

STRAVA HEAT MAP , ROCKLAND, MADISON, CT

BEYOND THE LINEAR TRAIL:

Designing quality trail systems for a variety of users

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PCT, Evergreen



NEMBA



AMC



NEMBA

Our Mission:

- **Promote** sustainable trail access for mountain bikers.
- **Maintain** the trails on which we ride.
- **Educate** the mountain bike community on how to ride in a sensitive and responsible manner.
- ***Protect** the natural environment.
- ***Enhance** the experience of all trail users.

“Ride the Trails, Save the Trails!”




Objectives for the day




Participants will:

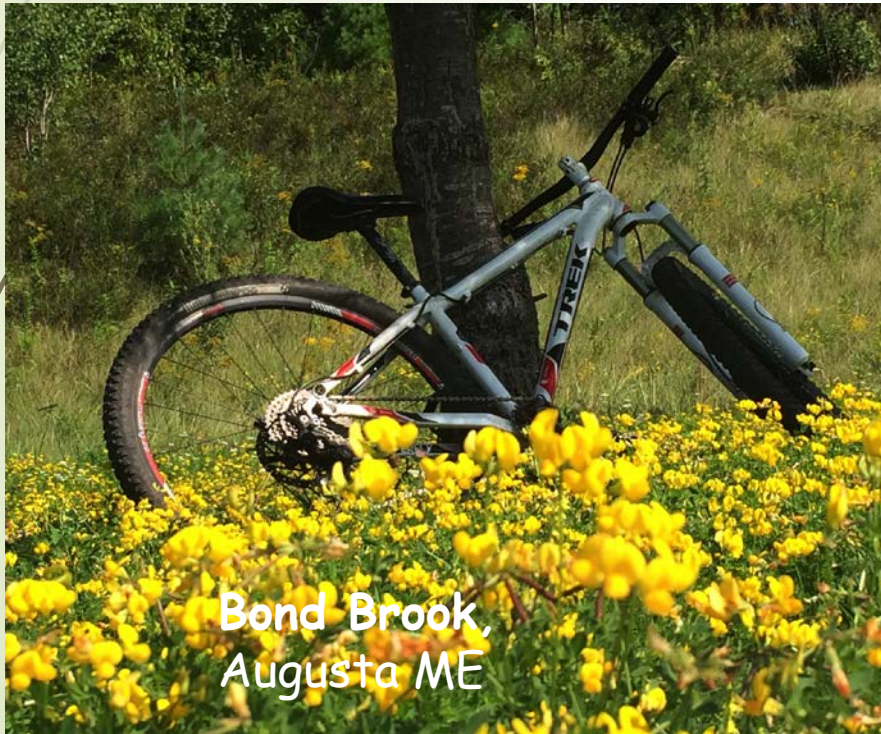
- ▶ Be provided with strategies to develop community among various passive user groups through the development of quality trail systems
- ▶ Understand how trail design and design of quality trail systems can promote the development social sustainability of a community based on the local park
- ▶ Be provided with strategies to avoid user conflicts through the design and management of a trail system



