GEORGIA DOT RESEARCH PROJECT 23-19

Final Report

DEVELOP AN OFF-SYSTEM BRIDGE MANAGERS TRAINING PROGRAM TO INCREASE COLLABORATION AND ACCESS TO GDOT'S RESOURCES INCLUDING LOCAL BRIDGE PROGRAMS AND PROMOTE BEST PRACTICES

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16. Abstract:

This study focuses on developing bridge asset management training resources to assist Georgia local governments in managing locally owned bridges and improving coordination with GDOT. The project was designed to address recurring challenges faced by local bridge owners, including employee turnover, limited in-house bridge expertise, difficulty interpreting inspection information, and inconsistent familiarity with GDOT resources and local bridge programs. Key deliverables include ten in-person bridge asset management workshop presentations delivered at all seven GDOT district offices, a participant workbook, fifteen on-demand training videos, two interactive modules, and seven county-specific bridge management reports. The in-person workshops provided local governments with practical training on bridge fundamentals, inspection reports, maintenance and preservation, bridge management, GDOT bridge programs, and available resources. The on-demand videos expanded the reach of the training through short videos and interactive modules developed to support continued learning beyond the workshop series. The project supported publication of the *Supplementary Bridge Management and Preservation Guide for Local Municipalities* alongside the on-demand videos on GDOT's external website. Together, these resources provide local governments with accessible tools to improve bridge management practices, strengthen communication with GDOT personnel, and support more informed decisions related to locally owned bridge maintenance, preservation, rehabilitation, and replacement.

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SI* (MODERN METRIC) CONVERSION FACTORS

APPROXIMATE CONVERSIONS TO SI UNITS

Symbol	When You Know	Multiply By	To Find	Symbol
		LENGTH		
in	inches	25.4	millimeters	mm
ft	feet	0.305	meters	m
yd	yards	0.914	meters	m
mi	miles	1.61	kilometers	km
		AREA		
in^2	square inches	645.2	square millimeters	mm^2
ft^2	square feet	0.093	square meters	m^2
yd^2	square yard	0.836	square meters	m^2
ac	acres	0.405	hectares	ha
mi^2	square miles	2.59	square kilometers	km^2
		VOLUME		
fl oz	fluid ounces	29.57	milliliters	mL
gal	gallons	3.785	liters	L
ft^3	cubic feet	0.028	cubic meters	m^3
yd^3	cubic yards	0.765	cubic meters	m^3
		NOTE: volumes greater than 1000 L shall be shown in m^3		
		MASS		
oz	ounces	28.35	grams	g
lb	pounds	0.454	kilograms	kg
T	short tons (2000 lb)	0.907	megagrams (or "metric ton")	Mg (or "t")
		TEMPERATURE (exact degrees)		
°F	Fahrenheit	5 (F-32)/9 or (F-32)/1.8	Celsius	°C
		ILLUMINATION		
fc	foot-candles	10.76	lux	lx
fl	foot-Lamberts	3.426	$candela/m^2$	cd/m^2
		FORCE and PRESSURE or STRESS		
lbf	poundforce	4.45	newtons	N
lbf/in^2	poundforce per square inch	6.89	kilopascals	kPa

APPROXIMATE CONVERSIONS FROM SI UNITS

Symbol	When You Know	Multiply By	To Find	Symbol
		LENGTH		
mm	millimeters	0.039	inches	in
m	meters	3.28	feet	ft
m	meters	1.09	yards	yd
km	kilometers	0.621	miles	mi
		AREA		
mm^2	square millimeters	0.0016	square inches	in^2
m^2	square meters	10.764	square feet	ft^2
m^2	square meters	1.195	square yards	yd^2
ha	hectares	2.47	acres	ac
km^2	square kilometers	0.386	square miles	mi^2
		VOLUME		
mL	milliliters	0.034	fluid ounces	fl oz
L	liters	0.264	gallons	gal
m^3	cubic meters	35.314	cubic feet	ft^3
m^3	cubic meters	1.307	cubic yards	yd^3
		MASS		
g	grams	0.035	ounces	oz
kg	kilograms	2.202	pounds	lb
Mg (or "t")	megagrams (or "metric ton")	1.103	short tons (2000 lb)	T
		TEMPERATURE (exact degrees)		
°C	Celsius	1.8C+32	Fahrenheit	°F
		ILLUMINATION		
lx	lux	0.0929	foot-candles	fc
cd/m^2	$candela/m^2$	0.2919	foot-Lamberts	fl
		FORCE and PRESSURE or STRESS		
N	newtons	0.225	poundforce	lbf
kPa	kilopascals	0.145	poundforce per square inch	lbf/in^2

* SI is the symbol for the International System of Units. Appropriate rounding should be made to comply with Section 4 of ASTM E380. (Revised March 2003)

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EXECUTIVE SUMMARY

Research Project 23-19, "Develop an Off-System Bridge Managers Training Program to Increase Collaboration and Access to GDOT's Resources Including Local Bridge Programs and Promote Best Practices," was developed to assist local governments in managing locally owned bridges throughout Georgia. Many local governments face challenges related to limited staff capacity, employee turnover, varying levels of bridge expertise, and inconsistent familiarity with GDOT resources, inspection information, maintenance and preservation practices, and local bridge programs. These challenges make it difficult for local bridge owners to prioritize bridge needs, understand available funding opportunities, and coordinate effectively with GDOT. The purpose of this project was to develop a practical bridge asset management training program that improves access to GDOT resources, strengthens communication between local governments and GDOT personnel, and supports more consistent bridge management practices across Georgia. The project included three major components: in-person bridge asset management workshops, on-demand bridge asset management modules, and one-on-one county support.

The in-person component included the development and delivery of bridge asset management workshops at each of GDOT's seven district offices. These workshops provided local government personnel with practical bridge training including broad fundamentals and in-depth case studies. The in-person training package included 10 presentation modules and a participant workbook. Across the seven district workshops, 121 of the 173 invited counties and municipalities attended, demonstrating substantial statewide participation and interest in bridge management training. The on-demand

component converted selected GDOT-reviewed in-person training content into shorter, self-paced digital resources. A total of fifteen on-demand training videos and two interactive modules were developed to support continued learning for local government personnel, GDOT staff, and future users. The videos were reviewed, revised, finalized, and paired with closed caption files to improve accessibility. The completed content was uploaded to GDOT's YouTube channel and made accessible through GDOT's external website. As part of this implementation effort, the *Supplementary Bridge Management and Preservation Guide for Local Municipalities* was also published alongside the video resources, creating a more complete bridge asset management resource for local governments. The one-on-one county support component provided one county that participated during the in-person workshop from each district with more focused assistance related to locally owned bridge management and preservation. This included the development of county-specific bridge management reports that summarized local bridge inventories, condition trends, maintenance considerations, funding opportunities, and recommended next steps to support future planning and coordination with GDOT.

Overall, RP 23-19 developed a statewide training framework to support local bridge owners through in-person instruction, on-demand training resources, and county-specific support. The project improved access to bridge management information, provided reusable training materials, supported knowledge transfer, and strengthened collaboration between local governments, GDOT district offices, and GDOT's Office of Bridge Design and Maintenance.

CHAPTER 1. INTRODUCTION

OVERVIEW

Locally owned bridges are a critical component of Georgia's transportation network and provide essential access for residents, businesses, schools, emergency services, and agricultural and industrial operations. These structures are often managed by local governments with varying levels of staffing, technical expertise, funding availability, and access to bridge-specific resources. In many counties, bridge management responsibilities may be assigned to public works directors, engineers, road supervisors, county managers, commissioners, or other local personnel whose professional backgrounds and familiarity with bridge inspection, maintenance, preservation, rehabilitation, and replacement processes may differ substantially. As a result, local governments often face challenges when interpreting bridge inspection reports, understanding Georgia Department of Transportation (GDOT) bridge program requirements, identifying appropriate maintenance actions, and determining how to prioritize bridge needs within limited budgets.

Research Project 23-19, titled "Develop an Off-System Bridge Managers Training Program to Increase Collaboration and Access to GDOT's Resources Including Local Bridge Programs and Promote Best Practices," was developed to address these challenges through bridge asset management training. The project focuses on assisting local governments in better managing their bridge inventories by improving access to bridge management information, strengthening coordination with the Georgia Department of Transportation (GDOT), and increasing understanding of available GDOT resources. The

project brought together local government bridge managers and other local personnel, GDOT district offices, and GDOT's Office of Bridge Design and Maintenance (OBDM) to promote more consistent communication, stronger working relationships, and improved bridge management practices across Georgia.

The primary purpose of the project was to initiate, develop, and deliver a training program that supports local governments responsible for managing locally owned bridges. For the purposes of this report, "locally owned" refers to bridges that are owned and managed by local governments, such as county, city, or municipal agencies, rather than state or federal authorities. Although these bridges are locally owned, they are inspected by GDOT in accordance with federal guidelines. This project specifically focused on county-level bridge owners and the local government personnel responsible for understanding bridge conditions, coordinating with GDOT, and supporting bridge maintenance, preservation, rehabilitation, and replacement decisions.

The project included three primary components. The first component consisted of in-person bridge asset management training workshops delivered at each of GDOT's seven district offices. These workshops were developed to provide local governments with practical information related to bridge fundamentals, inspection reports, maintenance and preservation practices, bridge management, project planning, and GDOT Local Bridge Programs. The second component consisted of on-demand training resources, including video modules and digital reference materials, developed to support continued training beyond the in-person workshops. These materials are intended to provide flexible, accessible training for new local government employees, GDOT personnel, and others involved in locally owned bridge management. The third component consisted of one-on-

one county assistance, in which one county from each GDOT district received additional focused support through the development of county-specific bridge management and preservation materials.

A central focus of the training program was improving the understanding of bridge structures and potential funding avenues available to local governments such as the Local Maintenance and Improvement Grant (LMIG). Programs like this provide important opportunities for local governments, but successful participation requires understanding eligibility requirements, application processes, local commitments, project coordination, and GDOT procedures and compliance. By incorporating these topics into both in-person and on-demand training, the project improved communication between local governments and GDOT and helped local bridge owners better understand how available resources may support bridge replacement, rehabilitation, and preservation needs.

Recognizing the need for practical, user-friendly resources, the project also incorporated supplementary materials intended to enhance local government understanding of GDOT bridge maintenance and preservation guidance. These resources were designed to simplify the bridge maintenance process and make technical information more relevant and accessible to local governments. The supplementary bridge management and preservation guidance provided concise, actionable recommendations tailored to the needs of smaller, locally owned bridges. By presenting bridge management information in a more approachable format, these materials supported local governments in understanding their structures, identifying maintenance needs, prioritizing bridge-related work, and communicating more effectively with GDOT.

Overall, the research study strengthened locally owned bridge asset management by combining statewide training, on-demand educational resources, and county-specific technical assistance. The project responded to recurring challenges related to local government turnover, limited in-house bridge expertise, inconsistent familiarity with GDOT resources, and the need for improved communication between state and local agencies. Through this combined approach, the project provided local bridge owners with practical tools, training, and guidance to support more informed bridge management decisions and promote long-term collaboration between GDOT and Georgia's local governments.

PROBLEM STATEMENT

Locally owned bridges represent a substantial portion of Georgia's bridge inventory and serve an essential role in maintaining access, mobility, and economic activity across the state. These structures support daily travel to homes, schools, health care facilities, businesses, agricultural operations, and emergency services. Although locally owned bridges are critical transportation assets, many local governments face significant challenges in managing these structures due to limited funding, limited staff capacity, varying levels of technical expertise, and differences in local bridge management practices.

Georgia has 159 counties, and each local government may approach bridge management differently depending on staffing, available resources, internal organization, and prior experience with bridge-related work. In some counties, bridge management responsibilities may be assigned to public works directors, county engineers, road supervisors, county managers, commissioners, or other local personnel. However, many rural and lower-

population local governments do not have an engineer on staff. In cases where engineering staff are available, those personnel may not have formal training in bridge design, bridge inspection, bridge maintenance, or bridge asset management. This variation in local capacity creates inconsistency in how locally owned bridges are understood, prioritized, maintained, and advanced for rehabilitation or replacement.

Employee turnover further compounds these challenges. Experienced local government personnel who previously managed bridge-related responsibilities may retire, leave for other opportunities, or transition out of roles without a formal process for transferring institutional knowledge. As new personnel assume bridge management responsibilities, GDOT may need to re-establish local contacts, explain existing bridge programs, and provide repeated guidance on inspection reports, maintenance expectations, funding opportunities, and project coordination. This creates challenges for both local governments and GDOT personnel and increases the need for consistent, accessible, and repeatable training resources.

Local governments also face challenges in accessing and interpreting bridge inspection information. Many local agencies lack the understanding of how inspection findings correlate to maintenance, preservation, rehabilitation, and replacement. Previous engagement with local governments indicated that local government personnel assuming bridge asset management responsibilities wanted a better understanding of bridge inspection results and terminology contained in GDOT correspondence. Without sufficient familiarity with inspection terminology, deficiency priorities, bridge condition ratings, and maintenance recommendations, local bridge owners struggle to determine which issues

require immediate attention, which activities support preservation, and how bridge needs should be prioritized within limited budgets.

