



HCPO 2024

BALANCING CHANGE IN
A DYNAMIC LANDSCAPE



HCPO 2024

BALANCING CHANGE IN
A DYNAMIC LANDSCAPE

Trails Are Not Highways!

Laura Kaakua
Marie Williams
Jackson Bauer

Joel Rathje
Ron Terry
Amy Ford-Wagner

Trails Are Not Highways!

Hawai'i Conference of Planning Officials

Hapuna Bay

September 12, 2024



Session Structure

- Guided panel discussion
- Audience Q&A
- Workshop
- Reconvene for Final Thoughts

























LOVE the WEST maui Greenway Day

EXERCISE
PLAY

Explore
NEW

CONNECT
Community

Experience
FREEDOM























TRAIL COURTESY



YIELD
TO



























Trails Are Not Highways!

Hawai`i Conference of Planning Officials

Hapuna Bay

September 12, 2024



GUIDING PRINCIPLES FOR SUSTAINABLE TRAILS

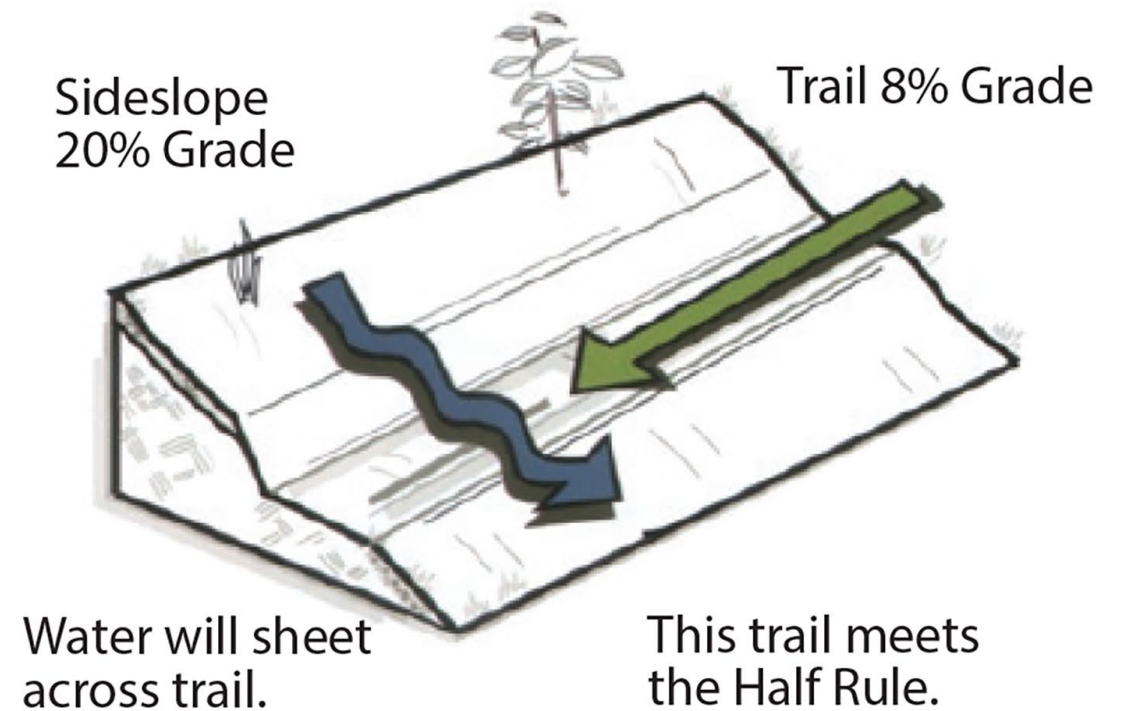
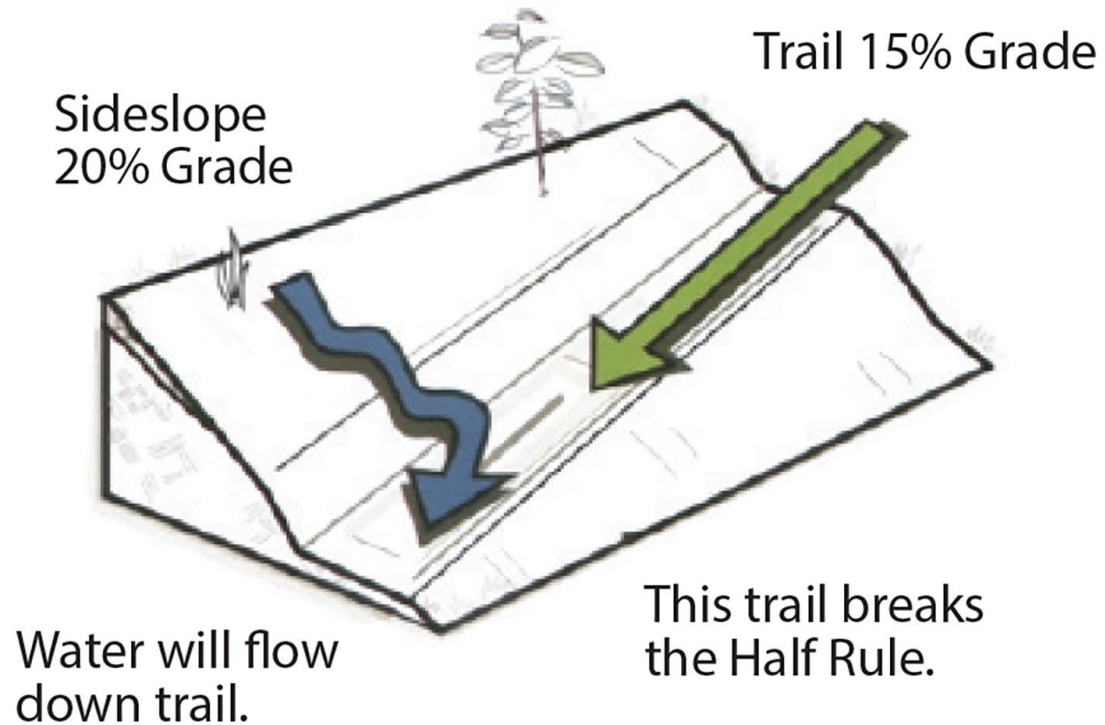
1. Avoid Sensitive Cultural, Ecological Areas, and Critical Habitats
2. Develop Trails in Areas Already Influenced by Human Activity
3. Provide Buffers to Avoid/Protect Sensitive Ecological and Hydrologic Systems
4. Use Natural Infiltration and Best Practices for Stormwater Management
5. Provide Ongoing Stewardship of the Trails and Natural Systems
6. Ensure that Trails are Sustainably Designed, Built, and Maintained
7. Formally Decommission and Restore Unsustainable Trail Corridors