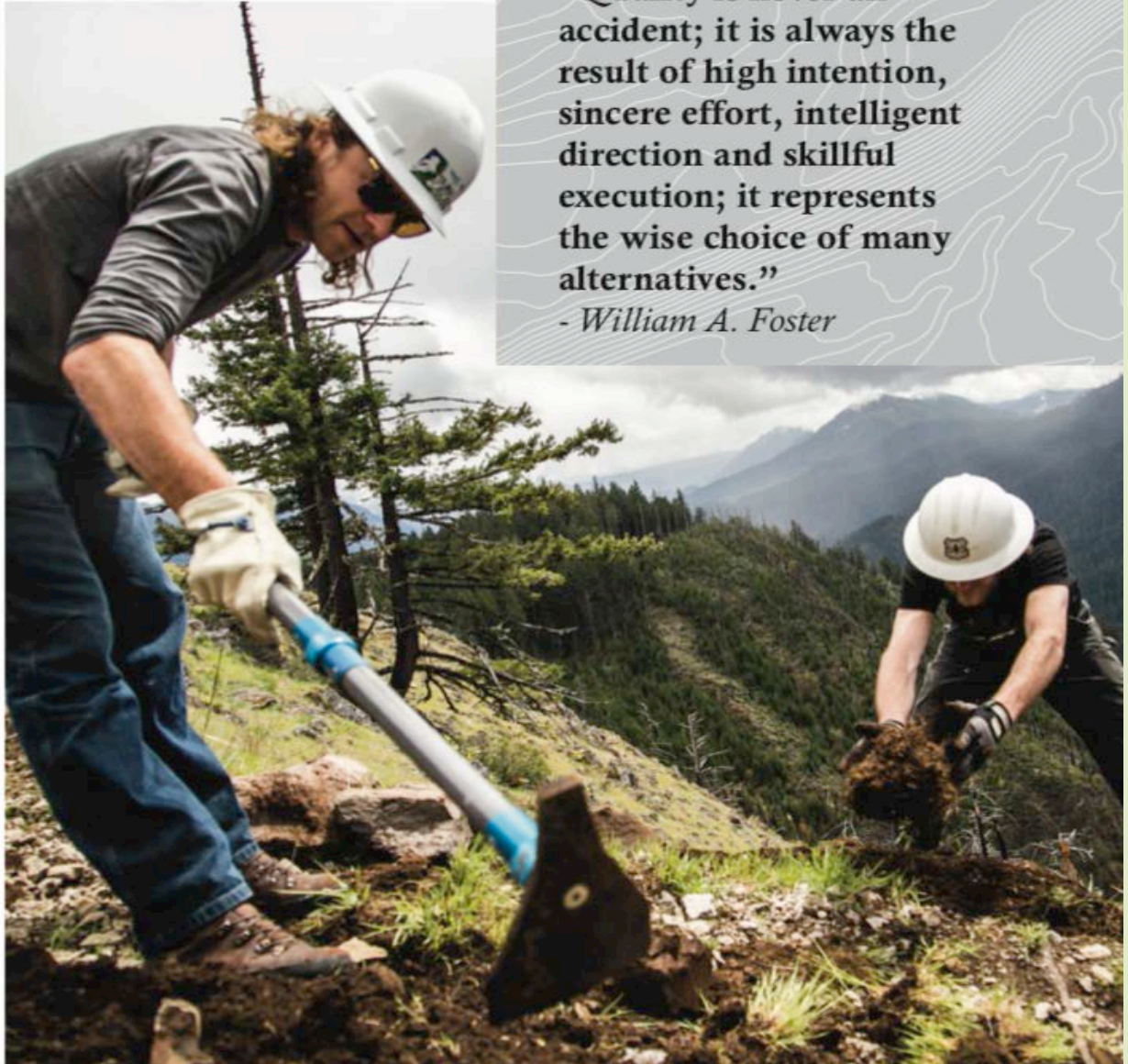
Activity 5 minutes

- Make groups of three or four, preferably with folks you haven't met before
 - Find one large piece of paper and a pile of markers
 - Identify three characteristics of a quality multi-user trail system
 - Be prepared to share
- 

*Quality is
difficult to
define but easy
to recognize*



- **Appropriate to a particular place and setting**
- **Environmentally and socially sustainable**
- **Economically responsible, taking into account long-term costs associated with maintenance and administration**
- **Outcomes-focused, able to provide the targeted experience and benefits for the identified rider skill level**



“Quality is never an accident; it is always the result of high intention, sincere effort, intelligent direction and skillful execution; it represents the wise choice of many alternatives.”

