Average Life Expectancy of Select Infrastructure Types and Potential Climate-Related Vulnerabilities

Mode	Example of Infrastructure Asset	Design Lifetime	Potential Climate-Related Vulnerabilities
Transportation	Paved Roads	10–20 Years	Softening, deterioration, and buckling caused by heat. Scour and erosion caused by flooding and storm surge. Sea level rise inundation. Accelerated corrosion in coastal areas caused by sea level rise. Road closures caused by landslides and washouts during heavy precipitation events. Damage to foundation caused by changes in soil moisture.
	Rail Tracks	50 Years	Buckling and deformation caused by heat. Scour and erosion caused by flooding, storm surges, and extreme precipitation events. Railway subsidence caused by groundwater depletion.
	Bridges	50–100 Years	Erosion and scour caused by flooding, storm surges, and sea level rise inundation. Accelerated corrosion in coastal areas caused by sea level rise and saltwater intrusion. Reduced vertical clearance over major waterways caused by sea level rise. Damage to foundation by changes in soil moisture or higher waterway levels.
Energy	Transmission Lines	50 Years	Lower transmission efficiency caused by increased temperatures; peak demand during highest temperatures compounds vulnerability. Wooden utility poles destroyed and damaged in wildfires. Lines disrupted or shut down by smoke and particulate matter ionizing the air and creating an electrical pathway away from transmission lines.
	High-Voltage Transformers	40 Years	Service disruptions caused by more frequent and severe precipitation events, flooding, and wildfires. Lower transmission efficiency caused by increased temperatures.
	Generating Plants and Substations	35–80 Years 35–45 Years	Inundation of coastal power plants and substations caused by king tides, storm surge, and sea level rise. Service disruptions caused by more frequent and severe extreme heat, precipitation events, flooding, and wildfires.
Water	Reservoirs and Dams	50–80 Years	Lower water availability caused by higher temperatures and droughts in some regions can decrease water supplies and hydropower. More severe precipitation events threaten dam integrity or dam breaching. More frequent and severe wildfires leave ash and eroded sediment in drinking water supplies.
	Treatment Plants and Pumping Stations	60–70 Years	System overwhelmed with storm water resulting from more extreme precipitation events and, in coastal areas, with seawater driven by storm surge. Increased water quality treatment needs during drought periods.
	Drinking Water Distribution and Storm and Sewage Collection Systems	60–100 Years	Storm water management and collection complicated by more extreme precipitation events and changes in water availability caused by higher temperatures.

*Critical infrastructure assets are vulnerable to extreme weather and climate change, with longer-lived assets facing more severe vulnerabilities expected later this century. A particular asset's vulnerability may vary from the general vulnerabilities listed due to its location, age, design, adaptive capacity, etc. The assets listed below are illustrative, not comprehensive. (*SOURCES: ASCE 2017; ASCE 2015; TRB 2014; DAVIS AND CLEMMER 2014; DOE 2013; STOMS ET AL. 2013; ASCE 2011; NRC 2008; EPA 2002).

Source: UCS Available online at www.ucsusa.org/climate-smart-infrastructure