LEGAL ISSUES WHEN MANAGING PUBLIC ROADS AFFECTED BY SEA LEVEL RISE: SOUTH CAROLINA

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PROJECT BACKGROUND

This white paper is one outcome of a four-state regional project funded by the National Oceanic Atmospheric Administration Office of Coastal Management, Florida Sea Grant, Georgia Sea Grant, South Carolina Sea Grant, and North Carolina Sea Grant (Project No.: FY2014-2018: NA14OAR4170084). Coastal communities are increasingly becoming aware of the risks to their ecosystems, homes, and economies because of increased flooding, more extreme storm surges, and sea level rise. Reducing risk on the coast will be achieved by means of a variety of approaches, including policy and regulatory changes, natural resource protection, structural and non-structural intervention and investment, and retreat. A project team involving researchers, legal and policy experts, and law students have assisted coastal communities in four states – Florida, Georgia, South Carolina, and North Carolina – to prepare for present vulnerabilities and projected future conditions based on likely sea-level rise scenarios. This paper is part of the project's objective to analyze legal and policy factors affecting adaptation responses, focusing on the state and local levels. Additional white papers associated with this project may be found at http://gacoast.uga.edu/.

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INTRODUCTION

In South Carolina, sea level rise and sinking land surface means that the coastal areas of the state will experience a relative sea level rise ranging between approximately 0.5 to 1.5 feet in 2030, 0.75 to 3.2 feet in 2050, and 1.75 and 10.8 feet by 2100.[1,2] These ranges are based on scenarios that encompass uncertainties about physical processes and about future levels of greenhouse gas emissions. They cover low rates of sea level rise and low greenhouse gas emissions to high rates of sea level rise and high greenhouse gas emissions to convey the future risks for the purpose of long-term decision making.

Many communities are already experiencing impacts of recurrent flooding, sometimes called nuisance flooding, associated with "king tides" and meteorological events. For the state and county and local governments, sea level rise and increased flooding pose a significant, costly, and persistent threat to roads and highways. These natural disasters and chronic flood damages will inevitably encourage South Carolinians to reconsider the status quo of road maintenance and repair. Under projected sea level rise, repetitive or severe damages will lead to tough decisions about whether to decrease routine maintenance, transfer control of the roads to different government authorities, or abandon existing roads.

Although the South Carolina Department of Transportation (SCDOT) owns more than 50% of the roads and highways across the state, adaptation efforts related to road maintenance and abandonment can be expected to occur at both the state and local levels.[3] The state, towns, cities, and counties have legal responsibilities to maintain roads, and they all certainly have an interest in ensuring that roads are safe and maintained.

This white paper discusses how South Carolina law may impact local governments that are facing the effects of coastal flooding on their public roadways. The paper first outlines the statutory basis for road ownership and the duties that flow from such ownership. It then reviews potential causes of actions resulting from the breach of duties of maintenance and good repair. Finally, it addresses the procedural requirements for formal road abandonment and takings liability from loss of road access.

1. National Oceanic and Atmospheric Administration (NOAA). 2017, January. Global and Regional Sea Level Rise Scenarios for the United States. Retrieved from tidesandcurrents.noaa.gov/publications/techrpt83_Global_and_Regional_SLR_Scenarios_for_the_US_final.pdf.

2. US Army Corps of Engineers. 2017. Sea-Level Change Curve Calculator (Version 2017.55). Retrieved from corpsmapu.usace.army.mil/rccinfo/slc/slcc_calc.html.

3. US Department of Transportation (DOT). "Highway Statistics 2016." Retrieved from www.fhwa.dot.gov/policyinformation/statistics/2016/.

KEY POINTS OF THIS PAPER INCLUDE:

- Sea level rise and coastal flooding will cause significant damage to roadways, and the state, counties, and municipalities all have a legal duty to maintain roads and highways in safe condition and in good repair. While the state owns the majority of roads in South Carolina, several coastal counties have more miles of road-length at risk from sea level rise than the state does. Additionally, even where the state may have the largest number of miles at risk, local governments also have significant numbers of miles at risk. **Consequently, long-term and comprehensive planning involving multiple jurisdictions is likely to be the best way to produce outcomes that result in community-wide resilience.**

- Although liability depends on the specific facts of the lawsuit, failing to keep a road in good repair is generally not likely to result in a successful negligence lawsuit based on a statutory duty. However, in a few cases, courts have allowed injured plaintiffs to argue that a municipality owed a common law duty to keep roads in good repair and thus have allowed suits to go forward. In addition, if the governmental entity knew of the hazard but failed to act, then it may be liable for injuries. **As sea level rise results in increased flooding on a more regular basis on roadways, government entities may be considered more likely to have "known" about the hazard and thus liable for any injuries that result.**

- Changing coastal conditions may prompt governmental entities to take discretionary action to deal with roads or to implement new or alternative road designs. State law exempts the state, counties, and municipalities from negligence liability related to these discretionary acts. A governmental entity is not liable for injuries caused by discretionary acts or decisions, or for injuries caused by road design or defects caused by a third party unless the entity knew about the defect and failed to act in a reasonable time. **Governments, therefore, should have immunity from liability for implementing new or alternative road designs to address recurrent flooding and sea level rise.**

- Sea level rise and coastal flooding may cause governmental entities to consider abandoning roads as repair and maintenance costs increase and damages recur. The state, a county, or a municipality may abandon a road if doing so is in the best interest of the public, and it must follow statutory procedures and obtain a final court order to lawfully abandon the road. **Road abandonment is therefore an option for governments when addressing areas affected by increased flooding and sea level rise, although a "takings" claim may result.**

- Even if a governmental entity lawfully abandons a road, if the entity acts affirmatively and materially injures a private property owner's access to his or her property, it may still be liable for a taking of private property and be required to pay just compensation. **For example, if a property owner is left with no access to his or her property, a taking has occurred. A recent South Carolina Supreme Court case concluded that essentially a property owner's "increased remoteness" and "increased complexity" in accessing his or her property are now relevant in assessing compensation for takings claims in South Carolina. Takings claims resulting from abandonment or roadway changes could inhibit several aspects of necessary roadway planning and management as sea levels rise.**

ROAD OWNERSHIP AND JURISDICTION

Determining road ownership is critical because it defines who has the authority to act with respect to road closure, maintenance, abandonment, and repair. In general, in South Carolina, a public road is owned or established by the state under the jurisdiction of SCDOT, a county, or a city or town.

