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TRANSPORTATION RESILIENCE IMPROVEMENT PLAN

ORIGINAL PLAN DATE: FEBRUARY 2, 2026

REVISED: SEPTEMBER 10, 2026

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Louisiana's transportation system plays a vital role in the health, safety, and economic stability of our communities. It supports daily commutes, connects people and services, and facilitates the movement of goods through our ports. While the people of Louisiana are the foundation of the State's economy, this network is essential to supporting them

and sustaining commerce at local, regional, national, and international levels. The system faces increasing risks from a range of environmental hazards, including hurricanes and tropical storms, coastal land loss, extreme heat, and other hazards identified in this plan. These growing risks underscore the need for proactive planning to protect critical infrastructure and strengthen the resilience of Louisiana's transportation system.

To address these challenges, the Louisiana Department of Transportation and Development [LADOTD] has developed the Transportation Resilience Improvement Plan [TRIP]. This Plan provides a strategic framework to assess vulnerabilities, identify at-risk assets, and guide investments that improve the resilience of Louisiana's transportation infrastructure.

A central goal of this plan is to position Louisiana to access federal funding through the U.S. Department of Transportation's Promoting Resilient Operations for Transformative, Efficient, and Cost-saving Transportation [PROTECT] Program. By identifying resilience projects and integrating resilience into our planning processes, the state can be more successful in demonstrating the need for competitive funding and deliver long-term value to the communities it serves.

The development of this Plan was a collaborative effort across LADOTD, drawing on the expertise and input of staff from across the organization. It considers the many ways transportation infrastructure supports daily life in Louisiana and the importance of building a system that can withstand future challenges. The Plan reflects LADOTD's ongoing commitment to serving the people and communities that depend on a safe, connected, and reliable transportation network.

LADOTD remains dedicated to planning, investing, and sustaining a multimodal transportation network that is safe, reliable, and supports mobility and economic opportunity for all communities.

Sincerely,



Glenn Ledet | Secretary, LADOTD

MESSAGE FROM LEADERSHIP





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Baton Rouge, Louisiana

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Acronyms and Abbreviations

AADT	Annual Average Daily Traffic
AEP	Annual Exceedance Probability
BIL	Bipartisan Infrastructure Law
CDBG	Community Development Block Grant
CFR	Code of Federal Regulations
CMAQ	Community Multiscale Air Quality
CPRA	Coastal Protection and Restoration Authority
CRP	Carbon Reduction Program
CTP	Cooperating Technical Partner
DEQ	Department of Environmental Quality
DMS	Dynamic Messaging System
DTM	Digital Terrain Model
ESF	Emergency Support Functions
ESG	Emergency Solutions Grants
EV	Electric Vehicle
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FIRM	Flood Insurance Rate Map
GHG	Greenhouse Gases
GIS	Geographic Information Systems

Acronyms and Abbreviations

GOHSEP	Governor's Office of Homeland Security & Emergency Preparedness
HOME	HOME Investment Partnerships Program
HOPWA	Housing Opportunities for Persons With AIDS
HSIP	Highway Safety Improvement Program
HUD	United States Department of Housing and Urban Development
ICS	Incident Command System
IHNC	Inner Harbor Navigation Canal
IJA	Infrastructure Investment and Jobs Act, also known as the Bipartisan Infrastructure Bill (BIL)
ITS	Intelligent Transportation System
LA	Louisiana
LADOTD	Louisiana Department of Transportation and Development
LED	Louisiana Economic Development
LWI	Louisiana Watershed Initiative
MPO	Metropolitan Planning Organization
MRL	Mississippi River Levees
NEVI	National Electric Vehicle Infrastructure
NFIP	National Flood Insurance Program
NHFN	National Highway Freight Network
NHPP	National Highway Performance Program
NHTF	National Housing Trust Fund



Acronyms and Abbreviations

NLD	National Levee Dataset
NRI	National Risk Index
PROTECT	Promoting Resilient Operations for Transformative, Efficient, and Cost-Saving Transportation Program
RIP	Resilience Improvement Plan
RPC	Regional Planning Commission
RSF	Recovery Support Functions
RWG	Resilience Working Group
SEOC	State Emergency Operations Center
SEOP	State Emergency Operations Plan
SHMP	State Hazard Mitigation Plan
STRAHNET	Strategic Highway Network
STIP	Statewide Transportation Improvement Program
TAMP	Transportation Asset Management Plan
TRIP	Transportation Resilience Improvement Plan
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USDOT	United States Department of Transportation
USGS	United States Geological Survey
VMT	Vehicle Miles Traveled

Definitions and Terminology

Asset	A resource, physical or digital, owned or managed, that has potential or actual value to an organization.
Asset Management	Strategic and systematic process for operating, maintaining, or upgrading assets to optimize performance, cost-efficiency, and service over the life cycle of the asset.
Consequence	The outcome or impact resulting from an event, immediate, short- and/or long-term, causing direct and indirect effects.
Criticality	An evaluation of the importance of an asset within a transportation system.
Disruption	An event or occurrence that interrupts normal operations, causing delays or failures in systems and processes.
Exposure	The extent to which an asset or system is subject to effects from hazards or related events.
Extreme Weather Events	Severe or significant weather events that can include anomalies in temperature, precipitation, and/or winds and can manifest as heavy precipitation and flooding, heatwaves, drought, wildfires, and windstorms. Extreme weather events can lead to safety concerns, damage, destruction, as well as human and economic losses.
Failure	Partial or complete loss of function or performance of a transportation asset or system.
LADOTD District	LADOTD divides the state of Louisiana into 9 districts. Each administrative district oversees transportation infrastructure and services.
Multimodal	Use of more than one mode of transportation [e.g., rail, truck, ship, aircraft] to transport goods or passengers within a single journey or system.



Definitions and Terminology

Mitigation	An action that reduces or eliminates negative consequences of a threat.
Parish	The state of Louisiana is divided into 64 parishes, which are commonly known as counties in other states.
Preparedness	The action and planning taken in advance to respond to disruptions or emergencies in the transportation system.
Project	A set of connected tasks taken to achieve a particular goal or outcome to improve resilience to natural hazards. Projects can include planning, design, maintenance, and/or construction activities.
Redundancy	Transportation systems provide backup or alternative travel options when primary routes or systems are compromised.
Resilience	Ability to anticipate, prepare for, and adapt to changing conditions and withstand, respond to, and recover rapidly from disruptions.
Risk	Likelihood that an asset will experience an impact, and the severity or consequence of that impact.
Sensitivity	The degree to which the functionality of an asset [or system] is impacted by exposure to a hazard.
Threat	A potential hazard or event that has the capability to disrupt or damage systems, infrastructure, and/or services.
Vulnerability	The degree to which a system is susceptible to, or unable to cope with, the adverse effects of hazard events.



Shreveport Bridge



EXECUTIVE SUMMARY



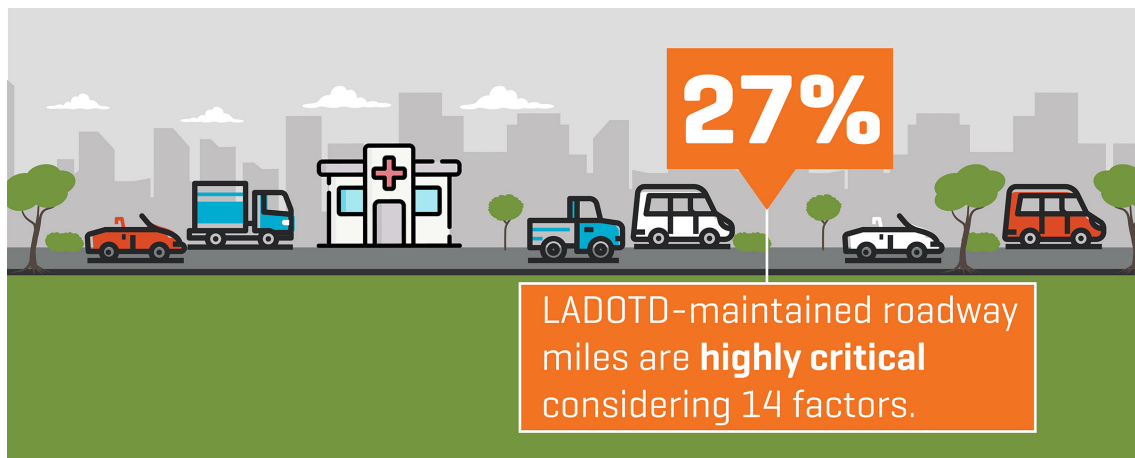
Executive Summary

The Louisiana Department of Transportation and Development (LADOTD) is transforming how the state plans, maintains, and invests in its transportation system to confront the growing threats from extreme weather and aging infrastructure. Alongside many other state agencies' and partners' resilience efforts, LADOTD is taking bold action through this Statewide Transportation Resilience Improvement Plan (TRIP) to strengthen the efficiency, reliability, and resilience of a network that powers the nation—serving as a critical gateway for North American energy, agriculture, and trade.

This Plan delivers a systemic, forward-looking approach, consistent with Federal Highway Administration (FHWA) guidance for Resilience Improvement Plans (RIPs). The TRIP anchors resilience in LADOTD's internal Strategic Improvement Plan, which prioritizes data governance, performance tracking, and improved project delivery. Together, these initiatives position LADOTD to lead in risk-informed decision-making while unlocking the full potential of federal resilience programs like Promoting Resilient Operations for Transformative, Efficient, and Cost-Saving Transportation (PROTECT).

By combining statewide hazard modeling with insights from the LADOTD Resilience Working Group and LADOTD districts, LADOTD developed a bottom-up and top-down strategy that reflects regional needs while aligning with state and national priorities [See Chapter 2: [Planning and Regulatory Landscape](#)]. The resulting list of 105 Priority Resilience Projects focused on land surface transportation assets offers Louisiana a competitive edge in seeking PROTECT implementation funding. These investments would reduce long-term maintenance costs, support safer travel, protect economic centers, and preserve essential corridors during major events from the wide range of natural hazards that can impact Louisiana [see [Chapter 3: Natural Hazard Profile](#)].

In addition to pursuing PROTECT funding for the eligible program asset types, LADOTD continues to support the protection and enhancement of other transportation modes [e.g., aviation] as part of statewide resilience efforts.



Transportation Criticality, Vulnerability, and Risk

LADOTD leveraged the best available data to identify essential LADOTD-owned surface transportation assets and evaluated where disruptions from natural hazards could have the greatest consequences. These assets include critical freight corridors, evacuation routes, and infrastructure supporting medical, industrial, and energy operations.

Based on the analysis conducted for this TRIP, nearly 27% of LADOTD-maintained roadway miles are classified as highly critical, including corridors that support hurricane evacuation, hospital access, ports, and interstate freight movement. Figure 1 shows the results of the vulnerability and risk assessments. These risks, when layered over critical assets, reveal the urgent need to invest in infrastructure that can perform under stress and recover quickly from disruption [See [Chapter 4: Criticality, Vulnerability, and Risk Assessment](#)].

 Flooding	 ROADWAYS	 BRIDGES
	 18% Highly Vulnerable	 33% Highly Vulnerable
	 9% High or Highest Risk	 13% High or Highest Risk
Extreme Heat 	 ROADWAYS	 BRIDGES
	 12% Highly Vulnerable	 4% Highly Vulnerable
	 5% High or Highest Risk	 0.7% High or Highest Risk
Winter Weather  (Extreme Cold)	 ROADWAYS	 BRIDGES
	 31% Highly Vulnerable	 100% Highly Vulnerable
	 13% High or Highest Risk	 71% High or Highest Risk
Other Hazards	<i>Network also exposed to:</i>  HIGH WIND  SLOPE INSTABILITY	

FIGURE 1: LADOTD Infrastructure: A By-the-Numbers Look at Criticality, Vulnerability, and Risk

Priority Resilience Projects and Investment Strategy

LADOTD has identified a set of resilience investments [105 projects] that address the most pressing vulnerabilities across the state's transportation network. Projects were prioritized based on criticality, risk, and alignment with regional and statewide goals, ensuring that investments deliver both immediate and long-term benefits [see Chapter 5: [Resilience Improvement Strategies](#)].

33

Projects

Establish a Geotechnical Hazards Program

to stabilize Louisiana's roadways, bridges, and associated infrastructure against the destructive and escalating impacts of erosion and subsidence as an immediate priority.

1

Project

Enhance Statewide Flooding Analysis with LWI Data

to ensure LADOTD's resilience program continues to use the best available flood models and scenario planning to inform project prioritization, emergency response and recovery operations, and asset design.

6

Projects

Advance Intelligent Transportation Systems

by developing a Telemetry and Sensor Network and implementing an Automated Lane Closure System [ALCS].

48

Projects

Expand Existing Flood Control and Drainage Improvements

to advance transportation corridor interventions that mitigate Louisiana's most destructive hazards, including at the Morgan City Harbor and Terminal District.

4

Projects

Facilitate Interagency Resilience Collaborations

to further implementation of identified resilience projects, improve critical structures not owned by LADOTD (especially flood control structures managed by federal agencies), and alleviate resilience concerns on roads that cross state lines.

1

Project

Increase Truck Parking and Staging Capacity Along Critical Routes

to facilitate the rapid, orderly, and safe movement of people and supplies before, during, and after emergencies.

12

Projects

Lead Materials Research and Roadway Hardening

to identify and implement solutions for roads that are repetitively damaged by extreme heat or the combination of extended periods of flood inundation followed by heavy freight traffic [e.g., for post-disaster debris management].

The planning horizon for the TRIP is 2050. LADOTD will strive to identify resources and begin implementation for projects identified as immediate priorities within the next 1–4 years, aligned with the State Transportation Improvement Program cycle. Long-range projects will be addressed as part of LADOTD’s standard 30-year planning cycle, aligned with its Statewide Transportation Plan. Louisiana’s long-range Statewide Transportation Plan has been updated to include this document by reference.

The sections that follow lay out the building blocks of a resilient transportation system. The TRIP begins by identifying the diverse range of hazards that currently affect, or may in the future affect, Louisiana’s transportation assets based on input from stakeholder consultations and existing state plans. It then defines and applies a framework to evaluate the criticality of LADOTD-owned infrastructure, focusing on assets that are essential to public safety, economic activity, and emergency response. With criticality established, the Plan assesses asset vulnerability based on exposure and sensitivity to different hazards.

From this foundation, the TRIP presents an initial prioritized set of resilience projects, selected to protect lives, safeguard economic corridors, and ensure reliable access across the state. The Plan concludes with an implementation strategy that will guide LADOTD in advancing these investments and measuring long-term impact.



CHAPTER ONE

INTRODUCTION



Introduction

Purpose

Transportation system resilience is essential to ensure the continued safety, reliability, and functionality of critical infrastructure in the face of increasing threats from extreme weather events and other natural hazards. Under a backdrop of aging assets and strained system maintenance budgets, a data-driven, risk-informed approach is needed to address the most critical vulnerabilities and enhance the ability of the system to withstand, adapt to, and recover from disruptions.

Recognizing this urgency, LADOTD developed this Transportation Resilience Improvement Plan [TRIP] in alignment with the requirements of the federal Promoting Resilient Operations for Transformative, Efficient, and Cost-Saving Transportation [PROTECT] Program, which was established in 2021 through the Infrastructure Investment and Jobs Act [IIJA]. The PROTECT program provides funding to states to enhance the resilience of surface transportation infrastructure through planning activities, resilience improvements, coastal infrastructure protection, and the development of community resilience and evacuation routes; FHWA offers program incentives for developing a TRIP to guide resilience project selection and implementation.

LADOTD developed the TRIP with the following objectives:

- Compile the best available data on LADOTD surface assets and evaluate their criticality to the overall transportation system.
- Identify and assess vulnerabilities in the land surface transportation system resulting from extreme weather events and other natural hazards.
- Recommend planning and infrastructure projects that directly address these vulnerabilities to enhance the overall resilience of the state's land surface transportation network.
- Ensure that assessments and project recommendations are aligned with the goals and requirements of the PROTECT Program.
- Coordinate the identification of resilience projects with the state's existing and ongoing transportation planning and economic development efforts.



Louisiana Interstate System

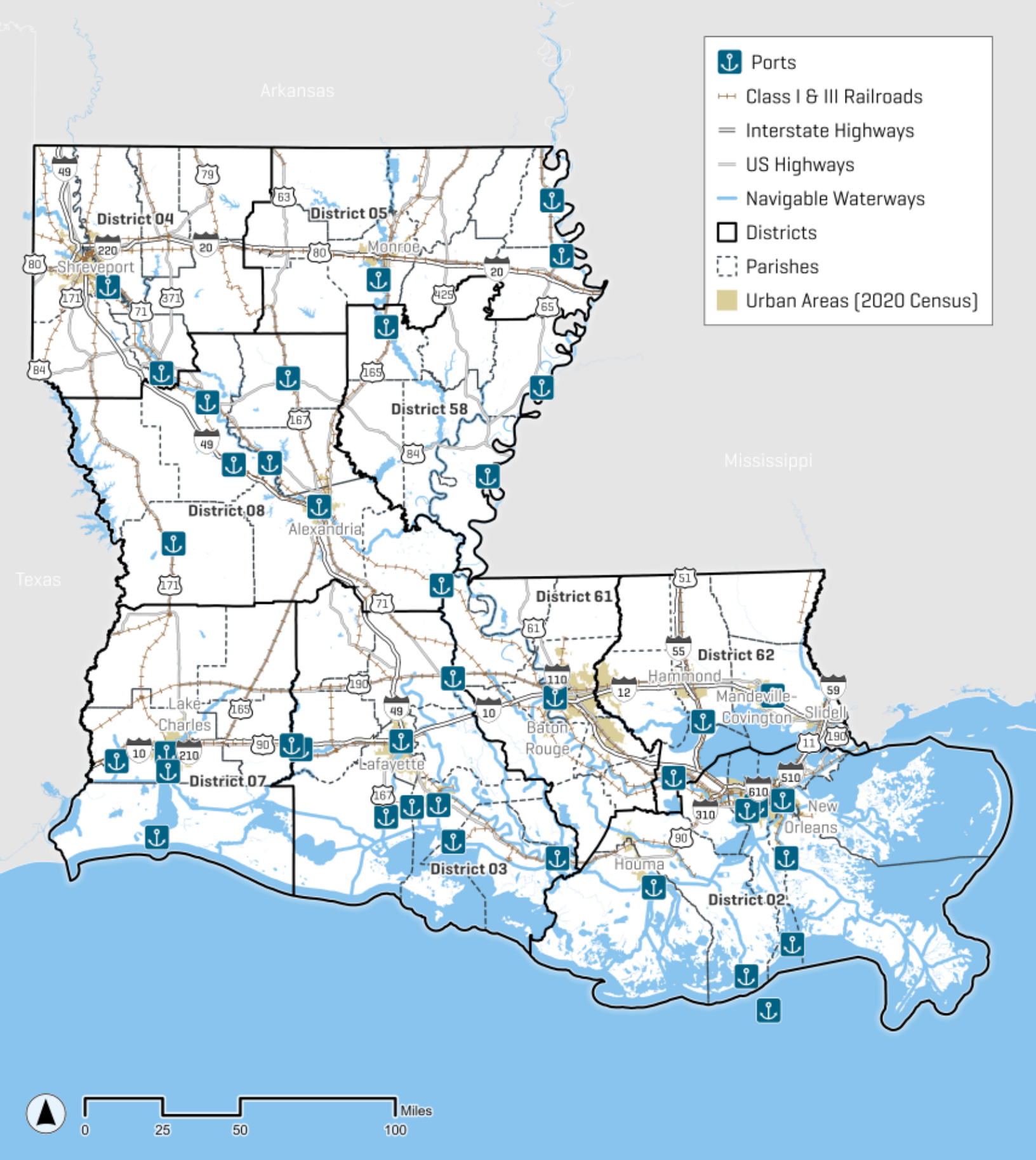


FIGURE 2: Louisiana's land and port transportation infrastructure

A Strategic Hub in the National Economy

Across Louisiana are 3,000 miles of Class I railroads, 16,000 miles of highways, 2,800 miles of navigable waterways, and 50,000 miles of pipelines moving raw materials and finished products to Middle America's markets.¹ Louisiana's eight deep-water ports handle significant U.S. waterborne commerce, including 60% of the nation's grain and 20% of its coal.² The Louisiana coast supplies 90% of the nation's outer continental shelf oil and gas, 20% of the nation's annual waterborne commerce, and 26% of the continental U.S. commercial fisheries.^{3,4}

Louisiana is an essential player in global trade; it ranks as the top U.S. export state, contributing over \$120 billion in goods and services annually.⁵ It is home to the nation's first and third busiest waterways. Its strategic location at the mouth of the Mississippi River and the Gulf Intracoastal Waterway makes the state a vital node for domestic and international trade routes. The Intracoastal Waterway, along with the federal interstate system, is an important transportation infrastructure network that connects products throughout the Southeast United States.

Beyond trade, Louisiana's transportation infrastructure supports a diverse range of industries. The state is a major energy producer, ranking third in natural gas and second in crude oil production, with 30 refineries across the state.⁶ The transportation network is integral to the timely movement of these energy resources, ensuring that local, national, and international energy supply chains remain operational.

Agriculture also plays a key role in Louisiana's economy, with significant exports of rice, soybeans, and seafood.⁷ The state's transport systems, particularly the Mississippi River and its ports, are essential for moving goods to domestic and international markets in regions such as Latin America, Asia, and Europe.⁸

Louisiana's transportation system drives job creation and access to employment, supporting nearly 400,000 jobs in manufacturing, logistics, infrastructure maintenance, and technology.⁹ By connecting people and products to markets, industries, recreational opportunities, and cultural attractions, Louisiana's transportation infrastructure fuels the state and the nation.

Plan Development Process

LADOTD developed the TRIP through a multi-step, collaborative process grounded in data, partnership, and practical implementation. The plan builds on a foundation of prior planning efforts with robust stakeholder engagement, using those inputs to guide new analyses

aligned with the Department's strategic goals. Each step of the process was built on the last, with stakeholder engagement embedded throughout to support an iterative process that refined both the risk analysis and the project prioritization approach.

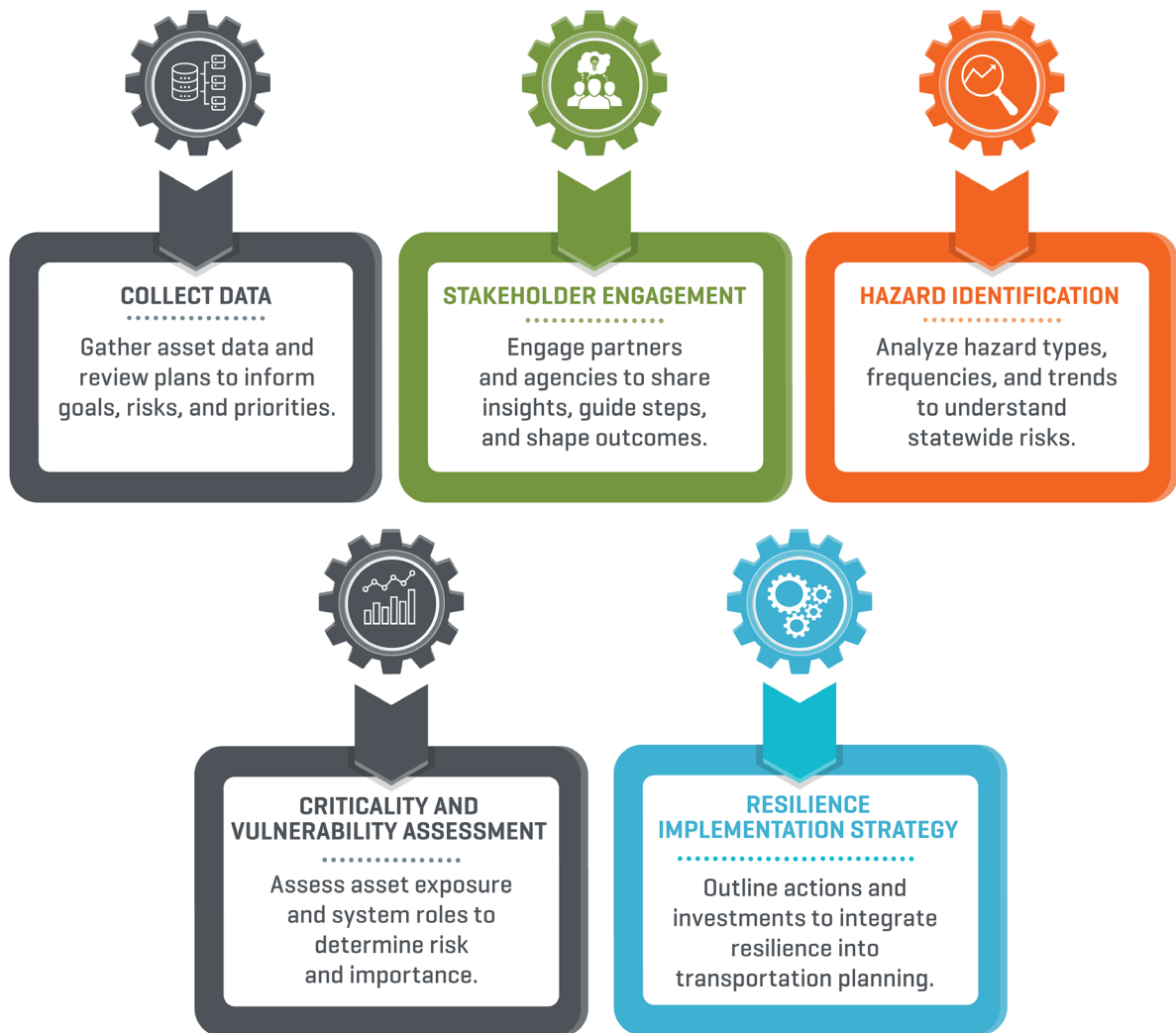


FIGURE 3: TRIP development process

STAKEHOLDER ENGAGEMENT AND COORDINATION

LADOTD combined stakeholder feedback with existing planning efforts, technical guidance, and new data analysis to create a well-rounded and actionable strategy.

- ♦ **Resilience Working Group (RWG):** LADOTD established the RWG to guide the TRIP planning process and support the integration of resilience into ongoing programs and decision-making. This group includes 11 senior leaders representing LADOTD's offices and multidisciplinary sections. The RWG meets monthly to shape objectives, identify key datasets, refine the analytical framework, and help align district-level insight with agency-wide strategy. This coordination supported a consistent, department-wide approach to resilience planning.
- ♦ **LADOTD districts:** Representatives from all nine LADOTD districts contributed local knowledge and practical insights into regional challenges, hazard impacts, priorities, and opportunities. District engagement was essential to advancing an on-the-ground perspective that complements agency goals.

LADOTD also worked closely with other state agencies, including the Governor's Office of Homeland Security and Emergency Preparedness [GOHSEP], to align with the State Hazard Mitigation Plan. The combination of external data, district input, and RWG coordination informed a more comprehensive understanding of risk, shaped the prioritization of projects, and supported a balanced, statewide investment strategy.

This integrated process combined strategic leadership with local knowledge to produce a TRIP that is technically robust, regionally responsive, and ready to inform long-term resilience planning and investment.

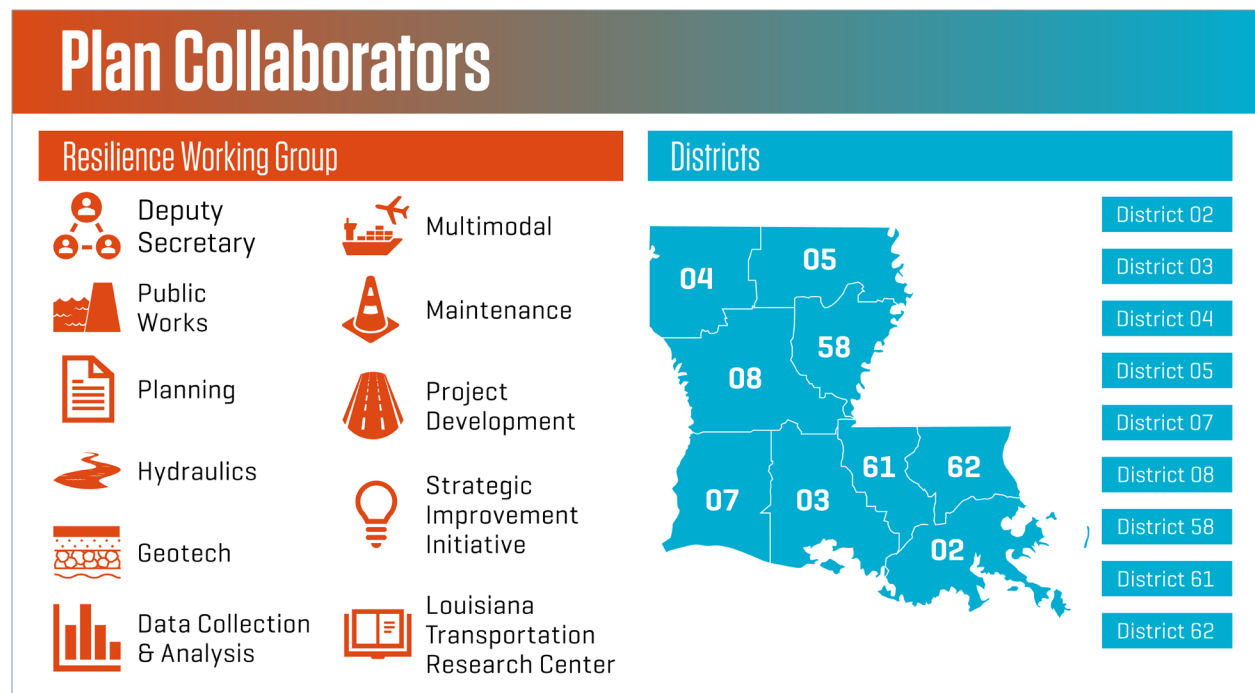


FIGURE 4: TRIP collaborators

Data Analysis and Model Development

LADOTD leveraged this TRIP as an opportunity to advance its internal data collection, analysis, and management practices, with a focus on hazard mitigation and project selection. The data model development and analysis for this TRIP supports LADOTD’s ongoing program and project management needs and improves the accuracy of future risk assessments.

The roadway mileage in the asset inventory used for analysis in the TRIP exceed those typically reported by LADOTD. To support consistent and repeatable analyses, LADOTD strategically included not only mainline roadway segments but also ramps and frontage roads. These features are often excluded from FHWA Functional Classification datasets but are critical for evacuation, emergency access, and system continuity during extreme events.

The detailed asset inventory, hazard datasets, and criticality, vulnerability, and risk results are now “living” components of the Department’s management activities that will be updated and refined as new data becomes available. LADOTD expects that the flood hazard data informing this TRIP will be the first element to be revised after Plan publication, based on integration of anticipated new flood modeling results from the ongoing Louisiana Watershed Initiative [see [LADOTD’s Resilience Partnerships](#)].

Chapter 4 of this Plan outlines LADOTD’s methodologies for data collection and analysis, while detailed technical descriptions and results are maintained in technical memorandum for LADOTD’s future reference.

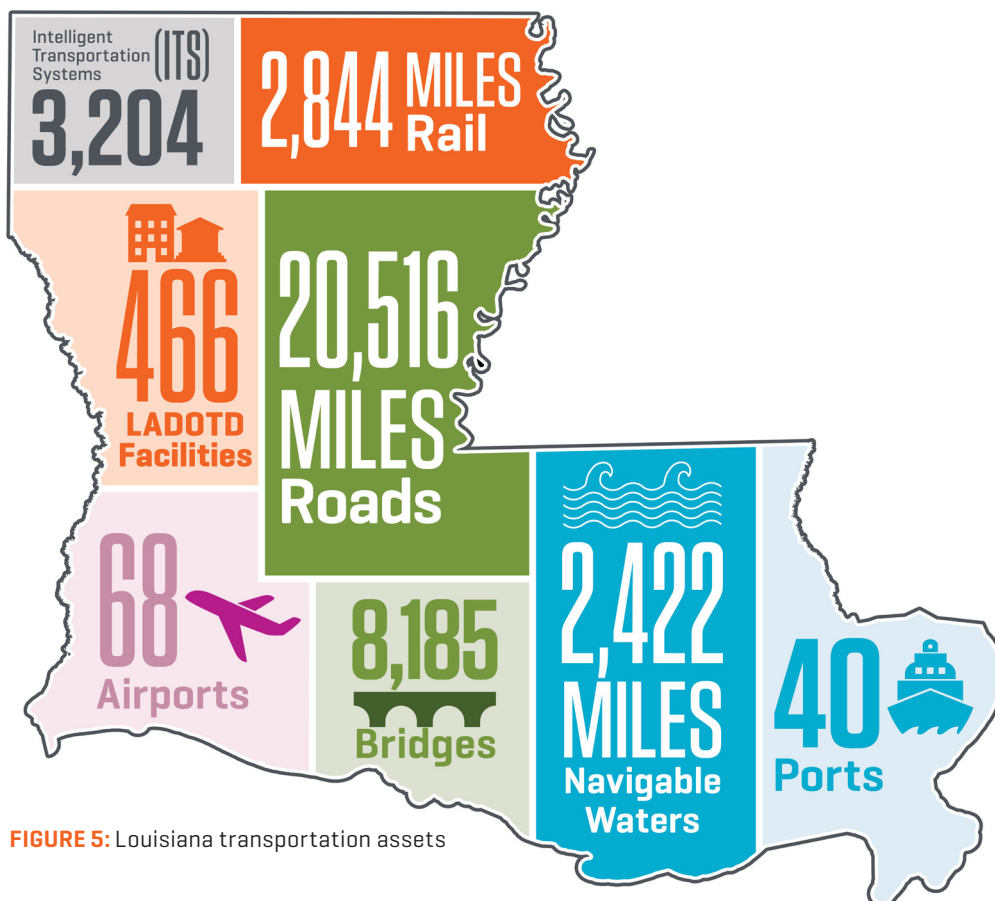


FIGURE 5: Louisiana transportation assets



FIGURE 6: Louisiana flooding map overview



CHAPTER TWO

PLANNING AND REGULATORY LANDSCAPE





Planning and Regulatory Landscape

This Plan is Louisiana’s first to be developed in accordance with the PROTECT program’s requirements. It builds upon the state’s previous efforts in transportation resilience, emergency management, and economic development, which are summarized below.

Louisiana Resilience and Transportation Plans

Four key plans played a critical role in shaping the TRIP. LADOTD’s Strategic Improvement Plan informed the approach to developing this Plan. The Louisiana State Hazard Mitigation Plan [SHMP] served as a resource for identifying and evaluating potential hazards. The Louisiana Statewide Transportation Plan outlines the state’s transportation goals and priorities, helping to align the TRIP with these objectives through a resilience-focused lens. The Louisiana Transportation Asset Management Plan offered critical insights into the current state of transportation infrastructure and guided strategic asset management decisions. Collectively, these plans provide a robust framework for embedding resilience into past and current planning efforts.

TABLE 1: Summary of Louisiana plans reviewed

Plan	Owners	Relationship to TRIP
Louisiana Strategic Improvement Plan	LADOTD	♦ Pledges to re-focus on project-specific planning in the service of holistic, long-range goals. ♦ Commits to establishing a consistent and transparent framework for selecting projects, which was conducted for TRIP projects. ♦ Identifies inefficient and insufficient financial resources as a significant challenge, which can be partially mitigated through reduced match requirements on potential PROTECT grant funds. ♦ The TRIP is a key initiative that supports LADOTD’s goals of On-time Project Delivery and driving statewide economic development.
Louisiana State Hazard Mitigation Plan	Governor’s Office of Homeland Security and Emergency Preparedness [GOHSEP]	♦ Establishes hazards likely to cause the greatest losses, informing a monetary framework for prioritizing projects. ♦ Establishes the Parishes most likely to experience the greatest losses, informing a geographic framework for prioritizing projects. ♦ Establishes parishes with the greatest projected growth of vulnerable populations, informing a demographic framework for prioritizing projects.

TABLE 1: Summary of Louisiana plans reviewed (continued)

Plan	Owners	Relationship to TRIP
Louisiana Statewide Transportation Plan	LADOTD	• The Louisiana Statewide Transportation Plan acknowledges the goals of Louisiana’s Hazard Mitigation Plan and Louisiana Climate Action Plan. • The plan recommends a risk-based assessment of vulnerable transportation assets that can be considered in long-term transportation planning in the state and can be used to identify a systematic approach to surface transportation system resilience. • The plan recommends dozens of policy, funding, programming, and construction projects, including improving priority highways, truck parking/staging, ITS, and emergency preparedness.
Louisiana Transportation Asset Management Plan	LADOTD	• Establishes a comprehensive framework for assessing and prioritizing asset conditions, focusing on data-driven decision-making to guide maintenance and improvement efforts. • Commits to long-term preservation strategies, emphasizing proactive maintenance to extend life of critical transportation assets. • Aligns with statewide transportation by integrating asset management practices into broader planning efforts to ensure funding aligns with future needs and goals. • Supports enhancing statewide mobility and economic development by ensuring transportation infrastructure remains functional, resilient, and capable of meeting changing demands.
Louisiana State Freight Plan	LADOTD	• Emphasizes the need for multi-agency collaboration to integrate coastal protection and transportation planning, fostering a unified approach to long-term resilience. • Pledges to incorporate disaster preparedness and recovery plans into freight transportation planning, ensuring rapid restoration and preservation of critical infrastructure after natural events. • Addresses hazards and recognizes the vulnerability of Louisiana’s key freight routes and infrastructure. Prioritizes LADOTD’s multimodal plan action goals and organizes priorities in alignment with the Louisiana Statewide Transportation Plan.

TABLE 1: Summary of Louisiana plans reviewed [continued]

Plan	Owners	Relationship to TRIP
Louisiana Waterways State Transportation Plan	LADOTD	• Informed TRIP project selection, including the Morgan City Harbor and Terminal District Improvements. • Developed the LA WATERS tool to contribute to accurate, standardized waterway data reporting across Louisiana.
Louisiana Coastal Master Plan	Coastal Protection and Restoration Authority (CPRA)	• Aligns natural-based solutions and infrastructure protection with coastal ecosystem restoration, ensuring both environmental and infrastructural resilience. • Commits to using data-driven strategies for prioritizing coastal projects with a focus on long-term sustainability and risk reduction.
Louisiana Emergency Operations Plan	GOHSEP	• Assigns responsibility for ESF-1 [Transportation] and ESF-3 [Public Works and Engineering] to LADOTD. • Assigns responsibility for RSF-5 [Infrastructure Systems] to LADOTD.
Louisiana Economic Development 5-Year Strategic Plan	Louisiana Economic Development Partnership	• The LED's objective to strategically improve Louisiana's community competitiveness by certifying at least 10 new sites annually includes strategies related to infrastructure and facilitating the physical development of the built environment.
Louisiana Climate Action Plan	State of Louisiana Climate Initiatives Task Force	• Proposes to accelerate the adoption and accessibility of low- and zero-emission vehicles and fuels as well as reduce vehicle miles traveled and increase public transit service. • Coordinates land use planning to reduce sprawl and support healthy and resilient communities.
Office of Community Development FY 2024 Annual Action Plan	Louisiana Division of Administration of Community Development	• It proposes increasing the number of affordable housing units for special needs populations, alongside developing alternative transportation infrastructure, including bicycle and pedestrian modes and public transit. • Potential for overall increase in housing supply to amount to increased demand on all transportation modes along existing routes, or to require new routes in the case of greenfield development.

TABLE 1: Summary of Louisiana plans reviewed [continued]

Plan	Owners	Relationship to TRIP
Louisiana State Plan for Electric Vehicle Infrastructure Development	LADOTD	- Plan outlines that Phase 2 of the program will focus on increasing “resilience and redundancy” of the charging network. - The plan commits to advancing the goals of the Louisiana Climate Action Plan. The Electric Vehicle Plan acknowledges that increasing the redundancy and resilience of the state’s charging station network can help reduce carbon emissions, which ultimately contribute to increasing extreme weather patterns.
Louisiana Carbon Reduction Strategy	LADOTD	- The Identifies 5 project types: Traffic/ Congestion Management, [or Active] Modes, Alternative Fuels/Energy Efficiency, Technology Solutions, and Other/On-Road Sources. - Identifies 11 MPOs key to implementation.
Louisiana Statewide Transportation Improvement Program (FY 2023- FY 2026)	LADOTD	Identifies key performance indicators and evaluation metrics for projects, by funding program type.
Housing: CDBG Action Plans	Louisiana Office of Community Development / Others	- Numerous Community Development Block Grant (CDBG) Action Plans have been prepared to improve the resilience of the state’s housing supply. - These plans propose solution to resolve unmet recovery and resilience needs for residents, businesses, and communities.
Louisiana Emergency Preparedness Guide	GOHSEP	- Public guidance for residents and localities about organizing emergency preparedness, response, and recovery. - Includes a state evacuation map, contraflow guidelines, emergency shelter information, and specific information for people with disabilities.
Water Use in Louisiana (2015 and 2020 Editions)	LADOTD, United States Geological Survey	- Collects, analyzes, and presents data on water use in Louisiana assessed by category, by parish, by aquifer, and by surface water basin. - Data is critical to understanding where green infrastructure and nature-based solutions will be most impactful toward replenishing ground water, or interacting with surface waters, and where LADOTD’s investments will best sustain connections to public supply and power generation infrastructure.

Statewide Resilience Activities and Projects

LADOTD'S RESILIENCE ACTIVITIES

LADOTD's asset management program is designed to maintain a transportation network that includes redundancy, robustness, and resilience, considering the hazards that impact the state, the constraints of the program, and the necessity of adapting to changing conditions, including supporting population and economic growth. LADOTD's resilience focus areas include implementing its emergency management responsibilities, protecting evacuation routes, preserving the function of existing infrastructure, reducing highway flooding, and implementing post-disaster recovery and mitigation projects to support long-term resilience. Flooding is the predominant emergency event in Louisiana [See page <PB>], so LADOTD's project planning and prioritization processes incorporate flood risk as a major consideration.

LADOTD's primary resilience activities include:

- ♦ Protect Program (formerly known as the Roadway Flooding Program),
- ♦ Statewide Flood Control Program, and
- ♦ Integration of resilience into Pavement Preservation Program

LADOTD reduces flooding and promotes safety for the traveling public through its Roadway Flooding Program. Through this program, LADOTD collaborates with LADOTD district staff throughout the State to identify roadways with recurrent flood issues. LADOTD is incorporating the Roadway Flooding Program into a more comprehensive Protect Program that can mitigate against other risks.

LADOTD's Statewide Flood Control Program provides resources to parish or municipal governments, levee boards, and drainage districts to reduce flood damages through structural and non-structural means. The Program's eligibility considerations reinforce a long-term and balanced perspective; statewide flood control projects may not include development in flood-prone areas. The program has a local match requirement of 10% for non-federal projects and 30% for federal projects, but rural communities with certain financial limitations can be excluded that requirement through the Rural Grant Opportunity Program.

In addition to these two programs, LADOTD also looks for opportunities to integrate resilience into routine maintenance performed through its Pavement Preservation Program and other initiatives. During pavement upgrades, for example, LADOTD will sometimes expand the project to incorporate roadway elevation or other mitigation activities when the benefit-cost ratio is favorable.

LADOTD'S RESILIENCE PARTNERSHIPS

LADOTD is the State Coordinating Agency that partners with FEMA to implement the National Flood Insurance Program (NFIP) in Louisiana, helping to promote safe and effective floodplain management and to ensure the availability of low-cost flood insurance. LADOTD's staff includes the State NFIP Coordinator, who also oversees LADOTD's efforts to release updated flood risk information as a Cooperating Technical Partner (CTP) through FEMA's Risk Mapping, Assessment, and Planning (Risk MAP) Program.

LADOTD is also a participant in the Louisiana Watershed Initiative (LWI), a statewide program focused on reducing flood risk by integrating a science-backed watershed-based approach. Louisiana launched the LWI in response to historic flooding that occurred across large portions of the state in March and August of 2016. Key priorities of the LWI include: using scientific tools and data, improving stormwater management, protecting critical infrastructure, enhancing floodplain conservation, and establishing a regional, watershed-based approach to flood risk management. Reducing flood risk at a watershed level includes keeping highways, bridges, and transit routes operational.

The LWI produces hydrologic and hydraulic modeling, which LADOTD is using through this planning initiative to both evaluate asset vulnerability and guide resilient infrastructure investments to protect critical infrastructure from severe flooding impacts. LADOTD also collaborates with the Louisiana State University (LSU) via the Louisiana Transportation Research Center (LTRC). The LTRC research advances and collects multimodal data that equips LADOTD with more effective tools for

mitigating hazards and improving resilience. The LTRC's research areas include:

- ♦ Material science investigation to construct longer-lasting roads and bridges with more advanced concrete and asphalt;
- ♦ Geotechnical and Pavement Research to assess pavement quality and embankment, and soil stability;
- ♦ Special Studies, which encompasses transportation planning, Intelligent Transportation Systems (ITS), and hurricane evacuation models, among other topics, and
- ♦ Transportation Innovation and Research Exploration (TIRE), which includes exploratory research.

LTRC has played a key role in collecting critical datasets, including those related to geotechnical walls and hydraulic structures.

Findings from these research efforts have the potential to enable LADOTD and its partners to improve the resilience of transportation networks and multimodal assets, catalyze more rapid recovery from disruptions, and make strategic investments that enhance asset useful life and mitigate system vulnerabilities.

NOTABLE RESILIENCE PROJECTS

LADOTD's resilience projects range from small-scale roadway improvements that mitigate specific problem areas to some of the largest protection initiatives in the country. The I 10 Twin Span Bridge Reconstruction and South Louisiana Submerged Roads Program exemplify the state's commitment to mitigating flood risks. LADOTD is also working to improve key evacuation routes [LA 1 Relocation] and restore rail service [Gulf Coast Corridor Improvement Project], bolstering both redundancy and reliability through the transportation system.

- ♦ **Reconstruction of the I 10 Twin Span Bridge:** The reconstruction of the I 10 Twin Span Bridge in Louisiana was a major post-Hurricane Katrina project. LADOTD secured approximately \$803 million in funding from the FHWA to fund the project. The original bridge, which connects New Orleans to St. Tammany Parish, was severely damaged by Hurricane Katrina. The new bridge was built with improved resilience, incorporating higher design standards to better withstand future storms and flooding. The project included replacing the old spans with two new, wider bridges, which increased capacity and enhanced traffic flow. The upgraded structure also included a more complex monitoring system and safety improvements, in addition to a more durable design, so it can continue to serve as a critical transportation link for commuters and commercial traffic.

- ♦ **South Louisiana Submerged Roads**

Program: The South Louisiana Submerged Roads Program, funded by a joint sponsorship between FHWA and the New Orleans Regional Planning Commission [RPC], was designed post-Hurricane Katrina to help LADOTD fund and address the issue of flooding and the inundation of critical roadways. The Submerged Roads Program included replacing or repairing over 50 roadway segments, more than 80,000 linear feet of sidewalks, and planting 1,125 trees along submerged roads corridors across south Louisiana parishes that were inundated by Hurricane Katrina or Rita or by levee failures. Alongside repairing and replacing, additional transportation enhancements were included with program funding such as shared-use lanes and dedicated-use bike lanes.



Pillars of the I 10 interstate bridge over the Atchafalaya basin near Baton Rouge, Louisiana

- ♦ **Gateway to the Gulf:** Through this project, LA 1 is receiving an 18-mile, fully access-controlled, elevated highway between Golden Meadow [LA 3235] and Port Fourchon [LA 3090]. The project will largely be constructed using “top-down” construction methods that minimize adverse effects on sensitive wetlands and marshes. By mid to late 2021, Phase 1 was completed, and construction of Phase 2 began in 2022, with completion expected by 2028. As a result of coordination between LADOTD, the Coastal Protection and Restoration Authority, and the South Lafourche Levee District, Phase 2 includes a major flood wall element where the new section of highway intersects the storm surge barrier.
- ♦ **Gulf Coast Corridor Improvement Project:** Backed by federal funding from the Bipartisan Infrastructure Law, the Gulf Coast Corridor Improvement Project sought to restore railways and passenger services in Louisiana. Passenger services were destroyed during Hurricane Katrina in 2005 and have stayed non-operational since. In addition to passenger service, the project aimed to enhance mobility and reliability for freight operations, benefiting ports and depots. The restoration began in October 2024 and full service from Mobile to New Orleans was restored in August 2025.

