverse and resilient housing stock for people at all income levels

Action A: Expand affordable and senior housing.
Action B: Create a housing incentive program to encourage development on higher ground.
Action C: Increase housing choices.
Action D: Expand access to legal help for low-income homeowners with title issues.
Strategy 1: Encourage focused, mixed-use development patterns to promote public health through walkable/bikeable neighborhoods

St. Tammany Parish is expected to experience continued growth, which should be directed in such a manner as to increase livability, maintain the area’s character, and improve the parish’s economic position. While the parish will likely experience minimal land loss over the next 50 years compared to some other coastal parishes, land along Lake Pontchartrain, particularly in the southeastern areas of the parish, is expected to be lost due to erosion and the effects from storm surge. Land use and development regulations must balance the need to accommodate anticipated growth with expected environmental changes. In addition, as people move into the parish from higher-risk areas, it will be important to support and enhance existing lower-income communities and longtime residents.

Downtown Covington
Covington and areas on higher ground are ideal for new and infill residential and commercial development.

Photo Credit: St. Tammany Parish Flickr
Action A: Restrict development in high-risk areas.

To ensure that economic damage is limited and fewer recovery efforts are required, the areas that are currently at high flood risk should not be available for development.

Steps needed:
- Review the parish’s Unified Development Code draft and amend, if necessary, to restrict development and investment in high flood-risk areas in unincorporated parts of the parish.
- Review and update ordinances for municipalities to restrict development and investment in high flood-risk areas.
- Evaluate parish urban growth boundary regulations for consistency with flood risk.
- Together with property owners, develop a plan for future mitigation and recovery needs in high-risk areas, including buyout/relocation options.
- Ensure that high-risk areas are restored to natural conditions that can assist with storm surge reduction and water management.

Urban Growth Boundary and Flood Risk
Future growth areas should be analyzed with future flood risk potential in mind.
Sources: CPRA Flood Risk Medium Scenario Modeling Data 2017; FEMA Preliminary DFIRM 100-year floodplain data for St. Tammany Parish 2008; St. Tammany Parish Government Department of Planning and Development
Action B: Encourage higher-density, multi-generational, residential, and mixed-use developments.

Low flood-risk areas are well-positioned to receive population and economic growth. Higher-density multi-generational, residential, and mixed-use developments should be prioritized. St. Tammany Parish’s population is projected to double in the next 15 years. According to the Urban Land Institute (ULI), under current development trends, this growth would consume about 50% of available land for future development. This is due to the fragmented and disconnected nature of conventional development patterns that exacerbate current traffic and transportation challenges.

ULI proposes a village-in-the-woods development model that would only consume 6% of available land by using smart-growth techniques and providing more sustainable growth opportunities. This model manages natural and engineered systems holistically for increased resilience, promotes more focused, mixed-use patterns for more walkable/bikeable neighborhoods, and enhances the suburban identity of new neighborhoods.

Steps needed:
- Conduct small area plans for areas south of the Urban Growth Boundary on high ground to plan for development, coordinating planning efforts between the parish and municipalities.
- Identify areas that could be repurposed into mixed-use developments such as shopping malls, other retail centers, and government buildings.
- Conduct market study to educate local developers, planners, and government officials on the demand for mixed-use development.
- Explore potential for joint development ventures with local commercial and residential developers.
- Evaluate current zoning to ensure that growth needs can be accommodated and appropriately located.
- Review the Urban Growth Boundary and amend as needed to accommodate growth.
- Explore applying Traditional Neighborhood Development (TND) zoning districts or other mixed-use zoning districts to encourage compact, walkable development in growth centers.
- Consider and evaluate incentives for locating residential and commercial development on higher ground, and educate developers on requirements and incentives.
Together with property owners, residents, and developers, create building design guidelines to ensure that building typology fits within the desired context and character of the community, and incorporate requirements for minimum building elevation and on-site stormwater management.

- Educate Louisiana Assessors’ Association members and the real estate community on the value of resilient building practices.
- Create a toolkit and/or communications package to clearly articulate the value of green building practices. If the parish and the real estate sector assign appropriate value to features that build resilience, market demand will follow.
- Evaluate infrastructure capacity to accommodate growth in target areas.
- Develop a coordinated capital improvement program to fund needed improvements to encourage growth in target areas.

**Conventional Development Pattern**
- Fragmented and disconnected systems
- Exacerbates current traffic and transportation challenges

**Village-in-the-Woods Concept**
- Higher density walkable/bikeable neighborhoods
- Comprehensive management of natural and engineered systems
Action C: Consider repurposing unused properties.

To encourage and concentrate development and redevelopment in existing communities, abandoned buildings should be repurposed to meet the community’s needs. St. Tammany Parish and other entities should work with property owners, residents, and others to identify opportunities for redevelopment and develop policies or incentives that encourage adaptive reuse of existing buildings.

Steps needed:
- Identify the commercial and public infrastructure needs of the community.
- Inventory abandoned public and private buildings, such as schools, post offices, big box stores, and others.
- Work with property owners, residents, and others to identify opportunities for redevelopment.
- Develop policies or incentives that encourage adaptive reuse of existing buildings.
- Encourage the sites to apply best practices for sustainable development and redevelopment.

Downtown Covington Revitalization
Following an oil bust in the 1980s, downtown Covington saw a decline in business and an increase in shuttered buildings. Following designation as a “Main Street Community” in 1992, the downtown area experienced a revitalization with buildings converting to retail and professional uses.
Action D: As growth occurs, maintain and enhance the parish’s existing diverse communities.

As people move north in St. Tammany Parish, growth pressures may increase property values and taxes and ultimately threaten residents’ ability to maintain ownership of their home and land, resulting in displacement of long-term, low-income residents. Programs and policies to protect the culture and affordability of these communities will enhance the overall quality and diversity of the parish.

Steps needed:
- Establish areas for middle-income housing on vacant land.
- Research and consider tax programs that can help retain long-time homeowners in at-risk neighborhoods.
- Protect senior homeowners who cannot afford rising property taxes in their neighborhoods and cannot afford the upkeep on their homes. Consider providing funding for existing senior home repair programs, with a priority for residents in at-risk neighborhoods.
- Create community and neighborhood development/improvement organizations to help maintain the quality and services for at-risk neighborhoods.

Parish Communities
As the parish’s population grows, towns and communities should strive to protect their unique identities.

Photo Credits: St. Tammany Parish Flickr
Action E: Protect natural assets and guide development.

While St. Tammany Parish is growing at a rapid pace, the natural assets are highly valued and need to be protected. To preserve these assets, the parish should promote developments that utilize natural systems of streams, wetlands, and waterways for overall stormwater management and establish a new character of the public realm.

Steps needed:

- Identify appropriate sites for development.
- Work with the Trust for Public Land, Louisiana Economic Development’s (LED) Certified Business Sites Program, and property owners to identify sites suitable and desirable for development and protection.
- Consider allowing development types that cluster higher-density housing while maintaining natural areas, resulting in an overall lower density but retention of open space and natural areas.

LED Certified Sites in Louisiana

The LED Certified Sites program offers a rigorous review process, including title work, environmental studies, soil analysis, and surveys for sites between 10 and 25 acres. These sites are then certified to be ready for the development of business parks, mixed-use developments, and Planned Unit Developments.

*Image Credit: Louisiana Economic Development*
Strategy 2: Create and maintain a diverse and resilient housing stock for people at all income levels

Expanding opportunities for vulnerable populations—including senior citizens, persons with disabilities, and low-income residents—increases the community’s resilience. The following actions focus on protecting their homes from future disasters, increasing access to resources for those who wish to age in place, and providing assistance to those who wish to move into areas characterized by economic opportunity, strong social networks, and ample public amenities.

Walkable Communities
New and infill development should offer different housing types within walkable services and amenities. Image Credit: National Disaster Resilience Competition for the City of New Orleans, Waggonner & Ball
**Action A: Expand affordable and senior housing.**

Maintaining housing affordability is often a challenge in areas experiencing growth pressures. Establish appropriate strategies to identify additional sources of funding for the development of affordable housing, including new construction, renovation, and retrofitting. Strategies could include partnering with philanthropic organizations to leverage funds and creating a low- or no-interest loan program for rehabilitation and repair and collaborating with local financial institutions to create financing tools for rehabilitation, repair, and replacement.

**Steps needed:**

- Identify local housing developers and nonprofits that have capacity to develop new housing and renovate or retrofit existing housing for elderly and low- to moderate-income residents.
- Convene a working group of local developers, service providers, major employers, and local government to address barriers to the development of affordable and senior housing in the parish.
- Identify local government rules and regulations that prevent or deter affordable as well as senior housing development and take steps to amend such rules and regulations.
- Reallocate federal funds to finance the development of affordable housing and renovation or retrofits of existing homes.
- Support Low-Income Housing Tax Credit applications throughout the parish.
- Research low-interest home loans or mortgage assistance programs available to households meeting affordability requirements.
- Encourage development of support services for senior housing.
- Identify qualified developers and Community Housing Development Organizations (CHDOs) to apply for Low-Income Housing Tax Credits to renovate or construct affordable housing units.
Action B: Create a housing incentive program to encourage development on higher ground.

People who want to move to areas on higher ground often do not have the resources to relocate or to purchase homes in lower-risk areas. Stressed with living in a high-risk area with degraded property values, they have limited funds for moving, closing costs, and down payments. A housing relocation fund could be established for three to five years to assist people moving from the highest-risk areas or areas with repetitive losses to areas of higher ground. One-time grants for moving costs, partial down payments, or closing costs would provide an incentive and assistance needed to move away from high-risk areas.

Steps needed:
- Initiate funding programs through public funding and nonprofits to pay closing costs, partial down payments, moving costs, and other related expenses.
- Identify additional funding sources or develop a partial repayment program to maintain this fund over the long term.
- Expand existing housing repair and maintenance programs to rehab and redevelop substandard housing, focusing on low-risk areas.
- Provide pre- and post-purchase housing education and counseling programs.
- Implement policies intended to prevent future development of permanent residences in these areas.

