



BRIDGE MANAGEMENT

PROGRAM OVERVIEW

DIVISION OF INFRASTRUCTURE MANAGEMENT

THE CITY OF
COLUMBUS

ANDREW J. GINTHER, MAYOR

DEPARTMENT OF
PUBLIC SERVICE

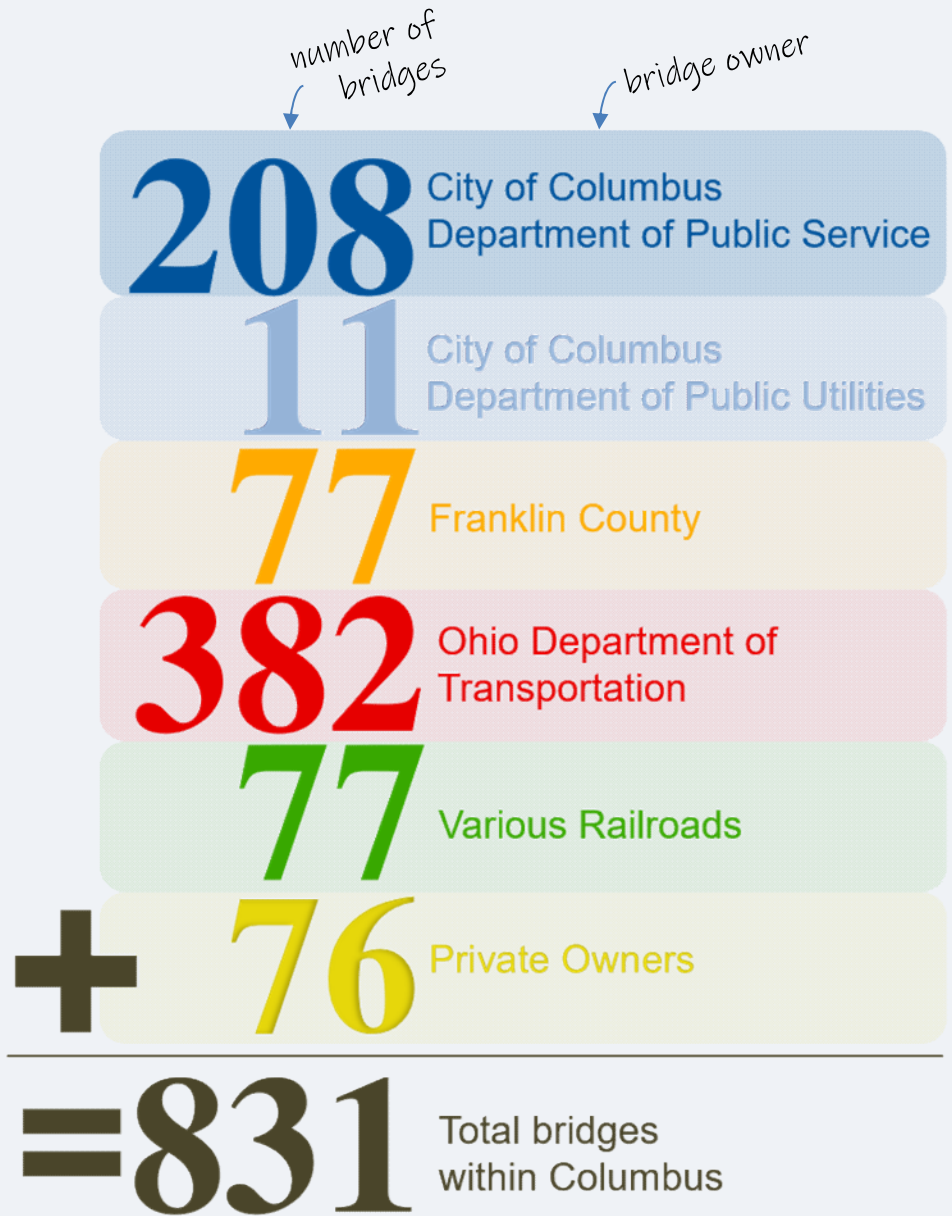
How many bridges are there in the City of Columbus?

