

# Automatic annotations in Killzone 3



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Paris Game/AI Conference June 24th, 2011



# Recast & Detour

NAVIGATION TOOLKIT

**LEVEL DESIGN PROCESS  
IN AAA GAMES**



**DESIGN PASS**



**ART PASS**

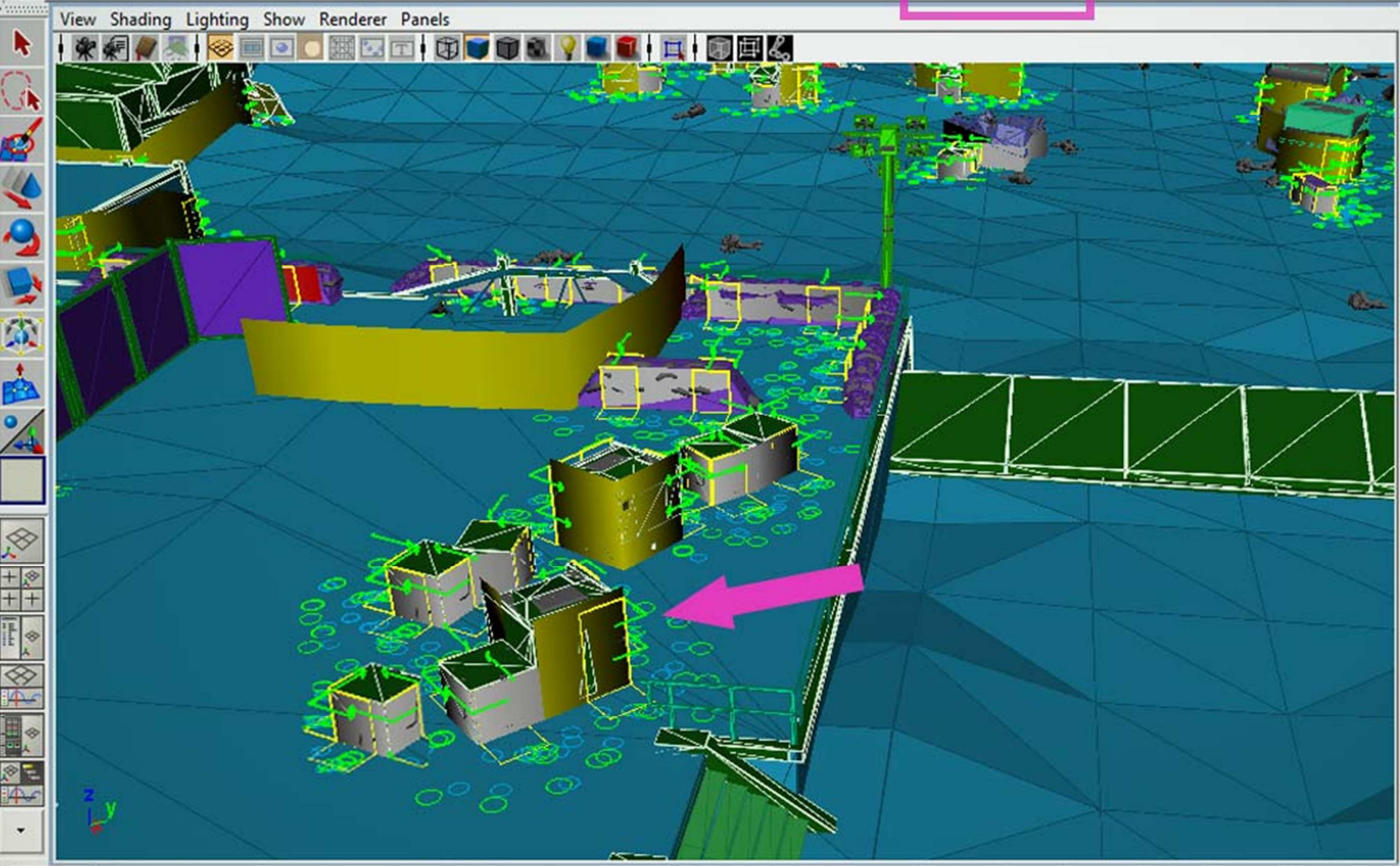
A 3D map of a game environment, likely a city or industrial area, overlaid with a green network of waypoints and player cover areas. The map shows various buildings, streets, and terrain. The waypoints are represented by green dots connected by green lines, forming a dense network across the map. Player cover areas are indicated by yellow and orange shaded regions, primarily located around buildings and structures. Two callout boxes with black backgrounds and white text are present: one labeled 'WAYPOINTS' pointing to a green dot, and another labeled 'PLAYER COVER' pointing to a yellow/orange shaded area.

**WAYPOINTS**

**PLAYER COVER**



# Automating Cover Building



Automatic Player Cover Gene

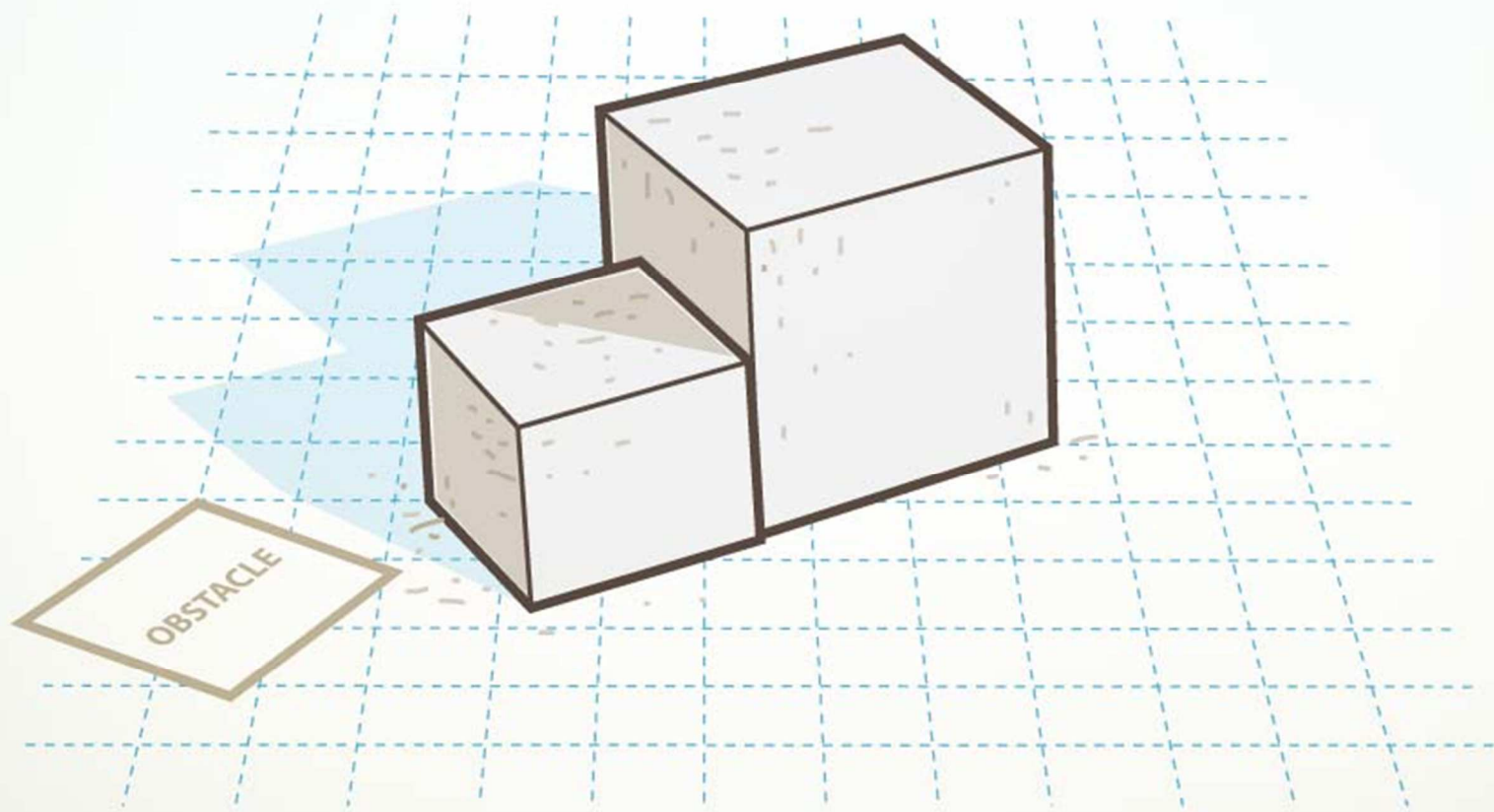
Tool Defaults

▼ RecastPlayerCover

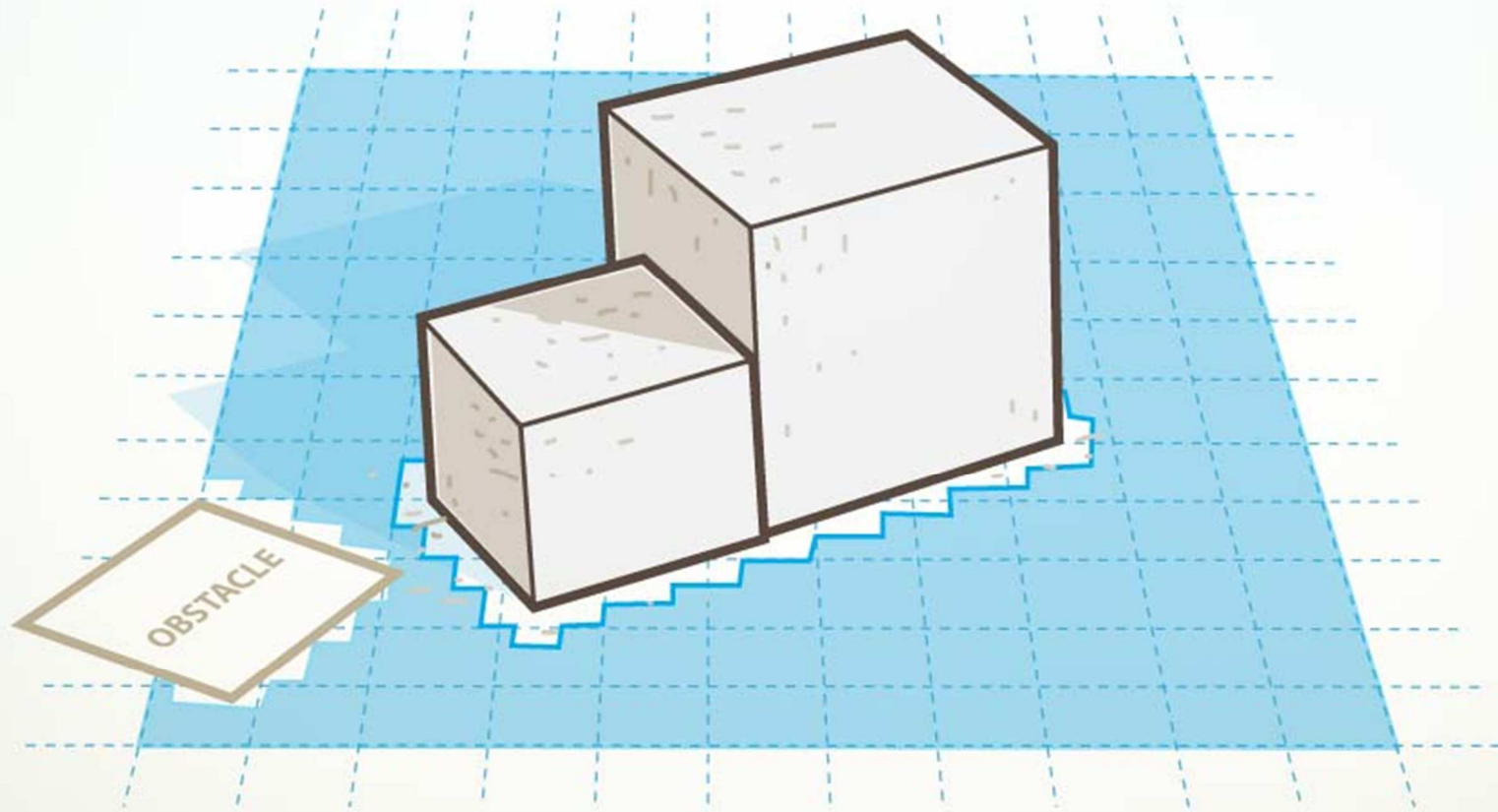
- Generation
- Cover Height
- Show Input
- Show Border
- Show Walls
- Show Doors
- Show Corners
- Show Stairs