In South Carolina, the majority—roughly 54%—of roads are state-owned.[4] In the 1950s, to ensure maximum access to federal highway funding, lawmakers created a process for allowing local roads to be placed into the state system with consent from SCDOT.[5]

SCDOT is responsible for the state highway system, which consists of the interstate system of highways, the state highway primary system, and the state highway secondary system. The interstate system is the roads and highways designated as the official national system of highways; the primary system comprises the roads that connect centers of population; and the secondary system consists of the remaining roads that are not part of either the interstate or primary system.[6]

Counties and municipalities have jurisdiction over roads not transferred to state jurisdiction. Of the total 76,250 miles of roads and highways in South Carolina, counties own 25,583 miles of rural roads and 4,345 miles of urban roads, or approximately 39% of the roadways. Municipalities own 523 miles of rural roads and 2,654 miles of urban roads, or approximately 5% of the roadways (Table 1).[7]

Table 1: Miles of South Carolina Roads by Jurisdiction

SOUTH CAROLINA ROAD MILES

RURAL						URBAN					
State	County	Town/ Muni	Other	Fed	Rural Total	State	County	Town/ Muni	Other	Fed	Urban Total
29,792	25,583	523	194	1,589	57,681	11,567	4,345	2,654	1	3	18,569

TOTAL *76,250 miles*

Of course, while understanding road ownership is essential to determining which jurisdiction has authority to act (or has a duty to act), road miles "owned" does not necessarily translate into vehicle miles traveled—large numbers of people often travel on a concentrated number of roads. Although South Carolina has more rural road miles than urban, for example, urban roads

4. US DOT. "Highway Statistics 2016"; Tim Smith. 2017, April 1. Why SC Primary Roads have Crumbled even as DOT Got More Money. Greenville News.

5. S.C. Code Ann. § 57-5-60 (providing that, "[t]he department may add to the state highway primary system any sections or connections which, in the judgment of the department may be necessary in the proper development of the federal-aid primary highway system or the state highway primary system.").

6. S.C. Code Ann. § 57-5-10.

7. US DOT, "Highway Statistics 2016."

carry a larger percentage of vehicle traffic. In South Carolina, approximately 29.5 million miles are traveled annually. Of that amount, 12.78 million are vehicles miles traveled on rural roads while 16.7 million are traveled on urban roads.[8] Inventorying high traffic areas and essential transportation infrastructure will be critical for addressing impacts associated with sea-level rise on road infrastructure.[9] One resource that may serve as an important planning tool is the South Carolina Multimodal Transportation Plan which identifies statewide strategic corridors based on a review of metropolitan planning organization and Council of Governments plans, corridor delay and deficiency data, level of service, and multimodal criteria reflecting areas where additions may help capture other modes of transportation.[10]

Finally, while increased extreme rainfall and riverine flooding has the potential to affect roadways across the state, this analysis focuses on the impact that sea level rise is likely to have on existing road infrastructure in the coastal zone. To begin to understand the potential scope of the problem, the research team analyzed roadways in coastal cities and counties in South Carolina vulnerable to sea level rise under one-, two-, and three-foot scenarios, using sea level rise data from NOAA's Office for Coastal Management Sea Level Rise Viewer Data Download and SCDOT's GIS Mapping website (Table 2; Methods Appendix A).[11] The analysis below reveals that although the state owns the majority of roads in South Carolina, several coastal counties have more miles of road-length at risk from sea level rise than the state does. Additionally, even where the state may have the largest number of miles at risk, local governments also have significant numbers of miles at risk.

The analysis shown in Table 2 (below) reveals several points for consideration. Local impacts vary widely, with Charleston County and Beaufort County facing the greatest exposure to potential road flooding by a wide margin. This is likely a result of geographic conditions such as elevation and topography as well as development patterns that promote infrastructure construction in more vulnerable areas. In most cases, the state is responsible for the majority of the road miles inundated, although that is not the case for all jurisdictions. For example, Colleton, Horry, and Jasper counties have more locally maintained roads projected to be inundated by sea level rise than state-maintained roads. These findings suggest that adaptation planning must be highly localized. While a birds-eye view of road ownership statewide is helpful, cities and counties will not be affected in the same way by sea level rise nor will their responsibility for roads in their jurisdictions necessarily reflect statewide trends.

In addition, the analysis in Table 2 shows that under some scenarios, proportional responsibility for road miles inundated by projected sea levels changes. In Beaufort County, for example, the state maintains the majority of roads inundated by a projected sea level rise of one foot. Projections of

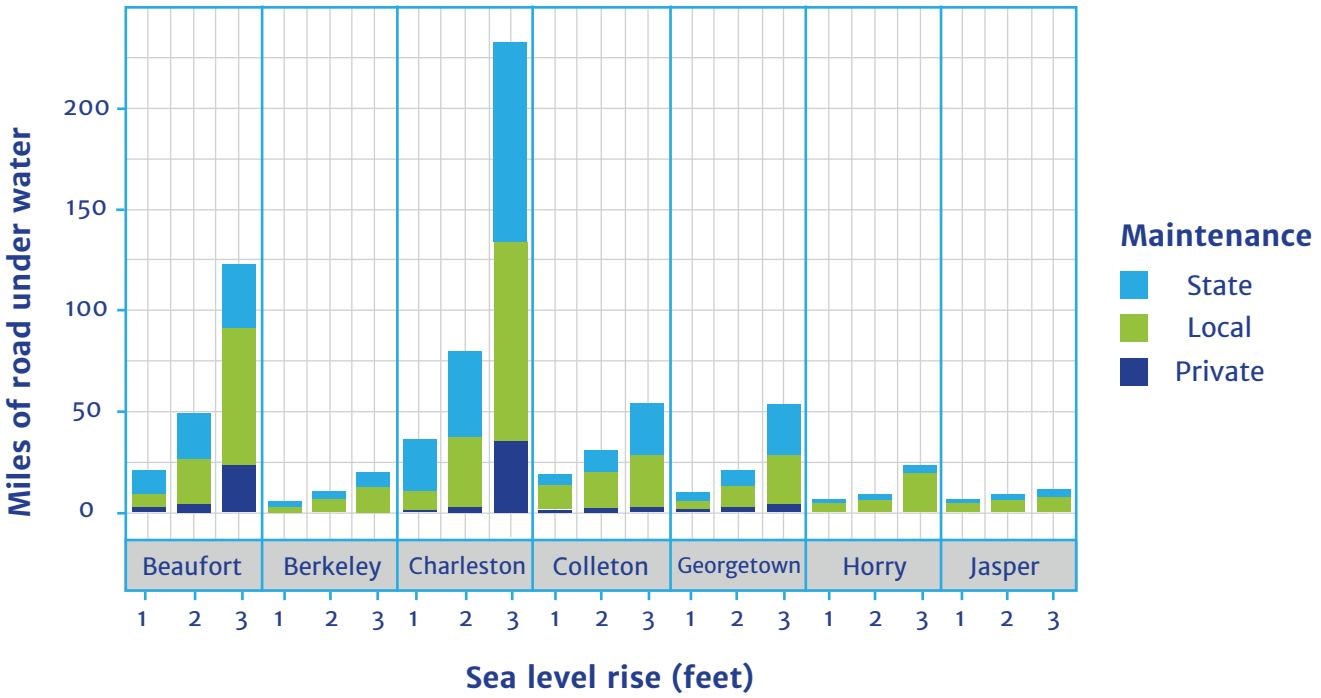
8. US DOT, Office of Highway Policy Information. 2017, September. "National Highway System Travel – 2016."