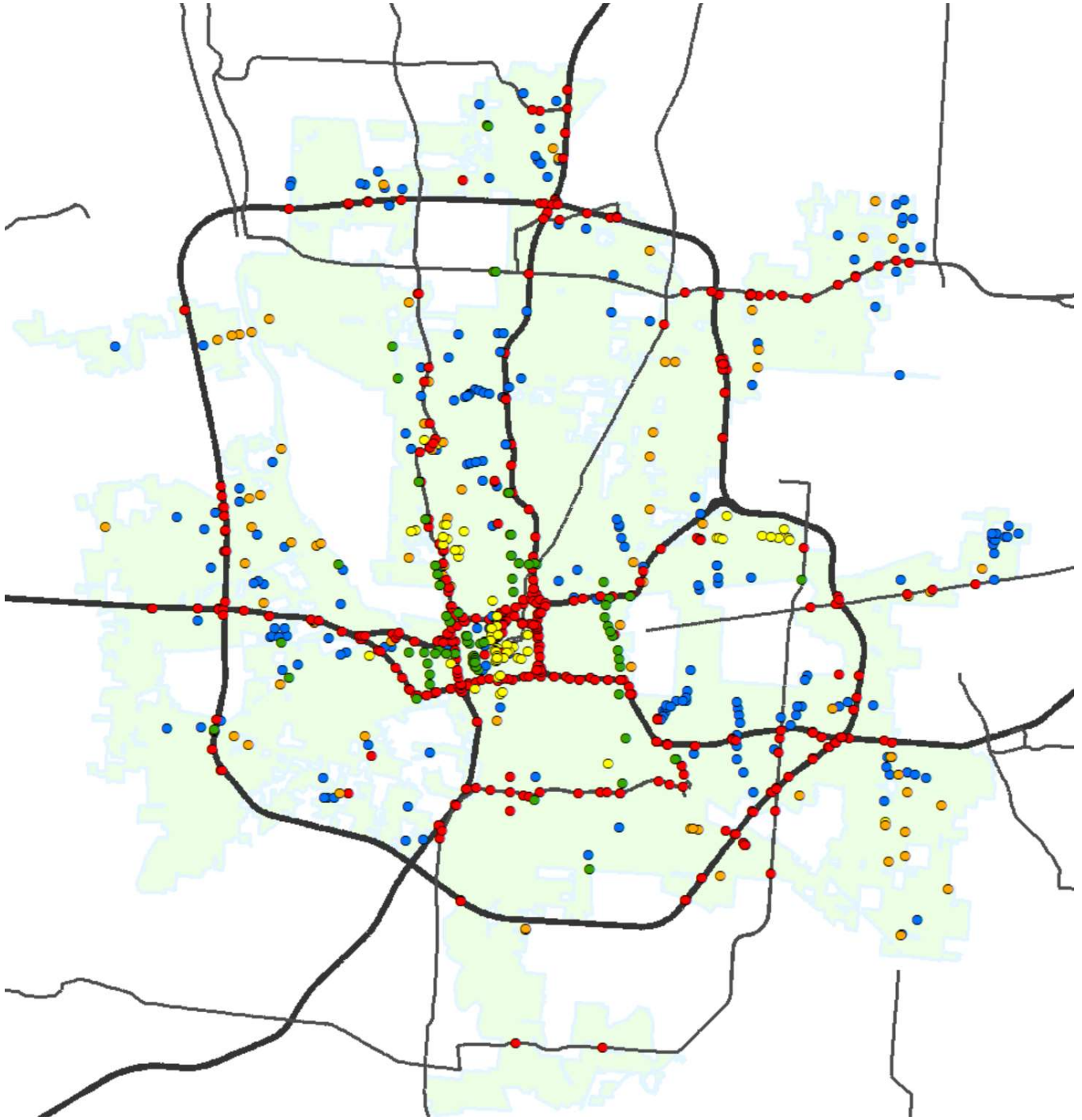
In Ohio, the definition of a bridge is “any structure of 10 ft or more clear span or 10 ft or more in diameter on, above, or below a highway, including structures upon which railroad locomotives or cars may travel.”