Terrabella: Covington, LA
Located in Covington on higher ground, the Terrabella Village concept offers different housing types, lot sizes, and price ranges. Amenities and services are located within walking distance in the neighborhood.

Photo Credits: Google Maps Street View
Throughout the community engagement process, many residents and leaders identified the need for a greater supply of housing types and affordability. Expanding housing options throughout the parish can better accommodate growth by appealing to a wider array of household types, income, and age levels. Considerations include offering not only varied price points for housing but also varied product types as well as desired community characteristics.

**Steps needed:**
- Create a working group of industry professionals and community representatives to identify desirable and marketable housing types.
- Review ordinances and the development approval process to identify any barriers to development of desired housing types.
- Develop design standards to ensure quality and compatibility standards for various housing types to enhance neighborhood integrity.
- Integrate resilient design and construction practices, such as the Enterprise Green Building Standard, into all housing development activities funded by HUD, parish government, local government, or housing authorities.

**“The influx of population in the Slidell area after Katrina—they had to have somewhere to go, so they went to Slidell probably.”**
—St. Tammany Parish Resident

Unclear property ownership is a major barrier to receiving assistance after a disaster or accessing funding—grant-based or traditional loans—for maintaining or improving property.

**Steps needed:**
- Partner with organizations such as Louisiana Appleseed or Southeast Louisiana Legal Services to provide legal assistance to low-income households both before and after disasters to resolve title issues.
- Market programs to homeowners to raise awareness about available services.
Case Study: Martha’s Vineyard Land Bank Commission

In response to immense development pressures and a building boom that has been significantly transforming the island’s landscape and way of life, the island residents voted for the establishment of a land bank in 1986. The land bank commission generates revenue by adding a 2% surcharge to real estate transfers. This revenue is then used to purchase land on the island that is set aside from development. Through this mechanism, about 5% of the island’s land has been conserved but more is needed.
As people in coastal industries (including fishing, oysters, oil and gas support, boating, boat building, and maintenance) are forced to move north to higher land, they will have longer commute distances to their work on the coast. Travel times and costs to work will increase, causing additional stress on residents’ financial stability. Alternative ways to get to work along the coast will be needed to sustain the coastal economy and the livelihood of people who live off of the land and water.
GOAL 3  Improve Mobility Throughout the Parish and Region

Strategy 1  Alleviate congestion
Action A:  Increase park and ride usage.
Action B:  Implement congestion management strategies.
Action C:  Increase telecommuting.
Action D:  Encourage school satellite pickup.
Action E:  Improve development patterns to reduce congestion.
Action F:  Coordinate transportation throughout the parish.

Strategy 2  Expand and diversify transportation options
Action A:  Provide regional transportation among St. Tammany and surrounding parishes.
Increase walking and biking opportunities.
Action B:  Plan for safe and efficient evacuation routes when planning and designing new roadways, as applicable.
Action C:  Promote rideshare programs.

Strategy 3  Support Complete Streets to encourage a more bikeable, walkable environment and improve community connectivity
Action A:  Design and construct roadways and intersections to enable safe access for all users.
Action B:  Incorporate stormwater management into roadway design.
Action C:  Set appropriate design standards for rural and urban areas.
Action D:  Evaluate capital improvements and coordinate design.
**Strategy 1: Alleviate congestion**

St. Tammany Parish is an auto-centered community and has a roadway network that centers on I-10 and I-12. As the only two major arteries within the parish, they are frequently congested, especially during morning and afternoon peak hours. As one of the fastest-growing parishes in Louisiana, St. Tammany and the state will eventually need to adjust its transportation system to help reduce congestion, accommodate those who do not own a vehicle, and connect urban centers within and outside of the parish.

**St. Tammany Parish Gateways**

A Complete Streets makeover of I-12 interchanges includes multi-use paths and stormwater management.

*Image Credit: Design Workshop*
Action A: Increase park and ride usage.

Currently nine park and rides exist within St. Tammany but have very low usage due to lack of signage, visibility, preference, and accessibility.

Steps needed:
- Conduct a marketing campaign targeting millennials and specific industries, highlighting the benefits of carpooling, such as reduction in vehicular volume and greenhouse gas emissions.
- Provide financial rideshare incentives.
- Incentivize ridesharing by expanding existing roadways to accommodate carpool or high-occupancy vehicle lanes.

Action B: Implement congestion management strategies.

Congestion management strategies can improve operating efficiency and traffic flow, including route guidance systems, traffic signal improvements, and incident management parish wide. The Federal Highway Administration provides guidance on congestion management.

Steps needed:
- Coordinate among the Regional Planning Commission, the parish, and local municipalities to create mutual objectives and support existing congestion management plans.
- Review policies relating to traffic circulation, traffic control, and parking.
- Create and monitor performance metrics for various modes of travel, not only automobiles.
- Identify and implement strategies for congestion management.
- Evaluate effectiveness of the program and adjust as needed.

Traffic Congestion

I-12, one of the main vehicular arteries in the parish, is frequently congested.

Photo Credit: Google Maps Street View
Action C: Increase telecommuting.

The dynamic of work is changing. More online platforms are available to host virtual meetings and improve employees’ ability to work from anywhere at any time. By formalizing programs in an organized way, a company can reduce the amount of workforce that is required to be in the office on a daily basis.

Steps needed:
• Identify large employers to pilot telecommuting programs.
• Assess feasibility of flextime and telecommuting for employees.
• Explore incentives to enable increased telecommuting.

Action D: Encourage school satellite pickup.

Incorporate recommendations for school satellite pickup and drop-off locations for congested areas like downtown Covington.

Steps needed:
• Consider requirements for high school student drivers to carpool from park and ride locations.
• Work with schools, parents, and community representatives to identify and map park and ride locations.
• Market program to raise awareness.

Action E: Improve development patterns to reduce congestion.

Efficient development patterns that provide a mix of uses can reduce vehicle miles traveled (VMT) in a community and lessen the need for new infrastructure. Additionally, well-planned road networks can provide multiple routes, which can reduce traffic burdens on main arterials and congested intersections.

Steps needed:
• Review land use, zoning, and development patterns.
• Increase density and encourage mixed-use development where appropriate.
• Review and update the Thoroughfare Plan and other policies guiding the development of local streets to ensure an interconnected grid of streets.
Action F: Coordinate transportation throughout the parish.

The St. Tammany Parish Department of Public Works is charged with two vital tasks: transportation infrastructure and drainage. Meeting the drainage and infrastructure needs in decades to come will become more challenging, but the parish can take measures now to prepare to meet future needs. The parish should focus on strengthening transportation (including transit) and stormwater management infrastructure and coordinating investments in future infrastructure needs.

**Steps needed:**
- Review and assess the Public Works Department’s current capacity.
- Evaluate the need for additional resources and identify funding for those resources.
- Study cost and evaluate if public transit should be operated by the parish.
- Work with the Regional Planning Commission to coordinate transportation efforts.
- Coordinate with municipalities to ensure continuity of transit service.

Airline Highway: LaPlace, LA
Example from St. John the Baptist Parish illustrating a street improvements project that includes both roadway and drainage infrastructure upgrades. This Complete Street features green infrastructure and shared pedestrian and bicycle paths. *Map Insert Credit: St. John the Baptist Parish*
Strategy 2: Expand and diversify transportation options

Within the parish, a personal automobile is the most reliable transportation option, and mass transit options are limited. Both factors exacerbate traffic congestion. Availability of additional transportation options would enable those who do not own a vehicle to be more mobile.

Multiple Modes of Transportation
Transportation options could include expanded bus networks, water transportation, and expanded pedestrian and bicyclist options.
Image Credit: National Disaster Resilience Competition for the City of New Orleans, Waggoner & Ball
Action A: Provide regional transportation among St. Tammany and surrounding parishes.

STAR Transit (St. Tammany Area Transportation), a demand response service provided by the parish, offers rural transportation Monday through Friday from 6:00 a.m. to 6:00 p.m. and urban transportation Monday through Saturday from 6:00 a.m. to 6:00 p.m. Exploring additional shuttle services or enhanced public transportation can help to connect out-of-parish workers with jobs and local residents to neighboring parishes.

Steps needed:
- Evaluate the viability of a fixed-route system in St. Tammany Parish.
- Coordinate proposed transit options with adjacent parishes to improve connectivity among job centers and neighborhoods.
- Increase cross-parish transportation options by connecting communities through water taxis on navigable bayous and canals.

Action B: Increase walking and biking opportunities.

Residents expressed desire for increased pedestrian and bicycle safety. The parish should identify opportunities to take quick corrective action where the most benefit can be realized—especially projects that benefit youth, seniors, and households without cars.

Steps needed:
- Develop a comprehensive bike/pedestrian plan for the parish.
- Update the inventory of sidewalk locations and conditions.
- Emphasize connecting neighborhoods to public spaces and amenities as well as to other parts of the region.
- Incorporate bike and pedestrian infrastructure into new street construction and reconstruction consistent with the proposed Complete Streets policy in the draft Unified Development Code.

St. Tammany Parish Culture, Recreation and Tourism Strategic Plan
The map identifies existing conditions within St. Tammany Parish, including the extents of the Tammany Trace.

Map Credit: St. Tammany Parish Culture, Recreation and Tourism Strategic Plan
Action C: Plan for safe and efficient evacuation routes when planning and designing new roadways, as applicable.

St. Tammany Parish’s transportation plan should require elevation of critical infrastructure to preserve existing hydrology and evacuation routes.

Steps needed:
- Coordinate with the Louisiana Department of Transportation and Development (DOTD) to identify upgrades to existing roads and new infrastructure projects.
- Require that DOTD model the impacts of new transportation projects on hydrological processes.
- Request that all DOTD projects include flood risk mitigation and cause minimal impact in the surrounding areas.

Action D: Promote rideshare programs.

