Seattle Department of Transportation

ROADWAY STRUCTURES

2021 Annual Summary

John Lewis Memorial Bridge

Seattle
Department of
Transportation

ASSET CONDITION

Bridges

SDOT assesses the condition of 32 pedestrian and 85 vehicular bridges. All bridges are inspected, at a minimum, on a 24-month cycle. The bridge condition and bridge type can also increase the frequency of the bridge inspections or require more specialized types of inspection such as inspection for nonredundant steel tension members, underwater (60-month cycle) or special inspection of atypical or non-standard bridge components.

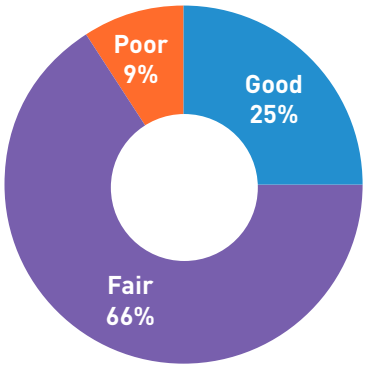
Bridge conditions are rated in accordance with the Federal Highway Administration's (FHWA) National Bridge Inspection Standards (NBIS). The system rates bridges on their current condition compared to when they were new and considers the condition of the key components of the bridge: the deck, superstructure, and substructure.

The structural condition of a bridge's key components is used to determine if there are structural or maintenance issues that need to be addressed. SDOT, in keeping with NBIS, ranks **vehicular bridges** in good, fair or poor condition based on the lowest ranking of those three components. SDOT ranks **pedestrian bridges** by the lowest condition state of each individual bridge element. Read more about component-level assessments from the FHWA and WSDOT.

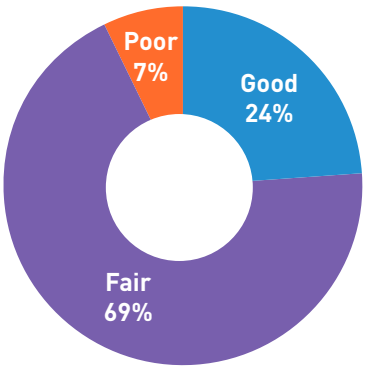
If a bridge is rated in poor condition, it is still safe for the traveling public. A bridge in poor condition has significant structural or maintenance issues, and to ensure ongoing safety, inspection frequency may be increased or other measures such as restricting the load capacity by re-striping or posting weight limits on the bridge may be implemented until repairs are made.