ELEMENTS OF SUSTAINABLE TRAILS DESIGN

- 1. The Half Rule**
- 2. The Ten Percent Average Guideline**
- 3. Maximum Sustainable Grade**
- 4. Grade Reversals/Rolling Contour Trails**
- 5. Outslope**

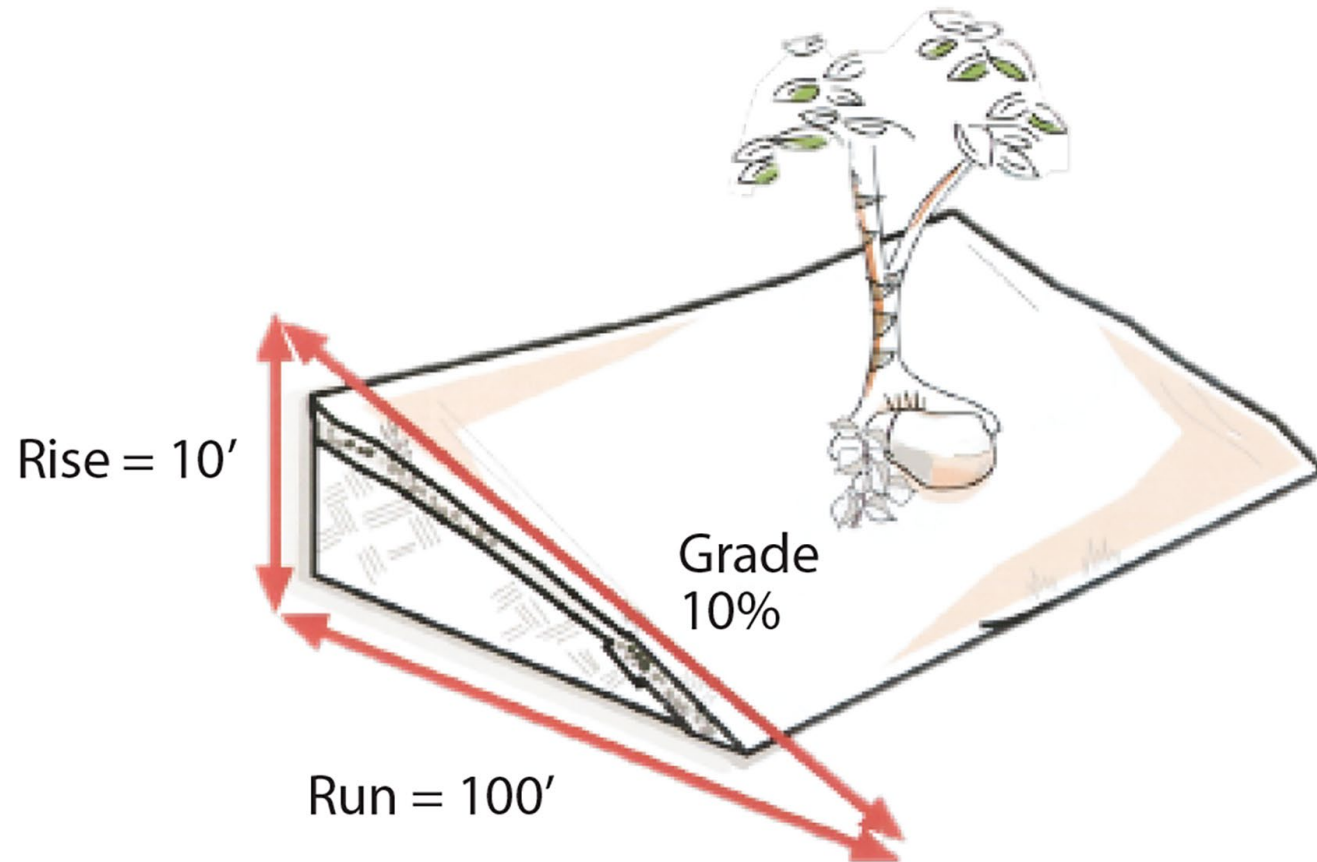
ELEMENTS OF SUSTAINABLE TRAILS DESIGN

The Half Rule - A trail's grade shouldn't exceed half the grade of the sideslope. If the trail grade is steeper than half the grade of the sideslope, it is considered a fall-line trail.



ELEMENTS OF SUSTAINABLE TRAILS DESIGN

The Ten Percent Average Guideline- Generally, an average trail grade of 10 percent or less is most sustainable. Also called overall trail grade, average trail grade is the slope of the trail from one end to the other.

