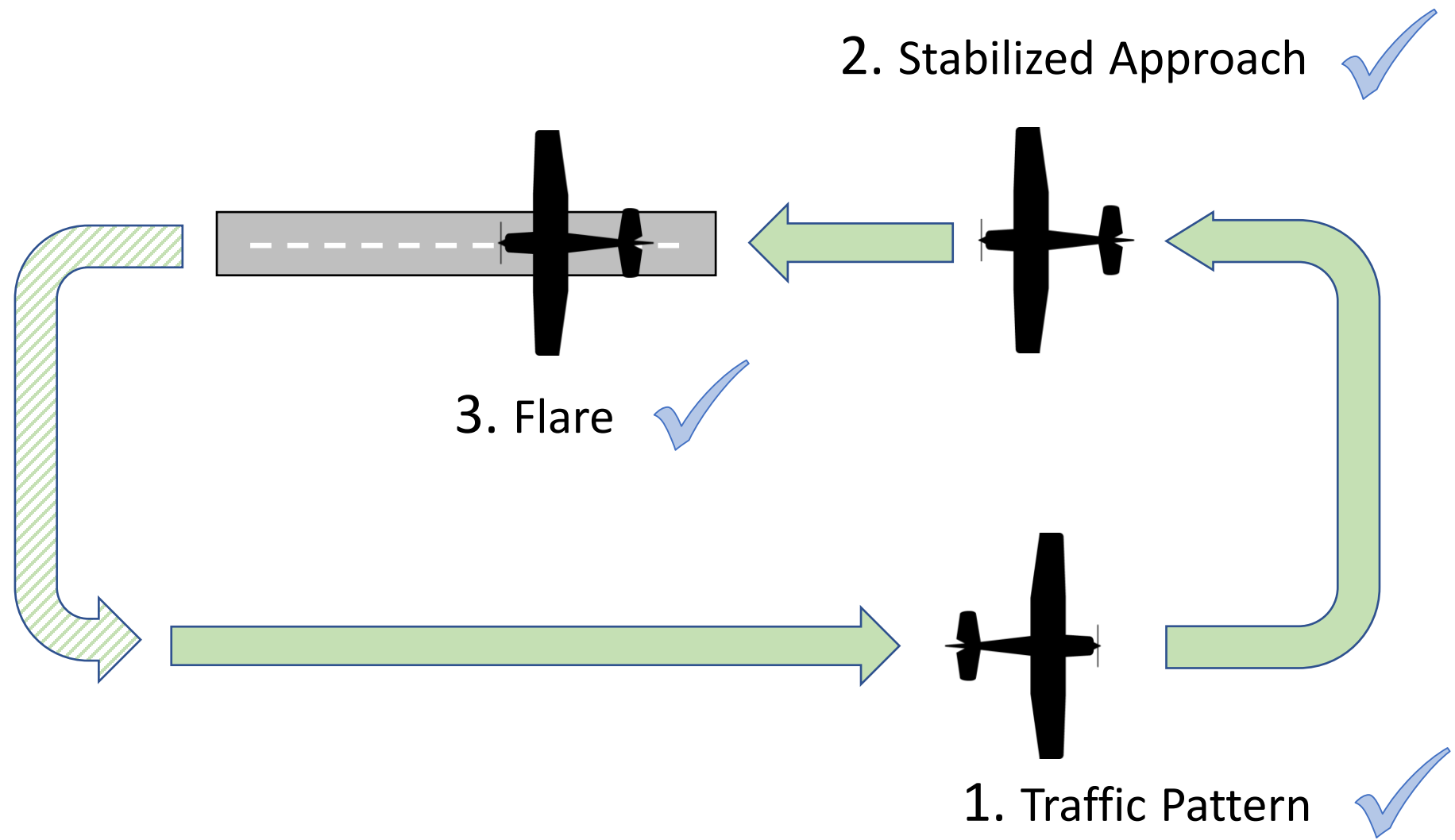


The Airplane Landing Cookbook

Dennis Strein, FI(A)