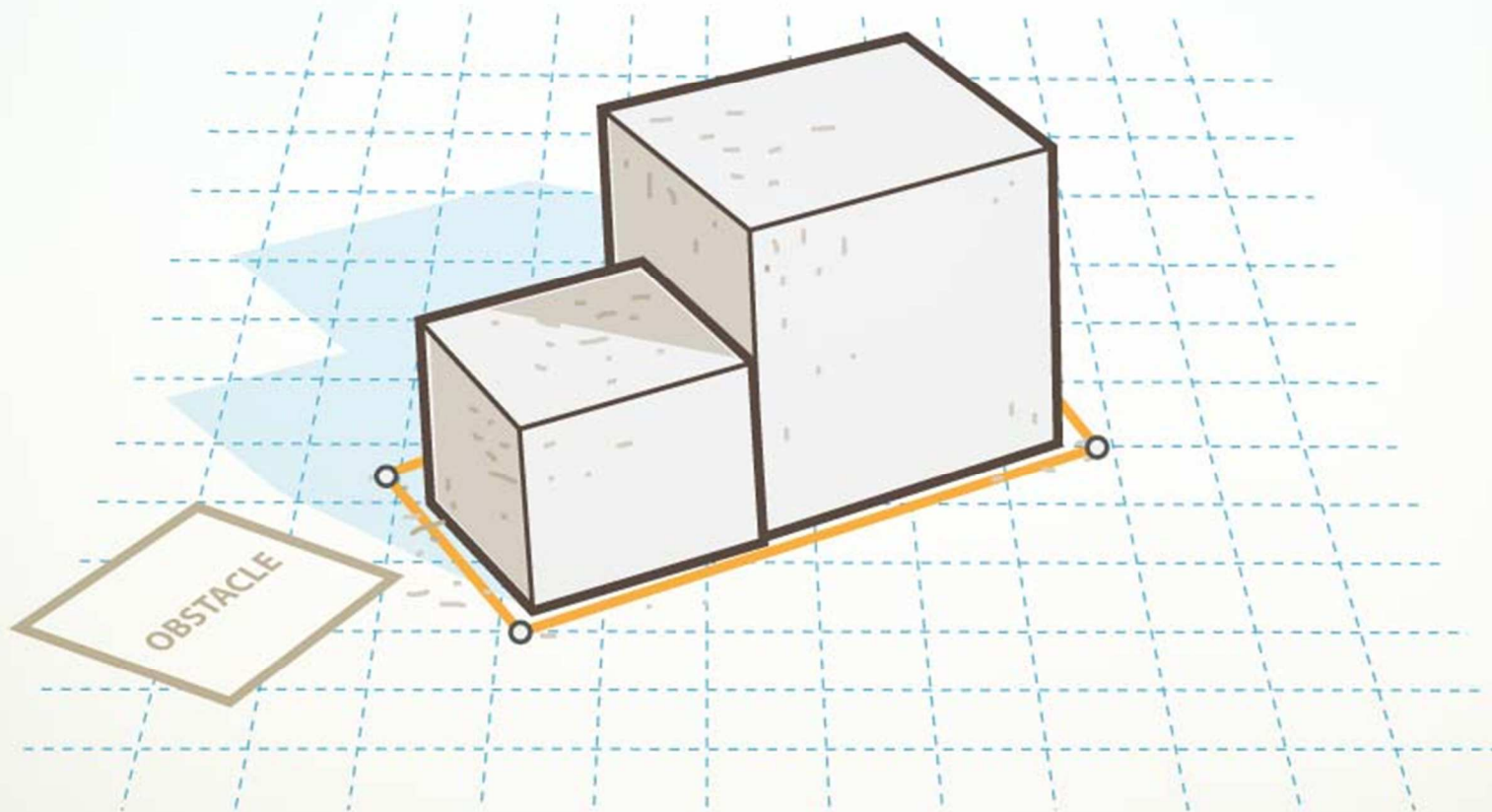




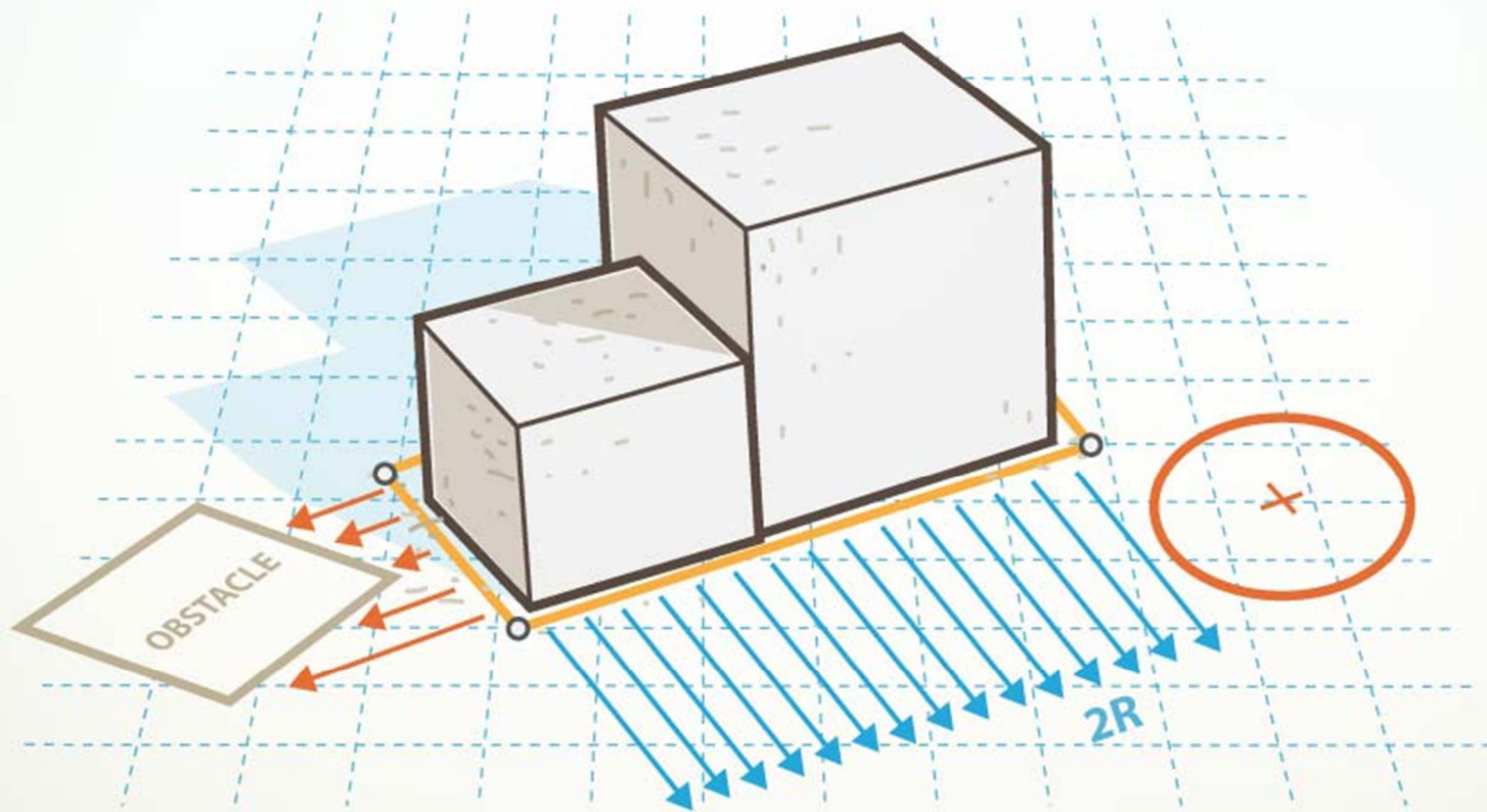
## FIND WALKABLE SURFACE



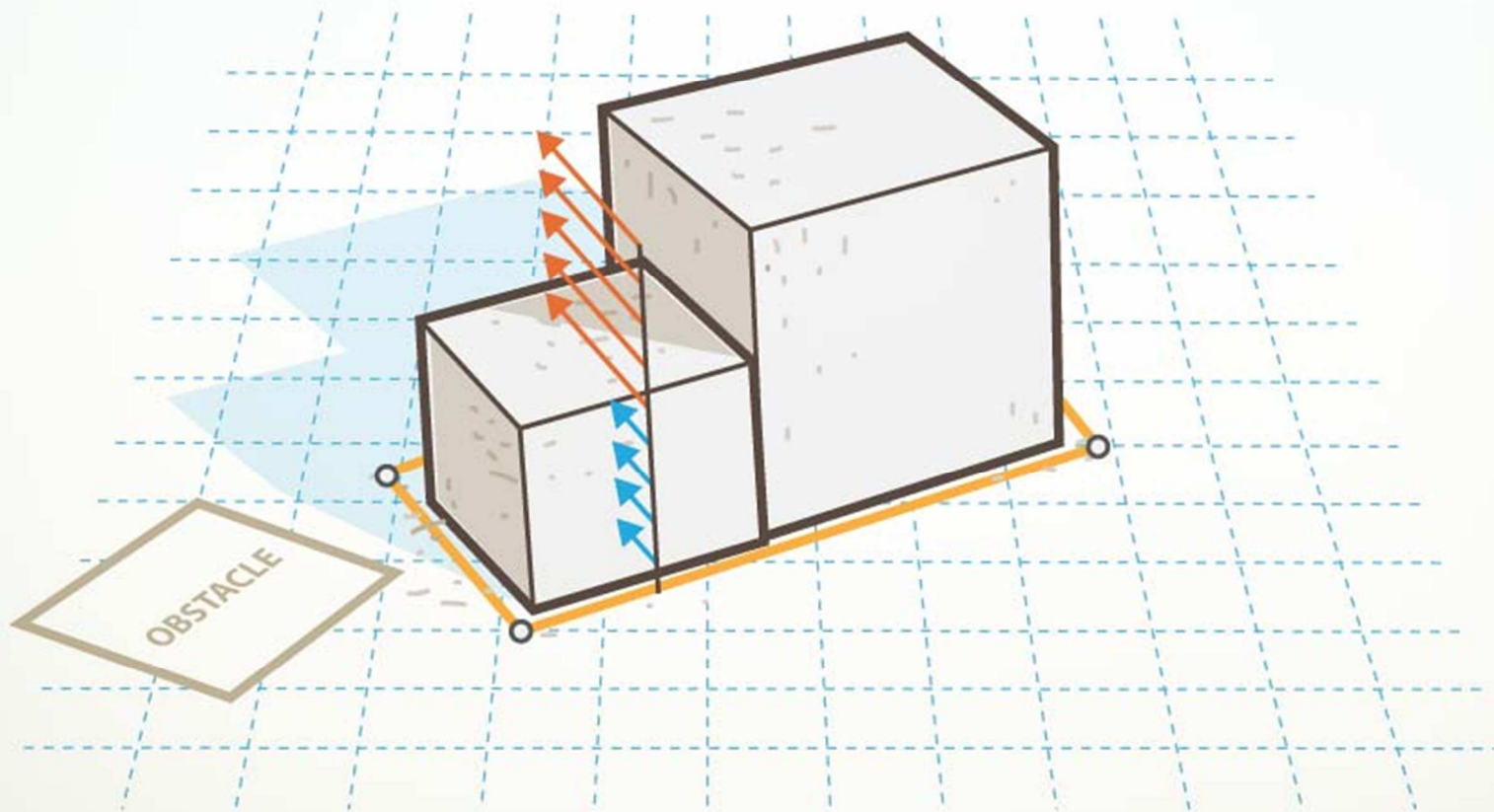
## FIND TIGHT OBSTACLE OUTLINE



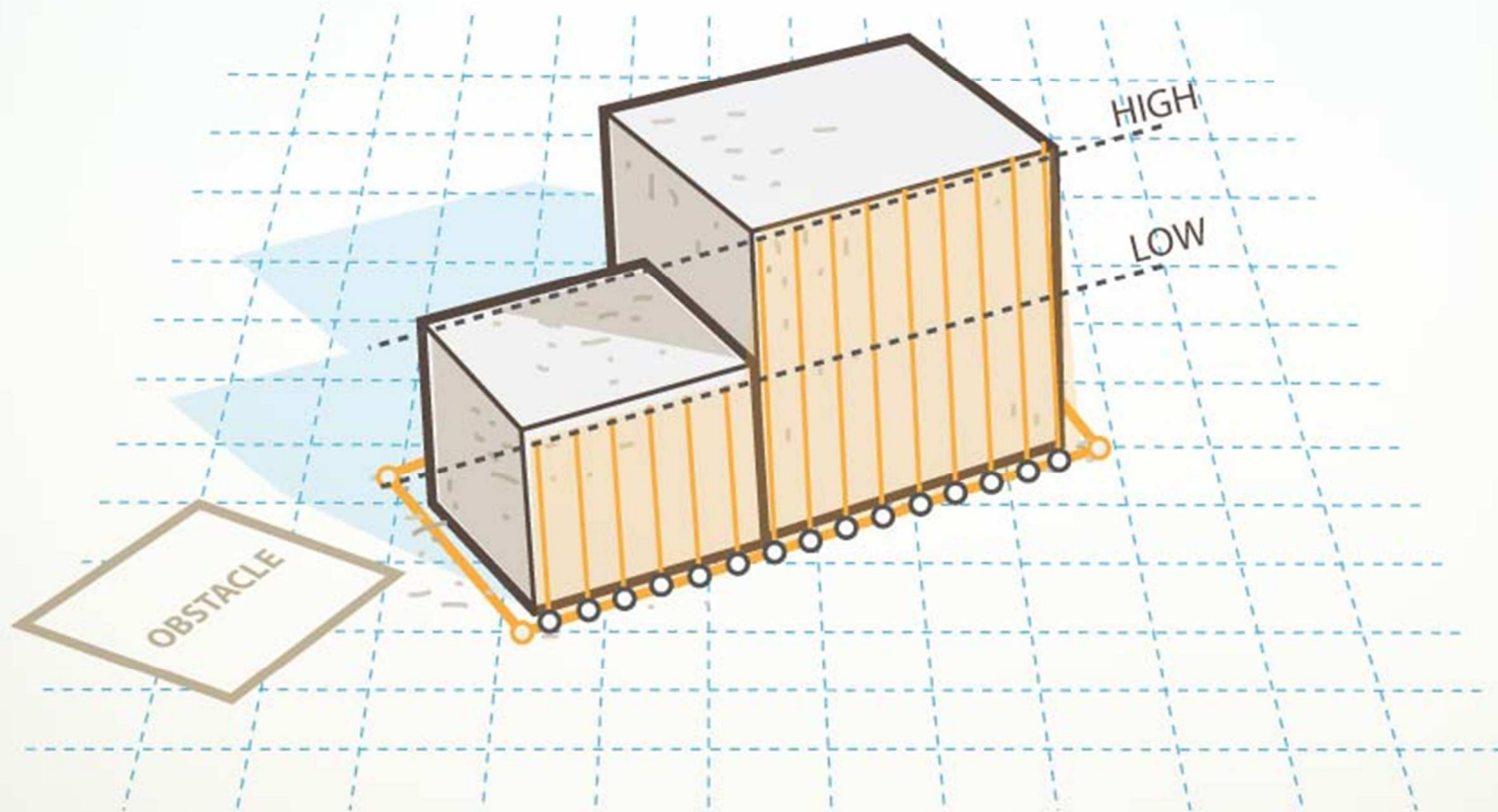