9. National Research Council of the National Academies. 2008. Potential Impacts of Climate Change on US Transportation, Transportation Research Board Special Report 290. Retrieved from onlinepubs.trb.org/onlinepubs/sr/sr290.pdf.

10. CDM Smith. 2014, November. "South Carolina Multimodal Transportation Plan: South Carolina Strategic Corridors Plan." Retrieved from www.scdot.org/Multimodal/pdf/SC_MTP_Strategic_Corridors_Plan_FINAL.pdf.

11. coast.noaa.gov/digitalcoast/tools/slr.html; http://info2.scdot.org/sites/GIS/SitePages/GISFiles.aspx?MapType=Shape. See Appendix A for a detailed description of the methodology used in this analysis.

Table 2: Roads at Risk to Sea Level Rise by County[12]



two or three feet, however, result in more locally maintained roads becoming inundated. These varied results suggest that long-term and comprehensive planning involving multiple jurisdictions may be the optimal strategy for creating outcomes that result in community-wide resilience. This coordination is likely to be even more vital as SCDOT works to rebalance the ownership and maintenance responsibility for the state's road network.[13] Given that projections are uncertain, jurisdictions should work together to jointly plan for several scenarios, understanding that their burdens may change depending upon what actually occurs.

Appendix B summarizes projections of the amount of sea level rise by scenario and by decade for the northern (Springmaid Pier), central (Charleston 1), and southern (Fort Pulaski) South Carolina sea level rise gauges. The timeline for the impacts of sea level rise numbers on roads is also uncertain due to ongoing research and monitoring of physical processes, such as rates of glacial melt, and unknowns about what progress the international community may make in reducing greenhouse gas emissions. The colors on the graphs in Appendix B show the range from the earliest and latest projected decades for reaching an additional one-, two-, and three-foot rise. The graphs also show how many of the scenarios project a given sea level to be exceeded in a decade. The projected timeline can help inform priority setting as under some scenarios a one-foot rise in sea level may occur by 2030.

Certainly, projected sea level rise and more frequent flooding will increase the costs of road maintenance, putting additional financial pressure on the state road system and potentially pushing the state to transfer roads back to local governments. In 2013, state law was amended to allow the

12. A table that lists impacts for each coastal county separately is included in Appendix A.

13. Abigail Darlington. 2018, August 31. "SCDOT Giving State Roads to Local Governments, Hoping to Shrink Huge Maintenance Backlog." Post and Courier. Retrieved from www.postandcourier.com/news/scdot-giving-state-roads-to-local-governments-hoping-to-shrink/article_cd13378c-aa3f-11e8-a884-27b190333273.html.

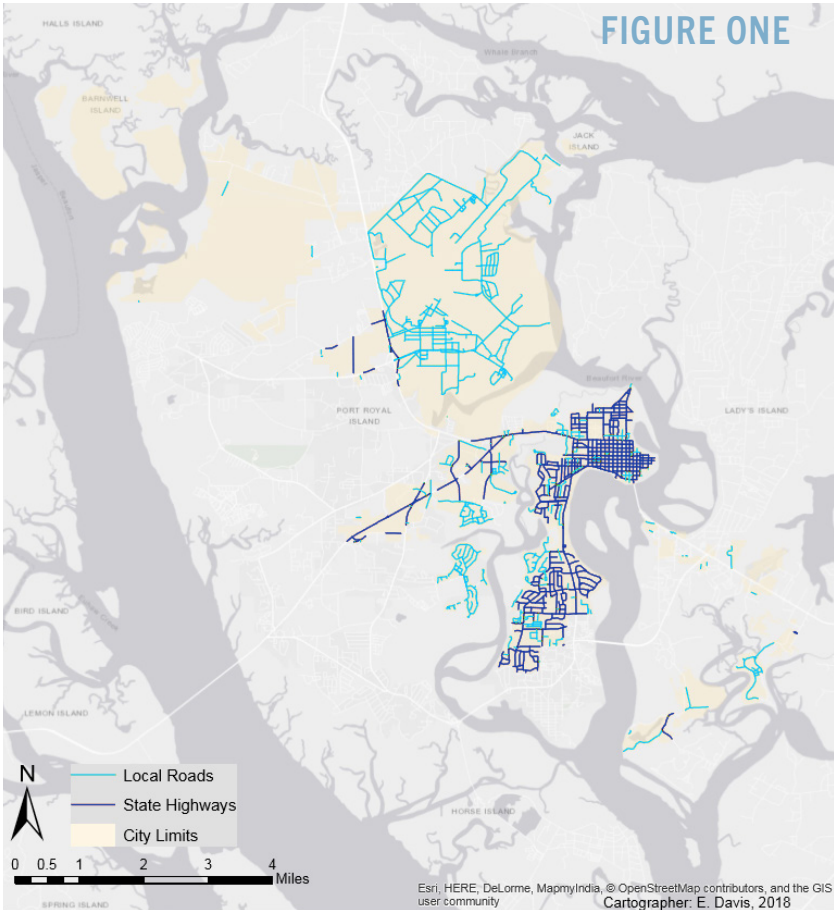
state to transfer roads to local governments and private entities. In 2014, state road ownership dropped from 63% to 54%. Many local governments are reluctant to take over roads and highways from SCDOT because they fear that the state will not provide adequate funding to help maintain them.[14] When ownership is transferred from the state to a local government entity or vice versa, maintenance and repair duties are generally also transferred.[15]