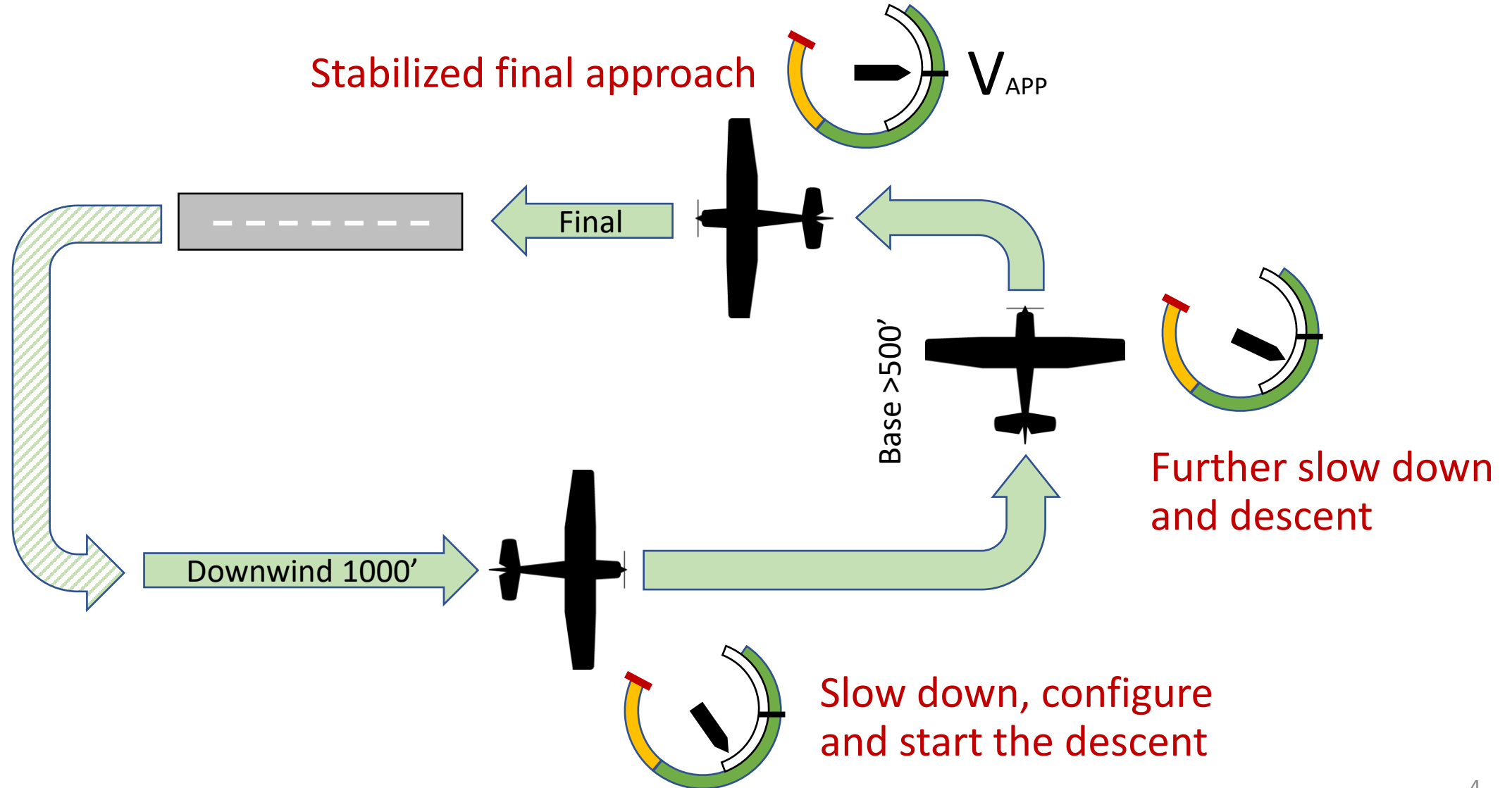
20/11/2020

Three steps to making a landing

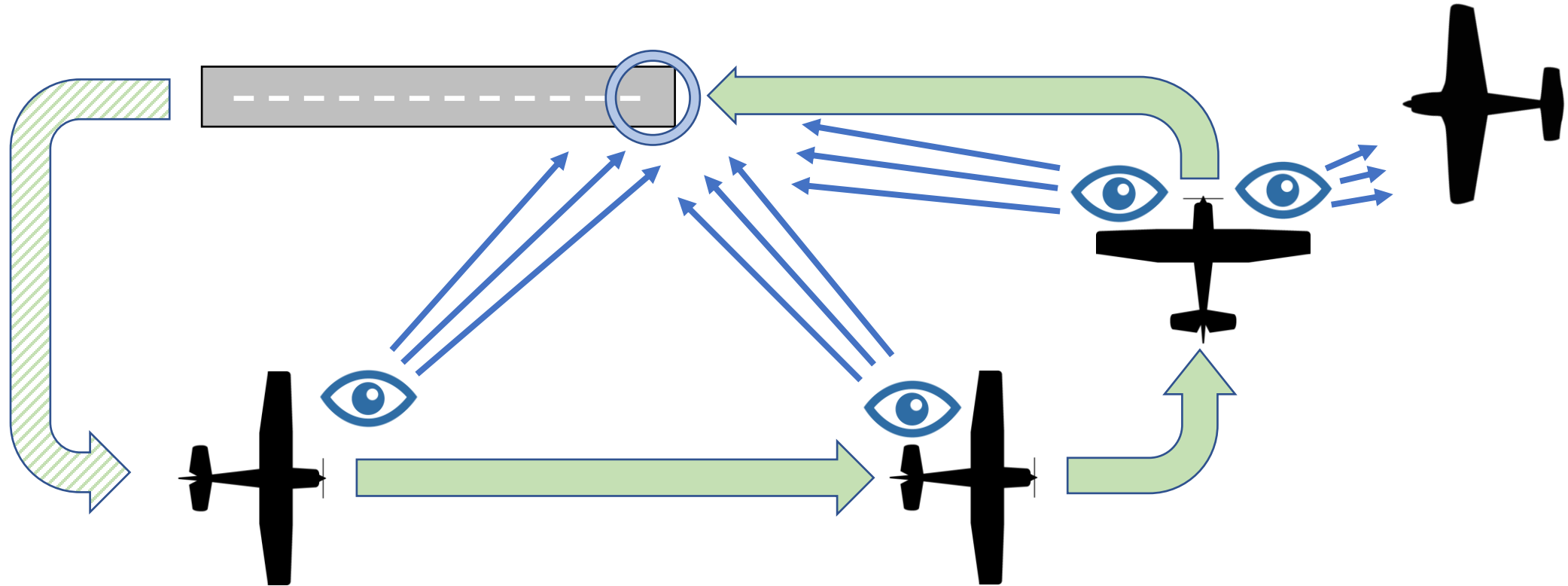


Traffic Pattern

A good landing starts with a good pattern

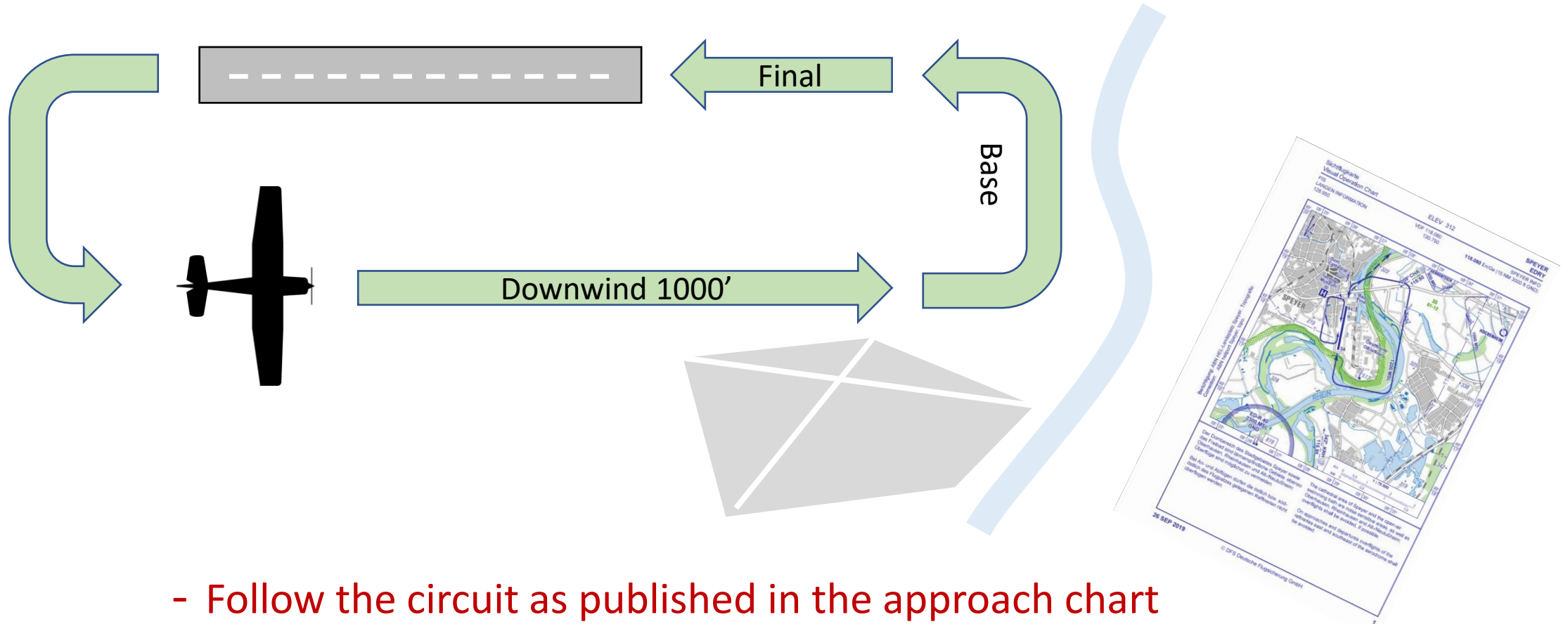


Keep the runway threshold in sight



- Observe height, direction and distance to the threshold while performing turns and descent. Watch out for traffic in long final

Follow the published circuit

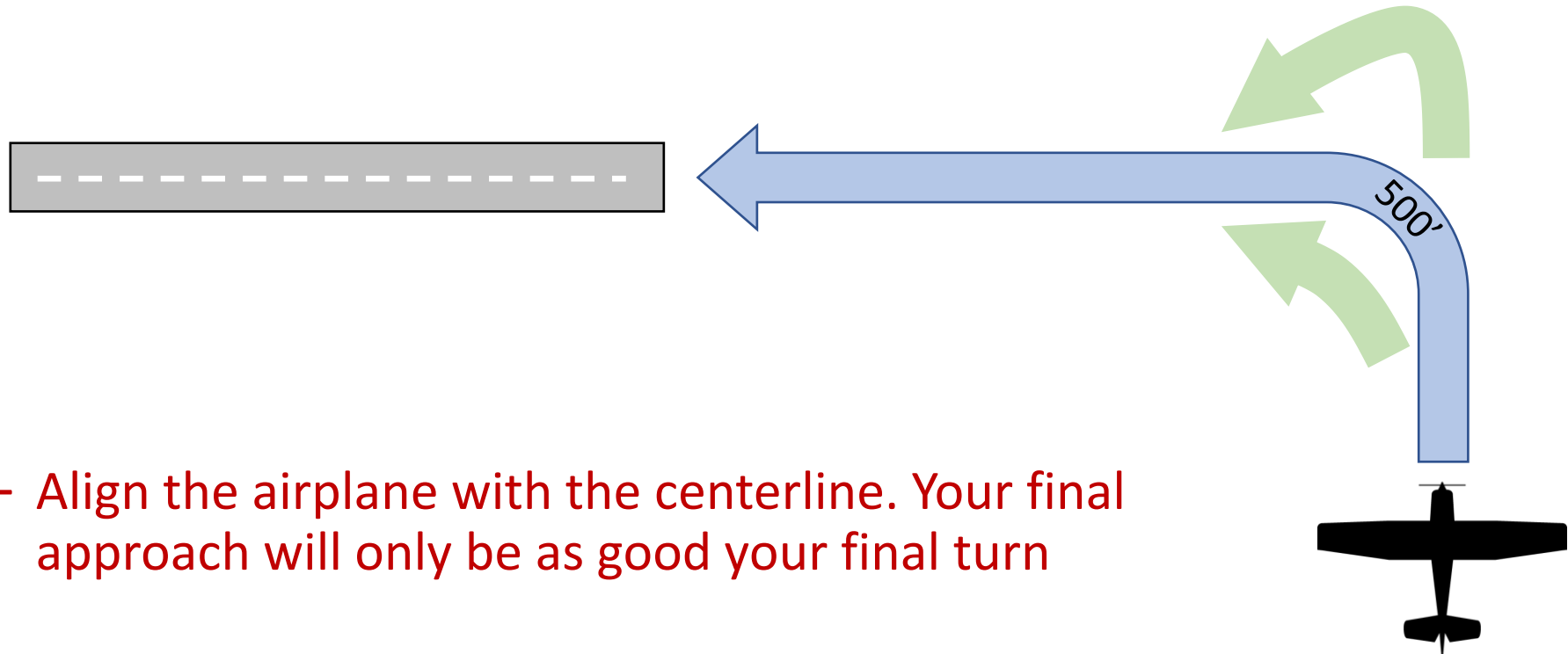


- Follow the circuit as published in the approach chart

Turn to final



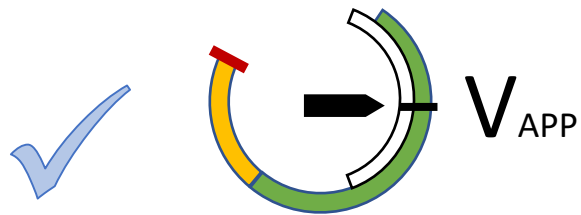
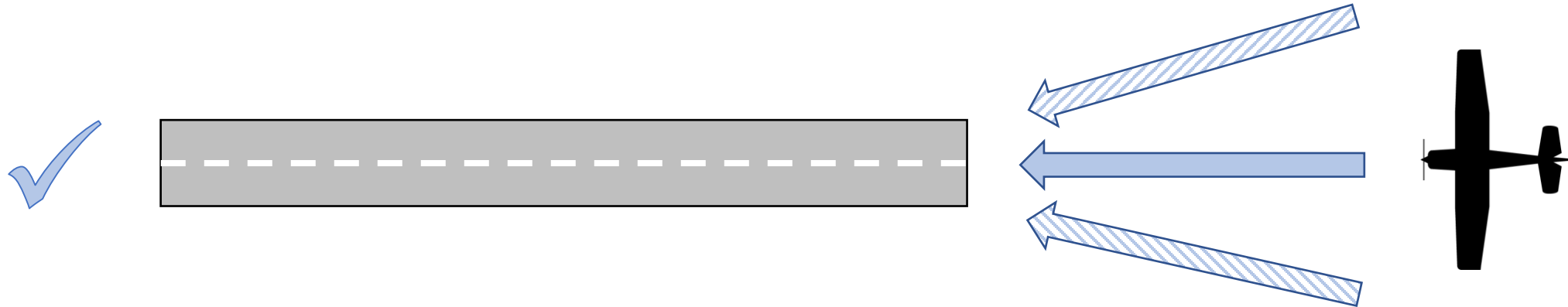
Max 20° bank!



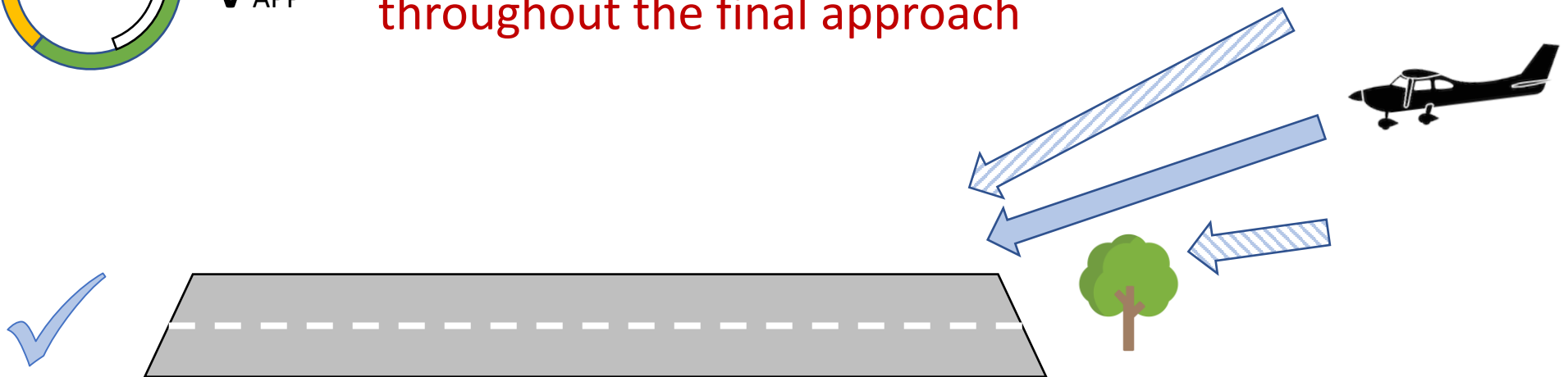
- Align the airplane with the centerline. Your final approach will only be as good your final turn

Stabilized Final Approach

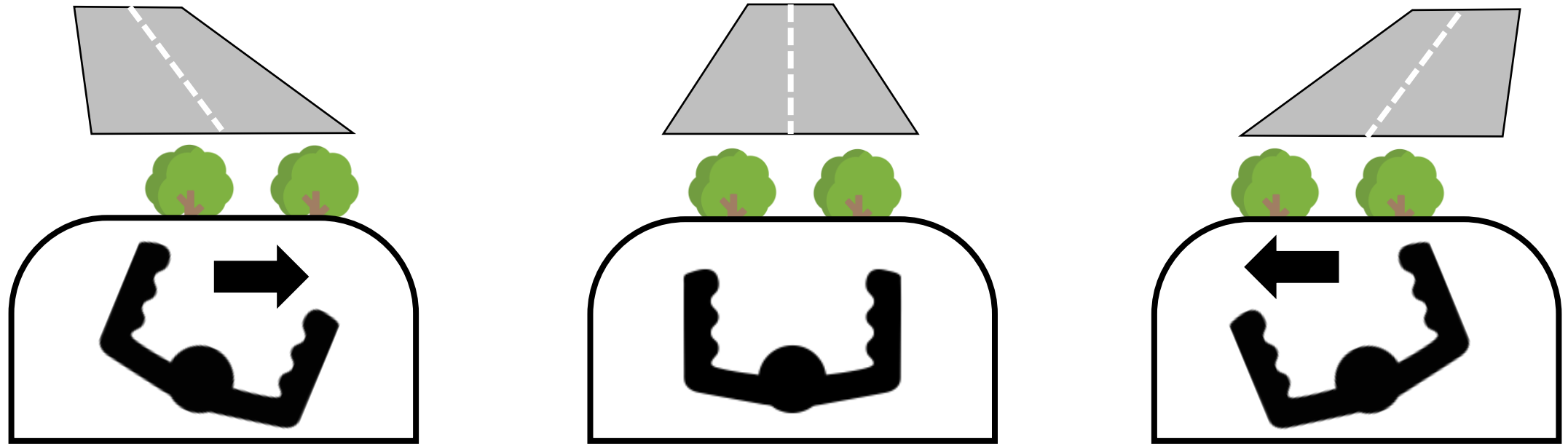
Control direction, descent angle and speed