In addition to inspection-related challenges, many local governments do not fully understand the requirements, processes, and decision-making procedures associated with LMIG and GDOT Local Bridge Programs, including the Low Impact Bridge Program, the State Funded Local Bridge Program, and the Local Bridge Replacement Program. These programs provide important opportunities to support locally owned bridge replacement and improvement efforts; however, participation may require knowledge of eligibility requirements, application procedures, local commitments, detour coordination, project prioritization, and GDOT review processes. When local governments do not have a clear understanding of these programs or GDOT's internal process, misunderstandings occur regarding project timing, bridge selection, funding availability, or program fairness.

Survey feedback from public works officials, collected by the University of Georgia (UGA) at an American Public Works Association (APWA) winter meeting, further demonstrated the need for bridge-related training focused on practical local government needs. Respondents identified better access and communication between state and local governments, quick information links, maps, graphs, basic bridge knowledge, bridge rehabilitation and replacement prioritization, proactive budgeting, bridge maintenance procedures, funding, inspection requirements, and communication with GDOT as desired training topics. Reported challenges included funding, training, and reports for bridge repair prioritization. These responses illustrate that local bridge owners need resources that are not only technically accurate, but also practical, accessible, and directly applicable to daily bridge management decisions.

The lack of a consistent, statewide training framework for locally owned bridge management creates a gap between available GDOT resources and local government understanding of those resources. While some state departments of transportation (DOTs) have provided webinars, local systems training, or funding announcements, there is limited literature on improving communication between the state DOT and local governments. Additionally, no current on-demand training is available for GDOT and local government personnel on the use of bridge management and inspection software, including InspectX, used by GDOT's Office of Bridge Design and Maintenance and local governments.

Therefore, the need existed for a structured bridge management training program that could improve communication, support knowledge transfer, and provide consistent guidance to local governments across Georgia. Such a program needed to address both immediate and long-term needs by combining in-person training, on-demand modules, digital reference materials, and county-specific support. By developing resources that explain bridge inspection reports, maintenance and preservation practices, bridge management principles, GDOT Local Bridge Programs, and available tools, this research study was designed to help local governments better understand and manage their bridge assets while strengthening coordination between local bridge owners, GDOT district offices, and GDOT's Office of Bridge Design and Maintenance.

BACKGROUND AND LITERATURE REVIEW

A thorough literature review was conducted to identify best practices, tools, and methodologies for bridge asset management training. The review focused on existing frameworks that could be adapted to Georgia's local government context, with emphasis

on resources that support locally owned bridge management, bridge inspection understanding, maintenance and preservation practices, bridge program awareness, and communication between state transportation agencies and local bridge owners. The findings from the literature review were integrated into the development of the in-person training workshops, on-demand training modules, digital reference materials, and other resources developed for local bridge owners.

Georgia's transportation infrastructure, including off-system routes, is built to provide access and mobility for the traveling public to jobs, health care, schools, emergency services, businesses, and other essential destinations. Based on bridge inventory data available through GDOT's InspectX MultiAsset system, locally owned bridges account for more than 60 percent of Georgia's bridge inventory. One of the major disadvantages that local governments face is the lack of funding priority for the development of effective bridge asset renewal programs. Existing GDOT Local Bridge Programs, including the Low Impact Bridge Program (LIBP), the Local Bridge Replacement Program (LOCBR), and the State Funded Local Bridge Program (SFLB), provide important opportunities for local governments to address bridge needs; however, successful use of these programs requires local governments to understand program requirements, eligibility considerations, local commitments, coordination expectations, and project delivery procedures [79].

With 159 unique counties in Georgia, there are many different approaches and styles to managing locally owned bridges. Job titles related to bridge management may range from public works director, engineer, road supervisor, county manager, commissioner, or other local personnel, particularly in smaller counties. Many local governments within rural and lower-population areas do not have an engineer in-house. In cases where an engineer is

available, that individual may not be a civil engineer with formal training in bridge design, bridge maintenance, or bridge management. Some counties previously had experienced personnel who managed off-system bridges, but many of those employees have retired or departed for other opportunities. In addition to county governments, Georgia includes municipalities such as cities, towns, consolidated city-counties, and consolidated cities, each with its own local government structure. For the purposes of this report, the term local governments includes both counties and municipalities. Employee turnover due to retirement and constrained resources has become a major challenge for local governments. As a result, GDOT must re-establish contacts with local governments and train new off-system bridge managers, when available, to continue improving local systems and promote best practices.

Recent findings from the UGA research team's interviews with approximately 50 local governments indicated that personnel assuming bridge asset management responsibilities would like to gain a better understanding of bridge inspection results and terminology that appear in GDOT correspondence to local governments. Local governments may also be hesitant to consult with GDOT regarding funding programs because they may not have the resources needed to complete an application, coordinate detours, or clearly understand how their bridge needs compare with bridges in other local governments. In addition, local governments may not fully understand the different GDOT Local Bridge Programs or GDOT's work process. As a result, local government bridge managers may misunderstand GDOT's efforts. For example, while GDOT may be diligently working to develop a bridge replacement plan for local governments, local personnel may assume that GDOT is taking too long or has avoided making a decision. When another bridge in a neighboring local

government is selected due to rigorous LIBP program requirements, some local governments may misinterpret the outcome and raise concerns regarding fairness [79].

There are few studies on developing training programs for communicating and administering bridge load postings and replacement projects with local governments [79]. Some state DOTs have held webinars for local governments or announced federal Bipartisan Infrastructure Law funding opportunities for local road and bridge improvements [79]. However, there has been no fixed method for improving communication between a state DOT and local governments. One of the best practices identified was the development of active training programs through Iowa DOT. This program developed recurring local systems training programs and videos to promote updates to DOT personnel and local systems contacts [79].

The national review of bridge asset management training demonstrated that bridge-specific training for local governments is not consistently available across the United States. Although all 50 states were considered during the review, only 30 relevant state DOT bridge-related training programs were identified. Of the 30 programs, 20 contained bridge-specific training, 2 were one-time training presentations, and 8 were broader structures-related training programs. This finding indicates that many states either do not provide publicly available bridge-specific training, provide only limited one-time training content, or provide broader structures-related training that may not directly address the needs of local bridge owners.

As shown in Figure 1, the national map revealed a fragmented training landscape. Bridge-related training exists in several states, but the level of detail, intended audience, delivery

format, and bridge-specific applicability vary considerably. The limited number of bridge-specific programs is particularly important for local governments because locally owned bridge management requires practical understanding of inspection reports, maintenance priorities, preservation practices, replacement and rehabilitation options, funding programs, and state DOT coordination procedures.

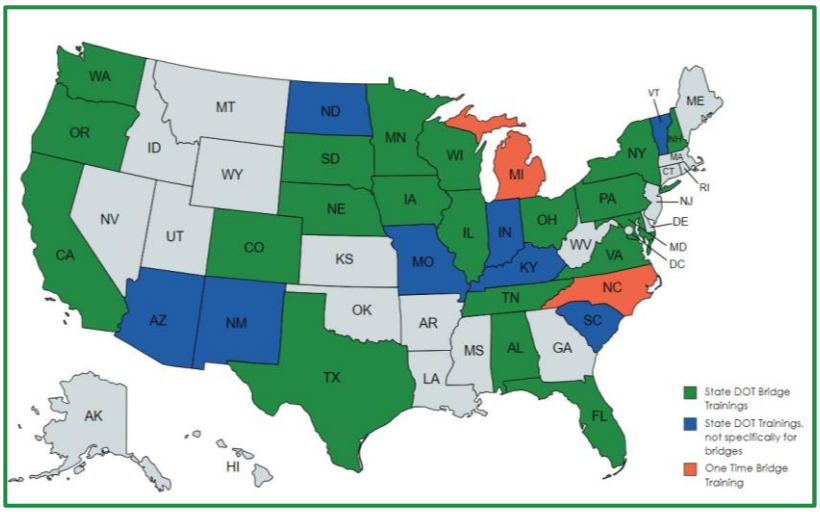


Figure 1. Photo. State DOT bridge training programs.

While the structure of some training programs or one-time presentations may provide useful information, often the format of such programs or presentations do not necessarily create a repeatable training framework for new local government personnel or for long-term bridge asset management support. This finding supported the need for a Georgia-specific bridge asset management training program that provides consistent, repeatable, and locally relevant guidance.

Alongside reviewing publicly available bridge asset management training resources across the nation, the research team reviewed bridge asset management resources published by GDOT. These resources included GDOT training programs, processes, and materials

associated with locally owned bridge management and GDOT Local Bridge Programs. These programs and funding resources included the LIBP, LOCBR, SFLB and LMIG. This review helped identify the need to present information related to program eligibility, decision-making forms, local commitments, coordination requirements, and other practical details that local governments need to understand when working with GDOT.

A key Georgia-specific resource was the Supplementary Bridge Management and Preservation Guide for Local Municipalities, which was developed in partnership with UGA as part of Research Project 21-02 and published by GDOT in 2026 [79, 79]. The Transportation Research Board paper, "Equipping Local Governments: A Georgia-Based Model for Local Bridge Preservation with National Implication," further described the guide as a Georgia-based model for improving local bridge preservation through accessible, actionable guidance for local governments [79]. The review evaluated manuals based on technical depth, relevance to local governments, organization, financial guidance, and accessibility. Findings showed that many states either lacked dedicated bridge maintenance guidance or provided technical documents that were difficult for non-engineering local government users to interpret and implement. This finding reinforced the need for resources that translate bridge preservation concepts into practical information for local officials.

The Supplementary Guide was developed to complement GDOT's Bridge Structure Maintenance and Rehabilitation Repair Manual by presenting maintenance and preservation information in a format more directly applicable to local governments [79, 79]. While the GDOT manual provides extensive technical guidance for bridge structure maintenance and rehabilitation, the Supplementary Guide translates key maintenance and

preservation concepts into a more user-friendly format for local governments. The guide provides practical explanations, priority-based maintenance recommendations, funding-related guidance, visual resources, and user-focused explanations tailored to the needs of smaller, locally owned bridges [79, 79, 79]. After the national review of bridge training practices and maintenance guidance, this Georgia-specific resource helped inform the development of the research study training content by connecting national training concepts with GDOT procedures, GDOT terminology, local bridge program information, and the practical maintenance needs of county-level bridge owners.

The findings from the literature review informed the organization of the initial training content. During the early stages of the project, the research team identified training topics that included bridge fundamentals, off-system bridges, bridge inspection, maintenance and preservation, bridge design principles, bridge management systems, bridge replacement, rehabilitation and retrofitting, bridge project management, legal and regulatory aspects, emergency response and bridge safety, community engagement and communication, and case studies and best practices. These topic areas provided the initial framework for developing the in-person training materials and later informed the organization of the on-demand resources.

The literature review also supported the organization of the training materials into four general content categories: informational, technical, administrative, and case studies. Informational content was intended to transfer facts, figures, forms, and illustrations to improve understanding of bridge-related topics. Technical content was intended to educate and reinforce skills or competencies related to a specific task, technology, or tool. Administrative content was intended to shorten the learning curve for new local

government officials by introducing important contacts, programs, and GDOT services. Case study content used real-world examples to illustrate or reinforce specific processes, procedures, or design considerations.

Overall, the literature review demonstrated the need for a Georgia-specific bridge asset management training program focused on locally owned bridges. Existing national training resources provided useful examples of bridge-related instruction, but the findings showed that available training was inconsistent across states and often not tailored to local bridge owners. In addition, national bridge maintenance guidance varied widely in technical depth, accessibility, organization, and usefulness to local governments. Therefore, the project required a framework that connected bridge management principles, GDOT Local Bridge Programs, inspection information, maintenance and preservation practices, software resources, and local government needs. The findings from the literature review were used to guide the development of the project's training structure, content categories, delivery methods, and supporting resources.

SCOPE AND OBJECTIVES

The scope of the research study includes the development, delivery, refinement, and documentation of a locally owned bridge asset management training program for Georgia local governments. The project was designed to support local government personnel responsible for managing locally owned bridges by providing practical training, reference materials, and direct engagement opportunities with GDOT personnel. The project focused on strengthening understanding of bridge management practices, GDOT Local Bridge

Programs, bridge inspection information, bridge maintenance and preservation, and available GDOT resources.

The project scope included three primary training and outreach components. The first component was the development and delivery of in-person training workshops at each of GDOT's seven district offices. These workshops were intended to provide local governments with direct access to GDOT personnel, structured bridge management training, and practical resources that could support local bridge decision-making. The second component was the development of on-demand training content and digital materials to support continued learning beyond the in-person workshops. These resources were intended to assist new local government employees, GDOT personnel, and other users who need flexible access to bridge management training after the completion of the project. The third component was the development of one-on-one support for selected counties, with at least one county from each GDOT district receiving more focused assistance related to locally owned bridge management.

The training program was developed to address several bridge management topics relevant to local governments, including managing locally owned bridges, understanding bridge inspection reports and associated deficiency items, coordinating with GDOT, identifying appropriate bridge maintenance and preservation practices, and understanding GDOT Local Bridge Programs. The project was completed through the development of training materials such as PowerPoint presentations, workshop materials, on-demand videos, and other digital reference materials.

The main objective of the project was to initiate, develop, and deliver a local-system bridge training program that connects local government bridge managers, other local government personnel, GDOT district offices, and GDOT's Office of Bridge Design and Maintenance. This objective was supported by two primary goals: to educate local government managers and GDOT employees on GDOT Local Bridge Programs and bridge management best practices, and to develop on-demand training modules that allow bridge management training to continue beyond the duration of the project.