ALTERNATIVE FUEL CORRIDORS

Louisiana has established corridors for all alternative fuels across most of the state’s interstate system. Additionally, there are electric vehicle charging corridors along US 90 between Lafayette and New Orleans, LA 3235 down to Golden Meadow, and LA 1 down to Port Fourchon. Alternative fuel corridors support fuel flexibility within the state of Louisiana, potentially boosting economic activity and providing electric vehicle fleets with increased options for long-distance travel. To fully realize this possibility, charging stations and truck parking and support facilities will need to be expanded along these corridors.

PERFORMANCE METRICS

LADOTD establishes agency-wide metrics through its Five-Year Strategic Plan. These measures of success are specific and time-bound, including performance expectations for maintenance and safety among other topics. LADOTD also tracks performance measures per transportation initiative/major funding sources and will evaluate options for expanding performance oversight through its Strategic Improvement Initiative.

Some of LADOTD’s key performance metrics include Highway Safety Improvement Program [HSIP] targets, National Highway Performance Program [NHPP] Travel Time Reliability Measures, the Truck Travel Time Reliability Index, the Target Useful Life Benchmark, and Community Multiscale Air Quality [CMAQ] statistics. LADOTD also views the absence of a transportation disruption as an indicator of success; for example, Protect Program projects for roadway flooding are considered successful when the project area remains safely passable and does not flood again.

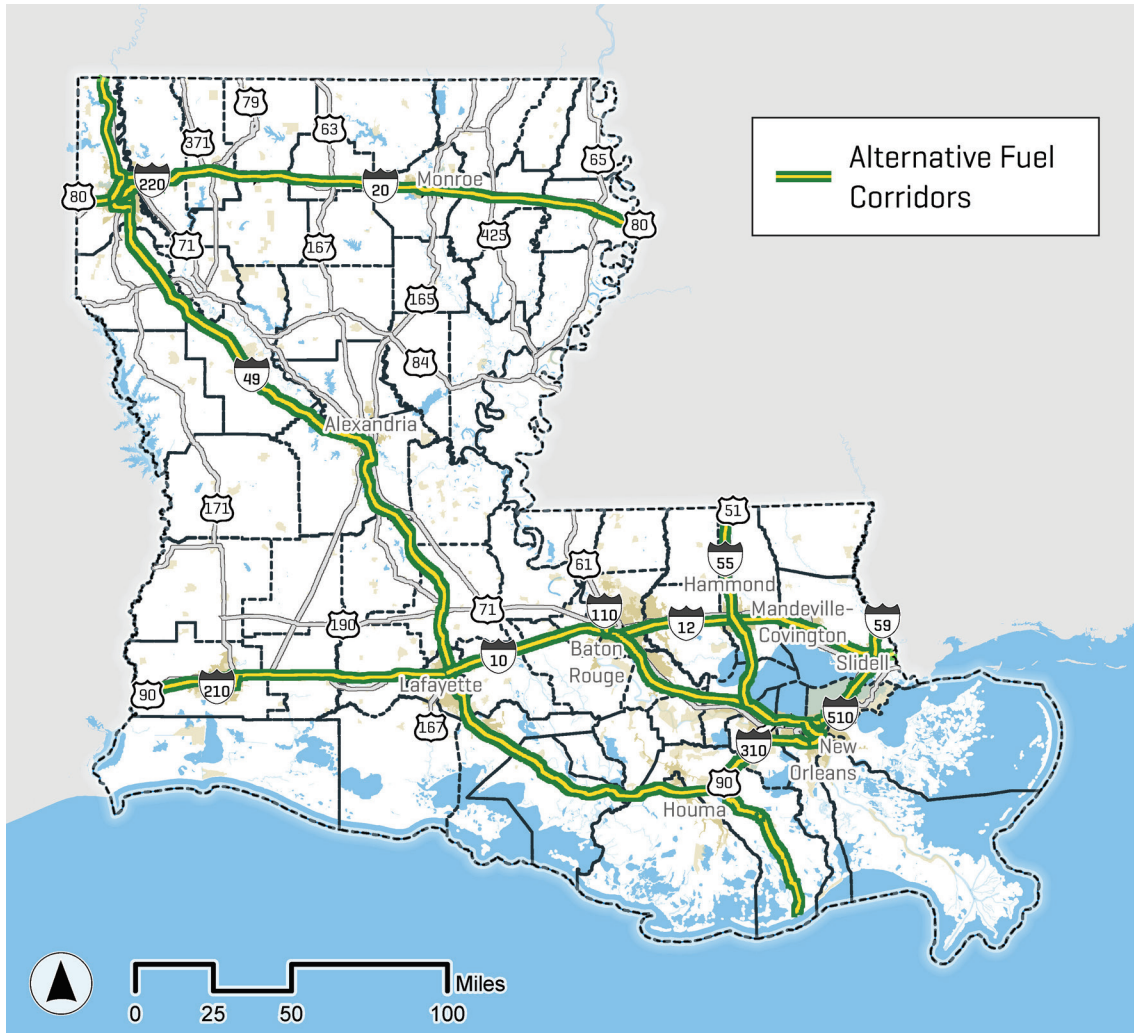


FIGURE 7: Alternative fuel corridors



Louisiana has a vast multimodal network that plays a pivotal role in state, national, and global trade and commerce

LADOTD EMERGENCY MANAGEMENT

Much of LADOTD's role in emergency management and recovery is defined by relevant Emergency Support Functions (ESF) and Recovery Support Functions (RSF). LADOTD is the lead agency for ESF 1 [Transportation] and ESF 3 [Public Works and Engineering], including establishing operational priorities for and overseeing all five phases of emergency situations [Prevention, Protection, Mitigation, Response, Recovery]. With the primary responsibility for ensuring emergency transportation, LADOTD coordinates with other state and federal agencies, as well as MPOs, parishes, and municipalities to maintain plans and procedures for keeping evacuation routes operational. LADOTD is also responsible for debris and wreckage removal per ESF 3, notably prioritizing state evacuation routes during an emergency. Assuring that there are no impediments to safe harbor for watercraft is another consideration of LADOTD in their maintenance of evacuation routes.

LADOTD is also responsible for fulfilling RSF 5 [Infrastructure Systems], meaning that during the recovery phase of a disaster, the Department is responsible for the efficient restoration and strengthening of infrastructure systems.

By way of fulfilling ESF 1 and ESF 3 and ensuring transportation infrastructure is safe, functional, and navigable, LADOTD sustains the mobility of response personnel and equipment before, during, and after an emergency. LADOTD is a supporting agency for ESF 8 [Public Health and Medical Services], with the role to assist the lead agency with the evacuation of vulnerable or disadvantaged persons. The State of Louisiana Emergency Operations Plan (SEOP) states that parishes have a responsibility to identify such individuals and to coordinate with the state to procure transportation assets that may be needed. Through the responsibilities outlined in these Functions and elsewhere in the SEOP, LADOTD coordinates personnel and resources from their own and other organizations, such as other state departments and localities. This also enables the Department to support the fulfillment of the responsibilities outlined for the Logistics Section Chief in the Incident Command System (ICS) Organizational Structure, which is used during State Emergency Operations Center activation.

Codes, Standards, and Regulatory Framework

Louisiana’s approach to transportation resilience is shaped by a foundational set of statutes, codes, and administrative rules that define how the state plans, manages, and funds infrastructure and water resource systems. These legal and regulatory tools support activities across flood control, construction standards, emergency preparedness, and agency coordination. In particular, the Louisiana Revised Statutes and the Louisiana Administrative Code include key provisions for resilience governance, including the designation of resilience officers, the implementation of national building codes, and the prioritization of water-related capital improvements. Table 2 summarizes the most relevant codes and standards informing LADOTD’s resilience strategy.

TABLE 2: Overview of key Louisiana resilience codes, standards, and regulations

Citation	Issuing Entity	Resilience Relevance / Summary
Louisiana Administrative Code Title 56 Part III Flood Control and Water Management	Division of Administration	- Establishes funding for water resource projects (including priority evaluation methods). - Establishes a Statewide Flood Control Program. - Establishes a Port Construction and Development Priority Program.
Louisiana Administrative Code Title 17 Part I Uniform Construction Code	Division of Administration	- Adopts national building and energy codes with Louisiana-specific amendments, incorporating from: - International Building Code - International Residential Code - International Energy Conservation Code
Revised Statutes Title 49 §220.41 Chief Resilience Officer	Office of the Governor	- Establishes the position of Chief Resilience Officer for the state. - Emphasizes resilience and long-term performance of bridge infrastructure. - Incorporates current and evolving considerations for environmental conditions.
Revised Statutes Title 49 §220.44 Resilience Officer Designations	Office of the Governor	- Requires each department head of the executive branch to designate a resilience officer. - Requires resilience officer appointments for both the legislative and judicial branches.

Policies and Guidance

Transportation network needs, direction from the state executive leadership, and LADOTD's design guidance establish the framework by which the agency advances its resilience objectives. Executive Order Number JML 24-60 and LADOTD's design guidelines directly inform the department's planning process and project design.

TABLE 3: Summary of Louisiana policies and guidance

Policy/Guidance	Owner	Alignment to TRIP
Executive Order Number JML 24-60 Reformation and Optimization of the LADOTD	State of Louisiana Executive Department Office of the Governor	Focuses on cost-efficient and successful management of the State's transportation system.
2011 Hydraulics Design Manual	LADOTD	Sets the hydraulic design standards for flood risk reduction on Louisiana's transportation infrastructure.
Louisiana Bridge Design and Evaluation Manual	LADOTD	- Incorporates current and evolving considerations for environmental conditions. - Specifies bridge elevation, flood-resistant materials, and hydrologic measures to reduce flood impacts. - Emphasizes resilience and long-term performance of bridge infrastructure.
Louisiana Department of Transportation and Development Minimum Design Guidelines	LADOTD	- Functional standards for proper drainage to protect infrastructure from severe weather. - Materials and construction practices to enhance asset durability and lifespan. - Roadway accessibility and safety standards for all users, including pedestrians and cyclists.



CHAPTER THREE

NATURAL HAZARD PROFILE





Natural Hazard Profile

Louisiana's Geography

Louisiana's diverse geography creates unique challenges for infrastructure assets in multiple environmental settings. Major rivers and a coastal region with wetlands and an evolving delta present unique opportunities and challenges. Coastal wetland loss and subsidence affect ecological balance and intensify natural hazards like flooding, hurricanes, and erosion. These factors directly influence the resilience of Louisiana's transportation systems, especially in low-lying and river-adjacent areas.

The state's geography is shaped by multiple rivers draining to the Gulf of America (i.e., the Mississippi, Red, Ouachita, and Atchafalaya Rivers). The Mississippi River carries water and sediment from 31 states and two Canadian provinces to the Gulf. The Red and Ouachita Rivers flow from the northwest and central regions, while the Atchafalaya branches off from the Mississippi and Red, creating a vital route through the Atchafalaya Basin. These rivers contribute to the 200-mile-wide coastal zone from Texas to Mississippi, which includes productive ecosystems like marshes, swamps, barrier islands, and estuaries.¹⁰

Louisiana experiences 90% of the coastal wetland loss in the U.S. due to natural processes and human activities, such as levee construction, oil and gas development, and rising sea levels.¹¹ The coastal area from the Chandeleur Islands to the Sabine River loses a football field's worth of land every hour.¹² While the land losses are widely distributed across the State, the Atchafalaya Basin has become an exception when forming new land at the mouths of the Wax Lake Outlet and the Atchafalaya River. The Atchafalaya and Wax Lake Outlet delta have added a combined 13 square miles of land between 1980 and 1995. Growth rates fluctuate based on sediment distribution from floods and hurricanes.¹³

The Mississippi Delta faces land subsidence, where sediment weight presses down on the North American plate. Despite offshore sediment deposition, subsidence continues in the Lower Mississippi Valley, posing a threat to Louisiana's coastline by exacerbating sea level rise. Subsidence rates can exceed 10 millimeters per year, with the Mississippi's Birdfoot Delta experiencing the highest rates at about 0.5 feet per decade.¹⁴ Factoring in sea level rise, the Birdfoot Delta could see a relative elevation loss of one foot per decade. Another key contributor to localized subsidence is the drawdown of groundwater within developed areas due to intensive use and slow groundwater recharge. When coupled with expansive soils, this artificial lowering of groundwater levels can intensify ground compaction and further cause localized land sinking. Increased forced drainage is also a major driver of subsidence within the polders.

The combined effects of sediment loss, land loss, and land subsidence not only exacerbate the risk of natural hazards like hurricanes and flooding but also compromise the strength and reliability of the state's transportation assets.

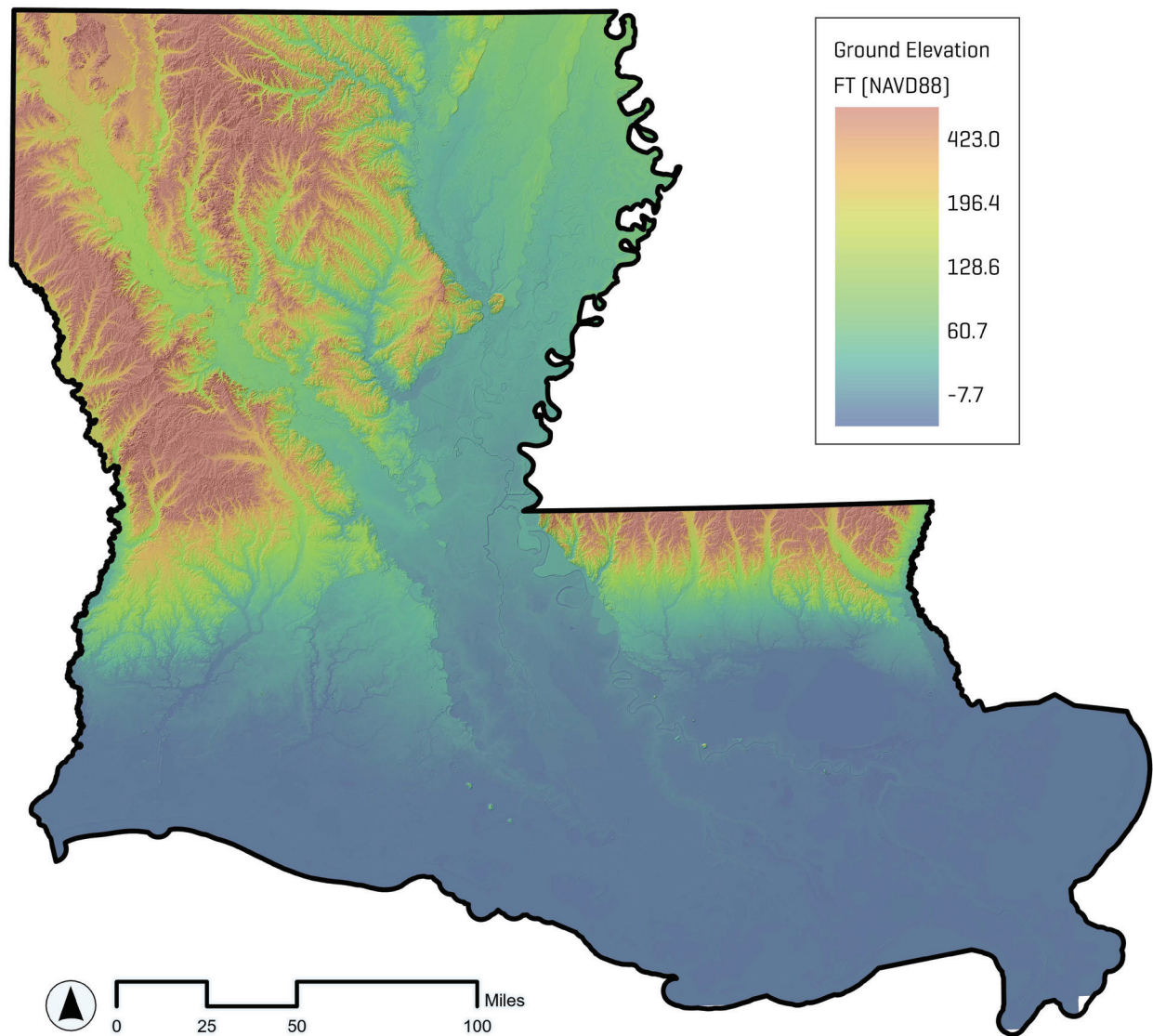


FIGURE 8: LADOTD statewide digital terrain model [DTM] for the TRIP using LiDAR. The DTM represents Louisiana’s elevation and provides a foundation for vulnerability and risk analyses



FIGURE 9: National Wetland Inventory [NWI] and major rivers across Louisiana

Overview of State Natural Hazards

The Louisiana State Hazard Mitigation Plan [SHMP] identifies 14 key hazards anticipated to impact the state over a mid-century time horizon [through 2050], including extreme heat and cold, drought, wildfire, wind, hail, lightning, tornado, flooding, dam and levee failure, sinkholes, expansive soils, subsidence, and hazardous materials incidents. To inform the TRIP, the planning team began by building off the SHMP's hazard inventory to identify those most relevant to Louisiana's transportation system. This process involved validating hazard relevance and impact with the RWG and LADOTD district staff, using input on observed disruptions and operational challenges to ground-truth hazard selection. While the TRIP aligns with the SHMP's foundational hazard data, it applies a risk-informed lens tailored to transportation, emphasizing hazards with the greatest potential to affect system performance and reliability. The following section summarizes key hazard profiles, incorporating historic impacts and future trends to support LADOTD's resilience planning.

FLOOD AND WIND HAZARDS

Louisiana's flat, low-lying terrain, combined with its dense network of rivers and bayous and proximity to the Gulf of America, makes it highly susceptible to both riverine and coastal flooding. Riverine flooding occurs when intense rainfall causes rivers like the Mississippi and its tributaries to overflow, while coastal flooding is driven by storm surges, wave action, hurricanes, and rising sea levels. Sustained strong winds can also push water inland and cause flooding even without a storm. The state's topography and limited natural drainage mean that floodwaters can spread rapidly and linger for extended periods. Acute and/or prolonged exposure to floodwaters leads to sub-base, base, and pavement deterioration, erosion of roadbeds, damage to bridges [including displacement of bridge decks], and damage to drainage systems. Repeated flooding accelerates infrastructure wear and increases maintenance costs, straining state and local resources.

Table 4 shows results from the SHMP, which indicate that 65% of Louisiana's land area and 25% of population and structures are in the special flood hazard area [SHFA]. While the SHMP indicates that no changes are projected for riverine flooding due to lack of data, the Louisiana CPRA has predicted increases in coastal flooding.¹⁵



Flooded Mississippi River with New Orleans skyline

TABLE 4: Flood and wind hazard overview [historical and projected high risk] **Information gathered from LA SHMP*

FLOOD AND WIND HAZARDS				
HAZARD	HISTORICAL OCCURRENCE	PROJECTED OCCURRENCE IN 2050	PROJECTED 2050 AVERAGE ANNUAL STATEWIDE LOSS	EVENTS
Flooding	65% of Louisiana's land area and 25% of population and structures are in the special flood hazard area (SHFA)	No expected change in riverine flooding, but CPRA predicts increases in coastal flooding	\$3,632,000,000	♦ Hurricane Francine (2024) ♦ Flash Flooding (May 17, 2021) ♦ Hurricane Ida (2021) ♦ Severe Storms, Tornadoes, and Flooding (2021) ♦ Hurricane Zeta (2020) ♦ Hurricane Delta (2020) ♦ Hurricane Laura (2020) ♦ Hurricane Barry (2019) ♦ Severe Storms and Tornadoes (2019) ♦ Flooding (2019) ♦ Severe Storms, Tornadoes, and Straight-line Winds (2017) ♦ Severe Storms and Flooding (2015, 2016)
Wind	700-year return period (0.14% annual probability) wind speeds ranging from 105 mph inland to 170 mph along the coast	Expected to remain the same	\$1,241,000,000	♦ Hurricane Ida (2021) ♦ Hurricane Zeta (2020) ♦ Hurricane Delta (2020) ♦ Hurricane Barry (2019) ♦ Tropical Storm Harvey (2017)

Opposite page: The destructive path of an E3 tornado after striking a neighborhood in St. Bernard Parish, Louisiana on March 22, 2022.



TEMPERATURE HAZARDS

In 2023, Louisiana faced extreme heat, with temperatures soaring to 95°F for 56 days straight. Some areas endured even higher summer temperatures, exceeding 100°F. In 2023, New Orleans experienced its hottest summer on record, with temperatures in June, July, and August surpassing the previous all-time hottest temperature record of 102°F in 1980.¹⁶ For future projections of extreme heat, areas could experience a 25% increase in extreme heat days, where regions could experience 50 to 60 days annually over 95°F by 2050.

Extreme temperatures have also affected the state during its winters. On January 22, 2025, Louisiana plunged into record-breaking cold, with Baton Rouge reaching 7°F, Lafayette dropping to 4°F, and New Iberia hitting a bone-chilling 2°F, setting new lows not seen since 1939, 1893, and 1948, respectively.¹⁷ While average extreme cold temperatures are expected to decrease by 20% by 2050,

there may be more intense individual cold events despite the overall warming trend.

Louisiana also experiences occasional drought conditions. One of the state's most widespread droughts occurred in 2023 when 90% of the state experienced severe drought conditions. Historical weekly drought probabilities ranged from 20% to 35% on average, suggesting roughly 10-18 weeks per year where dry conditions persist. The NASA CMIP6 data for 23 models projects a 10% increase in drought frequency by 2050, leading to drought week probabilities approaching 40% in some areas, with a general increase in longer dry spells. These prolonged droughts pose a significant risk to slope stability in Louisiana's expansive soils [see "Geotechnical Hazards" on page 56] and can increase the risk of wildfire. During the 2023 drought, Louisiana experienced multiple wildfires, including the Tiger Island Fire, the largest in the state's history.



Torrential downpour in bayou filled with cypresses

TABLE 5: Temperature hazard overview [historical and projected risk] **Information gathered from LA SHMP*

TEMPERATURE HAZARDS				
HAZARD	HISTORICAL OCCURRENCE	PROJECTED OCCURRENCE IN 2050	PROJECTED 2050 AVERAGE ANNUAL STATEWIDE LOSS	EVENTS
Extreme Heat (Temperatures Above 95°F)	1 to 43 days per year (on average) with temperature exceeding 95°F	Up to 52 days per year (on average) with temperatures exceeding 95°F	\$1,000,000	• 1936 North American Heat Wave: Reported high temperature of 114°F • August 2007: Heatwave across Lake Charles, Lafayette, New Iberia, and Alexandria [reported high temperatures between 101°F and 103°F] • Summer 2023: Hottest day in New Orleans [reported high temperature 105°F], State of Emergency Proclamation 131 JBE 2023
Extreme Cold (Temperatures Below 32°F)	1 to 56 days per year (on average) with temperatures less than 32°F	1 to 44 days per year (on average) with temperatures less than 32°F	\$15,000,000	• January 18, 2018: Record-breaking extreme cold temperatures of 20°F and 14°F at New Orleans International Airport and Baton Rouge Airport, respectively • February 2021: Louisiana Severe Winter Storms • January 2025: Historic Cold Weather and Snowstorms

GEOTECHNICAL HAZARDS

Expansive soils are a persistent geotechnical hazard in Louisiana’s southern coastal regions. These soils are highly sensitive to moisture fluctuations, undergoing shrinkage during extended dry periods and swelling rapidly when rehydrated. This shrink-swell cycle undermines slope stability, particularly in hilly or engineered areas, and can lead to ground movement, landslides, and structural damage. Extreme heat, as noted in the temperature hazard analysis, intensifies this risk by accelerating soil desiccation. When followed by heavy rainfall, the resulting re-saturation can trigger slope failures and surface instability. In addition to expansive soils, parts of Louisiana’s transportation infrastructure are built on unstable riverine-deposited soils, which are naturally soft, compressible, and prone to shifting under load. These weak foundational soils amplify the impacts of moisture changes, making roads, bridges, and levees more susceptible to structural instability.

Although the SHMP does not project an increase in swelling potential by 2050, expansive soils remain a significant threat to transportation infrastructure.

Their movement can cause cracking, uneven surfaces, and structural degradation in roads, highways, railways, and runways. In embankments, complete drying may lead to transverse cracking, which can initiate slides upon rewetting. These impacts increase maintenance demands, reduce safety, and disrupt transportation operations.

Additionally, the SHMP estimates a 0.05% annual probability of sinkhole formation by 2050. While relatively low, past events such as the Lake Peigneur sinkhole [Iberia Parish, 1980] and the Bayou Corne sinkhole [Assumption Parish, 2012] demonstrate the potential severity of such incidents. The Lake Peigneur sinkhole absorbed drilling equipment and barges, transformed about 65 acres of land into what is now the deepest lake in the state, and resulted in long-running insurance claim and liability disputes. The Bayou Corne sinkhole, which is at least 25 acres, led to a statewide emergency declaration, local evacuations, and concerns about the release of explosive gases.

TABLE 6: Geotechnical hazard overview [historical and projected risk] *Information gathered from LA SHMP

GEOTECHNICAL HAZARDS				
HAZARD	HISTORICAL OCCURRENCE	PROJECTED OCCURRENCE IN 2050	PROJECTED 2050 AVERAGE ANNUAL STATEWIDE LOSS	EVENTS
Expansive Soil	Soil swelling potential ranging from 3.5% to 58%	Soil swelling potential ranges from 4% to 66.7%	\$96,000,000	
Sinkholes	2 sinkholes in 52 years from 153 terrestrial salt domes [0.025%]	0.05% annual probability.	\$1,000,000	♦ Sinkhole in Lake Peigneur ♦ Sinkhole in Bayou Corne

Technological Hazards:

Louisiana has human-made and technological risks, including challenges from hazardous materials, nuclear facilities, cyber-attacks, and traffic accidents, that must also be considered to build transportation resilience. Disruptions caused by human and technological hazards can exacerbate the impacts of extreme weather events (and vice versa). For example, Hurricanes Katrina and Rita (2005) contributed to hundreds of on- and offshore hazardous materials releases. More recently, Hurricane Laura (2020) contributed to a gas fire in Lake Charles.¹⁸

Cyberattacks are an increasing concern for safety impacts and economic consequences. For example, in 2023, over six million records of personal information belonging to Louisiana residents were compromised in a cybersecurity breach at the Office of Motor Vehicles.¹⁹

LADOTD's Highway Safety Program strives to reduce the frequency, rate, and severity of potential crashes involving motor vehicles, bicyclists, and pedestrians on the state's public roads. In partnership with the Louisiana Highway Safety Commission and Louisiana State Police, LADOTD improves road safety by focusing on distracted driving, impaired driving, infrastructure and operations, and occupant protection.²⁰



In addition to resilience, LADOTD has highway safety and emergency management programs to mitigate technological hazards

Hazards Considered in the TRIP

The hazard analyses from the SHMP and other LADOTD plans were reviewed to identify and refine the list of primary natural hazards to be addressed in the 2025 TRIP. Figure 10 illustrates the relationship between the hazards identified in state plans and the National Risk Index (NRI) and their integration into the TRIP.

The selection of hazards for this TRIP plan was guided by the following criteria:

- ♦ Alignment with existing plans [consistency with hazards in state, regional, and local plans], and
- ♦ Relevance to transportation infrastructure [impact on critical transportation assets, historical hazard events causing transportation-related impacts or losses], and
- ♦ Scalability and applicability [applicability across multiple jurisdictions or transportation modes], and
- ♦ Data availability [availability of data, projections, or modeling on hazard impacts].

The SHMP highlights 14 natural hazards potentially impacting the state; however, not all the hazards identified in the SHMP have the potential to impact the surface transportation system. The RWG refined the list of hazards from the SHMP and honed in on the most salient hazards for the surface transportation system. Seven hazards were identified for analysis under the TRIP to assess their impacts on the state's transportation system.

These hazards are organized into the same three categories used by the SHMP, which helps group them based on the primary forces driving them:

- ♦ **Flood and Wind Hazards**—Involve dynamic atmospheric and hydrological events, such as riverine and coastal flooding and high winds [hurricane/tornadoes]. These events are often sudden and damaging, posing threats to safety, property, and essential services.
- ♦ **Temperature-Based Hazards**—These are driven by extreme climate conditions and include extreme heat and winter weather [extreme cold]. They typically arise from prolonged periods of unusual temperatures or lack of precipitation and can impact health, agriculture, infrastructure, and energy systems. For winter weather, the vulnerability assessment also considered ice because it is a direct result of freezing temperatures and winter storm conditions; ice formation on roads presents safety hazards and can disrupt mobility.
- ♦ **Geotechnical Hazards**—These originate from ground movement and instability, including slope stability, erosion, and expansive soils. They can cause significant structural damage and pose serious safety risks.

TABLE 7: Hazards considered in the TRIP

FLOOD AND WIND HAZARDS	TEMPERATURE HAZARDS	GEOTECHNICAL HAZARDS
Flooding [Coastal and Riverine]	Extreme Heat [Heat Wave]	Slope Stability [Landslide/Erosion]
High Wind	Winter Weather	Subsidence/Settlement
		Marsh Edge Erosion

Transportation Resilience Improvement Plan [TRIP] 2025	2022 Transportation Asset Management Plan [TAMP]	2024 State Hazard Mitigation Plan [SHMP]	National Risk Index
 Flooding: Coastal, Precipitation, & Riverine	- Floods - Hurricanes - Sea Level Rise	- Dam Failure - Flooding [Coastal & Riverine] - Levee Failure	- Coastal Flood - Hurricane - Riverine Flood
 High Wind	- Hurricanes - Tornadoes	- High Wind - Tornadoes	- Hurricane - Strong Wind - Tornado
 Extreme Heat		- Extreme Heat [Heat Wave] - Drought - Wildfire	- Drought - Heat Wave - Wildfire
 Winter Weather	Ice storms	Extreme Cold [Cold Wave]	- Cold Wave - Ice Storm - Winter Weather
 Geotechnical Hazards		- Expansive Soils - Sinkholes	- Earthquake - Landslide

FIGURE 10: Comparison of hazards in the National Risk Index and in key state plans



CHAPTER FOUR

CRITICALITY, VULNERABILITY, AND RISK ASSESSMENT





Criticality Assessment

Criticality Framework

LADOTD developed a framework to assess the criticality of state transportation roadways. This framework enables roadways to be analyzed and assigned a criticality score based on their functional role within three factor groups: Safety and Resilience, Use and Operations, and Community and Economy. Criticality scores were assigned to roadways based on a composite score of these factor groups and their parameters.

Criticality scores were also assigned to bridges and to some forms of ITS assets. Bridges and ITS assets were assigned the same criticality score as the road segment on which they are located. The ITS assets considered include dynamic messaging signs (DMS), closed-circuit television (CCTV) cameras, and traffic signals.

Table 8 summarizes the criticality categories, factor groups, and the specific parameters used to calculate the score for each one. The framework uses a 1 to 10 scoring scale, where higher scores mean higher criticality.

These scores are grouped into three levels: High [7–10], Medium [4–6], and Low [1–3]. Each factor group was evaluated using a set of parameters. Some of the parameters are inherently scalar (numeric), such as AADT or cost-distance (travel time) to certain important locations such as trauma centers. Other parameters represent binary classifications, such as the designation of a road as an evacuation route.

Each parameter was assigned a relative weight. LADOTD’s criticality technical memo details the method of converting the scalar and class values to raw scores and applying weights to those scores.

LADOTD validated the criticality framework and findings through consultation with districts and the RWG. Districts provided key local context such as identifying corridors repeatedly used for operations including winter response plans and hurricane evacuations, which was used to adjust parameter weights. These local insights were essential in evaluating and refining verifying the model’s outputs and highlighting locations where infrastructure serves essential community functions despite lower traffic volumes.

TABLE 8: Criticality assessment categories and parameters

CRITICALITY CATEGORY	PARAMETERS
Community and Economy	Access to Employment Centers, Access to Commercial and Industrial Energy Facilities, Freight Classification
Safety and Resilience	Access to Emergency Services, Access to Emergency Operations, Access to Military Installations, Strategic Highway Network [STRAHNET] Designation, Access to Energy Utilities and Reserves, Evacuation Route Designation
Use and Operations	Access to LADOTD Facilities, Access to Multimodal Connection, Usage [AADT], Redundancy

Criticality Results

Statewide, the analysis determined that approximately 27% of LADOTD-maintained roadway miles are highly critical. These corridors connect major ports, energy facilities, evacuation routes, and high-employment centers. Bridges located on these routes represent particularly important assets, especially in coastal areas with few or no alternate crossings. The majority of roadway miles fall into the medium [42%] and low [30%] criticality thresholds, providing a clear basis for setting investment priorities across the state. The analysis provided a clear, data-driven view of network importance, offering reproducible results that highlight which assets are most essential for access, mobility, evacuation, and commerce.

Key Insights:

- The high-population corridor from Lafayette to Baton Rouge and New Orleans shows elevated criticality across all scoring categories. High population density in these areas warrants proactive measures to prevent and quickly recover from disruptions.
- For the Safety and Resilience and Use and Operations categories, east-west corridors north of Lake Pontchartrain are also rated as high criticality. These serve as critical alternatives when western evacuation routes are compromised.
- Although not located in the top decile for the Community and Economy category, Alexandria (District 08) is a key node connecting the southeast and northwest regions. This corridor's roads are flagged as high criticality for Safety and Resilience, particularly as inland evacuation routes from the south Louisiana metro areas.
- High criticality corridors include segments of I 10, I 12, I 20, and I 49, which serve as primary east-west and north-south evacuation and freight routes. Corridors with the highest combined scores frequently connect regional population centers and pass through areas vulnerable to flooding and other hazards. Several of the most critical corridors are also among those with limited redundancy, highlighting potential resilience gaps.
- High criticality point assets such as bridges and large culverts are concentrated along major corridors and in urbanized areas, reinforcing the importance of targeted investments in these locations. Many of the highest scoring bridges and culverts are associated with corridors identified as having limited alternative routes, increasing the potential impact of asset failure during hazard events.

Composite

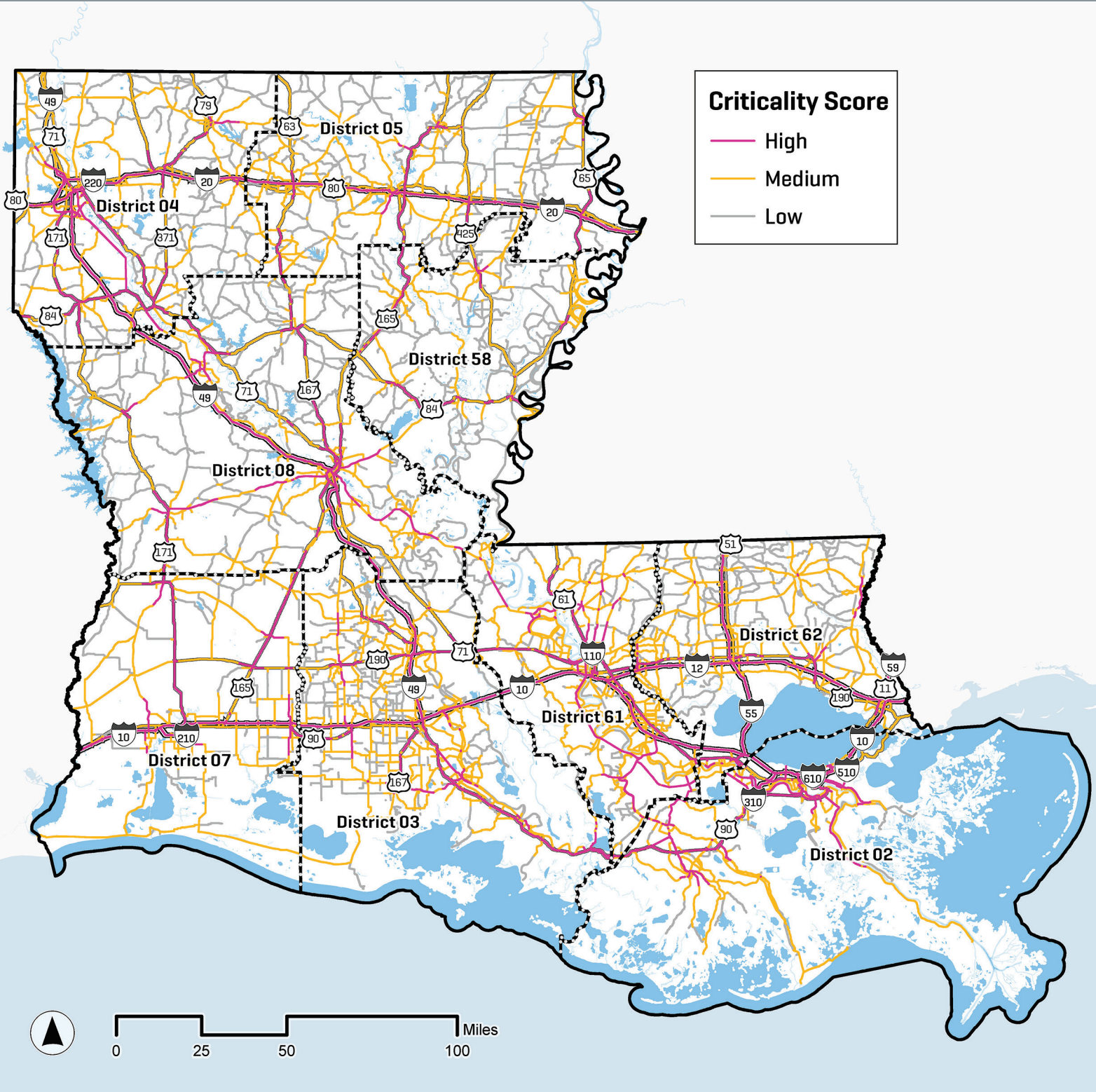


FIGURE 11: Composite criticality results

Community and Economy

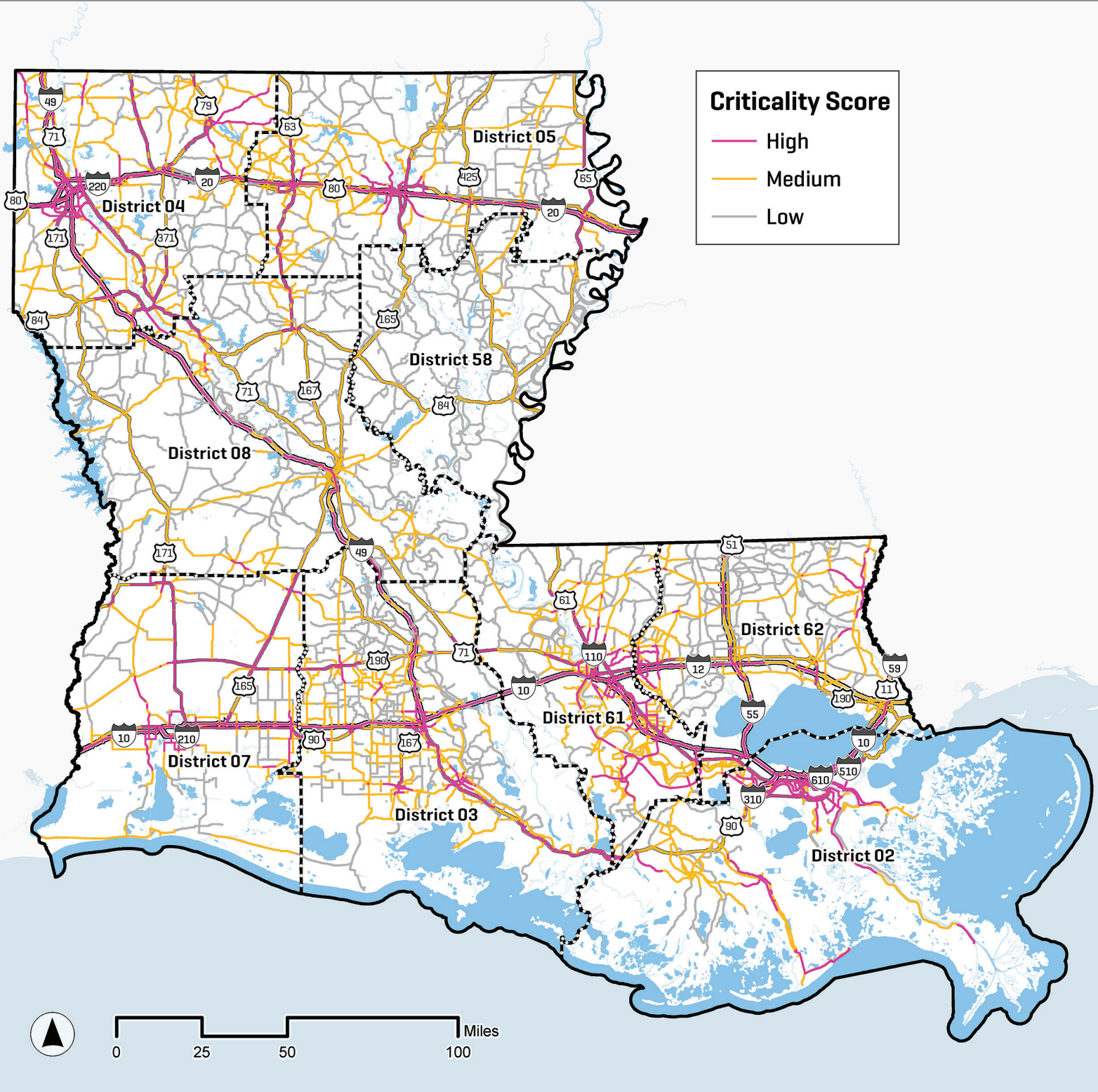


FIGURE 12: Community and economy criticality results

Safety and Resilience

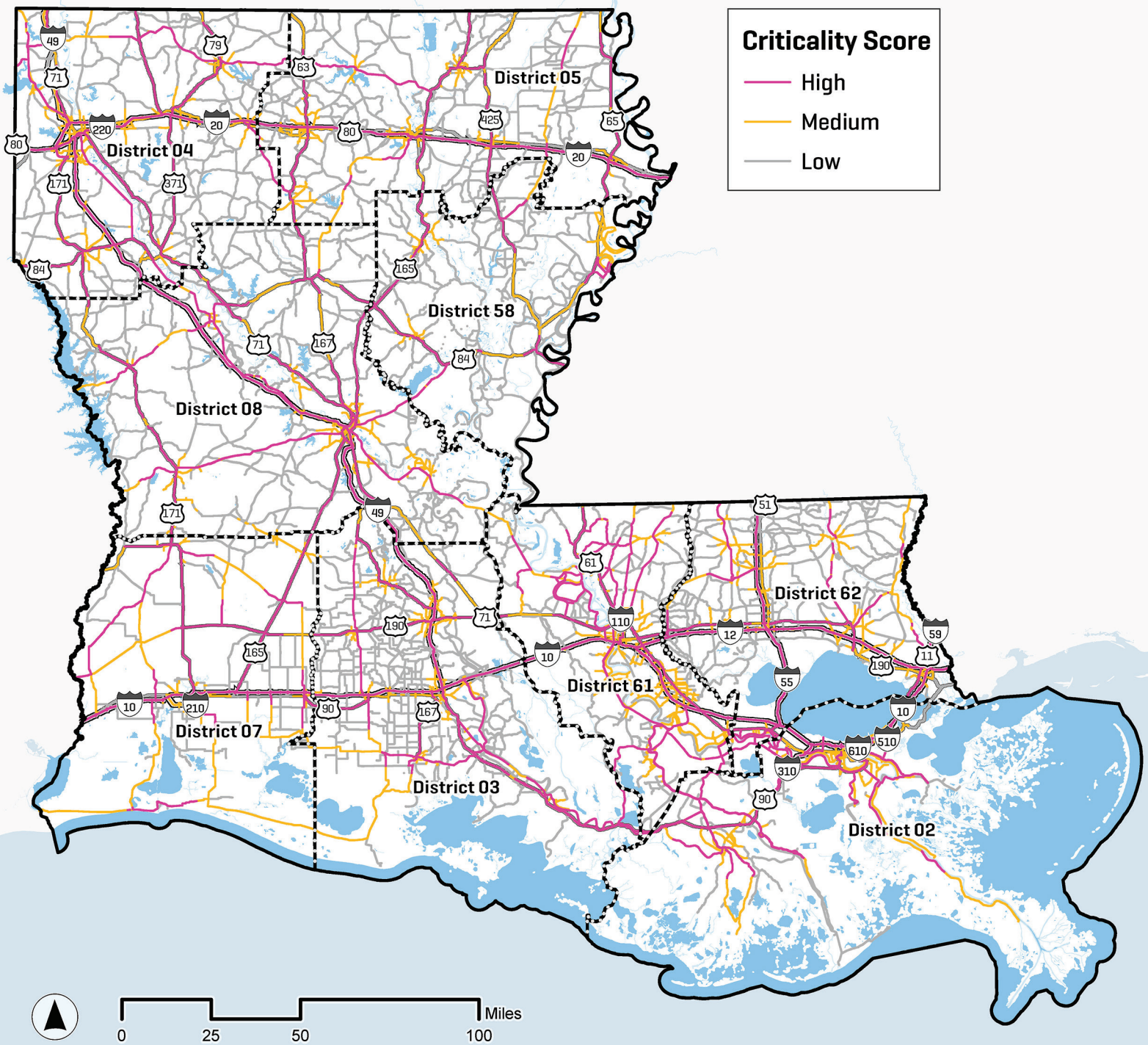


FIGURE 13: Safety and resilience criticality results

Use and Operations

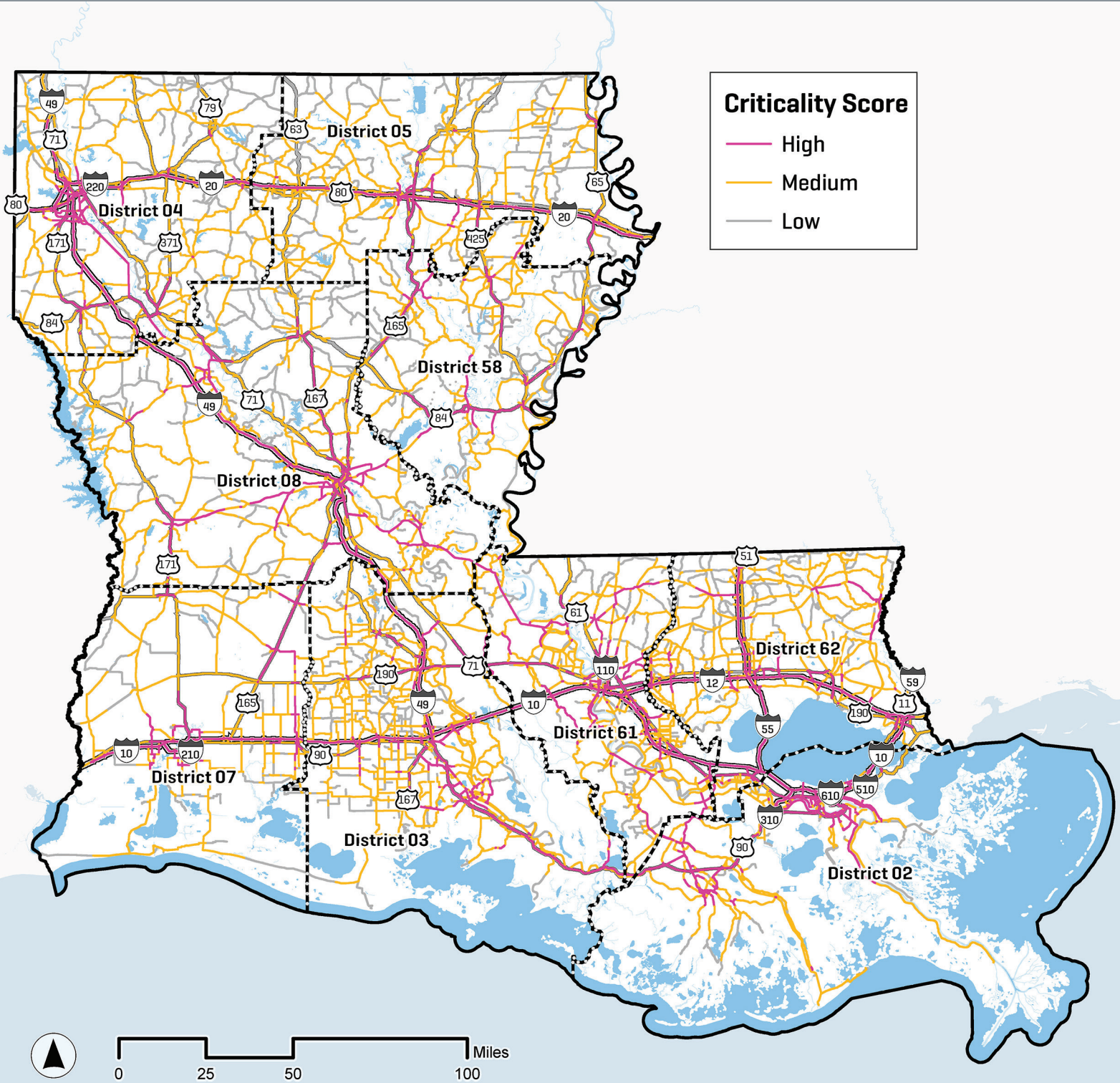


FIGURE 14: Use and operations criticality results

Transportation and Community Asset Criticality

While the intended scope of the TRIP is limited to the assets owned, managed, or controlled in partnership by LADOTD, the criticality assessment enables inferences about the resilience of other assets, such as energy infrastructure, buildings and housing, and water infrastructure.