All must be stable within limits throughout the final approach



Control direction with ailerons

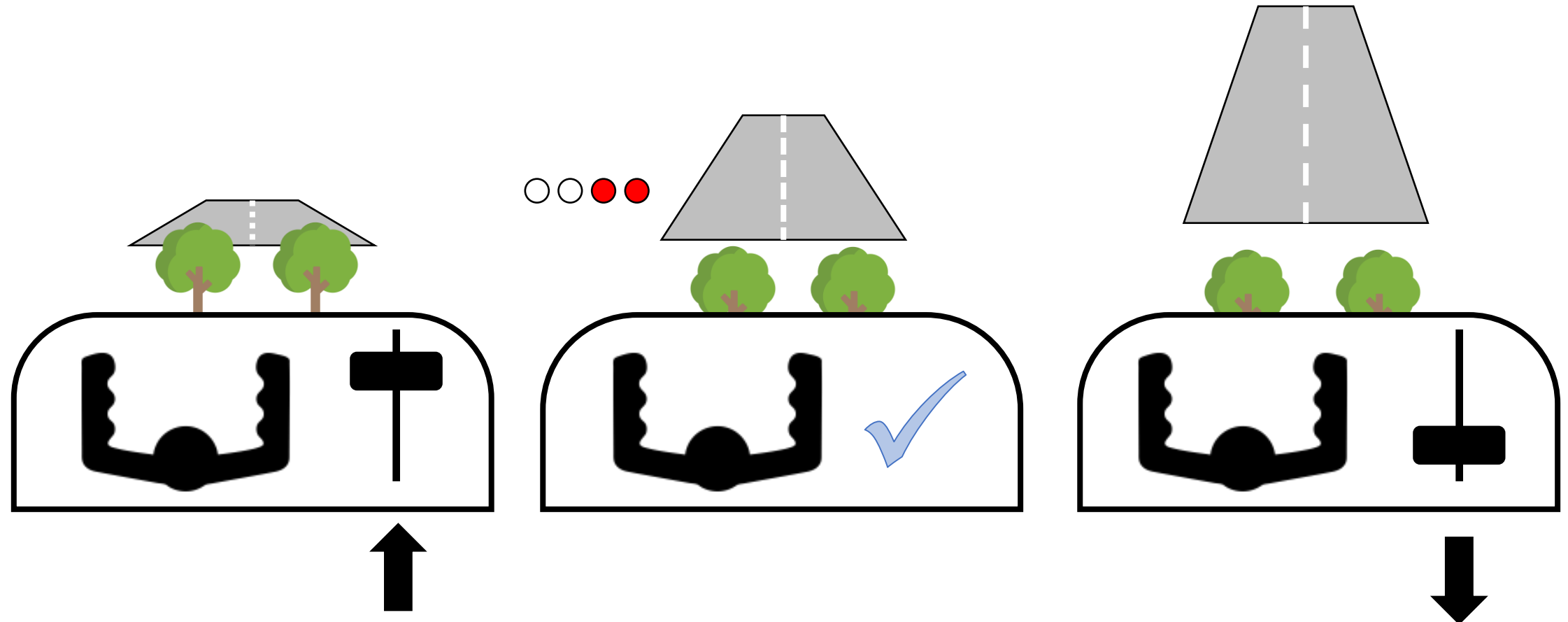


- Too far to the left. Turn right!



- Too far to the right. Turn left!

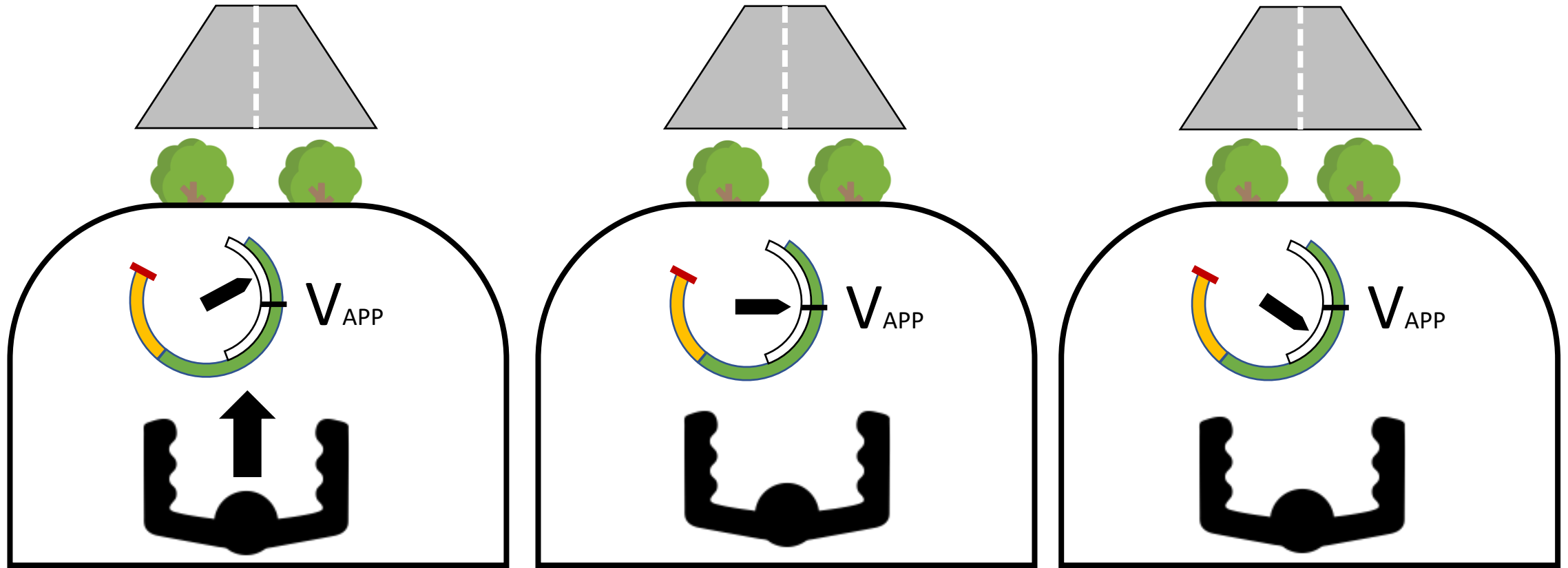
Control descent angle with power



- Too low. Increase power!

- Too high. Reduce power!

Control speed with elevator

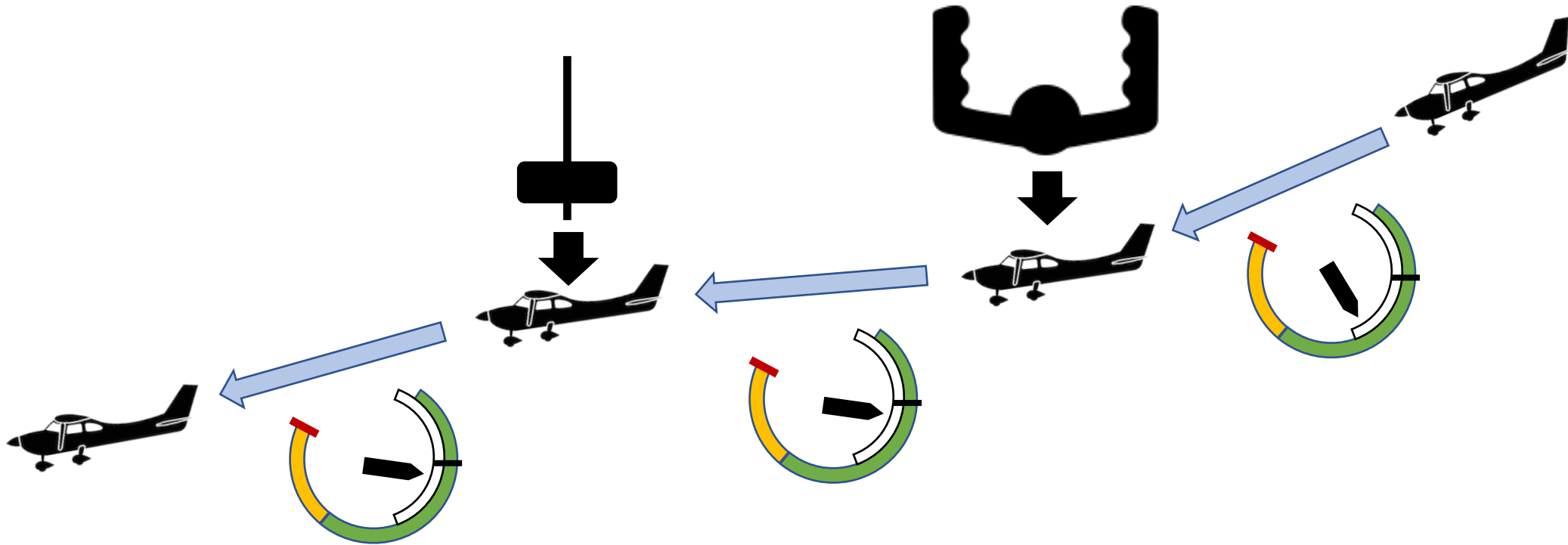


- Too slow. Push elevator!



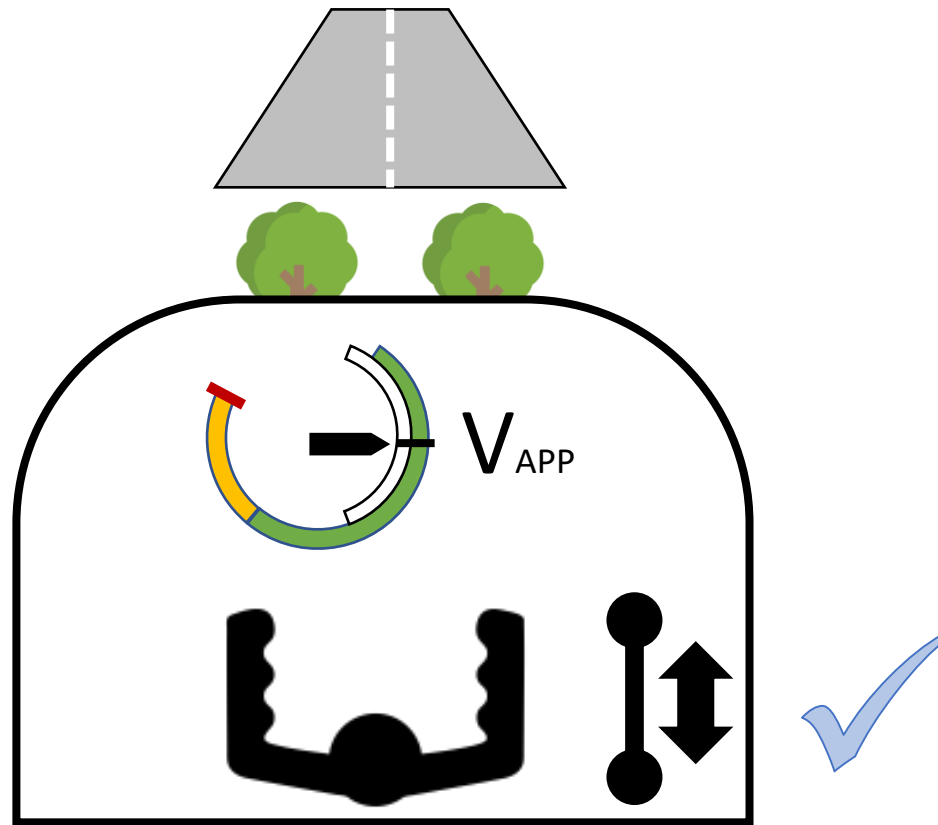
- Too fast. Pull elevator!