METHODOLOGY

This section outlines the general approach undertaken to achieve the objectives of the research study, which focused on improving locally owned bridge asset management practices for local governments in Georgia through training, digital resources, and targeted county-level support. The project methodology was organized around the development, delivery, refinement, and documentation of resources intended to assist local governments in better understanding bridge management responsibilities, GDOT Local Bridge Programs, inspection-related information, maintenance and preservation practices, and available GDOT resources.

The overall project approach followed six primary work plan tasks established for the research study: research best practices and resources; develop in-person training content and program materials; deliver and improve the in-person training content; develop on-demand training content and modules; deliver and implement the on-demand training resources; and develop the draft and final project report. These tasks provided the

framework for completing the project and ensured that each major project component was developed in a sequential and coordinated manner.

The methodology began with a review of relevant bridge asset management resources across the nation, training practices, GDOT bridge programs, existing GDOT materials, and resources developed through related research efforts. This initial review informed the development of training content and helped the research team identify topics that would be most applicable to local governments responsible for locally owned bridges. The study team also coordinated with GDOT personnel throughout the project to ensure that the training materials reflected current GDOT practices, terminology, program requirements, and communication needs.

Following the initial review and planning phase, the research team developed in-person training materials for delivery at GDOT's seven district offices. The content was intended to bridge knowledge gaps related to locally owned bridge management, inspection reports, deficiency items and priorities, GDOT partnerships, and programming support for bridge maintenance and replacement through LMIG, LIBP, LOCBR, and SFLB. These materials included presentation slides, workshop resources, and supporting reference materials intended to provide local governments with practical and accessible bridge management guidance. The in-person training content was reviewed, revised, and refined through coordination with GDOT before and during workshop delivery. Feedback and lessons learned from the training process were used to improve the materials and support the continued development of project resources.

In parallel with the in-person training effort, the research team developed on-demand training resources to support continued access to bridge management information beyond the in-person workshops. These resources included video modules, interactive modules, and digital reference materials designed to provide flexible training for local government personnel, GDOT staff, and future users. The on-demand resources were developed to reinforce major topics from the in-person training program while allowing users to access specific training content as needed.

The project also included one-on-one county assistance for selected counties across Georgia. This component was developed to provide more focused bridge management support at the county level and to demonstrate how project resources could be applied to local bridge inventories. County-specific materials were developed using a consistent reporting framework to help communicate bridge information, identify maintenance and preservation considerations, and support discussions between local governments and GDOT.

A total of thirty-five deliverables were generated throughout the course of the project. These deliverables included in-person training materials, on-demand training resources, interactive modules, digital reference materials, county-specific documents, and reporting materials. Each deliverable was developed in coordination with GDOT personnel. The deliverables are discussed in greater detail in Chapters 2, 3, and 4. Because the project consisted of three major components, the detailed methodology for each component is presented separately in the following chapters. Additional information regarding individual contributions is provided in the Acknowledgments section.

CHAPTER 2. IN-PERSON BRIDGE ASSET MANAGEMENT WORKSHOPS

OBJECTIVES

The objective of the in-person training component was to develop and deliver practical bridge asset management training for local government personnel responsible for locally owned bridges in Georgia. This component was intended to provide local bridge owners with a clearer understanding of GDOT resources, bridge inspection information, bridge maintenance and preservation practices, and GDOT Local Bridge Programs, including the LIBP, SFLB, and LOCBR.

The in-person workshops were also intended to strengthen communication and coordination between local governments, GDOT district offices, and GDOT's Office of Bridge Design and Maintenance. By delivering the training at each of GDOT's seven district offices, the project provided an opportunity for local government personnel to receive consistent bridge management guidance while also engaging directly with GDOT staff. The in-person training component served as the foundation for the broader training program and informed the development of on-demand resources and county-specific support materials.

METHODOLOGY

This methodology section includes identification of training needs, review of available GDOT and national resources, development of modular training content, UGA and GDOT review, coordination with GDOT district offices, and revision of the slides and participant workbook before and during workshop delivery. The approach for the in-person training component was to convert the project's identified bridge management needs into a

practical, technically accurate, and accessible one-day workshop for local government personnel. This process was completed through Task 2, Develop In-Person Training Content and Program Document, and Task 3, Deliver and Improve In-Person Training Content and Program Document. Rather than developing the workshop as a general informational presentation, the research team structured the training as a bridge asset management resource that could explain GDOT processes, introduce key bridge concepts, support local decision-making, and encourage direct communication between local governments and GDOT personnel.

The development approach began by connecting the findings from the national training review, GDOT's existing bridge resources, and local government training needs into a format that could be used in a district-level workshop. The UGA research team met with the GDOT advisory panel to review best practices and discuss the general organization of the training content. These meetings were important because they established the initial framework for converting broad findings from the literature and resource review into a Georgia-specific training structure. The goal was not only to identify what information should be included, but also to determine how that information could be presented to local government personnel with varying levels of bridge-related experience. The research team also considered how previous UGA and GDOT work could support the in-person training. Although the Supplementary Bridge Management and Preservation Guide was developed through a separate project, its maintenance and preservation content helped inform this research study's training approach because it translated technical bridge maintenance information into a format more applicable to local governments. This resource helped

support the project by providing an example of how technical bridge information could be simplified without removing the practical detail needed by local bridge owners.

In addition to informing the training content, the *Supplementary Bridge Management and Preservation Guide for Local Municipalities*, shown in Figure 2, served as an important companion resource for local governments. The guide was developed to support local bridge owners by presenting bridge maintenance and preservation information in a practical and accessible format. Rather than replacing GDOT's Bridge Structure Maintenance and Rehabilitation Repair Manual, the Supplementary Guide was intended to help local governments better understand common bridge maintenance needs, priority-based recommendations, and general preservation strategies for locally owned bridges. Because the guide aligned closely with the objectives of the research study, it was used as a supporting reference during development of the in-person workshop material and later supported the organization of the on-demand training content.

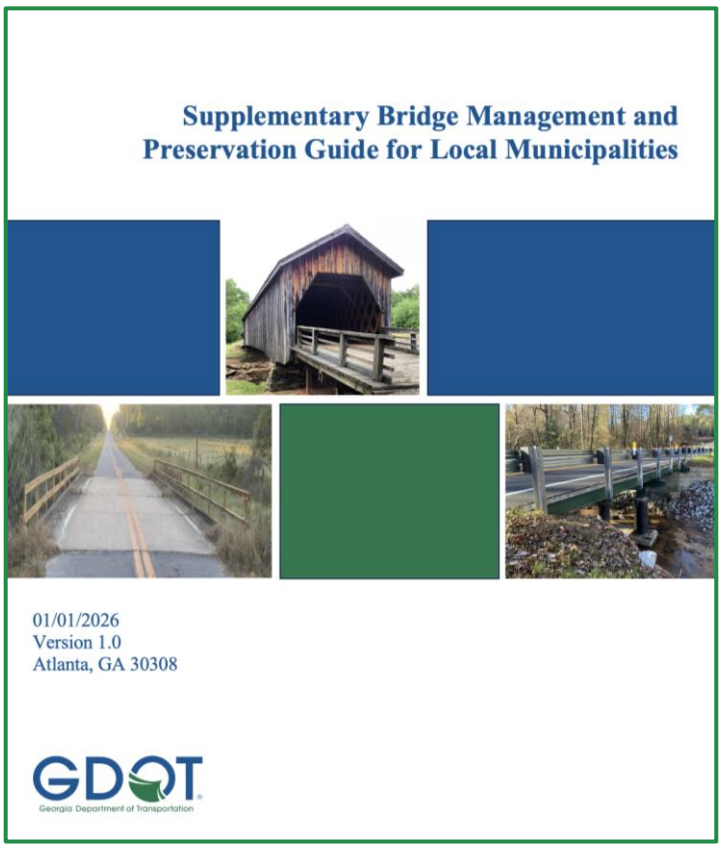


Figure 2. Photo. *Supplementary Bridge Management and Preservation Guide for Local Municipalities* cover page.

Another important implementation outcome of the research study was ensuring that the Supplementary Guide was available to local governments. Although the guide was developed through the previous UGA/GDOT RP 21-02 project, part of this research study's effort focused on completing minor branding revisions and coordinating its publication on GDOT's external website.

The research team began by developing the initial outline for the in-person training workshops and preparing the presentation content in PowerPoint format. The outline served as the framework for organizing the workshop into a logical sequence that could be delivered within a single day. This step required balancing technical depth with participant accessibility. The workshop needed to provide sufficient detail to meaningfully discuss

bridge fundamentals, inspection reports, maintenance and preservation, bridge management, funding resources, and GDOT coordination; however, the content also needed to remain digestible for an audience that could include county engineers, public works directors, road supervisors, county managers, commissioners, GDOT personnel, and other local government staff.

A central part of the in-person content development was determining what level of information could reasonably be delivered in a one-day workshop. The training could not include every bridge management topic in full technical detail without overwhelming participants or reducing engagement. Therefore, the content was organized to emphasize the most relevant concepts, common local government questions, and practical applications. The research team considered the order of topics, the amount of time needed for each module, the placement of structured breaks, and the need for discussion opportunities. This approach allowed the workshop to provide broad bridge management coverage while still giving participants time to ask questions and relate the material to bridge issues in their own counties.

The workshop content was developed as a series of training modules so that complex information could be separated into manageable sections. This modular approach allowed the research team to introduce foundational bridge concepts before moving into more specific topics such as inspection information, maintenance and preservation, GDOT Local Bridge Programs, bridge management responsibilities, and available resources. Organizing the material in modules also allowed individual sections to be reviewed, revised, and improved without disrupting the entire workshop structure.

A preliminary progress meeting was held to review training Modules 1 through 3 with a focus on formatting considerations and the process for providing detailed feedback in future phases. The comments received during this review were incorporated into the remaining module presentations. This review step ensured that early modules were technically accurate, appropriately organized, and aligned with GDOT expectations before the remaining workshop content was fully developed. The process helped establish the review-and-revision approach that was used throughout the development of the in-person training materials.

Following the preliminary meeting, the research team continued developing the content for each of the in-person training modules using a two-step approach. The first step focused on finalizing the technical content and receiving approval from GDOT for the information included in the training modules. This step was necessary to ensure the material accurately reflected GDOT terminology, program requirements, bridge management practices, and communication expectations. The second step focused on improving the presentation of the material such that the modules communicated the content effectively. This included refining the order of information, improving slide organization, strengthening visual communication, and adjusting the overall flow of the workshop. The intent was to create training materials that were both technically reliable and usable for local government participants.

After the presentation content was developed, the slides were combined and formatted into a participant workbook for use during the district workshops. The workbook was an important part of the in-person training because the training was intended to function as both a live workshop and a reference resource. Participants could follow the presentation

during the workshop, take notes, and retain the material for future use. The workbook helped maintain consistency across the seven district workshops by ensuring that participants received the same core information regardless of where they attended the training.

As the project progressed, the research team worked closely with GDOT to finalize the in-person training modules. This period focused on refining the presentations based on continued feedback and ensuring the materials aligned with GDOT expectations. The research team and GDOT met multiple times to review module content, address minor edits, and confirm final revisions. Nearly weekly email correspondence was used to discuss module content and resolve comments between meetings. This coordination helped maintain transparency throughout the review process and ensured the training materials communicated the intended objectives clearly and consistently. The finalized modules were approved by GDOT senior leadership in May 2025.

Following approval of the training content, the research team and GDOT developed a comprehensive implementation plan for the district workshops. The purpose of the implementation plan was to move the training from completed materials to consistent statewide delivery. The plan identified the logistics for each district, including the resources to be provided by UGA, the support needed from GDOT district offices, and the personnel who should attend each session. This step was necessary because the workshops were designed not as standalone presentations, but as part of a cohesive training experience that fostered direct engagement between GDOT district staff and local government representatives.

Before the first in-person workshop, GDOT and the research team held multiple mock presentations to prepare for the training rollout. These mock presentations allowed the team to evaluate the timing, presentation flow, clarity of the material, transitions between modules, and overall workshop structure. The mock presentations helped identify final modifications before the material was presented to local government participants. This step was necessary because an effective workshop required both accurate subject matter and a well-structured delivery approach that could be successfully completed within a one-day timeframe. Following these mock presentations, the first in-person workshop was completed on June 18, 2025, at the GDOT District 1 office located in Gainesville, Georgia.

The project included continued refinement of the training materials after presentation and review. When minor edits, clarifications, or formatting improvements were identified through GDOT review, mock presentations, or workshop delivery, the presentation slides and participant workbook were revised accordingly. These revisions were primarily intended to correct typographical errors, improve clarity, strengthen visual consistency, and hone the delivery of the material rather than alter the core technical content. This ensured that both the live presentation materials and the written workshop resource remained consistent, technically accurate, and responsive to feedback throughout the development and delivery process.

Overall, the methodology for the in-person training component included resource review, training content development, modular presentation design, participant workbook development, GDOT review, mock presentations, implementation planning, workshop delivery, and post-presentation revisions. This approach allowed the research team to develop a one-day workshop that delivered meaningful technical content while remaining

accessible and useful to local government personnel. The resulting in-person training materials provided the foundation for the district workshops and later supported the development of the project's on-demand training resources.