With many of the industries located in the Covington-Madisonville-Mandeville triangle and in Slidell, rideshare programs could decrease the number of vehicles used to travel to school, work, shopping and services. A mobile app for ridesharing as well as incentive programs for employers could encourage this option to alleviate traffic congestion. The same could be available for those commuting to and from New Orleans for jobs, which would reduce traffic on the Causeway.

Steps needed:
- Review commuting data to identify potential hot spots for a rideshare program.
- Work with employers and municipalities to develop appropriate incentives.
- Research the potential benefits and trade-offs such as air quality improvements, additional needed connections, and time to reach destination.
Strategy 3: Support Complete Streets to encourage a more bikeable, walkable environment and improve community connectivity

Complete Streets accommodate all users, including those who are walking, bicycling, driving, using public transportation, and those with disabilities. Implementing Complete Street design components creates an attractive environment that offers potential for green infrastructure elements for stormwater management in addition to encouraging bicycle and pedestrian transit, which contribute to overall well-being.

St. Tammany Parish’s draft Unified Development Code outlines a Complete Streets policy that requires roads to be designed to accommodate all users, employ best practices for design, respect the surrounding character, and incorporate sustainable stormwater management techniques.
**Action A: Design and construct roadways and intersections to enable safe access for all users.**

Streets must be safe for everyone, regardless of age, ability, or transportation mode. In many cases, this requires retrofitting existing streets to better accommodate users of modes other than cars. This changing approach to street design and construction must be guided by an overarching policy that defines priorities and outlines appropriate techniques to achieve them—for instance using traffic calming techniques to reduce speeds in areas of high pedestrian activity to improve safety; defining streetscape elements in a manner that provides federally compliant ADA access; and designing intersections to minimize conflicts among pedestrians, cyclists, vehicles, and transit to improve multimodal safety.

One of the catalytic projects developed during the LA SAFE process was the Covington Green Block, a proposed water garden and green street along S. Jefferson Ave. in Covington. This project is a replicable, scalable model Complete Street that provides a host of recreational and water management benefits. The proposal incorporates green infrastructure components to enhance water storage capacity and addresses street flooding issues. It also expands a multi-use trail, currently planned to extend from the end of the Tammany Trace. In addition, the water garden in front of William Pitcher Junior High School provides opportunities for in-field education on the benefits of green infrastructure and Complete Streets for the school’s students.

**Steps needed:**

- Adopt the Complete Streets policy that is included in the draft Unified Development Code.
- Draft a Complete Streets manual for St. Tammany Parish—as a companion document to the draft code—that provides street cross sections, offers technical details relating to street design, and specifies where and how to apply these techniques throughout the parish.
- Evaluate the parish’s street design criteria and establish guidelines to improve safety for pedestrians and bicyclists and to ensure ADA accessibility.
- Implement the S. Jefferson Ave. project in Covington as a demonstration to highlight best practices and benefits of Complete Street design.

**Complete Streets Manual**

See full report here: [https://www.cpex.org/complete-streets-manual/](https://www.cpex.org/complete-streets-manual/)
Action B: Incorporate stormwater management into roadway design.

Green streets are street right-of-ways that filter stormwater to reduce pollutants and reduce the quantity of water conveyed into the storm sewer system in lieu of conventional stormwater management. The proposed Complete Streets policy requires incorporating sustainable stormwater management facilities throughout street right-of-ways. This should be part of an integrated strategy to deal with stormwater runoff throughout the parish.

Steps needed:
- Evaluate current guidance and manuals relating to paving and drainage for barriers to implementing green streets.
- Update codes and manuals to reflect goals for implementing green streets and stormwater management, including green infrastructure.

Green Street Infrastructure
Pervious paving, subsurface storage, rain gardens, and water-loving plants reduce localized street flooding by providing pockets of space to which stormwater can flow. The water, filtered by this system, infiltrates the ground and is absorbed by plants.

*Image Credit: Greater New Orleans Urban Water Plan, Waggoner & Ball*
Context of South Louisiana
Development patterns vary depending on context.
*Image Credit: Louisiana Speaks Pattern Book*

Action C: Set appropriate design standards for rural and urban areas.

St. Tammany Parish contains a variety of different types of places. In the southern part of the parish, roads and development are near the shoreline of Lake Pontchartrain, which is eroding and susceptible to flooding. In the central part of the parish, communities are separated by large undeveloped areas, and are connected by roads. Older existing communities were often built on a grid system that promotes walking and bicycling. As development has spread out, the use of cars has increased, resulting in increased traffic congestion. Respecting this varied character throughout the parish requires a tailored approach to designing roadways that is consistent with the character of a place while also addressing safety, connectivity, and convenience for everyone using the roads. A palette of design standards that reflects the rich array of contexts will assist in developing street designs that better respond to and connect with the surrounding context. Design standards must also provide solutions to address differing priorities that must be addressed when there is limited right-of-way available.

Steps needed:
- Evaluate the existing and planned roadway network to determine the desired range of street types.
- Create design standards and typical cross sections for the range of street types identified.
- Provide a map that identifies applicability of various street types throughout the parish.
A number of subsurface utilities must be coordinated with one another as well as with above ground amenities in order to avoid conflicts. The amount of right-of-way available can often determine how easy or complex this task will be. Coordination must occur at a project’s early stages, beginning with project selection, to ensure that needs can be met, design can be coordinated, construction can take place efficiently, and ongoing maintenance is considered. This level of coordination requires a clearly articulated process that defines roles and responsibilities of everyone involved in street design, construction, and maintenance.

Steps needed:
- Create a coordinated capital improvement program for all departments and utility projects to leverage infrastructure investments and minimize conflicting projects.
- Outline a design process that requires all departments to work together to select projects, evaluate design alternatives, and coordinate throughout the construction and project delivery process.
- Coordinate with all utility providers during project selection, design, and construction of street projects.
- Outline maintenance needs for proposed Complete Streets projects during the initial design process.

Case Study: City of Takoma Park, MD

Through private and public funds, the City of Takoma Park is transforming a heavily-used road with little runoff management into a street that has reduced the runoff of polluted water into the nearby creek system while promoting safe pedestrian, bicycle, and vehicular use. The one-mile section will feature stormwater curb extension, bioretention cells, and bioretention swales to address stormwater management needs. The retrofit also includes wider, ADA-compliant sidewalks.
GOAL 4  Strengthen and Diversify Local Economies

Strategy 1  Expand the local workforce
Action A:  Address barriers to full participation for the local workforce.
Action B:  Connect residents to job opportunities in growing industry clusters.

Strategy 2  Improve career ladders and links to workforce development
Action A:  Continue to strengthen vocational programs.
Action B:  Create “earn-and-learn” apprenticeship programs for key industries.
Action C:  Encourage continuing education, skills upgrading, mentoring, and lifelong learning programs suitable for enhancing skills relevant to existing industries and local employers.
Action D:  Strengthen pre-K – 12 education.

Strategy 3  Retain existing business and develop new business opportunities throughout the parish
Action A:  Increase focus on business retention.
Action B:  Develop Northshore Launchpad for business incubation.
Action C:  Provide incentives and market development opportunities for targeted emerging sectors.
Action D:  Consider the use of Opportunity Zones to attract development to low-income areas.
Strategy 1: Expand the local workforce

St. Tammany has opportunities to continue to cultivate skilled labor to fill positions in the construction, maritime, and energy sectors. Programming and curricula at high schools, technical colleges, and universities must be guided by industry needs and shaped to directly meet their current and long-term hiring needs.

Potential New Industries

St. Tammany Parish presents abundant opportunities for the alternative energy sector, including solar, wind, and water technologies.
Action A: Address barriers to full participation for the local workforce.

Community leaders have identified the need for a skilled and qualified workforce across industries, specifically the maritime and construction industries. In addition to workforce training, mental health care and re-entry support services have the potential to increase opportunities for local businesses to hire qualified employees.

Steps needed:
• Incorporate workforce development activities into the wraparound services proposed as part of the Safe Haven Blue-Green Campus and Trails project.
• Expand reentry efforts across the parish by identifying employers to hire program participants.

Action B: Connect residents to job opportunities in growing industry clusters.

As part of a larger strategy, economic development organizations at local, regional, and state levels are spearheading initiatives to connect industry leaders, educational institutions, and residents to undertake workforce development activities.

Steps needed:
• Work with local economic development officials to identify target industries in need of additional workforce.
• Create a comprehensive inventory of existing educational and workforce training opportunities—informing the work of Greater New Orleans, Inc. (GNO, Inc.), the St. Tammany Parish Development District, the Coastal Protection and Restoration Authority, Northshore Technical Community College, and Southeastern Louisiana University—in the burgeoning water, coastal, and environmental industries to identify existing needs and opportunities.
• Continue to connect local firms and businesses with the Coastal Protection and Restoration Authority to support Coastal Master Plan activities.
• Explore the potential for local hiring requirements for Coastal Master Plan activities.
Strategy 2: Improve career ladders and links to workforce development

The parish’s ability to attract and retain employers that offer good jobs depends heavily upon the availability of a ready workforce. Therefore, the parish should support a range of strategies to ensure that resident workers have opportunities to gain marketable skills and training needed for the jobs available now and in the future.

Career Support
Provide the right resources to prepare workers to gain marketable skills for potential new industries.

Photo Credit: Victorgrigas/Wikimedia Commons/ShareAlike 3.0 Unported
Action A: Continue to strengthen vocational programs.

Training should create pathways to jobs in established fields as well as newer industries the parish is working to attract, including renewable energy, crude petroleum and natural gas extraction, coastal restoration construction, digital manufacturing, medical technologies, and healthcare.

Steps needed:
- Cultivate partnerships among industry, K –12 schools, and the St. Tammany Parish Development District to optimize alignment among education, job training, and hiring programs and practices.
- Update programming and curricula in schools to match forecasted job growth in emerging sectors, as well as in existing industries in the parish, with a particular focus on field-based workshop opportunities related to coastal resources and risks.
- Coordinate vocational programming with programming for Northshore Launchpad.
- Continue coordination with parish-level faculty liaison to convene educator and administrative working groups and oversee efforts on integrating curricula with state partners and other parishes.
- Focus on job placement within the parish for students graduating from vocational programs.
- Offer business classes in vocational programs for students interested in starting their own businesses in the future.