Control pitch and power in concert



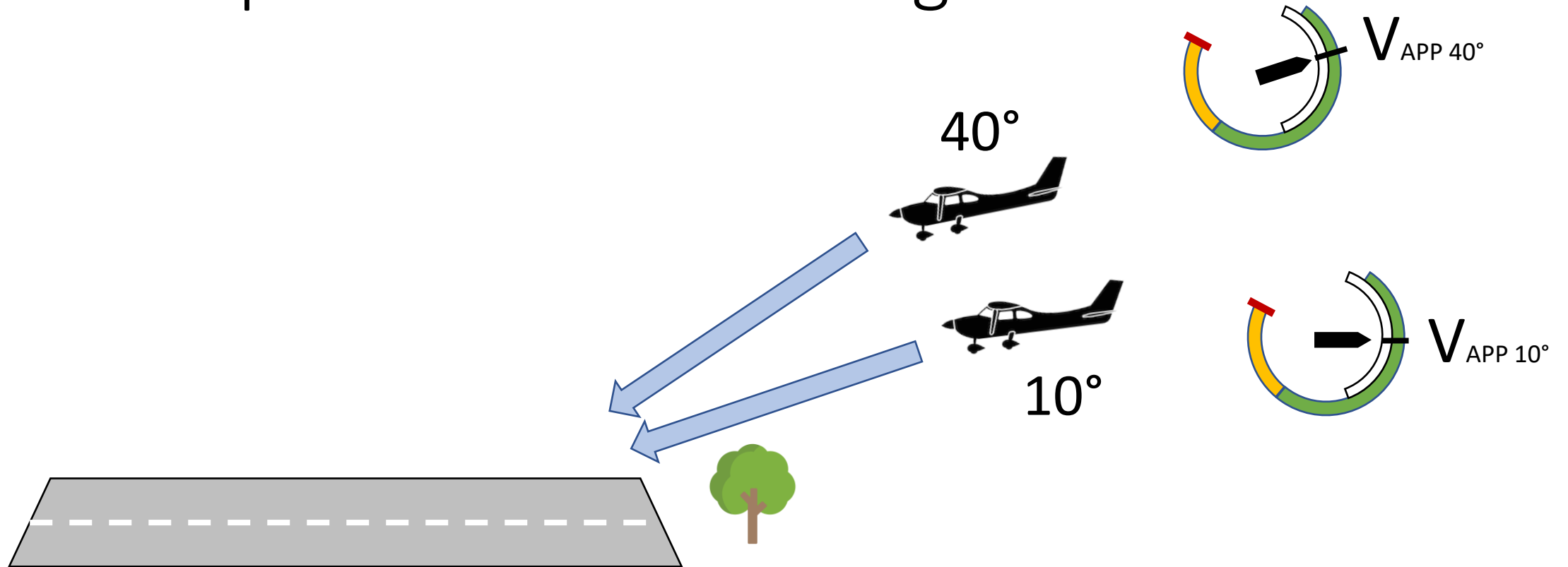
- Use pitch (elevator) for speed and power for descent rate. If you change one the other one is affected as well however

Trim the airplane



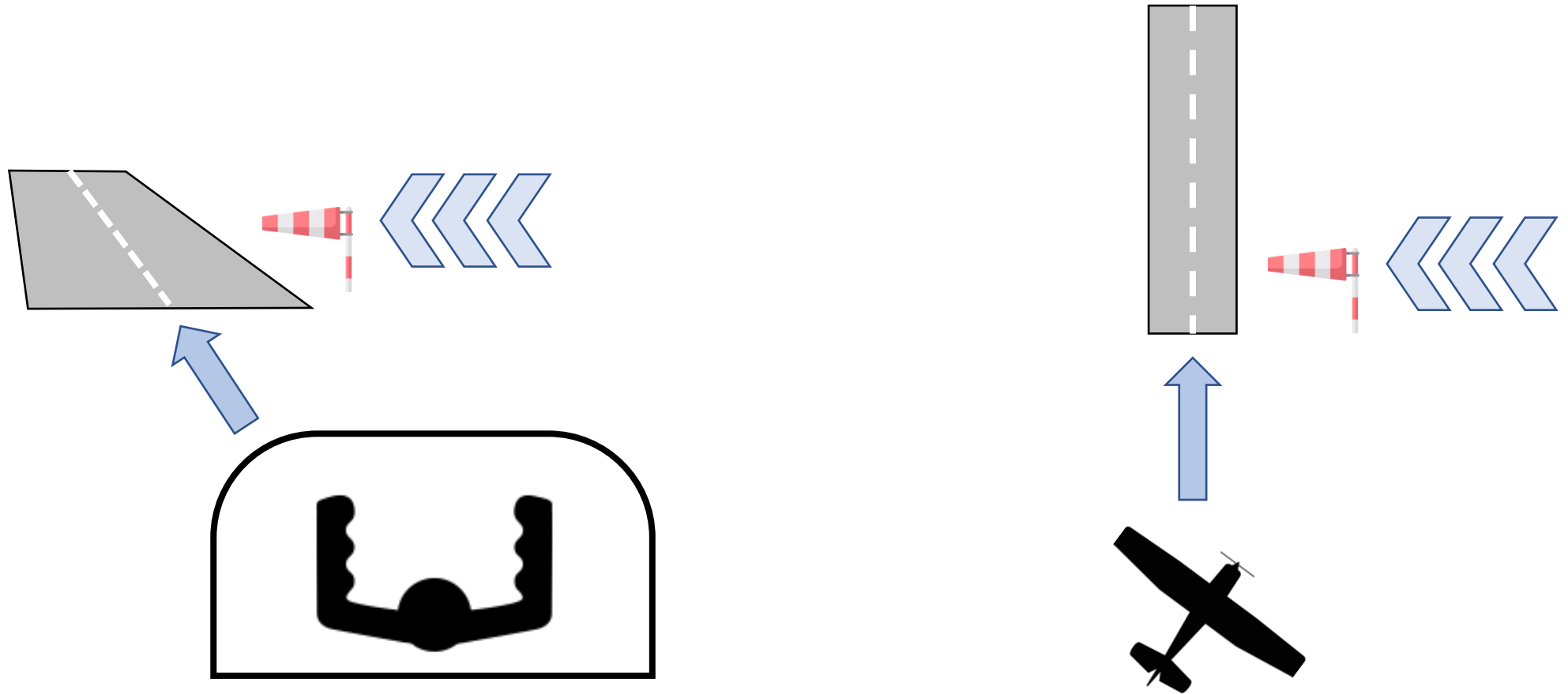
- Use the trim wheel to eliminate control forces at V_{APP} ! Check the POH for V_{APP}

Use flaps for shorter landings



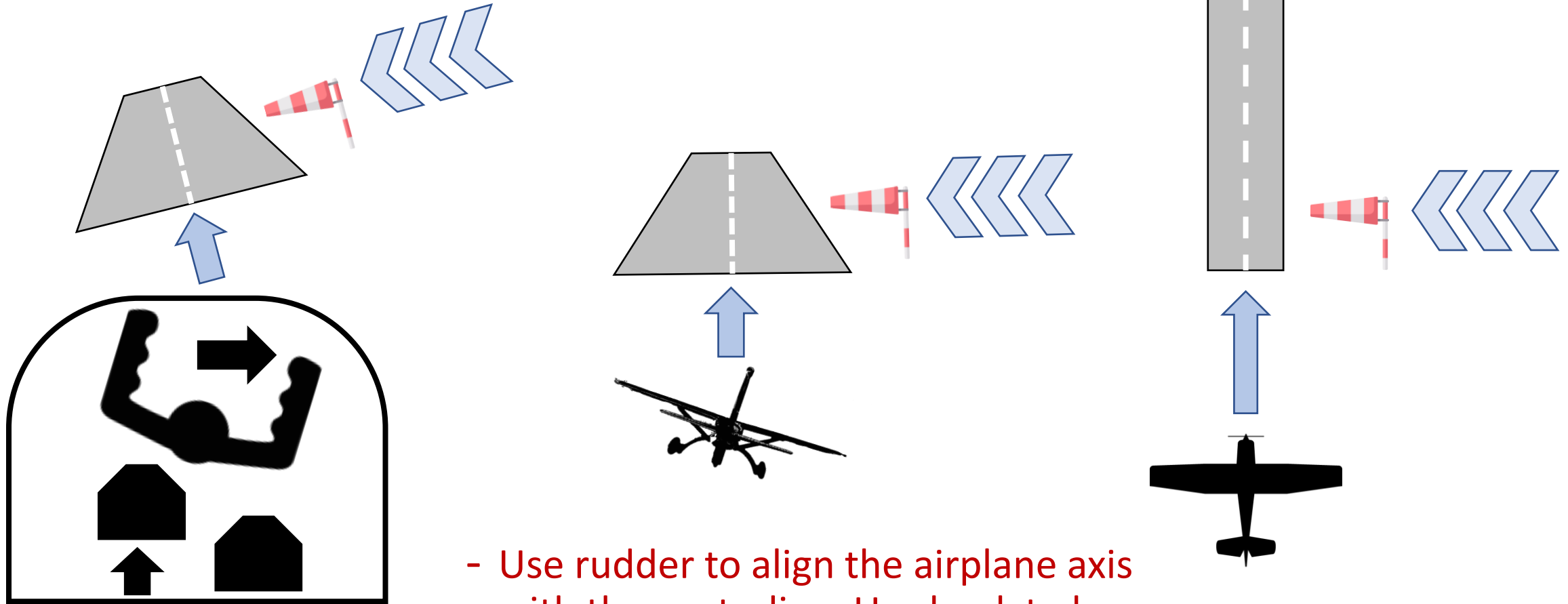
- Use flaps for steeper descents with less speed. Check the POH for speeds

Counter crosswind with crab angle



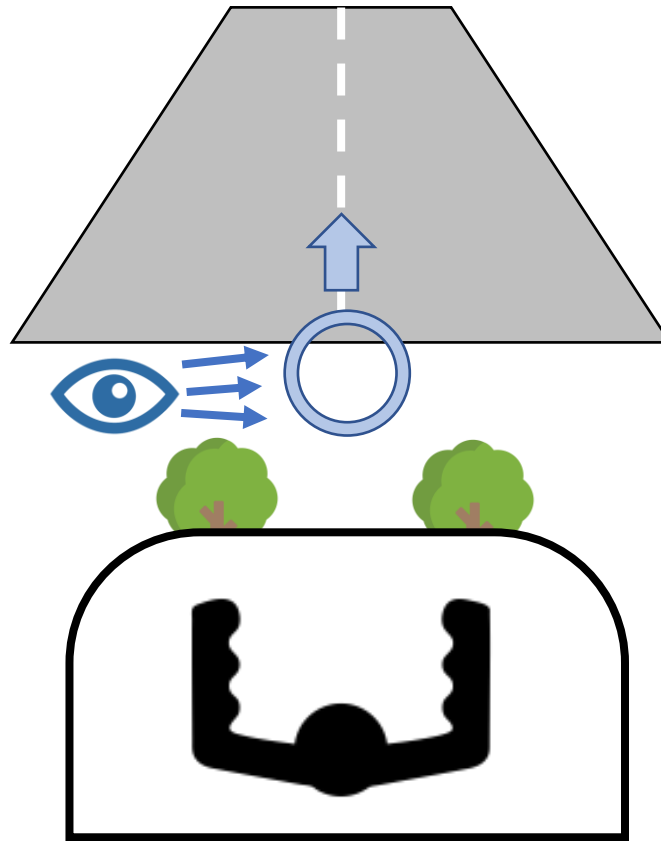
- Use a crab angle to keep the airplane on the centerline