There are several different bridge owners in Columbus. The figure on the right will help explain responsibility and ownership of the total 831 bridges within the City of Columbus corporate boundary.

Of these 831 bridges, the City of Columbus Department of Public Service (DPS) owns **208 bridges**. In addition to these 208 bridges, DPS also has additional levels of maintenance and inspection responsibility for bridges owned by some of the other bridge owners depicted on the right.

In total, DPS has a ranging level of maintenance for **321 bridges** and inspection responsibility for **310 bridges**. Several railroad bridges have maintenance responsibilities shared between the railroad company and the City. The party with the majority of the maintenance responsibility is listed as the owner in this report.





Bridges owned by: ■ City ■ State ■ County ■ Railroad ■ Private
 City of Columbus corporate boundary

Introduction

Bridges are an essential part of any transportation network, upholding our built environment and connecting our communities and economies. In addition to serving as vital built infrastructure, bridges occasionally fill unique and nontraditional roles in Columbus as canvases for public art and leisurely park destinations.

The Bridge Management Program exists within the City of Columbus Department of Public Service, Division of Infrastructure Management. Investing necessary resources into proactive maintenance of these bridges is critical to ensure the safety and welfare of the traveling public, maximize the tax dollars that supported the design and construction of these bridges, and prevent the need for unnecessarily expensive and environmentally-harmful future major bridge reconstruction. Under the US Code of Federal Regulations (CFR), the Federal Highway Administration (FHWA) sets the standard for bridge inspection and

designates responsible parties. Under the Ohio Revised Code (ORC), the Ohio Department of Transportation (ODOT) adapts and contextualizes these practices for the State of Ohio.

There are many bridge owners in Columbus, such as Franklin County, railroad companies, private entities, Ohio Department of Transportation (ODOT), and even multiple departments within the City of Columbus such as the Department of Public Utilities (DPU) and the Department of Public Service (DPS). This report will provide a high-level overview of all the bridges located within the City of Columbus corporate boundary, categorized by each bridge owner. Then, with special attention to the bridge-related activities and projects taking place in 2023, this report will focus specifically on the bridges maintained by the City of Columbus Department of Public Service (DPS).



Bridge on Long Street over I-71, ODOT owns the roadway bridge, City owns the park cap bridge.

State Bridges

The Ohio Department of Transportation (ODOT) owns all the bridges spanning over or under all interstates, state routes, and US routes within the state of Ohio. ODOT retains its own inspection and maintenance programs for ODOT bridges, and the City of Columbus DPS assists in performing routine maintenance on **114 ODOT bridges**. DPS routine maintenance responsibility includes pothole patching, minor patching of concrete bridge components, lane striping, and cleaning drainage systems on **state and US route bridges** passing through the City but excludes interstate bridges.

County Bridges

Franklin County Engineer's Office owns and maintains 77 select bridges within the City of Columbus located on routes historically maintained by the County. They manage their own bridge inspection and maintenance programs, and play a vital role in the upkeep of multiple high-profile bridge structures over waterways located within Columbus.

Private Pedestrian Bridges and Tunnels

Within the Columbus corporate boundary, 77 privately-owned bridges span public streets but are owned and maintained by a private entity. These include **49 pedestrian bridges or tunnels** spanning City of Columbus streets and connecting buildings. Every year, the City of Columbus DPS bridge inspection team completes a **safety inspection** (as opposed to an *in-depth inspection which is defined on page 7*) of these 49 bridges to ensure that drivers and pedestrians travelling on City streets are safe to pass over or under these private bridges. Safety inspections mainly focus on potential falling debris and loose concrete on overhead bridges or cracking and leaking for tunnels under the roadway. Railroad bridges are also privately owned, and they are discussed in greater detail on the following page.