Vocational Training
Vocational training can offer courses in emerging sectors, such as renewable energy, coastal restoration construction, creative and knowledge-based businesses, and medical technologies and healthcare.
Action B: Create “earn and learn” apprenticeship programs for key industries.

Community colleges across Southeast Louisiana often offer internships to provide students with on-the-job training, entry into the local workforce, and means to sustain themselves through completion of their programs. Many industries cite the need for this kind of experience in addition to Jump Start credentials to demonstrate an entry-level candidate’s job readiness. To augment existing programs and provide greater financial stability for students seeking career preparation, apprenticeship and paid internship programs should be facilitated between schools and industry partners.

Steps needed:

- Develop real-time research and data that accurately reflects job growth, wage levels, and skills needed for industry drivers. This information must be updated regularly to reflect incoming economic development projects and market shifts and made easily accessible to educators at all levels.
- Enhance coordination among K–12 education, community colleges, four-year universities, and industry to ensure students receive training that meets the needs of local employers.
- Create systems for demand-driven employer engagement with educational providers: two-year schools and high schools must have direct and ready access to employers in order to provide workforce-ready graduates.
- Facilitate apprenticeships and/or paid internship programs between industry and education partners. Apprenticeship programs often require facilitation between employers and high schools or higher education institutions. For high school students, issues of transportation, insurance, and liability are common barriers to overcome. In the case of two-year colleges or other higher education providers, trainings must typically be customized for the employer’s needs, and schedules must be arranged to accommodate a work/study balance. In order to streamline these processes and ensure success, appointed facilitators of such programs must be in place.
- Develop a coastal specialization certification pathway open to students seeking either a Jump Start TOPS technical diploma.
- Support an eventual transition to an apprenticeship-based model for training new employees in coastal careers.
- Use a combination of regulations, financial incentives, technical assistance, outreach, and education to build Louisiana’s expertise in coastal and stormwater management.
- Offer retraining programs in coastal careers.
- Market and promote Louisiana expertise in the fields of coastal restoration, adaptation and water management.
**Coastal Restoration Job Training**

St. Tammany Parish can become a leader in job training in water management and coastal restoration fields.

*Photo Credit: CPRA Applied Research Program*

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**Action C: Encourage continuing education, skills upgrading, mentoring, and lifelong learning programs suitable for enhancing skills relevant to existing industries and local employers.**

Programs should be reviewed and updated regularly to ensure that they are tailored to employer needs and marketable skills. The St. Tammany Economic Development Foundation has hosted an annual series focused on workforce development to raise awareness of workforce opportunities, provide information regarding training resources, and link to future workforce trends in the region. This series should be continued and expanded by the St. Tammany Parish Development District.

**Steps needed:**

- Develop incentives to link proposed industrial development projects with job training, education, and housing programs.
- Support continuation and expansion of programs at the St. Tammany Parish Development District that will focus on education and training for employment opportunities specifically in the parish.
- Support creation of a parish-wide workforce development council to spearhead creation of a workforce development plan for the next 20 years.
Education
High-quality schools and pre-K programs build the foundation for career success.

*Photo Credit: St. Tammany Parish Flickr*

**Action D: Strengthen pre-K –12 education.**

A strong pre-K –12 education lays the foundation for career success. Whether students choose to pursue vocational training, a university degree, or some other path, a high-quality education will open doors to a range of opportunities. Further, high-quality public schools and pre-K programs are an important asset for supporting the parish’s efforts to recruit new businesses, employers, and talent.

**Steps needed:**

- Improve accessibility to higher educational level opportunities.
- Improve measurable performance of high school graduates compared with other parishes in the state.
- Continue to support vocational skills training through the public school system and ensure that the training offered is consistent with current and anticipated employer needs and market demand.
Skilled Jobs
Skilled job training and education can prepare St. Tammany Parish’s residents for new and expanding industries.

Photo Credit: Coalition to Restore Coastal Louisiana

Strategy 3: Retain existing business and develop new business opportunities throughout the parish

The parish will recruit new employers and encourage long-term business investments that generate quality employment opportunities for residents and protect environmental quality. Increased diversity within the parish’s economic base can also add stability and lessen volatility in the local economy.
Action A: Increase focus on business retention.

Build upon existing staff and programs at the St. Tammany Parish Development District focused on business/industrial retention, attraction, and recruitment. Align programs, incentives, partnerships, and policies to bolster business retention efforts, and add additional staff if necessary.

Steps needed:
- Develop work program and priorities for staff.
- Host roundtables and discussions with existing industry representatives to discuss issues related to retaining and supporting parish businesses.
- Identify development opportunities that can build off new development hubs such as the Tamanend and Stirling developments.
- Identify adaptation needs arising due to environmental changes and tailor programs to support adaptation measures.

Businesses in St. Tammany Parish
St. Tammany Parish is home to several large employers, including Chevron Regional Headquarters, left, and Ochsner Medical Center, right.

Photo Credits: St. Tammany Parish Flickr
**Business Incubators and Makerspaces**

Incubators can offer training programs for starting new businesses as well as offer space and amenities for small business owners.

*Photo Credit: Lukas Boxberger/Wikimedia Commons/Share Alike 4.0 International*

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**Action B: Develop Northshore Launchpad for business incubation.**

Business incubators help launch new businesses, assist in diversifying the economy with industries that will strengthen the region in the future, and provide support for emerging entrepreneurs. Incubators can provide new business owners skills to run and market their businesses and mentors in their fields to help guide them as they start their businesses. Business incubators often provide coworking spaces with access to shared office equipment, and can also provide a range of other resources such as commercial kitchens, and makerspace for fabrication of new products.

**Steps needed:**
- Work with representatives from the alternative energy, coastal restoration, construction, and digital manufacturing industries, as well as economic development professionals and Northshore Technical Community College, to develop program outline.
- Identify public and private funding sources to build and maintain incubator.
- Identify staffing needs and other resources to operate the program.
- Conduct site selection and begin design.
Potential target sectors include renewable energy, coastal restoration construction, and digital manufacturing. Public policy, infrastructure development, workforce training, and other economic development initiatives should be supportive of these sectors.

Steps needed:

- Identify sufficient site locations and promote the development of diverse, well-designed industrial, commercial, and office uses that are compatible with the natural environment and adjacent land uses and that will support production of a wide range of goods, services, and jobs for the resident population.
- Review and update *Future Directions for St. Tammany Parish—A Strategic Plan for Economic Development*.
- Create an infrastructure development plan in cooperation with the private sector to promote desired development and business within the corridor.
- Assess land needs for desired economic development activity.

**Industry, Job, and Education Corridor**

Located in Jefferson Parish, Churchill Technology and Business Park is home to Jefferson Parish Economic Development Commission (JEDCO) headquarters, a conference center, and Patrick F. Taylor Science and Technology Academy. It is the future home of Delgado Community College’s River City Campus and Advanced Manufacturing Center of Excellence.

*Photo Credit: Google Maps Street View*
Action D: Consider the use of Opportunity Zones to attract development to low-income areas.

Census Tract 407.04 in St. Tammany Parish has been designated as an Opportunity Zone. An opportunity zone encourages development of commercial areas and affordable housing in distressed neighborhoods. Through the federal Opportunity Zones Program, banks, communities, and others may create Opportunity Funds to direct tax-advantaged investments to 150 federally designated Opportunity Zones in Louisiana.

Steps needed:
- Work with LED to determine the potential for use of Opportunity Zones.
- Create a small area plan for the area in and around Census Tract 407.04 to establish appropriate land uses and development guidelines.
- Use the Opportunity Zone incentives to spur appropriate development.

Opportunity Zones
Through the federal Opportunity Zones Program, Louisiana has secured U.S. Department of the Treasury certification for 150 lower-income census tracks to be Opportunity Zones. Census Tract 407.04 in St. Tammany Parish is highlighted in blue below.

*Image Credit: Louisiana Economic Development; ESRI*
Life in St. Tammany Parish is influenced largely by the natural environment as well as a small-town feel. Numerous waterways, wetlands, and wildlife refuges provide strong linkages to outdoor recreational activities as well as maintain a sense of character that is tied to the natural environment.
GOAL 5  Retain local culture and enhance recreation opportunities

Strategy 1  Protect and use river and lakefront amenities to their fullest
Action A: Improve access to the Bogue Falaya River in Covington.
Action B: Incorporate recreational and educational components into proposed wetland protection and restoration projects.

Strategy 2  Develop a cohesive vision for recreation in the parish
Action A: Develop a comprehensive, parish-wide plan for all recreational and cultural activities in the parish.
Action B: Expand the network of bike trails parish wide.
Action C: Develop and adopt a St. Tammany Parish tree plan.

Strategy 3  Combine drainage and green space features with recreational and cultural components
Action A: Design and retrofit stormwater management facilities and drainage canals as recreational assets.
Action B: Preserve and support Louisiana culture and historical sites.
Strategy 1: Protect and use river and lakefront amenities to their fullest

St. Tammany Parish residents strongly value their proximity to water and the many recreational opportunities it provides. From bird watching to fishing to water sports, access to the water is ingrained in the culture. To ensure that this way of life is preserved and to provide access to St. Tammany Parish’s waterways, additional amenities and services should be considered.

The parish’s waterways provide important environmental benefits and protection from storm impacts. Restoring and preserving these natural systems can decrease risks to the people and their communities’ infrastructures. St. Tammany Parish residents strongly value their proximity to water—this is ingrained in the culture—and enjoy the recreational opportunities it offers, from bird watching to fishing to water sports. To ensure the community’s way of life and enhance access to local waterways, additional amenities and services should be considered.
Action A: Improve access to the Bogue Falaya River in Covington.

Installation of recreational boating and fishing opportunities along the Bogue Falaya River would create jobs and provide an opportunity for tourism dollars to benefit the people of Covington.