LADOTD sought to include information on energy infrastructure, and made multiple attempts to contact federal agencies. Louisiana's vital position in national and global energy production and transportation means that much of this information was classified to protect national security. Based on available and publishable data, LADOTD incorporated access to commercial and industrial energy facilities as a parameter in evaluating asset criticality for both the Community and Economy and the Safety and Resilience categories.

Understanding the resilience of Louisiana's buildings and housing can be achieved, in part, through insight gained from the criticality assessment. Included in that analysis are data about total travel trips within the state, which includes (and is likely heavily skewed toward) trips made between people's homes and their places of employment. From this insight, LADOTD can infer geographically distinct risk profiles for heavily populated areas and, thus, make sophisticated judgments about its role in coordinating with populations whose housing supply may exhibit greater or lesser resilience to any of the hazards reviewed in this Plan. LADOTD-owned buildings and facilities were directly included in the criticality assessments using available data, as were non-LADOTD-owned medical facilities, given their critical role in the communities they serve.



Crescent City Connection, New Orleans

Water resources in Louisiana have received legislative investment via the LA Senate Bill No. 244. Effective in October 2025, this Bill establishes a Coordinated Use of Resources for Recreation, Economy, Navigation, and Transportation Board responsible for assessing water resources. Additionally, LADOTD partners with USGS every 5 years to develop the Water Use in Louisiana report about water withdrawals across the state, ensuring continuous awareness of ground and surface water conditions and availability to supply development.

Broadly, LADOTD's role in advancing resilience for Louisiana's water supply and the infrastructure that harvests, treats, stores, and distributes it is defined by ensuring that people and communities are connected to these infrastructure assets, and can access them during extenuating circumstances. The same travel analyses conducted as part of the criticality assessment that enable inferences about housing and buildings and

their geographic relationship to natural hazards, also inform understanding of travel patterns to and from water assets, setting a data-rich foundation for sophisticated planning and investment in sustaining connectivity to these critical infrastructures.

Cumulatively, the TRIP emphasizes that the importance of transportation infrastructure stems from the community's need for it. This Plan acknowledges and quantifies that need through robust, meaningful proxy analyses, like ADT network analyses and evacuation route reviews. It is beyond LADOTD's jurisdiction to prescribe specific investments in systems and assets it does not own, but analyses like this TRIP criticality assessment clarify the relationship between LADOTD's and others' assets so the Department is well-informed and equipped to be an effective, efficient partner to other agencies seeking to invest in the resilience of those assets.



Louisiana Highway Slidell Exit

Vulnerability and Risk Assessment

As a component of risk, LADOTD analyzed the transportation system's vulnerability to extreme heat, winter weather, flooding, geotechnical hazards, and wind, recognizing that significant segments of the system are vulnerable to natural hazards. Notably, about 18% of roadways and 33% of bridges are highly vulnerable to flooding translating to 1,819 miles [8.9%] of roadway and 1,097 bridges [13.4%] falling into the two highest risk categories. Additionally, nearly 13% of roadways meet the criteria for classification into the two highest risk categories for winter weather. All bridges were considered to be in the highest vulnerability category for winter weather for this analysis with approximately 35% [2,807] of bridges being characterized as having the highest risk. About 12% of roadways are highly vulnerable to extreme heat with 4.5% of roadways categorized as high or highest risk. Approximately 18.5% of roadway miles are highly vulnerable to combined geotechnical hazards with nearly 7.5% of roadways categorized in the high or highest risk groups. Wind vulnerability varies significantly by asset type and location. For example, over 45% of high criticality ITS assets fall into the highest two wind risk categories, while movable bridges show concentrated high risk despite low overall counts. This variability reflects both geographic differences in wind exposure and asset specific sensitivity thresholds.

Vulnerability and Risk Assessment Framework

Building on the criticality scores outlined above, the TRIP characterizes risk for each asset-hazard pair by combining vulnerability and criticality. Vulnerability is measured by the interaction of exposure [the likelihood and intensity of hazard contact] and sensitivity [the asset's ability to withstand that contact based on condition, age, material, and/or other factors]. Figure 15 illustrates the TRIP's conceptual framework connecting risk, vulnerability, criticality, exposure, and sensitivity.

LADOTD implemented the assessment with tabular and geospatial enterprise asset and hazard GIS data. Asset hazard exposure was evaluated by comparing asset location information with hazard extent and intensity data assembled for the TRIP, such as 1% annual chance flood depths, days above 95°, and slope stability hazards.

Then, asset sensitivity was assessed using attributes such as condition, material composition, bridge inspection ratings, and other characteristics. Intelligent Transportation Services [ITS] assets evaluated included the state's DMS, CCTV, and traffic light signals. ITS asset data did not consistently include condition information therefore, condition was not included in ITS asset sensitivity assessment. Facility assets assessed included LADOTD maintenance and storage buildings as well as district offices.

The metrics of exposure and sensitivity were analyzed to rank the vulnerability of each asset-hazard pair on a five-tier scale [lowest - LL, low - L, moderate - M, high - H, highest - HH]. Table 9 lists the asset-hazard pairs evaluated. Assets with an H or HH score are referred to as "highly" vulnerable.

FIGURE 15: Risk framework used for TRIP analysis

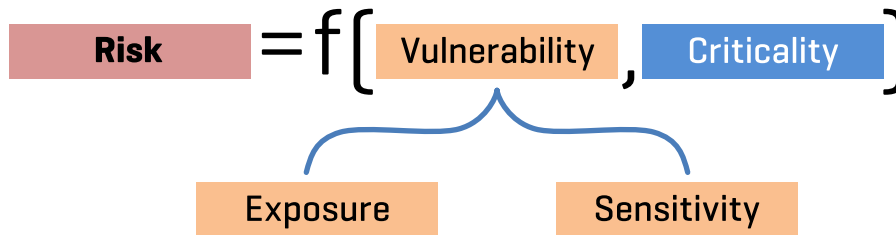


TABLE 9: Summary of asset-hazard pairs evaluated in the TRIP

ASSET	HAZARD				
	FLOODING	EXTREME HEAT	EXTREME WINDS	GEOTECHNICAL	WINTER WEATHER
ROADWAY	Yes	Yes	N/A	Yes	Yes
BRIDGE	Yes	Yes	Yes*	N/A	Yes
FACILITY	Yes	N/A	Yes	N/A	N/A
ITS	N/A	N/A	Yes	N/A	N/A

* Only movable bridges were assessed for wind

Risk was classified for each asset-hazard pair using the matrix in Table 10, based on a five-tier score [lowest-LL, low-L, moderate-M, high-H, highest - HH]. Matrix cells progress from green [LL], to blue [L], followed by pink [M], ending with orange [H] and yellow [HH], guiding mitigation priorities. The highest risk rating was assigned to assets with the highest vulnerability and criticality scores.

TABLE 10: Risk matrix

CRITICALITY	VULNERABILITY				
	LOWEST	LOW	MODERATE	HIGH	HIGHEST
High [H]	L	M	M	H	HH
Medium [M]	L	L	M	M	H
Low [L]	LL	L	L	M	M

This asset scale framework allows risk scores to be refreshed quickly and produced consistently as new asset or hazard information becomes available.

Flooding

FLOODING VULNERABILITY

LADOTD conducted a statewide analysis to assess roadway and bridge vulnerability to flooding using a combination of flood modeling, infrastructure condition data, and historical incident records.

Roads

Road segments were assigned a higher vulnerability score based on criteria including the following:

- ♦ **Flood Depth:** Projected to experience 3 feet or more of inundation during a 100-year storm event.
- ♦ **Drainage Condition:** Rated as “poor” in the roadway condition assessment, indicating inadequate stormwater performance.
- ♦ **Flood Closure History:** Experienced two or more flood-related closures between 2018 and 2025 (based on the 511 Road Closure Incident Database).

Approximately 1,996 miles of roadway across the state fall into the highest vulnerability category, representing approximately 10% of the total network assessed. An additional 1,715 miles, approximately 8% of the total miles assessed, are classified as high vulnerability.

Highly vulnerable road segments are found statewide, but two major clusters stand out. Coastal regions show a dense concentration due to low elevation, poor drainage, and storm surge risk.

Another significant cluster follows the Red River floodplain from Alexandria to Shreveport, where deep flooding, poor infrastructure condition, and frequent closures align.

Additionally, LADOTD also assessed storage facilities and maintenance buildings based on flood depth during a 100-year storm event. Of 466 facilities, 31 (~14%) are highly vulnerable to flooding

Bridges

LADOTD also assessed bridge vulnerability to flooding. Bridges with the following characteristics were assigned the highest vulnerability score:

- ♦ **Flood Depth:** 3 feet or more flooding over the bridge high chord during a 100-year event based on flood modeling.
- ♦ **Waterway Adequacy:** A low waterway adequacy scored indicating occasional overtopping based on the most recent bridge inspection.
- ♦ **Scour Condition:** A low scour critical score or low channel condition score indicating threatened piers and/or embankment based on the most recent inspection.

Based on these criteria, 1,531 bridges, or approximately 19% of the total bridges assessed, received the highest vulnerability score, and 1,140 bridges, or about 14%, received high vulnerability scores. Areas of high flood vulnerability are scattered across the state with no evident clusters.

FLOODING RISK

Flooding is Louisiana’s most frequent and damaging hazard, and this risk analysis provides a clear, data-driven foundation for prioritizing mitigation investments.

Roads

To translate the general risk framework into actionable insights, LADOTD applied the matrix-based risk classification to assess flood risk across the state-maintained roadway network.

Table 12 presents the results of the flood-specific risk assessment for roadway segments. Each cell represents the total miles of roadway that fall into a specific combination of criticality and vulnerability, with the corresponding risk classification derived from the matrix in Table 11. Percentages reflect the proportion of the total roadway mileage assessed [20,516 miles]. The roadway mileage used in the TRIP assessments is higher than in standard sources; see [Data Analysis and Model Development](#) for more information.

Key Insights:

- ♦ The highest flood risk segments represent some of the most urgent priorities for resilience investment, as failure of these assets would have severe consequences for safety, access, and economic continuity.
- Flood risk is not evenly distributed across Louisiana’s roadway network. The risk assessment reveals distinct geographic patterns that reflect both the physical environment and the functional importance of the transportation system. Figure 16 road segments are color-coded by risk level to reflect risk characterization, and several key trends are evident:
- ♦ Highest risk segments are concentrated in areas where critical infrastructure overlaps with high flood exposure. These include major corridors such as I 10, I 12, and I 20, which serve as essential routes for freight, evacuation, and regional mobility.
 - ♦ Urban clusters of highest risk segments are prominent in and around New Orleans, Baton Rouge, and Lafayette, where dense development and infrastructure interdependencies increase the consequences of disruption. While urban areas may have more roads, redundancy can be limited in practice due to chokepoints (e.g., bridges, interchanges), constrained detour options, and the high functional demand placed on specific corridors.
 - ♦ Medium risk segments are more broadly distributed across the state, often in areas with moderate flood exposure or aging infrastructure that may be less resilient to repeated events.
 - ♦ Over 1,800 miles of roadway fall into the two highest flood risk categories, concentrated in the medium and high criticality tiers, indicating that those essential corridors are significantly exposed to flood hazards.
 - ♦ Medium criticality road assets account for the largest share of miles with the highest flood risk (955 miles), followed by high criticality assets (443 miles), underscoring the need to protect infrastructure that supports both regional mobility and emergency response.

Key Insights [continued]:

- Lower risk segments are more common in the northern and central parts of the state, where higher elevation and better drainage reduce the likelihood and severity of flood-related impacts.
- This spatial distribution underscores the need for a strategic and regionally responsive investment approach that targets the most consequential risks while ensuring that rural and underserved areas are not overlooked in resilience planning.

TABLE 11: Roadway flooding risk matrix [miles, %]

CRITICALITY	VULNERABILITY				
	LOWEST	LOW	MODERATE	HIGH	HIGHEST
High [H]	959 [4.7%]	3,556 [17.3%]	230 [1.1%]	421 [2.0%]	443 [2.2%]
Medium [M]	1,825 [8.9%]	4,718 [23.0%]	426 [2.1%]	762 [3.7%]	955 [4.7%]
Low [L]	1,421 [6.9%]	3,346 [16.3%]	325 [1.6%]	532 [2.6%]	598 [2.9%]

Bridges

Bridges are uniquely vulnerable to flooding due to their location and their exposure to scour and overtopping. Further, bridges are critical connectors - often with limited or no alternative routes. To assess flood risk, LADOTD applied the same matrix-based approach used for asset-hazard pairs, combining each bridge's flood vulnerability with its criticality to the transportation system.

The table below presents the number and percentage of bridges in each risk category based on the intersection of criticality, and percentages reflect the share of the total number of bridges assessed [8,185].

TABLE 12: Bridge flooding risk matrix [count, %]

CRITICALITY	VULNERABILITY				
	LOWEST	LOW	MODERATE	HIGH	HIGHEST
High [H]	1,175 [14.4%]	496 [6.1%]	734 [9%]	215 [2.6%]	187 [2.3%]
Medium [M]	295 [3.6%]	451 [5.5%]	1,115 [13.6%]	476 [5.8%]	695 [8.5%]
Low [L]	62 [0.8%]	320 [3.9%]	866 [10.6%]	449 [5.5%]	649 [7.9%]

Flood Risk (Roadways)

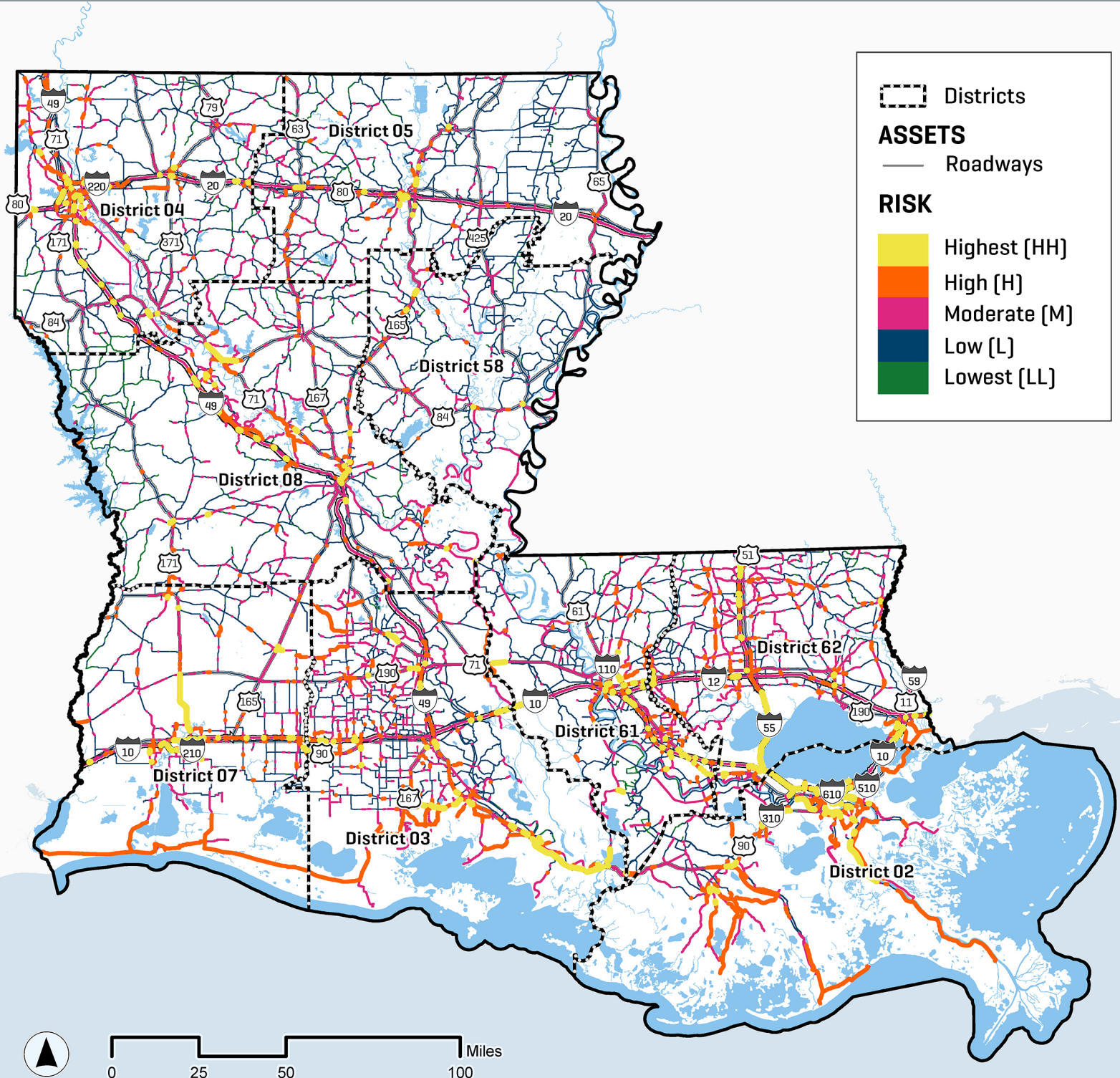


FIGURE 16: Flood risk characterization for roadways

Flood Risk [Bridges and Facilities]

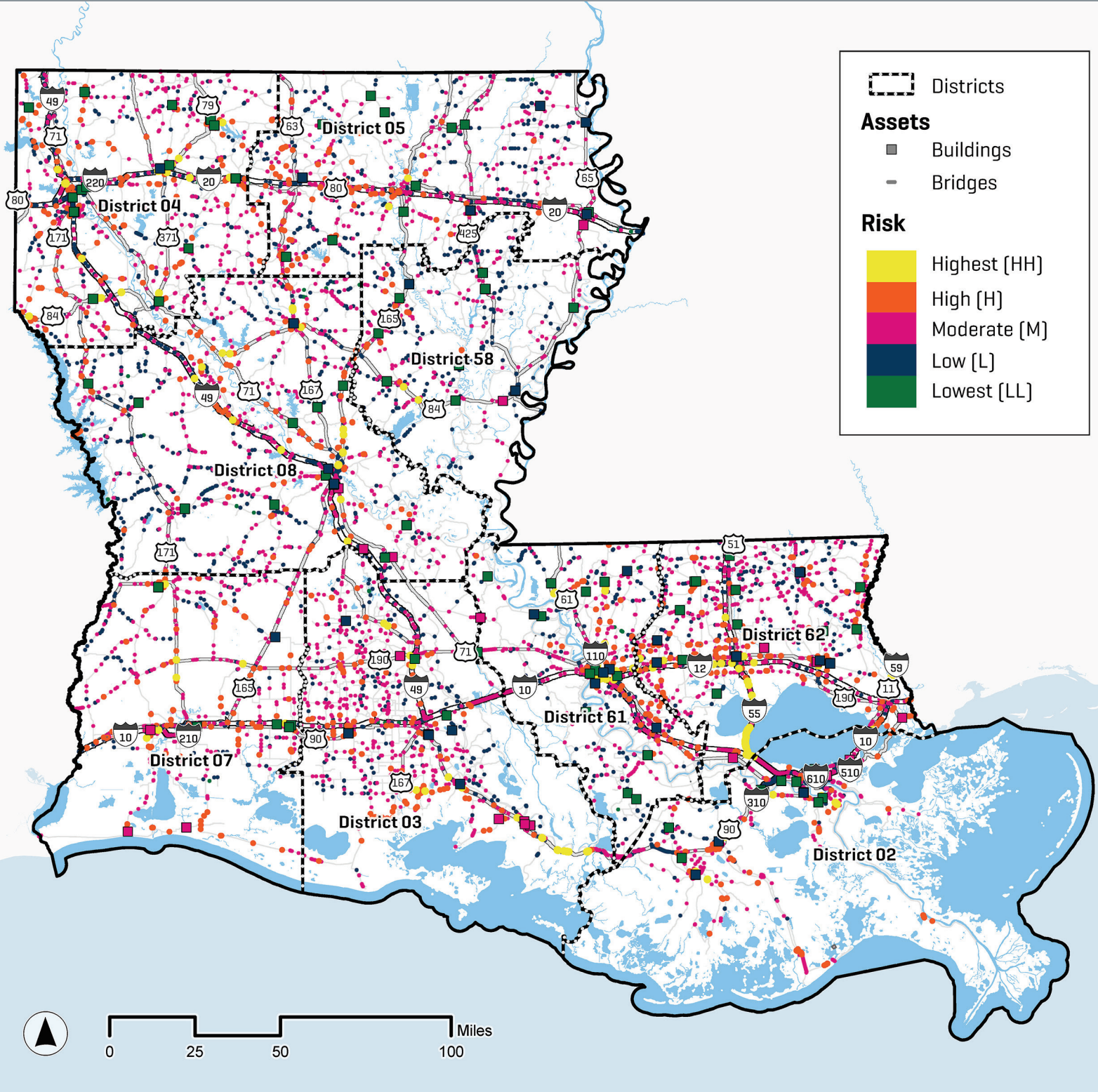


FIGURE 17: Flood risk characterization for bridges and facilities

Key Insights:

- Only 2.3% [186] of bridges statewide fall into the highest flood risk category, where both criticality and vulnerability are at their maximum. These structures represent the most urgent priorities for resilience investment due to the severe consequences of failure and limited redundancy.
- An additional 11.1% [908] of bridges fall into the next two high-risk categories, where either criticality or vulnerability is elevated. These include 2.6% [211] of high criticality bridges with high vulnerability and 8.5% [697] of medium criticality bridges with the highest vulnerability, highlighting the need to protect assets that support regional mobility and emergency response.
- Moderate risk scores are the most common, with 47.6% [3,898] of bridges falling into the six matrix cells that represent this tier. These assets may not require immediate intervention but should be monitored for future degradation or changing hazard conditions.
- Low risk bridges are also widespread, with 38.2% [3,126] of bridges falling into the five matrix cells representing low risk. These assets may still be important for local access or redundancy but are less likely to experience severe flood-related disruption.
- Only 0.8% [67] of bridges fall into the lowest risk category, where both criticality and vulnerability are minimal. These structures are least likely to require flood-related mitigation.

By identifying where critical infrastructure is most exposed to flood hazards, LADOTD can focus resources on the structures that matter most for safety, mobility, and economic continuity. As climate conditions evolve and new data becomes available, this risk-based framework can continue to support adaptive planning and help Louisiana's bridge network to remain reliable and resilient for years to come.

LADOTD Facilities

In addition to roadways and bridges, LADOTD assessed the flood risk of its own facilities, including maintenance yards, storage buildings, and operational centers. These facilities are essential for emergency equipment staging and day-to-day operations. However, based on input from the Resilience Working Group, all facilities were assigned a low criticality score [1] reflecting their support role rather than direct system-level impact. As a result, no facilities fall into the highest [HH] or high [H] flood risk categories as shown in Table 13.



Lake Pontchartrain traffic at night

TABLE 13: LADOTD facilities risk scores [facility counts]

RISK SCORE	LADOTD District								
	02	03	04	05	07	08	58	61	62
M [Medium]	2	9	0	2	4	1	5	2	4
L [Low]	5	3	2	1	1	4	5	7	6
LL [Lowest]	12	7	25	18	7	23	9	17	24
Number Assessed	21	22	31	26	19	36	77	87	96

Facilities' flood risk was determined by evaluating their exposure to flood risk at each site, including projected inundation depth during a 100-year storm event. Table 13 summarizes the number of facilities in each LADOTD district by their assigned flood risk score.

Key Insights:

- The majority of LADOTD facilities (69%, or 142 sites) fall into the very low flood risk category, indicating minimal exposure to flood hazards.
- 17% (34 facilities) are classified as low risk, and 14% (29 facilities) as moderate risk. No facilities are categorized as high or highest risk due to their uniformly low criticality scores.

- Districts 04 and 08 have the highest number of moderate-risk facilities. District 04 also has the largest number of very low-risk facilities.
- While the overall risk due to flood at LADOTD facilities is low, a subset may still benefit from mitigation measures such as site drainage improvements, elevation, or floodproofing, especially in areas with recurring flood events or limited emergency access.

This facility-level analysis contributes to resilience planning by highlighting potential vulnerabilities in LADOTD's supporting infrastructure and identifying opportunities to maintain continuity of operations during and after flood events.

Sunny Day Flooding

Louisiana transportation routes can also be impacted by coastal flooding hazards, including “sunny day flooding” [rise in water levels during high tidal conditions]. Roads and bridges in low-lying coastal areas are vulnerable to sunny day flooding inundation.

LADOTD analyzed sunny day flooding impacts to roads and bridges for current conditions [2025] and two future relative sea level rise scenarios. In 2025, about 850 miles of road are impacted by sunny day flooding. District 02 has the highest amount of road miles and bridges impacted by sunny day flooding; Districts 03, 07, 61, and 62 are also exposed. By 2050, between approximately 1,200 and 1,300 miles of road are expected to be impacted by sunny day flooding, depending on the relative sea level rise scenario.

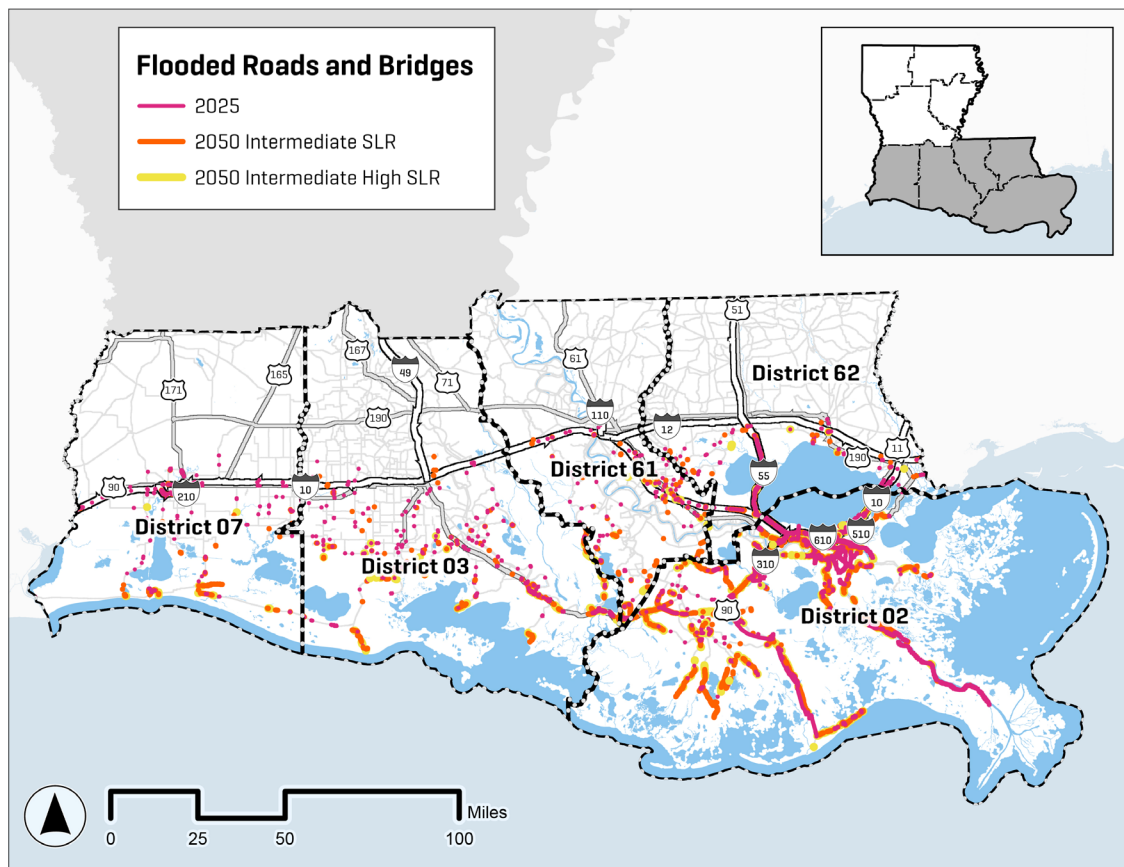


FIGURE 18: Sunny day flooding vulnerability

Extreme Heat

EXTREME HEAT VULNERABILITY

Extreme heat poses a growing threat to Louisiana's transportation infrastructure, particularly roadways surfaced with heat-sensitive materials or in poor condition. Prolonged high temperatures can cause rutting, cracking, and pavement blowouts, especially where asphalt overlays concrete. Bridges are also sensitive to extreme heat due to their structural materials, expansion joints, and exposure to direct sunlight. Prolonged high temperatures can accelerate material fatigue, cause joint displacement, and increase maintenance needs especially for older or heavily trafficked structures. The analysis assessed roadway and bridge vulnerability to extreme heat by integrating climate modeling, infrastructure conditions, and historical incident data.

Roadway segments were identified as more vulnerable based on criteria including the following:

- ♦ **Days Above 95°F:** Located in a part of the state with a relatively high average number of days over 95°F annually based on historic observations.
- ♦ **Road Materials:** Roadway pavement is asphalt over concrete, which is relatively sensitive to damage from extreme heat.
- ♦ **Pavement Condition:** Determined by field inspection to have poor pavement condition, including excessive rutting, which can worsen during high temperatures.

Additionally, the criteria used to identify bridges as more vulnerable to extreme heat include:

- ♦ **Days Above 95°F:** A relatively high average number of days over 95°F at bridges, annually based on historic observations.
- ♦ **Road Materials:** Bridge deck pavement is asphalt over concrete.
- ♦ **Pavement Condition:** Determined to have poor or worse bridge deck condition based on the deck rating from the NBI dataset, which is associated with greater sensitivity to high temperatures.

About 12% of Louisiana's road and bridge network is highly vulnerable to extreme heat, and another 25% of the network is moderately vulnerable to extreme heat. The remaining 63% has lower vulnerability to extreme heat.

Generally, system vulnerability to extreme heat increases from south to north across the state, reflecting the fact that northern latitudes in the state are warmer, and the coast has a moderating effect on temperatures. Deviations from this trend reflect the influence of roadway and bridge asset condition, namely the surface type and the performance index. Roadways and bridges with an asphalt surface and/or highly degraded pavement (e.g., exhibiting rutting or cracking) are more likely to be damaged by extreme heat exposure.

EXTREME HEAT RISK

To assess extreme heat risk, LADOTD applied its matrix-based framework, combining each roadway segment's vulnerability to extreme heat with its system-level criticality. The results provide a clear basis for prioritizing resilience investments.

Roads

Table 14 presents the results of the extreme heat risk assessment for state-maintained roadways. Each cell represents the total miles of roadway that fall into a specific combination of criticality and vulnerability, with the corresponding risk classification derived from the TRIP risk matrix. Percentages reflect the proportion of the total roadway mileage assessed [20,516 miles], which is higher than in standard sources [see "Data Analysis and Model Development" on page 30].

Key Insights:

- Only 0.6% [131 miles] of roadways fall into the highest extreme heat risk category, where both criticality and vulnerability are at their maximum. These segments represent the most urgent priorities for resilience investment due to the potential for severe pavement failure and limited redundancy.
- An additional 3.9% [815 miles] of roadways fall into the two high-risk categories, including 3.0% [620 miles] in the high criticality + high vulnerability cell and 0.9% [195 miles] in the medium criticality + highest vulnerability cell. These corridors are essential for freight, emergency response, and regional mobility and may require targeted mitigation strategies.
- Moderate risk scores are relatively common, with 38.5% [7,894 miles] of roadways falling into the six matrix cells that represent this tier. These segments may not require immediate intervention but should be monitored for degradation, especially in areas with aging pavement or high traffic volumes.
- Low risk roadways account for 54.8% [11,254 miles] of the network, indicating that while exposure to extreme heat is widespread, many segments are either less critical or more resilient to thermal stress.
- Only 2.1% [424 miles] of roadways fall into the lowest risk category, where both criticality and vulnerability are minimal. These segments are least likely to require heat-related mitigation.



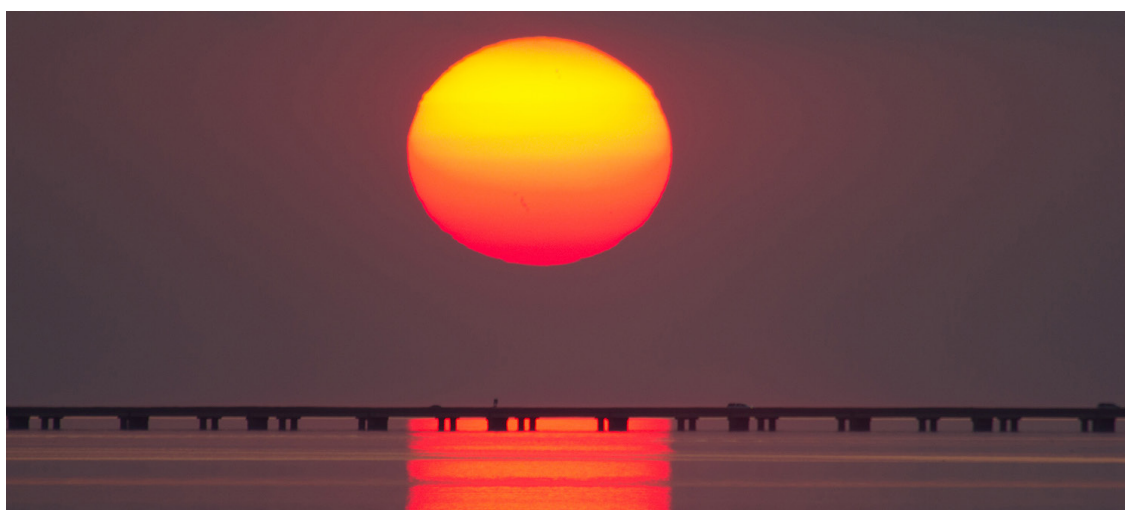
Wildfire in bayou

TABLE 14: Roadway heat risk characterization [miles, %]

CRITICALITY	VULNERABILITY				
	LOWEST	LOW	MODERATE	HIGH	HIGHEST
High (H)	667 [3.3%]	3,023 [14.7%]	1,170 [5.7%]	620 [3%]	131 [0.6%]
Medium (M)	971 [4.7%]	4,512 [22%]	2,118 [10.3%]	891 [4.3%]	195 [0.9%]
Low (L)	424 [2.1%]	3,290 [16%]	1,813 [8.8%]	555 [2.7%]	134 [0.7%]

Extreme heat risk is not as evenly distributed across Louisiana’s roadway network as extreme heat vulnerability:

- ♦ **Highest- and high-risk segments** occur primarily along roadways in the central and western parts of the state. District 04 and District 08 have the highest percentage of roads in the two high extreme heat risk categories.
 - ♦ **Moderate-risk segments** are widely distributed across the state, with notable concentrations in Districts 04, 05, 07, and 08. These areas often combine moderate exposure with infrastructure that may be vulnerable due to surface type or condition.
 - ♦ **Low-risk segments** dominate the eastern part of the state and the southern coastal regions, including Districts 58, 61, and 62. In the south, proximity to the Gulf of America moderates extreme heat exposure. These areas also include newer or better-maintained infrastructure that is less sensitive to thermal stress.
- This distribution highlights the importance of a regionally tailored investment strategy—one that prioritizes high-risk corridors in the north and central regions while continuing to monitor and maintain infrastructure statewide as climate conditions evolve.



Sunset over Lake Pontchartrain causeway

Bridges

LADOTD applied the matrix-based risk classification for each bridge, combining its vulnerability to extreme heat with its criticality to the transportation system.

The table below presents the number and percentage of bridges in each risk category. Percentages reflect the share of the total number of bridges assessed [8,185].

Key Insights:

- Only 0.1% [5 bridges] fall into the highest extreme heat risk category, where both criticality and vulnerability are at the maximum. These structures represent the most urgent priorities for resilience investment due to their essential function and high exposure to heat-related stress.
- An additional 0.7% [55 bridges] fall into the two high-risk categories, including 0.2% [15 bridges] in the high criticality + high vulnerability cell and 0.5% [40 bridges] in the medium criticality + highest vulnerability cell. These bridges support key corridors and may require targeted inspection or material upgrades.
- Moderate risk scores are assigned to approximately 39% [3,243 bridges], reflecting a broad distribution of exposure across all criticality levels. These structures may not require immediate intervention but should be monitored for signs of thermal degradation.
- Low risk bridges account for over 59% [4,882 bridges] of the network, suggesting that many structures are either less critical or more resilient to extreme heat due to design, materials, or location.



Bridge in Shreveport, Louisiana, across Red River

- Only 1.3% [103 bridges] fall into the lowest risk category, where both criticality and vulnerability are minimal.

High and moderate-risk bridges are concentrated in the northern and central parts of the state, particularly in Districts 04, 05, and 08, where extreme heat days are more frequent and infrastructure is more likely to be aging or heat-sensitive. Lower-risk bridges are more common in southern coastal areas, such as Districts 02 and 62, where proximity to the Gulf of America moderates temperature extremes. This distribution underscores the need for regionally tailored strategies that prioritize bridge inspections, material upgrades, and design adaptations in areas most exposed to prolonged heat events.

Extreme Heat Risk [Roadways]

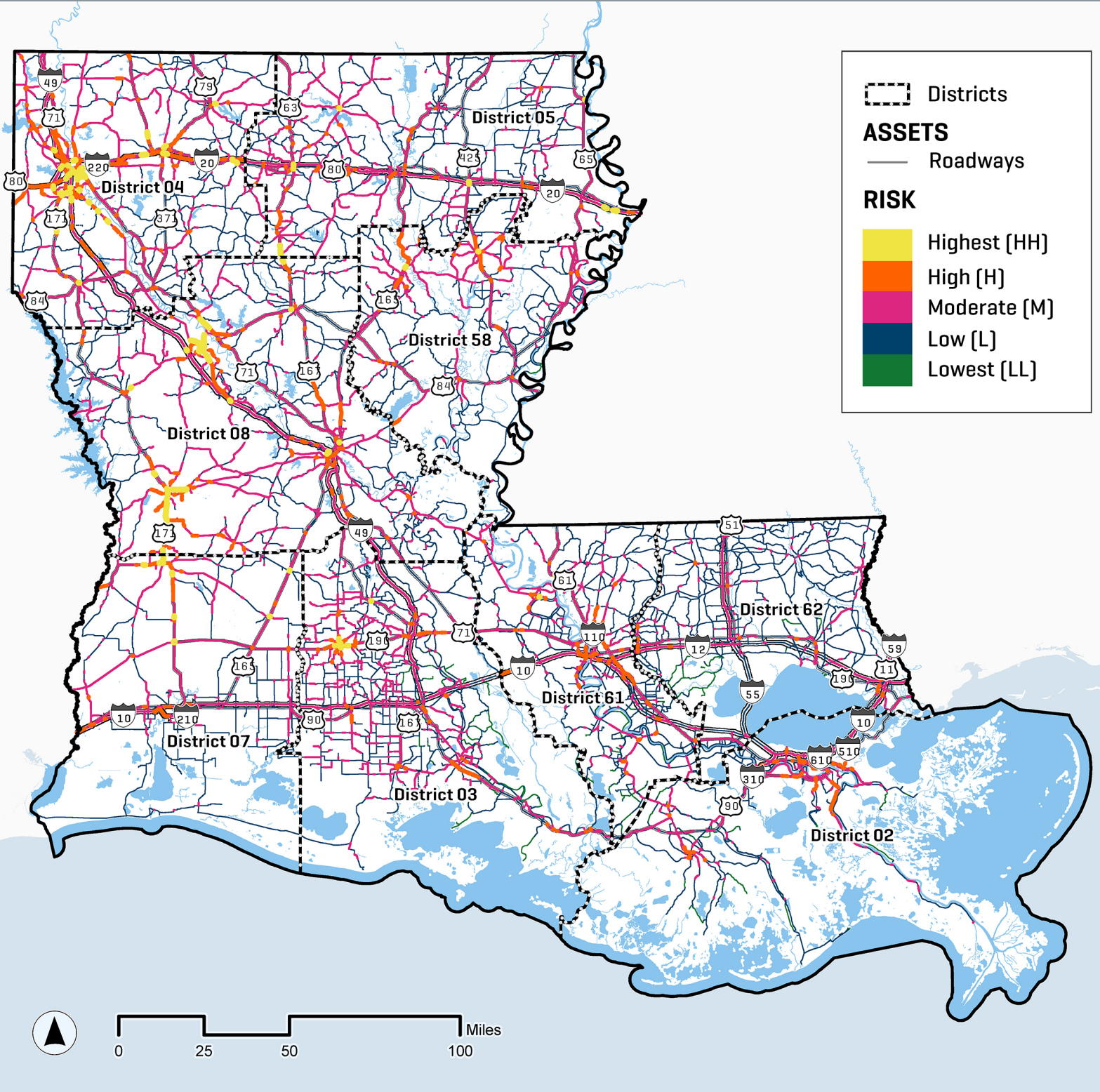


FIGURE 19: Extreme heat risk characterization for roadways

Extreme Heat Risk [Bridges]

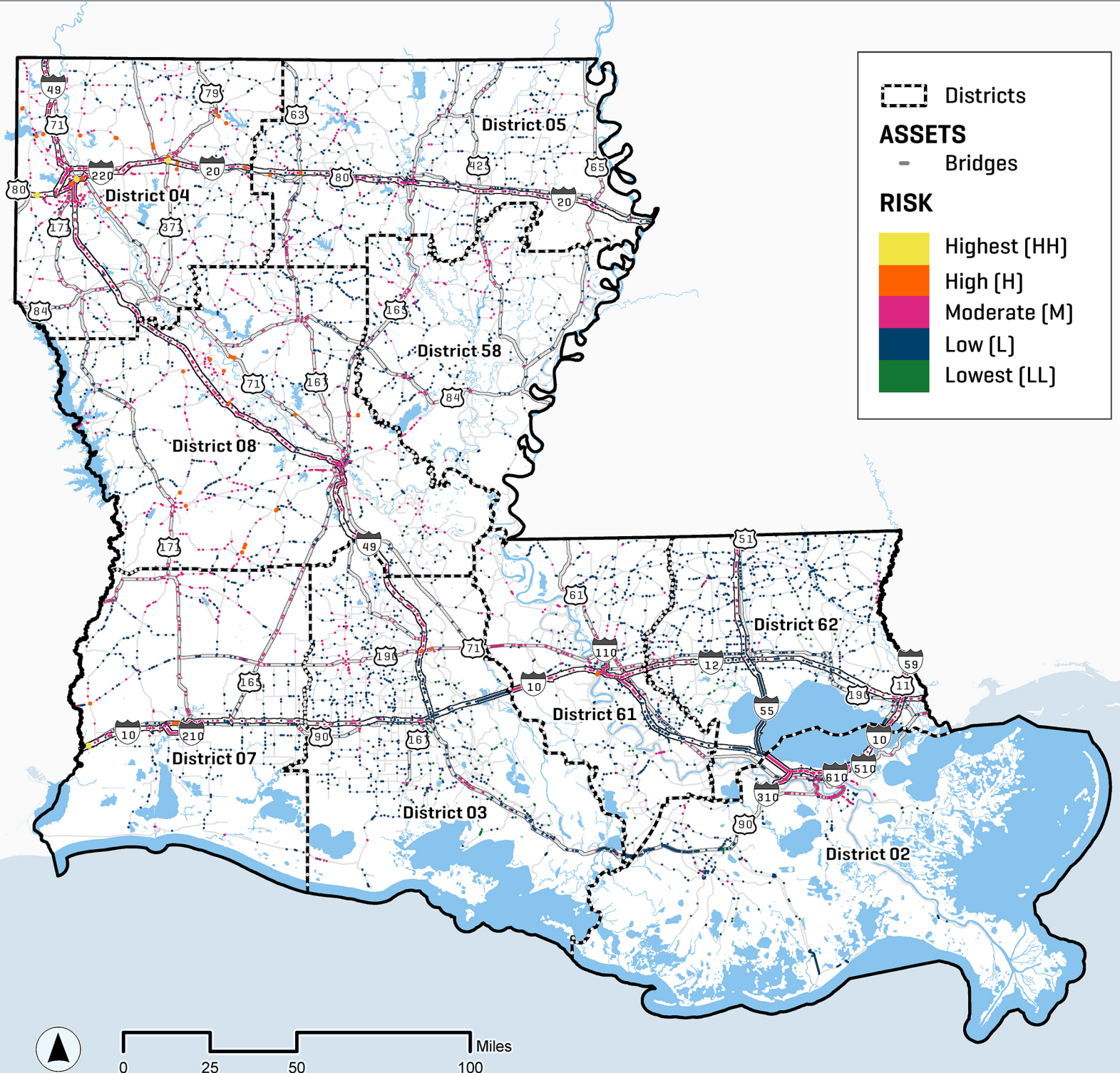


FIGURE 20: Extreme heat risk characterization for bridges

TABLE 15: Bridge heat risk characterization [count, %]

CRITICALITY	VULNERABILITY				
	LOWEST	LOW	MODERATE	HIGH	HIGHEST
High [H]	525 [6.4%]	1,822 [22.3%]	440 [5.4%]	15 [0.2%]	5 [0.061%]
Medium [M]	327 [4%]	1,888 [23.1%]	703 [8.5%]	74 [0.9%]	40 [0.5%]
Low [L]	103 [1.3%]	1,398 [17.1%]	641 [7.9%]	137 [1.7%]	67 [0.8%]

This analysis equips LADOTD with an understanding of where extreme heat poses the greatest risk to roadway infrastructure. By identifying the most vulnerable and critical segments, the Department can prioritize targeted interventions such as pavement upgrades, materials research, and operational adjustments to reduce long-term maintenance costs and enhance system reliability. As climate trends continue to evolve, this risk-based framework will support adaptive planning and ensure that Louisiana’s transportation network remains safe and functional under rising temperature extremes.