If SCDOT determines a road to be necessary for the interconnectivity of the state highway system, a county or municipality and SCDOT may by mutual consent agree to transfer a road from the county or municipal road system to the state highway system.[16] The transfer may be of the road "as is" without further improvement or upon such terms and conditions as the parties mutually agree. Notice of the transfer must be given to the county's legislative delegation. By statute, if SCDOT determines that a road in the county or municipal road system is necessary for the interconnectivity of the state highway system but the municipality or county does not consent to the transfer, SCDOT may initiate a condemnation action to acquire the road or a portion of it. At that point, the county or municipality is not required to make any further improvements to it. Alternatively, SCDOT may transfer any road under its jurisdiction from the state highway secondary system to a county or municipality, as well as to a nongovernmental entity or a person.[17]

A CLOSER LOOK: CITY OF BEAUFORT

In the City of Beaufort, the state of South Carolina owns many of the roads in the gridded downtown area as well as important access highways (see Figure 1). Examining the distribution of road ownership at the local level raises further considerations about the distribution of costs, potential pressure to transfer ownership, and the significance of the road for access to services, work, and residences or for other purposes, such as supporting business districts. It may also inform the possibility of creating ingress or egress options to areas at risk.

FIGURE ONE



Impacted City of Beaufort Roads: 3 ft. of Sea Level Rise (Right)

14. Tim Smith. 2017, April 1. Why SC Primary Roads Have Crumbled Even as DOT Got More Money. Greenville News.
15. See, e.g., S.C. CODE ANN. § 57-5-70; § 57-7-80.
16. S.C. CODE ANN. § 57-5-70.
17. S.C. CODE ANN. § 57-5-80.

GOVERNMENT DUTIES WITH RESPECT TO ROADS

This section briefly discusses the duties of the state, counties, and municipalities for road maintenance and repair. Under projected coastal flooding and sea level rise, road maintenance and repair will become more difficult and more expensive to perform.

State law imposes a duty on SCDOT to maintain the state highway system in a safe and serviceable condition.[18] The South Carolina Supreme Court has interpreted this duty as a duty owed to the public as a whole.[19]

For a county, Section 57-17-10 of the South Carolina Code states that "[t]he governing body of each county shall take charge and superintend the repair of the highways in the county." For a municipality, Section 5-27-120 mandates that "[t]he city or town council of any city or town of over one thousand inhabitants shall keep in good repair all the streets, ways and bridges within the limits of the city or town...." For town councils of towns with less than 1,000 inhabitants, state law requires the governing body to keep "all streets and ways which may be necessary for public use within the limits of the town open and in good repair." The Office of the Attorney General of South Carolina has advised that municipalities are responsible for the maintenance and repair of the roads located inside corporate limits and that county councils are only responsible for repairing the roads that are located in the unincorporated areas of the county.[20]

A county is responsible for repairing roads in unincorporated areas of the county, and a municipality is responsible for keeping streets and ways in good repair.

In addition to these statutory duties, the South Carolina Supreme Court has recognized the general common law duty that municipalities with full and complete control over the streets and highways within their limits must "use reasonable care to keep them in a reasonably safe condition for public travel." As discussed in subsequent sections, this *common law* duty—not the statutory duty—may be the basis for a negligence suit against a governmental entity.

Once a governmental entity voluntarily begins to keep a street in good repair and in safe condition, it must continue to maintain the street in a manner consistent with the reasonable standard of care. Although the common law generally does not proscribe any affirmative duty to act, a duty of care may arise where an act is undertaken voluntarily.[21] As discussed in subsequent sections, failure to continue maintaining a road in good repair may give rise to a negligence lawsuit.

18. S.C. CODE ANN. § 57-5-10.

19. Platt v. CSX Transportation, Inc., 379 S.C. 249 (2008) (vacated in part on other grounds, Platt v. CSX Transportation, Inc., 388 S.C. 441 (2010)).

20. See Op. S.C. Atty. Gen., 2016, November 15, (2016 WL 7031993).

21. See generally Russell v. City of Columbia, 305 S.C. 86,89, 406 S.E.2d 338, 339 (1991).

BREACH OF GOVERNMENT DUTIES

The expense of repeatedly repairing a coastal road damaged by flooding or coastal storms may be more than a governmental entity can afford, but failing to repair that road may lead to injuries or damages for which the entity is liable. However, liability may be difficult to establish under current South Carolina law. A plaintiff injured by this failure is likely to bring a negligence claim, which requires that he or she establish the following:

> **1. The governmental entity had a duty toward the plaintiff;**
> **2. The governmental entity breached that duty;**
> **3. The breach caused an injury to the plaintiff; and**
> **4. The plaintiff suffered losses or damages.**

The first step in a negligence lawsuit is determining whether any "duty" exists.

Under state law, municipalities are required to maintain streets within their jurisdictions. The South Carolina Supreme Court has determined that this law creates only a duty of care toward the general public, rather than a special duty owed to a certain class of individuals. As a result, the public duty doctrine precludes a plaintiff from arguing that a municipality owes him or her this statutory duty in a negligence lawsuit.