Steps needed:

- Provide services to residents and attract tourists by encouraging development of supportive facilities and activities around existing and new boat launches.
- Promote areas as a sportsman’s paradise, including tax incentives for recreational businesses operating in these areas.
- Partner with nonprofits or philanthropic organizations to expand access to outdoor recreational opportunities for Louisiana youth.
- Work with nonprofit and philanthropic partners to expand weekend or summer camp opportunities for coastal education.

Bogue Falaya
A tributary of the Tchefuncte River, the Bogue Falaya runs through Covington.

Photo Credit: St. Tammany Parish Flickr
Action B: Incorporate recreational and educational components into proposed wetland protection and restoration projects.

Wetlands provide recreational and storm surge attenuation benefits. Restoration and protection projects along the shorelines of Lake Pontchartrain can preserve the existing cypress swamps. To highlight their importance in the ecosystem and the benefits they provide, walking paths and well-designed interfaces with the community should be integrated into restoration and protection project design and implementation. Projects could include conservation efforts in a targeted area of the Pearl River, the Mandeville landbridge, and other strategic locations.

Steps needed:
- Work with local and regional nonprofits and environmental groups, state agencies, and other stakeholders to identify and pursue grant opportunities for funding of restoration and protection projects, including matching funding for existing efforts.
- Work with residents to incorporate local historic and cultural aspects into project designs.

Wetland Habitat
Wetlands along the shoreline of Lake Pontchartrain provide habitat for wildlife and a first line of defense from storm surge.

Photo Credit: St. Tammany Parish Flickr
Strategy 2: Develop a cohesive vision for recreation in the parish

The parish has diverse opportunities for addressing its recreational priorities, which include facilities serving residential areas and remote facilities for hunting, fishing, and conservation. A recreation vision would allow the parish to build on environmental assets and provide equitably-located recreational facilities.

Recreational Amenities
The parish’s parks and natural assets provide many opportunities for recreation and cultural education.

Photo Credit: St. Tammany Parish Flickr
Recreation and Education
Educational signage at recreational locations can help to unify the parish’s recreational and cultural activities and provide opportunities to learn about the culture and natural assets of the area.

*Photo Credit: St. Tammany Parish Flickr*

**Action A: Develop a comprehensive, parish-wide plan for all recreational and cultural activities in the parish.**

This plan would serve as the cornerstone for local planning and ensure a unified vision of the parish’s recreational and cultural development.

**Steps needed:**
- Inventory existing open space assets within the parish, and identify strategic opportunities for new open space.
- Develop guidelines for open space development based upon a hierarchy of open space amenities, such as parks, trails, pocket parks, and passive open space.
- Develop and fund a maintenance program for open space, including coordinating volunteer efforts.
- Create a capital improvement program for open space that identifies funding needs and priorities for open space development, and coordinate it with other capital investments and developments.
Action B: Expand the network of bike trails parish wide.

An integrated network of bike trails serves recreational, traffic abatement, and environmental functions, improving the quality of life in St. Tammany Parish. An expanded network can also provide improved access to parish destinations and amenities such as the Tammany Trace.

Steps needed:
- Identify gaps and prioritize completion of “missing links” in the existing trail system.
- Identify opportunities that take advantage of adjacent destinations, such as schools and open space amenities.
- Develop guidelines for both on-street and off-street bicycle facilities.
- Prioritize funding to implement “missing links” and desired connections first.

Opportunity to Expand
The Tammany Trace connects Covington, Abita Springs, Mandeville, Lacombe, and Slidell. The trail provides opportunities to expand and connections within these communities.

Photo Credit: St. Tammany Parish Flickr
Action C: Develop and adopt a St. Tammany Parish tree plan.

Trees are a critical component of the parish’s natural environment. Benefits of an urban tree canopy include improving stormwater management, increasing property values, lowering energy costs, improving wildlife habitats, and reducing air, noise, and water pollution. A tree plan will lay the groundwork for understanding the value of trees, new and old, as important economic and environmental assets and for creating a positive image of a community that values its natural assets.

Steps needed:
- Research best practices, such as Terrebonne Parish’s Tree Board and Tree Preservation Ordinance and Cleveland, OH’s Tree Plan.
- Prepare and adopt a tree management plan through a public input process.
- Based on the plan, adopt and implement a tree preservation ordinance.

Tree Canopy
Trees can improve stormwater management, increase property values, lower energy costs, improve wildlife habitats, and reduce air, noise, and water pollution.

Photo Credit: St. Tammany Parish Flickr
Cleveland Tree Plan
Together We’re Making Cleveland
the Forest City Once Again

EXECUTIVE SUMMARY

Three goals were defined that once achieved will pave the way for real and sustainable progress in rebuilding the urban forest:

- Recognize trees as critical community infrastructure.
- Reverse the trend of canopy loss.
- Assume full stewardship for the tree infrastructure.

With these goals in mind, a forward-thinking strategy has been mapped out in the form of 9 actions, each of which contains a lead organization, key partners, executable steps, and progress benchmarks.

**ACTION 1**
Establish a Unified Voice, Formalize Partnerships

**ACTION 2**
Develop and Implement an Outreach and Education Strategy

**ACTION 3**
Develop and Implement a Funding Plan

**ACTION 4**
Complete a Tree Inventory

**ACTION 5**
Develop and Implement a Management Plan

**ACTION 6**
Conduct an Operational Review

**ACTION 7**
Establish a Canopy Goal

**ACTION 8**
Institute Policy Changes

**ACTION 9**
Plant with a Purpose

**GOAL ONE**
Recognize trees as critical community infrastructure.

**GOAL TWO**
Reverse the trend of canopy loss.

**GOAL THREE**
Assume full stewardship for the tree infrastructure.

THE WAY FORWARD: A ROADMAP FOR SUCCESS

Through the Cleveland Tree Coalition, the City of Cleveland aims to grow its tree canopy from 19% to 30% by 2040.

Image Credit: Cleveland Tree Plan Executive Summary

Case Study: The Cleveland Tree Plan, Cleveland, OH

In 2015, the City of Cleveland’s Mayor’s Office of Sustainability, The Holden Arboretum, the Western Reserve Land Conservancy, LAND studio, and Cleveland Neighborhood Progress developed a comprehensive assessment of the city’s urban forest and an actionable strategy to restore it. The Cleveland Tree Plan identifies strategies to enhance and restore the city’s tree canopy and quantifies the benefits that trees provide in the urban environment. Twenty-five indicators for assessing the health of the city’s urban forest are included. The report describes restoration and maintenance of the urban tree canopy as a critical component of their efforts to prepare for climate change impacts. Benefits of an urban tree canopy, noted in the plan, include improved stormwater management, reduced urban heat island effects, improved air quality, reduced carbon pollution, increased property values, lowered energy costs, and improved wildlife habitats.

In addition to qualitative benefits, Cleveland’s tree canopy currently provides more than $28 million in quantifiable annual services to residents and another $25 million in lifetime carbon storage services.

The Cleveland Tree Plan integrates equity concerns into their plan through “Action #9: Plant with a Purpose—Trees for Neighborhood Equity.” To achieve this, the city devised a methodology to prioritize planting sites that included overall canopy increase, socioeconomic characteristics, stormwater management, energy savings, heat stress reduction, public health, economic development, neighborhood revitalization, and vacant land use.

According to the plan, tree planting should be based on the “Right Tree for the Right Place” concept. The city’s strategy ensures that the benefits of trees are socially equitable, and specific measures to address environmental justice are outlined in full in Appendix B.

Based on the vision and goals, nine actions were identified to rebuild Cleveland’s urban forest. These recommended actions detail the scope of work required of all partners, and each action lists a lead organization, key partners, executable steps, and progress benchmarks. Additionally, each task is listed on an achievement schedule, categorized into short-term (2015 – 2017), mid-term (2018 – 2020), and long-term (2021 – 2040) work.
Strategy 3: Combine drainage and green space features with recreational and cultural components

Drainage infrastructure, open space, and cultural elements should be integrated, providing multiple benefits. Canals, trails, habitat areas, boardwalks, and outdoor classrooms provide numerous recreational and educational opportunities for residents and visitors. Many of the stormwater management elements on these sites also offer opportunities for recreation, such as bird watching, walking, kayaking, and nature exploration.

Space for Water
The parish’s waterways present opportunities for safely storing water and improving the landscape.

Photo Credit: St. Tammany Parish Flickr
Action A: Design and retrofit stormwater management facilities and drainage canals as recreational assets.

When not in use as stormwater management features, these areas could serve as parks or festival grounds, complete with amphitheaters and other built features to accommodate visitors. Similarly, canals could be upgraded to include amenities for locals, beautifying and improving the quality of life for nearby residents. Water features and landscaped areas with swales, water gardens, permeable paths and sidewalks, and other amenities would enable properties to be recreational and open community assets while also holding floodwaters when needed.

Steps needed:
- Identify property and funding for potential multi-use facilities.
- Research best practices, using New Orleans and other cities that are creating multi-use retention facilities as sources.
- Update ordinances to require private properties that provide retention areas to design and build them as recreational or open space areas.
- Evaluate opportunities to retrofit canals with walking paths and habitat areas. Examples of potential canals that could be retrofitted are the W-14 and W-15 canals in Slidell.

Space for Water
The Mirabeau Water Garden, currently in design for the City of New Orleans, is a 25-acre empty lot that will become a model of sustainable water management in the region by reducing flooding and limiting subsidence in the neighborhood. The public park will also become a destination for recreation and environmental education.

Image Credit: Waggonner & Ball

Dry Condition

Rain Condition
Action B: Preserve and support Louisiana culture and historical sites.

An aggressive state, regional, and local cultural and historic marketing campaign will attract tourists and visitors to St. Tammany to experience the parish’s many assets.

Steps needed:
- Use web and mobile applications augmented reality, and other new technologies to help visitors discover Louisiana’s culture and history.
- Participate in a state-sponsored “stay-cation” marketing campaign aimed at Louisiana residents to promote local tourism.
- Promote use of the state’s Percent for Art program to include all capital expenditures from public funds, and allow the program to fund cultural assets such as space for music, festivals, or traditional cooking, in addition to visual arts.
- Colocate cultural events and programs near existing transportation corridors and community centers to make them more accessible to a wider range of people.