## CHECK SPACE BEHIND COVER



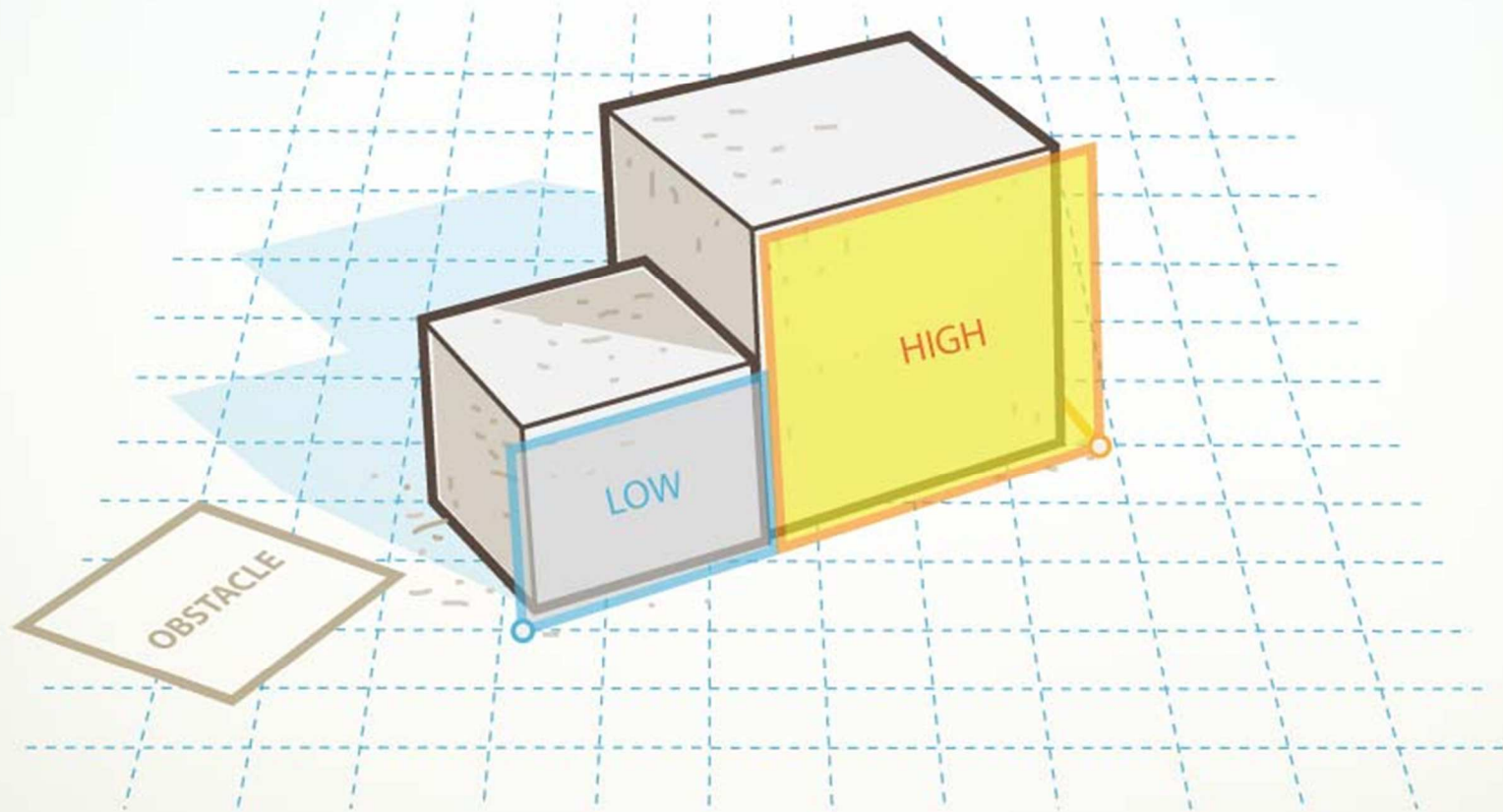
## SAMPLE COVER HEIGHT



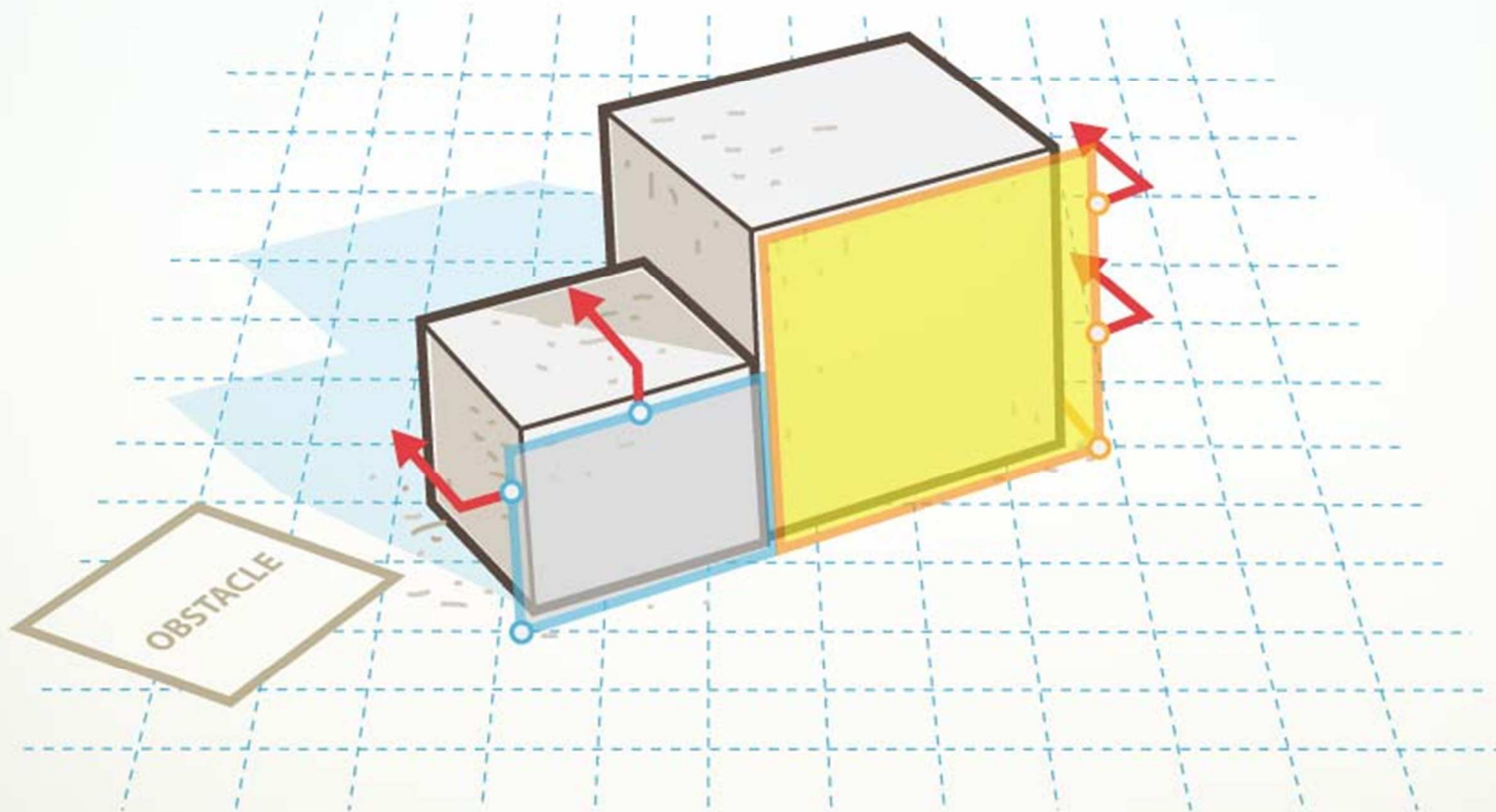
## FILTER COVER SAMPLES



## BUILD COVER PLANES

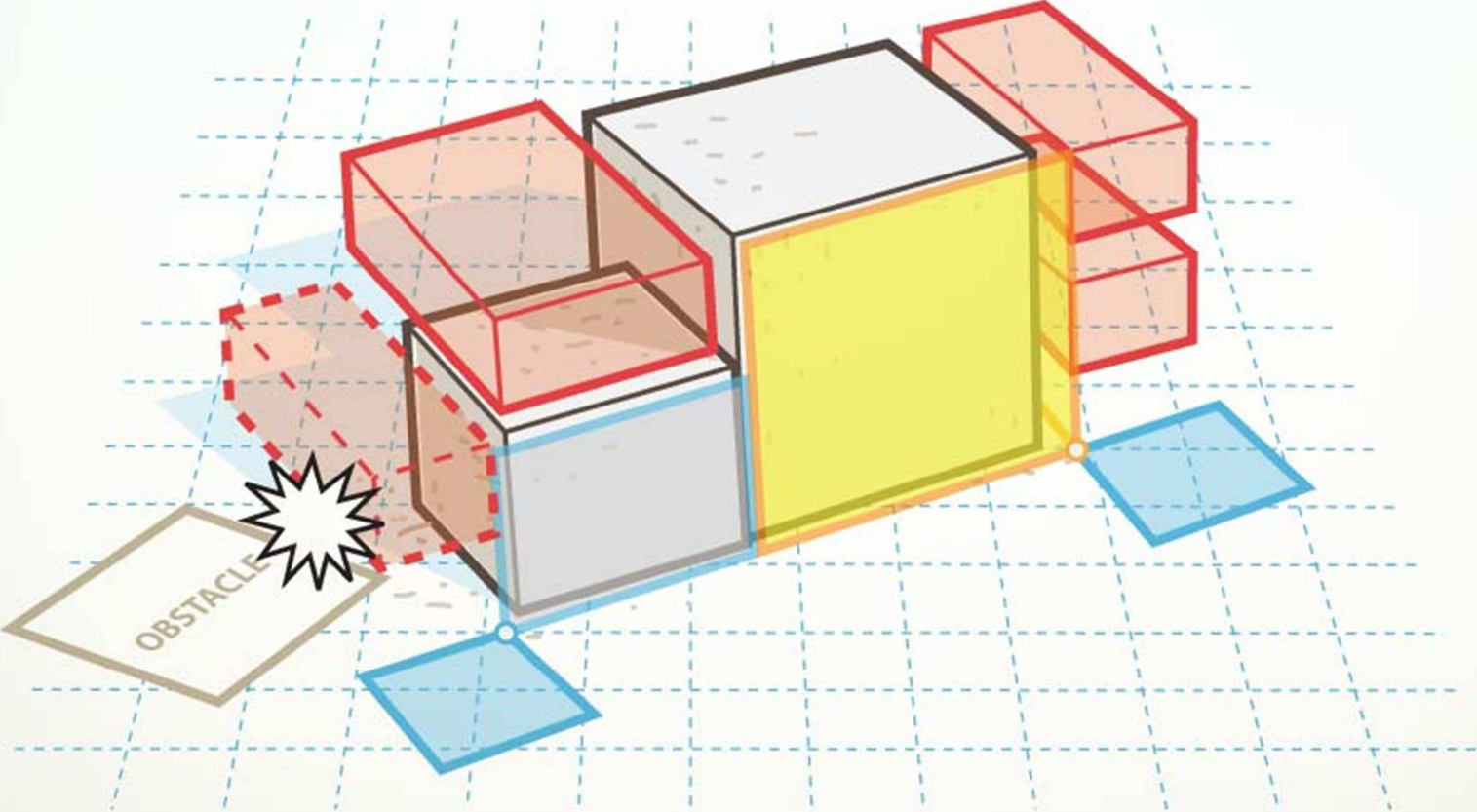


## VALIDATE FIRING LOCATIONS

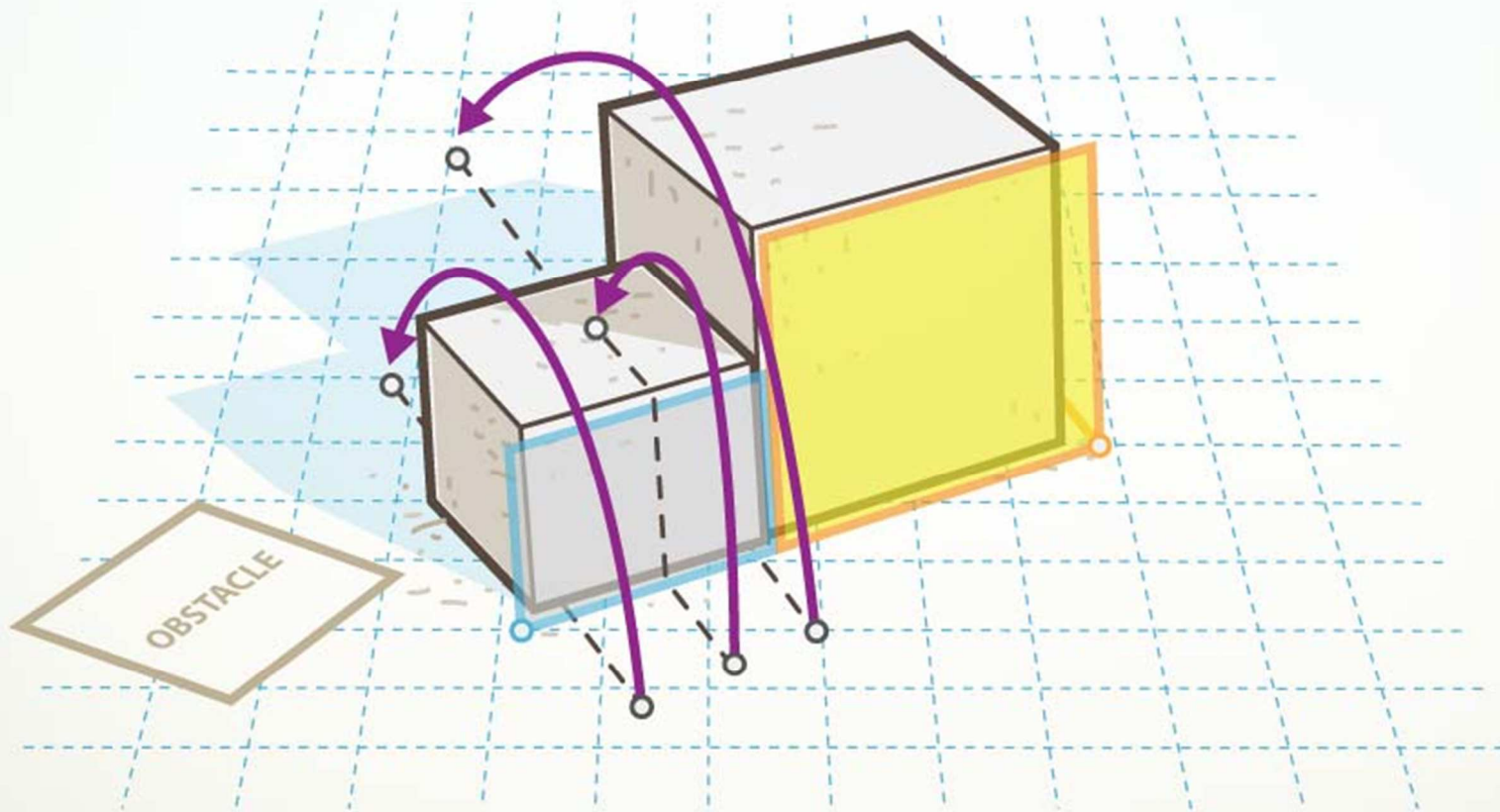