ODOT Bridge on US-40 Broad Street over Scioto River



Franklin County Bridge on Lane Avenue over Olentangy River



Columbus State Community College pedestrian bridge over Spring Street

Railroad Bridges

Railroad bridges are some of the nation's oldest bridges standing today. In the City of Columbus, there are 77 overhead railroad bridges belonging primarily to the two main freight railroad companies in this region: CSX and Norfolk Southern. The United States CFR designates separate trees of responsibility for rail and roadway bridges. Rather than reporting to FHWA, railroad companies are required to submit an inspection report to the Federal Railroad Administration (FRA) for their bridges carrying train traffic. Freight railroads have their own bridge inspection and maintenance programs, primarily optimizing for carrying loads safely over their bridges. Although not required by any US or Ohio code or agency, every year the City of Columbus DPS performs a *safety inspection* of the **49 railroad bridges** passing over City of Columbus streets.

When the City finds any safety or structural issues during safety inspection, DPS bridge engineers send letters to the railroad companies and other entities with regulating authority over the railroads such as the FRA and the Public Utilities Commission of Ohio (PUCO). The City takes every effort to alert railroad companies to issues on or under their bridges, but the City is not able to remediate any issues on overhead railroad bridges because the bridges are not legally owned by the City.

However, if there is ever a situation that causes City of Columbus DPS bridge engineers concern about the safety of the travelling public on a City street under a railroad bridge, or any other bridge, action is swiftly taken to close down the street in that area and safely reroute traffic around the hazard.



Bridge over Goodale Ave under Norfolk Southern



Bridge over Second Ave under CSX



Bridge over Williams Rd under CSX

Bridge In-Depth Inspection Program

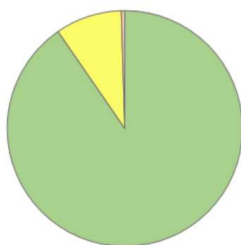
This report highlights the bridges owned by the Department of Public Service and managed by a team of bridge engineers within the City of Columbus DPS Bridge Management Program. In-depth inspections require bridge inspectors to be trained through FHWA-approved courses, and they involve visually inspecting every component of the bridge for structural and traveler safety among other FHWA and ODOT requirements. In addition to completing in-depth inspections for 201 of the 208 DPS-owned bridges (*the remaining 7 bridges are inspected by ODOT*), the DPS Bridge Management Program also performs in-depth inspections of *11 City of Columbus DPU bridges***, *49 private bridges* (non railroad), and *49 railroad bridges*. Completing an in-depth annual inspection is a crucial first step in determining what maintenance a bridge needs.

For every inspection the City of Columbus Department of Public Service completes, a report is submitted to a digital platform, Assetwise, that hosts all bridge data for the State of Ohio.

In order to comply with state and federally mandated inspection guidelines, each major component of the bridge, such as the deck, superstructure, substructure, and more, is assigned a rating from 0-9, as seen in the table below. Based on those individual component ratings, the bridge is then given a General Appraisal using a 0-9 scale. These scales are described in the Federal Highway Administration’s (FHWA) Specifications for the National Bridge Inventory, or SNBI, with detailed guidance on how to rate each individual component and use those ratings to tabulate the General Appraisal.