Historical Sites
St. Tammany Parish can expand on its historical sites, town centers, and parks to attract tourists and visitors.

Photo Credits: St. Tammany Parish Flickr
Case Study: Wally Pontiff Jr. Playground, Metairie, LA

Wally Pontiff Jr. Playground, located in the Old Metairie section of Jefferson Parish, is a high-performance landscape that maintains the appearance of a traditional suburban park. In addition to providing significant stormwater retention, it offers recreational opportunities for local residents including ball fields and a gymnasium. Pontiff Playground flooded after Hurricane Katrina and subsequent levee failures, damaging facilities and necessitating near total reconstruction.

The most striking strategy of the reconstruction of Pontiff Playground is a three-foot tall earthen berm, which was constructed around the perimeter of the park, creating a 40-acre stormwater retention area that is designed to retain water for up to a day before being siphoned into the 17th Street and Suburban Canals. The bermed area accommodates approximately 6.9 million cubic feet (52 million gallons) of stormwater. This is sufficient to drain six inches of standing water from a surrounding area totaling 180 acres, with the goal of mitigating a 10-year rain event (9.4 inches in a 24-hour period) During heavy rainfall, the playground can be intentionally flooded to help alleviate the burden on surrounding drainage systems. The berm, additional drainage modifications, and required pumps were financed by the Jefferson Parish Drainage Department for approximately $6 million. Enhancing the pre-Katrina park infrastructure with a cost-effective and high-capacity integrated landscape water management system has reduced risk of flooding in Old Metairie, dual-purposed public land, and has created a popular destination that improves the quality of life for Jefferson Parish residents.
Village-in-the-Woods

One of the catalytic projects, the Village in the Woods prototype is a concept for a higher-density, multi-generational, residential and mixed-use development that uses smart-growth techniques and best water management practices.
5  Realizing the Vision
Planning to Action

Residents constantly think about the risks associated with living in St. John the Baptist Parish and how they can live harmoniously with the water around them. Throughout the LA SAFE initiative, residents and stakeholders discussed their needs and possible solutions for adapting to future changes to their environment and risk profiles. The top strategies for each adaptation goal are described in Chapter 4: Vision and Strategies.

Based on resident and stakeholder input, the Louisiana Office of Community Development identified six catalytic projects that implement numerous adaptation strategies. Ideas gathered from meeting participants in Rounds 1 through 4 contributed to each project’s development. Residents and stakeholders reviewed the resulting six strategies and provided feedback on their preferences, which were factored into funding decisions. LA SAFE identified one or two projects in each parish to provide funding assistance.

Strategy Evaluation Criteria

Evaluation of catalytic projects eligible for LA SAFE funding is based on the following criteria—

1. Public Preference
   The results of the preference polling at the fifth round of meetings paired with the responses from an online survey, which allowed residents to indicate their preferences if they were unable to attend a Round 5 meeting.

2. Leverage Funds
   The level of matching funds from other sources available to implement the project.

3. LMI Benefit
   Projects that predominantly benefit a low-to-moderate income population.

4. Public Benefit (Quantitative)
   The level of benefit to the public that can be measured. For example, the number of units created in a housing proposal or the amount of water stored in a stormwater management proposal.

5. Public Benefit (Qualitative)
   The degree to which the project addresses future flood risk in a unique way and/or improves quality of life for residents.

6. CRS Score
   Awarded to projects that gain points in FEMA’s Community Rating System (CRS), which lowers flood insurance rates.

The table on the opposite page summarizes the six catalytic projects considered for LA SAFE funding and how they address the parish’s goals. Detailed descriptions of each of the six projects follow the table.
<table>
<thead>
<tr>
<th>Catalytic Projects</th>
<th>LA SAFE Goals</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Water Management</td>
</tr>
<tr>
<td>French Branch Pond Connectivity</td>
<td>Reduces surrounding neighborhood and street flooding by expanding detention capacity.</td>
</tr>
<tr>
<td>Safe Haven Blue-Green Campus and Trails</td>
<td>Enhances detention capacity in a critical drainage area adjacent to Cane Bayou, protecting campus facilities and surrounding neighborhood residences.</td>
</tr>
<tr>
<td>Northshore Launchpad</td>
<td>Incentivizes the development of new norms and emergent technologies in stormwater management.</td>
</tr>
<tr>
<td>Covington Green Block</td>
<td>Reduces potential for neighborhood and street flooding by expanding detention capacity through pervious paving, bioswales, and rain gardens.</td>
</tr>
<tr>
<td>Bayou Liberty Park</td>
<td>Enhances stormwater capacity and infiltration rates within the critical drainage area, reducing flood risk to surrounding commercial developments.</td>
</tr>
<tr>
<td>Village-in-the-Woods Prototype</td>
<td>Reduces floodplain impacts by utilizing residential stormwater management best practices incorporated in multifamily development with built-in detention, minimized paving, and increased density.</td>
</tr>
</tbody>
</table>
French Branch Pond Connectivity

Stormwater management has been a major concern among parish residents, and additional retention and detention areas are needed to protect development from flooding. St. Tammany Parish residents are supportive of using the landscape’s natural features to provide water storage functions. The French Branch Pond is an asset that can be enhanced to provide water management and other benefits.

In areas projected to experience low future flood risk and where a detention pond is already providing stormwater management functions, additional features can be implemented to increase the quality of life for residents and the stormwater management function.

The French Branch Pond Connectivity project proposes to add a suite of recreational and educational amenities to transform the traditional detention pond into a community asset. The detention pond itself is slated to be converted to add an additional 324 acres of floodplain storage to reduce flood risk in a critical drainage area. Educational signage along the walking/biking path surrounding the pond, floodable boardwalks within the pond, and a new trail under I-10 that connects Slidell to the existing trail network could significantly improve access to nature and learning opportunities as well as mobility for residents and visitors.

<table>
<thead>
<tr>
<th>Statistics</th>
<th>Approx. 55 acres</th>
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<tbody>
<tr>
<td>Project Area</td>
<td>Slidell</td>
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<tr>
<td>Location</td>
<td>La SAFE Investment</td>
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<tr>
<td>Estimated Project Cost</td>
<td>$3.7 million</td>
</tr>
<tr>
<td>Potential Partners</td>
<td>St. Tammany Parish; FEMA; City of Slidell</td>
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</tbody>
</table>
Left: Perspective view of formalized trail under highway to connect French Branch Pond to existing trail network.

Middle: Precedent image of multi-use trail under bridge along water.

Right: Precedent image of pavilion along trail with boardwalk and overlook.

Photo Credit: USFWS Midwest\Flickr\CC by SA 2.0
Safe Haven Blue-Green Campus and Trails

A major challenge identified by the parish’s stakeholders is flooding due to poor drainage and stormwater management, especially in the southern part of the parish. At the same time, the area’s natural beauty presents an asset around which many possibilities exist. Opportunities identified by residents include building to live with water, using better land and water management, and promoting the parish’s natural beauty through restoration efforts, education, and access to these assets.

Areas subject to moderate and high future flood risk must consider stormwater management features in addition to current and planned restoration systems. The Safe Haven Blue-Green Campus and Trails proposal transforms existing developments within a critical drainage area into a beautiful landscaped development consisting of spaces for workforce development, education, and smart-growth opportunities. The campus’ landscaped area will provide multiple ecosystem services, including stormwater management, water cleansing, and native habitat recovery.

The Safe Haven Blue-Green Campus and Trails will install green infrastructure such as pervious parking and driveways as well as numerous water storage features that will temporarily store excess water during heavy rain events. Through a trail network, the project will provide access to amenities such as bird watching, wildlife viewing, and educational pavilions. The project site will be designed to demonstrate the benefits of “living with water” and “smart growth” when building within constraints, such as adjacent drainage areas within which development is prohibited.

### Statistics

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<tr>
<th>Project Area</th>
<th>10 acres</th>
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<tr>
<td>Location</td>
<td>Near Mandeville</td>
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<tr>
<td>LA SAFE Investment</td>
<td>Up to $11.5 million</td>
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<tr>
<td>Estimated Project Cost</td>
<td>$11.5 million</td>
</tr>
<tr>
<td>Partners</td>
<td>St. Tammany Parish; City of Mandeville; St. Tammany Parish Public Schools; potential private and nonprofit entities</td>
</tr>
</tbody>
</table>

Stormwater Park & Recreation Paths; *Image Credit: USFWS Midwest\Flickr\CC by SA 2.0*

Precedent image of water storage area that doubles as terraced gathering space; *Image Credit: Payton Chung\Flickr\CC by SA 2.0*

Precedent image of wetland park; *Photo Credit: Matthias Süßen\Wikimedia Commons\CC by SA 3.0*
Campus Plan
The Safe Haven campus strategically repurposes existing buildings and land to manage stormwater in critical drainage areas, creates space for education and workforce development, and spurs smart-growth opportunities with expanded parks and trails.

1. Renovate and repurpose existing building
2. Education pavilion
3. Water storage
4. Remove portions of existing concrete walk; build new boardwalks
5. Install pervious parking and driveways
6. Improve existing path and integrate with new path network
7. Improve landscape throughout building site

Plan View

Future Boardwalks
- Pavilion
- Weir structure
- Bridge
- Future trail
- Existing trail
- Existing road
- Existing bayou
- Existing critical drainage
Northshore Launchpad

Entrepreneurship is on the rise in St. Tammany Parish, and additional resources and assistance could diversify and strengthen the economy. Through Propeller’s Growth Accelerator and in partnership with Northshore Technical Community College, the parish’s entrepreneurs could be supported by providing workspace, access to shared office equipment, and peers. Through the accelerator program, entrepreneurs can work with mentors in their fields to help guide them through their program as they start their own businesses.