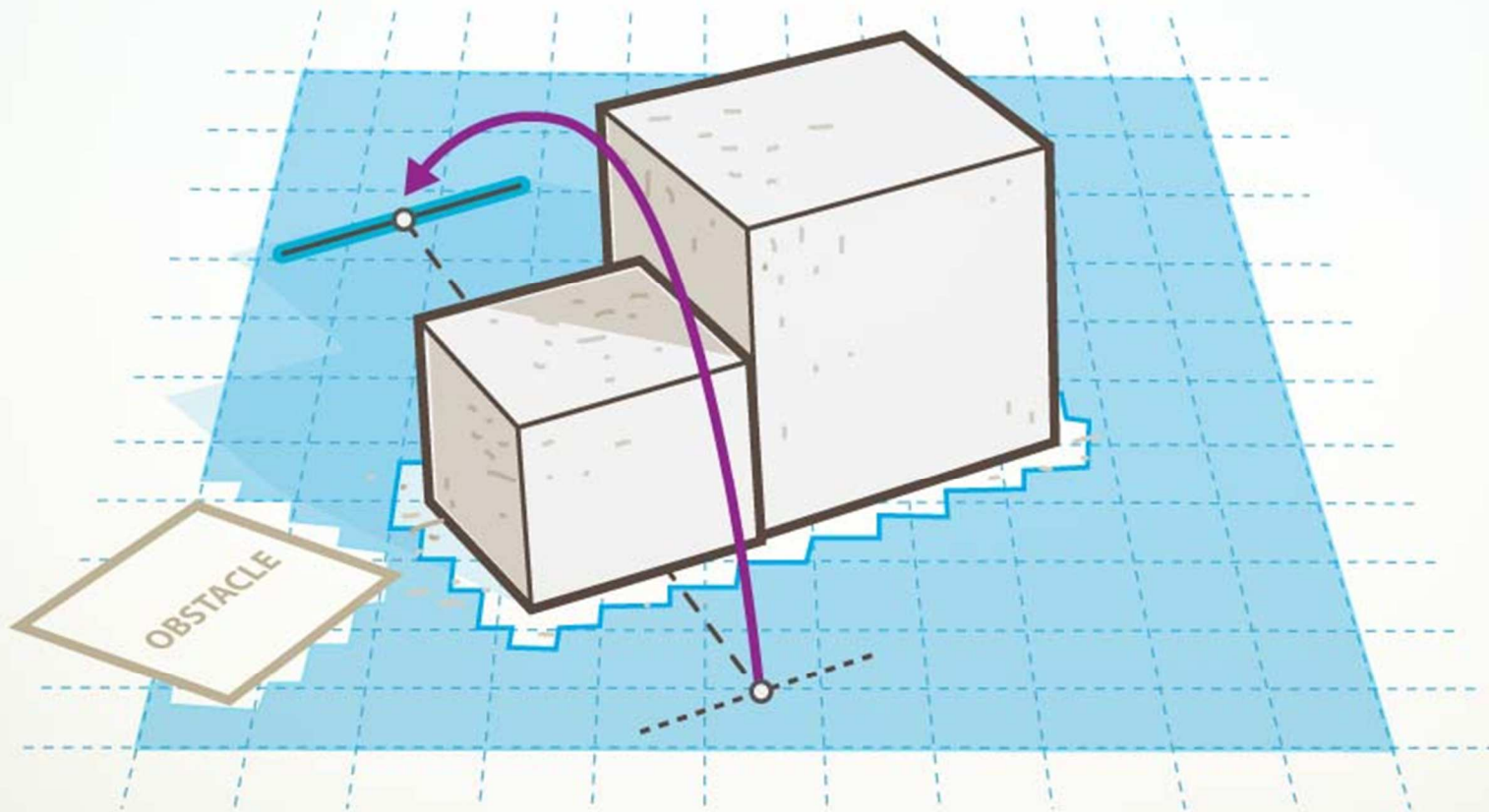
# CHECK PEEK & AIMING OBSTRUCTION



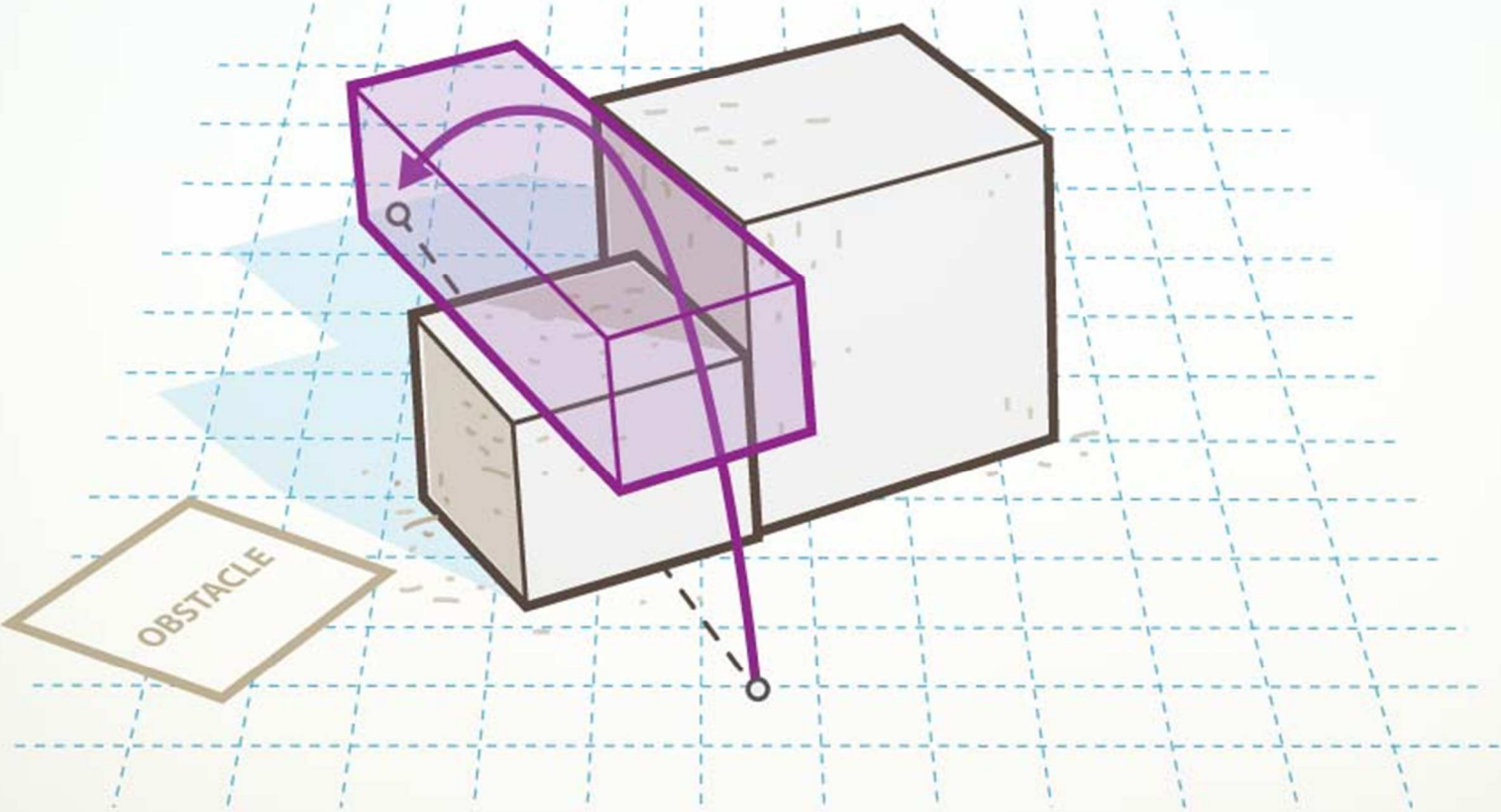
## VALIDATE VAULT ACTIONS



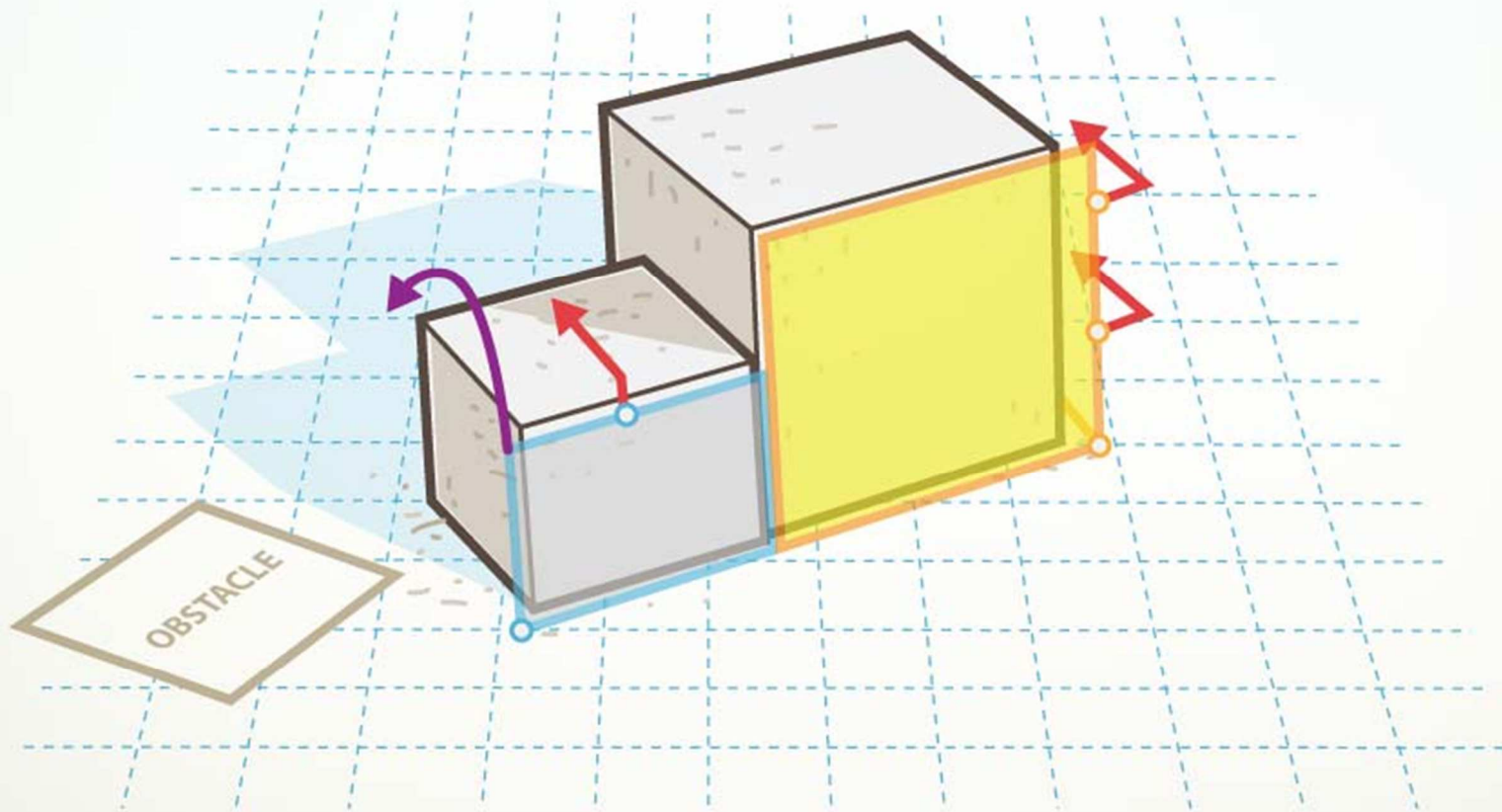
## CHECK VAULT TARGET



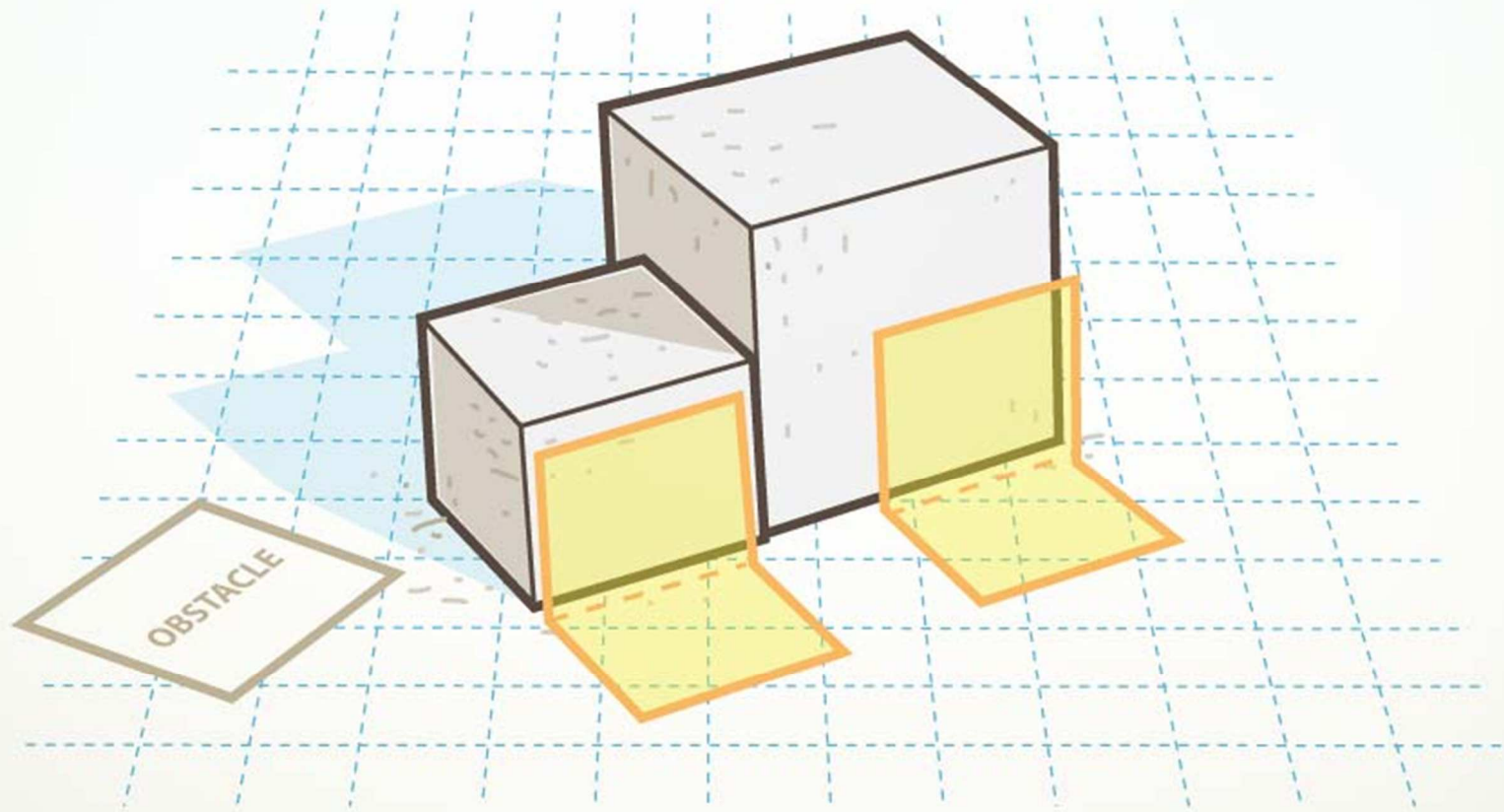