Atchafalaya Basin

Winter Weather

WINTER WEATHER VULNERABILITY

LADOTD evaluated the vulnerability of roadway segments to winter weather by analyzing cold [temperature] and ice hazard modeling, infrastructure condition data, and historical incident records. Ice was evaluated as a component of the winter weather hazard, as it results from prolonged cold and winter conditions. Districts also identified ice as a significant operational challenge, particularly due to its impact on road safety and mobility. Segments were classified as highly vulnerable based on criteria, including the following:

- ♦ **Days Below 32°F:** Located in a part of the state with a relatively high average number of days below 32°F per year based on historic observations.
- ♦ **Asset Type:** Elevated and therefore more susceptible to icing, including all bridges.
- ♦ **Past Damages:** Experienced one or more road closures due to ice or winter weather in the 511 road closure incident database from 2018 to the beginning of 2025. During that time, 5%-10% of Louisiana's reported road closures were due to winter weather.

The analysis found that a substantial portion [31%] of Louisiana's road and bridge network is highly vulnerable to extreme cold and ice. Another approximately 28% is moderately vulnerable to extreme cold and ice.

The system's vulnerability to cold and ice generally follows the state's temperature gradient; the coast moderates temperature in the southern portion of the state, but the northern reaches of the state can have colder temperatures [and overall more extreme temperature swings]. Nevertheless, some southern location such as I 10 and the network around Alexandria are also highly vulnerability to extreme cold and ice because those routes have been repeatedly closed due to winter weather conditions.

WINTER WEATHER RISK

While less frequent than other hazards in Louisiana, winter weather events can cause significant disruptions to the transportation network. These events often lead to hazardous driving conditions, road closures, and increased maintenance needs, particularly for elevated structures like bridges that freeze more quickly than surface roads. To assess this risk, LADOTD applied the matrix-based risk classification, combining each asset's vulnerability to cold and ice with its criticality to the transportation system.

Roads

The table below presents the results of the winter weather risk assessment for state-maintained roadways. Each cell represents the total miles of roadway that fall into a specific combination of criticality and vulnerability. Percentages reflect the proportion of the total roadway mileage assessed [20,516 miles].

TABLE 16: Roadway winter weather risk characterization [miles, %]

CRITICALITY	VULNERABILITY				
	LOWEST	LOW	MODERATE	HIGH	HIGHEST
High [H]	764 [3.7%]	1,526 [7.4%]	1,283 [6.3%]	795 [3.9%]	1,241 [6%]
Medium [M]	1,354 [6.6%]	2,844 [13.9%]	2,244 [10.9%]	1,631 [8%]	612 [3%]
Low [L]	367 [1.8%]	1,471 [7.2%]	2,301 [11.2%]	1,567 [7.6%]	514 [2.5%]

Key Insights:

- Around 6% [1,241 miles] of roadways fall into the highest cold and ice risk category, where both criticality and vulnerability are at their maximum. These segments represent the most urgent priorities for winter weather resilience due to their potential for icing and limited detour options.
- Additionally, almost 7% [795 miles in high criticality + high vulnerability and 612 miles in medium criticality + highest vulnerability] fall into the two high-risk categories. These corridors are essential for emergency response and regional mobility and may require enhanced winter weather treatment or monitoring.
- Moderate risk scores are assigned to approximately 43% [8,765 miles] of roadways, indicating widespread exposure to cold and ice across all criticality levels. These segments may not require intervention.
- Low-risk roadways account for approximately 43% [8,734 miles] of the network, suggesting that many segments are either less critical or less exposed to freezing conditions.
- Only 1.8% [367 miles] of roadways fall into the lowest risk category, where both criticality and vulnerability are minimal.

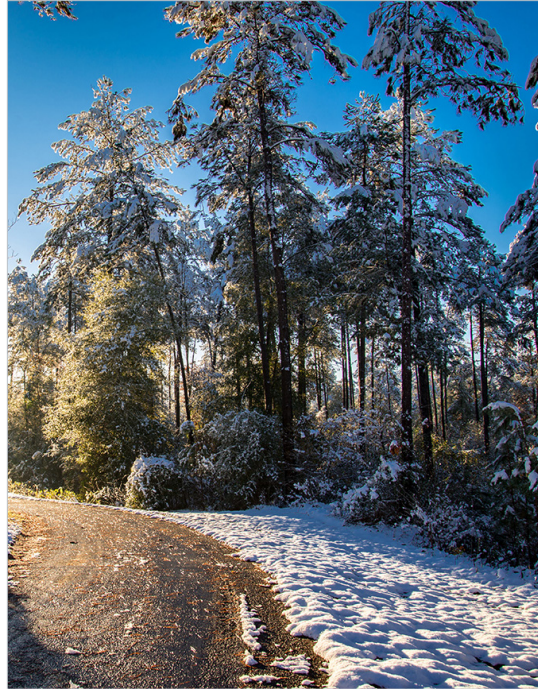
Bridges

Due to their elevation and exposure, bridges are especially vulnerable to extreme cold and ice. Unlike roadways, nearly all bridges in Louisiana are considered highly vulnerable to freezing conditions. As a result, the risk matrix for bridges is concentrated in the highest risk category.

Key Insights:

- Approximately 34% of bridges assessed fall into the highest cold and ice risk category due to their high criticality and uniform vulnerability to freezing.
- Medium and low criticality bridges make up the remaining 65.2% [5,378 bridges], many of which serve rural communities or provide the only access to isolated areas. While not top tier in criticality, their high vulnerability still warrants attention in winter weather planning.

These results reinforce the importance of LADOTD's existing winter weather response plan and the designation of winter weather priority routes. Given that all bridges are highly vulnerable to freezing, continued investment in bridge treatment, closure protocols, and traveler communication is essential to maintaining safety and mobility during cold weather events.



Snow at state park

TABLE 17: Bridge winter weather risk characterization [count, %]

VULNERABILITY		
HIGHEST		
Criticality	High (H)	2,807 [34.8%]
	Medium (M)	3,032 [37.6%]
	Low (L)	2,346 [29.1%]

**Table truncated due to bridges only being classified as "Highest" for winter weather-related risk, with no representation in other vulnerability levels.*

The spatial distribution of extreme cold risk reveals a clear north-to-south gradient across Louisiana. Higher-risk segments are concentrated in the northern and central parts of the state, particularly in Districts 04, 05, and 08, where colder temperatures and freezing events are more frequent. These areas also include many of the state's winter weather priority routes.

Moderate-risk segments are more widely distributed, including portions of Districts 03, 58, and 61, where infrastructure may be exposed to occasional freezing events or has experienced past closures due to winter weather. Lower-risk segments are more common in southern coastal areas, such as Districts 02 and 62, where warmer temperatures and proximity to the Gulf of America reduce the likelihood of freezing conditions.

This distribution supports LADOTD's regionally tailored winter weather strategy, which prioritizes treatment and monitoring along high-risk corridors while maintaining readiness across the broader network.

This analysis provides LADOTD with a detailed understanding of how winter weather affect both roadways and bridges across the state. By identifying the most at-risk segments and aligning them with existing winter weather priority routes, the Department can continue to implement targeted, proactive strategies that enhance safety, reduce disruptions, and support reliable mobility during freeze events. This risk-based framework will remain essential for adaptive planning and operational readiness during extreme winter weather events.



Snow canopy

Winter Weather Risk [Roadways]

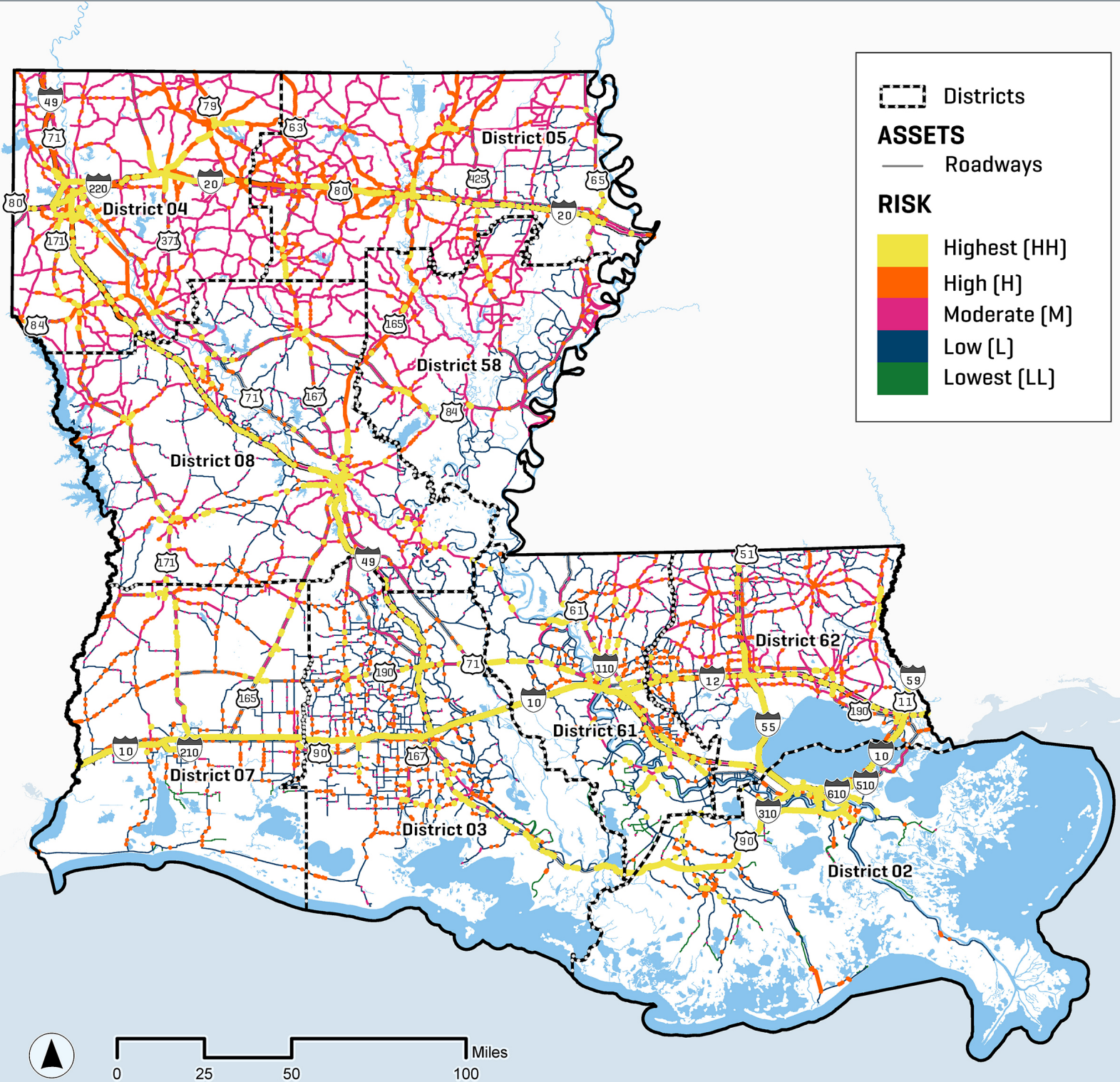


FIGURE 21: Winter weather risk characterization for roadways

Winter Weather Risk [Bridges]

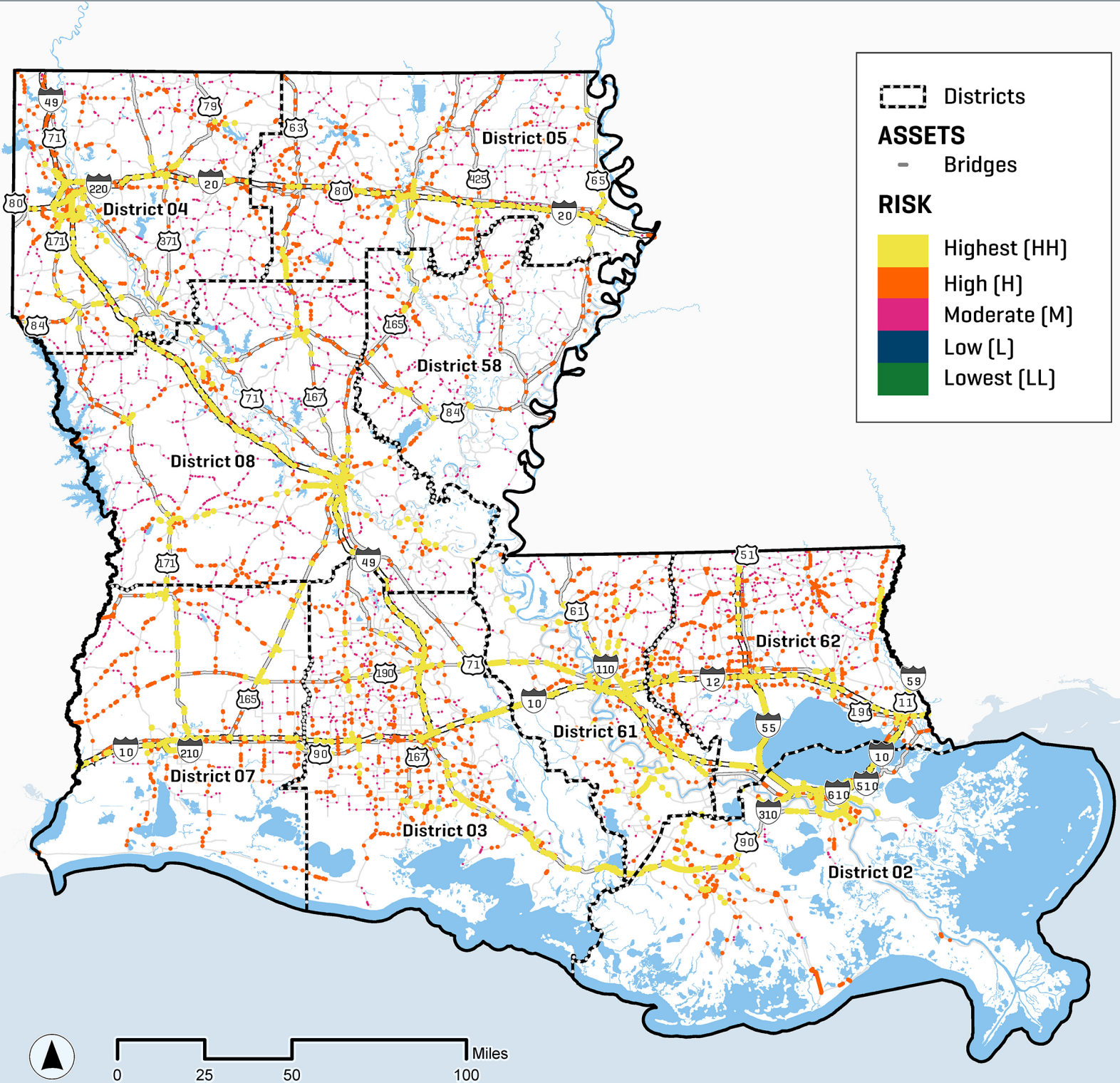


FIGURE 22: Winter weather risk characterization for bridges

Geotechnical Hazards

GEOTECHNICAL HAZARDS VULNERABILITY

Geotechnical hazards, including slope instability, shallow groundwater, subsidence, and both expansive and organic soils, can pose significant risks to Louisiana’s transportation infrastructure. These hazards can act independently or in combination, leading to pavement deformation, embankment failure, and long-term structural degradation. To evaluate geotechnical hazards, a collection of discrete datasets reflecting subsidence [CPRA], soils [USDA and SHMP], groundwater elevation [USGS], and slope stability [USGS], were evaluated along the road network.

If the soil under the road segment meets the minimum thresholds for organic content and expansiveness, a subsidence vulnerability score was added to the groundwater and slope susceptibility vulnerability scores indicating the increased risk of settlement and erosion. If highly organic or expansive soil was not present for a roadway segment, the subsidence data were not incorporated.

A composite geotechnical hazard vulnerability score was calculated by adding the slope stability and subsidence score, and the groundwater and subsidence score. This assessment is limited to the southern five districts of Louisiana due to data availability

The results in Table 18 show 146 miles [1%] of roadways are highly susceptible to slope failure alone across the state. An example can be seen along several segments of I 49, which runs along the Red River and is in one of the most heavily drawn aquifers in northwestern Louisiana. Roads along the Mississippi River West Bank, below Morganza Levee alignment lines, are also highlighted as being highly vulnerable to slope failure. When adding the additional hazard dimension of subsidence to roads that are built on top of organic or expansive soils, the results show more roadways at increased hazard exposure where roads are built along or near levees, particularly in District 02. About 190 [1%] roadway miles are the most vulnerable to slope failure, groundwater intrusion, and subsidence combined. Approximately 3,610 [17%] miles have high vulnerability.

TABLE 18: Roadway miles vulnerable to geotechnical hazards

HAZARD	HIGHEST	HIGH	MODERATE	LOW	LOWEST
Subsidence*	0.4	115	854	2,588	7,678
Slope Stability	21	125	752	2,181	17,434
Slope Stability & Subsidence*	211	1,279	2,920	6,085	739
Groundwater**	10,136	440	257	163	988
Groundwater & Subsidence***	9,760	222	368	427	95
Composite Risk***	190	3,610	6,526	458	86

*9,283 miles no data

**8,533 miles no data

***9,644 miles no data

Geotechnical Risk

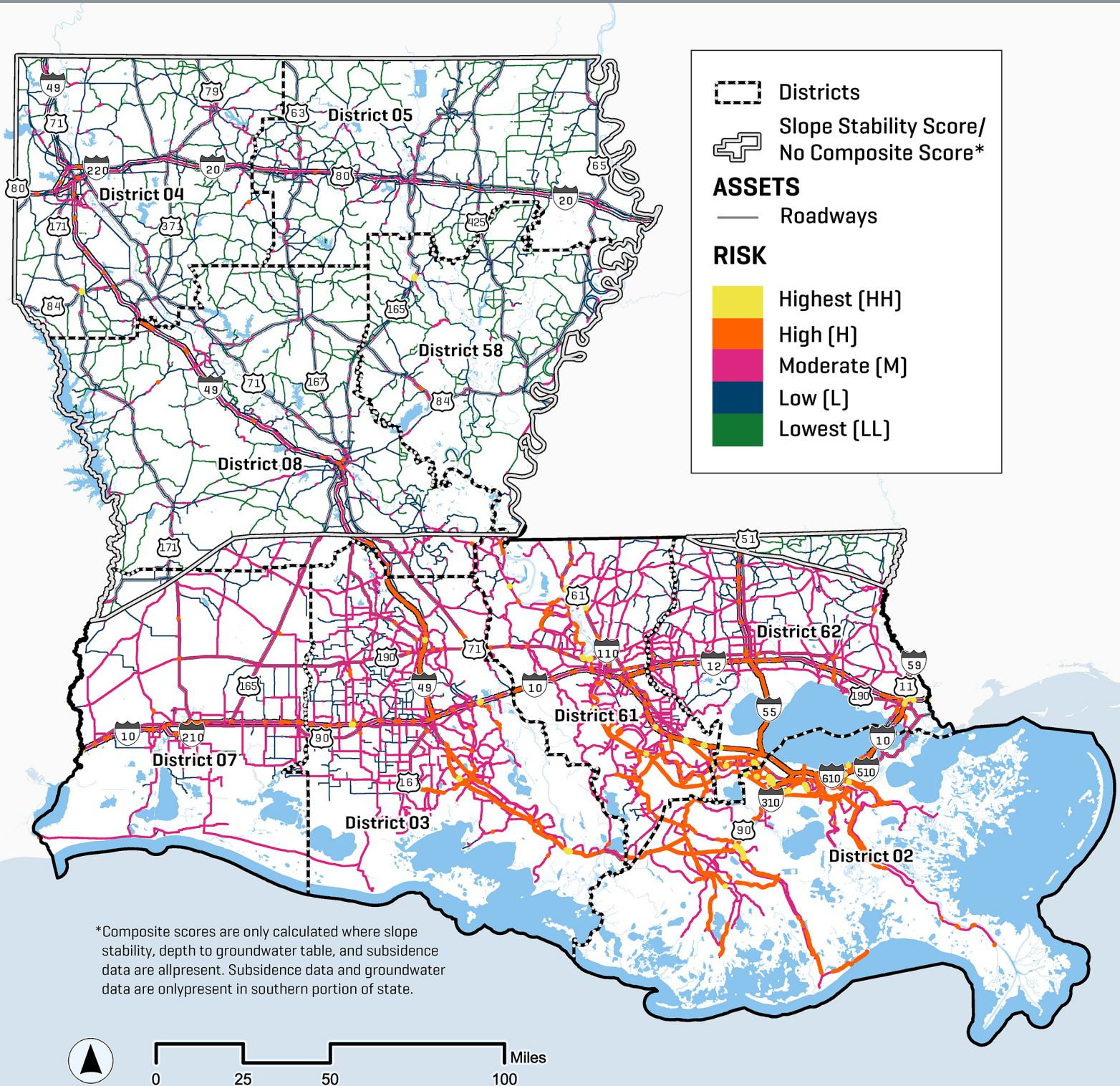


FIGURE 23: Geotechnical hazard risk characterization for roadways with composite/slope stability score

GEOTECHNICAL HAZARDS RISK

LADOTD assessed the geotechnical hazards using the risk matrix developed for the TRIP. Two primary risk assessments were conducted:

- **Slope Stability Risk:** Based on USGS landslide susceptibility data, which incorporates slope-derived raster analysis and historical landslide records.
- **Composite Geotechnical Risk:** A composite score integrating slope stability, groundwater depth, and subsidence. This assessment is limited to the southern five districts of Louisiana due to data availability.
- The highest composite risk segments [HH] total 19 miles and are concentrated in areas where critical infrastructure overlaps with high vulnerability, such as Districts 02, 03, 61, and 62.
- Moderate risk is the most common characterization for the composite risk assessment, approximately 68% [7,393 miles] of the 10,869 roadway miles assessed for the combined geotechnical risk falling into this category, particularly in medium and high criticality tiers.
- For slope stability, most roadway miles fall into the lowest and low risk categories, with only 35 miles [0.17%] in the high or highest risk tiers.
- For composite geotechnical risk, approximately 1,514 miles of roadway fall into the high or highest risk categories, representing over 7.4% of the entire roadway network assessed for the TRIP.
- Slope instability is more localized but still poses a threat in areas with steep embankments, aging embankments, poor drainage, or expansive soils.

Key Insights:

TABLE 19: Roadway composite geotechnical risk characterization [miles, %]

CRITICALITY	VULNERABILITY				
	LOWEST	LOW	MODERATE	HIGH	HIGHEST
High [H]	60 [0.3%]	279 [1.4%]	1,843 [9%]	1,370 [6.7%]	19 [0.1%]
Medium [M]	18 [0.1%]	132 [0.6%]	2,984 [14.5%]	1,702 [8.3%]	125 [0.6%]
Low [L]	8 [0%]	47 [0.2%]	1,698 [8.3%]	538 [2.6%]	47 [0.2%]

The spatial distribution of geotechnical hazard risk varies by hazard type and data availability:

- Slope stability risk is assessed statewide and shows localized areas of elevated risk, particularly along river corridors, levee-adjacent roads, and engineered embankments. Notable concentrations occur in Districts 02, 03, and 04, including segments of I 49 and roads near the Mississippi River.
- Combined geotechnical risk, which incorporates slope, groundwater, subsidence, and soil data, is limited to the southern portion of the state due to the spatial extent of groundwater and subsidence datasets. As a result, no combined risk scores are available for northern Louisiana, though slope stability risk is still assessed in those areas.
- The highest combined risk areas are concentrated in coastal and low-lying regions, particularly where organic and expansive soils, shallow groundwater, and subsidence coincide with critical transportation infrastructure. These include corridors in Districts 02, 03, 61, and 62.

This spatial pattern highlights the importance of both localized slope interventions and broader, integrated geotechnical strategies in the southern part of the state.

Geotechnical hazards, while often less visible than other threats, can lead to long-term degradation and failures in Louisiana's transportation network. The combined risk assessment highlights the importance of integrated mitigation strategies that address slope, groundwater, and subsidence risks together. Continued investment in data collection, particularly in the northern part of the state, will be essential to ensure a comprehensive understanding of geotechnical vulnerabilities and to support proactive infrastructure resilience planning.



Slope failure along LA 745

TABLE 20: Roadway slope stability risk characterization (miles, %)

CRITICALITY	VULNERABILITY				
	LOWEST	LOW	MODERATE	HIGH	HIGHEST
High (H)	4,401 [21.5%]	905 [4.4%]	276 [1.3%]	23 [0.11%]	3 [0.01%]
Medium (M)	7,604 [37.1%]	753 [3.7%]	268 [1.3%]	50 [0.24%]	9 [0.05%]
Low (L)	5,429 [26.5%]	523 [2.5%]	208 [1%]	52 [0.25%]	9 [0.04%]

Marsh Edge Erosion

Marsh edges and adjacent roadways exposed to wave action in coastal Louisiana are experiencing erosion. LADOTD evaluated the exposure of roadways to marsh edge erosion using CPRA data derived from a multi-year aerial shoreline imagery analysis. Roads in Districts 02, 03, 07, 61, and 62 are exposed to marsh edge erosion.

Approximately 0.3 miles of roadway are vulnerable to high erosion rates [3-4 meters per year], 9 miles are vulnerable to moderate rates [2-3 meters per year], 45 miles are vulnerable to low erosion rates [1-2 meters per year], and 7,328 roadway miles are vulnerable to erosion rates less than 1 meter per year. District 07 is the only district with roadways at high risk from marsh edge erosion, totaling 0.2 miles. Districts 02, 03, 07, and 62 have a total of 14 miles of road at moderate risk from marsh edge erosion. Louisiana has 7,369 miles of road at the low- and lowest-risk level for marsh edge erosion.

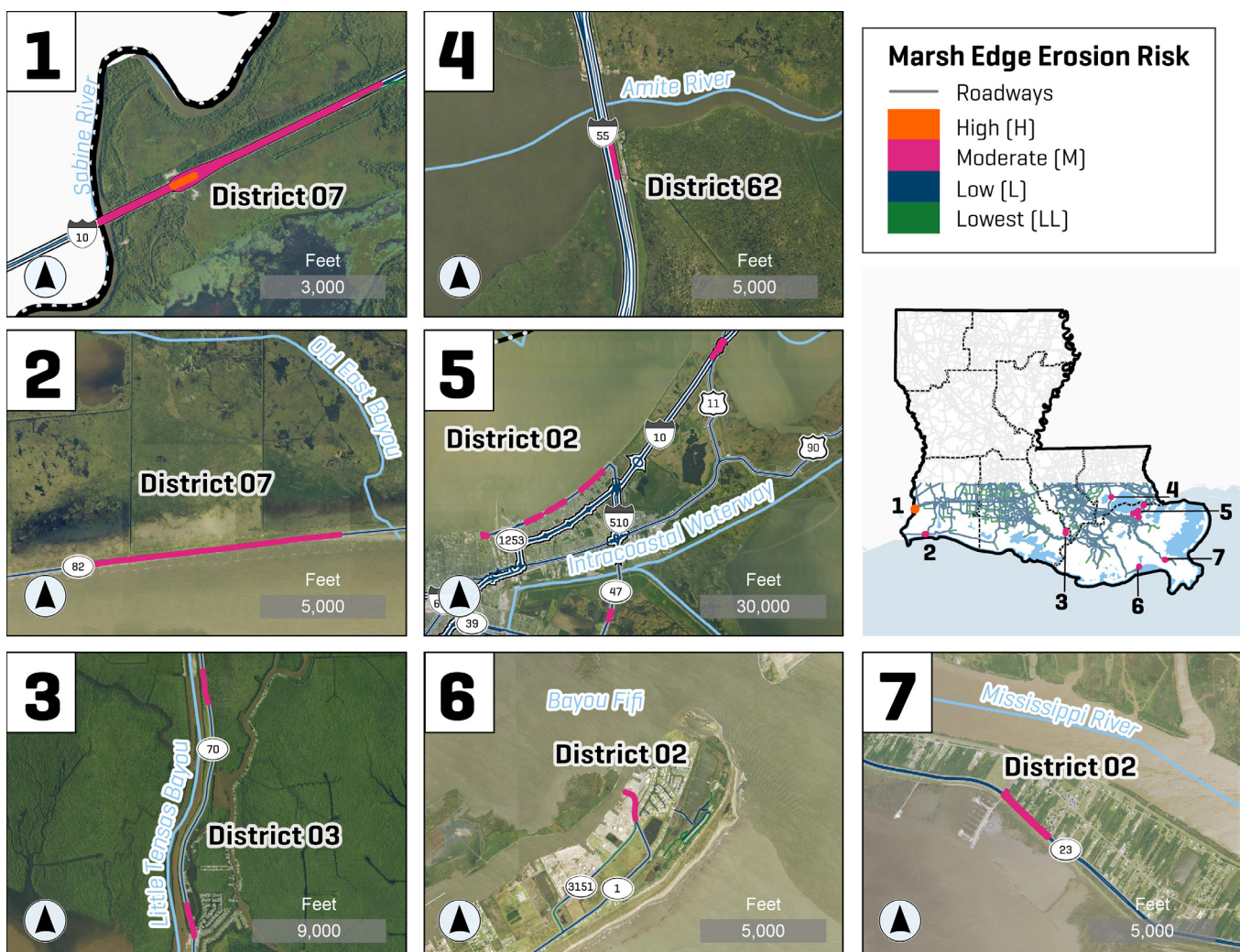


FIGURE 24: Marsh edge erosion risk

Wind

WIND VULNERABILITY

Transportation assets, including the Dynamic Messaging System (DMS), CCTV, traffic light signals, LADOTD facilities, and movable bridges, are most vulnerable to wind in the coastal and southern areas of the state. This vulnerability trend reflects Louisiana's wind patterns; wind speeds are generally higher along the coast and decrease going north. Using American Society of Civil Engineers thresholds for asset damage and safety, LADOTD used the following criteria to identify highly vulnerable assets:

- For movable bridges, exposure to 100-year wind speeds greater than 65 mph.
- For ITS assets, exposure to 100-year wind speeds greater than 85 mph.
- For buildings, exposure to 100-year wind speeds greater than 105 mph.

The key results from the wind vulnerability assessment include:

- 98% of movable bridges are highly vulnerable to wind, with 96% within the highest vulnerability category.

- 70% of the ITS are highly vulnerable to wind, with 29% within the highest vulnerability category.
- 7% of LADOTD buildings are highly vulnerable to wind, with none in the highest vulnerability category.

Almost all movable bridges in the state are highly vulnerable to wind, in part because they are clustered in coastal areas exposed to high winds. Additionally, movable bridges have a low tolerance for wind, so the combination of high exposure and high sensitivity results in high vulnerability.

LADOTD'S ITS assets are concentrated along high-traffic routes. Signs have low threshold tolerances for wind, so all DMS assets have some vulnerability to this hazard.

The vulnerability of LADOTD's facilities (storage and maintenance sites as well as engineering offices) follows the same trend, with the most vulnerable facilities in the southern parts of the state. Vulnerability scores are generally lower for buildings than for movable bridges and the DMS because buildings can more safely withstand higher winds.



September 6, 2020: Damage from Hurricane Laura in Lake Charles, Louisiana

WIND RISK

Wind risk was evaluated by combining each asset's vulnerability to wind with its criticality to the transportation system, using the risk matrix developed for this TRIP.

Movable Bridges

Movable bridges are among the state's most wind-sensitive assets. These mechanically complex structures are often located in coastal areas where wind exposure is greatest. Operationally, movable bridges are closed at sustained wind speeds of 35 miles per hour, which is below the threshold for a tropical depression. This makes them especially vulnerable to even moderate wind events.

- Only 4.9% [10 bridges] of movable bridges fall into the highest wind risk category, where both criticality and vulnerability are at their maximum. These structures represent the most urgent priorities for wind resilience due to their essential role in evacuation and freight movement.

- 33.7% [69 bridges] fall into the high-risk tier, combining very high vulnerability with medium criticality. While not the most critical assets, their operational sensitivity warrants consideration.
- An additional 2.0% [4 bridges] fall into the moderate risk category, all of which are of medium criticality with either high or moderate vulnerability.
- No movable bridges fall into the low or very low risk categories.

Although movable bridges represent only 1.3% of the total bridge inventory assessed in the TRIP, their high exposure and operational importance make them a disproportionately high-risk asset class in the context of wind hazards.

TABLE 21: Movable bridges wind risk characterization [count, %]*

CRITICALITY	VULNERABILITY		
	MODERATE	HIGH	HIGHEST
High [H]	1 [0.5%]	0 [0%]	10 [4.9%]
Medium [M]	1 [0.5%]	1 [0.5%]	69 [33.7%]
Low [L]	1 [0.5%]	1 [0.5%]	10 [4.9%]

TABLE 22: Facility wind risk characterization [count, %]**

CRITICALITY	VULNERABILITY				
	LOWEST	LOW	MODERATE	HIGH	HIGHEST
Low [L]	180 [87.8%]	83 [40.5%]	183 [89.3%]	20 [9.8%]	0 [0%]

*Table truncated because no movable bridges are in the low, or lowest classification for wind-related risk.

**Table truncated due to facilities only being classified as "Low" criticality for purposes of the TRIP.

Facilities

LADOTD buildings, including maintenance facilities and district offices, are generally more resilient to wind than other asset types. However, those located in southern and coastal regions still face elevated risk due to higher wind exposure.

- Most buildings fall into the low or moderate wind risk categories, with only a small percentage classified as high risk.
- Risk scores are highest for buildings in Districts 02, 03, and 07, where wind speeds regularly exceed design thresholds.
- While these facilities are not typically high in system criticality, their disruption can affect emergency operations, equipment staging, and maintenance response.

Intelligent Transportation Systems (ITS)

ITS infrastructure, including dynamic message signs (DMS), closed-circuit television (CCTV) cameras, and traffic signals, plays a critical role in emergency communication and traffic management. These assets are often mounted on poles or gantries, making them susceptible to wind damage.

- Near 91% of ITS assets fall into the high and moderate wind risk categories, reflecting both their exposure and their importance to system operations.
- Risk levels vary by asset type and location, with elevated risk concentrated along major corridors and evacuation routes.

The potential failure of ITS assets during high wind events could impair emergency response, traveler information systems, and traffic control. These findings emphasize the need for proactive strategies such as structural reinforcement, asset relocation, and integration of wind-resilient technologies to ensure uninterrupted system performance during and after severe weather.

Approximately 55% of ITS assets are classified in the highest two risk categories. The wind risk assessment highlights the concentration of high-risk assets in coastal and southern Louisiana, where exposure to hurricane-force winds is most severe. Movable bridges and ITS infrastructure are particularly at risk due to their structural characteristics and operational importance. While LADOTD buildings are generally less exposed, those in high-wind zones may still require mitigation to ensure continuity of operations. These findings support the need for targeted investments in wind-resistant design, asset hardening, and operational planning to maintain system functionality during and after wind events.

TABLE 23: ITS wind risk characterization [count, %]

CRITICALITY	VULNERABILITY				
	LOWEST	LOW	MEDIUM	HIGH	HIGHEST
High [H]	0 [0%]	414 [12.9%]	144 [4.5%]	818 [25.5%]	658 [20.5%]
Medium [M]	12 [0.4%]	272 [8.5%]	94 [2.9%]	413 [12.9%]	275 [8.6%]
Low [L]	3 [0.1%]	10 [0.3%]	3 [0.1%]	81 [2.5%]	7 [0.2%]

Wind Risk

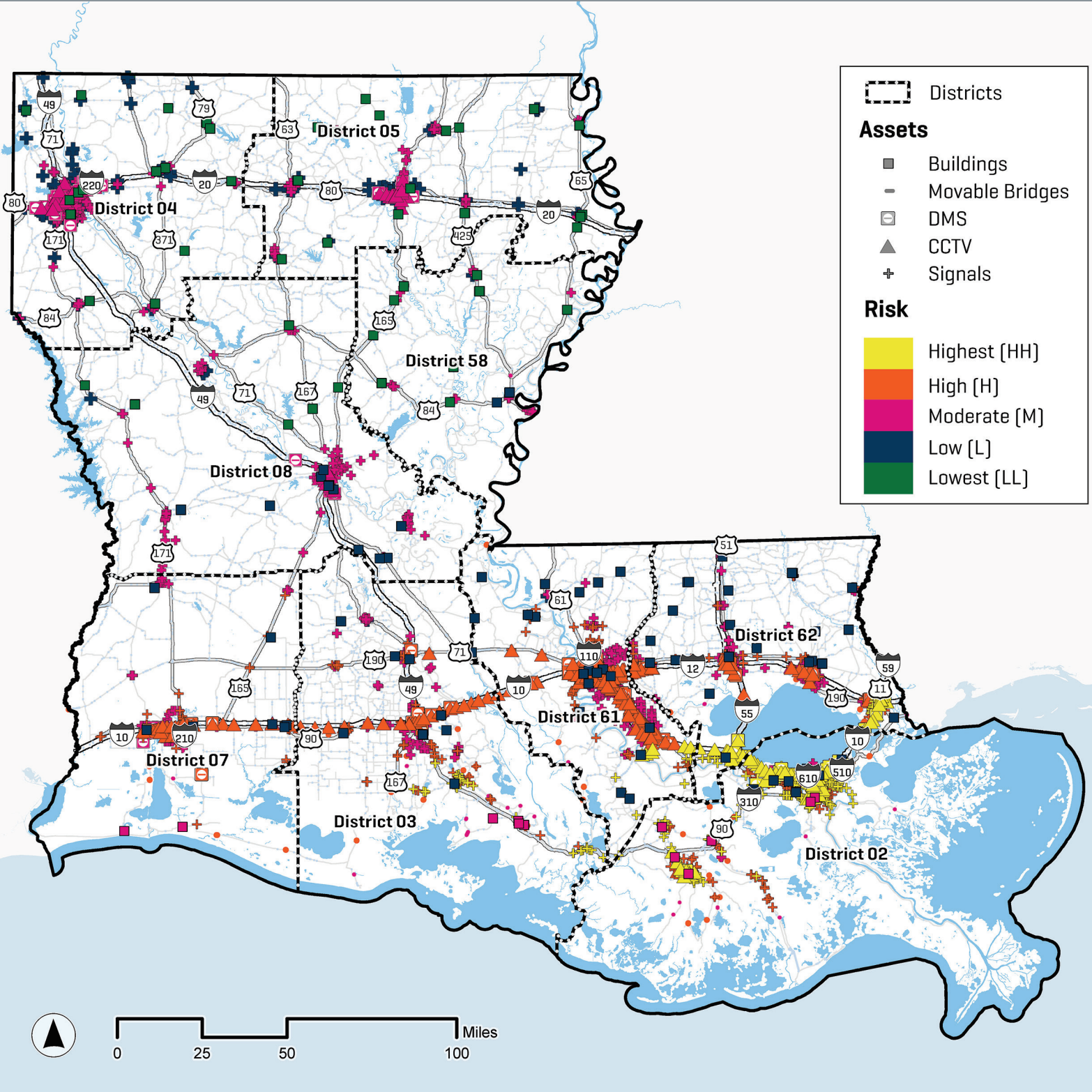


FIGURE 25: Wind risk characterization for LADOTD ITS assets, buildings, and movable bridges



CHAPTER FIVE

RESILIENCE IMPROVEMENT STRATEGIES



Resilience Improvement Strategies

LADOTD identified 105 resilience projects aligned with PROTECT’s mission and eligibility criteria. Nine of these projects would be completed at a state level, and the remainder reflect district recommendations. LADOTD categorized these projects to develop the Department’s statewide resilience strategies.

TABLE 24: Priority resilience projects summary

RESILIENCY STRATEGY	NUMBER OF PROJECTS
Advance Intelligent Transportation Systems	6
Enhance Statewide Flooding Analysis with LWI Data	1
Establish a Geotechnical Hazards Program	33
Expand Existing Flood Control and Drainage Improvements	48
Facilitate Interagency Resilience Collaborations	4
Increase Truck Parking and Staging Capacity Along Critical Routes	1
Lead Materials Research and Roadway Hardening	12

LADOTD would need to secure significant new resources to implement all the projects described in this Plan. Based on the prioritization framework and the stipulations and selection criteria of future funding rounds, the Department intends to select a subset of the project list for PROTECT grant applications. The remaining projects will be incorporated into LADOTD’s regular project planning process (see [Implementation Strategy](#)).



Rainy day in New Orleans with cars on wet streets, the French Quarter, and downtown buildings fading into the fog

Framework for Project Identification and Prioritization

The project prioritization framework for the TRIP offers a systematic and flexible approach to evaluating and prioritizing transportation projects based on two key factors: criticality and vulnerability. LADOTD's prioritization process groups projects into tiers that reflect their relative importance.

The project prioritization framework brings together results from assessments completed as part of the TRIP planning process [see Chapter 4: [Criticality, Vulnerability and Risk Assessment](#) section for more information].

The use of criticality and vulnerability scores ensures that the prioritization is a data-driven evaluation and identifies risk by combining criticality and vulnerability results. Figure 26 shows the steps involved in the prioritization process. The framework enables effective prioritization by assessing assets based on criticality and vulnerability, directing guidance and resources to where and when they are most needed. Building on the prioritization framework, the next step involves identifying and screening projects that align with priorities to maximize impact and efficiency.



Traffic over the Lake Pontchartrain Causeway Bridge, New Orleans

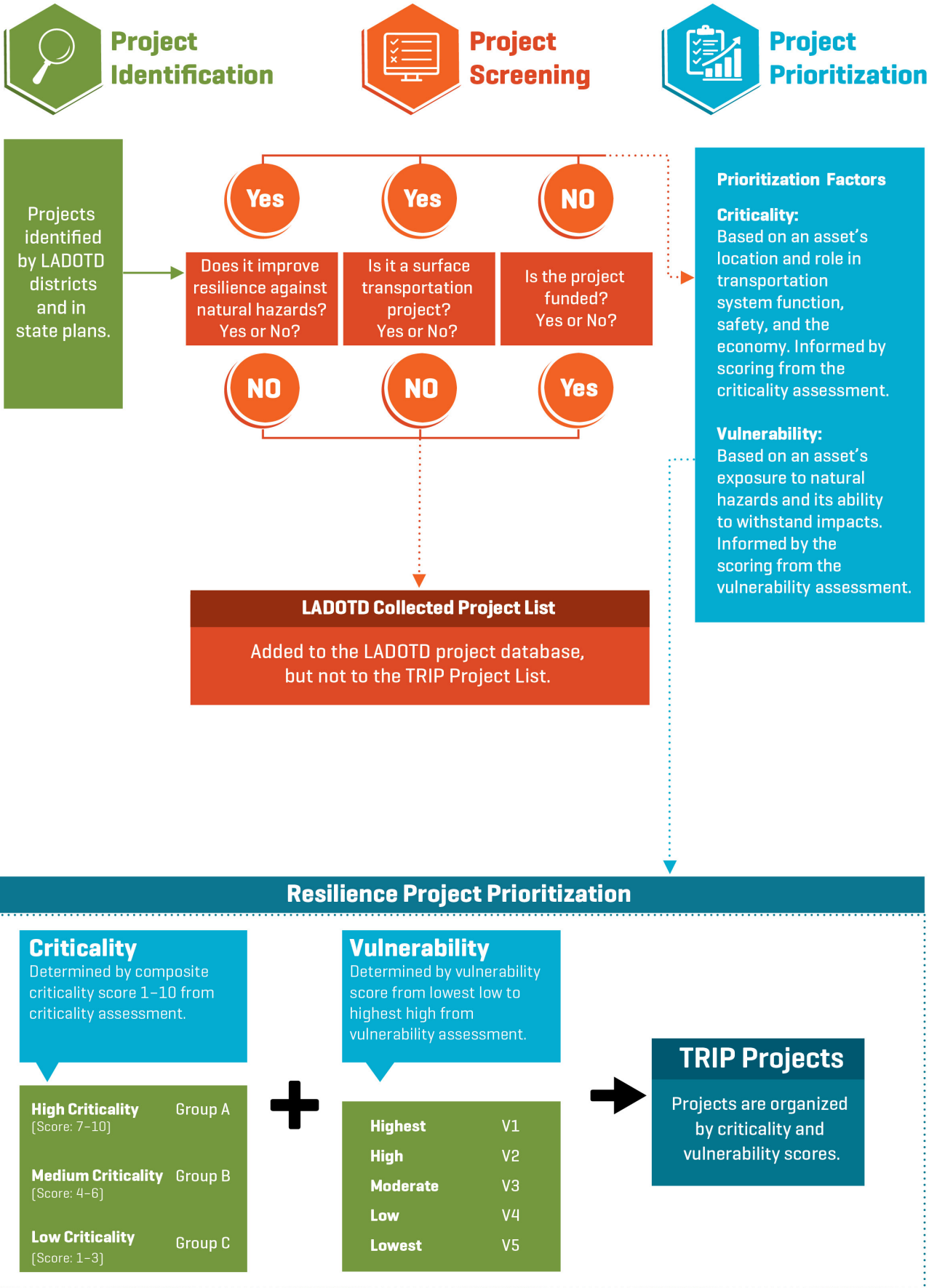


FIGURE 26: Project screening and prioritization process

PROJECT IDENTIFICATION AND SCREENING

LADOTD's Resilience Priority Projects combine previously proposed but unfunded needs with new project concepts developed through this planning process. Projects in the TRIP are in various stages from concept to design and ready for construction, but all address one or more natural hazards.

LADOTD's list of priority resilience projects is driven by district input and supplemented by alignment to statewide objectives. Each LADOTD district identified key resilience challenges and project opportunities. Based on district input, the RWG identified common needs that could be efficiently implemented at a statewide level to maximize positive outcomes.

Sources for Resilience Priority Projects include:

- ♦ LADOTD's project management database with 10,000+ project records,
- ♦ Review of 14 existing transportation strategic plans [see [Planning and Regulatory Landscape](#)],
- ♦ Submissions from LADOTD district leadership, and
- ♦ Recommendations from the Resilience Working Group.

Based on the consolidated list, LADOTD screened projects based on their applicability for the PROTECT Program:

- ♦ Improves resilience against natural hazards, and
- ♦ Serves as a surface transportation or planning project.

If the project improves resilience to natural hazards and is a surface transportation project, it is moved through the prioritization process to be added to a Priority Resilience Project List. If the project improves resilience against natural hazards but is not a surface transportation project, it is not moved ahead to the prioritization process but kept in the full project list for later consideration.

LADOTD Resilience Strategies and Projects

The priority resilience projects would directly reduce threats to local communities and critical infrastructure from the most impactful hazards, including flooding, slope instability and erosion, extreme heat, drought, wind, and winter weather. These projects reflect various transportation conditions and functions—including freight corridors, hurricane evacuation routes, winter weather priority routes, and access to rural and coastal communities.



Damaged pipes and standing water in an open hole during street repairs in New Orleans

TABLE 25: Louisiana’s priority resilience projects

RESILIENCY STRATEGY	DISTRICT	PROJECT	PRIMARY HAZARD	DESCRIPTION
Advance Intelligent Transportation Systems	STATE	Develop a Telemetry and Sensor Network	All-especially Flooding and Winter Weather	Develop and deploy a statewide telemetry and sensor network including RWIS systems for real-time data collection and conditions monitoring.
Advance Intelligent Transportation Systems	STATE	Implement an Automated Lane Closure System	All-especially Flooding and Winter Weather	Identify locations for and install automated gates and associated controls for routes that experience frequent weather-related closures, especially for elevated roadways and bridges.
Enhance Statewide Flooding Analysis with LWI Data	STATE	Incorporate Completed LWI Data	Flooding	Update and expand the roadway flooding analysis completed for this TRIP with completed LWI flood models, when available.
Establish a Geotechnical Hazards Program	STATE	Establish a Geotechnical Hazards Program	Geotechnical	Fund and implement a new program to stabilize Louisiana’s roadways, bridges, and associated infrastructure.
Expand Existing Flood Control and Drainage Improvements	STATE	Morgan City Harbor and Terminal District Improvements	Flooding	Restore and maintain waterways from recurrent shoaling and excessive flooding to support capacity expansion initiatives.
Facilitate Interagency Resilience Collaboration	STATE	Support Inter- and Cross-Agency Partnerships to Further Resilience Actions	All	Support collaboration to further implement identified resilience projects, improve critical structures not owned by LADOTD (especially flood control structures managed by federal agencies), and alleviate resilience concerns on roads that cross state lines.
Increase Truck Parking and Staging Capacity Along Critical Routes	STATE	Identify Locations to Expand Truck Parking/ Staging Along Critical Routes	All	Identify feasible locations to locate new (or expand) truck parking areas along state critical routes to improve emergency supply staging and distribution, develop resilient design standards for these areas, and integrate their management into LADOTD operations.
Lead Materials Research and Roadway Hardening	STATE	Investigate Extreme Heat-Resistant Roadway Materials	Extreme Heat	Determine an appropriate approach (or suite of options) for repairing and/ or replacing roadway materials that are failing during extreme heat conditions.
Lead Materials Research and Roadway Hardening	STATE	Conduct Debris Management Route Research and Hardening	Flooding	Assess debris management routes and potential hardening strategies to reduce post-flood secondary damage from heavy traffic.
Expand Existing Flood Control and Drainage Improvements	D 02	Grand Isle LA 1 Drainage Improvement	Flooding [Coastal], Wind	Drainage improvement along LA 1 in the Grand Isle area to reduce effects from hazards.