The Northshore Launchpad will provide the needed support for start-up firms and thus encourage the development of jobs in emergent technologies and growing industries. The main facility will use smart building strategies that respond to the environment and mitigate stormwater on site. Potentially, the Northshore Launchpad could have satellite locations, in leased or donated spaces, throughout the parish.

<table>
<thead>
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<tbody>
<tr>
<td>Location</td>
<td>TBD</td>
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<td>LA SAFE Investment</td>
<td>Up to $4 million</td>
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<td>Estimated Project Cost</td>
<td>$2 million for accelerator program development; $2 million for facility construction or renovation</td>
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<tr>
<td>Potential Partners</td>
<td>Propeller; Northshore Technical Community College (NTCC); St. Tammany Parish Government</td>
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</table>

Photo Credit: NHD - Info|Wikimedia Commons\CC by SA 2.0
Alternative Energy
Wind and Solar

Photo Credit: Louisiana GOHSEP\Flickr\CC by SA 2.0
Coastal Restoration

Photo Credits: (A) Victor Grigas\Wikimedia Commons\CC by SA 3.0; (B) Anno611\Wikimedia Commons\CC by SA 4.0; (C) Team Link Humans\Flickr\CC by SA 2.0; (D) Lukas Boxburger\Wikimedia Commons\CC by SA 4.0; (E) University of the Fraser Valley\Flickr\CC by SA 3.0
This proposed project is modeled after Propeller, a business incubator in New Orleans that offers a training program for starting new businesses as well as office space and amenities for small business owners. The Lafourche Parish incubator would support businesses that address alternative energy, coastal restoration, hospitality, and ecotourism.
Covington Green Block

St. Tammany Parish residents cherish their cultural assets such as downtowns and historic landmarks. They see an opportunity to build and expand on existing efforts to improve connectivity and address flood risk with green infrastructure.

The City of Covington, in partnership with the Regional Planning Commission, collected and analyzed land use, traffic, crash, and related data for the area around Jefferson Ave. The group made recommendations for new or enhanced policies to improve traffic circulation, signage, striping, signals, and safety for all transportation modes. Short-term recommendations include the installation of sidewalks, crosswalks, sharrows, and signage to enhance pedestrian and bicycle safety and accessibility.

Building on this planning effort, the Covington Green Block focuses on Jefferson Ave. to connect to the Tammany Trace and incorporate green infrastructure.

Connecting to Tammany Trace via a multi-use trail will enhance the connectivity in this high-traffic area and provide a clear, safe environment for bikers and pedestrians near the trailhead—a popular destination for residents and visitors alike. Incorporating green infrastructure, such as permeable street parking, bioswales, and rain gardens, will expand the area’s detention capacity to alleviate potential flooding. In addition, a water garden in front of William Pitcher Junior High School will provide educational opportunities for in-field education on the benefits of green infrastructure and complete streets for the school’s students and others.

**Statistics**

| **Project Area** | Approx. 6 acres |
| **Location** | Covington |
| **LA SAFE Investment** | Up to $4.7 million |
| **Estimated Project Cost** | $4.7 million |
| **Potential Partners** | St. Tammany Parish; City of Covington; DOTD |

Precedent images of stormwater management landscape. *Photo Credits, Left: Jamie\Wikimedia Commons\CC by SA 2.0*

Precedent images of green streets.

Precedent images of permeable street parking and shaded shared-use path.
1. Water storage and tree plantings around William Pitcher Junior High School
2. Sidewalk bioswales and shade tree plantings along both sides of street
3. Permeable systems in new street parking
4. New traffic circle with water feature
5. City-funded, 10-feet wide shared-use path
6. 10-feet wide, shared-use path extension to 15th Ave.

St. Tammany Parish School Board Perspective View
Bayou Liberty Park

In locations projected to have moderate future flood risk, it will become more important to maximize natural areas for their capacity to absorb and retain stormwater, providing flood mitigation to surrounding communities and commercial corridors. Bayou Liberty Park will develop a 48-acre land parcel into a formal stormwater retention park that would help to mitigate flooding in adjacent residential and commercial communities, boosting economic and social viability. The park would also be a new community gathering space where markets, picnics and the like could be held. Bayou Liberty would provide recreational trail and blueway connections to the Tammany Trace, adjacent neighborhoods and commercial centers.

The stormwater management features of Bayou Liberty help address flooding and drainage issues, one of the biggest concerns for Slidell community residents. The park also provides additional recreational trails and green space, allowing more bicycle and pedestrian activity, promoting multi-modal movement.

### Statistics

<table>
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<th>Project Area</th>
<th>48 acres</th>
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<td>Location</td>
<td>Slidell</td>
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<td>LA SAFE Investment</td>
<td>Up to $5 million</td>
</tr>
<tr>
<td>Estimated Project Cost</td>
<td>$5 million</td>
</tr>
<tr>
<td>Potential Partners</td>
<td>St. Tammany Parish; FEMA; City of Slidell; potential corporate partners via Walmart/Walton Family Foundation and Northshore Mall</td>
</tr>
</tbody>
</table>

Photo Credits: (1) Art Anderson\Wikimedia Commons\CC by SA 3.0 (2) USFWS Midwest\Flickr\CC by SA 2.0 (3) Matthias Süßen \Wikimedia Commons CC BY-SA 3.0; (5) Jamie\Wikimedia Commons\CC by SA 2.0; (6) Aron Volkening\Flickr\CC by SA 2.0; (8) National Park Service; (9) Robin Stott\Geograph\CC by SA 2.0
Image Credit: Design Workshop
Village-in-the-Woods Prototype

Low flood-risk areas are well-positioned to receive population and economic growth. Higher-density, multi-generational, residential, and mixed-use developments should be prioritized. St. Tammany Parish’s population is projected to double in the next 15 years. According to the Urban Land Institute (ULI), under current development trends, this growth would consume about 50% of available land for future development. This is due to the fragmented and disconnected nature of conventional development patterns that exacerbate current traffic and transportation challenges. ULI proposes a village-in-the-woods model that would only consume 6% of available land, by using smart-growth techniques, providing opportunities for more sustainable growth. This model manages natural and engineered systems holistically for increased resilience, promotes more focused, mixed-use patterns for more walkable/bikeable neighborhoods, and enhances the suburban identity of new neighborhoods.

**Statistics**

<table>
<thead>
<tr>
<th>Location</th>
<th>Between LA 1088 and LA 343, north of I-12</th>
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</thead>
<tbody>
<tr>
<td>LA SAFE Investment</td>
<td>Up to $6 million</td>
</tr>
<tr>
<td>Potential Partners</td>
<td>St. Tammany Parish; potential private developer (TBD through NOFA process)</td>
</tr>
</tbody>
</table>

**Precedent images of Terra Bella Development Community**

*Photo Credits: Google Maps Street View*
Implementation Plan

During the Round 5 meetings, residents evaluated and marked their preferences among the six catalytic project proposals. The six proposals reflect the vision and input gathered throughout the engagement process and targeted opportunities that St. Tammany Parish residents identified throughout the LA SAFE process.

Following the Round 5 meetings, a selection committee whose membership includes the Louisiana Office of Community Development’s resiliency and recovery staff reviewed each of the projects and used a point system to rank their potential for funding and implementation, taking into account public preference, leverage funds available, LMI benefit, public benefit (quantitative and qualitative), and CRS score.

The project selected via this process for St. Tammany Parish, **Safe Haven and Blue-Green Campus and Trails**, is described below.

**Safe Haven Blue-Green Campus and Trails**

Even in higher-ground locations, natural systems must be maximized to retain stormwater in response to current and future flood risk. The Safe Haven Blue-Green Campus and Trails project is a Community Nonstructural Mitigation/Flood Risk Reduction and Public Services project that will enhance detention capabilities in a critical drainage area adjacent to Cane Bayou, protecting campus facilities and surrounding neighborhood residences. The project, located in Mandeville, will divert stormwater into existing forested land, illustrating how a multiphase development with existing infrastructure in vulnerable environments can be repurposed to benefit surrounding areas. The project aims to catalyze development that integrates Safe Haven Campus and the essential services it provides into the surrounding community, with the ultimate goal of destigmatizing mental health and substance abuse programs and encouraging an inclusive culture in which Safe Haven’s critical services are better utilized.

During Round 1 of LA SAFE meetings, the project team hosted stakeholders of St. Tammany Parish at Northshore High School in Slidell. At this meeting, many residents recently affected by the floods of May and August 2016 were interested in discussing LA SAFE’s ability to help alleviate flood conditions both along the coast and near rivers, bayous, and streams. The data gathered during this meeting clearly revealed residents’ anxiety about flood risk. Residents mentioned feeling stressed, nervous, and concerned for the future condition of their community. The project team noted 10 specific instances where attendees mentioned feeling fear and hopelessness. The residents who attended this meeting also expressed a desire to maintain the high quality of life in the parish through smarter development decisions as the population continues to grow. Meeting attendees spoke to a need for the regulation of certain development, especially in how it relates to environmental impact and putting people at risk. Much of the discussion in the first meeting revolved around recurring themes of smarter development, environmental impact, and the high quality of life in St. Tammany Parish. These categories were referenced about 150 times in a meeting that was attended by approximately 85 people.
At the Round 2 meetings, attendees from Mandeville specifically identified a need to increase connectivity and to alleviate flood risk in the community.

In Round 3, the project team presented attendees with a vision for St. Tammany Parish based on the data gathered in the previous two rounds of engagement. Residents agreed with the overall vision and presented the project team with recommendations for specific projects ideas. They wanted to see projects that increased green space, enhanced stormwater retention capabilities, and improved connectivity in low- and moderate-risk areas.

In Round 4, the parish and representatives from Safe Haven proposed the Safe Haven Blue-Green Campus and Trails project idea as an opportunity to implement the concepts recommended by the public during the previous rounds of LA SAFE meetings.

During the public polling process in Round 5, residents confirmed their desire to have improved stormwater management capabilities as well as essential social and mental health services in St. Tammany Parish. Those who marked their preference for a particular project during Round 5 collectively chose this project as their favorite overall for investment. Eighteen different zip codes were represented across the in-person and online polling platforms.