# CHECK VAULT TRAJECTORY



## FINAL COVER WITH ACTIONS



## AI COVER MARKERS

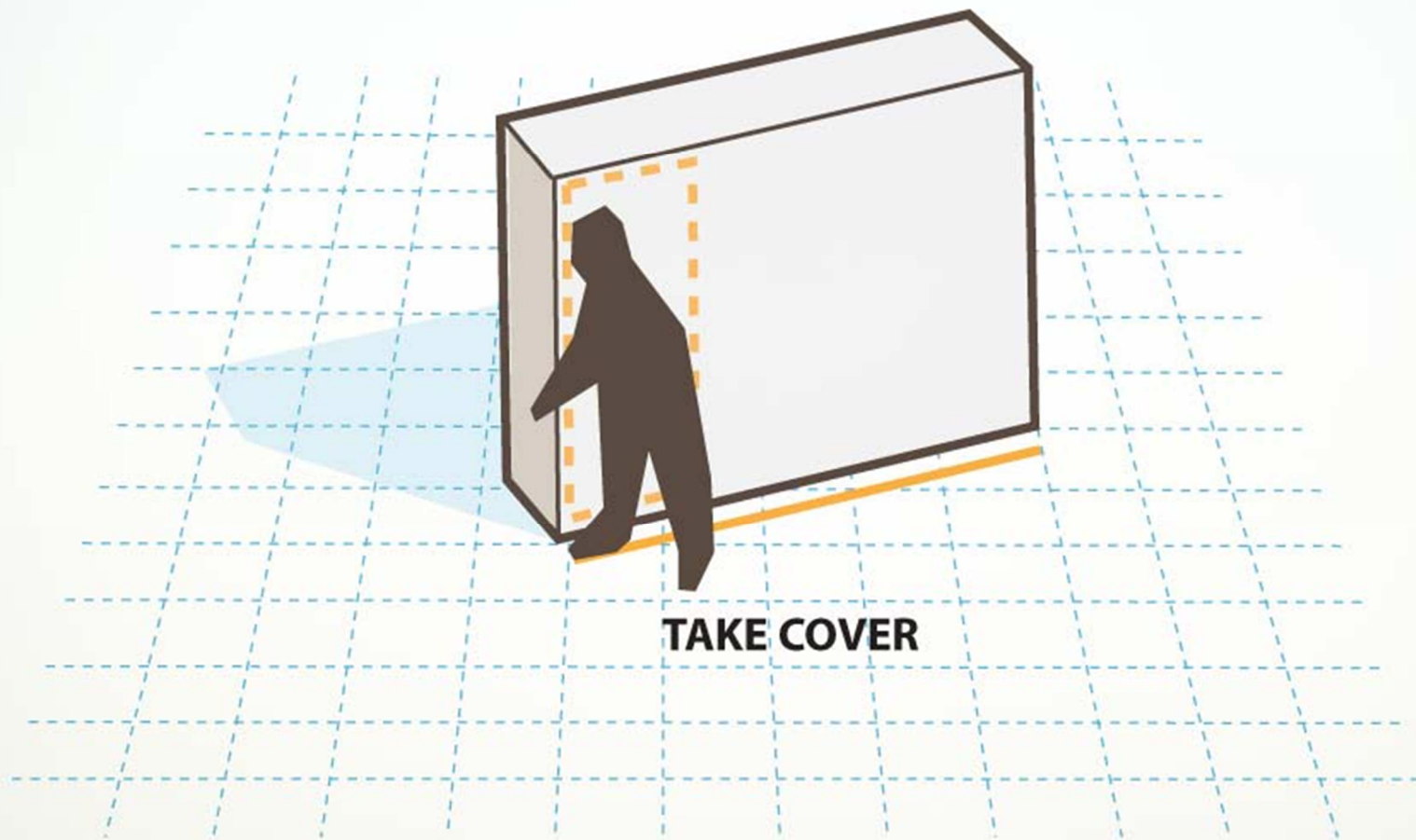




Streaming hint time: 0.00s, Est data read during hint: 0k of 0k  
Section: Harbor Gates (nodes 7,8)