- William A. Foster

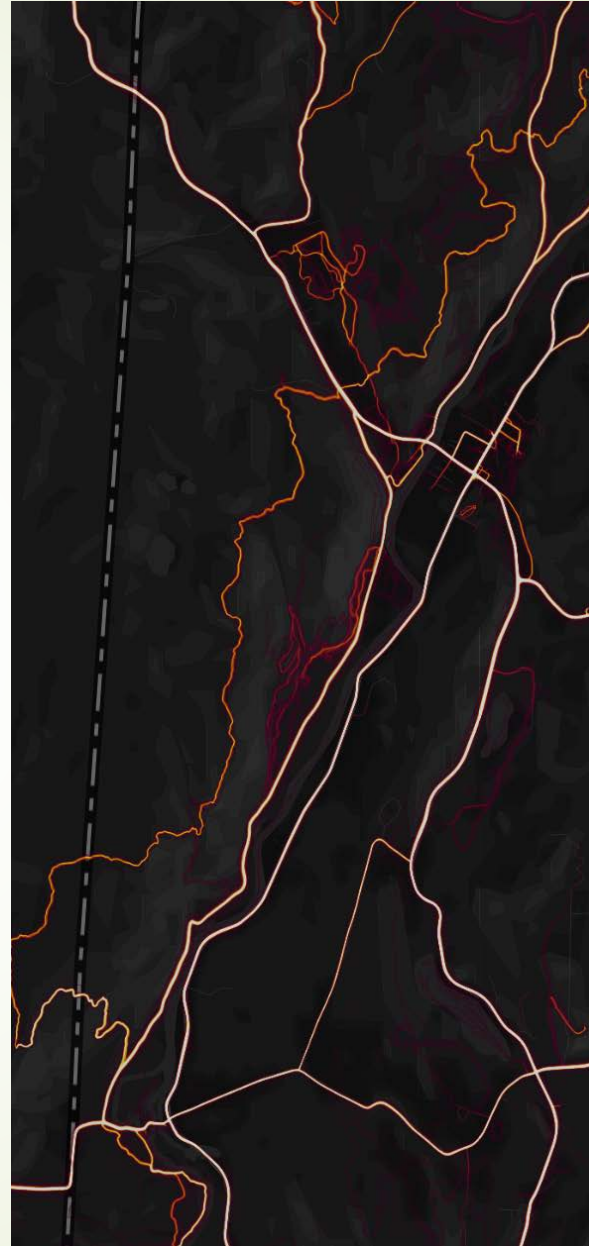
Mountain Bike Participants by Year



** Mountain bike participation data extracted from the BLM's Recreation Management Information System, Report 27: Visitor Days and Participants by Activity, National Office Summary.*



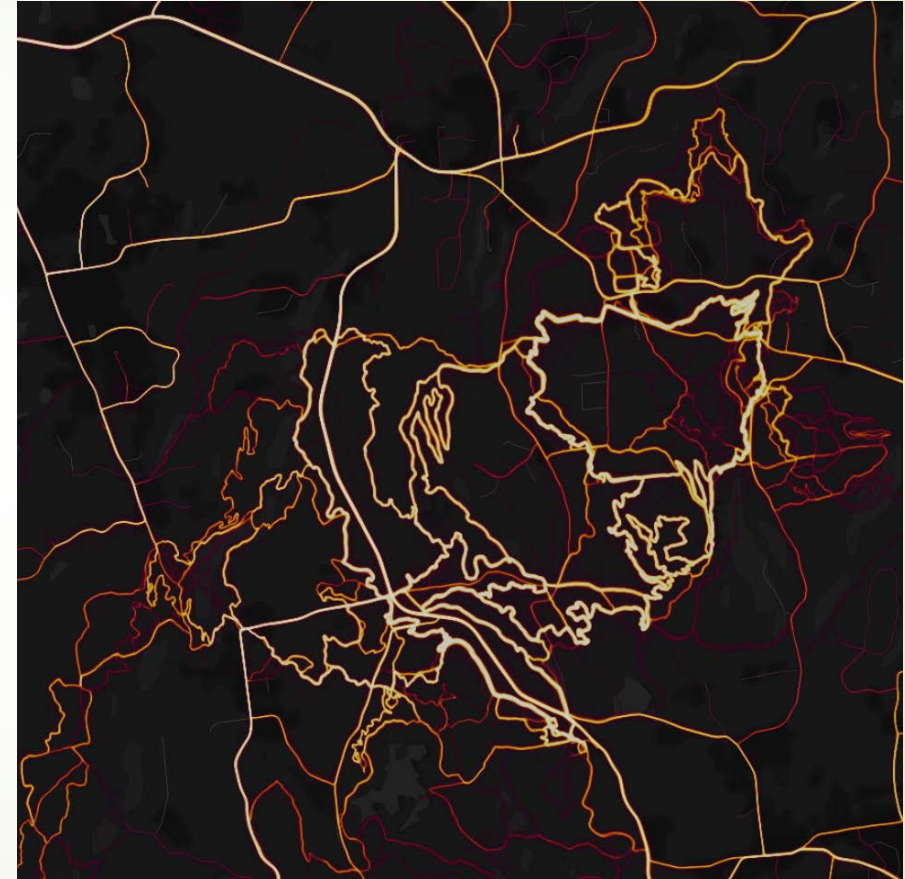
Appalachian
Trail
STRAVA
Heat Map



Session Woods Heat Maps



Hiker Traffic



Bicycle Traffic



Singletrack Trail Users

- **Hikers** – more focused on setting and destination, most mobile users, capable of cross-country travel
- **Equestrians** – less affected by tread condition, prefer loops, greatly prefer water access, require longer distances than hikers for a valued experience
- **Trail Runners** – most similar in movement to mountain bikers (speed, distance, preferred trail conditions) where the trail itself is an important factor along with exercise
- **Mountain Bikers** – wide range of desired experiences, but the trail itself is generally the primary factor, rather than destination or setting
- **Motorcyclists** – less commonly share trails with other users (outside of designated OHV areas), can be similar to mountain bikes but present unique challenges in trail design and flow due to throttle power
- **Electric-Powered Mountain Bikers** – similar in desired experiences to human-powered mountain bikers but able to cover more distance for a given fitness level