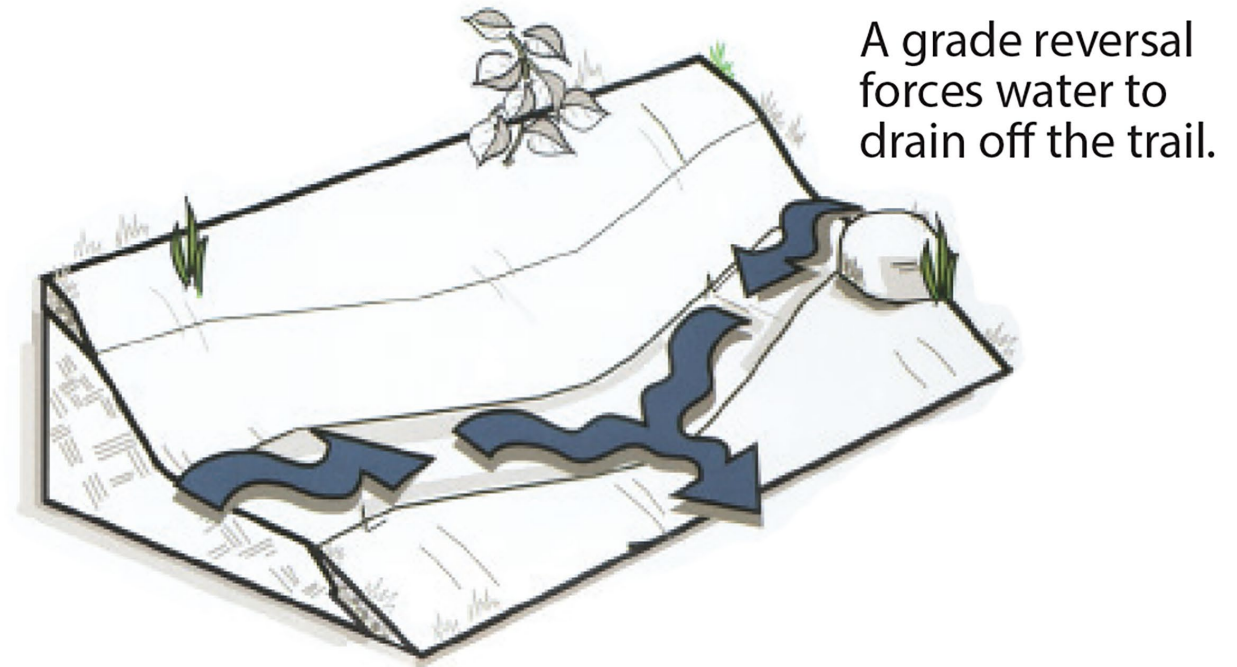
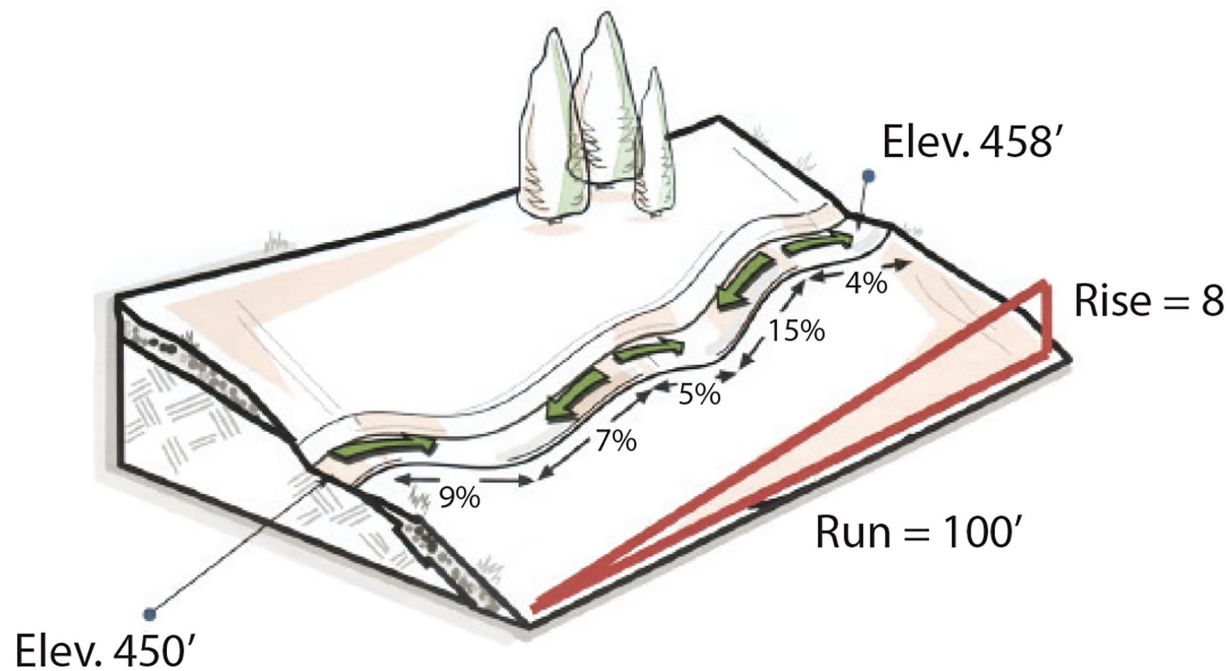


ELEMENTS OF SUSTAINABLE TRAILS DESIGN

Maximum Sustainable Grade: Maximum grade is the steepest section of trail that is more than about 10 feet in length. When designing a trail, it is essential to determine early in the process the precise maximum trail grades the trail will be able to sustain in your local conditions. This target figure will help guide your layout and ensure sustainability. Although maximum sustainable trail grade is **typically about 15 to 20 percent**, it is site-specific and fluctuates based on several factors including soil type, average rainfall, type of trail users, difficulty level.