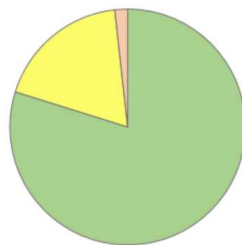
General Appraisal Rating	Description
9 - Excellent	No problems noted.
8 – Very Good	No problems noted.
7 - Good	Some minor problems.
6 - Satisfactory	Structural elements show some minor deterioration.
5 - Fair	Structural elements show deterioration but are sound.
4 - Poor	Advanced section loss.
3 - Serious	Advanced deterioration has affected all primary members. Local failures possible.
2 - Critical	Advanced deterioration. May be necessary to close the bridge.
1 - Imminent Failure	Major deterioration. Bridge is closed.
0 - Failed	Bridge closed

208 City Bridges Owned by City of Columbus DPS



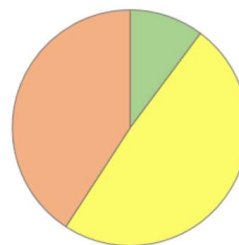
Good Fair
Poor Critical

114 ODOT Bridges With Routine Maintenance by City of Columbus DPS



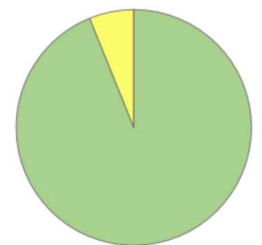
Good Fair
Poor Critical

49 Railroad Bridges Inspected by City of Columbus DPS



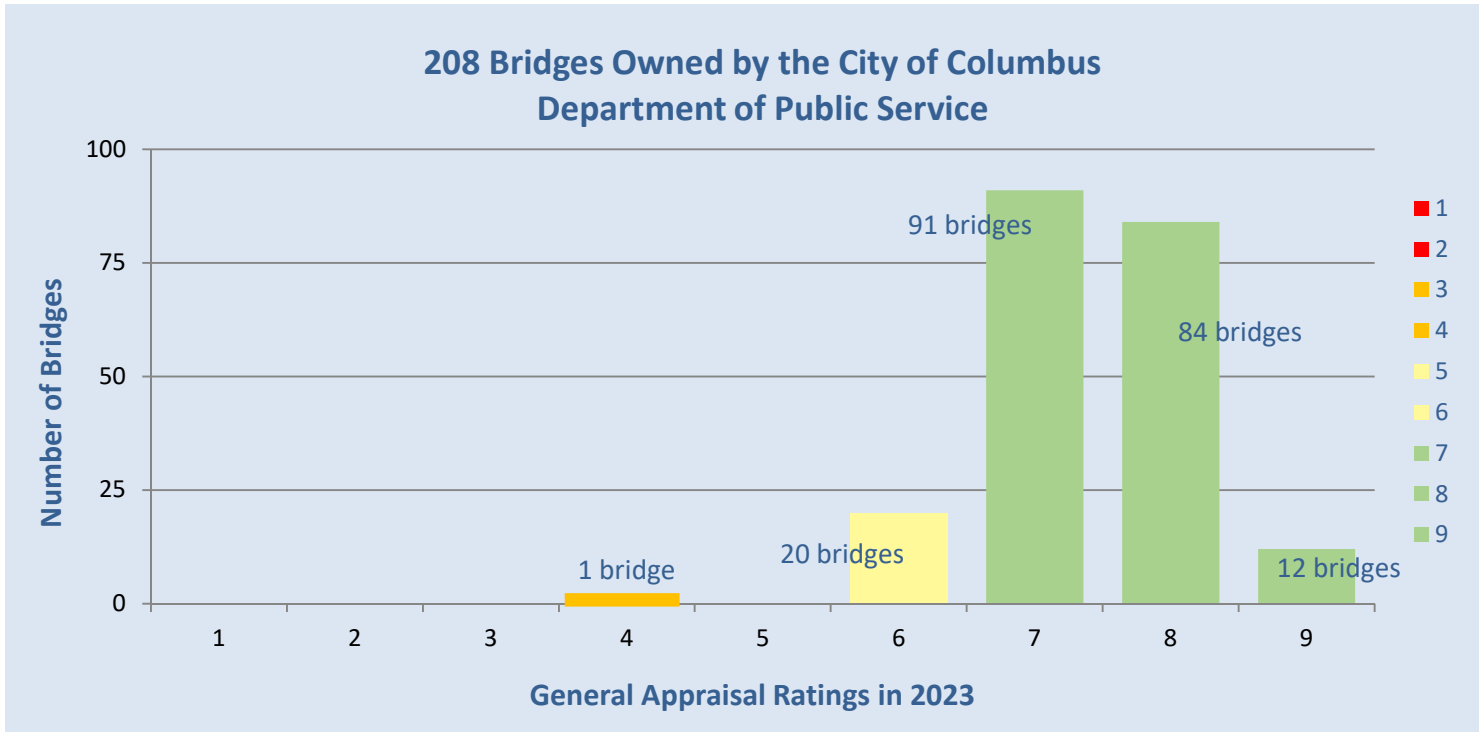
Good Fair
Poor Critical

49 Private Bridges Inspected by City of Columbus DPS



Good Fair
Poor Critical

** Columbus Recreation and Parks Department (CRPD) owns 108 bridge structures that do not legally qualify as bridges per the Ohio Revised Code definition on page 2 of this document, since they do not span over or under travelled streets but rather parks and trails. Therefore, CRPD bridges are excluded from counts and figures in this report.



As the table above depicts, *over 90%* of the 208 bridges owned and maintained by the City of Columbus DPS are rated in the “Good” category, with only one bridge with a 4 – Poor rating. This bridge is currently in design for replacement in 2025, which will bring its General Appraisal back up to a 9.

Bridge Inspection Tools

One noteworthy new tool DPS Bridge Management Program has added to their bridge inspection toolbox is a drone. This allows eyes on hard-to-reach portions of bridges in complex locations, such as over a river or creek. It also helps save taxpayer dollars and decrease safety risks by spacing out the frequency of costly and risky inspections done with a boom lift truck, where a bridge inspector is lifted in a bucket and transported near the bridge.

In order to safely fly the drone, at least one DPS bridge inspector is trained to be licensed as a Remote Pilots through the Federal Aviation Administration (FAA) and tested on FAA regulations.



Pedestrian Bridge over SR-315 and Olentangy River

City of Columbus DPS Bridges