**WHAT AN AGENT CAN DO  
AT THE BORDER OF WALKABLE SPACE?**

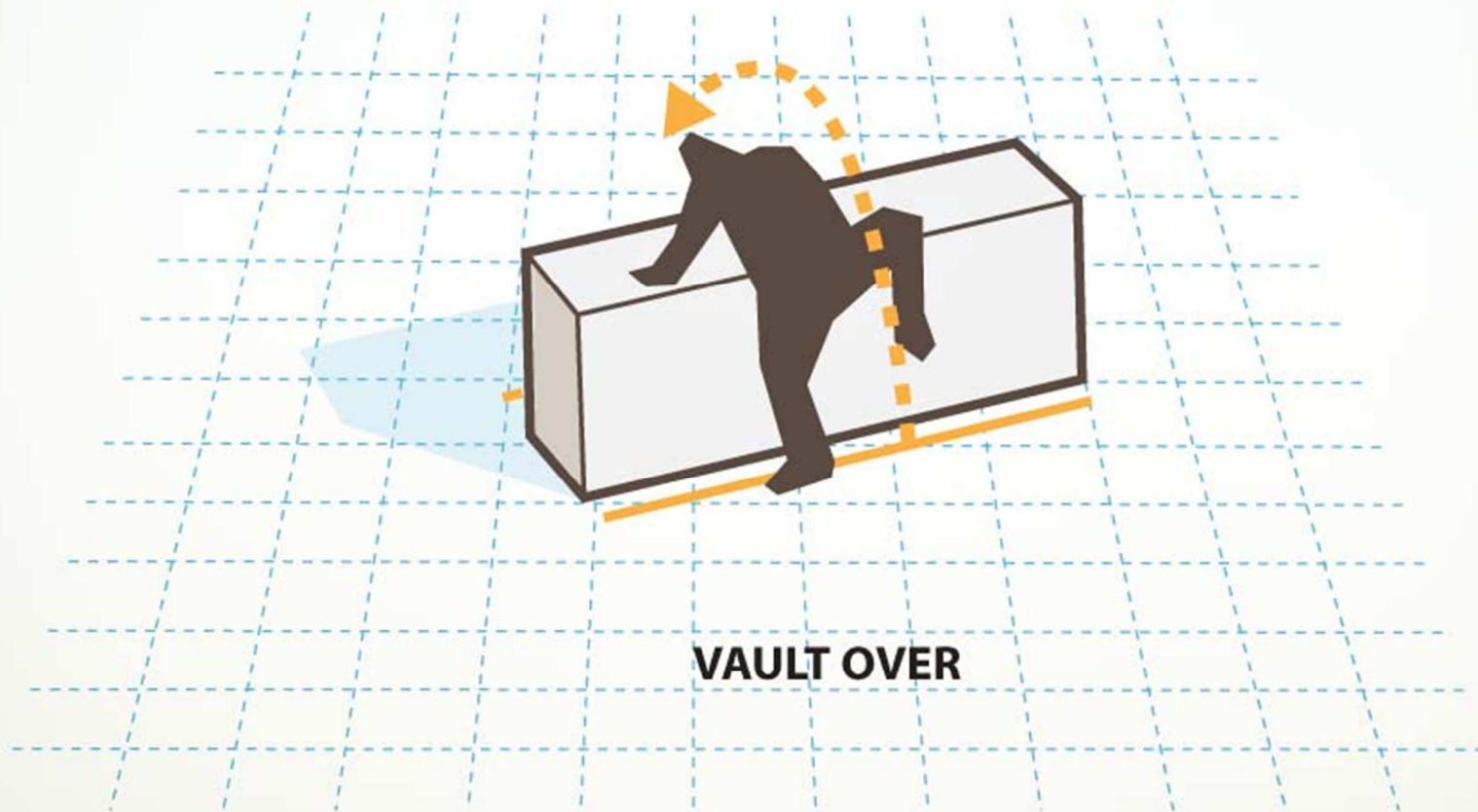




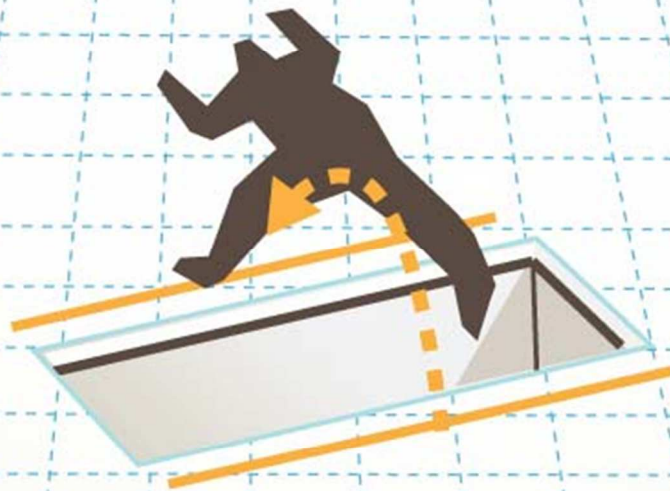
**TAKE COVER**



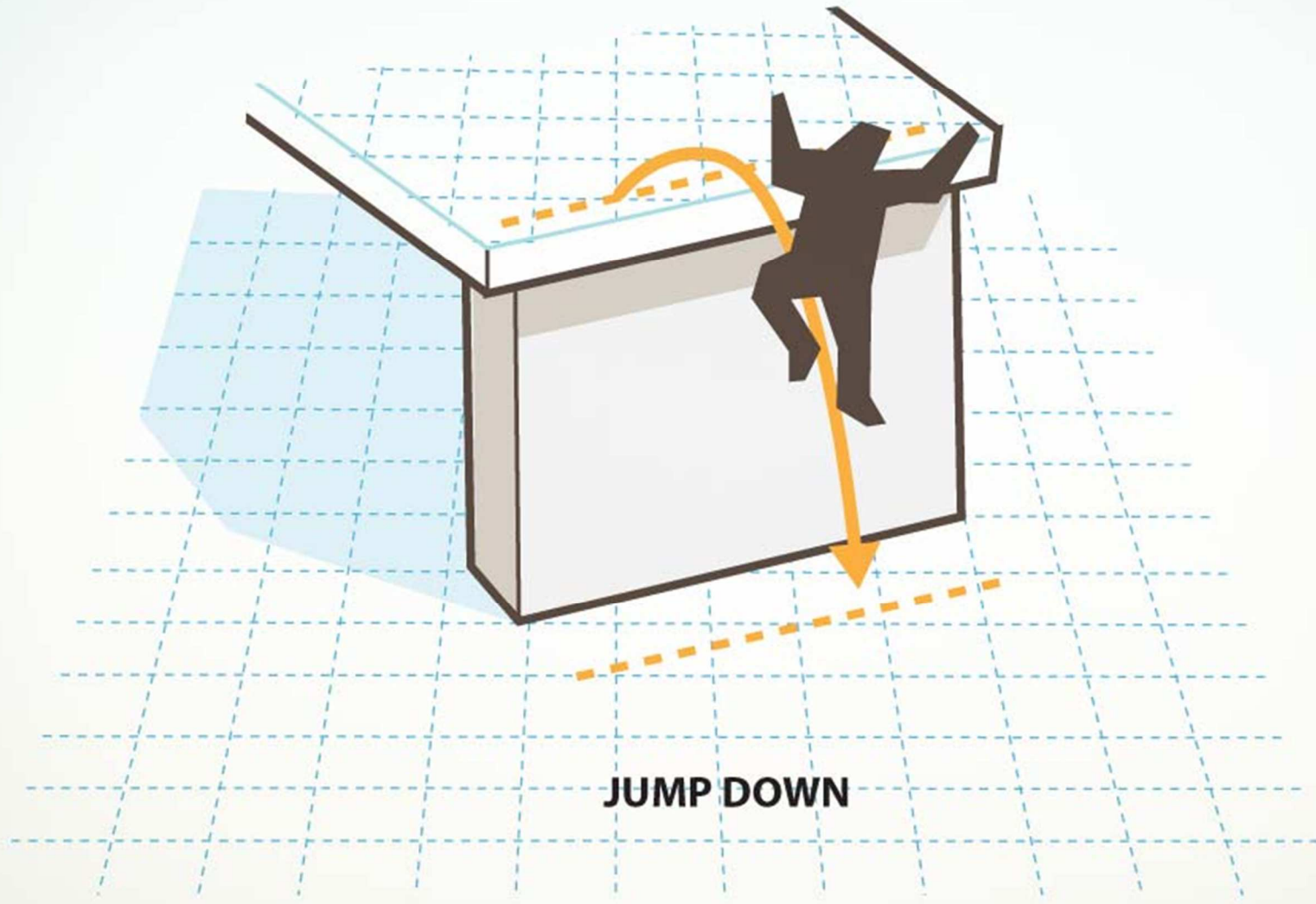
**TAKE COVER**



**VAULT OVER**



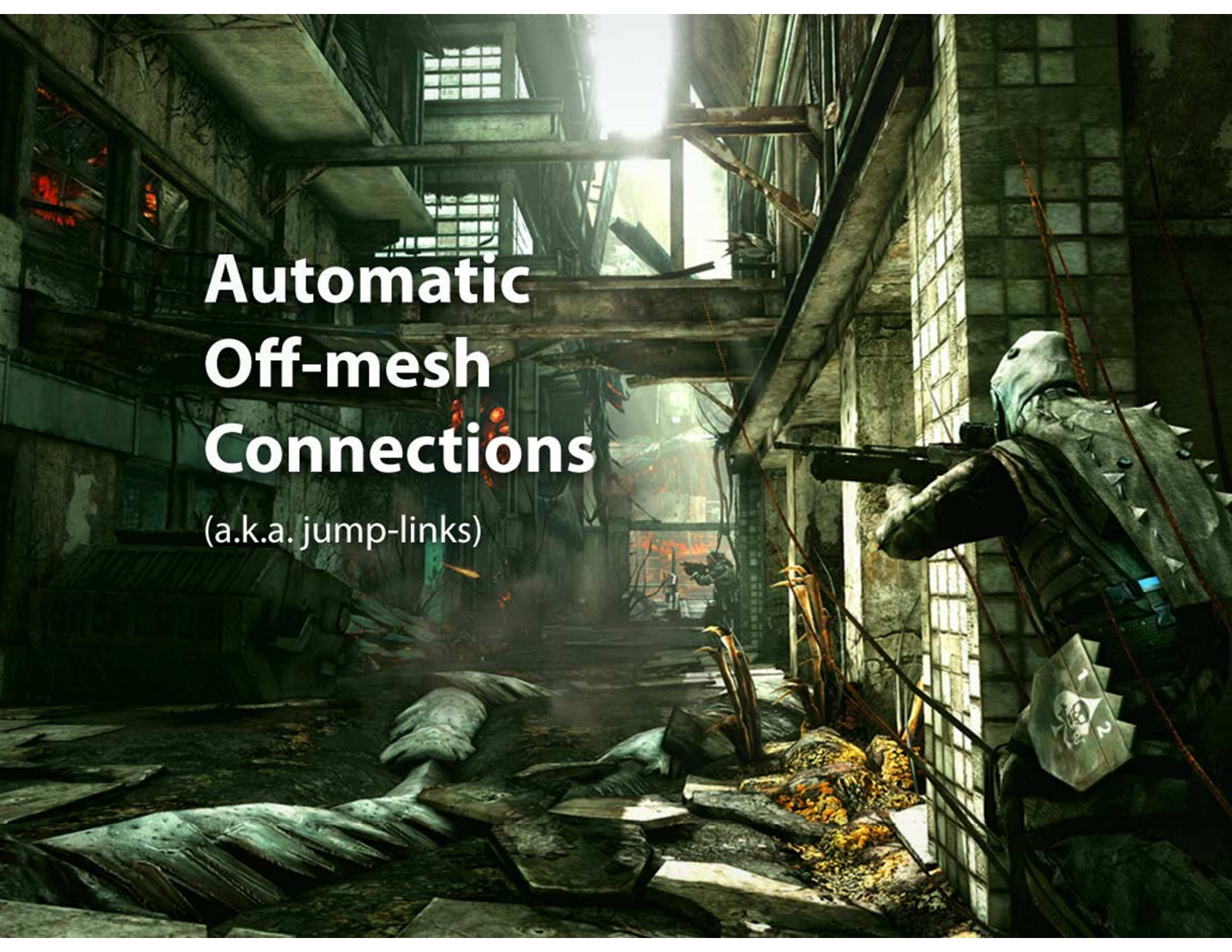
**LEAP ACROSS**

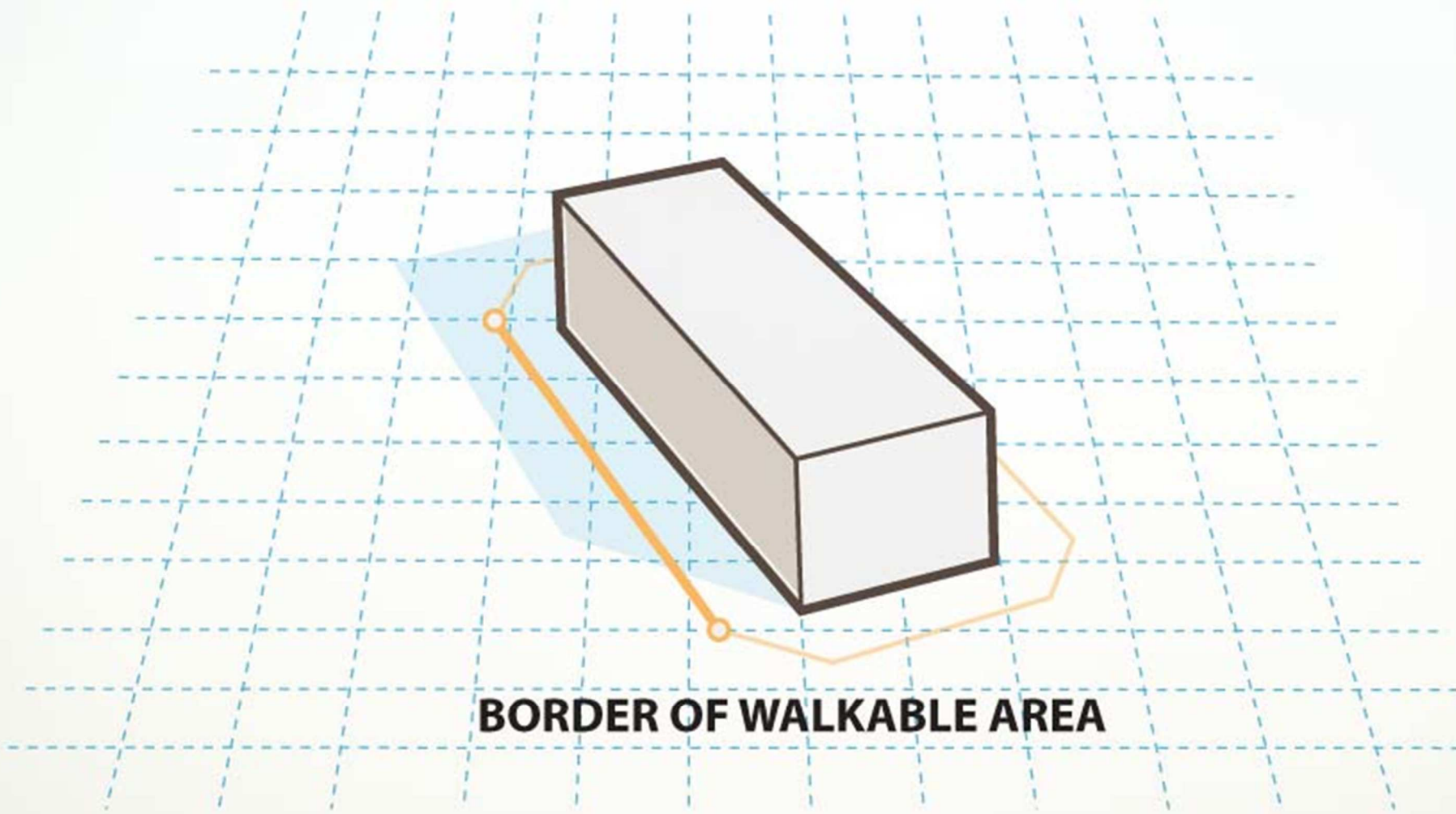


**JUMP DOWN**

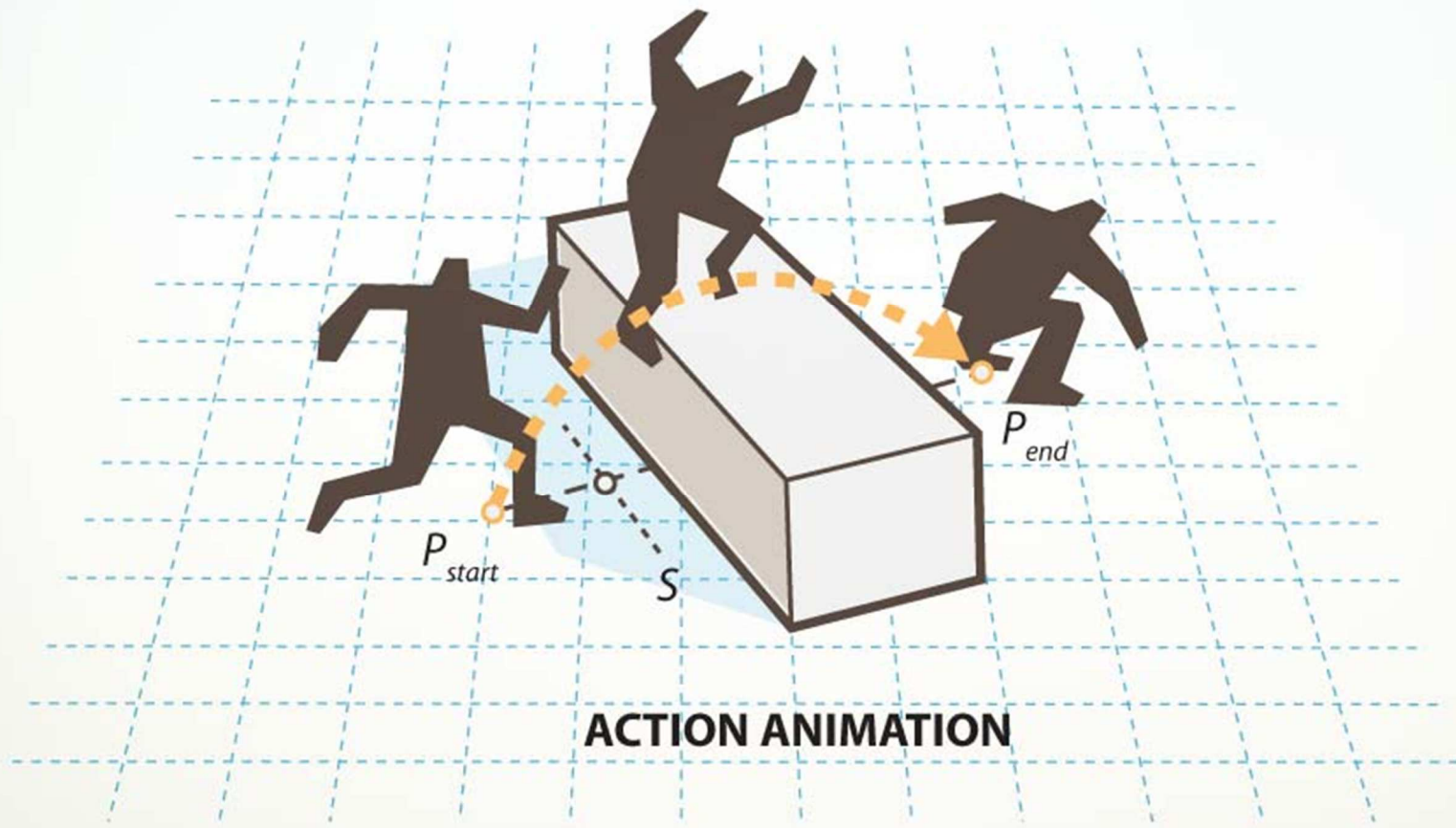
# Automatic Off-mesh Connections

(a.k.a. jump-links)