Even so, a plaintiff may use the common law duty to maintain roads in reasonably safe condition as the duty breached in a negligence lawsuit. The state supreme court has recognized that "[t]he general rule in this country is that municipalities which have full and complete control over the streets and highways within their corporate limits are liable in damages for injuries sustained in consequence of their failure to use reasonable care to keep them in a reasonably safe condition for public travel."[22] The legal analysis of common law duty of care focuses on whether the municipality had "full and complete control over the streets," which can be demonstrated by factors such as a municipality assuming general maintenance duties or fielding complaints about the streets, even if the municipality does not own the street.[23]

A breach of the common law duty of care may also give rise to a negligence lawsuit. As discussed above, when a municipal or county government voluntarily begins to repair or maintain a road that it did not have a duty to keep in safe condition, a duty of care arises: once having taken voluntary measures, the entity then has assumed a duty to maintain the street in a manner consistent with the reasonable standard of care. In a lawsuit, the first step is to see whether the city or county assumed the duty of maintaining the street in a safe condition. Although actual ownership of the street is one element considered, references to maintenance in town minutes and town ordinances regulating sidewalks are also evidence showing that the government entity had assumed a voluntary maintenance duty. Once a court determines that the city or county has undertaken such a duty, it can then analyze whether such a duty was breached and whether the breach was a proximate cause of the plaintiff's damages.

22. Terrell v. City of Orangeburg, 176 S.C. 518, 518–19, 180 S.E. 670 (1935).
23. Vaughan, 370 S.C. at 444.
24. Vaughan, 370 S.C. at 446–47.

Asserting Immunity to Defend Against Legal Claims

A governmental entity often has the ability to assert statutory immunity as a defense in a negligence case. The South Carolina Torts Claim Act (SCTCA),[25] which governs all tort claims against government entities,[26] eliminated sovereign immunity and makes the state and governmental entities and agencies liable for torts to the same extent as private individuals.

The SCTCA lists 40 exemptions to the waiver of immunity, however, meaning that a governmental entity is not liable for injuries caused by negligence in the exempted matters.[27] One of the SCTCA exemptions from liability addresses loss resulting from "the exercise of discretion or judgment" or "the performance or failure to perform" any discretionary act by the governmental entity.[28] For road maintenance, a governmental entity could argue generally that a plaintiff's injury was caused by a discretionary act, for which the entity is not liable. To establish this discretionary immunity, the governmental entity must show that it, faced with alternatives, weighed competing considerations, used accepted professional standards, and made a conscious choice.[29]

More specifically, the SCTCA also renders a governmental entity not liable for injuries caused by road design and other public ways, or from losses due to a defect or condition caused by a third party, unless the entity had notice and failed to act in a reasonable time.[30] If the governmental entity knew of the hazard, then it may be liable for injuries. For example, in *Elam v. South Carolina Department of Transportation* (2004), SCDOT had actual notice that improper maintenance created a flood hazard, numerous accidents had occurred in the same location over the past eight years, and highway patrol officials had reported the dangerous conditions to SCDOT on numerous occasions.[31] The South Carolina Supreme Court found that a jury could reasonably conclude that SCDOT knew of the hazard and was liable for injuring the plaintiff.

Compelling a Governmental Entity to Repair or Maintain a Road

The theories of liability discussed above only come into play when a municipal or county government has failed in its duty to maintain the roads under its control and such a failure has caused a cognizable harm to an individual. However, community members will likely wish to have a dangerous or problematic road condition abated prior to the occurrence of an incident that would rise to the level of tort liability.

A writ of mandamus is a judicial order compelling a governmental authority to perform its legal duties or to correct an abuse of discretion. Only one South Carolina case has directly dealt with a writ of mandamus to compel road maintenance after abandonment, and the court set forth the following rule: "If abandoned according to the method prescribed in such cases, no duty

25. S.C. CODE ANN. § 15-78-40 (abolishing sovereign immunity for the state of South Carolina, its agencies, political subdivisions and governmental entities, subject to limitations upon liability and damages and exceptions from liability outlined in this chapter of the code).
26. See Shaw v. City of Charleston (S.C. App. 2002) 351 S.C. 32, 567 S.E.2d 530, rehearing denied.
27. Under the SCTCA, governmental entities in South Carolina are not liable for nuisances. S.C. Code Ann. § 15-78-60(7).
28. S.C. Code Ann. § 15-78-60(5).
29. See Foster v. SC Highways and Public Transportation, 306 S.C. 519 (1992); Strange v. South Carolina Department of Transportation, 314 S.C. 427 (1994).
30. S.C. Code Ann. § 15-78-60(15).
31. Elam v. South Carolina Department of Transportation, 361 S.C. 9 (2004).

devolves upon the defendant commissioners to keep it in repair."[32] Thus, once a road is abandoned following statutory procedures, discussed below, no writ to compel maintenance will be issued.

The South Carolina precedent does not speak to a situation in which a writ has been sought to compel maintenance or repair of a currently in-use public road. Looking at other jurisdictions, it appears that the principle typically invoked is that such a writ will not be issued when the repair is discretionary.[33]

Fining Officials for Neglecting to Repair Highways and Bridges

In South Carolina, in small towns and unincorporated areas of counties, a state statute provides a remedy for the neglect of work on county highways and bridges: the governing body of a county[34] or town council of a town with less than 1,000 residents[35] may be guilty of a misdemeanor and fined up to $500 for neglecting to repair highways and bridges under its control.

No South Carolina case law has referenced this statute or interpreted its contours. Therefore, it is unclear what level and types of damage must be repaired to escape liability, or how long the town or county council has in which to act after notice or discovery of the damage. To our knowledge, a provision fining officials in this way is unique to South Carolina.

ROAD ABANDONMENT: AUTHORITY & PROCEDURE

Faced with the expense and, in some cases, likely futility of repairing coastal roads under constant threat of flooding and damage, the state or a county or a municipal government may decide to abandon the road and thus absolve its responsibility to maintain and repair the road. In South Carolina, "any interested person, the State or any of its political subdivisions or agencies" may initiate abandonment proceedings.[36]

The statute outlines the procedural steps that must be completed prior to filing suit in a court of competent jurisdiction: The interested party must publish notice of the intention to file an abandonment petition once a week for three consecutive weeks in a newspaper published in the county where the relevant street, road, or highway is located. Additionally, the party must send notice by mail with a return receipt to the last known addresses of all owners of property abutting the petitioned road.

