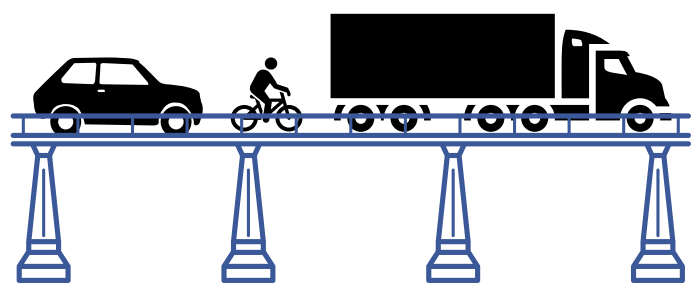


# Bridges

## What Is It?

Bridges are crucial aspects of road infrastructure that allow vehicles, pedestrians, or trains to traverse waterways, valleys, marshes, and more. Bridges work by distributing the weight of loads - like traffic or cargo - across key structural components, including beams, arches, or suspension cables.



## What is the Impact?

Bridges are essential for connecting local and national roadways, rails, and walkways. They are an integral component of the U.S. economy, allowing goods and services to travel more efficiently across otherwise difficult-to-cross barriers.

## What Does It Cost?

The cost of bridges varies largely depending on their size and material usage, and the construction method (whether public or privately built). Initial and maintenance costs can range from thousands to millions.



## How Does It Work?

1. Road planners identify a waterway or area that requires a crossing.
2. Funding is secured through a combination of local, state, and federal government sources, and sometimes private contributors.
3. Surveyors and engineers analyze the terrain, soil, and water conditions to determine the structural components necessary for the bridge's foundation.
4. Civil engineers design a bridge that spans the obstacle and accommodates the anticipated traffic load. They also factor in environmental conditions and safety standards.
5. Contractors are hired to begin construction. The process starts with building the foundation, which may involve deep excavation along the shoreline or into the waterbed to ensure stability. Foundations are sometimes placed hundreds of feet below ground to support the weight of the bridge.
6. Construction advances from the foundation to the bridge deck and its supporting structures, such as beams, cables, or arches. Extensive roadwork on both sides ensures that the approach roads seamlessly connect to the bridge.
7. Throughout construction, inspections ensure quality control and compliance with safety regulations. Finishing elements, such as sidewalks, barriers, lighting, and the road surface, are installed.
8. After final inspections and safety approvals, the bridge opens to the public.



## Space



There are over 600,000 bridges in the United States, ranging from just a few yards to almost 24 miles long. If placed end-to-end, they would span over 6,100 miles.

## Point

- Bridges are a crucial aspect of the U.S. economy, facilitating much easier travel.
- New bridges are designed to withstand the forces generated by heavier modern vehicles.
- Many bridges are iconic architectural landmarks.
- Bridges are necessary for expansion and economic growth.
- Bridges typically utilize large amounts of steel and concrete.

## Counterpoint

- Bridge collapses can have major effects on regional economies.
- Older bridges will require investment and rehabilitation to bring them up to modern standards.
- Modern traffic has overwhelmed the intended capacity of many of these historic bridges.
- The high cost of bridges can be prohibitively expensive for smaller local governments, creating budgetary strain and higher taxes.
- Alternative composite materials can save on costs for certain bridges expanses.

## Did You Know?

In the United States, there are over 600,000 bridges. At any given time, nearly 10% of those are considered structurally deficient, on which nearly 200 million daily crossings take place.

## What's Next?

Rehabilitation, repair, or removal of older bridges is a continual priority for the U.S. Department of Transportation, along with the construction of new bridges in areas with significant growth. New bridges are built to be more resilient by integrating new technology, such as sensors for *smart bridges*, and advanced construction techniques.