

The Role of Gravity, Slope Angle, and Material Strength



Steeper slopes and weaker materials are more likely to move.

1 HOW GRAVITY, SLOPE ANGLE, AND MATERIAL STRENGTH WORK TOGETHER

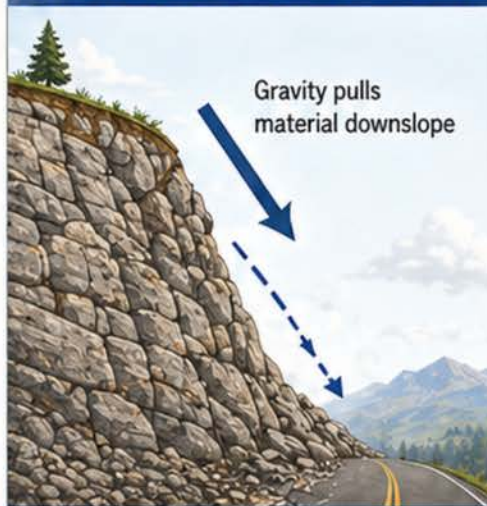
GENTLE SLOPE



More likely to stay stable

Gentle slope = lower driving force

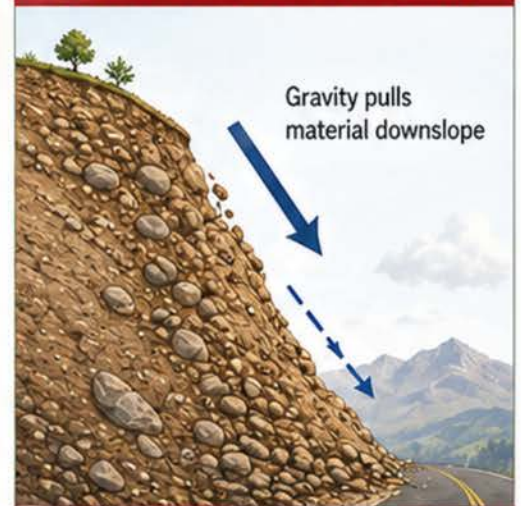
STEEP SLOPE + STRONGER MATERIAL



More likely to stay stable

Steep slope, but stronger material resists movement

STEEP SLOPE + WEAKER MATERIAL



Higher chance of movement

Steep slope with weak, loose, or weathered material = higher risk

Slope angle matters

Material strength matters

2 WHY MATERIAL MATTERS

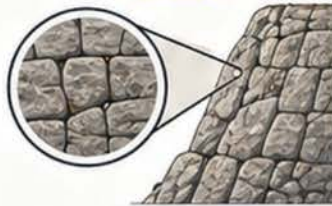
WEAK, LOOSE, OR WEATHERED MATERIAL



Particles are loose and poorly connected.

Easier to deform or slide.

STRONG, WELL-CEMENTED BEDROCK



Particles are tightly locked together.

Resists deformation and movement.

3 THE BIG PICTURE



4 KEY FACTORS THAT CONTROL SLOPE STABILITY



GRAVITY

Always acting downward, it drives materials downslope.



SLOPE ANGLE

Steeper slopes create greater driving forces on the material.



MATERIAL STRENGTH

Stronger, well-cemented materials resist movement; weaker materials do not.



POLICY TAKEAWAY

Policy takeaway: Steeper slopes and weaker earth materials usually need more careful design, review, and hazard screening. These factors matter for hillside development, road cuts, and land-use planning.