Official judicial abandonment procedures must be completed for any street, road, or highway to be legally "abandoned" in South Carolina. Simply discontinuing maintenance is insufficient to abandon a road.[37] Once the procedural requirements are met, a court will issue an order after

32. Gilmer v. Hunnicutt, 57 S.C. 166, 35 S.E. 521, 521, 524 (1900).

33. See e.g., People ex rel. Brokaw v. Commissioners of Highways, 118 Ill. 239, 8 N.E. 684 (1886); Klein v. People ex rel., 31 Ill. App. 302, 1888 WL 2369 (4th Dist. 1889); State ex rel. Cutter v. Kamman, 151 Ind. 407, 51 N.E. 483 (1898); Ashton v. Jones, 125 Kan. 741, 265 P. 1101 (1928); Schuyler v. Town of Angelica, 137 Misc. 190, 242 N.Y.S. 78 (Sup 1930), aff'd, 232 A.D. 718, 248 N.Y.S. 806 (4th Dep't 1931); Butler County v. Pittsburgh, H., B. & N. C. R. Co., 298 Pa. 347, 148 A. 504 (1929).)

34. S.C. CODE ANN. § 57-17-80.

35. S.C. CODE ANN. § 5-27-110.

36. S.C. CODE ANN. § 57-9-10.

A governmental entity may abandon a public road by following statutory procedure and obtaining a final court order that determines abandonment is in the best interest of all concerned.

determining whether abandoning or closing the street is in the best interest of all concerned parties and who shall have the title of the abandoned road.[38] *First Baptist Church of Mauldin v. City of Mauldin* illustrates the types of factors considered when deciding whether a road closure is in the "best interest" of all parties involved. In this case, the church owned two plots of land on either side of an unpaved public road and sought to close the road to expand its onsite daycare facilities. Among the factors for public interest were the value of the church to the community, the danger posed by the road due to its narrow and curvy nature, and the danger posed to children at the daycare by drivers who used the road exclusively to avoid the traffic lights on the major road. The court clarified that acting in the public interest must be the motivation to abandon the road, even if there are incidental benefits to private parties.[39]

SCDOT may abandon a right-of-way, road, or highway if it is in the best interest of all parties.[40] The agency also has the statutory authority to "abandon" the portion of the state highway system it plans to relocate. The portion of the highway then either reverts or returns to the jurisdiction of the local authority that was previously responsible for it or is abandoned as a public way.

By statute, a county may discontinue public roads under its control when they are found to be useless.[42] However, no cases define the term "useless." For municipalities with more than 5,000 residents, Section 5-27-150 of the South Carolina Code permits the city council of any municipality to close a street when it determines that it is necessary for the improvement of the city.[43] However, a municipality's decision to close a road may have additional consequences as a court may find that a road abandonment results in a taking of private property.

ABANDONMENT CHALLENGES & REMEDIES

If the state or a local government decides to abandon a road because it can no longer afford to maintain it or keep up with maintenance, that governmental entity may be liable in a takings lawsuit by a property owner who relies on the road to access the property. This section discusses the potential for a takings challenge to a governmental entity, including the threshold for a compensable taking.

37. K & A Acquisition Group, LLC v. Island Pointe, LLC, 383 S.C. 563 (2009).

38. S.C. CODE ANN. § 57-9-20.

39. First Baptist Church of Mauldin v. City of Mauldin, 308 S.C. 226, 229, 417 S.E.2d 592, 593 (1992). The court said that while a public street may not be vacated for the sole purpose of benefitting the abutting property owner, "the mere fact that the vacation was at the instigation of an individual who owns abutting property does not invalidate the vacation or constitute abuse of discretion, nor does the fact that some private interest may be served incidentally.... [I]t must appear clearly that no consideration other than that of public interest could have prompted the action."

40. S.C. CODE ANN. § 57-5-600.

41. S.C. CODE ANN. § 57-5-120.

42. S.C. CODE ANN. § 57-17-10.

43. S.C. CODE ANN. § 5-27-150

The South Carolina Constitution provides that "private property shall not be taken ... for public use without just compensation being first made for the property."[44] The deprivation of ordinary and beneficial use and enjoyment of one's property is equivalent to the taking of it and is considered as much of a taking as if the property were actually appropriated for public use.[45] While acquiring private property for use as a public road is clearly a physical taking of property, a total loss of access to property due to road closure or abandonment may also result in a compensable injury through inverse condemnation.[46]

Owners of property abutting a public road or highway inherently have an "easement of access."[47] In South Carolina, if a governmental action materially injures the easement of ingress and egress to the public road such that the property owner no longer enjoys the reasonable means of access to which he or she is entitled, a compensable taking has occurred.[48] Prior to a South Carolina Supreme Court decision that was issued in August 2018, all reasonable means of ingress and egress from the property must have been extinguished to amount to a taking; if only one point of access had been eliminated or the government has provided an alternative access easement, the landowner would not be compensated for a taking.[49]

If a governmental entity abandons a road and thus materially injures a private property owner's access to a public road, the governmental entity may be liable for a taking.

However, in *SCDOT v. Powell*, the South Carolina Supreme Court held that if access has been substantially restricted *related* to a physical appropriation of land, the landowner may be compensated for a taking.[50] In a case involving a property owner's indirect loss of access to a bypass, the South Carolina Supreme Court held that after a physical taking for a road project has occurred, any diminution in property value related to traffic control or road access may be considered in the amount of compensation.[51] In our view, it is hard to not agree with the dissenting opinion, which concludes that South Carolina eminent domain law has changed significantly, as essentially a property owner's "increased remoteness" and "increased complexity" in accessing his or her property are now relevant in assessing compensation for takings claims in South Carolina.