TABLE 25: Louisiana's priority resilience projects (continued)

RESILIENCY STRATEGY	DISTRICT	PROJECT	PRIMARY HAZARD	DESCRIPTION
Expand Existing Flood Control and Drainage Improvements	D 02	US 90 (Eastbound) Drainage Improvement	Flooding (Coastal), Wind	Drainage improvement along US 90 to reduce effects from coastal flooding.
Expand Existing Flood Control and Drainage Improvements	D 02	LA 39 Drainage Improvement	Flooding (Coastal), Wind	Drainage improvement along LA 39 in the Grand Isle area to reduce effects from hazards.
Expand Existing Flood Control and Drainage Improvements	D 02	US 11 Drainage Improvement	Flooding (Coastal), Wind	Drainage improvement/elevation along US 11 from New Orleans East from US 11 to Chef Menteur Pass; frequent wind-driven lake overtopping. Project will also support erosion control to slow subsidence and soil loss.
Expand Existing Flood Control and Drainage Improvements	D 02	US 90 Flood Mitigation	Flooding	Drainage improvement along US 90 to reduce effects from coastal flooding.
Expand Existing Flood Control and Drainage Improvements	D 02	US 11 Flood Mitigation to I 10	Flooding	Mitigate flooding at junction of US 11 and I 10.
Expand Existing Flood Control and Drainage Improvements	D 03	LA 339, LA 182, and US 90 Cross Drain Replacement	Flooding	Replace drainage structures with large box culverts to increase drainage capacity.
Expand Existing Flood Control and Drainage Improvements	D 03	LA 14 Bypass Elevation	Flooding	Elevate about 1,300 feet of the LA 14 Bypass near Abbeville.
Expand Existing Flood Control and Drainage Improvements	D 03	LA 317 Coastal Route Preservation	Flooding (Coastal)	Roadway improvements to reduce tidal and coastal flooding and preserve the only access to farms, oil/gas facilities, and a manufacturing plant.
Expand Existing Flood Control and Drainage Improvements	D 03	Flood Mitigation at Palmetto State Park Entrance Road (LA 1266)	Flooding (Coastal, Precipitation)	Widen lanes, relocate trees, improve drainage, and elevate the road to reduce tidal impacts and roadway flooding.
Expand Existing Flood Control and Drainage Improvements	D 03	Resize CMP Equalizer Pipes at LA 82 (Cameron Parish Line – Forked Island/LA 35)	Flooding (Coastal, Precipitation)	Increase CMP equalizer pipe size to reduce roadway flooding and storm surge effects.

TABLE 25: Louisiana's priority resilience projects (continued)

RESILIENCY STRATEGY	DISTRICT	PROJECT	PRIMARY HAZARD	DESCRIPTION
Expand Existing Flood Control and Drainage Improvements	D 03	LA 91 Interim Flood Mitigation and Pontoon Bridge Replacement	Flooding [Precipitation]	Replace pontoon bridge and improve roadway infrastructure to reduce flooding.
Expand Existing Flood Control and Drainage Improvements	D 03	LA 347 Curb and Gutter Flood Mitigation at LA 328 – Doyle Melancon	Flooding [Precipitation]	Increase storm drainage and inlet capacity in curb and gutter section to reduce reoccurring roadway flooding.
Expand Existing Flood Control and Drainage Improvements	D 03	LA 352 Upgrade Undersized Pipes in Henderson	Flooding [Precipitation]	Increase pipe size and drainage capacity in Henderson to reduce roadway flooding.
Expand Existing Flood Control and Drainage Improvements	D 03	LA 676 and Highway 14 Upgrade Clay Storm Drainpipes	Flooding [Precipitation]	Repair or replace clay storm pipes along to improve roadway drainage.
Expand Existing Flood Control and Drainage Improvements	D 03	LA 3073 Flood Mitigation at Robley Drive in Lafayette	Flooding [Precipitation]	Drainage system improvements, including more inlets and an expanded or new outfall, to increase capacity and reduce roadway flooding.
Expand Existing Flood Control and Drainage Improvements	D 03	LA 690 Port of Vermilion Abbeville Harbor Roadway Preservation	Flooding [Riverine]	Improve road and study elevation along LA 690 to reduce effects of low-lying flooding and preserve the only access route to the port.
Establish a Geotechnical Hazards Program	D 03	LA 10 Slide Repairs	Geotechnical	Repair multiple slides along shoulders, guardrails, and roadway areas.
Establish a Geotechnical Hazards Program	D 03	LA 103 Slide Improvements at North of Port Barre	Geotechnical	Repair embankments and stabilize slopes along LA 103 to prevent road impacts.
Establish a Geotechnical Hazards Program	D 03	LA 352 Levee Slide Repairs	Geotechnical	Stabilize known slide areas along LA 352 to prevent slope failure and lane closures.
Establish a Geotechnical Hazards Program	D 03	LA 745 Slide Repair near Bayou Courtableau	Geotechnical	Repair slope failures and open road along LA 745 near Bayou Courtableau.
Establish a Geotechnical Hazards Program	D 03	I 10 Slide Repairs	Geotechnical	Roadway fore slope is steep and has slide areas. Previous funding for the roadway project was limited so the slides were not addressed.

TABLE 25: Louisiana's priority resilience projects [continued]

RESILIENCY STRATEGY	DISTRICT	PROJECT	PRIMARY HAZARD	DESCRIPTION
Lead Materials Research and Roadway Hardening	D 04	Road Surface Rehabilitation in Shreveport and Bossier	Extreme Heat	Continue road resurface rehabilitation and identify approaches to reduce cracking and prevent blowup.
Expand Existing Flood Control and Drainage Improvements	D 04	Road Improvements and Flood Mitigation Projects across District 04	Flooding [Precipitation, Riverine]	Improve roads susceptible to flooding in the northwest corner of Louisiana and reduce impassable roads.
Expand Existing Flood Control and Drainage Improvements	D 04	Improve US 71 Levee Road	Flooding [Riverine]	Improve and maintain the roadway along top of the levee for LADOTD access.
Facilitate Interagency Resilience Collaborations	D 04	Prevent Red River Levee Failure along LA 515	Flooding [Riverine]	Cross-agency coordination to prevent levee failure and protect transportation assets.
Expand Existing Flood Control and Drainage Improvements	D 04	Dam Drawdown Gate Replacements	Flooding	Repair or install new drawdown gates on dams across District 04 to prevent structure failure.
Establish a Geotechnical Hazards Program	D 04	I 49 North and South Exit Ramp Improvements	Geotechnical	Repair embankments and stabilize slopes to prevent complete collapse and lane closures.
Establish a Geotechnical Hazards Program	D 04	I 220 and I 20 Corridor Stabilization	Geotechnical	Stabilize actively eroding embankments to prevent further erosion and failure.
Establish a Geotechnical Hazards Program	D 04	LA 3132 Repair and Stabilization	Geotechnical	Stabilize slides along LA 3132 ramps at Linwood Avenue to prevent failure and lane closure.
Establish a Geotechnical Hazards Program	D 04	Poor Condition Bridge Repairs and Replacements	Geotechnical	Repair or replace 7 overpasses and bridges along bayous to prevent failure and collapse. Locations include I 20 overpasses near Greenwood and Arcadia and bridges at Flat River [Tylortown], Mahlin Bayou [Blanchard], Boggy Bayou [Colquitt Road], and Bodcau Bayou [2 locations].
Facilitate Interagency Resilience Collaborations	D 04	Ivan Lake Dam Improvements	Geotechnical	Cross-agency coordination and maintenance to combat erosion and prevent additional failures.

TABLE 25: Louisiana's priority resilience projects (continued)

RESILIENCY STRATEGY	DISTRICT	PROJECT	PRIMARY HAZARD	DESCRIPTION
Establish a Geotechnical Hazards Program	D 04	Evaluate and Repair Aging Walls	Geotechnical	Assess, prioritize, and rehabilitate aging Mechanically Stabilized Earth (MSE) walls across the district as appropriate.
Facilitate Interagency Resilience Collaborations	D 04	Increase Bulk Salt Distribution for Interstate Routes	Winter Weather	Increase cross-state coordination, bulk salt storage, and salt pre-positioning for winter weather events.
Lead Materials Research and Roadway Hardening	D 05	US 165 and LA 15 Joint Resurfacing	Extreme Heat	Resurface joints to reduce pavement damage from heat and wear.
Expand Existing Flood Control and Drainage Improvements	D 05	US 425 Culvert and Drainage Rehab	Flooding	Rehabilitate culverts to reduce flooding along US 425 near Bonner Ferry Road.
Expand Existing Flood Control and Drainage Improvements	D 05	LA 132 Roadway Elevation Study	Flooding (Riverine)	Study the potential elevation of LA 132 to prevent regular flood closures.
Expand Existing Flood Control and Drainage Improvements	D 05	US 165 Flood Prevention	Flooding (Riverine)	Reduce flood impacts near US 165 and LA 554 in Sterlington.
Establish a Geotechnical Hazards Program	D 05	LA 15 Shoulder Restoration	Geotechnical	Restore eroded LA 15 shoulders to maintain safe access and prevent lane loss.
Establish a Geotechnical Hazards Program	D 05	I 20 Overpass Slope Stabilization	Geotechnical	Stabilize I 20 slopes near overpasses to prevent disruption and landslides.
Establish a Geotechnical Hazards Program	D 05	LA 33 Embankment Repair	Geotechnical	Repair embankments along LA 33 to prevent slope failure and road collapse.
Lead Materials Research and Roadway Hardening	D 05	Winter Storm Response Route Hardening	Winter Weather	Harden critical corridors to withstand ice, snow, and future winter events.
Expand Existing Flood Control and Drainage Improvements	D 07	Cameron Ferry Hardening	Flooding	Harden ferry landing to support community evacuations.
Expand Existing Flood Control and Drainage Improvements	D 07	LA 397 Elevation	Flooding	Elevate roadway and implement drainage improvements to prevent overtopping.
Expand Existing Flood Control and Drainage Improvements	D 07	LA 82 Elevation and Hardening	Flooding	Elevate roadway and harden shoulders to prevent overtopping from high tides and minor tropical systems

TABLE 25: Louisiana's priority resilience projects [continued]

RESILIENCY STRATEGY	DISTRICT	PROJECT	PRIMARY HAZARD	DESCRIPTION
Expand Existing Flood Control and Drainage Improvements	D 07	LA 27 Elevation and Stabilization	Flooding [Coastal]	Elevate multiple sections of LA 27 and install retaining structures and rip rap to stop regular tidal overtopping during minor tropical events.
Expand Existing Flood Control and Drainage Improvements	D 07	LA 101 Bridge Expansion in Hayes	Flooding [Precipitation]	Extend bridge to reduce flooding from swamp retention at LA 101.
Establish a Geotechnical Hazards Program	D 07	Cameron Parish Shoulder Hardening	Geotechnical	Harden shoulders to prevent erosion near LNG corridor, especially related to coastal storms.
Advance Intelligent Transportation Systems	D 07	Gibbstown Bridge Improvement	Winter Weather, Wind	Improve bridge to withstand and monitor winter storm impacts more effectively.
Lead Materials Research and Roadway Hardening	D 08	Replace Composite Pavement Roadways	Extreme Heat	Identify and improve road surfaces built with composite material post-WWII and/or other risk factors for cracking.
Expand Existing Flood Control and Drainage Improvements	D 08	I 49 Drainage Improvements [Rapides Parish North to US 167]	Flooding	Improve drainage to reduce flooding.
Expand Existing Flood Control and Drainage Improvements	D 08	LA 120 Flood Mitigation [Longlois Rd to I 49]	Flooding	Mitigate backwater flooding issues.
Expand Existing Flood Control and Drainage Improvements	D 08	LA 114 Drainage Improvements	Flooding	Improve drainage, including through lateral ditches, to reduce flooding.
Expand Existing Flood Control and Drainage Improvements	D 08	LA 107 South to LA 1181 Study	Flooding [Pluvial]	Conduct a study to document flooding issues and identify solutions.
Expand Existing Flood Control and Drainage Improvements	D 08	LA 478 Elevation at Bayou Provencal	Flooding [Riverine]	Elevate the roadway to prevent significant flooding to depths of ~3 feet that can persist for over a month.
Expand Existing Flood Control and Drainage Improvements	D 08	Red River Flood Mitigation	Flooding [Riverine]	Road elevation and flood infrastructure improvements for areas impacted by the 2015 Red River flood.

TABLE 25: Louisiana's priority resilience projects [continued]

RESILIENCY STRATEGY	DISTRICT	PROJECT	PRIMARY HAZARD	DESCRIPTION
Establish a Geotechnical Hazards Program	D 08	LA 1240 Dam Safety Improvement, Grand Parish	Geotechnical	Address stability issues with the LA 1240 Dam.
Establish a Geotechnical Hazards Program	D 08	LA 28 Slope Repair	Geotechnical	Permanently repair a backslope issue to eliminate repetitive interim fixes.
Establish a Geotechnical Hazards Program	D 08	US 167 Slope Repair	Geotechnical	Repair major spill slope and damage to concrete revetment for north- and southbound bridges at US 167/ LA 28.
Establish a Geotechnical Hazards Program	D 08	US 165 Erosion Countermeasures	Geotechnical	Mitigate extensive erosion along the bank of Indian Creek, in the road median, and along the adjacent slopes, which is threatening bridge and road integrity.
Establish a Geotechnical Hazards Program	D 08	Forestry Road Stabilization and Access	Geotechnical	Repair major slope failures in embankment to prevent structure from being closed to traffic on Forestry Road.
Advance Intelligent Transportation Systems	D 08	Remote Monitoring of I 49 through Alexandria and LA 8 River Crossing	Winter Weather	Install remote monitoring equipment and software to support forecasting and extreme weather response.
Lead Materials Research and Roadway Hardening	D 58	US 65 Joint Repair and Pavement Resurfacing	Extreme Heat, Drought	Resurface about 20 miles of US 65 to address locked concrete joints and long-term heat-related deterioration.
Establish a Geotechnical Hazards Program	D 58	LA 562 Erosion Mitigation	Geotechnical	Reconstruct the roadway and provide erosion/slope protection to prevent closures.
Establish a Geotechnical Hazards Program	D 58	US 84 Slope Stabilization [Willow Lake Area]	Flooding [Riverine] / Geotechnical	Stabilize a 1.5-mile segment of US 84 prone to erosion by decreasing slope and armoring the fore slope.
Establish a Geotechnical Hazards Program	D 58	LA 131 / LA 15 Levee Road Slide Mitigation	Flooding [Riverine]/ Geotechnical	Stabilize slide zones along levee roads critical to Old River emergency access.
Establish a Geotechnical Hazards Program	D 58	LA 559 Erosion Mitigation and Road Stabilization	Geotechnical	Reinforce LA 559, the only access and evacuation route for rural residents near the Ouachita River.
Establish a Geotechnical Hazards Program	D 58	LA 610 Realignment and Slide Repair	Geotechnical	Realign roadway away from Bayou Macon and restore LA 610's full width by repairing slides to keep road open.

TABLE 25: Louisiana's priority resilience projects [continued]

RESILIENCY STRATEGY	DISTRICT	PROJECT	PRIMARY HAZARD	DESCRIPTION
Establish a Geotechnical Hazards Program	D 58	LA 610 Realignment and Slide Repair	Geotechnical	Realign roadway away from Bayou Macon and restore LA 610's full width by repairing slides to keep road open.
Lead Materials Research and Roadway Hardening	D 61	District-wide Roadway Buckling Mitigation	Extreme Heat	Address heat-related pavement failures district-wide, including known issues along US 61 in Ascension and St. James Parishes.
Lead Materials Research and Roadway Hardening	D 61	Debris Management Plan	Flooding	Develop district-wide post-storm debris strategy.
Expand Existing Flood Control and Drainage Improvements	D 61	I 110 Drainage and Median Repairs	Flooding	Implement repairs to embankment and drainage issues, including damage to the concrete median near exit 8A.
Expand Existing Flood Control and Drainage Improvements	D 61	LA 3125 Improvements	Flooding	Install geo-polymer lining on existing CMP multi-barrel crossings along the corridor.
Expand Existing Flood Control and Drainage Improvements	D 61	LA 1 Elevation, Drainage Improvements, and Critical Facilities Access	Flooding	Reduce flooding through elevation and drainage fixes and preserve access to critical facilities.
Expand Existing Flood Control and Drainage Improvements	D 61	LA 641 Drainage Improvements	Flooding	Improve storm drainage in the residential LA 641 corridor.
Expand Existing Flood Control and Drainage Improvements	D 61	LA 67 and Other Sites Structural Steel Culvert Replacements	Flooding	Replace failing culverts at LA 67 and similar sites.
Expand Existing Flood Control and Drainage Improvements	D 61	LA 955 Box Culvert Drainage Revitalization	Flooding	Replace the culvert to reduce chronic localized flooding.
Establish a Geotechnical Hazards Program	D 61	LA 66 Embankment Repair and Angola Road Sliding Remediation	Geotechnical	Repair embankment failures aggravated during winter from US 61 north. Stabilize slopes along flood-prone Angola Road.
Establish a Geotechnical Hazards Program	D 61	I 10 Drainage Structures and Embankment Issues	Geotechnical	Repair drainage structures and slopes at multiple locations, including Highland Road and west-bound between Mainline and Ramp 166.

TABLE 25: Louisiana's priority resilience projects (continued)

RESILIENCY STRATEGY	DISTRICT	PROJECT	PRIMARY HAZARD	DESCRIPTION
Establish a Geotechnical Hazards Program	D 61	I 10 Median Slide Remediation	Geotechnical	Repair slope failure in the I 10 median near LA 30.
Establish a Geotechnical Hazards Program	D 61	LA 37 Embankment Issues	Geotechnical	Greenwell Springs northbound shoulder slope repair.
Establish a Geotechnical Hazards Program	D 61	LA 409 Scouring Remediation	Geotechnical	Address scour issues near the Sandy Creek Bridge.
Establish a Geotechnical Hazards Program	D 61	US 190 Scouring Remediation and Drainage Improvements	Geotechnical	Repair scour at Jones Creek between twin bridges and remediate drainage structures between Mainline and Service Rd.
Establish a Geotechnical Hazards Program	D 61	US 61 Drainage Structures and Embankment Remediation	Geotechnical	Repair drainage structures and slopes along US 61.
Lead Materials Research and Roadway Hardening	D 62	US 190 and LA 22 Roadway Buckling Mitigation	Extreme Heat	Design and construction of roadways using pavement and techniques less vulnerable to buckling.
Expand Existing Flood Control and Drainage Improvements	D 62	I 12 Widening	Flooding	I 12 bridge widening to two lanes to better facilitate evacuation efforts.
Expand Existing Flood Control and Drainage Improvements	D 62	I 55 Frontage Elevation Extension	Flooding	Extension of the elevated section of I 55 frontage further north.
Expand Existing Flood Control and Drainage Improvements	D 62	LA 1036 Flood Mitigation	Flooding	Flood mitigation on LA 1036 at Tickfaw.
Expand Existing Flood Control and Drainage Improvements	D 62	LA 22 Flood Mitigation	Flooding	Flood mitigation on LA 22 at LA 16.

TABLE 25: Louisiana's priority resilience projects [continued]

RESILIENCY STRATEGY	DISTRICT	PROJECT	PRIMARY HAZARD	DESCRIPTION
Expand Existing Flood Control and Drainage Improvements	D 62	LA 433 Flood Mitigation	Flooding	Flood mitigation measures along LA 433 in Bayou Liberty.
Expand Existing Flood Control and Drainage Improvements	D 62	LA 441 Flood Mitigation	Flooding	Flood mitigation on LA 441 between LA 442 and the St. Helena Parish line.
Expand Existing Flood Control and Drainage Improvements	D 62	I 59 Flood Mitigation	Flooding	Flood mitigation measures on I 59 at exit 5A.
Advance Intelligent Transportation Systems	D 62	Severe Fog Response Plan	Fog	Development of a plan coordinating state and municipal stakeholders during fog.
Establish a Geotechnical Hazards Program	D 62	LA 432 Slope Repair	Geotechnical	Repair slope failure east of the Amite River bridge where the stream migration undercuts the roadway embankment.
Advance Intelligent Transportation Systems	D 62	District-wide ITS Integration Plan	Multiple	Development of a plan for and/or installation of ITS technology district-wide.
Lead Materials Research and Roadway Hardening	D 62	Management Program for US 11, US 51, US 190	Multiple	Study of relevant hazard probabilities and impacts and development of a plan for prevention and response unique to this route.
Lead Materials Research and Roadway Hardening	D 62	Winter Weather Mitigation Program	Winter Weather	Strategic protocol to mitigate against winter weather hazards on US 190, LA 22 at Tickfaw, and LA 64 at Amite River.



Each project addresses an existing vulnerability and contributes to a more adaptive, reliable, and accessible transportation network for Louisiana. Completing these projects will require considerable resourcing [see [Implementation Strategy](#)].

STATEWIDE RESILIENCE STRATEGIES

LADOTD identified nine large-scale projects that are aligned with the PROTECT Program approach, would address public safety and resilience needs across the state, and would fulfill the Department's purpose to be a best-in-class transportation agency. These projects are unique from and in addition to LADOTD's regular preservation and maintenance projects; the priority resilience projects have a common theme of implementing advanced solutions to address long-term, systemic challenges.

Advance Intelligent Transportation Systems

LADOTD can advance its transportation system by investing PROTECT resources in technology that keeps LADOTD staff and the traveling public out of harm's way during emergency events while reducing the Department's operational time and expenses to make the most of taxpayer dollars. The Advance ITS Systems strategy includes a telemetry and sensor network project and an ACLS project.

- ♦ **Develop a Telemetry and Sensor Network:** Develop and deploy a statewide telemetry and sensor network focused on bolstering LADOTD's resilience to weather events and other disruptions. By integrating data feeds from strategically deployed assets – including RWIS systems for road weather conditions, environmental gauges [e.g., stream, rain] for flood monitoring, and traffic sensors – this network provides critical real-time data. This data fuels enhanced situational awareness, enables the use of predictive modeling for anticipating impacts, and empowers LADOTD to execute more effective, data-driven strategies for preparedness, response [e.g., targeted closures, crew dispatch], and recovery, ultimately minimizing disruption and enhancing safety.
- ♦ **Implement an Automated Lane Closure System:** Many districts assign staff to manually restrict elevated roadway or bridge access when weather conditions reach certain thresholds; this process involves hands-on monitoring of forecasts and field deployments of staff in worsening conditions [e.g., winter weather, high winds, flooding] to place barricades and signs. An ALCS – including horizontal swing gates, dynamic message signs, and lane control signals – would allow LADOTD to more quickly and efficiently route traffic.

Opposite page: Pillars of the I 10 bridge stretch over the Atchafalaya Basin bayou near Baton Rouge, Louisiana

Enhance Statewide Flooding Analysis with LWI Data

The roadway flooding analysis completed for this TRIP uses the best available data from early 2025 in preparation for the next PROTECT discretionary funding round; LADOTD would use PROTECT support to enhance this analysis with new LWI flood models once those are complete. Updating and expanding upon the analysis completed for this TRIP will ensure LADOTD's future project planning is based on the most up-to-date information. Further, with the LWI data, LADOTD could complete advanced flood event scenario planning to calculate the events for which specific transportation assets would become unsafe and inoperable. This level of detail would provide LADOTD with better data to prioritize projects based on flood exposure, support emergency response and recovery operations, and begin concept design for targeted resilient interventions.

Establish a Geotechnical Hazards Program

LADOTD would use PROTECT funds to establish a new program that would focus on identifying and addressing the most impactful soil stability and erosion issues, including from subsidence. This immediate priority program would continuously track stabilization project needs (including for slopes, walls, and culverts), establish criteria for evaluating and selecting projects, articulate research needs, provide support for district implementation, and share lessons observed across projects. The Geotechnical Program could be modeled on the structure of LADOTD's existing Roadway Flooding Program, which has effectively addressed common sources of flooding at the state and local level year over year.

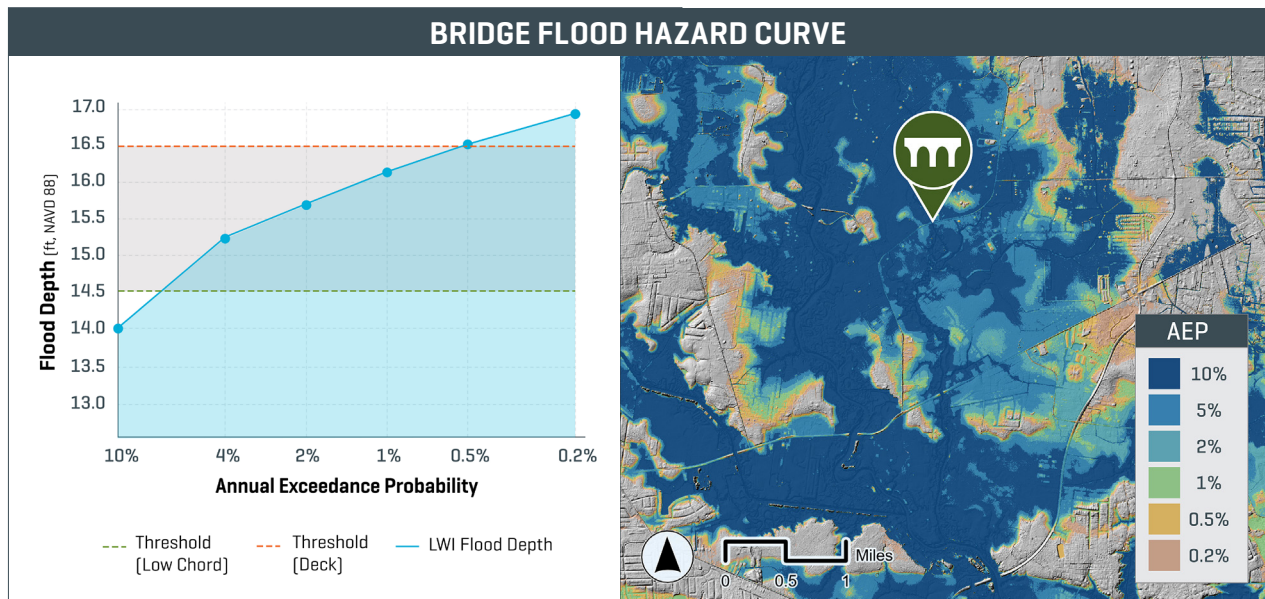


FIGURE 27: Example bridge flooding exposure produced with LWI data

Expand Existing Flood Control and Drainage Improvements

Flooding is the most expensive and destructive hazard in Louisiana; investment in the transportation network's flood resilience remains critical to the State's residents and economy. With PROTECT funding, LADOTD could expand its Roadway Flooding Program to more comprehensively protect coastal evacuation routes, one-way in-out thoroughfares, and at-risk multimodal connections. With additional resources, the Roadway Flooding Program could also continue to support stormwater management capacity improvements to reduce localized, sometimes long-lasting, flooding along key evacuation and commercial routes.

Facilitate Resilience Interagency Collaboration: Support Inter- and Cross-Agency Partnerships to Further Resilience Actions

Ongoing collaboration within LADOTD and with external partners is a critical process for implementing the Priority Resilience Projects and ensuring emergency preparedness for intensifying natural hazard events. At a state level, LADOTD intends to regularly convene resilience planning and implementation conversations with district leadership as part of the Geotechnical Hazards and Roadway Flooding Programs of work. District 04 also identified several projects that would necessitate coordination across state lines and/or with federal agencies, which LADOTD can support through technical assistance and facilitating connections to the external contacts.



Lake Charles, Louisiana — September 6, 2020: Aftermath of Hurricane Laura. Powerful winds left roofs torn, streets littered with debris, and tree branches scattered throughout the neighborhood

Increase Truck Parking and Staging Capacity Along Critical Routes

LADOTD would use PROTECT funds to evaluate where additional truck parking is needed along evacuation routes, debris management corridors, and near critical intermodal and multimodal hubs to facilitate the rapid, orderly, and safe flow of people and supplies during emergency situations. These parking areas would be used as staging areas to pre-position emergency supplies so that materials could be more quickly distributed to impacted areas and so that response leaders would have more options to direct and divert supplies during dynamic situations. The new [and/or expanded] parking areas would also protect traveler safety by providing adequate rest stops for drivers. The study would also develop resilient design standards for these parking areas and integrate their management into LADOTD's operations [e.g., integration with ITS for real-time availability, development of performance metrics and monitoring, development of emergency management Standard Operating Procedures and testing].



Aerial view of cars and trucks traveling along the highway near the New Orleans Union Passenger Terminal

Lead Materials Research and Roadway Hardening

This project would focus on the strategic development, testing, deployment, and lifecycle of materials that can withstand extreme loads, reduce maintenance costs and extend asset useful life. With PROTECT or other support, LADOTD seeks to conduct two projects to identify optimal materials for Louisiana roads so they can better withstand extreme heat and the combination of flooding with heavy truck traffic, which is a common post-disaster phenomenon. Both projects would identify long-term solutions to hazard challenges that lack an identified best practice solution and are prevalent and recurring across the state.

- **Investigate Extreme Heat-Resistant Roadway Materials:** Degradation caused by extreme heat has become an unsustainable maintenance challenge and near-constant safety concern on some Louisiana roadways, especially where asphalt overlays concrete. This project would determine an approach [or suite of approaches] for repairing and/or replacing roadway materials that are failing during extreme heat conditions.
- **Conduct Debris Management Route Research and Hardening:** LADOTD has identified, through observations and through the records of past recovery projects, that roads inundated for several weeks and then traveled by heavy trucks for debris management often become so degraded that they must be entirely reconstructed from the subbase. This dynamic of secondary disaster impact results in the need for repetitive, expensive repairs and disruption to traffic flow for recovering communities. This project would identify and implement more resilient roadway materials and/or design standards when extreme conditions exist, investigate multimodal debris management collection options, or evaluate other solutions that would prevent repetitive disaster damages along these critical routes.



Aerial view of Lake Charles illustrating urban infrastructure and key transportation corridors that could benefit from advanced telemetry, sensor networks, and automated lane closure systems

RESILIENCE STRATEGIES BY DISTRICT

All districts identified project-based solutions that enhance long-term system reliability, preserve access to essential services, and address threatened routes that have no viable alternative. These proposed interventions, developed through direct engagement with district leadership, represent resilience priorities and needs across a range of surface transportation assets. Figure 28 displays the locations of district-identified projects, categorized by roadway criticality, and illustrates the alignment between projects and transportation criticality. Not all LADOTD district-identified projects are individually symbolized in the map due to overlapping project extents.



Collage of images showcasing diverse district landscapes and infrastructure



The following summaries highlight each district’s resilience focus areas and the types of infrastructure improvements being pursued to strengthen Louisiana’s transportation network in alignment with statewide adaptation goals.

District 02: Bridge City

District 02 is focused on addressing coastal flooding, tidal surge, and wind-driven inundation, particularly along critical corridors outside of flood protection systems. The district’s strategy includes drainage infrastructure upgrades, subgrade reinforcement, and erosion control to reduce chronic closures and improve long-term access for evacuation and freight movement. These improvements support more reliable system performance during high-impact weather events. Examples of ongoing priorities include culvert and pipe replacements, stormwater capacity upgrades along low-lying highways, and stabilization efforts near canal-adjacent corridors.

District 03: Lafayette

District 03 is addressing persistent infrastructure vulnerabilities tied to chronic flooding, slope failures, and inadequate drainage systems, particularly in low-lying and levee-adjacent areas. Solutions include roadway elevation, culvert and inlet upgrades, integration of nature-based solutions, and embankment stabilization to preserve access for coastal communities, freight corridors, and emergency routes. These improvements enhance long-term system performance and reduce disruptions from seasonal storms. The district is advancing projects such as drainage enhancements near port access roads, slope repair along rural corridors, and flood mitigation near critical agricultural and industrial sites.

District 04: Shreveport

District 04 is focused on addressing roadway degradation due to erosion, extreme heat, and drought impacts, mitigating riverine flooding, preparing for winter storm events, and identifying ways to coordinate with other entities that own and operate assets within the region. The district is home to multiple flood control structures that protect communities and important transportation assets (including railways); not all of these flood control structures are operated by LADOTD, so improving these assets requires a coordinated approach, especially with federal entities. Finally, District 04 is contending with more aging infrastructure of several types [Flat Deck Timber Pile Bridges and Mechanically Stabilized Earth Walls] than any other district in Louisiana; a scalable solution to the assets that are at the end of their life could enhance system resilience, minimize service disruptions, and ensure critical connectivity.

District 05: Monroe

District 05 is advancing resilience strategies that target riverine flooding, slope instability, and seasonal road closures, particularly along its rural north-south corridors. Priority solutions include embankment stabilization, improved stormwater conveyance, and elevation of flood-prone segments to protect public safety and maintain connectivity across long-detour-prone areas. These interventions are essential for ensuring uninterrupted access to freight routes, small communities, and emergency services. Notable solutions underway include slope repairs on interstate embankments, drainage improvements near flood-prone intersections, and shoulder stabilization on erosion-prone rural highways.

District 07: Lake Charles

District 07 is focused on improving coastal access, drainage capacity, and structural resilience along routes frequently impacted by storm surges, tidal flooding, and wind-related bridge closures. Proposed solutions include shoulder elevation, culvert upgrades, and bridge improvements that support critical energy infrastructure, evacuation routes, and rural community access. These efforts aim to reduce chronic disruptions, strengthen mobility during emergencies, and extend the lifespan of vulnerable coastal assets. This includes work such as the elevation of flood-prone coastal highways, stormwater improvements in low-lying neighborhoods, proliferation of nature-based solutions, and operational upgrades to wind-sensitive movable bridges.

District 08: Alexandria

District 08 is implementing strategies to address slope failure, extreme heat-related pavement issues, and localized flooding, particularly along rural routes and aging infrastructure. Solutions focus on embankment stabilization, drainage retrofits, and the replacement of heat-sensitive composite pavement systems, many of which date to the post-WWII era. These improvements are designed to reduce weather-related damage, improve response capabilities during winter events, and enhance year-round reliability for inland communities. To achieve these outcomes, the district is pursuing efforts such as erosion control near river-adjacent slopes, structural upgrades near dam-adjacent roadways, and remote weather monitoring for critical bridge crossings.

District 58: Chase

District 58 is prioritizing resilience measures that address riverine flooding, drought-related pavement failure, and slope instability along rural corridors that often lack alternate routes. The district is focused on bank stabilization, drainage improvements, and pavement rehabilitation to preserve access for small communities, emergency services, and agricultural freight movement. These strategies are critical for reducing isolation during weather events and extending the life of infrastructure exposed to extreme conditions. Among the identified priorities are embankment reinforcement near river-adjacent roads, elevation or flood-proofing of repeatedly submerged corridors, and repairs to heat-damaged pavement sections.

District 61: Baton Rouge

District 61 is targeting infrastructure vulnerabilities linked to slope failure, drainage system overload, and pavement buckling from extreme heat, particularly along major freight and evacuation routes. The district's solutions include embankment stabilization, drainage rehabilitation, and structural repairs at bridge crossings, with a focus on multi-parish corridors that experience recurring disruptions. These efforts are essential for maintaining system reliability, minimizing closure durations, and protecting infrastructure in a high-traffic urban-rural transition zone. The district is prioritizing initiatives such as scour remediation at bridge abutments, drainage upgrades near municipal bottlenecks, and district-wide mitigation for heat-induced pavement failures.

District 62: Hammond

District 62 is addressing transportation risks tied to flooding, fog-related hazards, and winter weather impacts on elevated structures, particularly in areas with limited alternative routes. The district is advancing solutions such as drainage improvements, bridge hardening, and operational upgrades to enhance safety and year-round accessibility. Emphasis is also placed on integrating intelligent transportation systems (ITS) to improve visibility and hazard response. To support these goals, the district is implementing projects such as flood mitigation at low-lying bridge approaches, upgrades to fog-prone corridors, and winter weather enhancements for priority evacuation routes.

EXPECTED ENHANCEMENTS

If funded and implemented, LADOTD's list of priority resilience projects would improve emergency response, support interagency coordination, expand existing nature-based solutions, and maintain a viable environment for economic growth and energy security. These enhancements are aligned with FHWA priorities and would advance connections between district, state, and federal transportation priorities. LADOTD is committed to implementing resilience projects that are part of a comprehensive strategy to enhance overall transportation safety and resilience.

Improved Emergency Response

Improved emergency response is a priority of LADOTD because it defends the safety and well-being of residents and first responders during critical situations. LADOTD's focus is on maintaining clear and efficient evacuation routes, which are essential for residents in times of natural disasters or weather-related emergencies. Special attention is given to the development and upkeep of these routes to support swift and orderly evacuations, minimizing potential losses. Louisiana is considering the implementation of statewide weather sensors and potential strategies for automatic road closures as statewide projects. This will allow the state and districts to more quickly and efficiently identify which roads should be closed in the event of extreme weather events, decrease response times, reduce risk to response personnel who travel in extreme conditions, and improve efficiency of the overall response by redeploying staff to tasks that cannot be automated.

Interagency Coordination

Interagency coordination is the main activity of at least three priority resilience projects, and it is a vital component of long-term flood control in Louisiana. Ongoing federal-state-local coordination is critical for managing and improving major flood control structures in some of Louisiana's most vulnerable and critical areas. LADOTD's resilience partnerships with LWI and the LTRC produce data that informs resilience projects and day-to-day upkeep of the transportation system. LADOTD plans to conduct two statewide research projects on roadway materials. Coordinating this research between headquarters and districts will create a more thorough localized testing process and accurate understanding of the proposed best practices.

Nature-Based Approaches

LADOTD recognizes that nature-based solutions are an important complement to its ongoing infrastructure protection and development projects to comprehensively enhance the transportation system's resilience. The expertise and resources needed to implement nature-based solutions are often procured through robust, durable partnerships with other state and federal agencies.

LADOTD regularly collaborates with federal and state agencies for cross-state boundary projects that improve regional resilience. For example, LADOTD, in cooperation with the Mississippi Department of Transportation and FHWA, has proposed investments along US 90 to maintain system linkages, provide a new diversion route, support hurricane evacuation, and improve the function of the 5 bridges.

The improvements will maintain floodplain connectivity and overbank flow processes that are foundational to nature-based flood mitigation strategies.

LADOTD has a history of supporting large- and local-scale nature-based solutions. For example, LADOTD is a member of the Louisiana Watershed Initiative, a coalition of 5 state agencies that are leveraging the U.S. Department of Housing and Urban Development funding to complete 129 proactive flood defense projects within a Nature-Based Solution Program framework. LADOTD also supports non-state partners whose work intersects with transportation assets and may yield nature-based mitigation benefits, such as the Louisiana Aquatic Connectivity Team, which implements green infrastructure improvements to support natural habitats and wildlife movement. These are immediate and ongoing priority projects.

LADOTD incorporates nature-based solutions when they are cost-effective and support risk-reduction outcomes. Louisiana's unique climate, ecology, and geology mean nature-based solutions are not always cost-effective or may work best as an augmentation of gray infrastructure approaches. Strategies that are commonly effective in Louisiana include restoring wetlands and planting trees along roadways to reduce flooding and stabilize soil, as well as improving and replacing roadway-adjacent culverts to reduce flood risk.



Examples of nature-based solutions in Louisiana. Starting from the top: restored floodplains slow and store floodwaters to reduce downstream flood risk. The middle image illustrates urban green infrastructure designed to temporarily retain stormwater during heavy rainfall, and the bottom image shows coastal wetland restoration that provides natural protection from flooding and storm surge while supporting wildlife habitat. Source: Louisiana Watershed Initiative.

Economic Development and Energy Security

Implementing the identified priority resilience projects would maintain the services of critical infrastructure and transportation routes that support the State’s economy and nationwide energy security. By maintaining the State’s roads, bridges, and other transportation networks, Louisiana can facilitate smoother and more efficient movement of goods and services, which is crucial for economic growth. Reliable transportation infrastructure also attracts businesses and investment, further strengthening the State’s economy. In addition, well-maintained transportation routes are vital during emergencies and extreme weather

events, as they provide the necessary access for emergency response teams and essential supplies. This is particularly important for maintaining energy infrastructure, ensuring that power can be restored quickly and efficiently to affected areas, and ensuring the uninterrupted flow of vital energy resources into the State and beyond.

Table 26 lists expected enhancements identified through this process. These enhancements support the long-term improvements of their district’s infrastructure and align with FHWA’s priorities.

TABLE 26: Expected enhancements of priority resilience projects

ENHANCEMENT	DISTRICT(S)	AFFECTED ASSETS	OUTCOMES	FHWA PRIORITY ALIGNMENT
Box Culvert Installations	61	Drainage Crossings	Prevents washouts, supports rural access	Infrastructure Resilience, Rural Access
Bridge Scour Remediation	58, 61	Bridges	Extends bridge life, prevents closures	Emergency Access, Infrastructure Preservation
Composite Pavement Replacement	05, 58, 61	Roadways	Improves durability, reduces heat-related failures	Infrastructure Resilience, Safety

TABLE 26: Expected enhancements of priority resilience projects [continued]

ENHANCEMENT	DISTRICT(S)	AFFECTED ASSETS	OUTCOMES	FHWA PRIORITY ALIGNMENT
Culvert Replacements	02, 03, 61	Drainage systems, roadways,	Reduces roadway closures, improves flood resilience	Emergency Access, Nature-Based Solutions
Debris Management Planning	61	Emergency routes, roadways	Faster post-event recovery, safer clearance operations	Interagency Coordination, Storm Preparedness
Drainage Capacity Upgrades	02, 03, 04, 05, 07, 08, 61	Roadways, stormwater systems	Faster water removal, reduced roadbed saturation	Emergency Preparedness, Nature-Based Solutions
Elevation of Flood-Prone Roads	02, 03, 05, 07, 58	Low-Lying road segments	Maintains access during floods, reduces detours	Continuity of Operations, Emergency Access
Erosion Control Along Canal-Adjacent Roads	02	Canal-adjacent roadbeds	Prevents road loss; stabilizes canal-facing edges	Coastal Resilience, Nature-Based Solutions
Evacuation Route Resilience Enhancements	02, 07, 62, Statewide	Evacuation corridors	Improves flow, access, and storm evacuation safety	Emergency Access, Emergency Preparedness, Safety
ITS Deployment	08, 62, Statewide	Bridges, evacuation routes	Improves visibility, enhances decision support	Emergency Preparedness, Safety
Outfall Coordination with Non-LADOTD Assets	02, 61	Drainage systems	Improves project feasibility and downstream flow	Interagency Coordination, Stormwater Management
Pipe Rightsizing	61, 03	Drainage infrastructure	Reduces backflow and drainage system overload	Stormwater Resilience
Roadway Buckling Mitigation	04, 05, 58, 61, 62	Roadways	Improves traveler safety, reduces VMT delays	Emergency Preparedness, Safety
Scour Monitoring and Protection	58, 61	Bridge foundations	Prevents foundation loss, extends bridge life	Infrastructure Preservation, Safety

TABLE 26: Expected enhancements of priority resilience projects (continued)

ENHANCEMENT	DISTRICT(S)	AFFECTED ASSETS	OUTCOMES	FHWA PRIORITY ALIGNMENT
Severe Fog Response Plan	62	Fog-Prone corridors	Reduces crashes, improves visibility, and alerts	Emergency Response, Safety
Slope Stabilization	02, 03, 04, 05, 07, 08, 58, 61	Embankments, roadways	Prevents road loss, ensures structural integrity	Infrastructure Resilience
Winter Weather Treatment Plan	61, 62	Priority Routes, bridges	Enhances pre-treatment and route reliability	Emergency Access, Safety
Roadway Materials Research Program	Statewide	Roadways, bridges	Improved durability, reduces heat-related failures, improved flood resilience	Infrastructure Preservation, Safety
Establish a Geotechnical Hazards Program	Statewide	Roadways, drainage systems, embankments	Improved durability, improved flood resilience	Infrastructure Preservation, Stormwater Resilience
ATS Deployment	Statewide	Roadways, bridges, priority routes, evacuation routes	Improved visibility, enhanced decision support, improved traveler safety	Emergency Preparedness, Interagency Coordination
Commercial Vehicle Parking/ Staging	Statewide	Priority routes, evacuation routes, debris management corridors	Faster emergency response and post-event recovery, improved traveler safety	Continuity of Operations, Emergency Preparedness, Safety, Storm Preparedness

IMPLEMENTATION STRATEGY

LADOTD's resilience project implementation strategy will be driven by the guiding principles of its Strategic Improvement Plan: efficiency, reliability, and transparency, with a focus on enhanced tools, processes, and communication. LADOTD headquarters and districts collaborated closely to develop the TRIP analyses and project list; continued coordination is a key component of implementation. The Department is concentrating on long-term planning while navigating significant challenges with resource allocation and securing adequate funding for transportation projects. LADOTD will maximize the opportunity to fund and implement the TRIP's Priority Resilience Projects through best practice data governance, more centralized project management processes, and proactive funding applications and advocacy. Expanding the amount and certainty of funding that Louisiana has to deliver transportation infrastructure is a critical resilience implementation strategy, in addition to internal efficiency and standardization measures.

LADOTD intends to implement the Priority Resilience Projects through a combination of competitive PROTECT applications and use of discretionary funds, consideration of other federal opportunities, and by integrating these resilience solutions into the Department's regular cycle of long-term planning. LADOTD is committed to leveraging the data, tools, and resources developed for this Plan—including the asset database, criticality assessment, vulnerability and risk assessment, prioritization framework, the Priority Resilience Project list, and the Resilience Working Group structure—to inform transportation resilience planning and operations in the long term. In addition to informing the selection of Priority Resilience Projects for potential PROTECT grant applications, the results of the TRIP analyses and the system of project prioritization will be integrated into the concurrent Statewide Transportation Plan update to guide transportation system management for the next decade.



