

Seattle Department of Transportation

# ROADWAY STRUCTURES

## 2019 Annual Summary



**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.

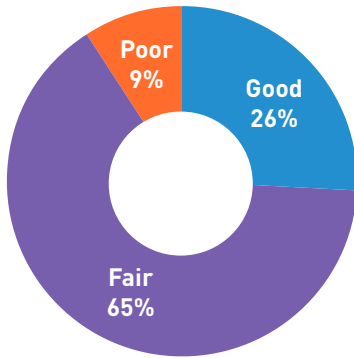


*Fremont Bridge*

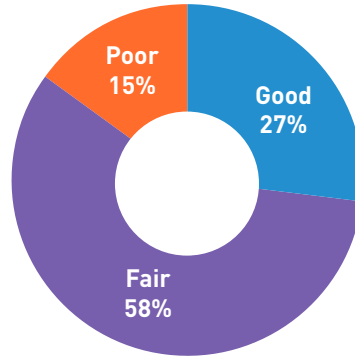
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**NOTE:** Beginning this year and in alignment with the Federal Highway Administration requirements, SDOT will assess the conditions of its bridges using a component level assessment instead of using sufficiency ratings. Sufficiency Rating is a legacy classification that referred to funding eligibility but was discontinued with the enactment of MAP-21 federal legislation in 2012 and is no longer used within the Federal-aid Highway Program.

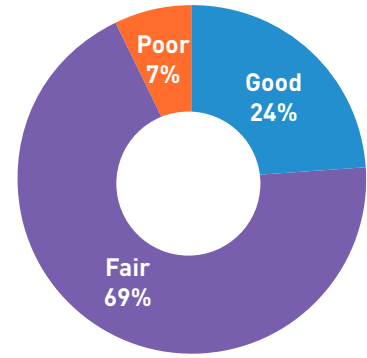
**Overall Bridge Condition**



**Pedestrian Bridge Condition**



**Vehicular Bridge Condition**



**Main Component Condition**



Deck



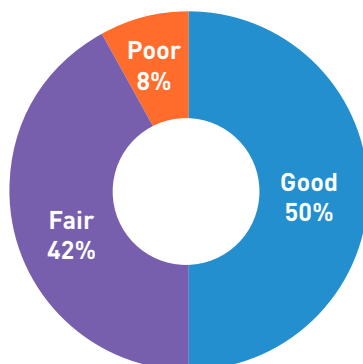
Superstructure



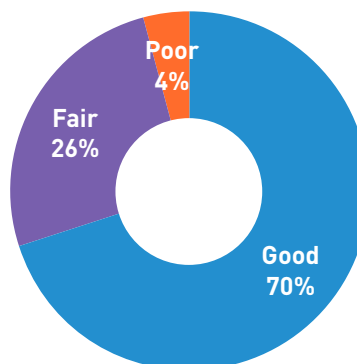
Substructure

**Other Structural Assets**

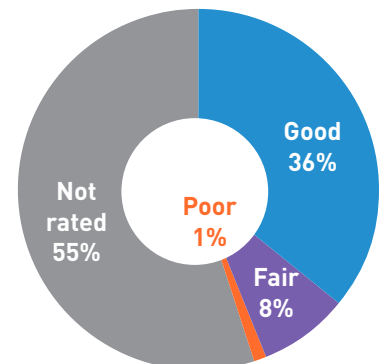
**Retaining Wall Condition**



**Stairway Condition**



**Areaway Condition**



# STRUCTURAL OPERATIONS AND MAINTENANCE HIGHLIGHTS

## Levy to Move Seattle Highlights



### Bridge Maintenance

Completed 457 bridge spot repairs, including repairing:

- Cracks on the West Seattle High-Rise Bridge Main Span
- Expansion joint at 1st Ave S/Argo Railroad
- Bridge rails on NE 50th St and 5th and 20th Ave NE / Thornton Creek
- Concrete spalls at Ballard Bridge, Magnolia Bridge Viaduct, University Bridge, Seattle Blvd Bridge, S Spokane St Viaduct, Jose Rizal Bridge, Rainier and Martin Luther King (MLK) Jr Pedestrian Bridge, and 4th Ave S/Jackson

### Stairway Rehabilitation

- SW Orleans St & 60th Ave SW
- S Bradford St between 31st Ave S and S Letitia St
- S Adams St & 34th Ave S
- S Judkins St between 14th Ave S and 15th Ave S
- S Ferdinand St & 54th Ave S

### Other Maintenance

- Repaired girder at Airport Way/Argo Railroad
- Repaired pedestrian gate at SW Spokane St Swing Bridge
- Removed deteriorated deck planks and replaced with new treated timber planks at 33rd Ave W/Railroad
- Fabricated splice brackets for E Pine St Pedestrian Bridge

### Bridge Load Rating Assessment

- E Interlaken Blvd/26th Ave E Bridge
- Phinney Ave N/N 57th St



*Martin Luther King Jr Way Pedestrian Bridge*

## BRIDGE INSPECTIONS

**Completed 100% of NBI bridges**

Routine: 76  
Fracture Critical: 4  
Special: 2  
Private/Other: 87  
Underwater: 4  
Condition: 42  
Short Span: 5

## COMPLETED WORK ORDERS

Areaways: 6  
Bridges: 363  
Retaining Walls: 11  
Stairways: 24

## BRIDGE OPENINGS

**Variance from 2019 identified at right**

|                   |       |
|-------------------|-------|
| Ballard: 3,799    | ↓ 184 |
| Fremont: 4,995    | ↓ 293 |
| University: 3,172 | ↑ 80  |
| Spokane St: 1,739 | ↑ 273 |
| South Park : 632  | ↑ 56  |

## EMERGENCY RESPONSE

Accidents: 5  
Operational: 64  
Other Maintenance: 10

## OTHER INSPECTIONS

Areaways: 2  
Retaining Walls: 64  
Stairway: 40

## OTHER

Plan Review: 327



## 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.

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