44. S.C. Const., art. I, § 13.
45. See South Carolina State Highway Department v. Wilson, 254 S.C. 360 (1970).
46. Inverse condemnation refers to a situation in which a government entity takes private property and fails to pay appropriate compensation.
47. Frampton v. South Carolina Department of Transportation, 406 S.C. 377, 388, 752 S.E.2d 269, 275 (Ct. App. 2013).
48. Id. See e.g., South Carolina State Highway Department v. Allison, 246 S.C. 389, 393, 143 S.E.2d 800, 802 (1965) ("[A]n obstruction that materially injures or deprives the abutting property owner of ingress or egress to and from his property is a 'taking' of the property, for which recovery may be had."); Sease v. City of Spartanburg, 242 S.C. 520, 524–25, 131 S.E.2d 683, 685 (1963) ("The protection of [the South Carolina takings clause] extends to all cases in which any of the essential elements of ownership has been destroyed or impaired as the result of the construction or maintenance of a public street."); Brown v. Hendricks, 211 S.C. 395, 403, 45 S.E.2d 603, 606 (1947) ("The accessibility of one's property may in some instances constitute a great part of its value, and to permit a material impairment of his access would result in the destruction of a great part of the value ... and his property is therefore as effectually taken as if a physical invasion was made thereon and a physical injury done thereto") (quoting Foster Lumber Co. v. Arkansas Valley & W. Ry. Co., 20 Okla. 583, 95 P. 224, 227 (1908), aff'd on reh'g, 1909 OK 49, 20 Okla. 583, 100 P. 1110).
49. S.C. Dep't of Transp. v. Powell, 818 S.E.2d 433 (Ct. App. 2015), rev'd by S.C. Dep't of Transp. v. Powell, 818 S.E.2d 433 (S.C. 2018).
50. S.C. Dep't of Transp. v. Powell, 818 S.E.2d 433 (Ct. App. 2015), rev'd by S.C. Dep't of Transp. v. Powell, 818 S.E.2d 433 (S.C. 2018).
51. SC Department of Transportation v. Powell, No. 2016-000594, 2018 WL 3748876 (SC August 8, 2018).

Finally, while failing to act may have generally precluded governments from being liable for a takings claim in the past in South Carolina, *SCDOT v. Powell* may influence courts to reach a different outcome. Prior to the South Carolina Supreme Court's decision, alleging only a failure to act likely would not have been able to sustain such a claim. In *Hawkins v. City of Greenville*, for example, the plaintiff alleged he was deprived of his full rights as a property owner because of the city's design of and failure to maintain its storm water drainage system.[52] The court concluded in that case that mere failures to act are insufficient to support *a takings claim.*[53] *SCDOT v. Powell* seems to step away from the long-standing rule that only an "affirmative, positive, aggressive act" on the part of a government agency can serve as the basis for an inverse condemnation claim.[54] A recent case in Florida has suggested that in some circumstances, a failure to maintain the sole road providing access to a parcel of property could result in a compensable taking. In *Jordan v. St. Johns County*, the District Court of Appeal of Florida for the Fifth District found that "the County must provide a reasonable level of maintenance that affords meaningful access, unless or until the County formally abandons the road."[55] The court was clear that it was not proscribing any particular manner of maintenance or level of accessibility that had to be achieved to avoid liability. As storm damage and nuisance flooding increases, South Carolina courts may begin to follow in Florida's footsteps and detail more exacting standards on municipal and county governments than the complete discretion to maintain the roads in their jurisdictions.

CONCLUSION

With the state responsible for more than half of the roads and highways across South Carolina, decisions about how to deal with roads and highways in the face of sea level rise will likely occur at the state level. County and municipal governments nevertheless have duties to maintain and repair roads in their jurisdictions. For a government entity unable to keep up with the expense of maintaining and repairing roads, one potential option is to abandon the road and thus end those obligations. In South Carolina, a governmental entity must follow both statutory procedure and obtain a final court order before it can officially abandon a road. However, abandoning a road may lead to a takings challenge, depending on whether the road abandonment materially injures the access rights of abutting property owners.

Sea level rise poses a significant threat to infrastructure in coastal areas of South Carolina. Deciding how to adapt and manage roads in light of this threat is a question for all levels of government to consider.

52. *SC Department of Transportation v. Powell, No. 2016-000594, 2018 WL 3748876, *7 (SC August 8, 2018)(dissent).*
53. *Hawkins v. City of Greenville, 594 S.E.2d 557, 562–63 (S.C. Ct. App. 2004).*
54. *Id. at 294; 594 S.E.2d at 564.*
55. *Jordan v. St. Johns County, 63 So. 3d 835, 838 (Fla. Dist. Ct. App. 2011).*

APPENDIX A: METHODOLOGY

The methodology for NOAA's Sea Level Rise Inundation Mapping is considered a modified bathtub model that "attempts to account for local and regional tidal variability and hydrological connectivity" not including wind tides.[56] It maps sea level rise on top of mean higher high water but does not "incorporate future changes in coastal geomorphology" and does not include a detailed hydrological network analysis. It is meant for high-level management decisions, and further research and surveys are necessary for "navigation, permitting, or other legal purposes."[57] These data came in one-foot intervals in geodatabases that were separated geographically by state and then by coastal region in the state (Table A1).

The county shapefiles were selected from the Census Boundary Shapefiles at a 1:500,000 scale.[58] The South Carolina road data came from the SCDOT GIS Mapping website.[59] These data came in two files, "Statewide Highways" and "Statewide Other Roads." SCDOT defines highways as those maintained by SCDOT, while the other roads are maintained by local or private entities.

TABLE A1 | *Sea Level Rise Viewer Data Download Geodatabases for South Carolina Counties*

Geodatabases	South Carolina Counties
Region 1	Florence, Georgetown, Marion, Williamsburg
Region 2	Beaufort, Berkeley, Charleston, Colleton, Dorchester, Hampton, Jasper
Region 3	Horry

To select and calculate roads affected by sea level rise, two primary steps were required: data preprocessing and processing. ArcMap and Python were used to conduct the majority of the methodology. To begin the preprocessing, 12 identified counties were exported as a separate shapefile. If necessary, the multiple regional geodatabases were merged to encompass the entire coastline as well as potentially impacted inland counties. This process resulted in three sea level rise shapefiles at one-, two-, and three-feet of sea level rise. South Carolina's road shapefiles were clipped by the county shapefiles, resulting in individual county-level road networks.

56. *coast.noaa.gov/data/digitalcoast/pdf/slr-inundation-methods.pdf*
57. *coast.noaa.gov/slr/*
58. *www.census.gov/geo/maps-data/data/cbf/cbf_counties.html*
59. *info2.scdot.org/sites/GIS/SitePages/GISFiles.aspx?MapType=Shape*

After the data preprocessing took place, the extraction of impacted road data commenced. Each county's road layers were clipped by the sea level rise layers. The length of each road segment included within the final clipped road shapefiles was calculated using ArcMap. They were then aggregated by depending on the state's road shapefile metadata into three categories: state maintained, locally maintained, and privately maintained. For South Carolina, the roads were aggregated by route type. The highway route types were all maintained by the state, and they were simply aggregated without respect to route type. The "other roads" were separated into locally or privately maintained, and then totaled (Table A2). This procedure was repeated for each potential foot of sea level rise up to three feet. Additionally, the City of Beaufort, South Carolina, was separately calculated using a similar methodology.

