

M•O•R•C

Minnesota Off-Road Cyclists

MORC Mission

- Minnesota Off-Road Cyclists is a non-profit volunteer organization dedicated to safeguarding the future of mountain biking in Minnesota through the promotion of responsible mountain biking, the establishment and maintenance of mountain bike trails, and the preservation of Minnesota's natural resources.

Presentation Agenda

- Trail features cyclists desire
- Brief history of mountain biking in MN
- Sustainable trails and how they are constructed
- MORC volunteer coordination & training
- How MORC works with cities and land managers to create and maintain sustainable trail systems

What Off-Road Cyclists Seek

- An aerobic cycling experience in a natural setting
- Natural surface trails
- Challenges posed by natural obstacles
- A variety of trail types
 - Open and flowing
 - Tight and technical
 - Multiple loop options, with a variety of difficulties

MN Mountain Bike History

- No designated trails in the 1980's
- In the late 80's and early 90's land managers opened XC ski trails for summer mountain biking
- Few trails designed specifically for mountain bikes & accelerated ski trail erosion occurred
- Erosion mitigation attempts: filling, class-5 gravel, parallel trail, seasonal trail, closure?
- Mid-late 90's saw much new trail development for off-road cycling - rerouting & sustainable construction provided long-term solutions

Sustainable Trail Construction

Step 4: Familiarize Yourself with the Area and Identify Control Points

Positive Control Points:

- Scenic overlooks
- Waterfalls
- Rock outcroppings
- Historical / archeological sites
- Lakes & rivers

Negative Control Points:

- Low-lying wet areas
- Steep sideslopes
- Fall lines
- Environmentally sensitive areas
- Private property

Three Types of Trails

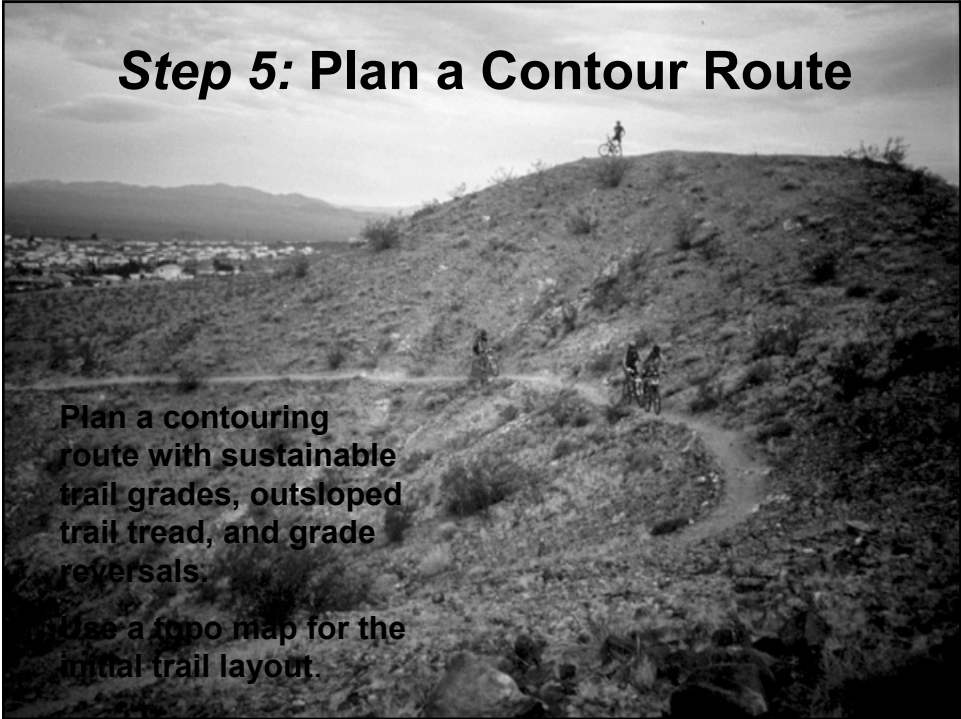
- 1 Fall-Line Trails
- 2 Flat Ground Trails
- 3 Contour Trails

- Only one of these is sustainable

Trails on Flat Ground

- Temptingly easy to construct
- Begins as a narrow, defined trail
- Tread compacts
- Water collects in the depressions
- Users remove material (mud) with use
- Depressions deepen and become a series of endless mud holes
- Users create re-routes to avoid deep mud
- The “mud-hole cycle” begins again
- NEVER build trails on flat ground!!!