View of the Horace Wilkinson Bridge [also known as the Baton Rouge Bridge] carrying Interstate 10 over the Mississippi River in Baton Rouge, Louisiana

District Summaries

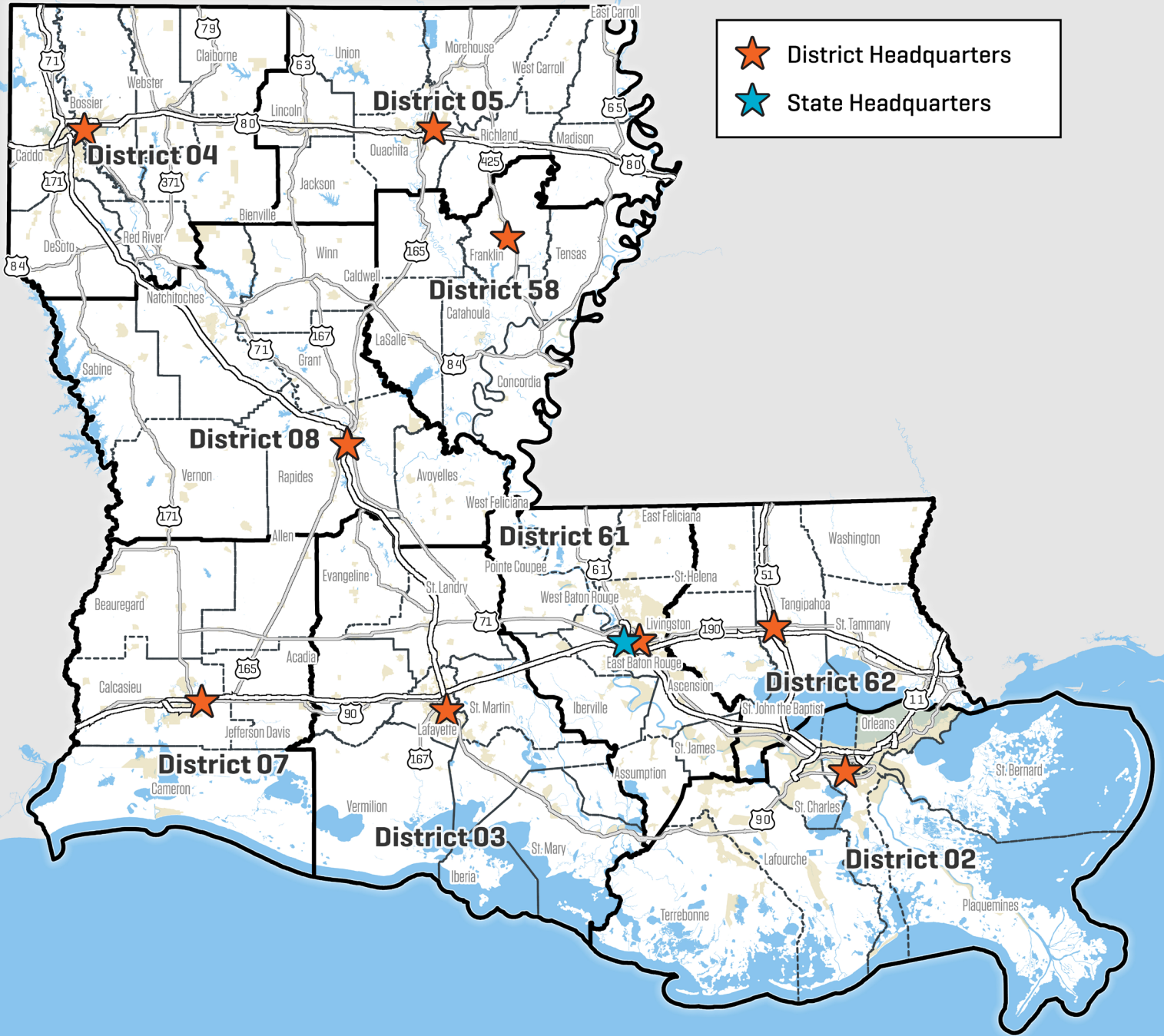


FIGURE 29: Map of LADOTD districts showing District and state headquarters locations



DISTRICT 02: BRIDGE CITY

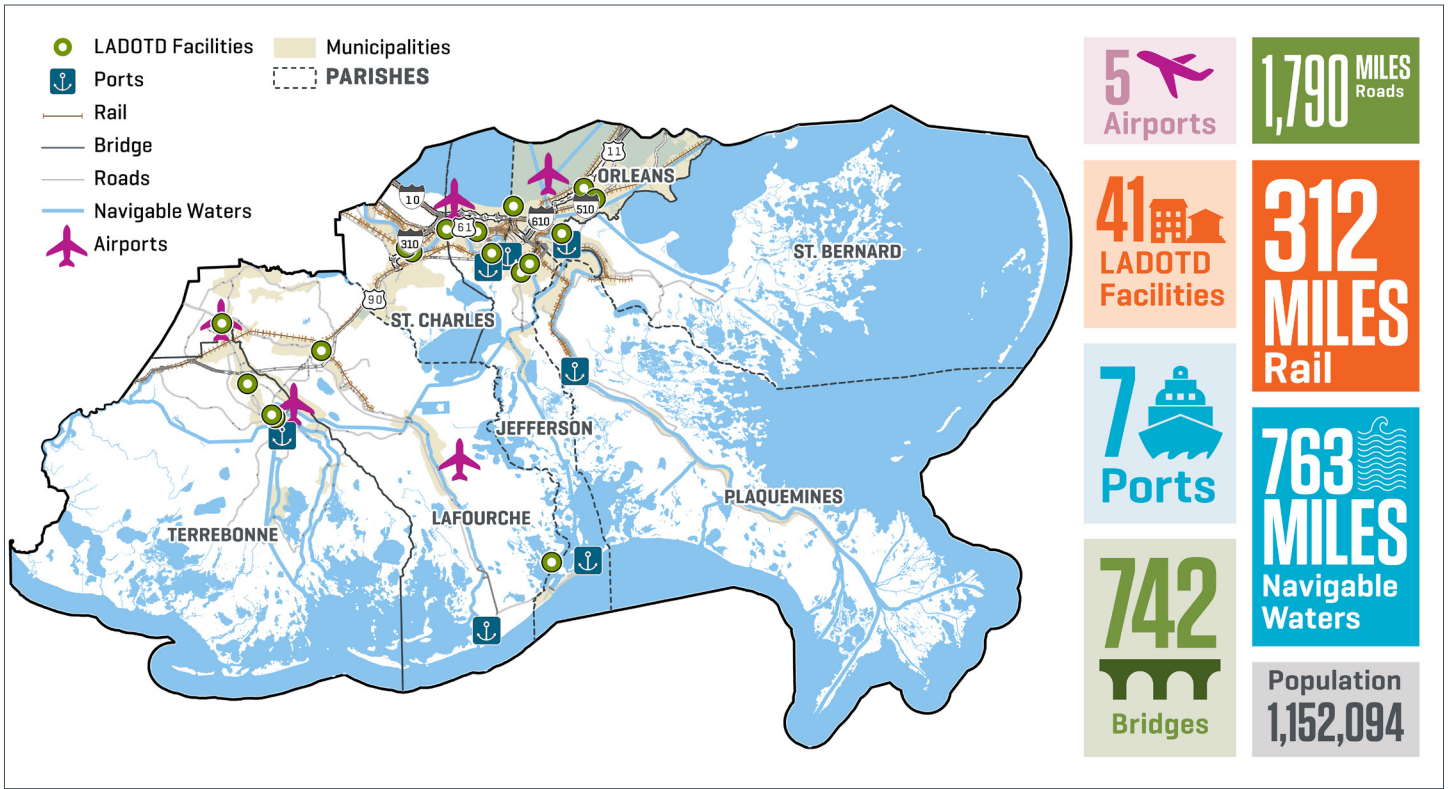


FIGURE 30: LADOTD District 02 transportation and infrastructure asset map

**Miles reported differ from FHWA figures because this analysis includes additional parts of the network.*

Summary

District 02 spans the southeastern Louisiana parishes of Lafourche, Orleans, Plaquemines, St. Bernard, Terrebonne, St. Charles, and Jefferson. It includes critical infrastructure and coastal communities that help fuel and feed America through energy, seafood, and agricultural production.

Key assets include LA 1, the only highway to Port Fourchon, which supports over 90 percent of U.S. deepwater oil production, and the Port of New Orleans, a major cargo hub with direct service from six Class I railroads.^{1,2} Louis Armstrong New Orleans International Airport (MSY), located in Jefferson Parish, provides commercial air service and supports evacuation logistics, while the Naval Air Station in Plaquemines Parish contributes to national defense and emergency readiness. St. Charles Parish also includes major industries, along with the Bonnet Carré Spillway, which controls flooding from the Mississippi River.³

The District also contains the Venice Port Complex and a network of seafood, petrochemical, and bulk transfer facilities that span Plaquemines, St. Bernard, Terrebonne, and St. Charles Parishes—linking coastal industries to domestic supply chains and global markets.⁴

District 02 depends on an extensive levee system but remains highly exposed to flood hazards, including storm surge and sea level rise, and has limited evacuation routes. Resilience investments are critical to protecting lives, sustaining operations, and safeguarding this nationally significant region.

ROADWAY CRITICALITY OVERVIEW	CATEGORY	COMPOSITE
	HIGH	44%
	MEDIUM	47%
	LOW	9%



Paddle steamer in Mississippi River in New Orleans



DISTRICT 02: BRIDGE CITY

Hazard Impacts

Extreme Heat	Pavement damage from prolonged high temperatures.
Flooding [Coastal]	Tidal flooding affects roads like US 90 and US 11 outside flood protection systems.
Flooding [Precipitation]	Undersized culverts and canal-adjacent roads flood during rain events.
Geotechnical	Pavement dips and structural concerns near bridges are caused by subsurface issues.

Risk Results

Hazard	LADOTD Asset Type	H and HH Count	H and HH %	H and HH State % Comparison	Units
Extreme Heat	Bridge	1	0.1%	0.7% ▼	Number
Extreme Heat	Road	58	3.2%	4.6% ▼	Miles
Flood	Bridge	77	10.4%	13.4% ▼	Number
Flood	Road	511	28.5%	8.9% ▲	Miles
Geotechnical [Composite]	Road	681	38.7%	13.9% ▲	Miles
Geotechnical [Slope Stability]	Road	0	0.0%	0.2% ▼	Miles
Wind	Movable Bridge	35	83.3%	74.5% ▲	Number
Wind	ITS	677	99.4%	54.7% ▲	Number
Winter Weather	Road	345	19.3%	12.9% ▲	Miles
Winter Weather	Bridge	35	83.3%	71.3% ▲	Count



This District's High [H] and Highest [HH] % is lower than the State's %



This District's High [H] and Highest [HH] % is equal to the State's %



This District's High [H] and Highest [HH] is higher than the State's %



DISTRICT 02 PROJECTS

PROJECT LOCATION CRITICALITY

- █ High
- █ Medium
- █ Low

HAZARD TYPE

- Drought
- Extreme Heat
- Flooding
- Flooding [Coastal]
- Flooding [Precipitation]
- Flooding [Riverine]
- Geological Hazard
- Winter Weather

PROJECT

- X Temperature
- X Flooding
- X Geologic
- X Combined

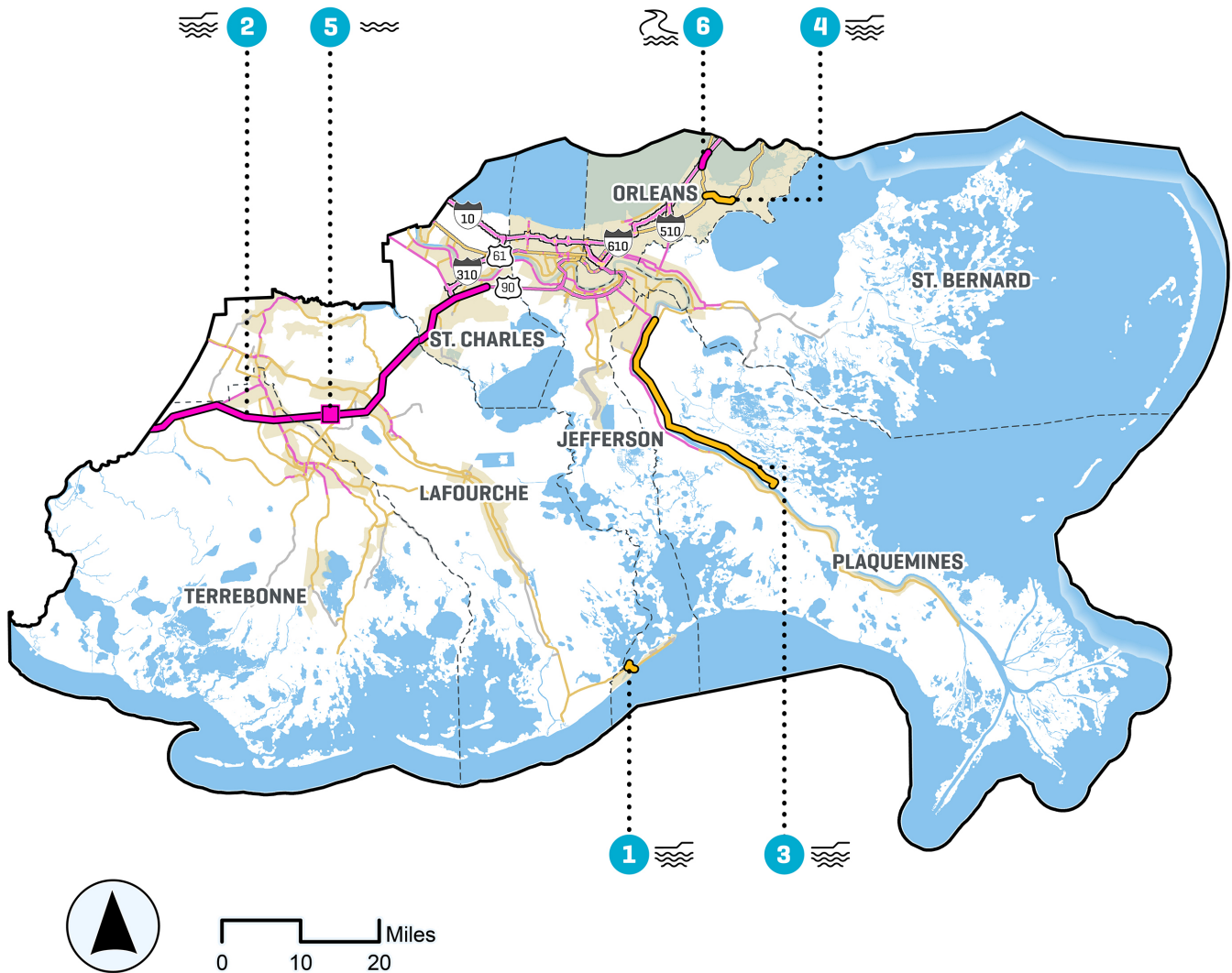


FIGURE 31: LADOTD District 02 resilience projects by hazard type and criticality



DISTRICT 02 PROJECTS

RESILIENCE PROJECT LIST

NO.	PROJECT	PRIMARY HAZARD	DESCRIPTION
1	Grand Isle LA 1 Drainage Improvement	Flooding (Coastal), Wind	Drainage improvement along LA 1 in the Grand Isle area to reduce effects from hazards.
2	US 90 (Eastbound) Drainage Improvement	Flooding (Coastal), Wind	Drainage improvement along US 90 to reduce effects from coastal flooding.
3	LA 39 Drainage Improvement	Flooding (Coastal), Wind	Drainage improvement along LA 39 in the Grand Isle area to reduce effects from hazards.
4	US 11 Drainage Improvement	Flooding (Coastal), Wind	Drainage improvement/elevation to mitigate wind-driven lake overtopping and erosion control.
5	US 90 Flood Mitigation	Flooding	Drainage improvement along US 90 to reduce effects from coastal flooding.
6	US 11 Flood Mitigation to I 10	Flooding	Mitigate flooding at junction of US 11 and I 10.



Flood sign in New Orleans



Freight cargo in New Orleans



Aerial view of neighborhood in New Orleans



DISTRICT 03: LAFAYETTE

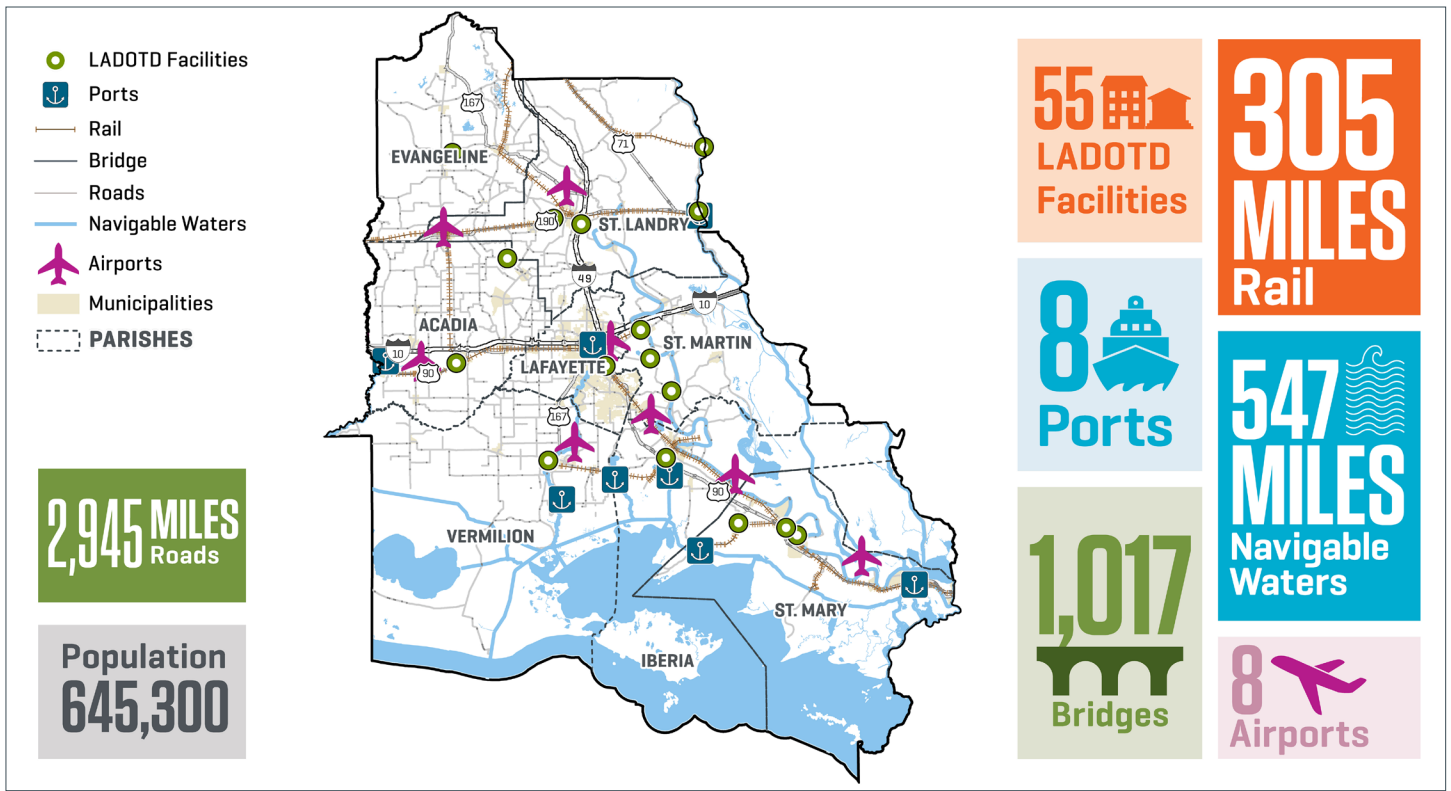


FIGURE 32: LADOTD District 03 transportation and infrastructure asset map

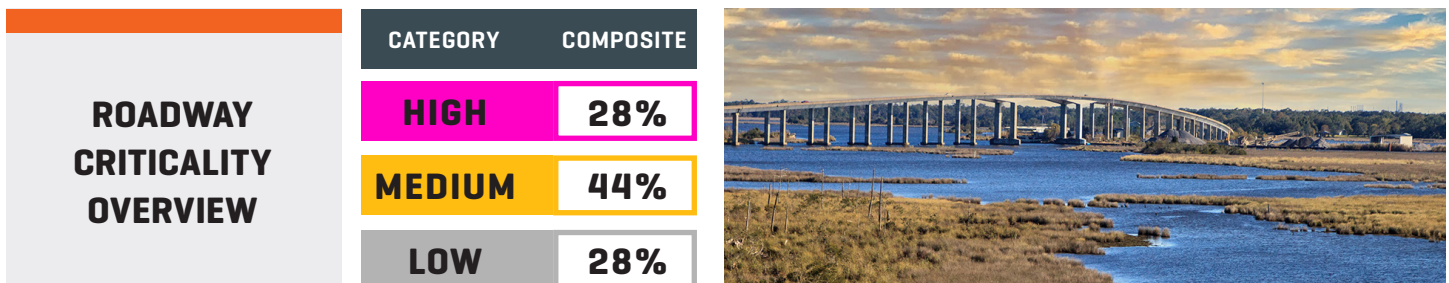
**Miles reported differ from FHWA figures because this analysis includes additional parts of the network.*

Summary

District 03 is a vital economic engine for Louisiana, from the rice fields and crawfish ponds in Acadia Parish to oil and gas operations. The District includes Evangeline, Iberia, Lafayette, St. Landry, St. Martin, St. Mary, and Vermilion Parishes. The District includes regional airports and the Port of Iberia, a 4,000-acre industrial complex with rail access and human-made canal linking to the Gulf Intracoastal Waterway. A deeper access channel is under development to accommodate larger vessels and increase freight capacity.

The Atchafalaya Basin extends into the District, providing a natural and recreational attraction through crawfish harvesting, fishing, and tourism. The Atchafalaya Basin Bridge, one of the largest in the U.S., plays a key role in regional connectivity and highlights the importance of resilient regional infrastructure.

Roads like LA 92 and LA 82 in the District are essential for freight and evacuation when US 90 is congested. In low-lying areas, a pontoon bridge on LA 92 floods multiple times each year, limiting access and requiring detours. Flooding and poor drainage along LA 82 also restrict heavy truck movement. These issues, including road collapses and residual damage from the 2016 floods, highlight vulnerabilities. For example, Youngsville experienced rainfall comparable to a 500-year flood that damaged 600 structures.⁵



Atchafalaya Bridge in Lafayette



DISTRICT 03: LAFAYETTE

Hazard Impacts

Extreme Heat	Surface deterioration and faulting are observed on LA 690 and other routes; aging pavements are vulnerable to repeated heat cycles.
Flooding [Coastal & Riverine]	Tidal surges and backwater flooding affect LA 317, LA 690, and LA 1266; roads frequently close and lack alternate access.
Flooding [Precipitation]	Undersized culverts and low-lying roads cause pooling and overtopping on LA 347, LA 3073, and LA 352.
Limited Access and Evacuation	Several corridors are the only access for communities, ports, or evacuation routes; closures isolate residents and disrupt freight.
Geotechnical	Slides impact I 10, LA 745, LA 103, and levee-adjacent LA 352; erosion undermines rural mobility and increases detour mileage.
Winter Weather	I 10 Basin Bridge experiences ice during storms; the District lacks formal response measures for freeze conditions.

Risk Results

Hazard	LADOTD Asset Type	H and HH Count	H and HH %	H and HH State % Comparison	Units
Extreme Heat	Bridge	2	0.2%	0.7% ▼	Number
Extreme Heat	Road	79	2.7%	4.6% ▼	Miles
Flood	Bridge	151	14.8%	13.4% ▲	Number
Flood	Road	368	12.5%	8.9% ▲	Miles
Geotechnical [Composite]	Road	325	11.0%	13.9% ▼	Miles
Geotechnical [Slope Stability]	Road	3	0.1%	0.2% ▼	Miles
Wind	Movable Bridge	24	66.7%	74.5% ▼	Number
Wind	ITS	231	70.6%	54.7% ▲	Number
Winter Weather	Road	183	10.2%	12.9% ▼	Miles
Winter Weather	Bridge	757	74.4%	71.3% ▲	Count



This District's H and HH % is lower than the State's %



This District's H and HH % is higher than the State's %



03

DISTRICT 03 PROJECTS

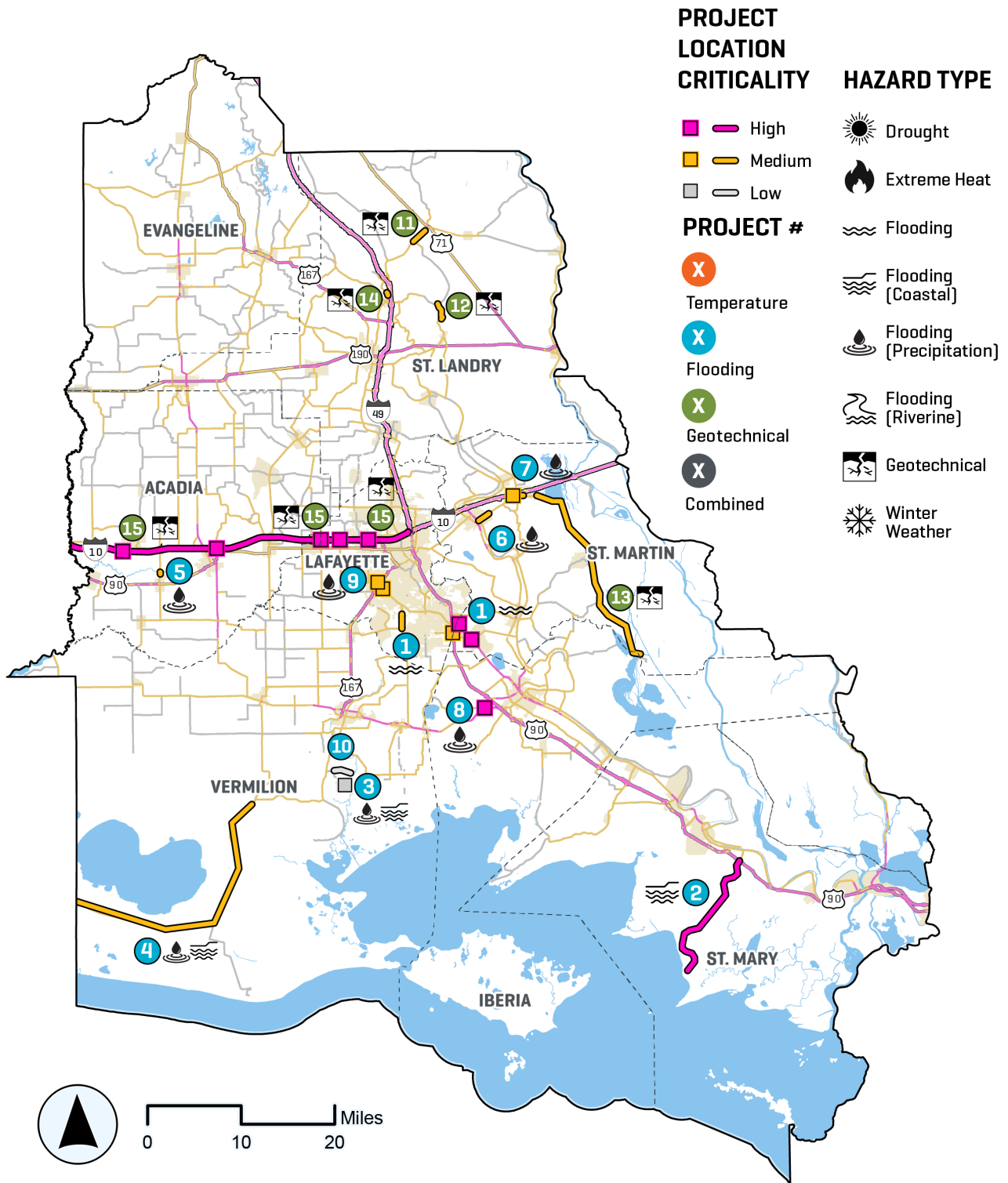


FIGURE 33: LADOTD District 03 resilience projects by hazard type and criticality



DISTRICT 03 PROJECTS

RESILIENCE PROJECT LIST

NO.	PROJECT	PRIMARY HAZARD	DESCRIPTION
1	LA 339, LA 182, and US 90 Cross Drain Replacement	Flooding	Replace drainage structures with large box culverts to increase drainage capacity.
2	LA 14 Bypass Elevation	Flooding	Elevate about 1,300 feet of the LA 14 Bypass near Abbeville.
3	LA 317 Coastal Route Preservation	Flooding [Coastal]	Roadway improvements to reduce tidal and coastal flooding and preserve the only access to farms, oil/gas facilities, and a manufacturing plant.
4	Flood Mitigation at Palmetto State Park Entrance Road [LA 1266]	Flooding [Coastal, Precipitation]	Widen lanes, relocate trees, improve drainage, and elevate the road to reduce tidal impacts and roadway flooding.
5	Resize CMP Equalizer Pipes at LA 82 [Cameron Parish Line – Forked Island/LA 35]	Flooding [Coastal, Precipitation]	Increase CMP equalizer pipe size to reduce roadway flooding and storm surge effects.
6	LA 91 Interim Flood Mitigation and Pontoon Bridge Replacement	Flooding [Precipitation]	Replace pontoon bridge and improve roadway infrastructure to reduce flooding.
7	LA 347 Curb and Gutter Flood Mitigation at LA 328 – Doyle Melancon	Flooding [Precipitation]	Increase storm drainage and inlet capacity in curb and gutter section to reduce reoccurring roadway flooding.
8	LA 352 Upgrade Undersized Pipes in Henderson	Flooding [Precipitation]	Increase pipe size and drainage capacity in Henderson to reduce roadway flooding.
9	LA 676 and Highway 14 Upgrade Clay Storm Drainpipes	Flooding [Precipitation]	Repair or replace clay storm pipes along to improve roadway drainage.
10	LA 3073 Flood Mitigation at Robley Drive in Lafayette	Flooding [Precipitation]	Drainage system improvements, including more inlets and an expanded or new outfall, to increase capacity and reduce roadway flooding.
11	LA 690 Port of Vermilion Abbeville Harbor Roadway Preservation	Flooding [Riverine]	Improve road and study elevation along LA 690 to reduce effects of low-lying flooding and preserve the only access route to the port.
12	LA 10 Slide Repairs	Geotechnical	Repair multiple slides along shoulders, guardrails, and roadway areas.
13	LA 103 Slide Improvements at North of Port Barre	Geotechnical	Repair embankments and stabilize slopes along LA 103 to prevent road impacts.
14	LA 352 Levee Slide Repairs	Geotechnical	Stabilize known slide areas along LA 352 to prevent slope failure and lane closures.
15	LA 745 Slide Repair near Bayou Courtableau	Geotechnical	Repair slope failures and open road along LA 745 near Bayou Courtableau.
16	I 10 Slide Repairs	Geotechnical	Roadway fore slope is steep and has slide areas. Previous funding for the roadway project was limited so the slides were not addressed.



04

DISTRICT 04: SHREVEPORT

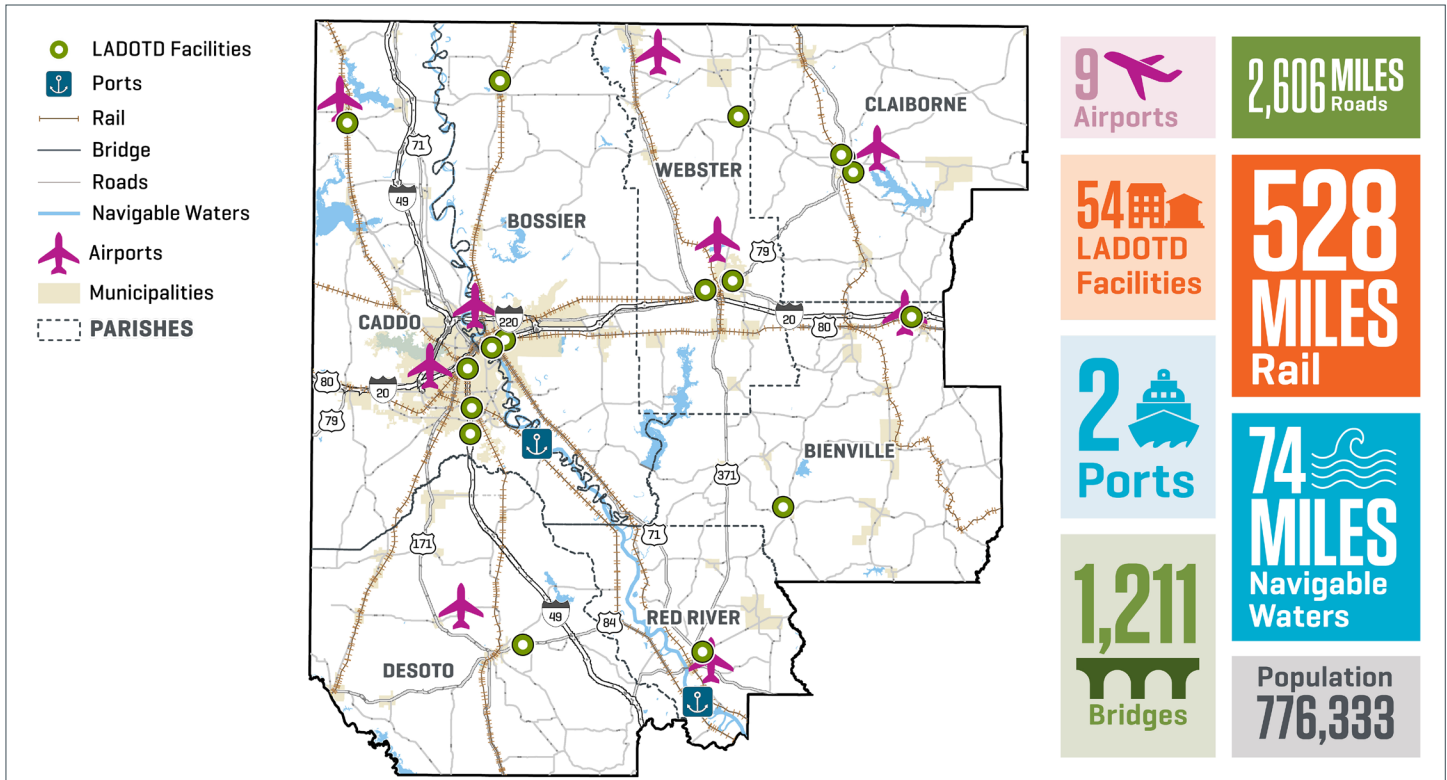


FIGURE 34: LADOTD District 04 transportation and infrastructure asset map

**Miles reported differ from FHWA figures because this analysis includes additional parts of the network.*

Summary

District 04 includes Caddo, Bossier, Webster, Claiborne, De Soto, Red River, and Bienville Parishes. The District plays a critical role in mobility, commerce, and public safety across north Louisiana. The Shreveport–Bossier area is the region’s largest economic and cultural hub and is home to Barksdale Air Force Base (BAFB), Camp Minden, and Louisiana National Guard units. The base’s proximity to I 20, I49, and US 71 underscores the importance of maintaining reliable transportation access for national security, emergency response, and regional mobility.

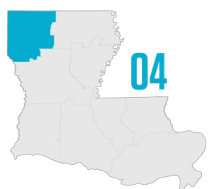
The Caddo–Bossier Port along the Red River provides key inland and rail shipping access, attracting industries that rely on and benefit from the economic base.⁶

District 04 is home to one of the largest inventories of flat deck timber pile bridges in Louisiana—many built in the 1960s and now requiring upgrades. These crossings serve vital functions, such as the Shreveport Bridge, which provides access to the region’s only trauma center, one of two in the state. The District also manages the most mechanically stabilized earth retaining walls statewide, many of which are aging past their 25-year life expectancy, along with levee-top roadways that provide both flood protection and critical access in vulnerable areas.

ROADWAY CRITICALITY OVERVIEW	CATEGORY	COMPOSITE
	HIGH	27%
	MEDIUM	43%
	LOW	30%



Skyline of Shreveport



DISTRICT 04: SHREVEPORT

Hazard Impacts

Extreme Heat	Road blow-ups happen when temperatures rise and remain elevated, typically in the high 90°Fs and above. Cracking followed by rain leads to saturation and separation of bonding for slope plating.
Flooding	Multiple flood control structures (maintained by multiple government agencies) need repair or enhancement to prevent failure. Non-maintained levees or dams can be particularly vulnerable to worsening weather conditions.
Flooding [Riverine]	The District has multiple areas that experience frequent flooding. Some areas require high water road signs for 10-year floods. In 2015 and 2016, major flooding from the Red River inundated I 220, I 20, and I 49.
Geotechnical	The District has identified areas with concerning slope stability and erosion. I 49 North and South have issues with slope-to-shoulder erosion, and one local levee with a major top road would be impacted in the event of a dam failure due to slope stability, erosion, and/or flood events.
Winter Weather	Winter weather events have led to near-complete transportation closures for multiple days and reoccurring needs for coordination with Arkansas for treatment on connecting, elevated roadways.

Risk Results

Hazard	LADOTD Asset Type	H and HH Count	H and HH %	H and HH State % Comparison	Units
Extreme Heat	Bridge	34	2.8%	0.7% ▲	Number
Extreme Heat	Road	321	12.3%	4.6% ▲	Miles
Flood	Bridge	176	14.5%	13.4% ▲	Number
Flood	Road	113	4.3%	8.9% ▼	Miles
Geotechnical [Composite]	Road	N/A	N/A	13.9%	Miles
Geotechnical [Slope Stability]	Road	6	0.2%	0.2% ▬	Miles
Wind	Movable Bridge	0	0.0%	74.5% ▼	Number
Wind	ITS	0	0.0%	54.7% ▼	Number
Winter Weather	Road	746	28.6%	12.9% ▲	Miles
Winter Weather	Bridge	900	74.3%	71.3% ▲	Count



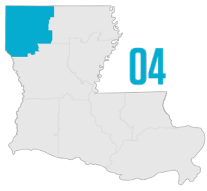
This District's H and HH % is lower than the State's %



This District's H and HH % is higher than the State's %



This District's High [H] and Highest [HH] % is equal to the State's %



04

DISTRICT 04 PROJECTS

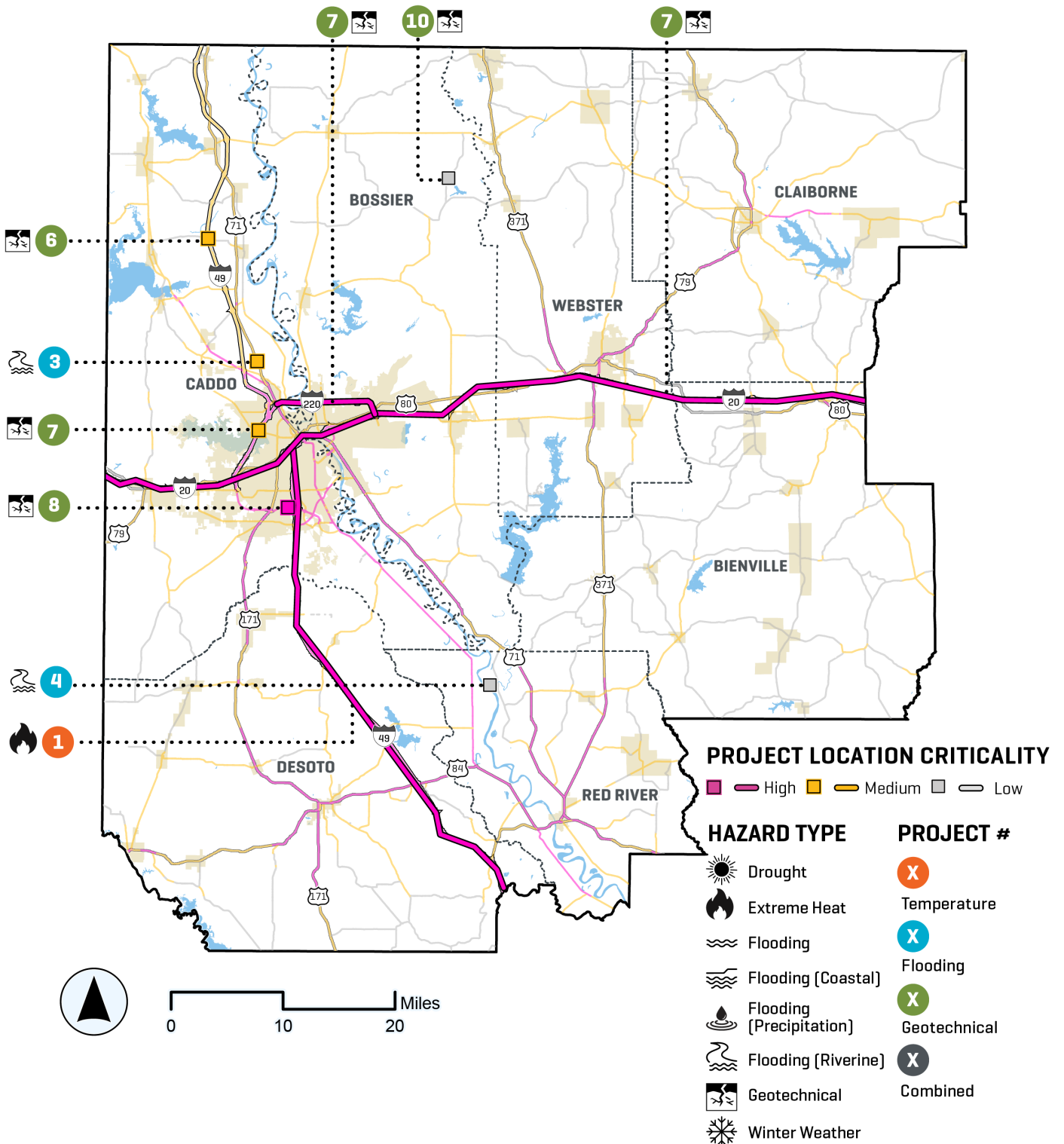
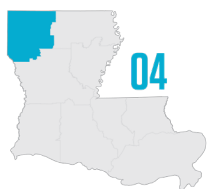


FIGURE 35: LADOTD District 04 resilience projects by hazard type and criticality



DISTRICT 04 PROJECTS

RESILIENCE PROJECT LIST

NO.	PROJECT	PRIMARY HAZARD	DESCRIPTION
1	Road Surface Rehabilitation in Shreveport and Bossier	Extreme Heat	Continue road resurface rehabilitation and identify approaches to reduce cracking and prevent blowup.
2	Road Improvements and Flood Mitigation Projects across District 04	Flooding [Precipitation, Riverine]	Improve roads susceptible to flooding in the northwest corner of Louisiana and reduce impassable roads.
3	Improve US 71 Levee Road	Flooding [Riverine]	Improve and rehabilitate the roadway along top of the levee for LADOTD access.
4	Prevent Red River Levee Failure along LA 515	Flooding [Riverine]	Cross-agency coordination to prevent levee failure and protect transportation assets.
5	Dam Drawdown Gate Replacements	Flooding	Rehabilitate or install new drawdown gates on dams across District 04 to prevent structure failure.
6	I 49 North and South Exit Ramp Improvements	Geotechnical	Rehabilitate embankments and stabilize slopes to prevent complete collapse and lane closures.
7	I 220 and I 20 Corridor Stabilization	Geotechnical	Stabilize actively eroding embankments to prevent further erosion and failure.
8	LA 3132 Rehabilitation and Stabilization	Geotechnical	Stabilize slides along LA 3132 ramps at Linwood Avenue to prevent failure and lane closure.
9	Poor Condition Bridge Rehabilitation and Lightweight Bridge Deck Replacements	Geotechnical	Repair or replace 7 overpasses and bridges along bayous to prevent failure and collapse. Locations include I 20 overpasses near Greenwood and Arcadia and bridges at Flat River [Taylortown], Mahlin Bayou [Blanchard], Boggy Bayou [Colquitt Road], and Bodcau Bayou [2 locations].
10	Ivan Lake Dam Improvements	Geotechnical	Cross-agency coordination and rehabilitation to combat erosion and prevent additional failures.
11	Evaluate and Rehabilitate Aging Walls	Geotechnical	Assess, prioritize, and rehabilitate aging Mechanically Stabilized Earth [MSE] walls across the District as appropriate.
12	Increase Bulk Salt Distribution for Interstate Routes	Winter Weather	Increase cross-state coordination, bulk salt storage, and salt pre-positioning for winter weather events.



DISTRICT 05: MONROE

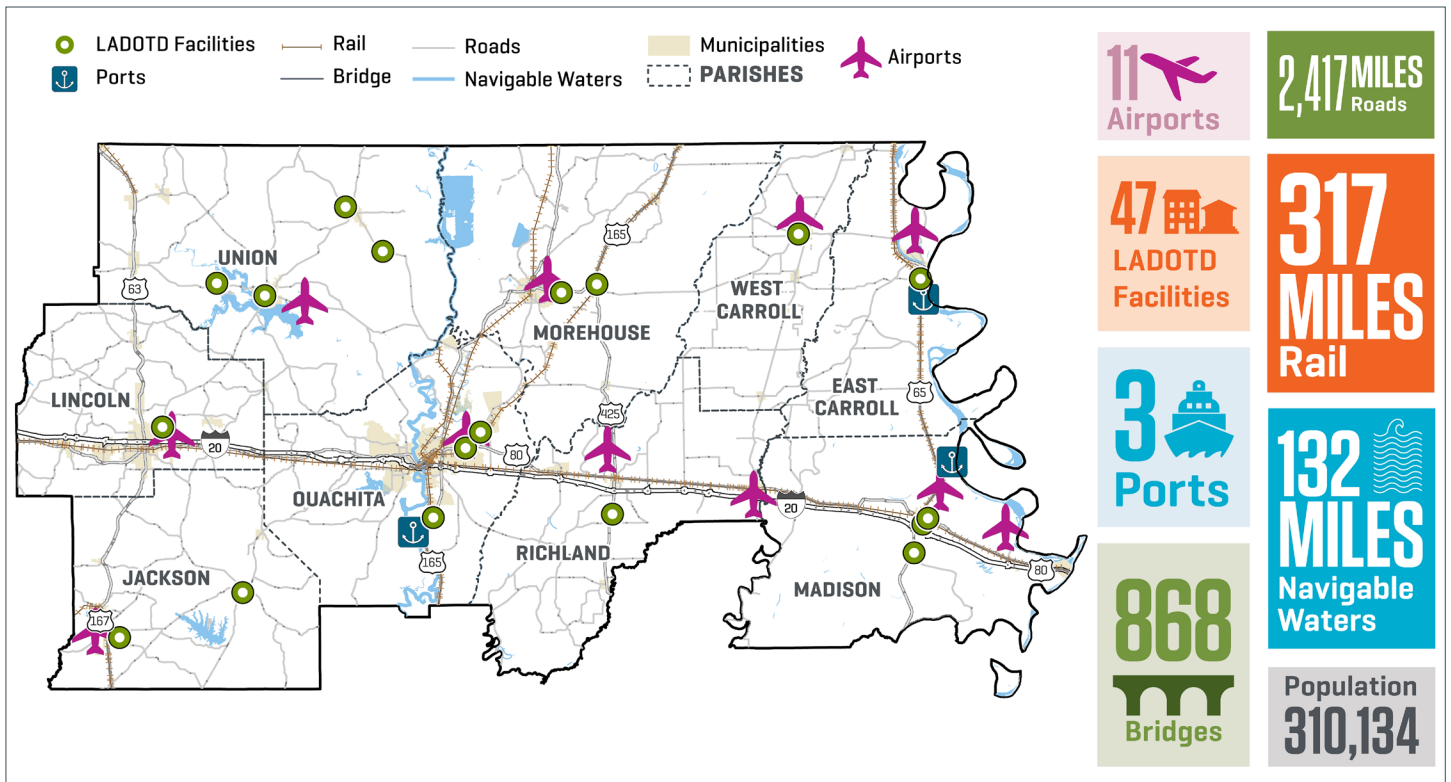


FIGURE 36: LADOTD District 05 transportation and infrastructure asset map

**Miles reported differ from FHWA figures because this analysis includes additional parts of the network.*

Summary

District 05 contains the northeastern Louisiana parishes of Union, Lincoln, Jackson, Ouachita, Richland, Madison, East Carroll, West Carroll, and Morehouse. These parishes provide crucial agricultural capacity to the state and region with crops like cotton, soybeans, rice, and livestock. The District is also home to two universities and several important historical and cultural sites.