WORKSHOP DELIVERY

The in-person training workshops were delivered at each of GDOT's seven district offices to provide consistent bridge asset management training across the state while also allowing local governments to engage directly with GDOT district personnel. The workshops were scheduled and delivered in the following order: District 1 on June 18, 2025, in Gainesville; District 6 on July 10, 2025, in White; District 7 on August 19, 2025, in Chamblee; District 2 on September 9, 2025, in Tennille; District 3 on September 24, 2025, in Thomaston; District 4 on October 15, 2025, in Tifton; and District 5 on November 5, 2025, in Jesup. The statewide workshop schedule is shown in Figure 3. Delivering the training at the district offices supported the project objective of bringing local government personnel, GDOT district offices, and GDOT's Office of Bridge Design and Maintenance together in a setting that encouraged discussion, questions, and relationship building.

Each workshop was organized as a one-day training session supported by a participant workbook. Each attendee received a printed copy of the training slides, which allowed participants to follow the presentation, take notes, and retain the material for future reference. The workbook also included dedicated meeting notes pages for attendees to document questions, local bridge concerns, GDOT contacts, or follow-up items identified during the session shown in Figure 4. This format helped the workshop function as both a

live training event and a practical reference document that participants could use after returning to their counties or local agencies.

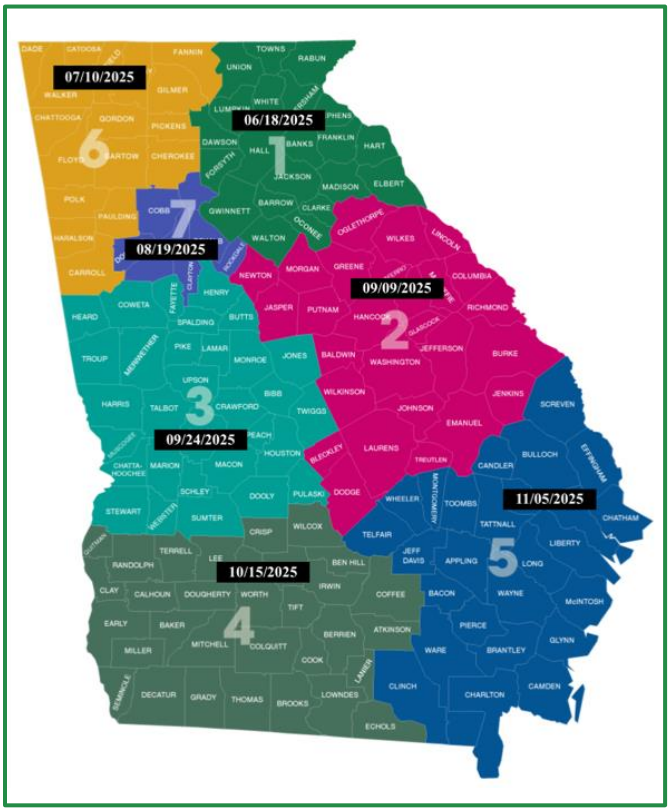


Figure 3. Photo. In-person workshop delivery schedule by GDOT district.

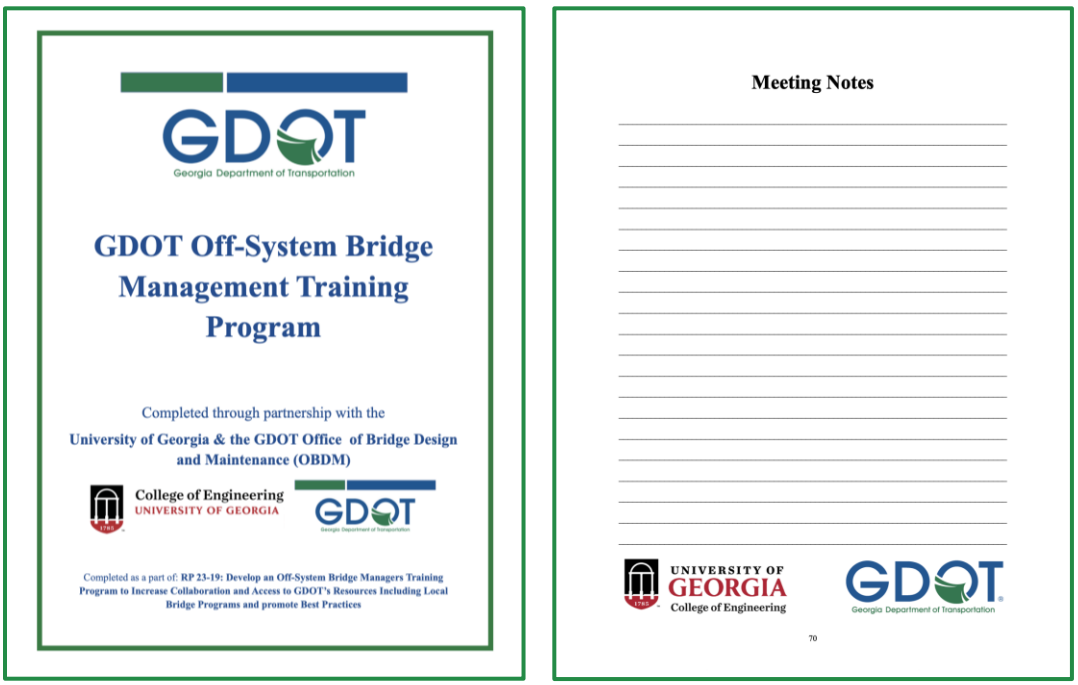


Figure 4. Multiple elements. Participant workbook cover and meeting notes page.

The workshop delivery format was intentionally interactive. Rather than presenting the material as a single lecture, the training included opportunities for participant questions, group discussion, and short pop quizzes to reinforce key concepts and maintain engagement throughout the day as shown in Figure 5. The quizzes were used to confirm understanding of important topics, such as the difference between NBI condition ratings and maintenance priority levels, while also giving participants a break from continuous presentation material. The training produced practical slides, including guidance on available resources, InspectX navigation, regional bridge inspection contacts, and training and support options. These elements helped connect the workshop content to resources that local governments could use after the training.



Figure 5. Photo. Workbook sample page.

The presentation responsibilities were shared between the UGA research team and GDOT personnel. The day began with UGA presenting the introductory module and establishing the purpose, structure, and background of the training. After the opening module, UGA and GDOT personnel alternated presentation responsibilities so that technical and program-specific topics could be discussed by individuals in the respective areas of GDOT. This approach allowed the research team to provide continuity across the workshop while also giving GDOT personnel the opportunity to explain their areas of expertise, answer questions, and clarify how local governments should communicate with GDOT regarding inspection information, bridge maintenance needs, and available bridge programs. This shared delivery format strengthened the practical value of the workshop by combining the

structure of the research-developed training materials with the applied knowledge of GDOT staff.

FINDINGS AND OUTCOMES

The in-person training component resulted in the development and statewide delivery of a complete workshop package for locally owned bridge asset management. The final training package included presentation modules, a participant workbook, meeting notes pages, interactive quiz slides, GDOT resource information, InspectX guidance, bridge program content, and supporting reference material. Together, these materials provided local government personnel with a structured introduction to bridge management topics while also serving as a reference resource that could be used following the workshop. The completed materials were designed to support consistent training across all seven GDOT districts while still allowing discussion of district-specific questions, contacts, and bridge management concerns.

A major outcome of the in-person training effort was the creation of a repeatable training format that could be delivered to local governments across Georgia. The workshops provided a common foundation for discussing bridge fundamentals, inspection reports, maintenance and preservation, GDOT Local Bridge Programs, InspectX resources, and communication with GDOT. Because the same core presentation materials and participant workbook were used across districts, attendees received consistent information regardless of workshop location. At the same time, the in-person format allowed participants to ask questions, discuss local bridge concerns, and interact directly with GDOT personnel who work with local governments on bridge-related issues.

The workshops also demonstrated the value of combining research-developed training materials with GDOT subject matter expertise. The UGA research team provided continuity across the training sessions by presenting the overall framework, background, and bridge management concepts, while GDOT personnel contributed program-specific and practice-based knowledge related to their areas of expertise. This shared delivery format strengthened the training by allowing local government participants to hear directly from the personnel responsible for bridge inspection, maintenance, programming, and local bridge support. As a result, the workshops served not only as instructional sessions, but also as opportunities to improve communication and strengthen working relationships between local governments, GDOT district offices, and GDOT's Office of Bridge Design and Maintenance.

Participant engagement was another important outcome of the workshop format. The use of pop quizzes, discussion opportunities, and resource-focused slides helped maintain attention during the one-day training and provided checkpoints for reinforcing key concepts. These interactive elements helped break up the technical content and encouraged participants to think through how the material applied to their own bridge management responsibilities. The inclusion of workbook pages and meeting notes also allowed participants to document questions, contacts, and follow-up items during the session, increasing the practical value of the workshop materials.

The in-person workshops provided an opportunity to refine the training materials through review, delivery, and feedback. Revisions made during the workshop delivery period were primarily minor edits intended to correct typographical errors, improve clarity, strengthen visual consistency, and hone the delivery of the material. These revisions did not

substantially alter the core technical content, but helped improve the quality and usability of the final presentation slides and participant workbook. By maintaining consistency in the core material while allowing minor improvements between workshops, the research team was able to preserve the integrity of the training package while continuing to respond to feedback.

As shown in Table 1, 121 of the 173 invited counties and municipalities attended the in-person training workshops. Fulton County, which has delegated all structure ownership and maintenance responsibilities to its municipalities, was the only county for which invitations were extended directly to the individual cities rather than to the county government. A total of twenty invitations were shared for the District 7 workshop including the other five counties in the district and to the fifteen municipalities within Fulton County. This attendance demonstrates that the workshop series reached a substantial portion of the intended local government audience and provided broad district-level access to bridge asset management training across Georgia. Several invited counties and municipalities were unable to attend due to scheduling conflicts, while others did not respond despite multiple outreach efforts, including emails and phone calls from the UGA research team and follow-up contact from GDOT personnel. Even with these limitations, the overall attendance indicates strong interest in practical bridge management training among local governments. The value of the workshops was further reinforced after the training series, when multiple counties that attended contacted both GDOT and UGA to express that the training was highly beneficial and to request that additional training opportunities be offered in the future.

Overall, the in-person workshop component achieved its intended purpose by delivering practical bridge asset management training at the district level and producing a reusable set of training materials for future reference. The workshops helped local government personnel better understand GDOT resources, bridge inspection information, maintenance and preservation concepts, and available bridge programs. The workshops also helped create direct communication opportunities between local bridge owners and GDOT personnel. These outcomes supported the broader goals of the research study by improving access to bridge management information, promoting best practices, and strengthening collaboration between GDOT and Georgia's local governments.

Table 1. In-person training attendance.

District	Number of Counties Within District	Number of Counties in Attendance	List of Participating Counties
1	21	16	Barrow, Clarke, Dawson, Forsyth, Franklin, Gwinnett, Habersham, Hall, Jackson, Lumpkin, Madison, Oconee, Stephens, Towns, Union, White
2	27	14	Baldwin, Emanuel, Glasscock, Jasper, Laurens, Lincoln, Morgan, Newton, Oglethorpe, Putnam, Richmond, Treutlen, Wilkes, Wilkinson

Table 1. In-person training attendance. (Continued)

3	31	24	Bibb, Butts, Coweta, Crawford, Fayette, Harris, Henry, Houston, Lamar, Macon, Marion, Meriwether, Peach, Pike, Pulaski, Schley, Spalding, Stewart, Sumter, Talbot, Taylor, Troup, Twiggs, Upson
4	31	22	Baker, Ben Hill, Berrien, Brooks, Calhoun, Coffee, Cook, Decatur, Dougherty, Early, Echols, Grady, Lowndes, Mitchell, Randolph, Seminole, Terrell, Thomas, Tift, Turner, Wilcox, Worth
5	26	19	Appling, Bacon, Brantley, Bryan, Bulloch, Camden, Candler, Charlton, Effingham, Glynn, Jeff Davis, Long, McIntosh, Montgomery, Pierce, Telfair, Toombs, Ware, Wayne
6	17	13	Bartow, Carroll, Catoosa, Chattooga, Cherokee, Dade, Fannin, Floyd, Gilmer, Gordon, Haralson, Murray, Walker

Table 1. In-person training attendance. (Continued)

7	6	13	City of College Park, City of East Point, City of Fairburn, City of Johns Creek, City of Milton, City of Mountain Park, City of Roswell, City of Sandy Springs, City of Union City, Clayton, Cobb, Douglas, Rockdale

TRAINING MATERIALS DEVELOPED

The in-person training component resulted in the development of 11 primary workshop deliverables; 10 training modules and 1 participant workbook.

The 10 training modules included:

- Module 1: Bridge Fundamentals
- Module 2: Off-System Bridges
- Module 3: Bridge Inspection, Maintenance, and Preservation
- Module 4: Bridge Design Principles
- Module 5: Bridge Management Systems
- Module 6: Bridge Replacement, Rehabilitation, and Retrofitting
- Module 7: Bridge Project Management
- Module 8: Emergency Response and Bridge Safety
- Module 9: Community Engagement and Communication
- Module 10: Case Studies and Best Practices

These modules were organized to provide local government personnel with a broad but practical understanding of locally owned bridge structures and asset management, beginning with foundational bridge concepts and progressing into inspection, maintenance, preservation, management systems, project delivery, emergency response, communication, and applied examples. The participant workbook previously discussed combined the workshop slides into a printed reference document with space for notes, allowing attendees to follow the presentations during the workshop and retain the material for future use.