Step 5: Plan a Contour Route

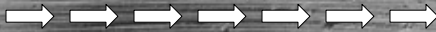


Plan a contouring route with sustainable trail grades, outsloped trail tread, and grade reversals.

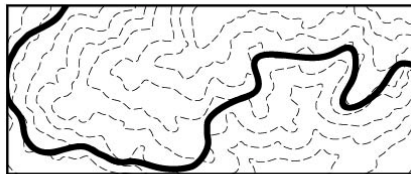
Use a topo map for the initial trail layout.

The Contour Trail

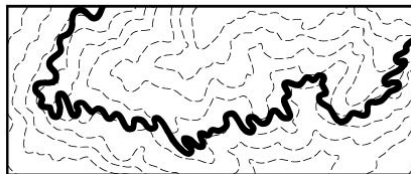
- Erosion resistant and low maintenance
- Keeps users on the trail
- Keeps water off the trail
- Sustainable and yet fun trails are the best way to achieve the balance between resource protection and user recreation.



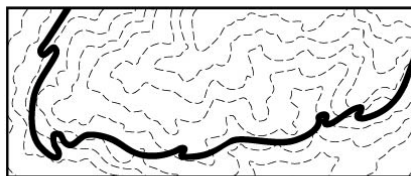
TRAIL FLOW



Open and Flowing



Tight and Technical



Poor Design (Abrupt transitions from one type of design to

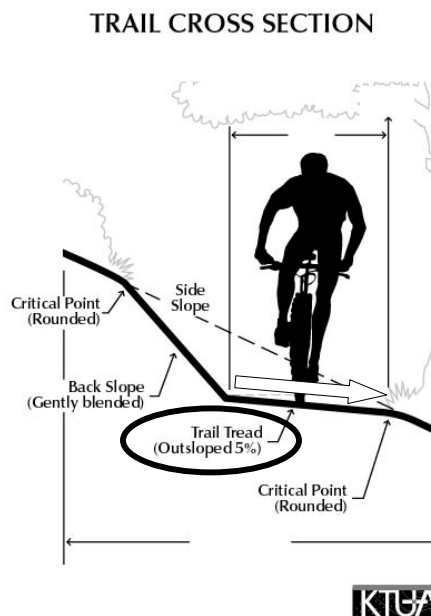


Trails Sustainability = Water Management

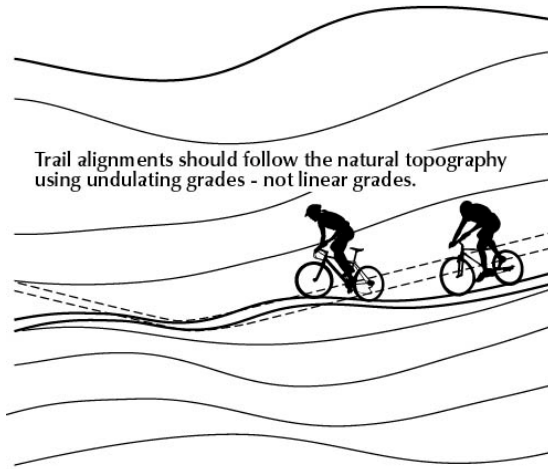
- Rule #1 - The laws of gravity and physics supercede all other laws and regulations
- Rule #2 - If you don't plan to manage water flow, it will destroy your trails
- "V's" are bad
 - Volume & Velocity = Violent Erosion
- "S's" are good
 - Shallow, Slow & Sheeting = Sustainable

Outslope

The trail tread should be **outsloped** by 5% to allow for ***sheet flow*** of water off the trail.



GRADE REVERSAL

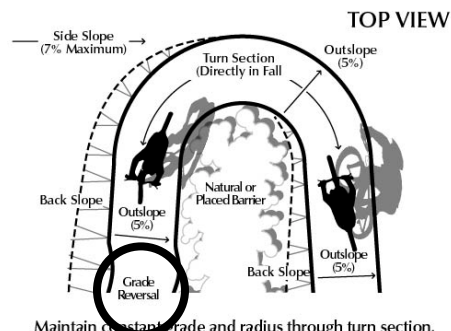


Trail alignments should follow the natural topography using undulating grades - not linear grades.