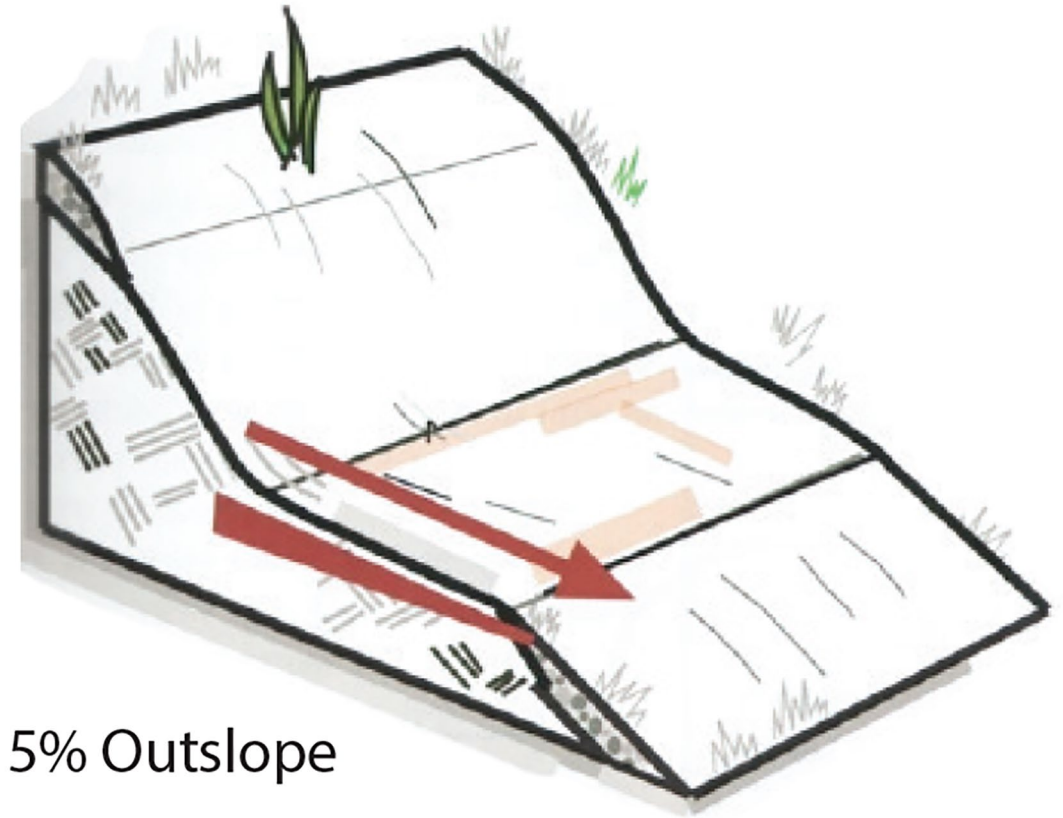
ELEMENTS OF SUSTAINABLE TRAILS DESIGN

Grade Reversals/Rolling Contour Trails: A grade reversal is a short dip followed by a rise, forcing water to drain off the trail. It is an essential technique for preventing water from channeling down the trail. Frequent grade reversals will allow for slightly steeper trail grades.



ELEMENTS OF SUSTAINABLE TRAILS DESIGN

Outslope: As the trail contours across a hillside, the downhill or outer edge of the tread should tilt slightly down and away from the high side. This tilt is called outslope, and it encourages water to sheet across and off the trail instead of funneling down its center. Outslope is one reason why contour trails last for years and years. It is recommended that all trail treads be built with a 5-percent outslope. Outslope can be difficult to maintain in loose soils. Tires, feet, and hooves constantly compact the center of the trail and push loose soil to the sides, creating a concave tread. Frequent grade reversals are essential in order for water to drain in this situation.



5% Outslope