For the 208 bridges owned by the City of Columbus Department of Public, all responsibility for inspection and maintenance falls on the Bridge Management Program, and a fixed annual budget is used to finance this work. Engineers in the DPS Bridge Management Program inspect these bridges annually, plan and scope all maintenance of these bridges, manage much of the design and construction contracts for these bridges, and even complete some of the engineering design in-house. This holistic approach to asset management equips the Bridge Management Program with expertise over the entire life cycle of the City’s bridges and ensures DPS prioritizes bridges as valuable taxpayer investments.

Bridge Program Philosophy

The objective of any proficient bridge maintenance program is to employ cost-effective strategies and actions to maximize the useful life of bridges. The City’s Bridge Program takes a proactive, balanced approach to preserving our bridges that are in good condition and replacing the ones nearing the end of their service life. Focusing only on replacing deficient bridges and ignoring maintenance needs is an inefficient and cost-prohibitive strategy the City avoids. A “worst first” approach to managing bridge assets also yields ineffective results that allow bridges in good condition to deteriorate into the deficient category which generally is associated with higher costs and other challenges. The primary goal of the City’s bridge maintenance program is to optimize the expenditure of taxpayer funds by conducting the appropriate bridge preservation activities at the appropriate time to extend the useful life of the bridge assets.

Types of Maintenance

There are two types of bridge maintenance the City employs: *scheduled* and *condition-based*. Scheduled maintenance includes cleaning and sealing bridges to remove any buildup of de-icing salts at the end of the winter season and prevent those salts, water, and other chemicals from deteriorating critical elements of the bridge. As its name suggests, scheduled maintenance occurs cyclically on a predetermined interval. Condition-

based maintenance activities, listed in the table below, would include all other types of work the bridge may need in order to resolve or prevent a specific issue identified through the inspection process. Although the DPS Bridge Management Program minimizes the need for full bridge replacements with a preventative and proactive bridge maintenance philosophy, sometimes replacement is inevitable because outdated standard bridge design, construction, and maintenance practices lead to deterioration over time.