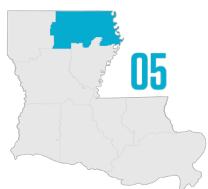
The Port of Lake Providence, an inland port shipping over 1.3 million tons annually,⁷ relies on access from I 20, US 65, LA 3181, and LA 2.⁸ Monroe Regional Airport provides high-volume commercial air service, and each parish contains at least one aviation facility, many of which offer commercial service and support regional agriculture. Three major medical institutions serve the District, employing over 3,000 people collectively,^{9,10} and new employment centers are emerging, such as Meta's \$10 billion data center slated for construction in Richland Parish.¹¹

The Fifth Louisiana Levee District and the Tensas Basin Levee District manage District 05's levees, the former having allocated \$9 million for right-of-way acquisitions, accompanying over \$130 million in federal investments, since 2021.¹² Ensuring district resilience is crucial to protecting local life and safety, the state economy, and the nationally important east-west connection of I 20.

ROADWAY CRITICALITY OVERVIEW	CATEGORY	COMPOSITE
	HIGH	20%
	MEDIUM	42%
	LOW	38%



Steel railroad bridge in Monroe



DISTRICT 05: MONROE

Hazard Impacts

Extreme Heat	Roadway cracking and degradation due to extreme temperatures.
Flooding	Flooding from multiple sources leads to inundation, road closures, and asset damage.
Geotechnical	Slope shifts, shoulder instability, and washouts (flood-related) reduce road width and threaten structures. Lack of slope and slide sensors complicates efforts to recognize and track these impacts.
Winter Weather	Public safety issues, access restrictions, and asset damages, especially due to ice on bridges.

Risk Results

Hazard	LADOTD Asset Type	H and HH Count	H and HH %	H and HH State % Comparison	Units
Extreme Heat	Bridge	2	0.2%	0.7% ▼	Number
Extreme Heat	Road	48	2.0%	4.6% ▼	Miles
Flood	Bridge	94	10.8%	13.4% ▼	Number
Flood	Road	39	0.0%	8.9% ▼	Miles
Geotechnical [Composite]	Road	N/A	N/A	13.9%	Miles
Geotechnical [Slope Stability]	Road	2	0.1%	0.2% ▼	Miles
Wind	Movable Bridge	0	0.0%	74.5% ▼	Number
Wind	ITS	0	0.0%	54.7% ▼	Number
Winter Weather	Road	548	22.7%	12.9% ▲	Miles
Winter Weather	Bridge	560	64.5%	71.3% ▼	Count



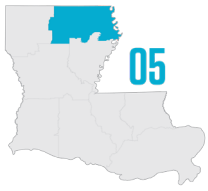
This District's H and HH % is lower than the State's %



This District's H and HH % is equal to the State's %



This District's H and HH % is higher than the State's %

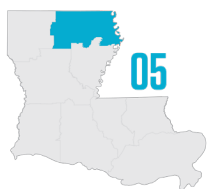


05

DISTRICT 05 PROJECTS



FIGURE 37: LADOTD District 05 resilience projects by hazard type and criticality



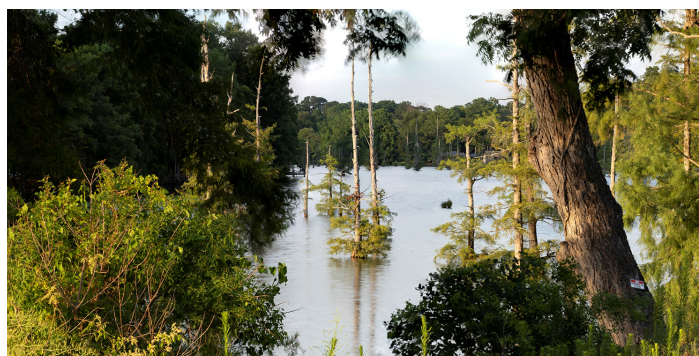
DISTRICT 05 PROJECTS

RESILIENCE PROJECT LIST

NO.	PROJECT	PRIMARY HAZARD	DESCRIPTION
1	US 165 and LA 15 Joint Resurfacing	Extreme Heat	Resurface joints to reduce pavement damage from heat and wear.
2	US 425 Culvert and Drainage Rehab	Flooding	Rehabilitate culverts to reduce flooding along US 425 near Bonner Ferry Road.
3	LA 132 Roadway Elevation Study	Flooding [Riverine]	Study the potential elevation of LA 132 to prevent regular flood closures.
4	US 165 Flood Prevention	Flooding [Riverine]	Reduce flood impacts near US 165 and LA 554 in Sterlington.
5	LA 15 Shoulder Restoration	Geotechnical	Restore eroded LA 15 shoulders to maintain safe access and prevent lane loss.
6	I 20 Overpass Slope Stabilization	Geotechnical	Stabilize I 20 slopes near overpasses to prevent disruption and landslides.
7	LA 33 Embankment Repair	Geotechnical	Repair embankments along LA 33 to prevent slope failure and road collapse.
8	Winter Storm Response Route Hardening	Winter Weather	Harden critical corridors to withstand ice, snow, and future winter events.



I 20 Highway



Bayou DeSiard in Quachita Parish



Ouchita River boardwalk



DISTRICT 07: LAKE CHARLES

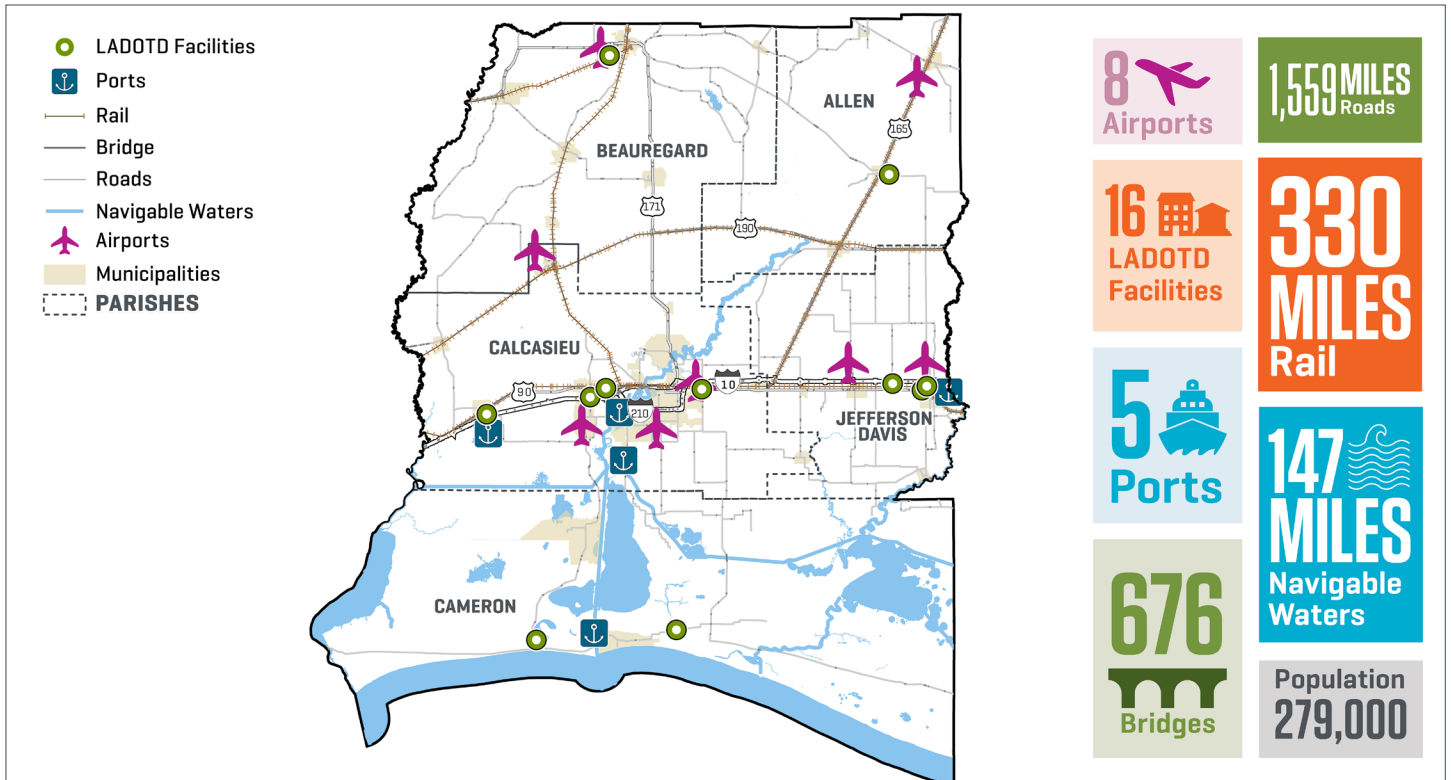


FIGURE 38: LADOTD District 07 transportation and infrastructure asset map

**Miles reported differ from FHWA figures because this analysis includes additional parts of the network.*

Summary

District 07 contains the southwestern Louisiana parishes of Beauregard, Calcasieu, Cameron, Jefferson Davis, and Allen. Rice and soybean farming are major economic activities, as is a growing tourism industry, which includes the Cameron Prairie National Wildlife Refuge, part of the Creole Nature Trail All-American Road that protects migratory bird habitat along with critical petrochemical and LNG facilities.

The Port of Lake Charles, the 10th-busiest U.S. port district and top LNG export hub globally, is accessed via I 10, I 210, US 90, and US 171.¹³ The I 10 Calcasieu River Bridge is a critical connector in the region providing access to the Port and is currently being upgraded through one of the largest public-private partnerships in the country. Chennault International Airport has one of the longest runways on the Gulf Coast and operates within a Foreign Trade Zone.¹⁴

Nearly \$21 billion in foreign direct investment (FDI) in the District has been announced or approved since Q2 2024, including the largest single FDI in the state's history: a \$17.5 billion LNG facility in Calcasieu Parish expected to produce up to 16.5 million metric tons annually.¹⁵ Investing in resilient transportation infrastructure here is of paramount importance to sustaining operations and mobility of people and goods in this district of ever-greater economic preeminence.

ROADWAY CRITICALITY OVERVIEW	CATEGORY		COMPOSITE	
	HIGH		32%	
	MEDIUM		48%	
	LOW		20%	



Calcasieu River World War II Memorial Bridge connecting Lake Charles and Westlake, Louisiana



DISTRICT 07: LAKE CHARLES

Hazard Impacts

Extreme Heat	Multiple roadways and bridges have sustained damage due to prolonged heat waves.
Flooding [Coastal]	Multiple roads flood during high tides, affecting LNG access, coastal mobility, and isolating some locations with only one-way access.
Flooding [Pluvial]	Roads like LA 101 and LA 397 flood from rainfall; drainage capacity is limited in some areas.
Flooding [Riverine]	US 171 near Barnes Creek floods often; detours increase delays for freight.
Geotechnical	Localized erosion occurs after major storms; it is not widespread but creates safety issues.
Wind	Wind causes closures of movable bridges, including those that are part of emergency routes.
Winter Weather	Areas near waterways or under tree cover [i.e., shaded] become ice-covered and remain that way for longer than other areas, reducing road safety.

Risk Results

Hazard	LADOTD Asset Type	H and HH Count	H and HH %	H and HH State % Comparison	Units
Extreme Heat	Bridge	3	0.4%	0.7% ▼	Number
Extreme Heat	Road	71	4.6%	4.6% =	Miles
Flood	Bridge	130	19.2%	13.4% ▲	Number
Flood	Road	220	14.1%	8.9% ▲	Miles
Geotechnical [Composite]	Road	27	1.7%	13.9% ▼	Miles
Geotechnical [Slope Stability]	Road	1	0.1%	0.2% ▼	Miles
Wind	Movable Bridge	7	87.5%	74.5% ▲	Number
Wind	ITS	142	60.4%	54.7% ▲	Number
Winter Weather	Road	208	13.4%	12.9% ▲	Miles
Winter Weather	Bridge	537	79.4%	71.3% ▲	Count



This District's H and HH % is lower than the State's %



This District's H and HH % is equal to the State's %



This District's H and HH % is higher than the State's %



07

DISTRICT 07 PROJECTS

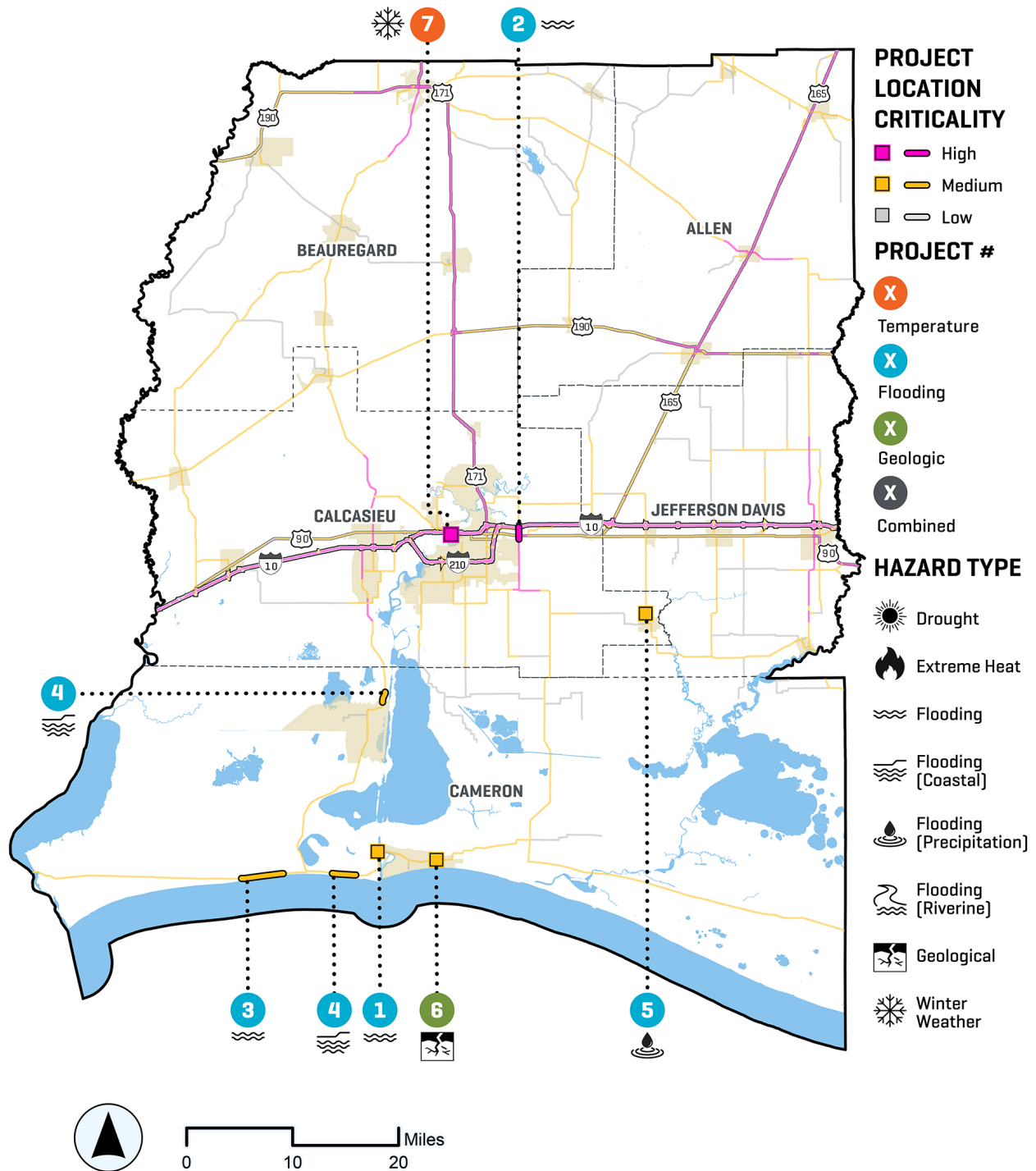


FIGURE 39: LADOTD District 07 resilience projects by hazard type and criticality



DISTRICT 07 PROJECTS

RESILIENCE PROJECT LIST

NO.	PROJECT	PRIMARY HAZARD	DESCRIPTION
1	Cameron Ferry Hardening	Flooding	Harden ferry landing to support community evacuations.
2	LA 397 Elevation	Flooding	Elevate roadway and implement drainage improvements to prevent overtopping.
3	LA 82 Elevation and Hardening	Flooding	Elevate the roadway and harden shoulders to prevent overtopping from high tides and minor tropical systems.
4	LA 27 Elevation and Stabilization	Flooding [Coastal]	Elevate multiple sections of LA 27 and install retaining structures and rip rap to stop regular tidal overtopping during minor tropical events.
5	LA 101 Bridge Extension	Flooding [Precipitation]	Extend bridge to reduce flooding from swamp retention at Hwy 101.
6	Cameron Parish Shoulder Hardening	Geotechnical	Harden shoulders to prevent erosion near LNG corridor, especially related to coastal storms.
7	Gibbstown Bridge Improvement	Winter Weather, Wind	Improve bridge to withstand and monitor winter storm impacts more effectively.



Lake Charles aerial port harbor



Veterans Memorial Park damage in Lake Charles, LA from Hurricane Laura



DISTRICT 08: ALEXANDRIA

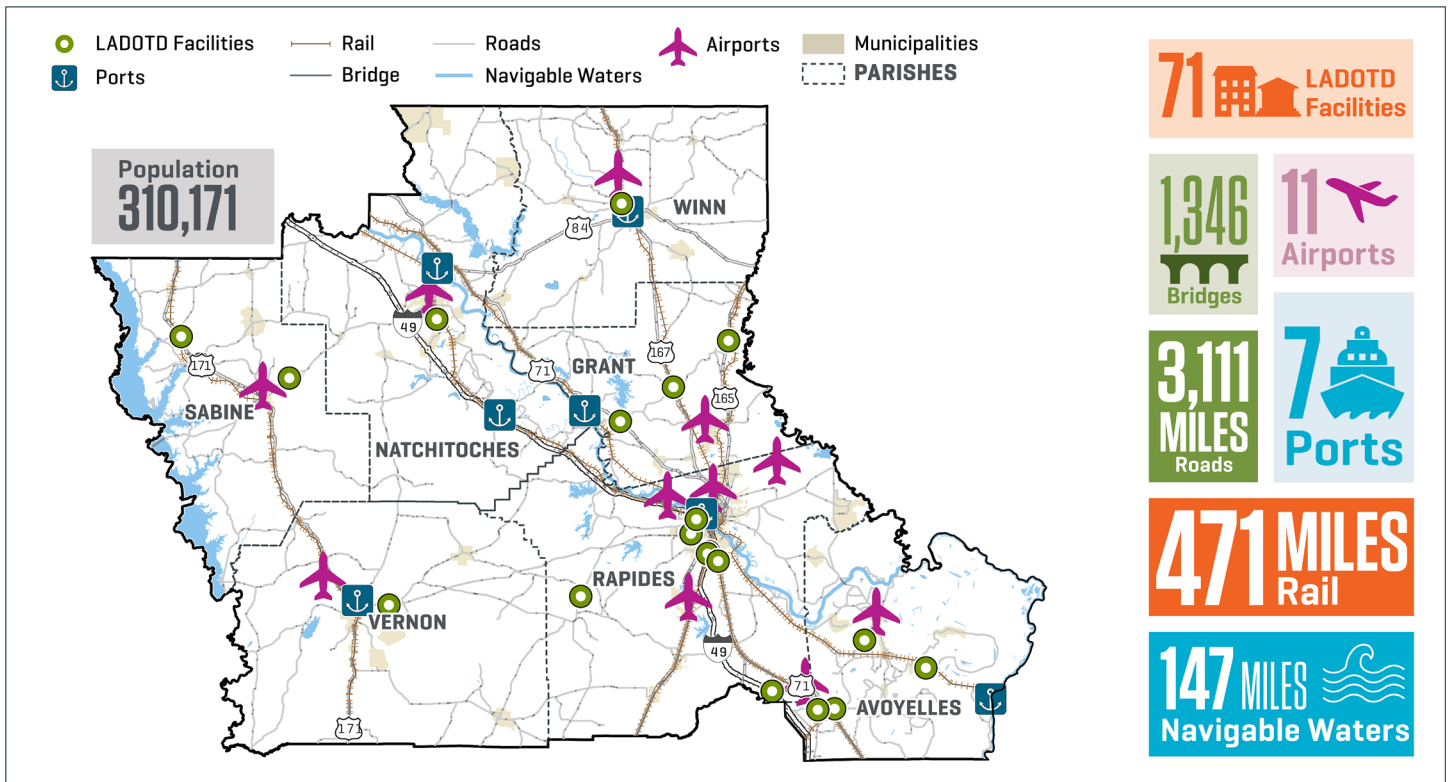


FIGURE 40: LADOTD District 08 transportation and infrastructure asset map

**Miles reported differ from FHWA figures because this analysis includes additional parts of the network.*

Summary

District 08 covers much of central Louisiana, including Avoyelles, Rapides, Vernon, Sabine, Natchitoches, Grant, and Winn Parishes. Though landlocked, the District maintains maritime connectivity through the Red River Waterway, which links to the Mississippi River System. The District features a diverse economy with strong roots in agriculture, timber, and forestry.¹⁶ Home to Kisatchie, Louisiana's only national forest, it spans over 604,000 acres across seven parishes, most of which fall in District 08.¹⁷

Across the District I 49 plays a pivotal role in interstate travel and evacuations, and in the Alexandria corridor routes like US 165, US 171, US 167, and LA 28 support access to major health care facilities and regional employment centers.

Key assets in the region include Alexandria International Airport, which serves as a transportation and military hub, and Central Louisiana Regional Port. Located in Rapides Parish, the port supports barge movement, military activity, and natural disaster response as a backup provider of fuel and fertilizer.¹⁸

District 08 experiences seasonal floods from spring rains, which can cause drainage backups into the Red River, road closures, and traffic rerouting. Resilience infrastructure is essential to ensure extreme weather has a limited impact on the District's daily traffic, essential freight corridors, and inland connectivity.

ROADWAY CRITICALITY OVERVIEW	CATEGORY	COMPOSITE
	HIGH	24%
	MEDIUM	33%
	LOW	43%



Bridge in Alexandria



DISTRICT 08: ALEXANDRIA

Hazard Impacts

Extreme Heat	Heavy rain followed by dry heat causes desiccation cracking on low-slope roadways. WWII-era asphalt over concrete roads like LA 1 and LA 28 buckle under prolonged heat exposure.
Flooding	Stability issues at the LA 1240 dam in Grant Parish; oversight is split between entities. Silted bayous and blocked outfalls limit drainage near Alexandria and surrounding areas.
Flooding (Pluvial)	Canal backup can cause extended flooding on LA 10 and LA 478.
Flooding (Riverine)	LA 120 and LA 478 flood seasonally, often remaining submerged for weeks.
Geotechnical	Slides and eroded medians and embankments impact key corridors, disrupting traffic and threatening roadways and utilities.
Winter Weather	Fog-influenced icing affects I 49 and LA 8 bridges; conditions can change rapidly with localized temperature changes.

Risk Results

Hazard	LADOTD Asset Type	H and HH Count	H and HH %	H and HH State % Comparison	Units
Extreme Heat	Bridge	16	1.2%	0.7% ▲	Number
Extreme Heat	Road	208	6.7%	4.6% ▲	Miles
Flood	Bridge	124	9.2%	13.4% ▼	Number
Flood	Road	154	5.0%	8.9% ▼	Miles
Geotechnical [Composite]	Road	6	0.2%	13.9% ▼	Miles
Geotechnical [Slope Stability]	Road	9	0.3%	0.2% ▲	Miles
Wind	Movable Bridge	0	0.0%	74.5% ▼	Number
Wind	ITS	0	0.0%	54.7% ▼	Number
Winter Weather	Road	151	4.8%	12.9% ▼	Miles
Winter Weather	Bridge	758	56.3%	71.3% ▼	Count



This District's H and HH % is lower than the State's %



This District's H and HH % is higher than the State's %



08

DISTRICT 08 PROJECTS

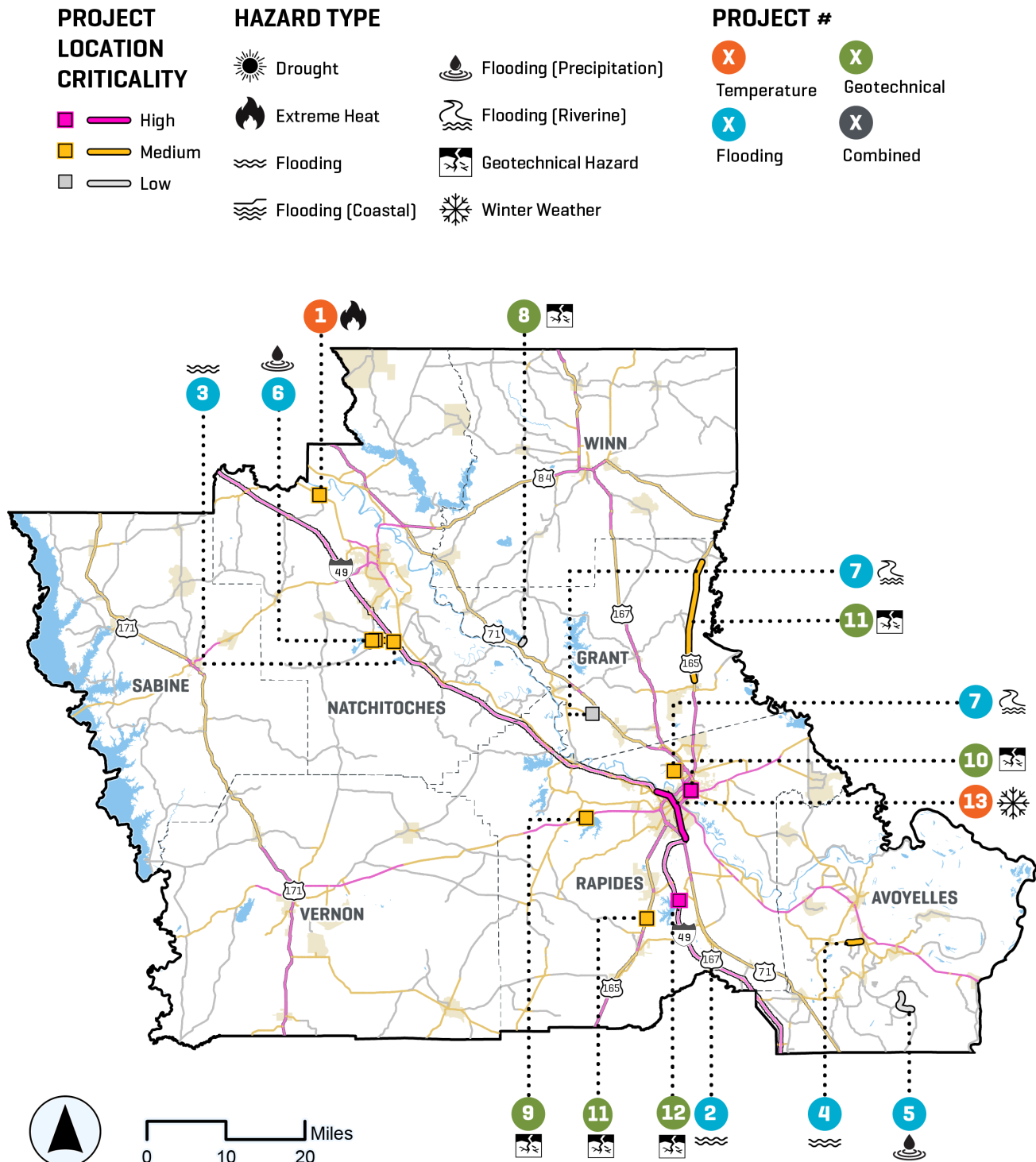


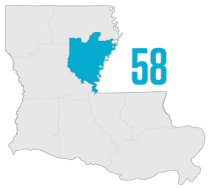
FIGURE 41: LADOTD District 08 resilience projects by hazard type and criticality



DISTRICT 08 PROJECTS

RESILIENCE PROJECT LIST

NO.	PROJECT	PRIMARY HAZARD	DESCRIPTION
1	Replace Composite Pavement Roadways	Extreme Heat	Identify and improve road surfaces built with composite material post-WWII and/or other risk factors for cracking.
2	I 49 Drainage Improvements [Rapides Parish North to US 167]	Flooding	Improve drainage to reduce flooding.
3	LA 120 Flood [Longlois Rd to I 49]	Flooding	Mitigate backwater flooding issues.
4	LA 114 Drainage Improvements	Flooding	Improve drainage, including through lateral ditches, to reduce flooding.
5	LA 107 South to LA 1181 Study	Flooding [Pluvial]	Conduct a study to document flooding issues and identify solutions.
6	LA 478 Elevation Flooding at Bayou Provencal	Flooding [Pluvial]	Elevate the roadway to prevent significant flooding to depths of ~3 feet that can persist for over a month.
7	Red River Flood Mitigation	Flooding [Riverine]	Road elevation and flood infrastructure improvements for areas impacted by 2015 Red River flood.
8	LA 1240 Dam Safety Improvement, Grand Parish	Geotechnical	Address stability issues with the LA 1240 Dam.
9	LA 28 Slope Repair	Geotechnical	Permanently repair a backslope issue to eliminate repetitive interim fixes.
10	US 167 Slope Repair	Geotechnical	Repair major spill slope and damage to concrete revetment for north- and southbound bridges at US 167/ LA 28.
11	US 165 Erosion Countermeasures	Geotechnical	To preserve Forestry Road access, mitigate extensive erosion along the bank of Indian Creek, in the road median, and along the adjacent slopes, which is threatening bridge and road integrity.
12	Forestry Road Stabilization and Access	Geotechnical	Repair major slope failures in embankment to prevent structure from being closed to traffic on Forestry Road.
13	Remote Monitoring of I 49 through Alexandria and the LA 8 River Crossing	Winter Weather	Install remote monitoring equipment and software to support forecasting and extreme weather response.



DISTRICT 58: CHASE

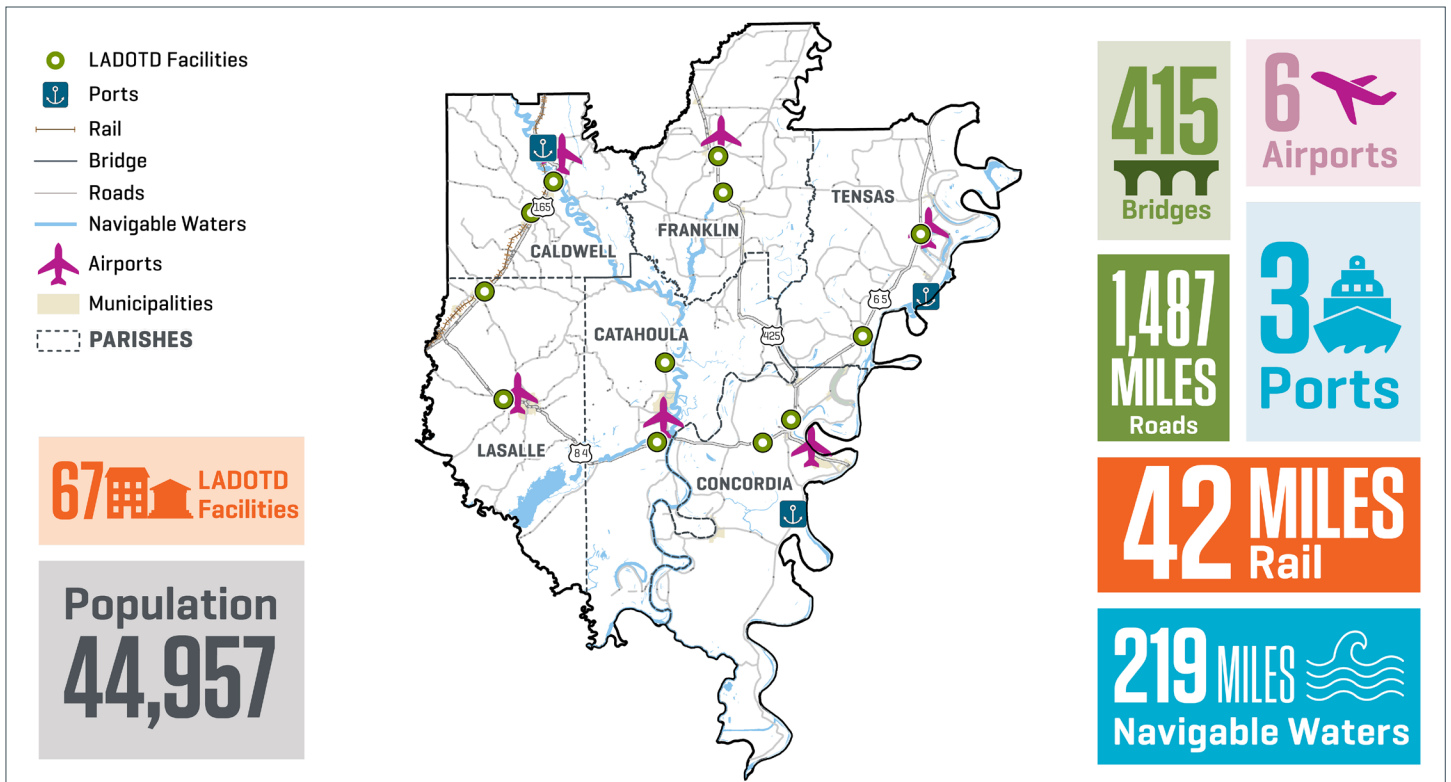


FIGURE 42: LADOTD District 58 transportation and infrastructure asset map

**Miles reported differ from FHWA figures because this analysis includes additional parts of the network.*

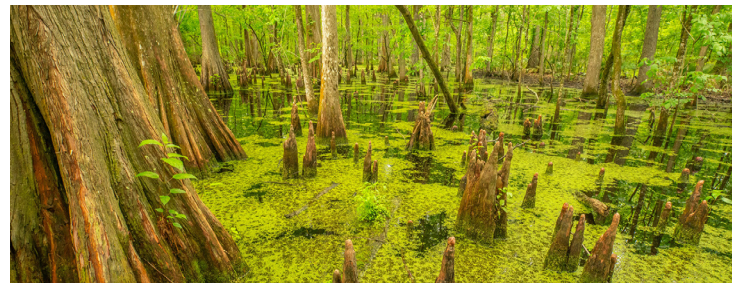
Summary

District 58 spans the rural northeastern parishes of Caldwell, La Salle, Catahoula, Tensas, and Concordia. Surrounded by rivers and wetlands, Concordia Parish has direct access to the Mississippi River, making it a vital hub for trade and connectivity.¹⁹ The region plays a significant role in agricultural production and conservation, with over 100,000 acres of hardwood forests and protected wildlife between the Tensas River National Wildlife Refuge and Catahoula National Wildlife Refuge.^{20,21}

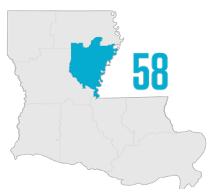
The inland region's agriculture-driven economy relies on freight corridors and rural access routes such as LA 559, US 65, US 84, and local ports. The Port of Columbia provides cargo, warehousing, and vessel services to the region and is expecting future growth from a planned renewable diesel plant in Caldwell. The project will create over 1,200 jobs and expand the region's energy infrastructure.²²

Many routes across the region are vulnerable to severe slope erosion, extreme heat, and persistent flood hazards. Overflow from major rivers such as the Mississippi and Ouachita threatens the District's protected ecosystems and can result in closures, detours, and infrastructure decay of critical freight corridors. Resilient upgrades and increased resources could play a pivotal role in strengthening the District's connectivity and long-term economic stability.

ROADWAY CRITICALITY OVERVIEW	CATEGORY		COMPOSITE	
	HIGH		8%	
	MEDIUM		37%	
	LOW		55%	



Tensas wildlife refuge



DISTRICT 58: CHASE

Hazard Impacts

Extreme Heat	US 65 has experienced at least 200 joint blowups in one parish; heat and soil movement worsen roadway cracking.
Flooding	Flooding (riverine and precipitation) inundates and damages roads, restricting travel access, threatening public safety, and increasing maintenance needs. Flood issues have occurred on multiple routes, including LA 84, LA 133, LA 165, LA 506, LA 562, LA 559, LA 847, and US 84. Routes like LA 559 lack detours, isolating communities when submerged.
Geotechnical	Slides and slope failures threaten multiple roadways, including at least one levee-topped road.
Winter Weather	Freezing fog and ferry closures disrupt access.

Risk Results

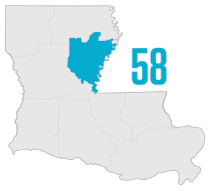
Hazard	LADOTD Asset Type	H and HH Count	H and HH %	H and HH State % Comparison	Units
Extreme Heat	Bridge	0	0.0%	0.7% ▼	Number
Extreme Heat	Road	58	3.9%	4.6% ▼	Miles
Flood	Bridge	27	6.5%	13.4% ▼	Number
Flood	Road	13	0.9%	8.9% ▼	Miles
Geotechnical [Composite]	Road	N/A	N/A	13.9%	Miles
Geotechnical [Slope Stability]	Road	4	0.3%%	0.2% ▲	Miles
Wind	Movable Bridge	0	0.0%	74.5% ▼	Number
Wind	ITS	0	0.0%	54.7% ▼	Number
Winter Weather	Road	94	5.2%	12.9% ▼	Miles
Winter Weather	Bridge	180	43.4%	71.3% ▼	Count



This District's H and HH % is lower than the State's %



This District's H and HH % is higher than the State's %



58

DISTRICT 58 PROJECTS

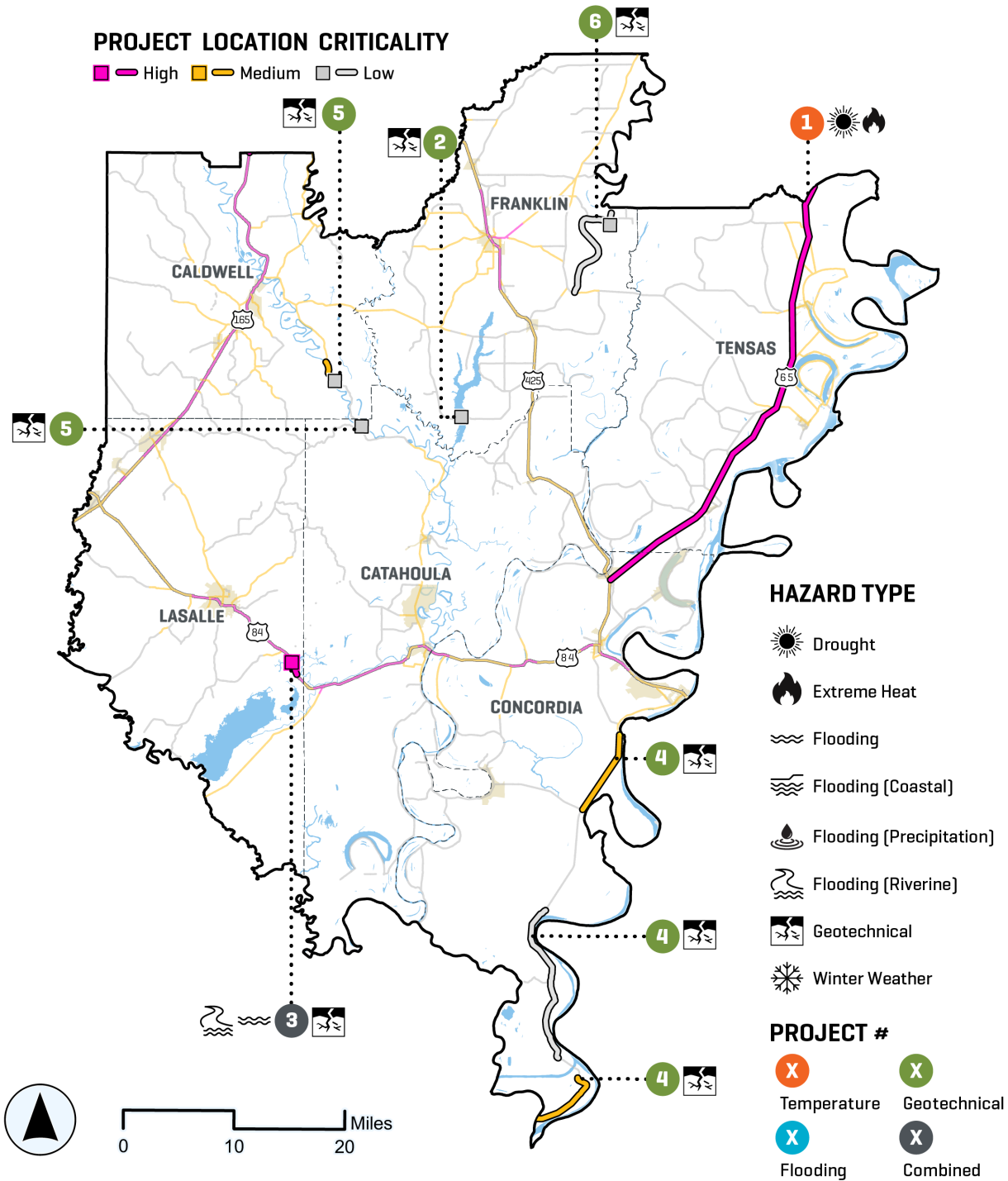
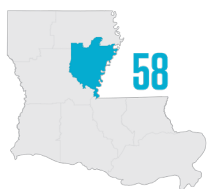


FIGURE 43: LADOTD District 58 resilience projects by hazard type and criticality



DISTRICT 58 PROJECTS

RESILIENCE PROJECT LIST

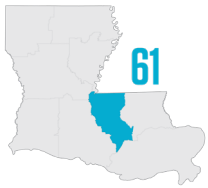
	PROJECT	PRIMARY HAZARD	DESCRIPTION
1	US 65 Joint Repair and Pavement Resurfacing	Extreme Heat, Drought	Resurface about 20 miles of US 65 to address locked concrete joints and long-term heat-related deterioration.
2	LA 562 Erosion Mitigation	Geotechnical	Reconstruct roadway and provide erosion/slope protection to prevent closures.
3	US 84 Slope Stabilization [Willow Lake Area]	Flooding (Riverine) / Geotechnical	Stabilize a 1.5-mile segment of US 84 prone to erosion by decreasing slope and armoring the fore slope.
4	LA 131 / LA 15 Levee Road Slide Mitigation	Geotechnical	Stabilize slide zones along levee roads critical to Old River emergency access.
5	LA 559 Erosion Mitigation and Road Stabilization	Geotechnical	Reinforce LA 559, the only access and evacuation route for rural residents near Ouachita River.
6	LA 610 Realignment and Slide Repair	Geotechnical	Realign roadway away from Bayou Macon and restore LA 610's full width by repairing slides to keep road open.



Tensas roadway flooding



Tensas Lake Bruin



DISTRICT 61: BATON ROUGE

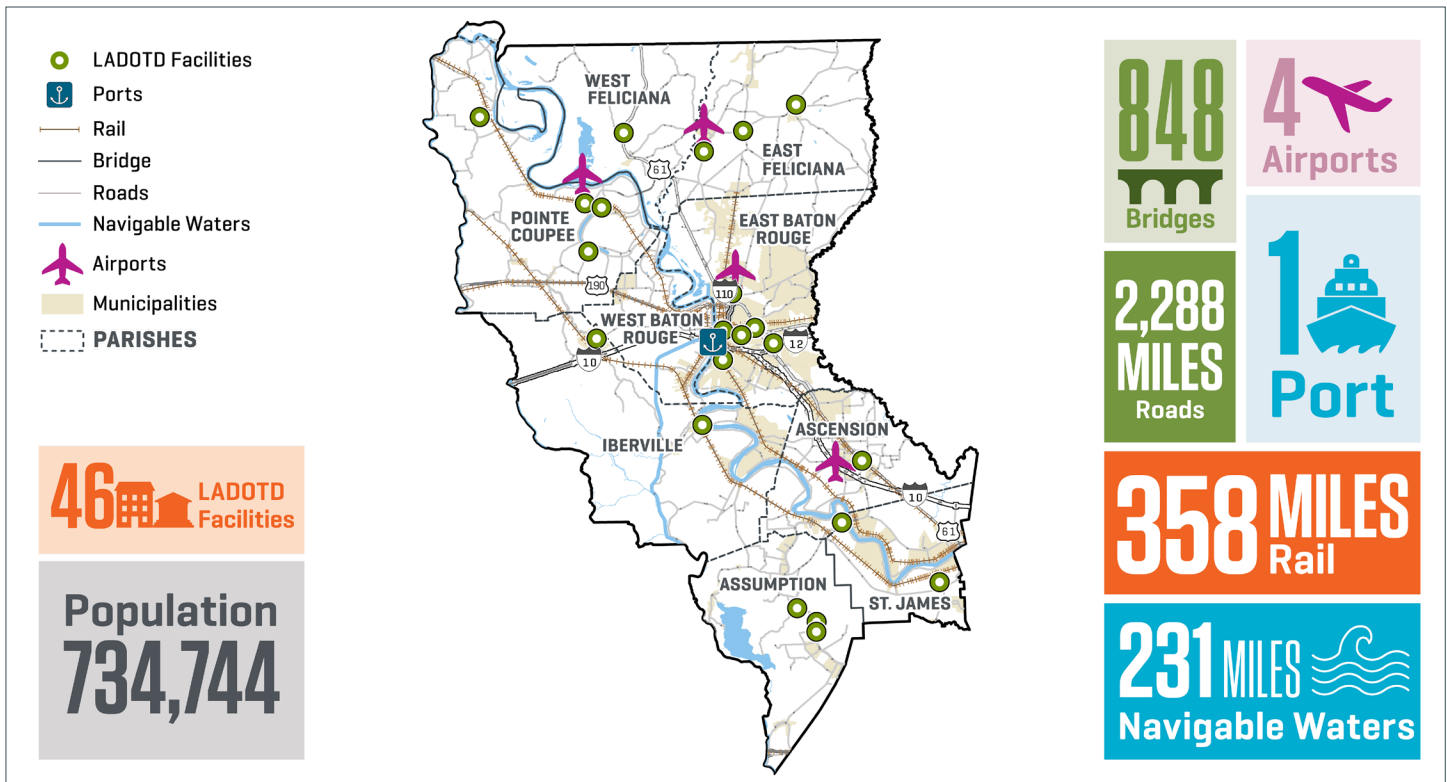


FIGURE 44: LADOTD District 61 transportation and infrastructure asset map

**Miles reported differ from FHWA figures because this analysis includes additional parts of the network.*

Summary

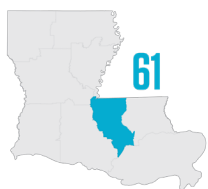
District 61 contains Iberville, Pointe Coupee, West Feliciana, East Feliciana, East Baton Rouge, West Baton Rouge, Assumption, St. James, and Iberville Parishes. Agriculture is a major industry in Pointe Coupee, Assumption, and Iberville Parishes,^{23,24,25} and as the seat of state government, hundreds of state and federal offices employ thousands of people.²⁶ District 61 has the sixth-largest refinery in the United States²⁷ and the River Bend Nuclear Generating Station, which produces 8% of Louisiana's electricity.²⁸ District 61 is also home to Louisiana State University, a major employer and supporter of agricultural, engineering, and coastal systems research throughout Louisiana.

The Audubon Bridge, the second-longest cable-stayed bridge in the western hemisphere, connects communities across the Mississippi River and supports freight and emergency access.²⁹ I 10, I 12, US 61, US 190, and state routes provide access to refineries, job centers, and river-based industries. The Port of Greater Baton Rouge, 8th largest in the nation in 2022, contributes to over \$1 billion in agricultural exports from Louisiana.³⁰ The only commercial airport in the District is the Baton Rouge Metropolitan Airport, which houses a 33,000 square foot cargo facility and functions within a Foreign Trade Zone.³¹ Resilience investments here are vital to supporting the state's recovery capabilities, energy infrastructure, and sustaining substantial national economic activity.