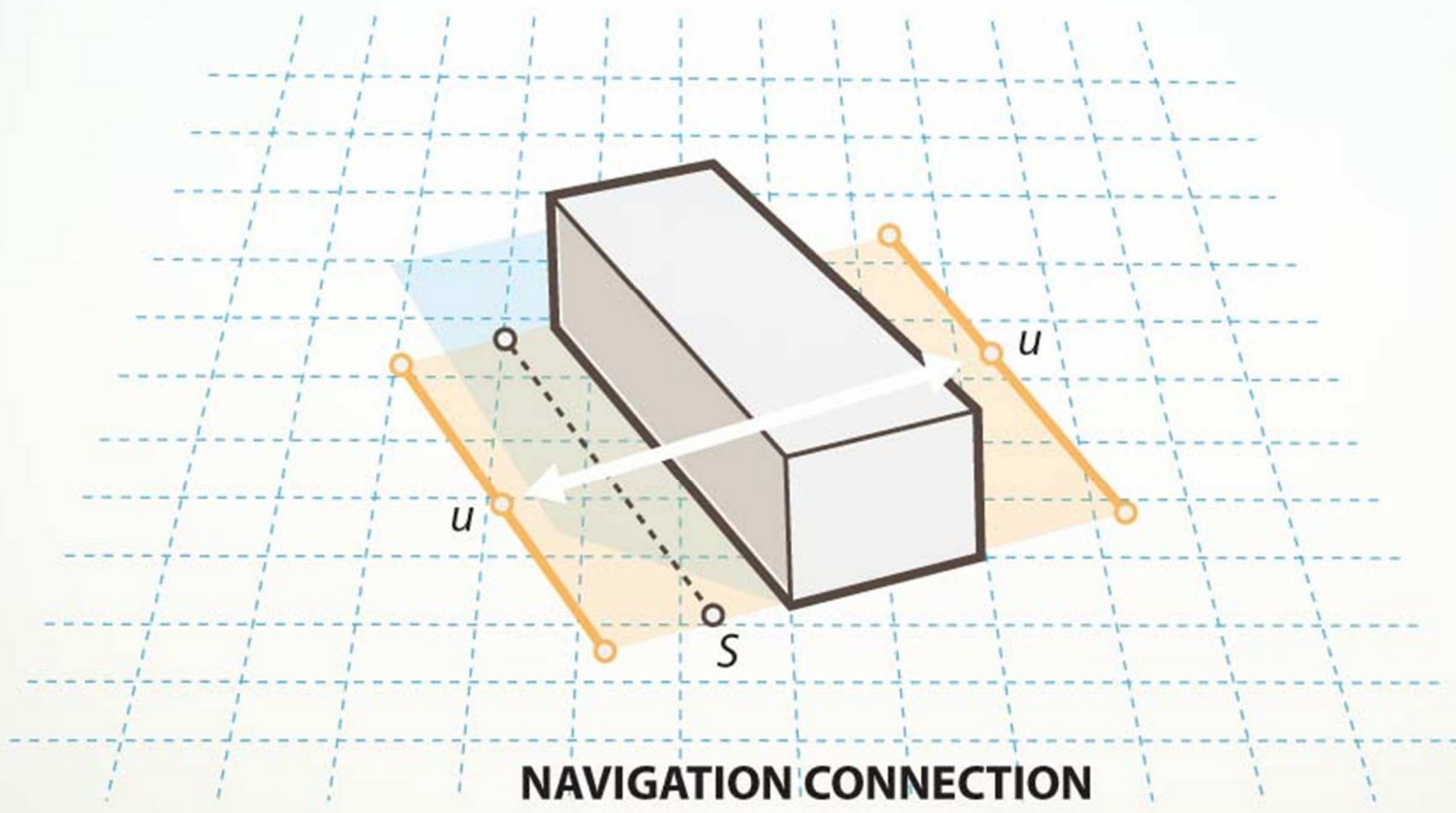


**BORDER OF WALKABLE AREA**

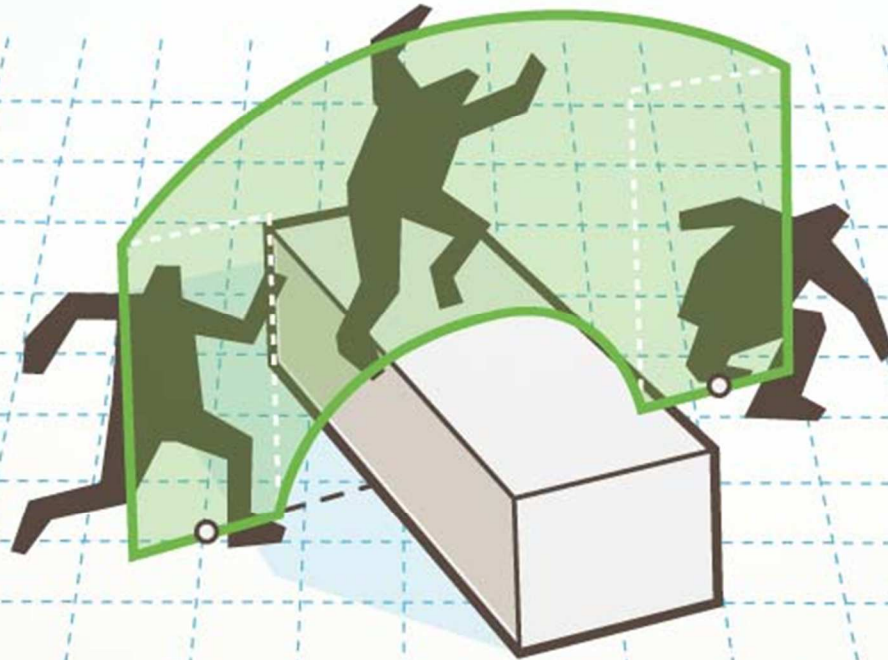


**ACTION ANIMATION**

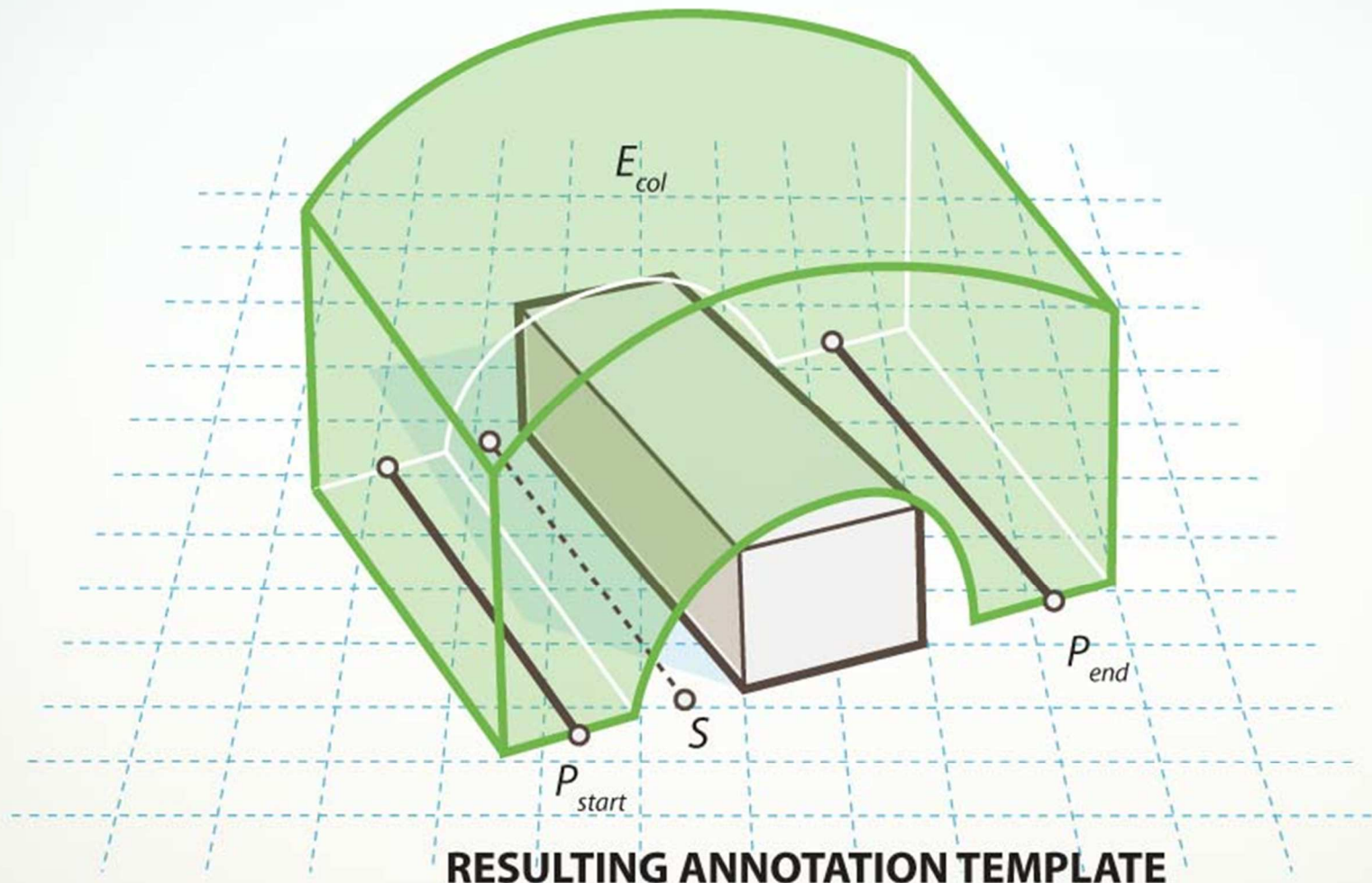




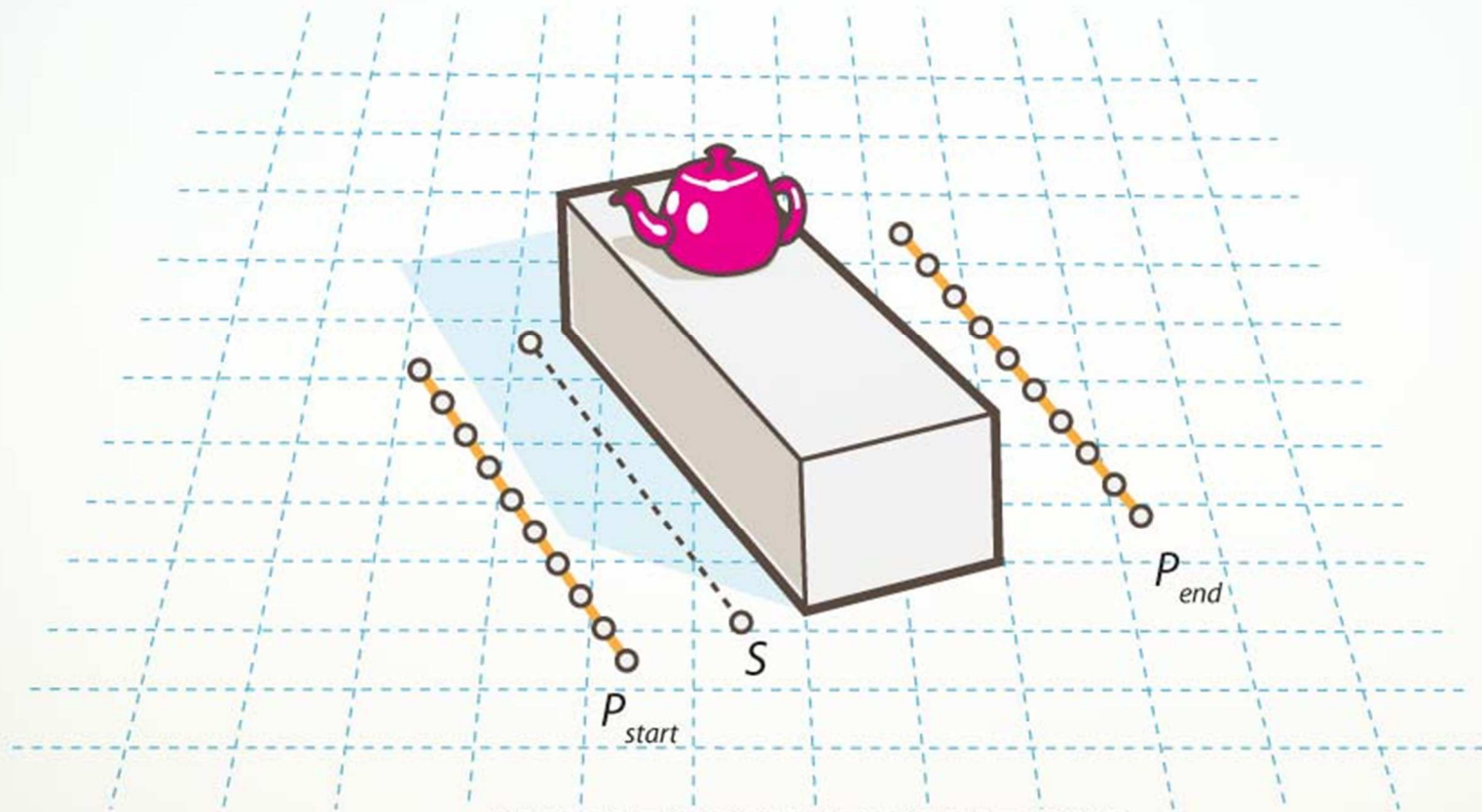
**NAVIGATION CONNECTION**



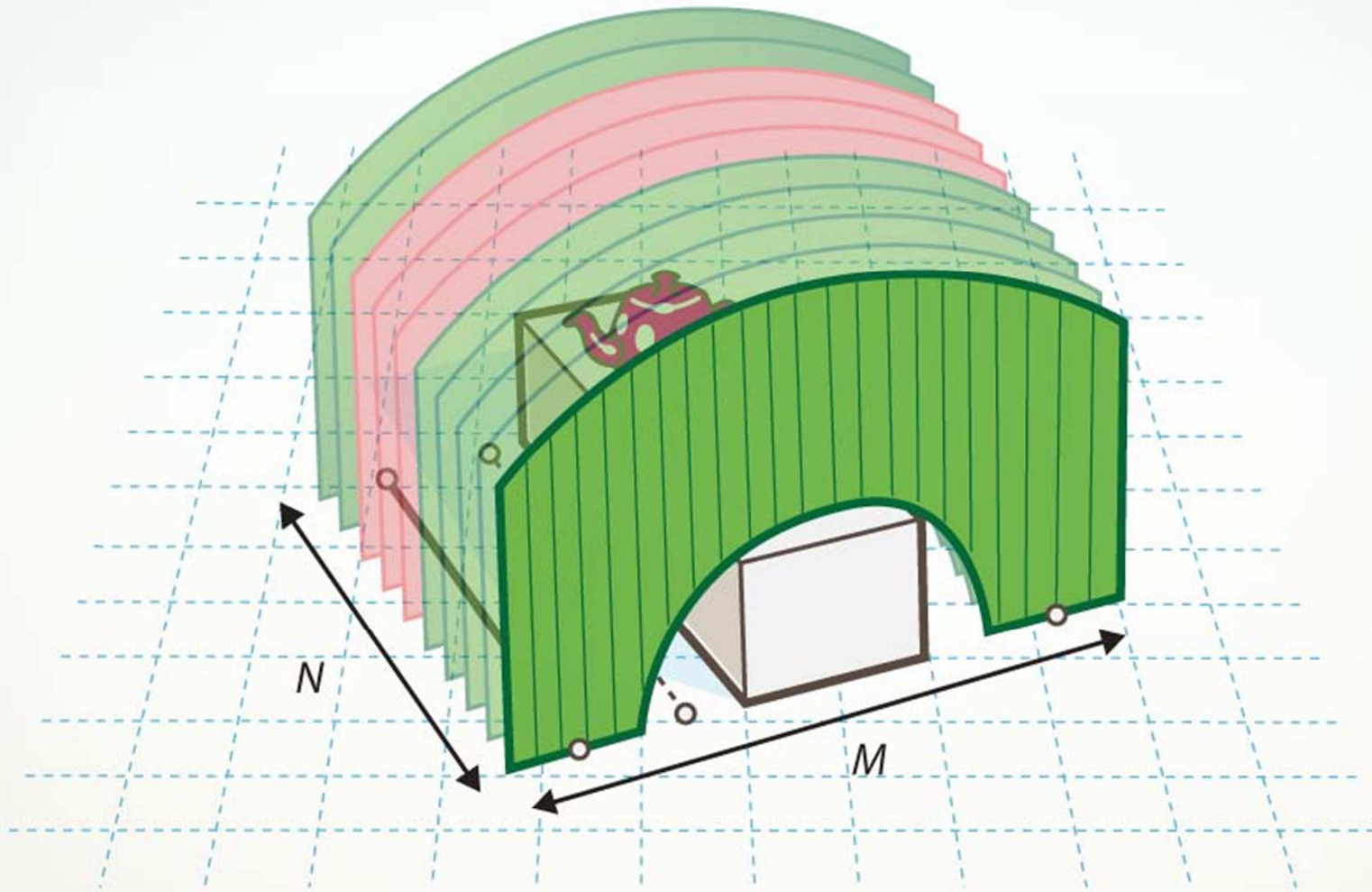
**COLLISION ENVELOPE**



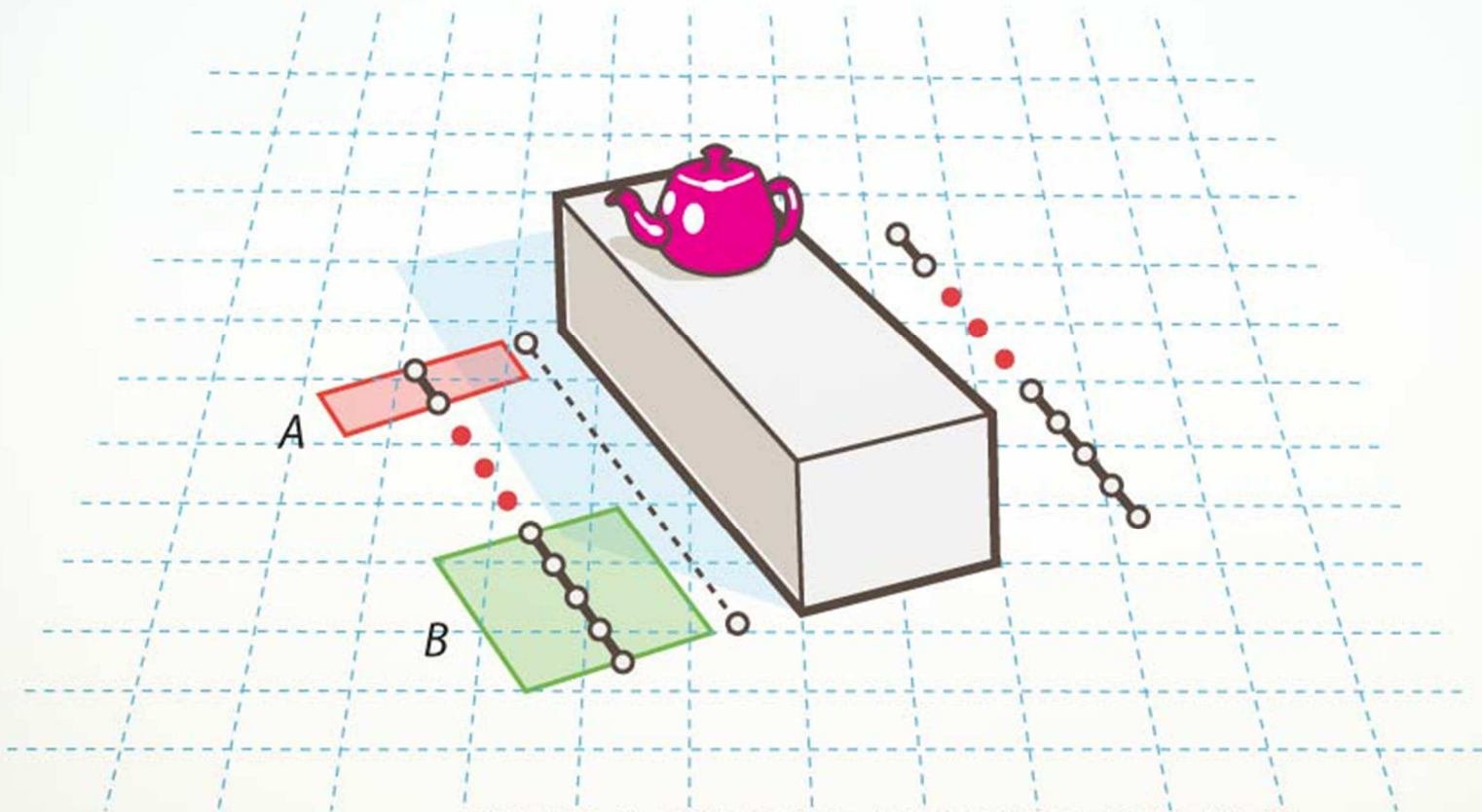
**RESULTING ANNOTATION TEMPLATE**



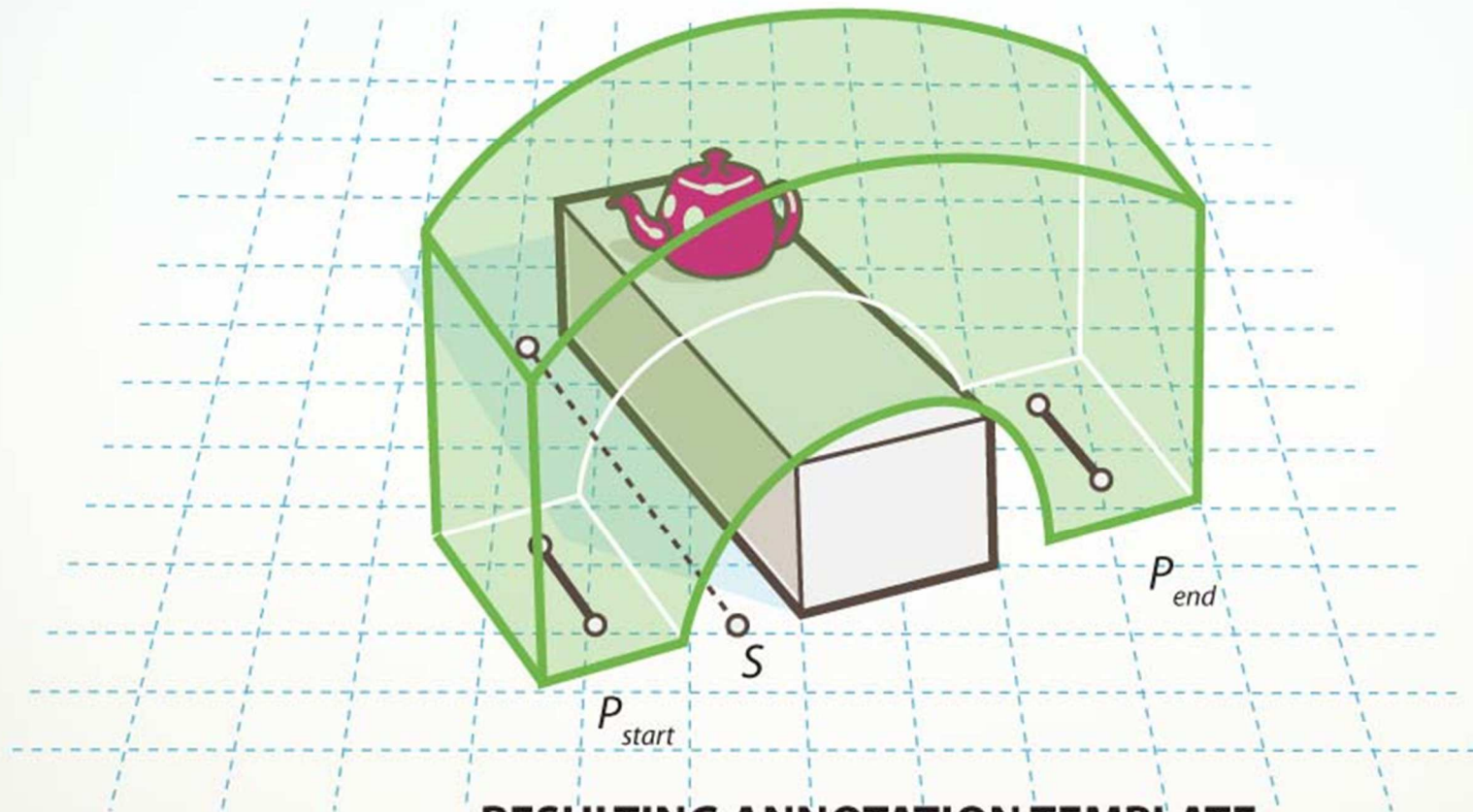