Source : BLM



Plan, Plan, & Plan for a Quality Trail System

Spend the time needed to properly design and build the trails for environmental, social, and economic sustainability

- Seek input from all user groups.
- Understand the different needs and expectations of the user groups. What experiences are users seeking?
- Expect a few bumps in the road
- Plan for the maintenance & future funding
- Have clear communications and common language
- Seek out models and then adapt those models for your area



Today's
Focus:
Social
Sustainability
BUT
All three are
needed for a
quality trail
system

Three components of trail sustainability:

- 1. Environmental Sustainability** – Will the trail provide for resource protection? This is the definition that is commonly used when referring to what does or does not provide for a sustainable trail.
- 2. Social Sustainability** – This is frequently overlooked in the trail development process. Evidence of the failure to meet desired user outcomes (experiences and associated benefits) are everywhere: overcrowded trails, trails with little use, trail users who feel “pushed out” by other users, and unauthorized routes.
- 3. Economic Sustainability** – Can the land manager and the community bear the long-term costs of maintaining a trail? If it provides a valuable experience, it is likely worth the investment, but it must be weighed against shrinking maintenance budgets.

Trail Experiences > Social Sustainability

- Reduce user conflict
- Reduce informal and unauthorized trails
- Fulfill management objectives
- Engage stakeholders in balanced and positive trail management



Positives of a Planned Trail System

- Engaging a more diverse group of people in "ownership" of open space or parks equals more volunteerism
- Introducing people to outdoors (recreation), and education, leads to citizens advocating for open space and parks (Recreation -Education-Conservation)
- Planning for those physical connections to schools, recreation centers, and neighborhoods allows for direct engagement in recreation and then to conservation and advocacy
- Any other positives?