Counter crosswind with sideslip



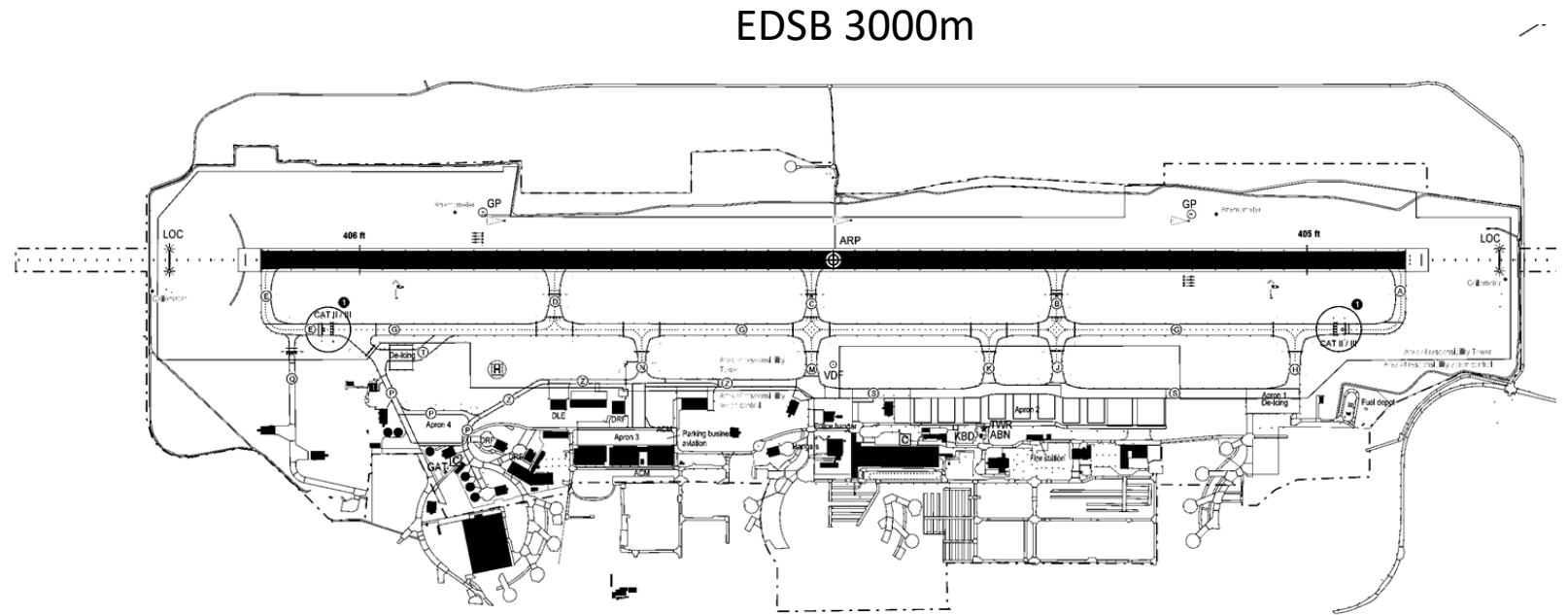
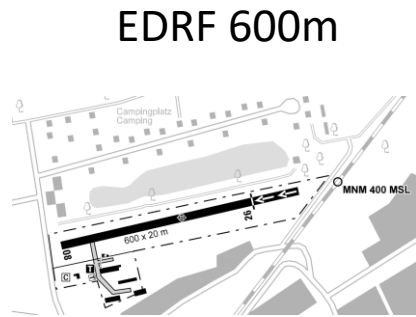
- Use rudder to align the airplane axis with the centerline. Use bank to keep the airplane on the centerline

Focus your aiming point



- Aim for a point on the centerline slightly before the touch down point

Short vs large runways

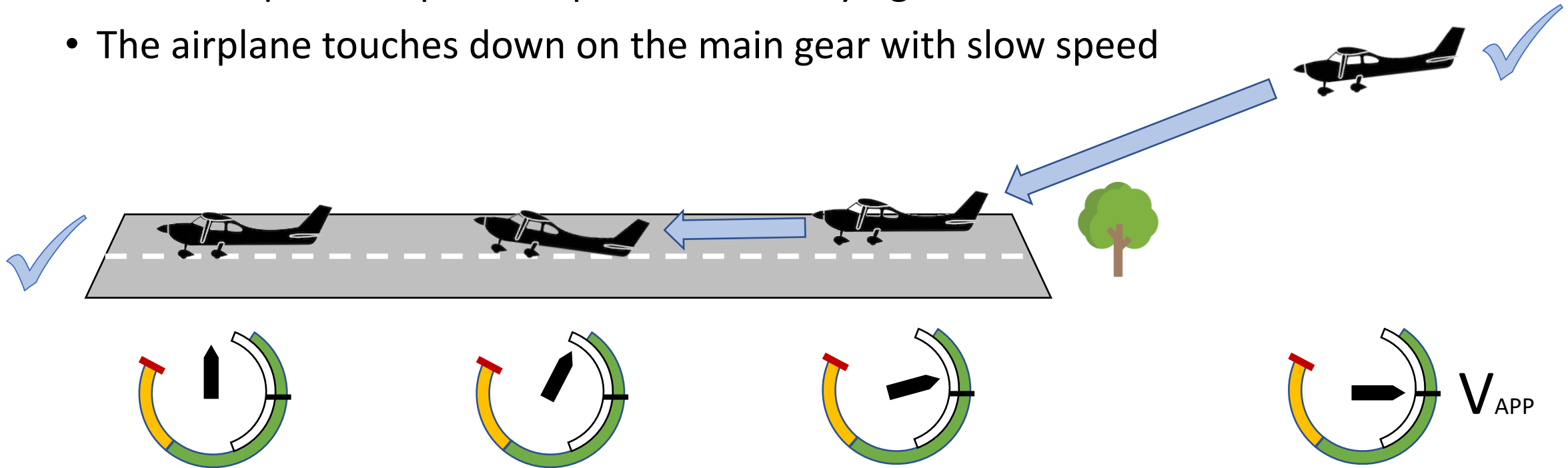


- Short runways require a precise approach. Practice it on larger runways as well!
- Be prepared for a different visual impression

Flare

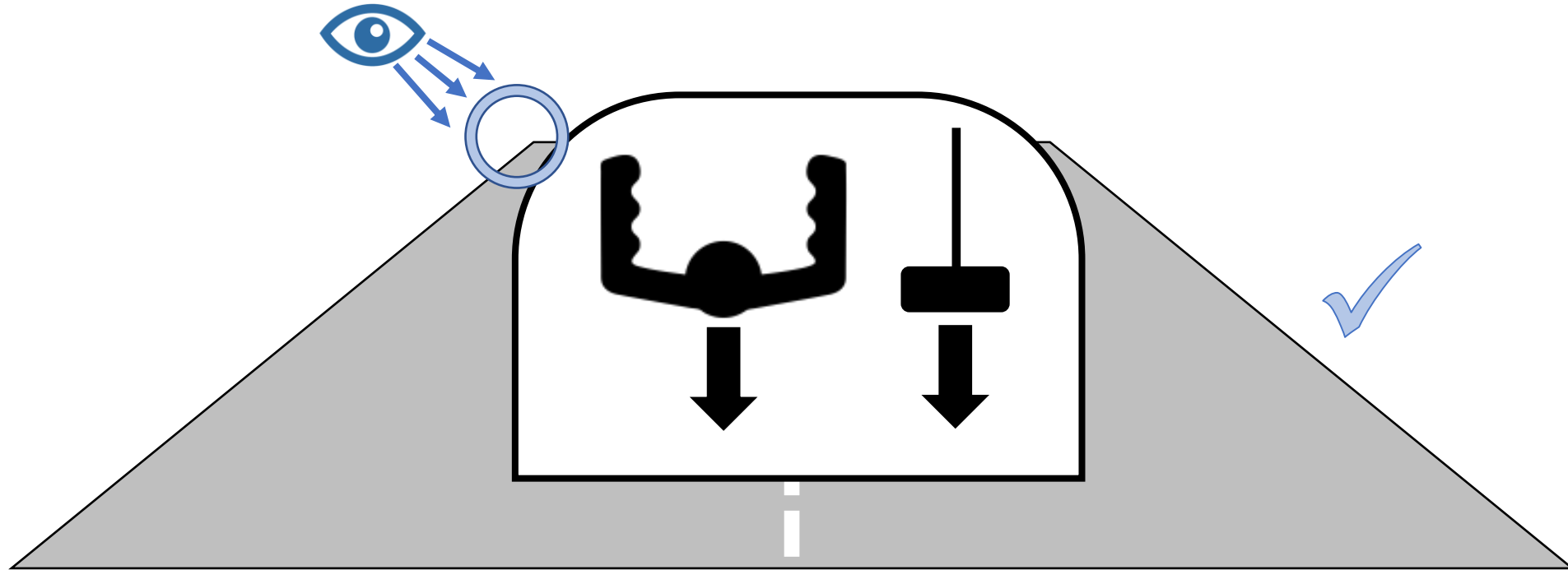
The perfect landing

- The stabilized final approach ends with a smooth round out
- The nose pitches up while speed reduces flying above the centerline
- The airplane touches down on the main gear with slow speed



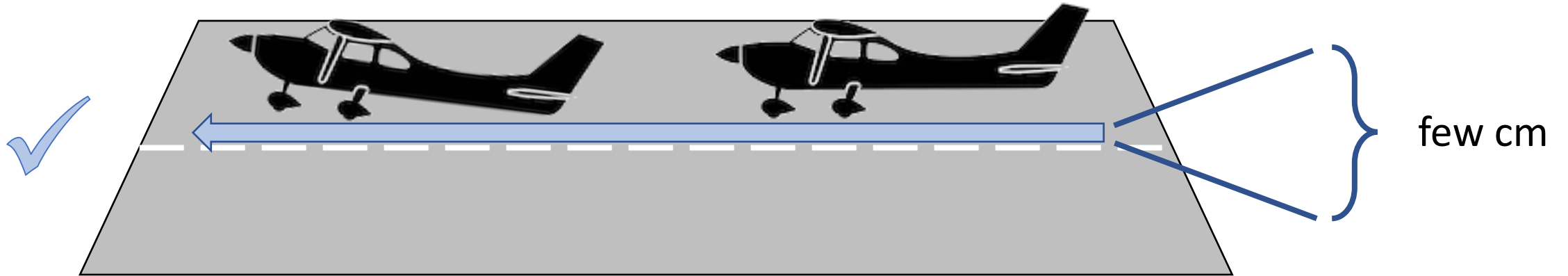
- Your landing will only be as good as your (stabilized!?) final approach