**SAMPLE GROUND LOCATIONS**



**SAMPLE SLICES**



**FILTER & COMBINE USABLE SEGMENTS**

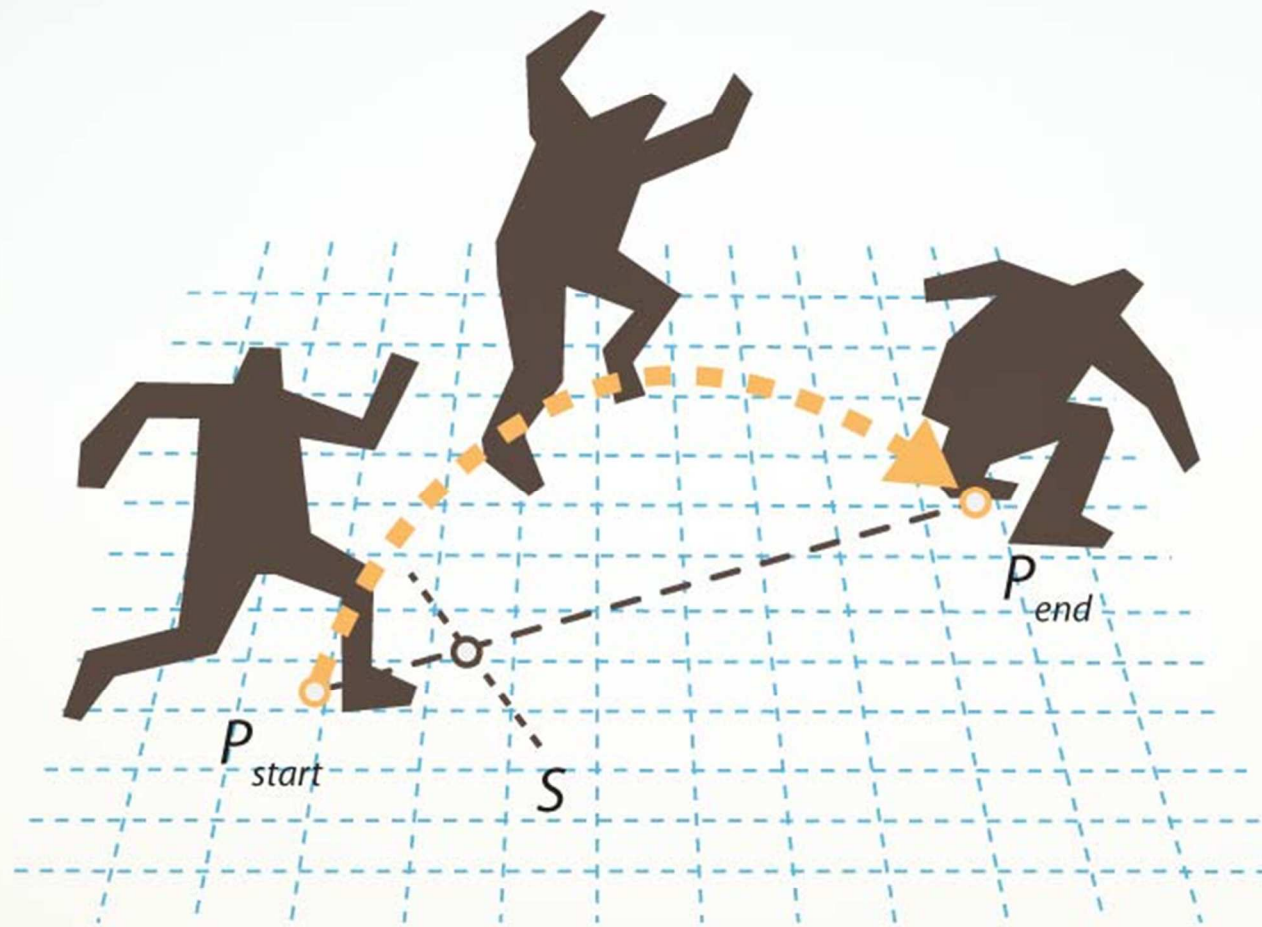


**RESULTING ANNOTATION TEMPLATE**

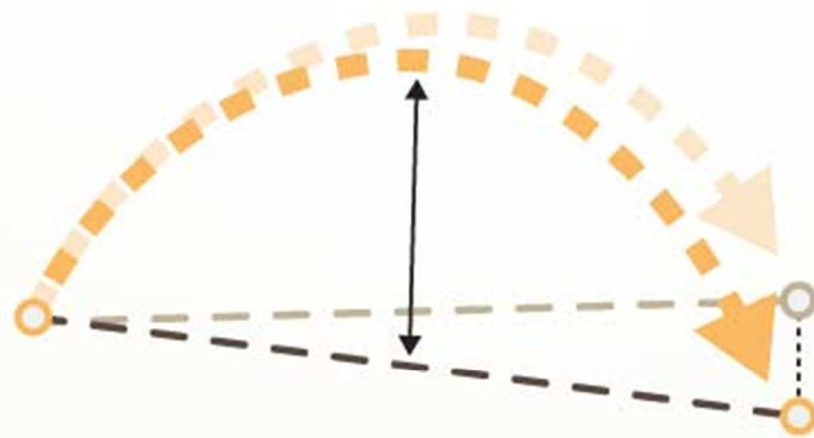
## **VALIDATING ANNOTATION TEMPLATE**



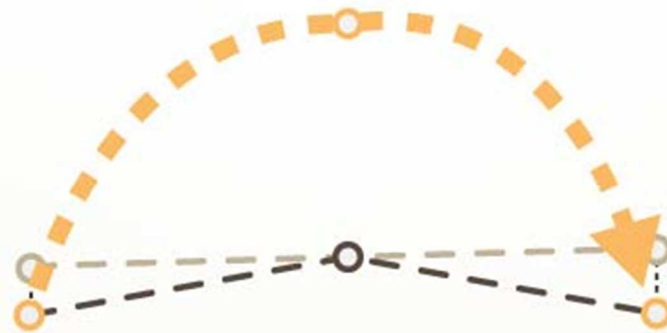
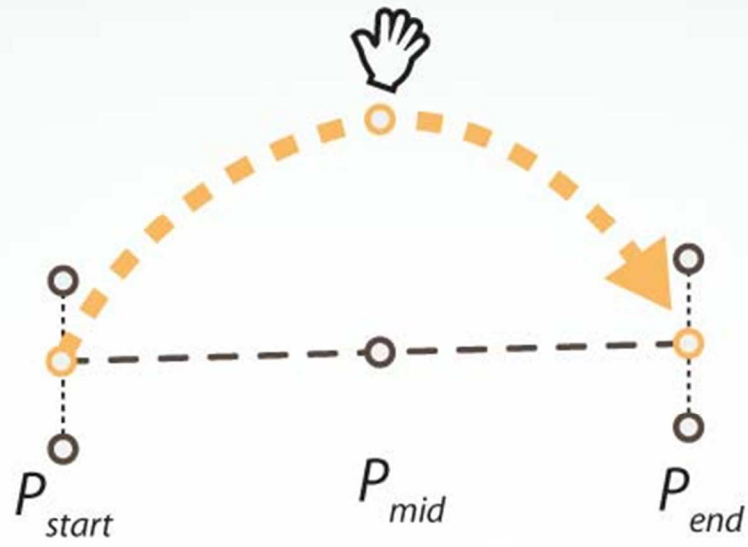
**DEMO**



## DEFORMABLE ANIMATIONS



**ROOT MOTION vs. PROJECTED MOTION**



**HANDLING CONTACTS**

# Questions?

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