BENEFITS TO LOCAL GOVERNMENTS

The in-person workshops provided local governments with direct access to bridge asset management information that is often difficult to locate, interpret, or apply without bridge-specific experience. By organizing GDOT resources, bridge inspection information, maintenance and preservation guidance, funding program information, and contact information into a single workshop format, the training helped local government personnel better understand how to approach locally owned bridge management. The workshops also provided attendees with a participant workbook that could be retained as a reference document after the training, allowing local governments to revisit the material when reviewing inspection reports, identifying maintenance needs, preparing for bridge-related discussions, or coordinating with GDOT.

The workshops also helped strengthen communication between local governments and GDOT personnel. Because the training was delivered at GDOT district offices and included participation from both the UGA research team and GDOT subject matter experts, attendees were able to hear directly from the personnel involved in bridge inspection,

bridge maintenance, programming, and local bridge support. This format allowed local government participants to ask questions, clarify program requirements, and better understand which GDOT offices or contacts may be involved in different bridge-related processes. As a result, the workshops supported the project's broader goal of improving collaboration between local bridge owners, GDOT district offices, and GDOT's Office of Bridge Design and Maintenance.

Overall, the in-person workshops benefited local governments by presenting bridge management information in a practical and accessible format. The training helped connect technical bridge topics to the responsibilities of local government personnel, including understanding bridge inspection reports, recognizing maintenance and preservation needs, identifying available GDOT resources, and improving communication with GDOT. These benefits are important because many local governments manage bridges with limited staff capacity, varying levels of bridge expertise, and frequent personnel turnover. By providing consistent training and a reusable reference resource, the workshops supported more informed local bridge management decisions and provided a foundation for continued learning through the project's on-demand training materials.

At the conclusion of each district workshop, GDOT personnel and the research team received positive feedback from local government attendees indicating that the training was beneficial, informative, and directly applicable to their bridge management responsibilities. This feedback reinforced the value of presenting bridge asset management information in a structured, district-level workshop format. In addition, following the workshop series, multiple local governments expressed interest in additional training opportunities. These requests demonstrated continued demand for bridge management

education and further emphasized the need for accessible, repeatable training resources for local bridge owners across Georgia.

CHAPTER 3. ON-DEMAND BRIDGE ASSET MANAGEMENT MODULES

OBJECTIVES

The on-demand bridge asset management modules were developed through Task 4, Develop On-Demand Training Content and Modules, and Task 5, Deliver and Implement On-Demand Training Content and Modules. These tasks extended the in-person training effort by converting selected bridge asset management topics into digital resources that could support continued training beyond the district workshop series.

The objective of the on-demand bridge asset management modules was to develop accessible digital training resources that support continued bridge management education beyond the in-person workshop series. The in-person workshops provided direct engagement between local governments, GDOT district offices, and GDOT's Office of Bridge Design and Maintenance; however, the on-demand modules were intended to provide a repeatable training format that could be accessed after the workshops and used by future local government personnel, GDOT employees, and other users involved in locally owned bridge management. This objective directly supported the project goal of developing on-demand training modules that allow for continuity and improvement of off-system bridge management beyond the duration of the project.

The on-demand modules were developed to reinforce and expand upon key bridge asset management topics introduced during the in-person training. These topics included bridge fundamentals, locally owned and off-system bridge management, bridge inspection information, maintenance and preservation practices, bridge program awareness, funding resources, and coordination with GDOT. The modules were intended to break larger

training concepts into shorter, more focused lessons that could be reviewed independently as needed. This format was especially important for users who may not have attended the in-person workshops, new employees assuming bridge-related responsibilities, or local government personnel who need to revisit specific topics while reviewing inspection reports, identifying maintenance needs, or coordinating with GDOT.

A secondary objective was to develop on-demand resources that were technically accurate while remaining concise, engaging, and practical for local government users. Prior to the development of the on-demand videos, an informational meeting was held with the UGA research team and GDOT's Office of Information Technology to review platform details and support integration within GDOT. Adobe Captivate was selected as the platform for creating short, accessible modules expected to be approximately 7 to 12 minutes in length as displayed in Figure 6. The on-demand component therefore served both an educational purpose and an implementation purpose: it translated workshop content into digital modules that could be distributed, revisited, and maintained as part of a longer-term bridge management training resource.

In addition to video-based instruction, the on-demand component included two interactive modules intended to improve user engagement and reinforce important concepts. These resources were developed to support self-paced learning by allowing users to interact with InspectX rather than only passively watch training content. Together, the videos and interactive modules were intended to provide GDOT and local governments with a sustainable training resource that supports knowledge transfer, reduces the effect of employee turnover, and improves access to consistent bridge asset management guidance across Georgia.

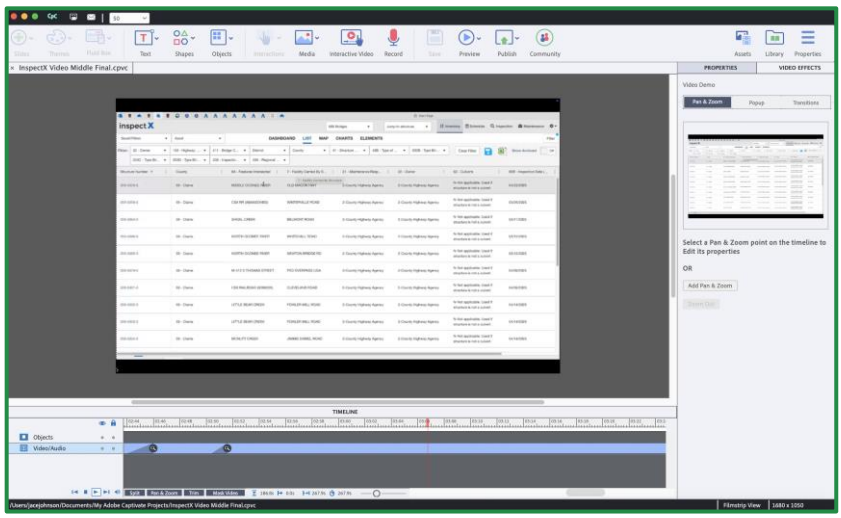


Figure 6. Screenshot. Adobe Captivate video creation.

METHODOLOGY

The methodology for the on-demand bridge asset management modules focused on converting the reviewed in-person training content into short, accessible, and self-paced digital training resources. The on-demand modules were not developed as separate or unrelated training materials. Instead, they were created by using the in-person training content as the technical foundation and reorganizing selected topics into shorter video modules that could be viewed independently. This approach ensured the on-demand modules remained consistent with the GDOT-reviewed in-person training while providing a more flexible format for future users.

The development process began with coordination between the UGA research team and GDOT to establish a preliminary list of on-demand video topics and titles. The purpose of this step was to determine which portions of the in-person workshop content were most appropriate for short-form digital training. Because the in-person workshop was designed as a one-day training event, the content had to be separated into smaller topic areas for on-

demand use. The research team reviewed the in-person modules and identified logical divisions where larger training concepts could be converted into focused lessons. This allowed the on-demand modules to reinforce the workshop content while making the material easier for users to access, revisit, and apply as needed.

After the preliminary video topics were identified and the video titles approved, the UGA research team adapted the in-person slide content into video-specific slide sets. The core technical content from the in-person training was maintained; however, minor presentation adjustments were made so the material would perform more effectively in a video format. These adjustments included refining slide material, simplifying visual flow, adjusting wording where needed for narration, and ensuring that each video could stand alone without requiring the full context of the one-day workshop. The intent was not to alter the technical content, but to make the delivery more appropriate for a short on-demand module.

Once the video-specific slide set was developed, a script was written for each module. The script served as the narration plan for the video and helped ensure that the audio explanation aligned with the slide content. This step was important because on-demand users would not have a live presenter available to clarify the material during the training. Therefore, the script had to provide enough explanation to guide the viewer through the topic while remaining concise and easy to follow. The script also helped maintain consistency in tone, terminology, and pacing across the on-demand module series.

After the script and edited slides were prepared, both were reviewed by the UGA research team. This internal review was used to confirm the module was technically accurate, clearly organized, and consistent with the intent of the in-person training materials. The UGA

review helped identify wording issues, slide sequence concerns, or content that needed additional clarification before the audio was recorded. Once the internal review was complete, the narration audio was recorded and the video module created.

Following video creation, the draft video was shared with both the UGA research team and GDOT for review. This review step gave each group an opportunity to provide feedback and suggest edits before the module was finalized. Revisions during this stage primarily included GDOT branding edits, slide timing adjustments, wording changes, punctuation corrections, and minor presentation refinements. These revisions were intended to improve the clarity, professionalism, and consistency of the videos rather than change the underlying content. Because the on-demand modules were developed from the previously reviewed in-person materials, the technical content remained generally consistent from the in-person training to the on-demand format.

After review comments were received, the video was re-recorded or edited as needed to address the requested changes. A revised final version was then prepared and shared with GDOT. Once the final video was complete, the finalized script was used to generate a closed caption file in SubRip Subtitle format, commonly referred to as an SRT file. The SRT file contains the closed caption text along with the timing information that determines when each caption appears on the screen. Including the caption file improved accessibility and supported future implementation of the modules in a digital training environment.

At the completion of each on-demand module, both the final video file and the corresponding SRT closed caption file were uploaded to the project's shared Microsoft Teams folder. This provided GDOT with access to the completed module files and

maintained project documentation for each video. The shared folder served as the central location for storing the on-demand training deliverables, allowing GDOT and the research team to review, organize, and access the final materials as the module series was completed.

In addition to the video-based modules, the on-demand component included the development of interactive modules. These modules were created to provide a more active learning format for InspectX that benefited from user interaction rather than passive video instruction alone. The interactive modules were developed using the same general workflow as the video modules, including topic selection, content organization, internal review, GDOT review, and revision. However, instead of relying only on narrated slides, the interactive modules incorporated user-driven navigation and applied activities intended to reinforce video instruction. This approach was especially useful for the InspectX content because users could engage with the training material in a way that better reflected how bridge information is accessed in practice.

Overall, the methodology for the on-demand modules used a structured production workflow that included topic identification, adaptation of in-person content, script development, internal review, audio recording, video creation, GDOT review, revision, closed caption generation, and final upload. This process allowed the research team to convert the in-person workshop content into a sustainable digital training format while maintaining consistency with GDOT-reviewed material. The resulting videos, interactive modules, and closed caption files provide a training resource that can support future local government personnel, GDOT staff, and others involved in locally owned bridge asset management.

FINDINGS AND OUTCOMES

The on-demand training component resulted in the development of a digital training package intended to extend the reach and long-term usefulness of the in-person bridge asset management workshops. The completed on-demand resources included fifteen training videos, two interactive modules, closed caption files, and website deployment for making the materials readily accessible through GDOT's external website. These resources were developed to provide local government personnel, GDOT employees, and future users with a repeatable training format that could be accessed beyond the district workshop series.

A total of fifteen on-demand training videos were produced as part of the bridge asset management training program. These videos were developed from the GDOT-reviewed in-person training content and organized into shorter, topic-specific modules that could be viewed independently. The fifteen video topics were selected to reinforce major bridge asset management concepts, provide access to practical GDOT resources, and support continued training for users who may not have attended the in-person workshops.

The completed video topics included:

- Bridge Types
- Beam Bridges
- Bridge Inspection
- Bridge Maintenance and Best Practices
- InspectX – Overview
- InspectX – Shortcuts
- Priority Levels, Condition States, and the National Bridge Inventory (NBI) Ratings

- Bridge Asset Management
- Supplementary Bridge Management and Preservation Guide for Local Municipalities – Overview
- Local Maintenance and Improvement Grant (LMIG)
- Community Engagement
- Emergency Response
- Bridge Project Management
- Developing a Work Breakdown Structure
- Case Studies and Best Practices

The videos were intended to provide concise training on specific topics rather than replicate the full one-day workshop format. This structure allows users to revisit individual topics as needed, such as reviewing bridge inspection terminology, understanding maintenance priorities, learning about InspectX resources, or refreshing knowledge of GDOT-related bridge management processes. The final videos also provide GDOT with a reusable training resource that can support new employees, local government staff turnover, and continued bridge management education after the completion of the project. A meeting with GDOT's IT office led to the inclusion of GDOT-branded introduction and conclusion animations, as well as standardized title slides (Figure 7), to ensure uniformity of all of the on-demand content. Figure 8 provides an example of the InspectX – Overview content within the video.



Figure 7. Photo. On-demand training video title slide.