It is anticipated that funding for these projects will become available mid-2018. Project completion is expected by September 2022.
Priority Implementation Table

The St. Tammany Parish Adaptation Strategy has been specifically outlined in previous sections of this document. Implementing the vision will require an effective partnership between the private businesses and stakeholders, federal, state and local public entities, nonprofits and the members of the community. This Implementation Table provides a road map for the parish and other stakeholders to follow that prioritizes those relationships based on a series of action items over the near-term (1 to 10 years), medium-term (11 to 25 years), and long-term (over 25 years). Based on the issues identified by the extensive public input and on the concepts forwarded in this strategy, action items have been organized into the following key goals:

- Goal 1: Manage Flooding and Subsidence
- Goal 2: Direct Growth to Low-Risk Areas
- Goal 3: Improve Mobility Throughout the Parish and Region
- Goal 4: Strengthen and Diversify Local Economies
- Goal 5: Retain Local Culture and Enhance Recreation Opportunities
<table>
<thead>
<tr>
<th>Stormwater Management</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Retain and detain stormwater</strong></td>
</tr>
<tr>
<td>Protect and restore shoreline habitats.</td>
</tr>
<tr>
<td>Increase retention areas throughout the parish.</td>
</tr>
<tr>
<td>Promote the use of shared detention areas to adjacent property owners.</td>
</tr>
<tr>
<td>Retrofit retention areas to also manage water quality.</td>
</tr>
<tr>
<td>Create an “Adopt-a-Ditch (or Bayou)” or “Maintain the Drain” program.</td>
</tr>
<tr>
<td><strong>Reduce impervious surfaces</strong></td>
</tr>
<tr>
<td>Incorporate green infrastructure into development designs and drainage updates.</td>
</tr>
<tr>
<td>Incorporate green streets infrastructure and water management into road design.</td>
</tr>
<tr>
<td>Expand green space requirements to also manage stormwater.</td>
</tr>
<tr>
<td><strong>Review and update stormwater policies and programs</strong></td>
</tr>
<tr>
<td>Conduct an audit of all parish plans, regulations, and policies relevant to stormwater regulation and amend development codes to achieve consistency with stormwater management best practices across all departments.</td>
</tr>
<tr>
<td>Develop a regional stormwater management plan.</td>
</tr>
<tr>
<td>Continue to develop and update stormwater utilities that create fee-based services to help pay for green infrastructure flood risk reduction projects.</td>
</tr>
<tr>
<td>Provide incentives for private developers to implement green infrastructure to handle stormwater on site.</td>
</tr>
<tr>
<td>Strategy</td>
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</tr>
<tr>
<td><strong>Stormwater Management</strong></td>
</tr>
<tr>
<td>Reduce the impact of storm surge</td>
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<tr>
<td></td>
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<tr>
<td><strong>Housing and Development</strong></td>
</tr>
<tr>
<td>Encourage focused, mixed-use development patterns to promote public health through walkable/bikeable neighborhoods</td>
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<tr>
<td>Create and maintain a diverse and resilient housing stock for people at all income levels</td>
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<tr>
<td>Strategy</td>
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<td><strong>Transportation</strong></td>
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<tr>
<td><strong>Alleviate congestion</strong></td>
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<td><strong>Expand and diversify transportation options</strong></td>
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<td><strong>Support Complete Streets to encourage a more bikeable, walkable environment and improve community connectivity</strong></td>
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<tr>
<td>Strategy, Economy, and Jobs</td>
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<tr>
<td>Expand the local workforce</td>
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<td>Improve career ladders and links to workforce development</td>
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<td>Retain existing business and develop new business opportunities throughout the parish</td>
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### Culture and Recreation

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Action</th>
<th>Risk Zone</th>
<th>Timeline</th>
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</thead>
<tbody>
<tr>
<td>Protect local culture and enhance recreation opportunities</td>
<td>Improve access to the Bogue Falaya River in Covington.</td>
<td>Low</td>
<td>Near Term (1 – 10 years) Medium Term (11 – 25 years)</td>
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<td>Incorporate recreational and educational components into proposed wetland protection and restoration projects.</td>
<td>Low Moderate High</td>
<td>Near Term (1 – 10 years)</td>
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<td>Develop a cohesive vision for recreation in the parish</td>
<td>Develop a comprehensive, parish-wide plan for all recreational and cultural activities in the parish.</td>
<td>Low Moderate High</td>
<td>Near Term (1 – 10 years)</td>
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<td>Expand the network of bike trails parish wide.</td>
<td>Low Moderate High</td>
<td>Near Term (1 – 10 years) Medium Term (11 – 25 years)</td>
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<td></td>
<td>Develop and adopt the St. Tammany Parish tree plan.</td>
<td>Low Moderate High</td>
<td>Near Term (1 – 10 years) Medium Term (11 – 25 years)</td>
</tr>
<tr>
<td>Combine drainage and green space features with recreational and cultural components</td>
<td>Design and retrofit stormwater management facilities and drainage canals as recreational assets.</td>
<td>Low Moderate High</td>
<td>Near Term (1 – 10 years) Medium Term (11 – 25 years)</td>
</tr>
<tr>
<td></td>
<td>Preserve and support Louisiana culture and historical assets.</td>
<td>Low Moderate High</td>
<td>Ongoing (0 – 50 years)</td>
</tr>
</tbody>
</table>
Catalytic Project Implementation
On April 20, 2018, Governor John Bel Edwards announced the 10 projects across six parishes selected for development.

“We believe LA SAFE represents a crucial step forward in cementing Louisiana’s place on the cutting edge in resilience-building activities. Although our Coastal Master Plan is the country’s preeminent effort to reduce future land loss and coastal flood risk, LA SAFE has taken the next step in illuminating a path forward for how our communities develop future housing, economic, social, and transportation needs to withstand future disasters and adapt to environmental changes over time. In an age of heightened risk, now is the time to start addressing the needs of our communities.”

—Governor John Bel Edwards
Call to Action

St. Tammany Parish has a lively culture and robust economy. Due to its proximity to Lake Pontchartrain and various rivers, St. Tammany Parish has always lived with the risk of flooding. Responding to annual storm threats and subsequent storm surge as well as riverine flooding is a way of life, and dealing with these challenges has brought the community closer together. This has made St. Tammany Parish's leaders and residents experts at weathering storms and bouncing back from hurricanes, damaging storm surge, and riverine flooding. However, these hazards have lately been exacerbated by both natural and man-made disasters, including climate change and infrastructure development. The result is that wetlands along St. Tammany Parish's shorelines are transforming into open water at an alarming rate, bringing the Gulf of Mexico via Lake Pontchartrain closer than ever and making the parish more vulnerable to storm and tidal surge. Outdated stormwater management is contributing to this flood risk, as drainage capacities are now easily overwhelmed by simple downpours. The threat of flooding has intensified the need for timely flood risk-reduction measures and adaptation strategies—not only to secure in pursuit of a bright, viable future but also to preserve the parish's history, culture, and economy.

To date, St. Tammany Parish has planned and implemented numerous wetland restoration projects. However, as flood risk continues to increase locally and globally, different strategies are needed to ensure the parish will adapt to an ever-changing environment.

Through funding from the National Disaster Resilience Competition, LA SAFE was conceived to address flood hazards in St. Tammany Parish and five other parishes and to provide adaptation strategies that will strengthen each parish's approach to flood resilience. Throughout this plan's development, residents, stakeholders, and experts took into account the existing and potential threats facing the parish. They considered the complex aspects of flood hazards such as historical occurrence, causes, and exacerbating factors. Risks include overland, riverine, and backwater flooding as well as storm surge, shoreline erosion, relative sea level rise, and climate change. The Adaptation Strategy is built on the parish's planning, regulatory, and emergency management capabilities, which are very strong but severely limited in resources.

Through the LA SAFE process, St. Tammany Parish residents and stakeholders developed a variety of strategies that will enable their communities to chart a new path in known territory—one that will allow the rich and deeply rooted traditions to persevere, economies to diversify, and communities to make informed, wise development decisions. The adaptation strategies identified and prioritized through this project aim to propel St. Tammany Parish toward a future where flood risk is mitigated by—

- ensuring that no one is left behind in the highest-risk areas;
- building on existing assets and repurposing buildings to accommodate a smaller, more concentrated community footprint that will be easier to protect from flood risk;
- providing economic opportunities and safe properties for those in the moderate-risk areas; and
- using natural functions of our wetlands and floodplains to manage water.

The adaptation strategies were developed by the people of St. Tammany Parish for the people of St. Tammany Parish. Implementation of the strategies through deep involvement of the parish's leadership and residents will continue to improve St. Tammany Parish's ability to reduce impacts from hazards and bounce back after natural and man-made disasters, allowing residents to live in the rich cultural and natural environment that residents love to call home.
References

Unless otherwise noted, all photos and drawings were produced by the LA SAFE project team.

Additional Map Sources

These additional sources were used to create the maps throughout the St. Tammany Parish Adaptation Strategy—

Atlas: The Louisiana Statewide GIS, accessed 2017

CPRA 2017 Coastal Master Plan: Structural Projects, 2017

OpenStreetMap, accessed 2017

National Land Cover Database created by the Multi-Resolution Land Characteristics (MRLC) Consortium, 2011

USACE Louisiana Geographic Information Center, 2006

USGS National Hydrology Dataset, accessed 2017

Endnotes


2. Coastal Protection and Restoration Authority, Louisiana’s Comprehensive Master Plan for a Sustainable Coast.


11. The Gulf Coast Region is defined as Texas, Louisiana, Mississippi, Alabama, and Florida.


38. Coastal Protection and Restoration Authority, Louisiana’s Comprehensive Master Plan for a Sustainable Coast.


50. Urban Land Institute, Bridging the Divide with the South Central Study Area through Resilience.
Working together for community resilience, economic prosperity, and a better quality of life for everyone in Louisiana.