Control the flare



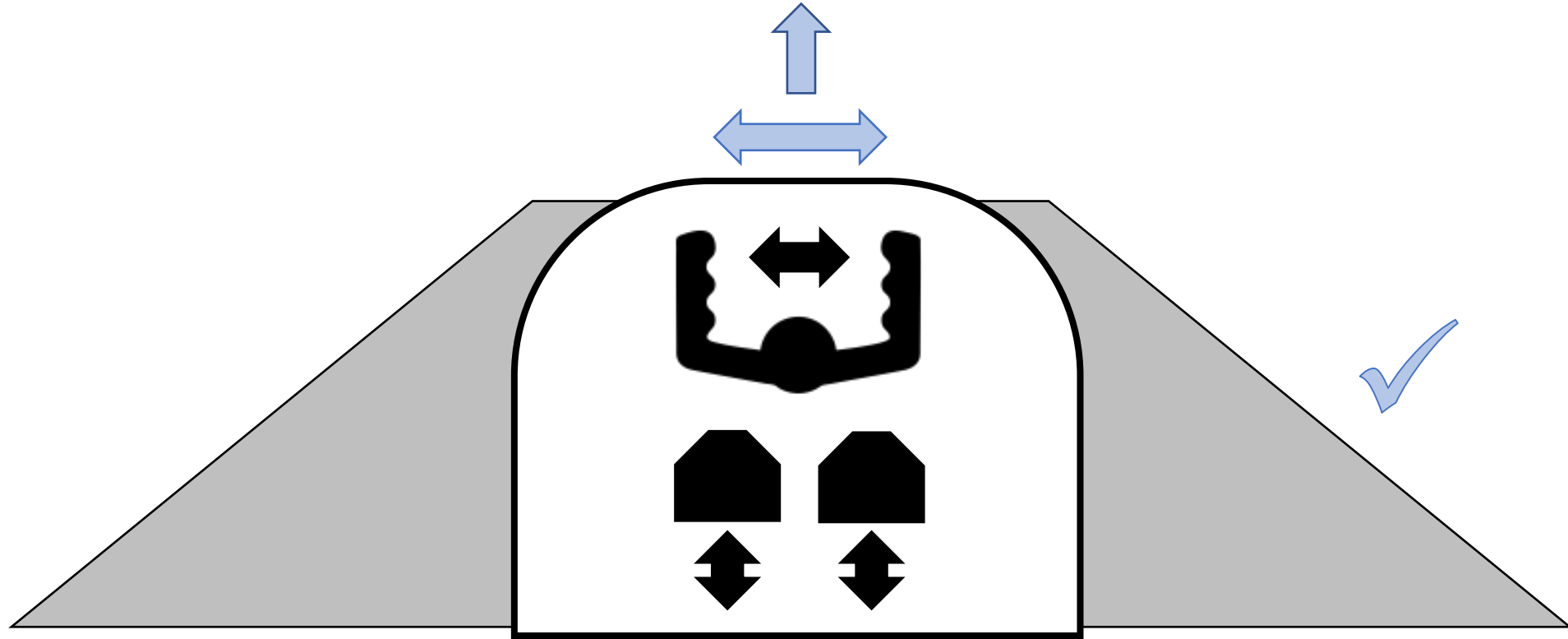
- Pull back the elevator and reduce power smoothly
- Keep pulling to keep the airplane flying until it reaches stall speed
- Look slightly to the side while the nose is pointing up

Try not to land



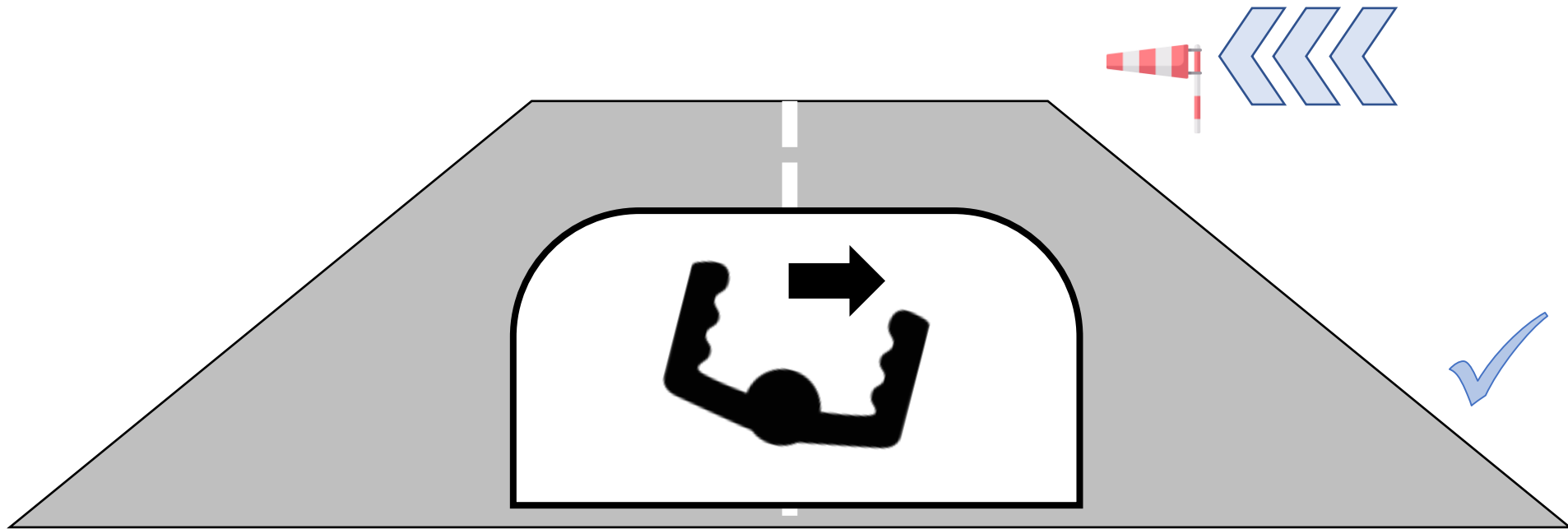
- Keep the airplane flying just a few centimeters above the runway. Keep the nose up after touch down

Control airplane direction



- Use rudder to align the airplane axis with the centerline
- Gently use ailerons to stay above the centerline

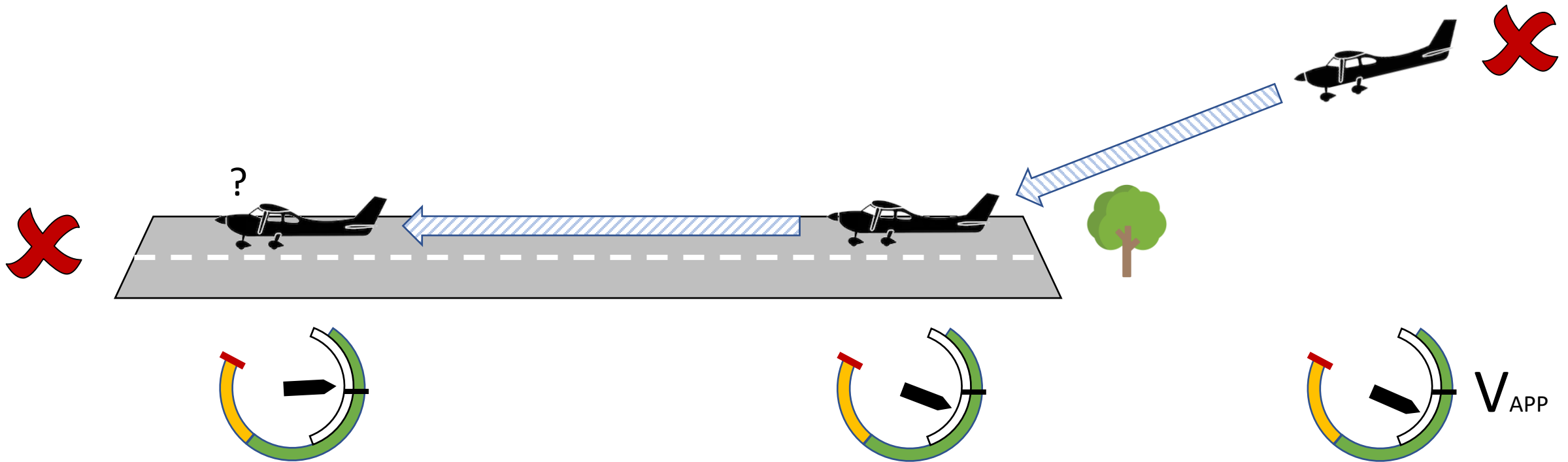
Turn ailerons into the wind after touch down



- Counter the wind with ailerons to avoid tipping over

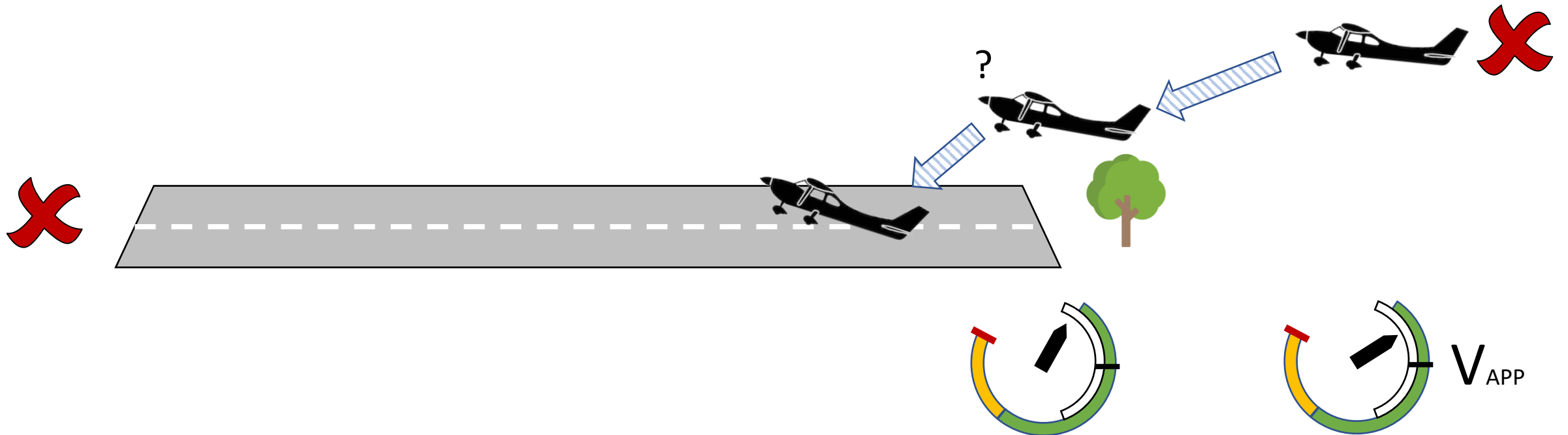
They say: Any landing you can walk away from is a good one...