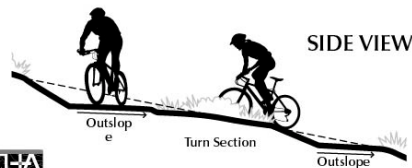
Grade reversals direct water off trail surface and are self cleaning. In this case, grade reversals occur before a water crossing, diverting water and sediments as sheet flow off the trail before they can reach the stream.

Climbing turns are built on the existing grade, and *do not* have a constructed turning platform or landing.

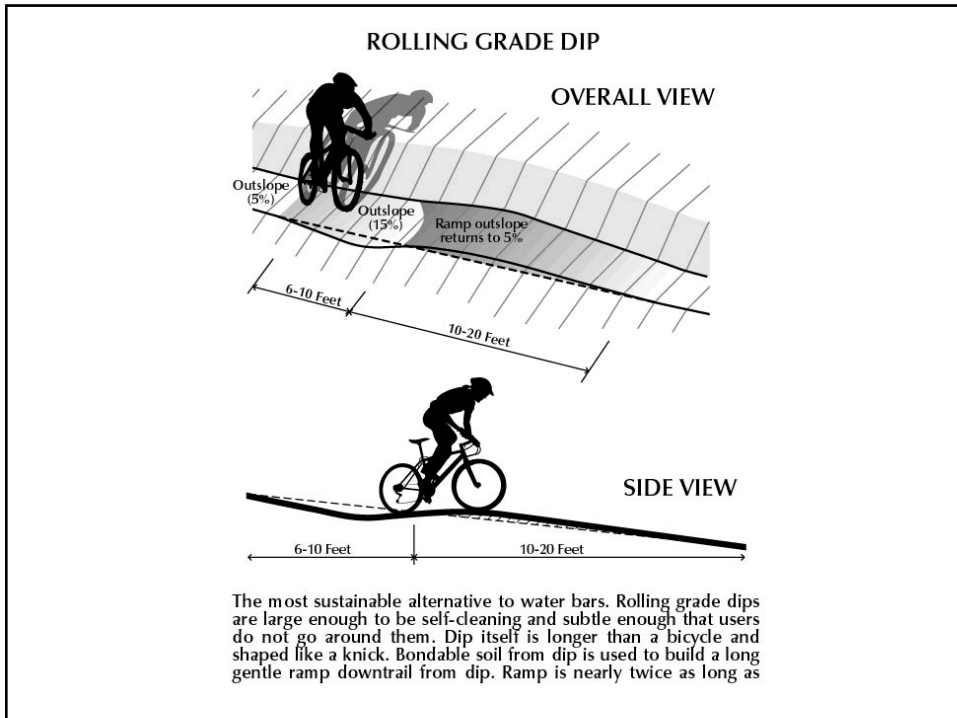
CLIMBING TURN



Maintain constant grade and radius through turn section. Climbing turns may not be sustainable on side slopes exceeding 7%.



Any turn that climbs (or descends) on fall line of side slope is considered a climbing turn. Sustainability of climbing turns can be maximized by placing them on very gentle side slopes and draining water off above them with a grade reversal. Climbing turns should have very large turning radii with barriers between legs to prevent shortcutting.



MORC Adopt-a-Trail

- Single point of contact between MORC and the land manager
- Trail monitoring & user education
- Free consulting on trail design and erosion mitigation
- Coordination of periodic volunteer trail maintenance sessions
- MORC provides trail construction tools
MORC provides standard trail signage for use, direction, difficulty, & safety

MORC Adopt-a-Trail

- Minnesota River Bottoms
- Terrace Oaks - Burnsville
- Lebanon Hills - Dakota County
- Battle Creek - St. Paul
- Lake Elmo - Washington County
- Minneapolis Parks (4)
- Murphey-Hanrehan - Burnsville
- Chippewa Nat'l Forest
- Duluth, Winona, Mankato