Schedule Based	Condition Based
Cleaning	Expansion Joint Replacement
Concrete Sealing	Structural Steel Painting
	Concrete Deck Overlay
	Waterproofing Replacement
	Concrete Patching
	Vegetation Removal

Completing Maintenance

The Bridge Program has several contracts that facilitate completing bridge maintenance, design, and construction work: the annual *Bridge Cleaning and Sealing Contract*, the regularly recurring *Bridge Rehabilitation Citywide Maintenance Contract*, and our biannual *Bridge General Engineering Contract*. After developing the scope for a project, these contracts are used to procure any necessary design or construction services. If the plans for a specific project were developed by DPS bridge engineers in-house, then only construction or maintenance work is secured via these contracts. For more complex projects, DPS procures additional outside services including engineering studies and design, public relations, stakeholder coordination, and more.

Major Bridge Projects

Inevitably, bridges deteriorate with age, use, weather, and salt used in the wintertime. The City of Columbus DPS inspection program drives which major bridge rehabilitation projects are planned. Sometimes, a cost analysis of repairs needed by a bridge reveals it would be more cost efficient to replace the bridge entirely, given its condition. This section highlights a few past, present, and future major bridge projects managed by the Bridge Management Program.

Harrison Road over Dry Run: Bridge replacement project completed in 2022. This bridge was designed entirely in-house by DPS bridge engineers and with the aid of DPS surveyors, saving the City over \$100,000. Double Z constructed the new bridge, and the total cost of this project was \$450,000.



Harrison Road over Dry Run during construction 2022

Lehman Rd over Pickering Creek: Bridge replacement project completed in 2021. The previous bridge, with its substandard load capacity, only provided for a narrow two lane road with no shoulders. The new bridge has enough width for three lanes, paved shoulders and sidewalk on both sides. GPD Group designed this bridge and Shelly and Sands constructed it, for a total cost of \$1.4 million.



Harrison Road over Dry Run after construction 2023



Lehman Rd. over Pickering Creek

Whittier St over NS and CSX Railroad: Bridge rehabilitation project designed during 2022-2023 by Fishbeck and planned for construction in 2024, including widening the sidewalk into a shared use path between Front Street and the Scioto Audubon Metro Park and improving the connectivity of the Lower Scioto Greenway Trail. The total estimated cost for this project is \$3.5 million.

Kimberly Parkway over Mason Run: Bridge replacement project currently being designed by PRIME AE Group during 2023-2024 and programmed for construction in 2025. The City of Columbus was awarded \$1.4 million in federal grant funding from ODOT for the design and construction of this project.

Front St and Nationwide Blvd over Railroad: Proactive bridge rehabilitation of two railroad tunnel bridges in downtown Columbus currently being studied by Gannett Fleming, with design planned for 2024 and construction planned for 2026 and 2027.

References

1. [Ohio Manual of Bridge Inspection 2014](#)
2. [Specification for the National Bridge Inventory \(SNBI\)](#)
3. [State of Ohio Roadway Infrastructure Maintenance Responsibility Manual](#)
4. [Franklin County Engineers Office – Bridge Builders Biography](#)
5. [Ohio Revised Code Title 55 Roads-Highways-Bridges](#)
 - a) [Chapter 5523 Grade Crossings](#)
 - b) [Chapter 5591 County Bridges](#)
 - c) [Chapter 5593 Bridge Commissions](#)
6. [Code of Federal Regulations Title 49, Subtitle B, Chapter 11, Part 237 Bridge Safety Standards](#)