Do not continue if airspeed is too high



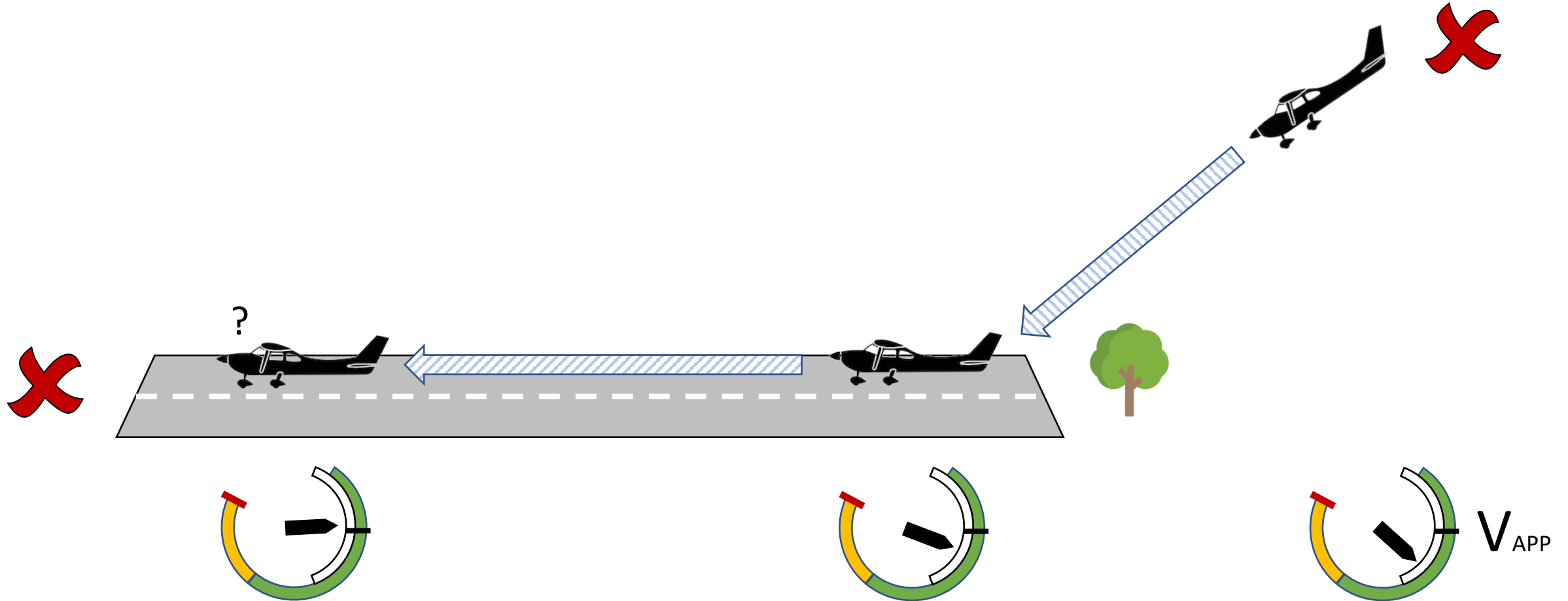
- The flare will be very long and the runway too short

Do not continue if airspeed is too low



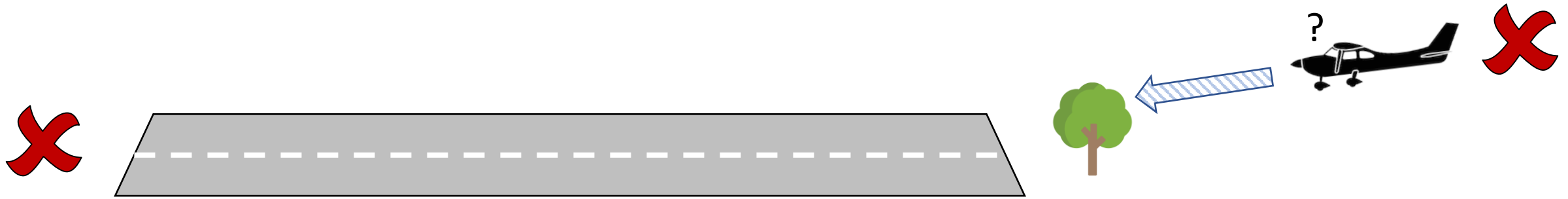
- The airplane may stall early during the flare or even at high altitude

Do not continue if descent angle is too steep



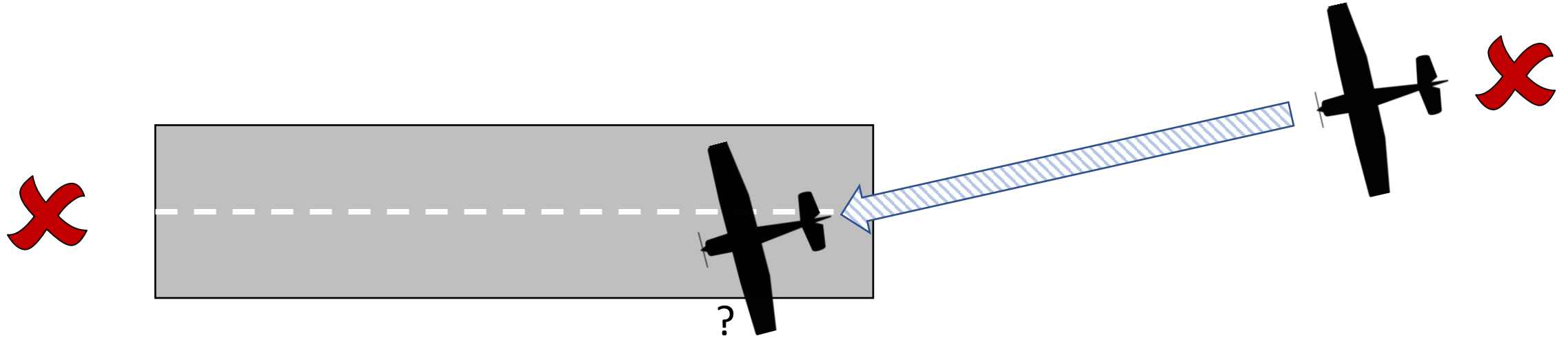
- Too steep descent makes it impossible to keep the correct airspeed

Do not continue if descent angle is too flat



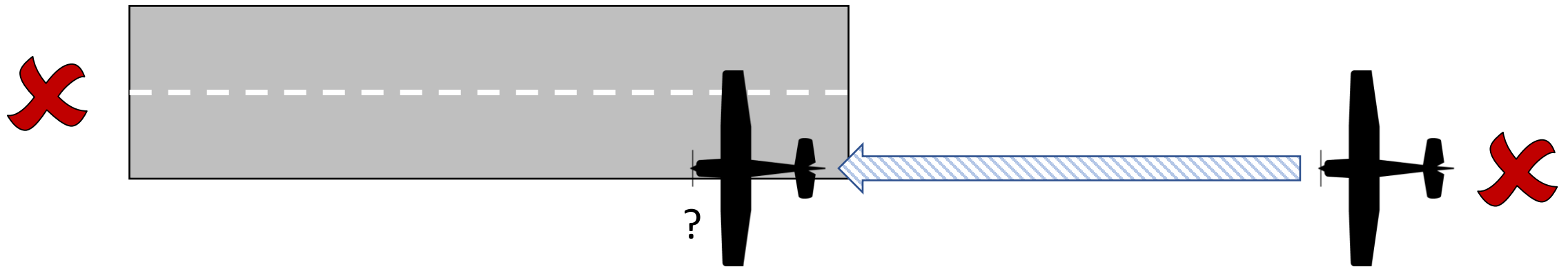
- You may not even make it to the runway due to obstacles

Do not continue if direction is not aligned



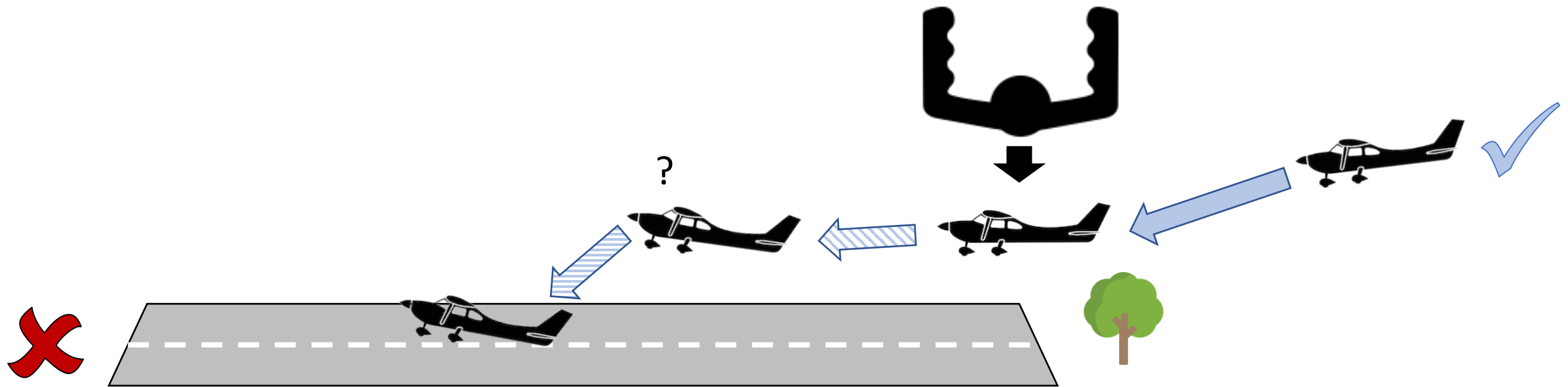
- The airplane may leave the runway during the flare

Do not continue if not on the centerline



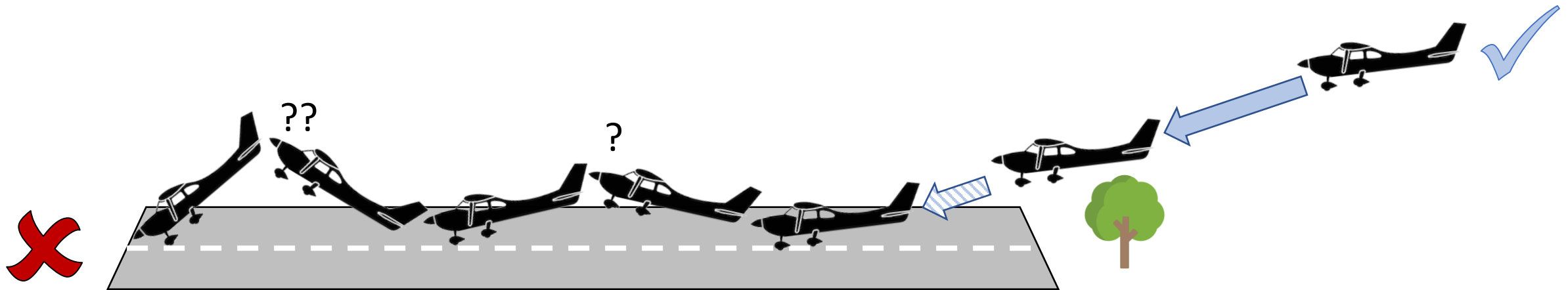
- The airplane may leave the runway during the flare

Do not flare too early/high



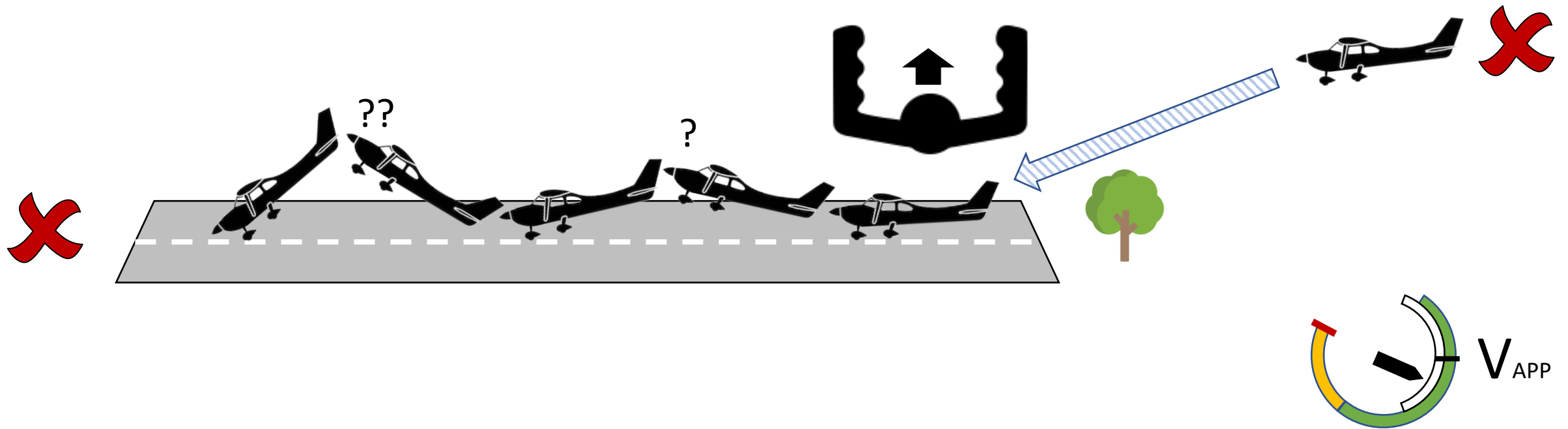
- The airplane will end up stalled with a high descent rate