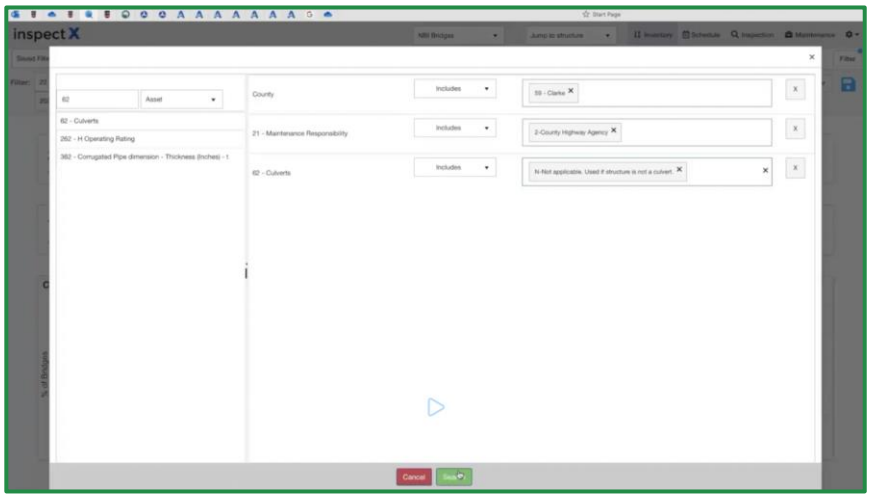


Figure 8. Screenshot. On-demand InspectX – Overview video example.

In addition to the fifteen video modules, two interactive modules were developed to support a more active learning experience. These modules were designed for topics that benefited from user interaction rather than passive video instruction alone. The interactive modules allowed users to engage with selected training content, navigate through applied examples, and reinforce key concepts through a self-paced format. Users follow a series of prompts

to input information, apply filters, and learn how to navigate InspectX to download an example bridge inspection report, as displayed in Figure 9. This format was especially useful for InspectX-related training because it allowed users to interact with content in a way that more closely reflects how bridge inventory information, inspection reports, and bridge management resources may be accessed or interpreted in practice.

The interactive modules supplemented the video-based resources by providing a different mode of learning. While the videos introduced and explained key bridge asset management topics, the interactive modules provided an opportunity for users to engage with the material more directly. Together, the videos and interactive modules created a more complete on-demand training package by combining narrated instruction, visual examples, self-paced review, and applied interaction.

The two interactive modules include:

- InspectX Overview Interactive Module
- InspectX Shortcuts Interactive Module

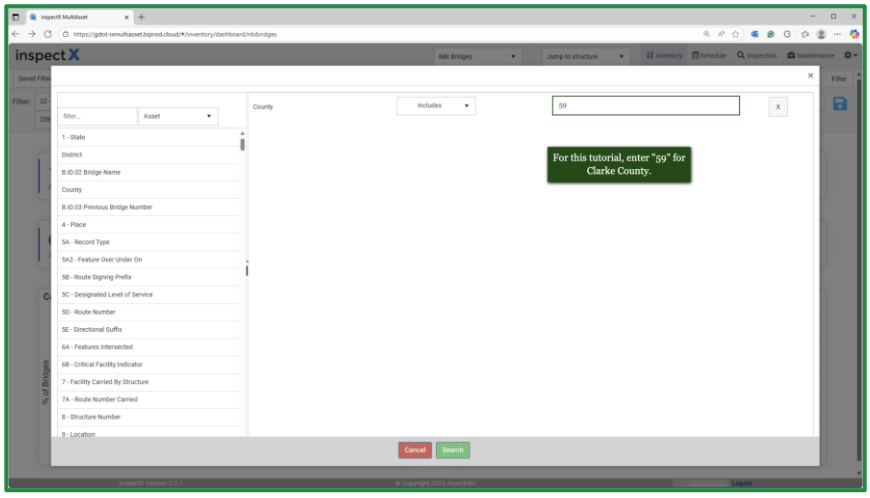


Figure 9. Screenshot. Example interactive module screen.

The on-demand training resources improved accessibility by allowing bridge management training to be accessed outside of the in-person workshop setting. Each video was developed as a short, focused module so users could review individual topics without needing to complete the entire workshop sequence. This format benefits local government personnel who were unable to attend the in-person training, new employees who assume bridge-related responsibilities after the workshops, and GDOT personnel who need a consistent reference for locally owned bridge management topics. The development of closed caption files further improved accessibility and implementation readiness. After each final video was completed, the script was used to generate a SubRip Subtitle (SRT) file.

The on-demand training component supports long-term sustainability by creating a repeatable bridge asset management training resource that does not depend on a live workshop or a single presenter. The videos preserve core training content in a format that can be distributed, revisited, and maintained over time. This is especially important because employee turnover, varying levels of bridge management experience, and changing local government responsibilities were major reasons for developing the training program. The on-demand modules provide a way for GDOT and local governments to continue training future users after the project period.

The videos also support consistency across users and locations. Because the modules were developed from GDOT-reviewed in-person training content, future viewers receive the same core information related to bridge fundamentals, inspection information, maintenance and preservation, InspectX, funding resources, and GDOT coordination. This consistency helps reduce the risk of different local governments receiving different

information and supports the broader project goal of improving communication and access to GDOT resources.

A major outcome of the research study was the successful publication of the on-demand training content and the *Supplementary Bridge Management and Preservation Guide for Local Municipalities* on GDOT's external website. The Supplementary Guide was developed as part of the previous UGA/GDOT Research Project 21-02; however, prior to this implementation effort, the guide had not yet been made available through GDOT's external website or shared more broadly. The Supplementary Guide played a significant role in developing the in-person training content, which in turn served as the foundation for the on-demand videos. Making the guide available alongside the videos creates a more complete and integrated bridge asset management resource for local governments. Although the Supplementary Guide was developed through a previous research project, part of this research study's implementation effort focused on ensuring the guide was ready for publication. This included completing minor branding revisions and coordinating its placement alongside the on-demand bridge asset management videos such that local governments could readily access the written guidance and related training materials from the same GDOT bridge resources location.

The website implementation was achieved through the development of a website dissemination plan, meetings with GDOT's Office of Information Technology, clear coordination with GDOT personnel, and continued follow-up throughout the deployment process. The research team recommended that the Supplementary Guide and the on-demand videos be housed on GDOT's external website under the Bridge Resources page, as shown in Figure 10. This location was selected because local governments seeking

bridge manuals, guides, and related resources would be likely to look for bridge asset management training materials in the same area of the website.

As part of the dissemination plan, the research team recommended revisions to the existing Bridge Resources page so the on-demand videos could be housed in a logical and visible location. Specifically, the research team recommended retitling the existing "Manuals and Guides" section to "Manuals, Guides, and Videos" displayed in Figure 10. This change allowed the completed training videos to be grouped with related bridge resources rather than placed on a separate or less visible page. Once the drop-down menu is opened, the research team recommended the existing manuals headline be revised to "Manuals and Guides" and that a new section be created for videos.

Under the proposed videos heading, the fifteen video titles would be listed in a format similar to the current list of manuals and guides. This structure allows users to identify the video topic they need and select the corresponding title. Each video title then directs users to the appropriate video hosted on GDOT's YouTube channel. This approach allows GDOT to store and stream the videos through YouTube while using the GDOT external website as the organized access point for local governments and other users.

The website deployment process included coordination with GDOT's Office of Information Technology. A meeting was held with GDOT IT to transfer the completed videos, explain the recommended website revisions, and ensure that the UGA research team, GDOT project team, and GDOT IT personnel had a shared understanding of where and how the videos should be placed.

Through this coordination, the on-demand training content was published on GDOT's external website prior to completion of the project, representing an important implementation achievement for the research study. The final deployment approach uses GDOT's YouTube channel to host the videos and the GDOT website to organize access to each resource. Under this approach, the GDOT website provides the official bridge resource location and lists each video title, while the hyperlink associated with each title directs the viewer to the corresponding YouTube video. This structure provides a practical balance between accessibility, website organization, and ease of video viewing. Further, it supports long-term training sustainability by placing the on-demand modules in a location that is consistent with other GDOT bridge resources and accessible to local governments across Georgia.

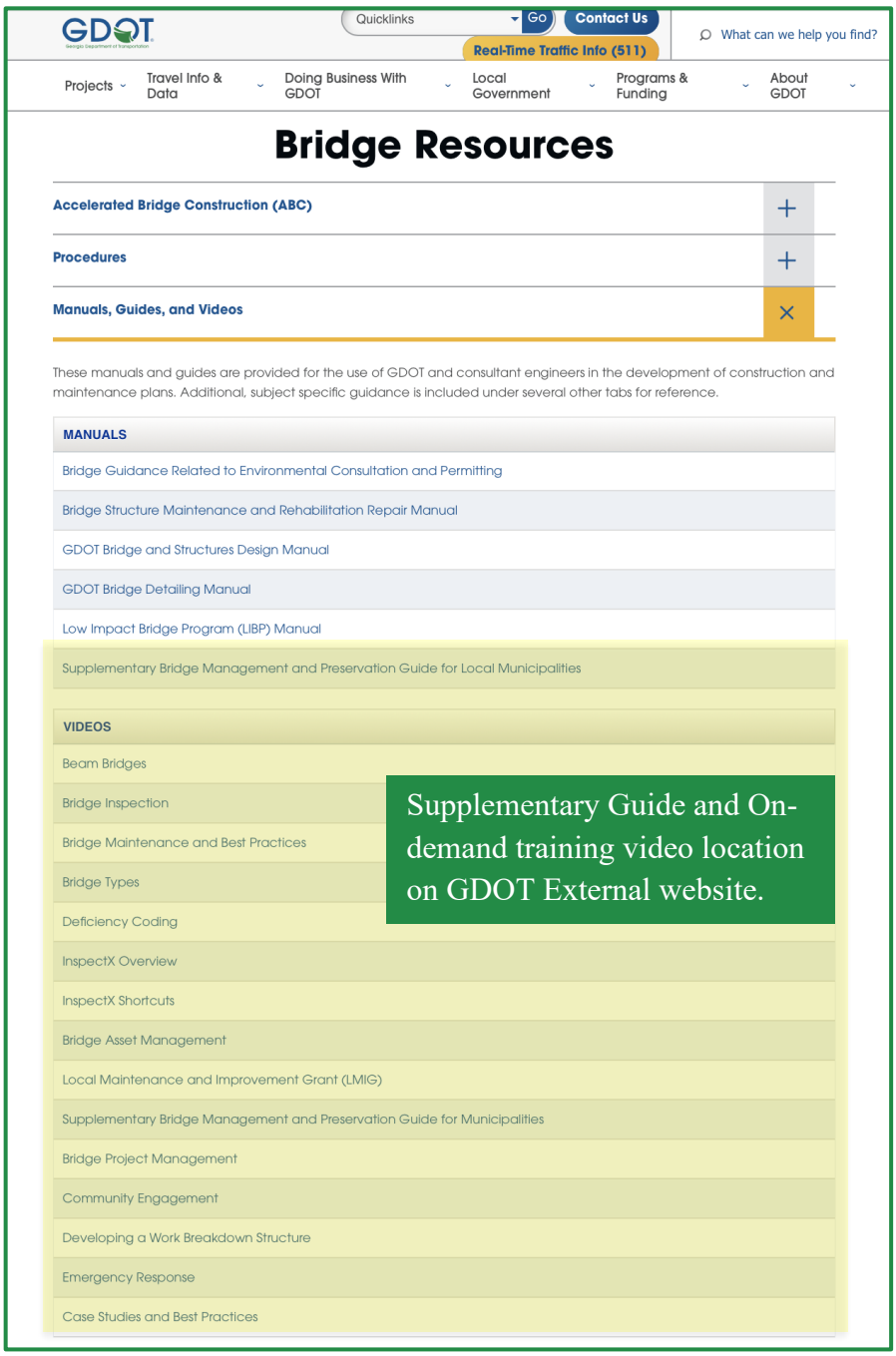


Figure 10. Screenshot. GDOT Bridge Resources page, including on-demand videos.

CHAPTER 4. COUNTY ENGAGEMENT

OBJECTIVES

The one-on-one county support component was completed as part of Task 3, Deliver and Improve In-Person Training Content and Program Document. In addition to delivering the in-person training workshops at the seven GDOT district offices, Task 3 included identifying and working with at least one local government from each GDOT district to provide additional support in managing locally owned bridges. Therefore, the objective of this chapter is to document how the county-level support component satisfied this task by applying the project's bridge asset management training concepts, GDOT resources, and maintenance and preservation guidance to selected county bridge inventories.

The objective of the one-on-one support component was to move beyond general training and provide selected local governments with more focused assistance related to their own locally owned bridges. While the in-person workshops provided broad district-level training and the on-demand modules provided long-term digital resources, the county-specific support reports were intended to demonstrate how bridge inspection information, maintenance and preservation considerations, bridge inventory data, and GDOT coordination could be organized and communicated at the local level. This allowed the project to connect the statewide training program to the practical bridge management decisions that counties face when reviewing inspection reports, identifying maintenance needs, prioritizing bridge work, and coordinating with GDOT.

The goal of this component was not to create seven completely different processes, but to develop a consistent reporting framework that could be applied to one selected county from

each GDOT district. Each selected county has a unique bridge inventory, staffing structure, funding capacity, maintenance history, and level of bridge-related experience; however, the same general template and review process were used so that the county reports remained consistent, practical, and comparable. This approach allowed the research team to provide county-specific value while maintaining a uniform structure that could be reviewed by GDOT and potentially adapted for future local government support.

Overall, the one-on-one county support component completed an important requirement of the research study by demonstrating how the project's training materials and GDOT bridge resources could be applied directly to selected local governments. This component provided a more direct connection between the training program and county-level bridge asset management and supported the broader project goal of improving communication, knowledge transfer, and locally owned bridge management across Georgia.

