

How Rockfalls Happen

Rockfalls occur when fractures and triggers loosen blocks from steep slopes.



Rock block loosens

Fractures weaken the rock

Weathering opens cracks

Freeze-thaw can widen fractures

Roots can grow into cracks

Rockfall path

Falling, bouncing, and rolling rocks

Road or trail below

People and infrastructure may be exposed

Protective features can reduce risk

- Rockfall fence
- Catch ditch
- Barriers or closure gates

HOW A ROCKFALL DEVELOPS

1 Cracks form
Fractures break the rock into blocks.

2 Triggers weaken the block
Weathering and other processes open cracks and reduce strength.

3 Block detaches
A trigger releases the block from the slope face.

4 Rocks fall, bounce, and roll downslope
Rocks travel to the base and can reach roads, trails, or other infrastructure.

COMMON TRIGGERS THAT CAN RELEASE ROCK BLOCKS

Weathering
Rain, wind, and temperature changes break down rock and open cracks.

Freeze-thaw
Water gets into cracks, freezes, and expands—widening fractures over time.

Root growth
Tree and plant roots can grow into cracks and pry rock blocks apart.

Earthquake shaking
Ground shaking can suddenly trigger movement and cause failure.

Erosion / undercutting
Streams, waves, or runoff remove support at the base, making slopes unstable.

Road cuts / excavation
Cutting into slopes steepens them and removes support, increasing risk.



POLICY TAKEAWAY: Rockfall hazards matter where steep rocky slopes overlook roads, trails, parks, rail lines, or developed areas. Inspection, slope design, barriers, setbacks, and temporary closures can all help reduce risk.