ROADWAY CRITICALITY OVERVIEW	CATEGORY	COMPOSITE
	HIGH	36%
	MEDIUM	47%
	LOW	17%



Baton Rouge downtown



DISTRICT 61: BATON ROUGE

Hazard Impacts

Extreme Heat	Composite pavement buckles under prolonged heat on major roads.
Flooding [Precipitation, Riverine]	Inundation or restricted access to LA 1 and LA 15 limits critical facilities access, including to federal sites. Overtopping and culvert failures can occur on key routes. Some roads rely on pumps to remain passable.
Geotechnical	Slides on I 10 and Angola Road signal wider embankment risks. Steel culverts like those on LA 67 show failure risk from erosion and age.
Wind	2021 storm winds knocked a transmission line into a priority route, and a 2024 tornado downed more than 10,000 trees; tornado cleanup spanned multiple districts.
Winter Weather	Ice storms disrupt bridges and key routes despite implementing response protocols.

Risk Results

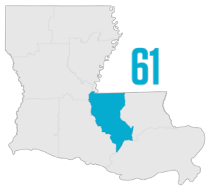
Hazard	LADOTD Asset Type	H and HH Count	H and HH %	H and HH State % Comparison	Units
Extreme Heat	Bridge	2	0.2%	0.7% ▼	Number
Extreme Heat	Road	90	3.9%	4.6% ▼	Miles
Flood	Bridge	92	10.8%	13.4% ▼	Number
Flood	Road	127	5.5%	8.9% ▼	Miles
Geotechnical [Composite]	Road	260	11.4%	13.9% ▼	Miles
Geotechnical [Slope Stability]	Road	7	0.3%	0.2% ▲	Miles
Wind	Movable Bridge	7	87.5%	74.5% ▲	Number
Wind	ITS	439	66.1%	54.7% ▲	Number
Winter Weather	Road	186	10.4%	12.9% ▼	Miles
Winter Weather	Bridge	730	86.1%	71.3% ▲	Count



This District's H and HH % is lower than the State's %



This District's H and HH % is higher than the State's %



DISTRICT 61 PROJECTS

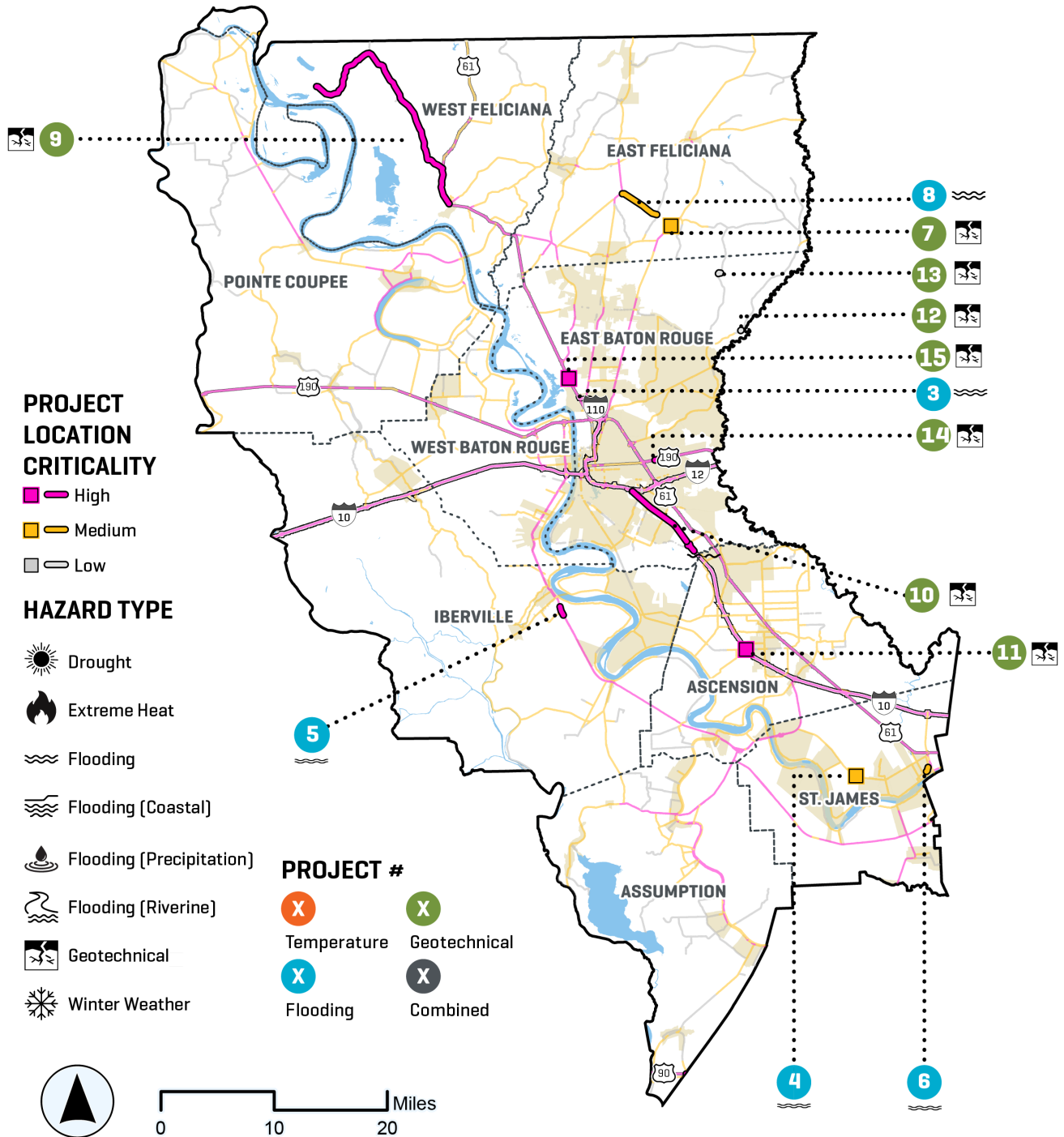
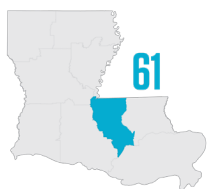


FIGURE 45: LADOTD District 61 resilience projects by hazard type and criticality



DISTRICT 61 PROJECTS

RESILIENCE PROJECT LIST

NO.	PROJECT	PRIMARY HAZARD	DESCRIPTION
1	District-wide Roadway Buckling Mitigation	Extreme Heat	Address heat-related pavement failures district-wide.
2	Debris Management Plan	Flooding	Develop district-wide post-storm debris strategy.
3	I 110 Drainage and Median Repairs	Flooding	Implement repairs to embankment and drainage issues, including damage to the concrete median near exit 8A.
4	LA 3125 Improvements	Flooding	Install geo-polymer lining on existing CMP multi-barrel crossings along the corridor.
5	LA 1 Elevation, Drainage Improvements, and Critical Facilities Access	Flooding	Reduce flooding through elevation, pipe upgrades, and drainage fixes and preserve access to critical facilities.
6	LA 641 Drainage Improvements	Flooding	Improve storm drainage in the residential corridor.
7	LA 67 and Other Sites Structural Steel Culvert Replacements	Flooding	Conduct an inventory of steel drains and pipes; replace failing culverts at LA 67 and similar sites.
8	LA 955 Box Culvert Drainage Revitalization	Flooding	Replace the culvert to reduce chronic localized flooding.
9	LA 66 Embankment Repair and Angola Road Sliding Remediation	Geotechnical	Repair embankment failures aggravated during winter, from US 61 North. Stabilize slopes along flood-prone Angola Road.
10	I 10 Drainage Structures and Embankment Issues	Geotechnical	Repair drainage structures and slopes at multiple locations, including Highland Road and west bound between Mainline and Ramp 166.
11	I 10 Median Slide Remediation	Geotechnical	Repair slope failure in the I 10 median near LA 30.
12	LA 37 Embankment Issues	Geotechnical	Greenwell Springs northbound shoulder slope repair.
13	LA 409 Scouring Remediation	Geotechnical	Address scour issues near the Sandy Creek Bridge.
14	US 190 Scouring Remediation and Drainage Improvements	Geotechnical	Repair scour at Jones Creek between twin bridges and remediate drainage structures between Mainline and Service Rd.
15	US 61 Drainage Structures and Embankment Remediation	Geotechnical	Repair drainage structures and slopes along US 61.



DISTRICT 62: HAMMOND

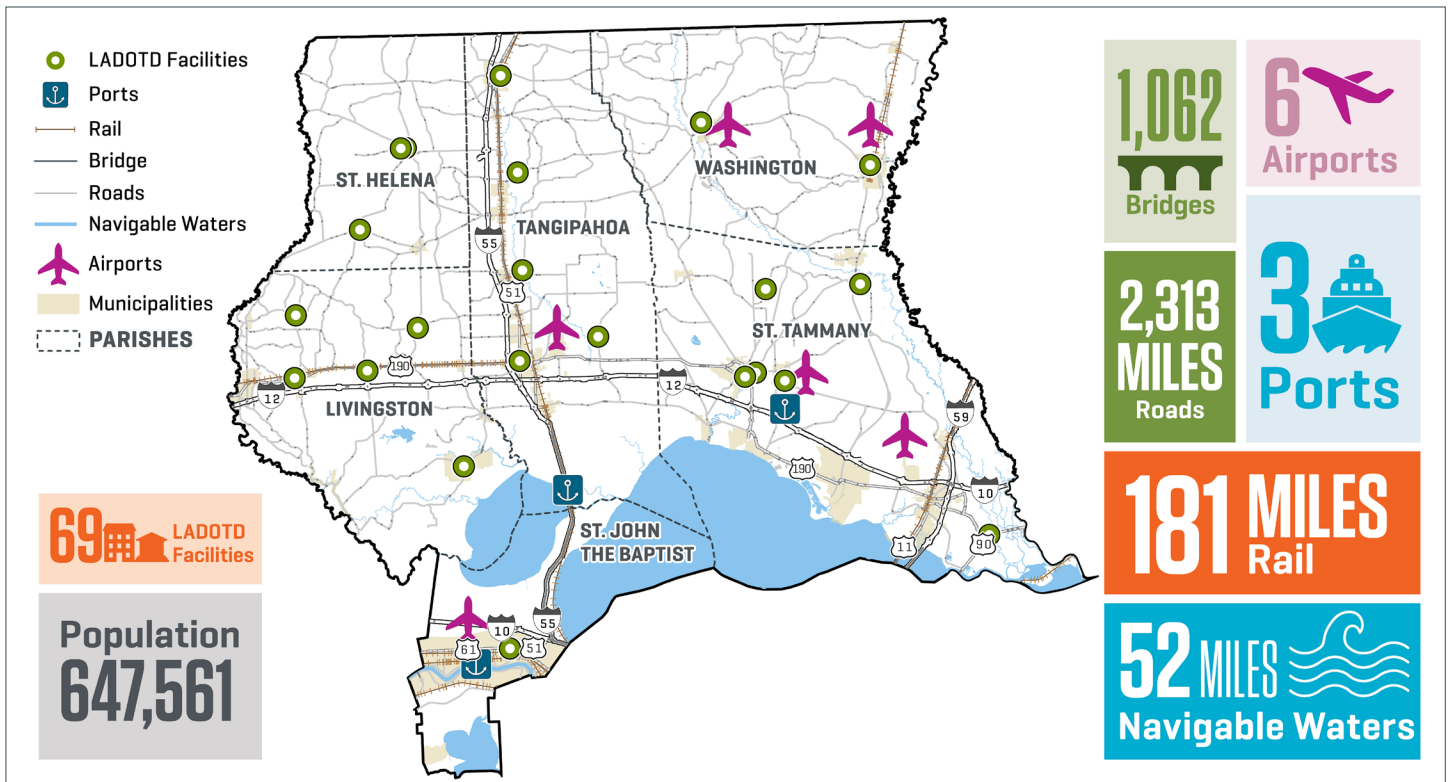


FIGURE 46: LADOTD District 62 transportation and infrastructure asset map

**Miles reported differ from FHWA figures because this analysis includes additional parts of the network.*

Summary

District 62 consists of St. Helena, Livingston, Tangipahoa, Washington, St. Tammany, and St. John the Baptist Parishes. Economic sectors vary from manufacturing and agriculture to food processing, service, petroleum refining, and petrochemical transfer.³² Spanning 54 miles, the Port of South Louisiana ships over 50% of all U.S. grain exports, further boosting the District's diverse economy.³³

The District contains critical assets like ports, refineries, and hospitals that rely on access from I 10, I 12, I 55, and I 59. I 10 connects Baton Rouge, New Orleans, and Mississippi via the Pearl River and Twin Spans bridges, supporting hurricane evacuations and freight movement through vulnerable coastal zones and offering redundancy when inland routes or urban bridges are impacted. St. Tammany Parish is home to the Lake Pontchartrain Causeway, which spans 24 miles to New Orleans. Constructed in 1956, the causeway is one of the world's longest bridges over a body of water and provides a critical evacuation route for New Orleans.³⁴

Many key assets across the District are prone to riverine flooding from numerous waterways. Tropical storms and hurricanes can cause tidal surges that disrupt critical infrastructure. The District also experiences severe weather events, sometimes causing disruption to major infrastructure such as I 10 and I 90 due to ice accumulation and heavy snow.

ROADWAY CRITICALITY OVERVIEW	CATEGORY	COMPOSITE
	HIGH	27%
	MEDIUM	44%
	LOW	30%



Old Pearl River lined with green trees in White Kitchen of St. Tammany Parish Louisiana



DISTRICT 62: HAMMOND

Hazard Impacts

Extreme Heat	US 190 and I 55 buckle in summer during high temperatures.
Flooding [Coastal, Precipitation, Riverine]	Multiple roadways experience frequent flooding from sunny day tidal flooding as well as storm events. LADOTD does not own or operate local flood control assets; drainage coordination is critical.
Winter Weather	Ice on roadways (including I 10, LA 22, and LA 64) creates severe lane hazards and refreezing challenges.

Risk Results

Hazard	LADOTD Asset Type	H and HH Count	H and HH %	H and HH State % Comparison	Units
Extreme Heat	Bridge	0	0.0%	0.7% ▼	Number
Extreme Heat	Road	12	0.5%	4.6% ▼	Miles
Flood	Bridge	226	21.3%	13.4% ▲	Number
Flood	Road	272	11.8%	8.9% ▲	Miles
Geotechnical [Composite]	Road	214	9.3%	13.9% ▼	Miles
Geotechnical [Slope Stability]	Road	3	0.1%	0.2% ▼	Miles
Wind	Movable Bridge	6	75.0%	74.5% ▲	Number
Wind	ITS	262	67.7%	54.7% ▲	Number
Winter Weather	Road	188	10.5%	12.9% ▼	Miles
Winter Weather	Bridge	719	67.7%	71.3% ▼	Count



This District's H and HH % is lower than the State's %



This District's H and HH % is higher than the State's %





DISTRICT 62 PROJECTS

RESILIENCE PROJECT LIST

NO.	PROJECT	PRIMARY HAZARD	DESCRIPTION
1	US 190 and LA 22 Roadway Buckling Mitigation	Extreme Heat	Design and construction of roadways using pavement and techniques less vulnerable to buckling.
2	I 12 Widening	Flooding	I 12 bridge widening to two lanes to better facilitate evacuation efforts.
3	I 55 Frontage Elevation Extension	Flooding	Extension of the elevated section of I 55 frontage further north.
4	LA 1036 Flood Mitigation	Flooding	Flood mitigation on LA 1036 at Tickfaw.
5	LA 22 Flood Mitigation	Flooding	Flood mitigation on LA 22 at LA 16.
6	LA 433 Flood Mitigation	Flooding	Flood mitigation measures along LA 433 in Bayou Liberty.
7	LA 441 Flood Mitigation	Flooding	Flood mitigation on LA 441 between LA 442 and the St. Helena Parish line.
8	I 59 Flood Mitigation	Flooding	Flood mitigation measures on I 59 at exit 5A.
9	Severe Fog Response Plan	Fog	Development of a plan coordinating state and municipal stakeholders during fog.
10	LA 432 Slope Repair	Geotechnical	Repair slope failure east of the Amite River bridge, where the stream migration under cuts the roadway embankment.
11	District-wide ITS Integration Plan	Multiple	Development of a plan for and/or installation of ITS technology district-wide.
12	Management Program for US 11, US 51, US 190	Multiple	Study of relevant hazard probabilities and impacts and development of a plan for prevention and response unique to this route.
13	Winter Weather Mitigation Program	Winter Weather	Strategic protocol to mitigate against winter weather hazards on US 190, LA 22 at Tickfaw, and LA 64 at Amite River.



Brown pelican perched on a wooden pole by the lake shore in St. Tammany Parish, Louisiana



West Pearl River US 90 Bridge



APPENDICES



TRIP References

1. Louisiana Economic Development. [2025]. *Business climate*.
<https://www.opportunitylouisiana.gov/why-louisiana/business-climate>
2. Coastal Protection and Restoration Authority. [n.d.]. *National significance*.
<https://coastal.la.gov/whats-at-stake/national-significance/>
3. Louisiana Economic Development. [2025]. 2025 Comprehensive Statewide Strategic Plan [PDF]. <https://admin.opportunitylouisiana.gov/wp-content/uploads/2025/03/LED-2025-Comprehensive-Statewide-Strategic-Plan-FINAL.pdf>
4. Louisiana Economic Development. [2025]. *Agribusiness – Key industries*.
<https://www.opportunitylouisiana.gov/key-industry/agribusiness>
5. Coastal Protection and Restoration Authority. [n.d.]. *National Significance*.
<https://coastal.la.gov/whats-at-stake/national-significance/>
6. Louisiana Department of Natural Resources. [2022]. *Louisiana Energy Facts Annual 2022* [PDF].
https://www.dnr.louisiana.gov/assets/TAD/newsletters/energy_facts_annual/LEF_2022.pdf
7. United States Department of Agriculture, National Agricultural Statistics Service. [2024]. *Louisiana State Agriculture Overview 2024*. https://www.nass.usda.gov/Quick_Stats/Ag_Overview/stateOverview.php?state=LOUISIANA
8. Office of the United States Trade Representative. [2024]. Louisiana. <https://ustr.gov/map/state-benefits/la>
9. Louisiana Workforce Commission. [2025.]. *Louisiana Workforce Resources*.
<https://www.louisianaworks.net/hire/vosnet/Default.aspx?plang=>
10. Couvillion, Brady R., et al. "Spatial Configuration Trends in Coastal Louisiana from 1985 to 2010." *Wetlands*, vol. 36, no. 2, 13 Feb. 2016, pp. 347–359, <https://doi.org/10.1007/s13157-016-0744-9>
11. Ibid.
12. "World of Change: Growing Deltas in Atchafalaya Bay." *Earthobservatory.nasa.gov*, 10 Mar. 2015, earthobservatory.nasa.gov/world-of-change/WaxLake
13. Ibid.

14. Day, John, et al. *Science & Engineering Special Team Environmental Defense Fund Everglades Division South Florida Water Management District the Science and Engineering Special Team Is a Network of Eminent Scientists and Engineers Convened by the National Audubon Society, the Environmental Defense Fund, and the National Wildlife Federation to Provide Objective and Independent Analysis Pertaining to Mississippi River Delta Restoration*. Mississippi River Delta Science and Engineering Special Team.
15. US Department of Commerce, NOAA. [2023]. "2023 Summer Heat & Climatology." [www.weather.gov. www.weather.gov/lix/2023summerheat](http://www.weather.gov/lix/2023summerheat)
16. Collins, Nicole. [2025] "Historic January 2025 Snowstorm in the Southern U.S." NOAA Climate.gov. www.climate.gov/news-features/event-tracker/historic-january-2025-snowstorm-southern-us
17. Governor's Office of Homeland Security and Emergency Preparedness. [2024]. State Hazard Mitigation Plan. <https://gohsep.la.gov/divisions/hazard-mitigation-assistance/state-hazard-mitigation-plan/>
18. U.S. Chemical Safety and Hazard Investigation Board. [April 24, 2023]. "U.S. Chemical Safety Board Releases Final Report into 2020 Toxic Gas Release and Chemical Fire at Bio-Lab Facility in Westlake, LA." <https://www.csb.gov/us-chemical-safety-board-releases-final-report-into-2020-toxic-gas-release-and-chemical-fire-at-bio-lab-facility-in-westlake-la/>
19. Fuentes, Andrés. [2023] "6 Million Records Impacted by Louisiana OMV Hack in June, Cyber Security Group Reports." <https://www.fox8live.com>, FOX 8 Local First. www.fox8live.com/2023/08/25/6-million-records-impacted-by-louisiana-omv-hack-june-cyber-security-group-reports/.
20. Destination Zero Deaths Louisiana. [n.d.] Homepage. <https://destinationzerodeaths.com/>

District Summaries References

1. NOLA Ready. [2025]. *New Orleans Community Profile*. <https://ready.nola.gov/hazard-mitigation/new-orleans-profile/>
2. Greater New Orleans Parishes [2025]. *Explore the Parishes of Greater New Orleans*. <https://gnoinc.org/doing-business/parishes/>
3. Ibid.
4. Ibid.
5. KLFY Acadiana Local News. 2 years after historic flood, Youngsville working to prevent future flooding. [August 18, 2008]. <https://www.klfy.com/local/2-years-after-historic-flood-youngsville-working-to-prevent-future-flooding/>
6. Alexander, R. [July 11, 2023]. *Red River Waterway Commission, Port of Caddo-Bossier are a dynamic economic asset for North LA*. The Shreveport Times. <https://www.shreveporttimes.com/story/opinion/2023/06/11/red-river-waterway-commission-port-of-caddo-bossier-are-a-dynamic-economic-asset/70302610007/>
7. Louisiana State University Agricultural Center. [2025]. *East Carroll Parish*. LSU AgCenter. Retrieved July 7, 2025, from https://www.lsuagcenter.com/portals/our_offices/parishes/east%20carroll
8. International Raw Materials & Port Terminals. [2025]. *Lake Providence Port*. IRPT. Retrieved July 7, 2025, from https://www.irpt.net/map-location/lake-providence-port/?mpfy_map=628&mpfy-pin=101
9. Franciscan Missionaries of Our Lady Health System. [2025]. *Northeast Louisiana*. FMOLHS. Retrieved July 7, 2025, from <https://www.fmolhs.org/locations/northeast-louisiana>
10. Glenwood Regional Medical Center. [n.d.]. *About Glenwood*. Retrieved July 7, 2025, from <https://glenwoodregional.org/about/>
11. Louisiana Economic Development. [2025]. *Meta Data Center*. Opportunity Louisiana. Retrieved July 7, 2025, from <https://www.opportunitylouisiana.gov/metadatabasecenter>
12. Louisiana Department of Transportation and Development. [2025]. *Mississippi River Levee Raising Project – Fifth Levee District*. Retrieved July 7, 2025, from <https://www.dotd.louisiana.gov/about/office-of-public-works/levees/mississippi-river-levee-raising-project-fifth-levee-district/>

District Summaries References (Continued)

13. Port of Lake Charles. [2025]. *Home*. Retrieved July 7, 2025, from <https://portlc.com/>
14. Chennault International Airport. [2025]. *Home*. Retrieved July 7, 2025, from <https://chennault.org/>
15. Louisiana Economic Development. [April 28, 2024]. *Historic investment: Woodside Energy announces \$17.5 billion final investment decision for LNG facility in Southwest Louisiana; becomes largest foreign direct investment in state history*. Opportunity Louisiana. Retrieved July 7, 2025, from <https://www.opportunitylouisiana.gov/news/historic-investment-woodside-energy-announces-17-5-billion-final-investment-decision-for-lng-facility-in-southwest-louisiana-becomes-largest-foreign-direct-investment-in-state-history>
16. Central Louisiana Regional Chamber of Commerce. [2025]. *A Hub for Business & Industry*. <https://cenlachamber.org/hub-for-business-and-industry/>
17. Alexandria. [n.d.]. *CenLA; Central Louisiana*. <https://www.alexandria-louisiana.com/cenla-central-louisiana.htm>
18. Louisiana Department of Transportation and Development. [2024]. *Profile of Louisiana's Public Ports [PDF]*. <https://dotd.la.gov/media/qgdkbe0t/2024-lla-profiles-of-public-ports.pdf>
19. Louisiana State University Agricultural Center. [n.d.]. *Concordia Parish - About the Parish*. https://www.lsuagcenter.com/portals/our_offices/parishes/concordia/features/about
20. U.S. Fish and Wildlife Service. [n.d.]. *Tensas River National Wildlife Refuge*. <https://www.fws.gov/refuge/tensas-river>
21. U.S. Fish and Wildlife Service. [n.d.]. *Catahoula National Wildlife Refuge*. <https://www.fws.gov/refuge/catahoula>
22. Louisiana Department of Transportation and Development. [2024]. *Profile of Louisiana's Public Ports [PDF]*. <https://dotd.la.gov/media/qgdkbe0t/2024-lla-profiles-of-public-ports.pdf>
23. Louisiana State University Agricultural Center. [2024]. *Pointe Coupee Parish Profile 2024 [PDF]*. LSU AgCenter. <https://www.lsuagcenter.com/~media/system/5/4/f/a/54fad09e287553778c8bcd2933c316cc/pointe%20coupee%20parish%202024pdf.pdf>
24. Louisiana State University Agricultural Center. [2025]. *Assumption Parish Profile 2025 [PDF]*. LSU AgCenter. <https://www.lsuagcenter.com/~media/system/e/a/e/e/eae1f3bb2accd70058e4cfaf2db7ad1/2025%20assumption%20parish%20profile%20r2pdf.pdf>

District Summaries References (Continued)

1. Louisiana State University Agricultural Center. [2020]. *Ascension Parish Profile 2019–2020 [PDF]*. LSU AgCenter. https://www.lsuagcenter.com/~media/system/3/0/8/7/3087621f3684deafc007a0c42d6280b1/2019-20%20ascension%20parish%20profile_adapdf.pdf
2. POI Data. [2025]. State government offices in Louisiana. Retrieved July 7, 2025, from <https://www.poidata.io/report/state-government-office/united-states/louisiana>
3. U.S. Energy Information Administration. [n.d.]. *Refining crude oil: U.S. refinery rankings*. Retrieved July 7, 2025, from <https://www.eia.gov/energyexplained/oil-and-petroleum-products/refining-crude-oil-refinery-rankings.php>
4. Entergy. [2025]. *River Bend Nuclear Station*. Retrieved July 7, 2025, from <https://www.entergy.com/nuclear/river-bend>
5. Louisiana Transportation Research Center. [2012]. *John James Audubon Bridge [PDF]*. <https://www.ltrc.lsu.edu/pdf/2012/FEHRL/JOHN%20JAMES%20AUDUBON%20BRIDGEI%203-30-12.pdf>
6. Port of Greater Baton Rouge. [2022]. *Financials*. Retrieved July 7, 2025, from <https://www.portgbr.com/financials>
7. U.S. Department of Commerce. [n.d.]. *Foreign Trade Zone 178*. Trade.gov. Retrieved July 7, 2025, from <https://ofis.trade.gov/Zones/Details/178>
8. Greater New Orleans Inc. [2025]. *Greater New Orleans Parishes* <https://gnoinc.org/doing-business/parishes/>
9. Louisiana Department of Transportation and Development. [2024]. *Profile of Louisiana’s Public Ports [PDF]*. <https://dotd.la.gov/media/qgdkbe0t/2024-lla-profiles-of-public-ports.pdf>
10. Louisiana State University Agricultural Center. [n.d.]. *St. Tammany Parish – About the Parish* https://www.lsuagcenter.com/portals/our_offices/parishes/st%20tammany

State Plans References

- Louisiana State University Agricultural Center. [2020]. *Ascension Parish Profile 2019–2020* [PDF]. LSU AgCenter. https://www.lsuagcenter.com/~media/system/3/0/8/7/3087621f3684deafc007a0c42d6280b1/2019-20%20ascension%20parish%20profile_adapdf.pdf
- 1. Louisiana Department of Transportation and Development. [January 2025]. Louisiana Strategic Improvement Plan [PDF]. https://dotd.la.gov/media/dhnjb5cg/la-dotd-strategic-improvement-plan_01_15_25.pdf
- Governor’s Office of Homeland Security & Emergency Preparedness. [March 21, 2024]. Louisiana State Hazard Mitigation Plan. <https://gohsep.la.gov/divisions/hazard-mitigation-assistance/state-hazard-mitigation-plan/>
- Louisiana Department of Transportation and Development. [2015]. Louisiana Statewide Transportation Plan. [PDF]. <https://dotd.louisiana.gov/about/office-of-project-delivery/planning/transportation-planning/statewide-transportation-plan/2015-plan-update/>
- Louisiana Department of Transportation and Development. [2022]. Louisiana Transportation Asset Management Plan. [PDF]. <https://dotd.la.gov/about/office-of-project-delivery/planning/data-collection-management-systems/asset-management/>
- Louisiana Department of Transportation and Development. [2024]. Louisiana State Freight Plan. [PDF]. <https://dotd.la.gov/about/office-of-project-delivery/planning/transportation-planning/freight-plan/>
- 2. Louisiana Department of Transportation and Development. [April 2023]. Louisiana Waterways State Transportation Plan [PDF]. <https://www.dotd.louisiana.gov/media/latkolw1/louisiana-waterways-state-transportation-plan-final-letter-digital.pdf>
- 3. Coastal Protection and Restoration Authority. [2023]. Louisiana’s Comprehensive Master Plan for a Sustainable Coast. [PDF]. https://coastal.la.gov/wp-content/uploads/2023/06/230531_CPRA_MP_Final-for-web_spreads.pdf
- 4. Governor’s Office of Homeland Security & Emergency Preparedness. [May 2024]. State of Louisiana Emergency Operations Plan. [PDF]. <https://gohsep.la.gov/media/pm0phlib/la-eop-2024-final-final.pdf>

Chapter Two State Plans References (continued)

- Louisiana Economic Development. [2025]. 5-Year Strategic Plan FY 2020-2021 through 2024-2025. <https://cdm16313.contentdm.oclc.org/digital/collection/p267101coll4/id/36250/rec/3>
- Louisiana Climate Action Plan. [February 2022]. Executive Summary. <https://gov.louisiana.gov/assets/docs/CCI-Task-force/CAP/CAPExecutiveSummaryFinalWEB.pdf>
- Office of Community Development. Final 2020-2024 State of Louisiana Consolidated Plan. [PDF]. <https://www.doa.la.gov/media/zpxcs5km/final-2020-2024-louisiana-consolidated-plan.pdf>
- Louisiana Department of Transportation and Development. [2024]. Louisiana State Plan for Electric Vehicle Infrastructure Deployment. [PDF]. <https://dotd.la.gov/media/iugbyrzn/louisiana-nevi-plan-update-2024.pdf>
- Louisiana Department of Transportation and Development. [November 13, 2023]. Louisiana Carbon Reduction Strategy. <https://dotd.la.gov/about/office-of-project-delivery/planning/transportation-planning/carbon-reduction-strategy/>
- Louisiana Department of Transportation and Development. [Revised on December 12, 2024]. Louisiana Statewide Transportation Improvement Program [STIP] Federal Fiscal Years 2023-2026. https://dotd.la.gov/media/o4inh5fk/approved_2023_to_2026_stip_11-21-2022_revised_12-12-2024_updated_7-18-2025.pdf
- Executive Order No. JML 24-60, Reformation and Optimization of the LADOTD. [PDF]. State of Louisiana Executive Department, Office of the Governor. <https://dotd.louisiana.gov/media/n0abfxia/jml-executive-order-60.pdf>
- Louisiana Department of Transportation and Development. [2011]. 2011 Hydraulics Design Manual. [PDF]. <https://dotd.la.gov/media/gyzjm1fu/hydraulics-manual.pdf>
- Louisiana Department of Transportation and Development. [August 8, 2019]. Louisiana Bridge Design and Evaluation Manual. <https://www.dotd.louisiana.gov/about/office-of-project-delivery/engineering/bridge-and-structural-design/design-manuals-memoranda/bridge-design-evaluation-manual-revision-9/>
- Louisiana Department of Transportation and Development. Louisiana Department of Transportation and Development Minimum Design Guidelines. <https://www.dotd.louisiana.gov/about/office-of-project-delivery/engineering/bridge-and-structural-design/bridge-design-documents/minimum-design-guidelines/>

Data Sources

SUB-CATEGORY/DATA TYPE	SOURCE NAME	URL
FLOOD		
Riverine Flooding - Water Surface Elevation (WSE) grids (1% & 0.2% AEP)	Federal Emergency Management Agency (FEMA) Non-Regulatory Flood Risk Datasets (FRD)	Link
Riverine Flooding - WSE grids (1% & 0.2% AEP)	FEMA Base Level Engineering (BLE)	Link
Riverine Flooding - Base Flood Elevation (BFE) lines & Special Flood Hazard Area (SFHA) polygons (1% AEP)	FEMA National Flood Hazard Layer (NFHL)	Link
Riverine Flooding - WSE grids (20%, 10%, 4%, 2%, 1%, 0.5%, 0.2% AEP)	Louisiana Watershed Initiative (LWI) Deliverables	Link
Coastal Flooding - Sunny Day Tidal Flooding (Gridded Sea Level Rise data & vertical land movement adjustments)	National Oceanic and Atmospheric Administration (NOAA) MHHW & Sea Level Rise (SLR) Calculator	Link
Coastal Flooding - Storm Surge Elevation (Hydro compartment mesh polygons & CSVs for scenarios E-L)	Coastal Protection and Restoration Authority (CPRA) Coastal Master Plan (CMP)	Link
WIND		
Wind speed polygons by Census tract (AEPs: 10%, 5%, 2%, 1%, 0.5%, 0.2%, 0.1%)	Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP) / State Hazard Mitigation Plan (SHMP)	NA
EXTREME TEMPERATURES		
Daily max/min temps (Tmax/Tmin) from 1992-2022	National Centers for Environmental Information (NCEI) Climate Data Online (CDO)	Link
Daily max/min temps (Tmax/Tmin) from 1992-2022	NOAA Global Historical Climatology Network daily (GHCNd)	Link
GEOTECHNICAL HAZARDS		
Deep and shallow subsidence datasets (southern Louisiana)	CPRA Coastal Master Plan (CMP), 2023	Link
Soil organic carbon (SOC) in 2-4 ft layer	United States Department of Agriculture (USDA) Web Soil Survey (WSS), 2024	Link
Groundwater table elevation	United States Geological Survey (USGS) Coastal Lowlands Aquifer System, 2015	Link
Slope Stability	USGS Landslide Susceptibility Models, 2024	Link
Marsh edge erosion	CPRA CMP Marsh Edge Erosion, 2023	Link
Expansive soils (swelling potential)	GOHSEP, SHMP 2024	Link

SUB-CATEGORY/DATA TYPE	SOURCE NAME	URL
DIGITAL TERRAIN MODEL (DTM)		
Pre USGS LiDAR [LA_NortheastDOTD_2017_C20, LA_2021FloridaParishes_C24]	LADOTD	NA
Original Product Resolution [OPR]	USGS	Link
NED 1-meter resolution	USGS	Link
NED 1/3 arcsecond [10m resolution]	USGS	Link
Vertical datum conversion	NOAA VDatum Tool	Link
ASSET DATA		
Airports	US Department of Transportation [DOT] Bureau of Transportation Statistics [BTS], LADOTD [for program-managed airports]	Link
Roadways	LADOTD Roads and Highways [RH], December 2024 Snapshot, feature class "LouisianaRoadways"	NA
Bridges	LADOTD RH December 2024 Snapshot feature class "Bridges"	NA
Bridges [LADOTD Bridge Information Server]	LADOTD	Link
Bridges [LWI hydraulic models]	LWI Deliverables	Link
Bridges [National Bridge Inventory [NBI]	FHWA/USDOT BTS REST Service	Link
Traffic Signals	LADOTD	NA
Dynamic Messaging Signs [DMS] & Closed-circuit Television [CCTV], Intelligent Transportation Systems [ITS]	LADOTD	NA
LADOTD Facilities	LADOTD REST Service, Microsoft US Building Footprints, Google Street View	Link
Ports	LADOTD REST services, 2024 LLA Profiles of Public Ports [PDF]	Link
Navigable Waterways	LADOTD REST services	Link
Rail Lines	LADOTD RH December 2024 Snapshot feature class "Trans_DOTD_Rails", US DOT BTS	Link
CRITICALITY DATA		
Trauma hospitals	HIFLD Hospitals	Link
State police	FEMA Hazus Inventory feature class "PoliceStation"	Link
Aeromedical Marshaling Points	Table 6-1 of LADOTD Aviation System Plan [June 2015]	NA
Parish emergency centers	FEMA Hazus Inventory feature class "EmergencyCenter"	Link
Military Bases	USDOT BTS REST Service	Link
Non-nuclear evacuation routes	LADOTD RH December 2024 Snapshot feature class "EvacuationRoutes"	NA
Nuclear Route Description PDFs	Entergy Emergency Management [EM] Plan	Link

SUB-CATEGORY/DATA TYPE	SOURCE NAME	URL
CRITICALITY DATA (CONTINUED)		
Nuclear Spatial Data [Radiological Hazards]	FEMA	Link
Natural gas facilities	FEMA Hazus Inventory feature class "NaturalGasFacility"	Link
Strategic petroleum reserves	US Energy Information Administration [EIA] REST Service	Link
Power plants	EIA REST Service	Link
Maintenance units and storage sites	LADOTD REST Service "DOTD Facilities"	Link
Salt/Brine locations	LADOTD REST Service "SaltLocation"	Link
Airports with facilities that support emergency preparedness and response	Map from LADOTD	NA
Railway Facility	FEMA Hazus Inventory feature class "RailwayFacility"	Link
Marine Roll-on/off intermodal freight facilities	USDOT BTS REST Service	Link
National Highway System [NHS] designation	LADOTD RH December 2024 Snapshot feature class "NHS"	NA
Jobs Proximity Index	US Department of Housing and Urban Development [HUD] Jobs Proximity Index Server	Link
Correctional Facilities	GOHSEP	Link
Federal National Highway Freight Network [NHFN]	USDOT BTS REST Service	Link
VULNERABILITY DATA		
511 Road Closure	LADOTD	Link
Roadway Drainage Condition	LADOTD RH December 2024 Snapshot feature class "Drainage"	NA
Roadway Surface Type	LADOTD RH December 2024 Snapshot feature class "hmps_surfacetype", if null then "surfacetype"	NA
Pavement Performance Index	LADOTD RH December 2024 Snapshot feature class "pms_tenth"	NA

Appendix: Plan Revision Record

Revision No. 1 | September 10, 2026 | Addition of the LA 384 Black Bayou Bridge Replacement Project

This revision sheet adds one project to the TRIP Priority Resilience Project list: replacement of the LA 384 Black Bayou pontoon bridge in Calcasieu Parish with a fixed span over the Gulf Intracoastal Waterway. A barge struck the pontoon on June 22, 2026 and put the crossing out of service for an estimated one to two years, leaving the Grand Lake pontoon bridge as the only remaining route north into Lake Charles for the communities south of the waterway.

No text in the published Plan is changed by this sheet. The sheet is self-contained: it states the added project, the added resiliency strategy, and the revised counts in full, so the Executive Summary, Chapter 5, Table 24, Table 25, and the District 07 project list stand as printed and are not reissued. Where a statement in the published Plan differs from a statement in this sheet, the two are read together and this sheet governs. The sheet does not alter any analysis, methodology, or finding in Chapters 1 through 4.

This sheet files as the last item in the Appendices and remains part of the Plan until the next revision or full TRIP update supersedes it.

TABLE R-1: TRIP revision log

REV. NO.	DATE	PLAN SECTIONS READ WITH THIS SHEET	DESCRIPTION OF REVISION
1	09/10/2026	Executive Summary (pp. 18, 20); Chapter 5 Tables 24 and 25 (pp. 104, 108-124); District 07 project list (p. 155); Appendices	Adds the LA 384 Black Bayou Bridge Replacement project to the Priority Resilience Project list as a District 07 project, adds an eighth resiliency strategy to carry it, and raises the statewide project count from 105 to 106. The sections listed at left are not edited or reprinted. They are read with this sheet.

1. PRIORITY RESILIENCE PROJECT NO. 106, ADDED BY THIS SHEET

The project below is added to the Priority Resilience Project list in Chapter 5 as project No. 106. The entry carries the same fields as Table 25 so it reads directly against the published table without any change to that table.

TABLE R-2: Added priority resilience project, stated in the field format of Table 25

RESILIENCY STRATEGY	DISTRICT	PROJECT	PRIMARY HAZARD	DESCRIPTION
Improve Evacuation Route Reliability	D 07	LA 384 Black Bayou Bridge Replacement	Wind, Flooding (Coastal)	Replace the Black Bayou pontoon bridge with a fixed span carrying LA 384 over the Gulf Intracoastal Waterway at mile 237.5, so that highway traffic and marine traffic can both move through the crossing at the same time during tropical events and the roadway no longer closes at the 35 mph wind threshold that governs movable bridge operation.

District 07 resilience project list (published at page 155)

The same project is District 07 project No. 8. The published list, numbered 1 through 7, is not renumbered or reprinted. Project No. 8 continues that numbering from this sheet.

TABLE R-3: Added District 07 project list entry

NO.	PROJECT	PRIMARY HAZARD	DESCRIPTION
8	LA 384 Black Bayou Bridge Replacement	Wind	Replace the pontoon bridge with a fixed span to keep the Big Lake Road evacuation route open to vehicles and the waterway open to tows during the same storm.

2. ADDED RESILIENCY STRATEGY AND REVISED COUNTS

Table 24 of the published Plan lists seven resiliency strategies and a statewide total of 105 projects. This sheet adds an eighth strategy and one project. Both are stated in full below, so Table 24 needs no edit and is not reprinted.

TABLE R-4: Added resiliency strategy, stated in the field format of Table 24

STRATEGY NO.	RESILIENCY STRATEGY	PROJECTS
8	Improve Evacuation Route Reliability	1

Adding one project changes four counts and the strategy total. The published figures and the operative figures appear side by side below. No other count or statement in the Plan is affected.

TABLE R-5: Counts as revised by this sheet

LOCATION IN THE PUBLISHED PLAN	AS PUBLISHED	OPERATIVE FIGURE UNDER THIS REVISION
Executive Summary, p. 18	"The resulting list of 105 Priority Resilience Projects..."	The list comprises 106 Priority Resilience Projects.
Executive Summary, p. 20	"a set of resilience investments (105 projects)"	The set of resilience investments comprises 106 projects.
Chapter 5, p. 104	"LADOTD identified 105 resilience projects aligned with PROTECT's mission and eligibility criteria."	LADOTD has identified 106 resilience projects aligned with PROTECT's mission and eligibility criteria.
Table 24, p. 104	Seven resiliency strategies; project counts total 105.	Eight resiliency strategies, the eighth being Improve Evacuation Route Reliability with one project; counts total 106.
District 07 summary, p. 155	Resilience project list numbered 1 through 7.	Resilience project list numbered 1 through 8, the eighth being the project stated in Table R-3.

Reading rule. The published pages quoted above are not edited. A reader who cites a count from one of those pages cites the operative figure in the right-hand column and cites this sheet as its source.

3. JUSTIFICATION FOR THE REVISION

3.1 The crossing is out of service and the parish is down to one route

The Black Bayou Pontoon Bridge carries LA 384, Big Lake Road, across the Gulf Intracoastal Waterway at mile 237.5 west of Harvey Locks in Calcasieu Parish. On June 22, 2026 a barge struck the structure and heavily

damaged the pontoon, the north apron, the north apron spans, and the northeast fender system. LADOTD removed the bridge from service the same morning. The Department has estimated the crossing will stay closed for one to two years, and the pontoon has been moved to a shipyard for dry dock inspection before a firm repair schedule can be set.

With Black Bayou closed, the Grand Lake pontoon bridge is the only route north into Lake Charles for the communities south of the waterway. LADOTD has staged crews and equipment at Grand Lake so the pontoon can be closed by hand if a winch or cable fails, because a second failure would isolate those communities entirely. The Department is currently holding a single aging movable structure open by manual intervention on a route that carries hurricane evacuation traffic, and this project is intended to remove that dependency.

3.2 A movable bridge cannot serve a highway evacuation and a marine evacuation at the same time

The conflict is structural and not operational, so better scheduling cannot resolve it. When a tropical system approaches, vehicles leaving the lower parishes need the pontoon closed to traffic across the water, and tows running for safe harbor need it open to traffic along the water. The bridge can do one or the other. Every minute given to one evacuation is taken from the other, and both are running against the same landfall.

The bridge also stops being available well before the storm arrives. As the TRIP records in Chapter 4, movable bridges are closed at sustained wind speeds of 35 miles per hour, which is below the threshold for a tropical depression. The structure therefore locks in place well before hurricane conditions arrive, and it locks in one position. Bridge operators must also evacuate, which ends discretionary operation earlier still. So the period in which the crossing can serve either evacuation closes before the period in which people and vessels still need to move.

3.3 The TRIP already identifies this asset class as disproportionately high risk

This project follows the Plan's own findings and does not add a new premise to them. Chapter 4 concludes that movable bridges represent only 1.3 percent of the bridge inventory assessed in the TRIP, and that their high exposure and operational importance make them a disproportionately high-risk asset class in the context of wind hazards. No movable bridge in the state falls into the low or very low wind risk categories.

District 07 carries more of that risk than the state as a whole. The District 07 profile reports seven movable bridges in the high and highest wind risk tiers, or 87.5 percent of the District's movable bridge inventory, against 74.5 percent statewide. The same profile lists wind as a hazard because wind causes closures of movable bridges, including those that are part of emergency routes. Black Bayou is one of those bridges, and LA 384 is one of those routes.

What the published Plan lacks is a strategy to act on the finding. Table 24 lists seven resiliency strategies, and none of them addresses movable bridge reliability. The two pontoon replacement concepts already in the Plan sit under flood control headings because flooding drove them, which is accurate for those projects and a poor fit for this one. This revision therefore adds an eighth strategy, Improve Evacuation Route Reliability, so the Plan has a home for a project whose primary hazard is wind. Because the strategy is stated in Table R-4 above, published Table 24 requires no edit.

3.4 A fixed span meets the PROTECT Resilience Improvement eligibility test

The category requires the following:

The project must include one or more construction activities to improve the ability of an existing surface transportation asset to withstand one or more elements of a weather event or natural disaster, or to increase the resilience of surface transportation infrastructure from the impacts of changing conditions, such as sea level rise, flooding, wildfires, extreme weather events, and other natural disasters.

Replacing the pontoon with a fixed span is a construction activity on an existing surface transportation asset, and it improves that asset's ability to perform both of its primary responsibilities under weather event conditions. The roadway becomes more reliable for vehicles because a fixed span does not lock out traffic at wind speeds of 35 miles per hour and does not require an operator on site. The waterway becomes more reliable for maritime traffic

because vessels pass beneath a fixed span without an opening, so tows can keep running for safe harbor after the roadway evacuation has begun. The project matches two of the construction activities the category lists as eligible:

- Resurfacing, restoration, rehabilitation, reconstruction, replacement, improvement, or realignment of an existing surface transportation facility eligible for assistance under Title 23.
- Lengthening or raising bridges to increase waterway openings, including responding to extreme weather.

The first activity covers the replacement itself. The second covers the vertical clearance, since a fixed span sized for unimpeded navigation increases the waterway opening at this location from an intermittent opening that depends on a machine and an operator to a permanent one.

3.5 Consistency with the TRIP prioritization framework

The project clears both screening tests in Chapter 5. It improves resilience against a natural hazard, and it is a surface transportation project, so it moves through prioritization to the Priority Resilience Project List instead of staying in the full project list for later consideration. It also comes from a source the Plan names: district input, supplemented by alignment to statewide objectives.

On criticality, LA 384 is the shorter of two routes serving the communities south of the waterway and is used for hurricane evacuation, which places it in the criticality categories the TRIP built around public safety and emergency response. On vulnerability, the asset is a movable bridge in the coastal zone, which is the highest-vulnerability structure type in the wind assessment. High criticality combined with highest vulnerability is the top cell of the risk matrix in Table 21, and the Plan describes the ten movable bridges in that cell as the most urgent priorities for wind resilience due to their essential role in evacuation and freight movement.





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