METHODOLOGY

The methodology for the county engagement component focused on applying the broader research study training resources to individual county bridge inventories through a consistent and repeatable reporting process. While the in-person workshops and on-demand modules provided broad training resources for local governments across Georgia, the one-on-one county support component was intended to provide a more focused application of bridge asset management concepts for one selected county within each GDOT district. The methodology included development of a standardized county report template, review of bridge inventory and inspection information, coordination with GDOT

to select participating counties, county-level discovery meetings, report development, GDOT review, and follow-up meetings with the selected counties.

The research team first developed a standardized reporting template to ensure that each county-level deliverable followed a consistent structure. This template was created to organize bridge inventory information, inspection-related data, maintenance and preservation considerations, funding and budgetary constraints, and recommended prioritization strategies in a clear and practical format. The use of a standard template was important because each selected county had a unique bridge inventory, staffing structure, funding capacity, and level of bridge-related experience; however, the overall purpose of each report remained the same. The template allowed the research team to provide county-specific information while maintaining consistency in formatting, terminology, and content across all county deliverables.

County selection was completed through coordination between UGA and GDOT. For each district, the research team reviewed bridge inventory and condition information for counties that participated during the in-person district workshop. This review considered factors such as overall bridge condition, number of poor-condition structures, load-posted bridges, demonstrated need for technical support, and the opportunity to provide meaningful bridge management assistance. Based on this review, UGA developed a shortlist of approximately three to five candidate counties within a district and shared the list with GDOT for review. GDOT then used the information provided by UGA, along with its knowledge of local needs, prior relationships, district priorities, and communication history, to select the county for one-on-one assistance. This collaborative selection process

helped ensure the selected counties represented both a need for support and an opportunity to demonstrate the usefulness of targeted bridge asset management assistance.

After a county was selected, the research team used bridge inventory and inspection information available through InspectX to develop the county-specific report. This included reviewing the county's locally owned bridge inventory, current inspection information, condition ratings, load posting information, and maintenance-related items where applicable. The purpose of this review was not to replace GDOT inspection procedures nor provide design-level recommendations, but to organize existing bridge information in a way that could help the county better understand its bridge assets and identify areas where maintenance, preservation, rehabilitation, replacement planning, or additional coordination with GDOT may be needed.

The one-on-one process included a county discovery meeting. During this meeting, the research team discussed county-specific needs and constraints with local personnel to better understand how bridge management was being handled at the local level. Topics included critical or high-priority structures, budgetary limitations, available bridge-related funding, whether the county maintained a dedicated bridge budget, current maintenance practices, planned bridge replacements, and specific questions or concerns identified by county staff. These discussions were important because they allowed the research team to understand the county's bridge management context beyond the inspection data alone. Information gathered during the discovery meeting helped shape the county-specific report so that the final document reflected both the bridge inventory data and the practical realities, limitations, and priorities of the local government.

Following the discovery meeting, the research team developed the county-specific bridge maintenance and preservation report using the standardized template. Information gathered from InspectX, GDOT coordination, and county discussions was incorporated into the report to provide a practical summary of the county's bridge inventory, current condition information, maintenance and preservation considerations, and potential prioritization strategies. The draft report was then shared with GDOT for review to ensure technical accuracy, clarity, consistency with statewide objectives, and alignment with GDOT guidance. GDOT comments were incorporated before the report was finalized for county review.

After GDOT review, the county report was shared with the selected county through a follow-up meeting. The purpose of this meeting was to review the report page by page, explain the contents of each section, answer questions, and provide an opportunity for discussion between the county and the research team. This step was important because the county reports were intended to be practical support documents rather than static deliverables. Reviewing the report directly with county personnel helped ensure that the information was understood and allowed county staff to discuss how the report could be used when reviewing inspection reports, planning maintenance activities, identifying funding needs, budgeting for bridge work, or coordinating with GDOT.

Overall, the methodology for the county engagement component used a consistent process to provide individualized support without creating a separate approach for each county. By combining county selection criteria, InspectX data review, GDOT coordination, county discovery meetings, a standardized reporting template, GDOT review, and follow-up report discussions, the research team developed a repeatable framework for applying the

research study training concepts to selected local governments. This approach allowed the one-on-one component to provide county-specific value while remaining consistent with the broader goals of the project.

FINDINGS AND OUTCOMES

The one-on-one county engagement component resulted in the development of county-specific bridge management reports and follow-up discussions intended to help selected local governments better understand their locally owned bridge inventories, bridge condition trends, maintenance and preservation needs, and available GDOT resources. The research team worked one-on-one and collaboratively with Stephens County, District 1; Laurens County, District 2; Meriwether County, District 3; Thomas County, District 4; Toombs County, District 5; Walker County, District 6; and the Douglas County, District 7.

The county-specific reports were developed using a consistent reporting framework so that each selected county received information in a similar format. Each report included an introduction to the purpose of the document, a discussion of GDOT and local government responsibilities, GDOT contact information, a summary of the county's bridge inventory, bridge location maps, bridge condition information, condition history trends, opportunities and recommendations, funding opportunities, and final recommendations. This structure allowed the reports to remain consistent across counties while still reflecting the bridge inventory, condition information, funding context, and local priorities of each selected government. Figure 11 displays a sample cover page used for each of the one-on-one reports.

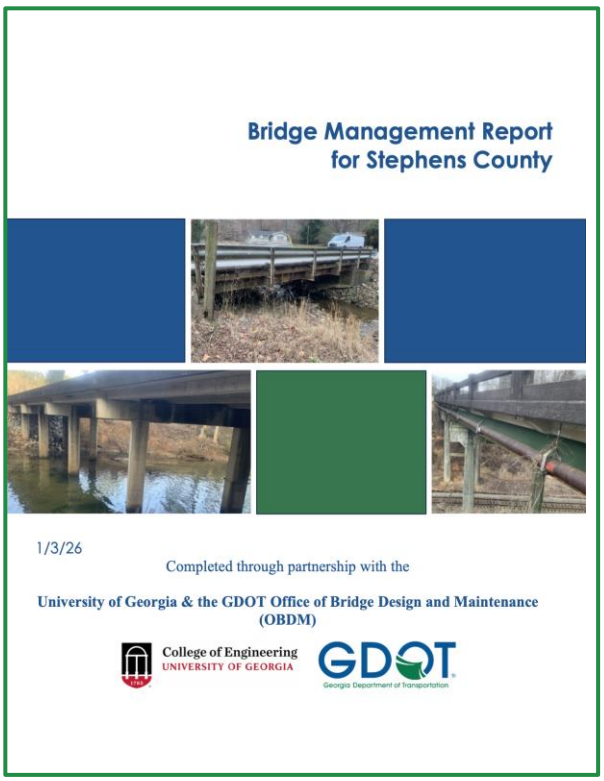
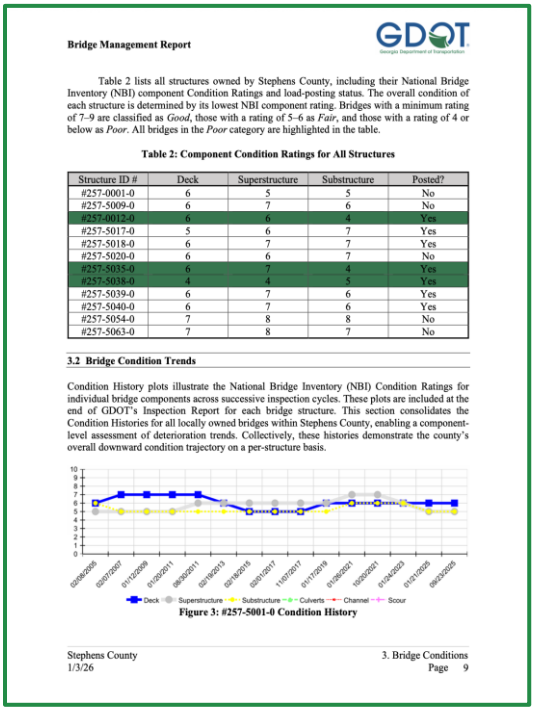


Figure 11. Photo. Example county bridge management report cover page.

A common trend identified through the county engagement process was that preventive bridge maintenance is often difficult for local governments to prioritize. With the exception of local governments that already had a more developed bridge maintenance approach, several counties appeared to prioritize roadway maintenance over bridge maintenance. This was not necessarily due to a lack of concern for bridges, but rather because bridge structures are more specialized assets and local personnel may have less familiarity with bridge components, inspection terminology, deterioration mechanisms, and maintenance priorities. As a result, bridge maintenance needs may be less visible or less understood than roadway needs, even though deferred bridge maintenance can lead to more extensive rehabilitation or replacement costs.

Another common trend was that bridge condition histories frequently showed downward trajectories across bridge components. The county reports used condition history plots and bridge inventory information to help communicate how bridge components were changing over time. In several cases, bridges that were still classified as Fair or Good showed signs of deterioration that could continue without timely maintenance. This finding reinforced the importance of helping local governments understand that bridge maintenance should not only focus on structures already classified as Poor. Preventive maintenance on bridges in Good or Fair condition can be an important strategy for slowing deterioration, preserving service life, and reducing long-term costs. As part of the report for each county, the bridge condition history chart for all bridges in their inventory was included. Figure 12 presents an example of a bridge condition history chart included in each one-on-one report.



Bridge Management Report

Table 2 lists all structures owned by Stephens County, including their National Bridge Inventory (NBI) component Condition Ratings and load-posting status. The overall condition of each structure is determined by its lowest NBI component rating. Bridges with a minimum rating of 7–9 are classified as *Good*, those with a rating of 5–6 as *Fair*, and those with a rating of 4 or below as *Poor*. All bridges in the *Poor* category are highlighted in the table.

Table 2: Component Condition Ratings for All Structures

Structure ID #	Deck	Superstructure	Substructure	Posted?
#257-0001-0	6	5	5	No
#257-5009-0	6	7	6	No
#257-0012-0	6	6	4	Yes
#257-5017-0	5	6	7	Yes
#257-5018-0	6	7	7	Yes
#257-5020-0	6	6	7	No
#257-5035-0	6	7	4	Yes
#257-5038-0	4	4	5	Yes
#257-5039-0	6	7	6	Yes
#257-5040-0	6	7	6	Yes
#257-5054-0	7	8	8	No
#257-5063-0	7	8	7	No

3.2 Bridge Condition Trends

Condition History plots illustrate the National Bridge Inventory (NBI) Condition Ratings for individual bridge components across successive inspection cycles. These plots are included at the end of GDOT's Inspection Report for each bridge structure. This section consolidates the Condition Histories for all locally owned bridges within Stephens County, enabling a component-level assessment of deterioration trends. Collectively, these histories demonstrate the county's overall downward condition trajectory on a per-structure basis.

Deck Superstructure Substructure Culverts Channel Scour

Figure 3: #257-5001-0 Condition History

Stephens County 3. Bridge Conditions
1/3/26 Page 9

Figure 12. Photo. Condition history chart example.

The maintenance needs observed across the county reports generally included both corrective and preventive actions. Common maintenance needs included cleaning and sealing deck joints, addressing scour or erosion concerns, restoring or redressing riprap, removing debris and vegetation, repairing localized concrete cracking or spalling, cleaning and painting steel components, repairing or protecting piles and caps, and addressing deficiencies in primary load-carrying components where needed. These recommendations varied by county and by bridge, but the overall pattern showed that many locally owned bridges could benefit from a more systematic maintenance program that addresses smaller deficiencies before they progress into larger structural or funding challenges.

The county engagement process also identified knowledge gaps related to bridge inspection information, maintenance prioritization, and funding coordination. For some counties, this was the first time seeing the bridge condition chart found which is included as part of every inspection report created by GDOT. This indicates that in some instances counties are not taking the initiative to access and download the inspection reports from InspectX. In other instances, local governments may receive inspection reports and deficiency letters, but the connection between those documents and practical bridge management decisions is not always clear. The county-specific reports helped close this gap by organizing inspection information, condition ratings, load posting information, maintenance needs, and funding opportunities into a format that was easier to review and discuss. The follow-up meetings shown in Figure 13 provided an opportunity for the research team to explain the report contents, answer questions, and help county personnel understand how the information could be used in planning and decision-making.