University Bridge

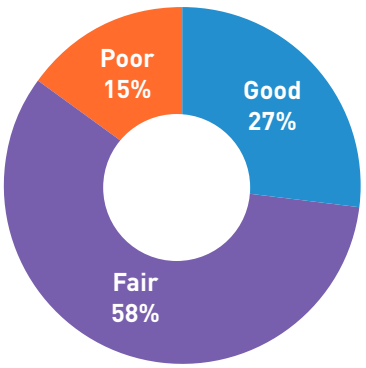
Overall Bridge Condition



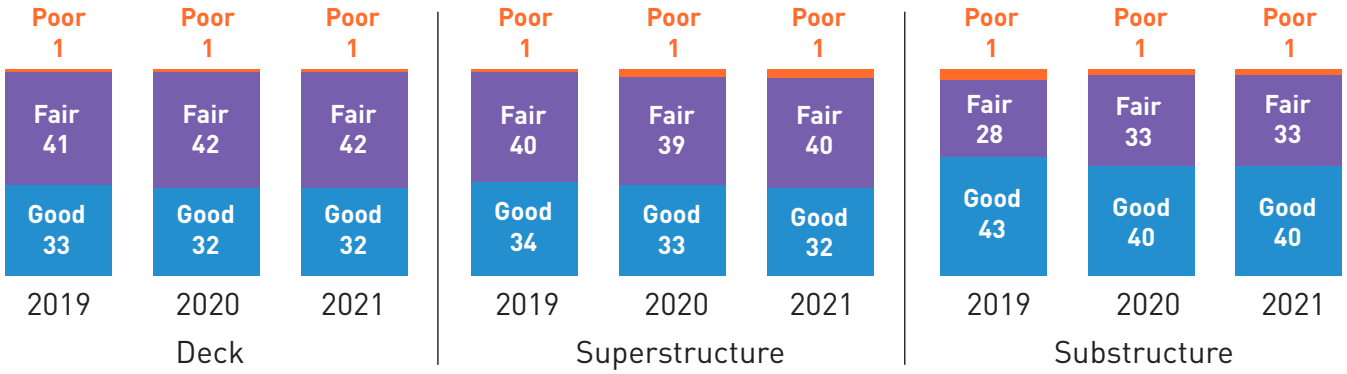
Pedestrian Bridge Condition



Vehicular Bridge Condition

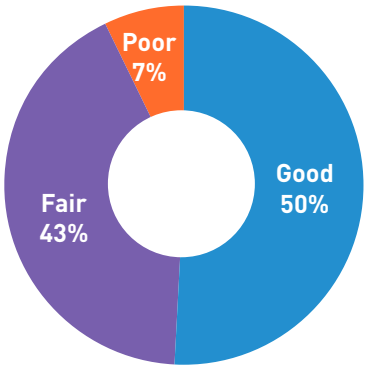


Main Component Condition

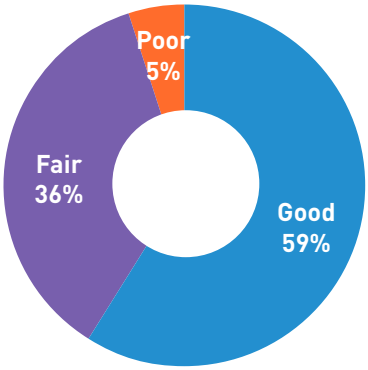


Other Structural Assets

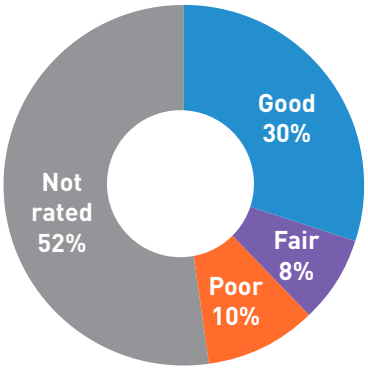
Retaining Wall Condition



Stairway Condition



Areaway Condition



STRUCTURAL OPERATIONS AND MAINTENANCE HIGHLIGHTS

Levy to Move Seattle Highlights

Bridge Maintenance

- Completed 374 bridge spot repairs, including repairing:
- Cracks on the Magnolia and Ballard Bridges
- Expansion joints on Jose Rizal, Magnolia, and Fremont Bridge
- Bridge rails on Fremont Bridge, Ravenna Sewer Trestle, and Ballard Bridge
- Concrete spalls at Magnolia Bridge and Ballard Bridge, University Bridge, Spokane St Viaduct, West Seattle Highrise, Schmitz Park Bridge and W Dravus St/15th Ave Bridge

Stairway Rehabilitation

- SW Edmunds St & 38th Ave SW
- 10th Ave S & S Donovan St
- SW Charlestown & Delridge Way SW
- 19th Ave SW & SW Orchard St
- SW Stevens St & 53rd Ave SW

Other Maintenance

- Replaced University Bridge camera system
- Install Metro Protection rails at Othello at MLK Platform
- Finished Royal Brougham Fire System Pipe run
- Performed emergency repairs of Spokane St Swing bridge Pump #2
- Fabricated protection rail at the Delridge on ramp
- Removed of Jersey/Water barriers at Pier 58

Bridge Load Rating Assessment

- Fremont Bridge
- Harbor Ave Bridges (4 bridges)
- SW Spokane St Swing Bridge – West Bound
- University Bridge – Bascule
- W Howe St Bridge
- West Seattle High-Rise Bridge – East Approach
- West Seattle High-Rise Bridge – East Approach Ramp
- Yesler Way over 5th Ave

BRIDGE INSPECTIONS

Completed 100% of NBI bridges

Routine: 78
Fracture Critical: 6
Special: 2
Private/Other: 62
Underwater: 5
Condition: 35
Short Span: 4

COMPLETED WORK ORDERS

Bridges: 356
Retaining Walls: 17
Stairways: 70

BRIDGE OPENINGS

Variance from 2020 identified at right

Ballard: 3,405	↑ 323
Fremont: 5,107	↑ 523
University: 2,855	↑ 339
Spokane: 1,748	↑ 167
South Park: 733	↑ 86

EMERGENCY RESPONSE

Operational: 39
Other Maintenance: 9

OTHER INSPECTIONS

Areaway: 46
Retaining Walls: 172
Stairway: 127

OTHER

Plan Review: 282

GLOSSARY

Bridge Inspection Types:

- **Routine:** Regularly scheduled inspections consisting of documenting observations, measurements, or both, used to determine the physical and functional condition of the bridge at a point in time.

- **Non-redundant Steel Tension Member (NSTM) (previously Fracture Critical):** Inspection to assess the structural condition of each NSTM member, whose failure could result in the partial or total collapse of the bridge.

- **Private/Other:** Inspection of privately-owned structures that spans across the public right-of-way.

- **Condition:** Inspection to assess the condition of pedestrian structures or other bridge structures that may not meet National Bridge Inspection Standards guidelines for a "routine" inspection.

- **Short Span:** Inspection used for vehicular bridges that are 20 feet or less.

- **Special:** Inspection to assess the condition of special features on a bridge, such as the electrical and mechanical elements of a moveable bridge.

- **Underwater:** In-water inspections to examine the underwater elements of the bridge to determine their structural condition and adequacy.

Bridge Load Rating: Activity to determine a bridge's capacity to carry specific types of vehicle loads. This information is used to manage and enforce legal vehicle loads on bridges. This is important for bridge safety and long-term health. Activities include:

- Analyzing the vehicle load capacity of bridges
- Field verification tests
- Monitoring deficient bridges
- Posting or restricting the weight and or type of vehicle for bridges or structures with reduced load ratings.

Component level assessment: Detailed assessment of the condition state of the individual bridge components, which includes and is not limited to the deck, the substructure, and the superstructure (defined in this glossary, below).

Deck: The surface on which a vehicle drives on, or for pedestrian structures, the surface a pedestrian walks/rolls on.

Other Inspections: Inspections to assess the condition of other roadway structures that are not identified as a bridge, such as areaways, retaining walls, and stairways.

Substructure: Typically refers to all the other elements of the bridge that supports the superstructure.

Superstructure: Typically used to reference all the bridge elements that are part of the bridge that is supported on the bearings and including the bearings.

Sufficiency rating: The Federal Highway Administration (FHWA) describes sufficiency rating as "a method of evaluating highway bridge data by calculating four separate factors to obtain a numeric value which is indicative of bridge sufficiency to remain in service. The result of this method is a percentage in which 100 percent would represent an entirely sufficient bridge and zero percent would represent an entirely insufficient or deficient bridge."

Roadway Structures Mission

Make the most of Seattle's transportation investment, preserve infrastructure, manage capital improvements and maintain and operate bridges, retaining walls, stairways and areaways to provide a safe and reliable transportation system.

Seattle Department of Transportation
700 5th Avenue, Suite 3800
PO Box 34996
Seattle, WA 98124-4996
(206) 684-ROAD (7623)
www.seattle.gov/transportation

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