TABLE A2 | *South Carolina Road Maintenance Designations*[60]

Aggregated Category	Highway Shapefile	Other Roads Shapefile
State maintained *(highway file)*	I-, US, SC, S-, D-, R-, RS	
Locally maintained		L-, D-
Privately maintained		PR

It is crucial to emphasize that this is just the tip of the iceberg in terms of using these data to identify future road vulnerabilities to sea level rise. The databases breakdown road types further into paved and unpaved as well as including other information. Further work to distinguish between county- and city-maintained roads would also seem prudent in South Carolina. Additionally, this analysis was done assuming that the roads are at the same elevation as the surrounding land; however, with the addition of LiDAR, a more comprehensive outlook of future impacts could be conducted.

60. In downloadable road zip file, titled "Data Dictionary."

SOUTH CAROLINA:

MILES OF ROAD MAINTAINED BY STATE, LOCAL (CITY/COUNTY), OR PRIVATE ENTITIES THAT WILL BE IMPACTED BY ONE, TWO, OR THREE FEET OF SEA LEVEL RISE

	1 foot of SLR	2 feet of SLR	3 feet of SLR
Beaufort			
State maintained	13.5	19.5	34.7
Locally maintained	8.5	23.6	70.7
Privately maintained	0.9	3.5	23.7
Berkeley			
State maintained	3.9	5.7	8.7
Locally maintained	2.9	6.2	13.5
Privately maintained	0.0	0.0	0.2
Charleston			
State maintained	24.9	44.0	93.7
Locally maintained	11.0	34.6	99.4
Privately maintained	1.1	3.6	35.9
Colleton			
State maintained	6.9	12.8	24.9
Locally maintained	10.9	18.6	28.3
Privately maintained	0.6	0.9	1.1
Dorchester			
State maintained	0.06	0.07	0.07
Locally maintained	0.1	0.2	0.4
Privately maintained	0.0	0.0	0.0
Georgetown			
State maintained	5.0	9.5	15.2
Locally maintained	3.8	9.7	24.6
Privately maintained	2.0	2.2	2.9
Horry			
State maintained	1.6	2.9	4.9
Locally maintained	5.2	7.6	18.7
Privately maintained	0.0	0.0	0.0
Jasper			
State maintained	1.5	2.3	4.7
Locally maintained	3.5	4.9	7.0
Privately maintained	0.0	0.0	0.0

APPENDIX B: SEA LEVEL RISE SUMMARY PROJECTIONS

The following tables summarize projections of the amount of sea level rise by scenario and by decade for the northern (Springmaid Pier), central (Charleston 1), and southern (Fort Pulaski) South Carolina sea level rise gauges.

Scenarios for SPRINGMAID PIER
NOAA2017 VLM: 0.00276 feet/yr
All values are expressed in feet

Year	NOAA2017 Low	NOAA2017 Int-Low	NOAA2017 Intermediate	NOAA2017 Int-High	NOAA2017 High	NOAA2017 Extreme	Year
2000	0	0	0	0	0	0	2000
2010	0.13	0.16	0.26	0.33	0.39	0.39	2010
2020	0.3	0.36	0.49	0.66	0.75	0.82	2020
2030	0.46	0.56	0.79	1.08	1.31	1.44	2030
2040	0.59	0.72	1.08	1.51	1.9	2.13	2040
2050	0.75	0.92	1.44	2.03	2.62	3.12	2050
2060	0.92	1.12	1.87	2.69	3.58	4.3	2060
2070	1.05	1.31	2.33	3.44	4.63	5.58	2070
2080	1.18	1.51	2.82	4.27	5.87	7.05	2080
2090	1.31	1.67	3.31	5.15	7.19	8.66	2090
2100	1.38	1.8	3.84	6.17	8.66	10.6	2100

Scenarios for CHARLESTON I
NOAA2017 VLM: 0.00417 feet/yr
All values are expressed in feet

Year	NOAA2017 Low	NOAA2017 Int-Low	NOAA2017 Intermediate	NOAA2017 Int-High	NOAA2017 High	NOAA2017 Extreme	Year
2000	0	0	0	0	0	0	2000
2010	0.13	0.16	0.26	0.33	0.39	0.39	2010
2020	0.33	0.39	0.52	0.69	0.79	0.85	2020
2030	0.49	0.59	0.82	1.12	1.31	1.48	2030
2040	0.66	0.79	1.15	1.54	1.94	2.2	2040
2050	0.82	0.98	1.51	2.1	2.69	3.18	2050
2060	1.02	1.21	1.94	2.76	3.67	4.36	2060
2070	1.15	1.41	2.4	3.51	4.72	5.68	2070
2080	1.28	1.61	2.89	4.33	5.91	7.12	2080
2090	1.41	1.77	3.41	5.25	7.28	8.79	2090
2100	1.54	1.97	4	6.33	8.83	10.79	2100

Scenarios for FORT PULASKI
NOAA2017 VLM: 0.00440 feet/yr
All values are expressed in feet

Year	NOAA2017 Low	NOAA2017 Int-Low	NOAA2017 Intermediat	NOAA2017 Int-High	NOAA2017 High	NOAA2017 Extreme	Year
2000	0	0	0	0	0	0	2000
2010	0.13	0.16	0.26	0.33	0.36	0.39	2010
2020	0.33	0.39	0.52	0.69	0.79	0.85	2020
2030	0.49	0.59	0.82	1.12	1.31	1.48	2030
2040	0.66	0.79	1.15	1.54	1.9	2.17	2040
2050	0.85	1.02	1.54	2.1	2.69	3.18	2050
2060	1.02	1.21	1.94	2.76	3.64	4.33	2060
2070	1.15	1.41	2.4	3.48	4.66	5.64	2070
2080	1.31	1.64	2.92	4.36	5.91	7.12	2080
2090	1.44	1.8	3.44	5.28	7.28	8.79	2090
2100	1.54	1.97	4	6.33	8.79	10.73	2100

Source: USACE Sea Level Change Curve Calculator (2017.55) using NOAA et al. 2017 scenarios
The US Global Change Research Program 2017 (NOAA et al. 2017) Created 9/13/18