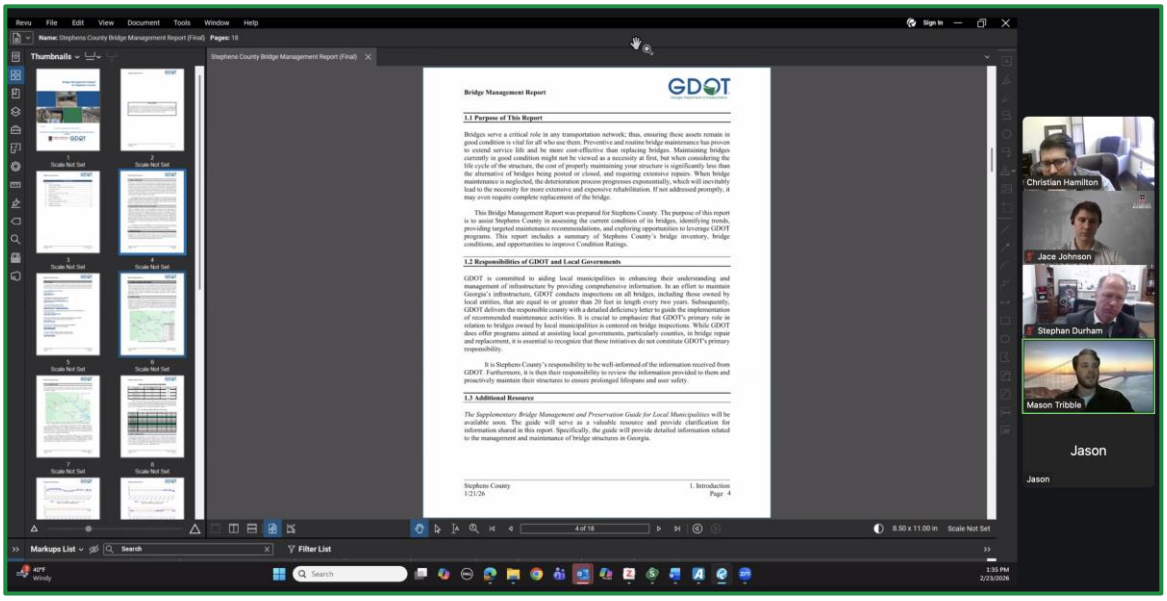


Figure 13. Screenshot. One-on-one county report presentation with selected county.

A major benefit of the individualized assistance was that it connected the broad research study training program to real county bridge inventories. The in-person workshops introduced bridge management concepts at the district level, and the on-demand modules provided repeatable training resources; however, the one-on-one reports demonstrated how those same concepts could be applied to a specific local government. By reviewing county-owned bridges, identifying condition trends, summarizing maintenance opportunities, and discussing funding considerations, the reports provided participating counties with a practical resource to support communication with GDOT, internal planning efforts, and the prioritization of bridge maintenance and preservation activities.

Overall, the one-on-one county engagement component provided a practical extension of the statewide training program. The process produced consistent county-specific reports, created opportunities for direct discussion between local governments and the research team, and helped translate bridge inspection and inventory data into more usable bridge

management information. These outcomes supported the broader goals of the project by improving access to GDOT resources, strengthening communication with local bridge owners, and promoting more informed bridge maintenance and preservation decisions.

CHAPTER 5. CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

This research study marks an important step in strengthening the partnership between Georgia local governments and GDOT for locally owned bridge asset management. The project was developed in response to recurring challenges faced by local bridge owners, including employee turnover, varying levels of bridge expertise, limited in-house engineering support, difficulty interpreting inspection information, and inconsistent familiarity with GDOT resources and local bridge programs. Through this project, the research team developed a comprehensive bridge asset management training program intended to improve access to information, support knowledge transfer, and promote more effective communication between local governments, GDOT district offices, and GDOT's Office of Bridge Design and Maintenance.

One outcome of the project was the development and delivery of in-person bridge asset management workshops at each of GDOT's seven district offices. These workshops provided local government personnel with practical training on bridge fundamentals, locally owned and off-system bridges, bridge inspection information, maintenance and preservation practices, bridge management systems, project planning, emergency response, communication, and GDOT bridge programs. The in-person training package included 10 training modules and a participant workbook, which allowed the workshops to function as both live training events and future reference resources. Attendance from 121 of the 173 invited counties and municipalities demonstrated substantial statewide participation and confirmed the need for accessible bridge management training for local governments.

The project also resulted in the development of on-demand bridge asset management modules intended to extend the usefulness of the in-person training beyond the workshop series. A total of fifteen on-demand training videos and two interactive modules were developed from GDOT-reviewed in-person workshop content. These resources were designed to provide short, focused, and accessible training for local government personnel, GDOT staff, and future users who may need to revisit specific bridge management topics. The videos were paired with closed caption files to improve accessibility and were deployed through GDOT's external website and YouTube channel. In addition, the project supported publication of the *Supplementary Bridge Management and Preservation Guide for Local Municipalities* alongside the on-demand videos, creating a more complete bridge asset management resource for local governments.

The project further supported selected counties through one-on-one county assistance, which was designed to provide more focused support related to locally owned bridge management and preservation. This component applies the broader project resources to county-specific bridge inventories and helps demonstrate how training materials, inspection information, maintenance and preservation guidance, and GDOT coordination can be used to support local bridge management decisions. This component was completed for one GDOT selected county within each of GDOT's seven districts. The report shared with the county provided an additional layer of support beyond the statewide workshops and on-demand resources.

The success of the research study was made possible through continued coordination between the UGA research team, GDOT district offices, GDOT's Office of Bridge Design and Maintenance, the Office of Performance-based Management and Research, and other

GDOT personnel involved in the development, review, delivery, and implementation of the training materials. GDOT personnel provided technical review, participated in workshop delivery, assisted with outreach to local governments, supported communication with counties and municipalities, and helped improve access to the developed materials. These efforts were essential to ensuring that the training content was technically accurate, relevant to local government needs, and aligned with GDOT practices and expectations.

Overall, the research study delivered a statewide bridge asset management training framework that combines in-person instruction, on-demand training resources, and county-specific support. The project improved access to GDOT resources, strengthened communication between state and local personnel, and provided reusable materials that can continue supporting local bridge owners beyond the project period. The training program and associated resources provide a foundation for continued education, improved coordination, and more informed decision-making related to locally owned bridge maintenance, preservation, rehabilitation, and replacement in Georgia.

RECOMMENDATIONS

This study identified three key areas for continued improvement in the management of locally owned bridge assets: continued engagement and customer service, maintenance of local government contact information, and assistance with budgetary planning for bridge maintenance, preservation, rehabilitation, and replacement.

First, GDOT should continue regular engagement with local bridge owners to support consistent communication and collaboration. The in-person workshops demonstrated that local governments benefit from direct access to GDOT personnel and opportunities to ask

questions in a structured training environment. Although the on-demand videos and interactive modules provide an important long-term training resource, the in-person workshops offered a level of interaction that cannot be fully replicated through digital training alone. During and after the workshop series, multiple counties expressed that the training was beneficial and requested similar training be offered again. Based on this feedback, it is recommended that GDOT continue the in-person bridge asset management workshops on a biannual basis. Continued workshops would provide recurring opportunities to train new local government personnel, reinforce best practices, answer questions, and maintain strong working relationships between GDOT district offices, GDOT's Office of Bridge Design and Maintenance, and local bridge owners.

Second, GDOT should maintain and regularly update a contact list for county and municipal personnel responsible for locally owned bridges. During the in-person training effort, the research team and GDOT were able to identify and update contact information for many local governments. This was an important outcome because personnel turnover remains a major challenge for both local governments and GDOT. When local contacts change and contact lists are not updated, GDOT may continue sending information to individuals who are no longer in their positions, and local governments may miss important bridge-related communication. Maintaining an updated contact list would improve communication, reduce missed correspondence, and help GDOT quickly identify the appropriate local contact for inspection reports, maintenance recommendations, bridge program information, training opportunities, and follow-up support. Future in-person workshops, annual check-ins, and digital confirmation forms could be used to keep this contact information current.

Third, local governments would benefit from continued assistance in budgetary planning for bridge maintenance and rehabilitation. Many local bridge owners face challenges in budgeting for bridge-related work, partly because local personnel may not have formal training in bridge structures or may not fully understand the long-term consequences of deferred maintenance. This research study helped educate local governments on bridge structures, maintenance and preservation concepts, and potential funding sources such as LMIG, SPLOST, and TSPLOST. However, continued support is needed to help local governments align maintenance priorities with available resources. GDOT should continue to provide tools, resources, and guidance related to funding strategies, long-term financial planning, and prioritization of bridge maintenance activities. By helping local bridge owners better understand the relationship between inspection findings, maintenance needs, and available funding, GDOT can support more effective and sustainable bridge asset management practices across Georgia.

DISCUSSION

Local governments may delay or avoid bridge maintenance, repair, rehabilitation, or replacement for several reasons. These challenges are often connected to financial limitations, incomplete information, short-term decision-making pressures, and uncertainty regarding state or federal support. Understanding these challenges is important because locally owned bridges remain critical transportation assets, even when local governments have limited staff capacity or competing infrastructure priorities.

Budget constraints are one of the most common challenges. Many local governments operate under tight budgets and must prioritize spending across roads, schools, public

safety, health care, and other public services. Through discussions with counties during the in-person workshops, some local government representatives indicated that roads are often prioritized over bridges. In some cases, this prioritization may be related to limited bridge-specific knowledge rather than a lack of concern for bridge safety or serviceability. Roads are often more visible to the public and may generate more frequent complaints, while bridge maintenance needs may appear less urgent until a significant deficiency, posting, closure, or replacement need occurs. As a result, bridge maintenance, especially for aging structures, may be deferred when there are no immediate consequences.

A second challenge is insufficient information or limited understanding of available information. Local governments may receive inspection reports and maintenance recommendations but may not fully understand how the findings relate to deterioration, preservation, repair urgency, or long-term costs. Without a clear understanding of bridge condition information, maintenance priorities, or the consequences of delaying repairs, local governments may struggle to determine when action is needed. This reinforces the importance of training resources that explain inspection terminology, maintenance priorities, condition ratings, and the connection between inspection findings and bridge asset management decisions.

Short-term focus can limit bridge asset management decisions. Local governments often operate within annual budget cycles and may need to address issues that appear more immediate or visible to the public. Bridge maintenance and preservation activities may not always produce immediate public recognition, even though they can reduce long-term costs and extend service life. As a result, maintenance needs that are important from an asset

management perspective may be delayed because they do not appear as urgent as other local priorities.

Another challenge is the assumption that state or federal funds will eventually cover major bridge work. In some cases, local governments may delay maintenance because they believe another level of government might ultimately fund replacement or major rehabilitation. This can contribute to a free-rider problem in which local action is delayed while the bridge continues to deteriorate. While GDOT Local Bridge Programs provide important opportunities, local governments still benefit from understanding their role in routine maintenance, preservation, local funding commitments, and project coordination which was highlighted during the in-person workshops and continues to be emphasized in the on-demand videos.

Political and organizational factors may influence bridge management decisions. Elected officials and local decision-makers may be reluctant to support bridge maintenance or rehabilitation when the benefits are not immediately visible to the public. Maintenance, repair, and rehabilitation activities can be expensive, disruptive, and difficult to communicate to citizens when compared with more visible projects. Local governments may also exhibit status quo bias, where the perceived effort, cost, or disruption associated with bridge work discourages action, even when maintenance needs are documented.

Despite these challenges, GDOT has shown continued dedication to working with local bridge owners, even in the face of significant turnover and varying levels of local capacity. This research study demonstrated that local governments are interested in practical bridge management information and benefit from direct communication with GDOT personnel.

Continued collaboration, training, and follow-up support will help GDOT and local bridge owners address these challenges more effectively and strengthen the management and maintenance of locally owned bridges across Georgia.

LESSONS TO SHARE WITH BRIDGE OWNERS

One important lesson for bridge owners is that field conditions may differ from inspection documentation or generalized maintenance recommendations. GDOT maintenance recommendations are based on routine visual inspections and the delivered inspection report may not fully capture the extent, severity, or repair complexity of every field deficiency. For example, cracking in concrete members may require different repair methods depending on crack severity, location, cause, and progression. This means that local bridge owners should not rely only on broad recommendations without reviewing inspection reports, observing bridge conditions where appropriate, and communicating with GDOT when clarification is needed. Being familiar with local bridge structures and staying engaged with inspection information will help bridge owners better understand maintenance needs before they become larger repair issues.

A second lesson is that budgetary planning should account for bridge maintenance before repair needs become more costly. Bridge maintenance and preservation are generally more cost-effective than major rehabilitation and always more cost-effective than replacement. Local governments should plan for routine and preventive maintenance activities before project scopes become larger and more difficult to fund. Budgeting for bridge maintenance should not occur only after a significant deficiency is identified. Instead, local governments

should use inspection information, maintenance recommendations, local knowledge, and available funding sources to plan recurring bridge maintenance activities.

A third lesson is that some maintenance activities may warrant a higher local priority than initially apparent. Activities such as cleaning and sealing expansion joints may be categorized as lower-priority items in some contexts, but they can have a significant effect on reducing long-term deterioration. Properly functioning joints help limit water and debris intrusion, which reduce deterioration of bridge seats, bearings, beams, caps, and other substructure components. However, these activities must be performed correctly. Sealing joints or completing other maintenance work without following appropriate procedures may fail to achieve the intended protection and ultimately reduce the effectiveness of the maintenance effort.

A fourth lesson is that local governments should focus on high-return maintenance activities that extend service life and reduce long-term costs. Preventive maintenance activities such as cleaning joints, addressing drainage issues, mitigating scour concerns, redressing riprap, painting or protecting steel components where applicable, and repairing minor defects promptly improve bridge condition and delay more expensive repairs. Prioritizing these activities in budget planning help local governments make better use of limited funds and support more sustainable bridge asset management.

Overall, local bridge owners should view bridge maintenance as an ongoing responsibility rather than a one-time response to inspection findings. Routine attention to bridge condition, early action on maintenance needs, communication with GDOT, and proactive

budgeting help local governments extend bridge service life, reduce future costs, and better support the safety and reliability of Georgia's local transportation network.

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