Do not flare too late



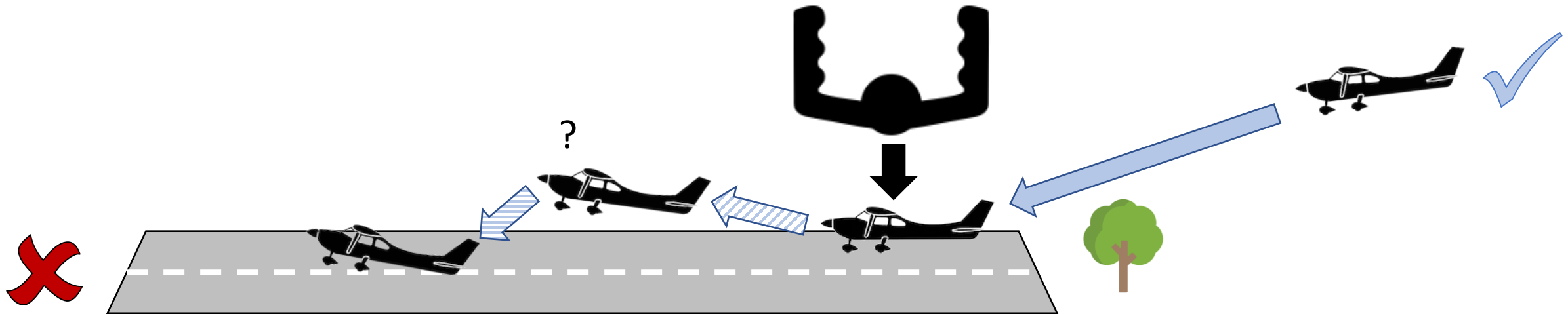
- The airplane will touch down with the nose wheel first and may start porpoising

Do not force the airplane to land



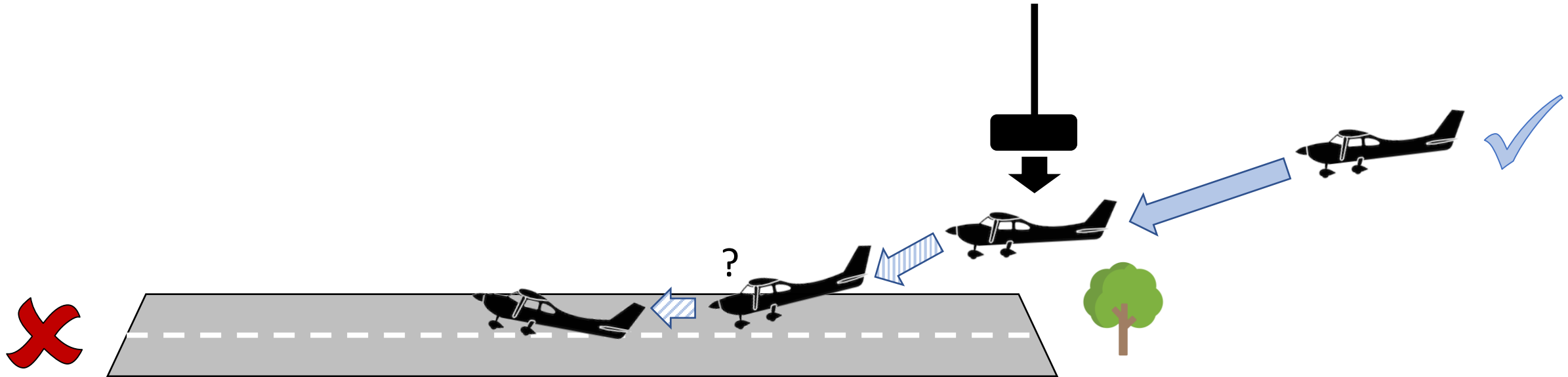
- The airplane may start porpoising

Do not pull too fast or too hard



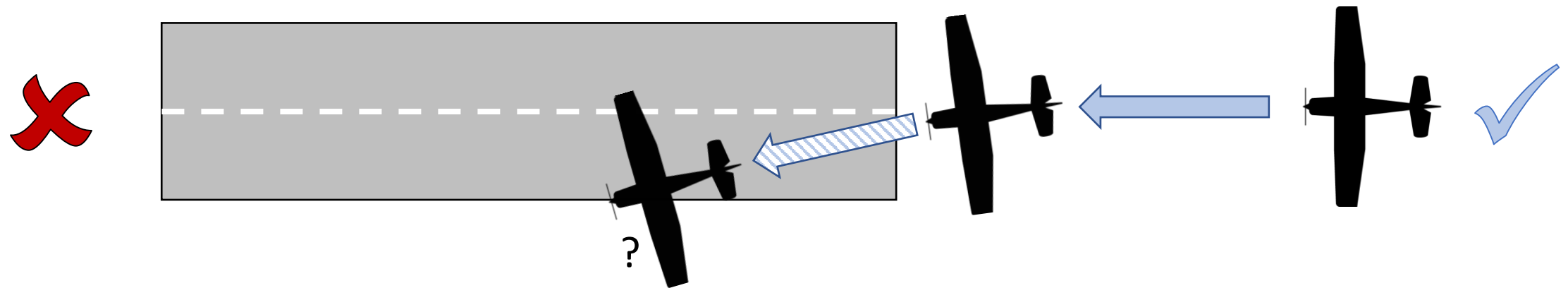
- The airplane will balloon up and end up stalled with a high descent rate

Do not reduce power too early



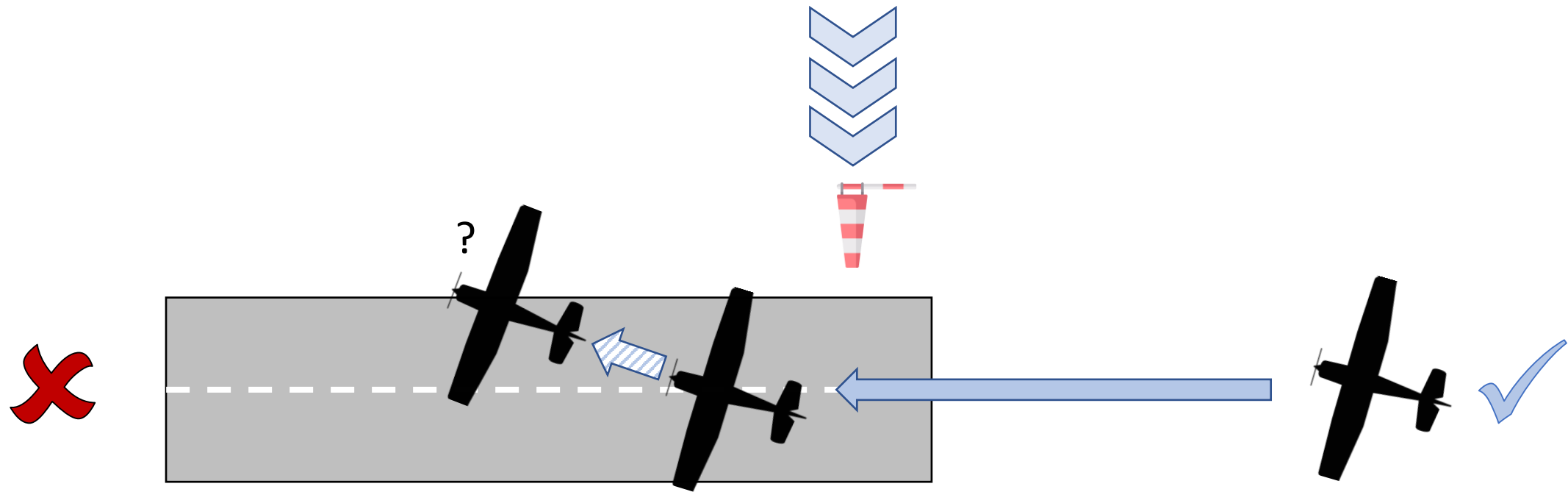
- You will destabilize the approach. The descent rate will increase before the flare

Do not stop to control direction



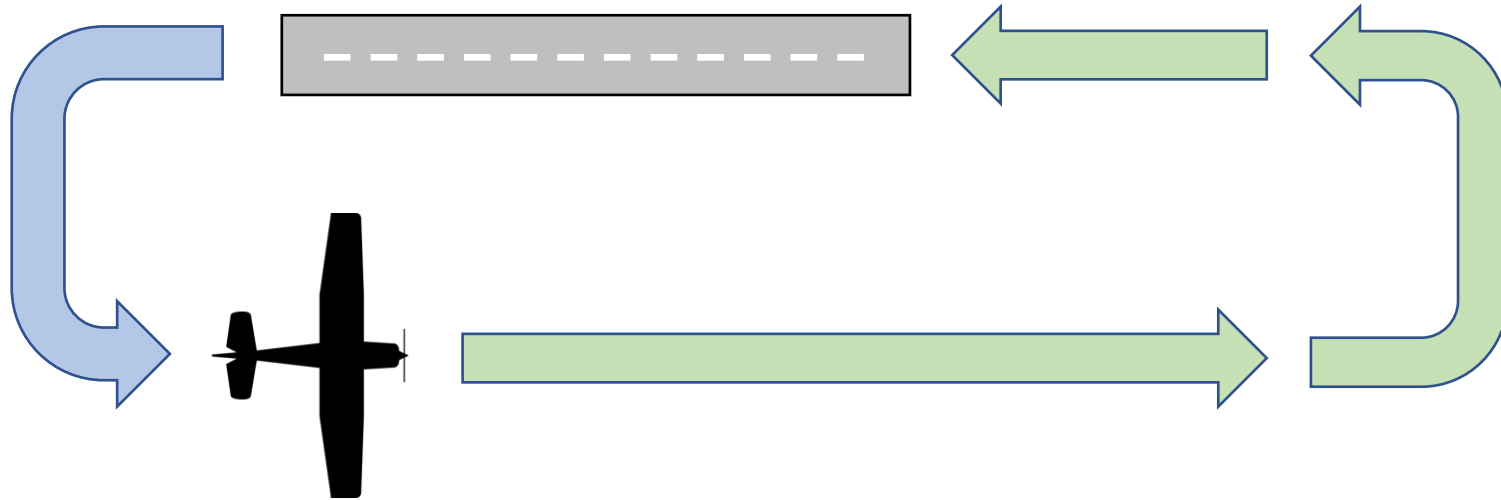
- The airplane's tendency is to break out to the left if you do not control direction throughout the landing

Do not land with crab angle



- The airplane will instantly change direction after touch down

You can always go around!



- Go around if something goes wrong during any stage! Join the pattern and try again. However, do not make this an argument for not trying hard