Trail Planning Process



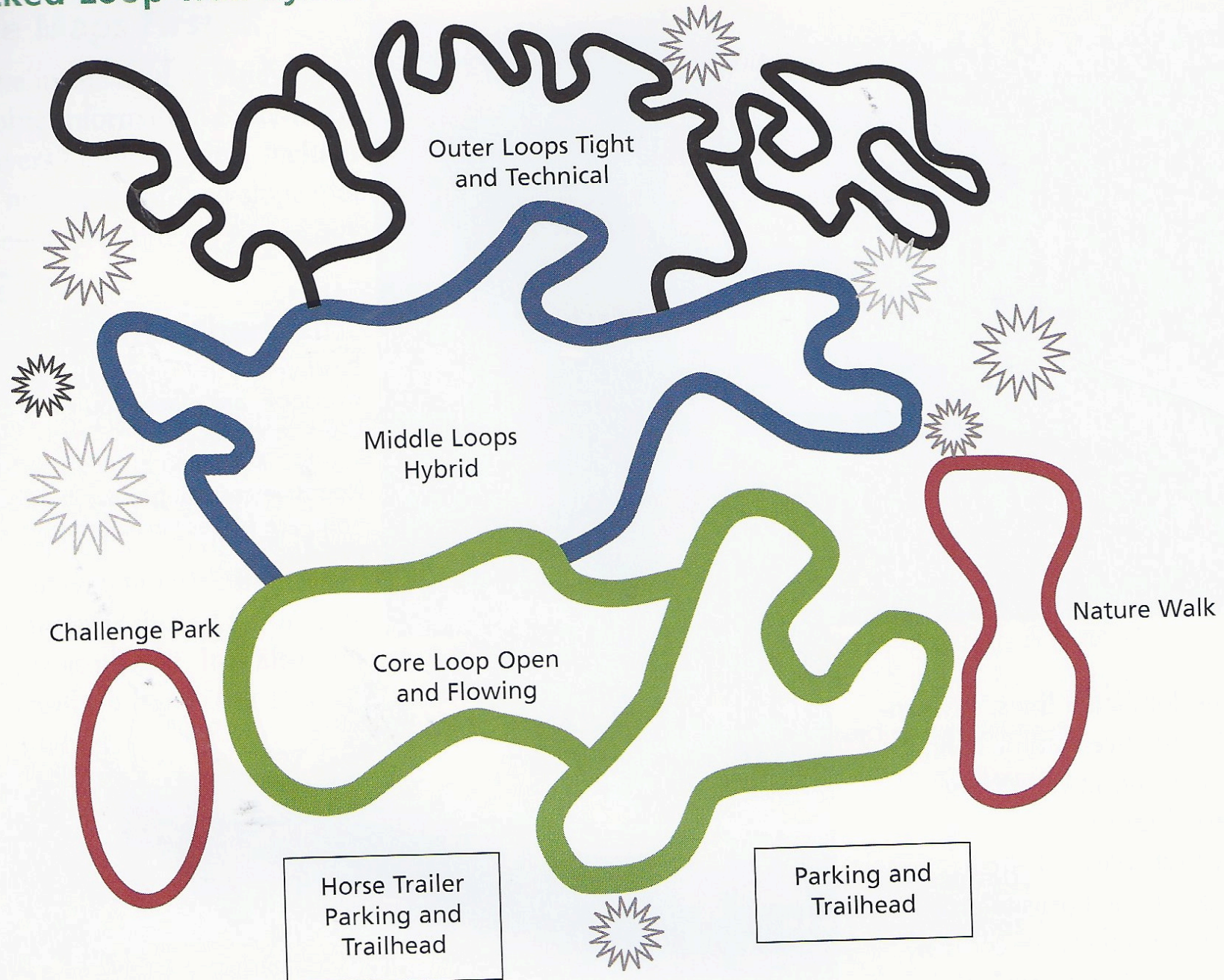
Source BLM



Nuts and Bolts

- Stacked loop system
- Levels of challenge
- Bridges (differences for different users: hikers, bikers, equestrians)
- Trail features
- Positive Control points (views, water, interesting geologic features)
- Sight lines
- Sustainable grades

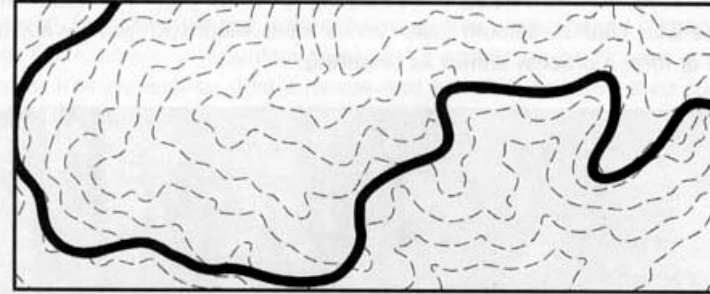
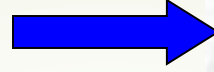
Stacked Loop Trail System



Trail Flow

Open & Flowing trails are good for core areas

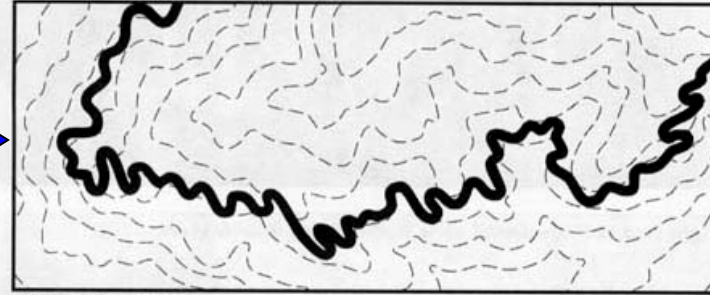
- Use speed-reducing techniques for corners/junctions



Open and flowing

Tight & Technical trails are good for challenge and speed-reduction

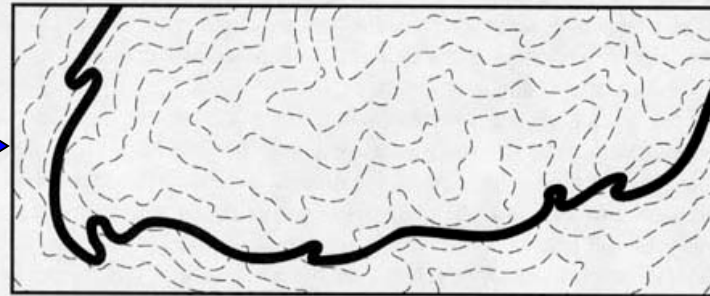
- Appropriate for advanced, outer loops



Tight and Technical

Abrupt transitions create design and use problems

- Potential for user conflict and trail degradation



Poor Design - Abrupt transitions from one type of design to another.

Bike Friendly Multi-use Trails



Appropriate for Shared/Preferred Use: Bike-optimized features can be appropriate for shared or preferred-use trails depending on their amplitude and frequency. A small feature placed strategically within the trail corridor would be enjoyed by riders but could go unnoticed by other trail users.



Rollers



Small Berms



Rock Gardens



Slow-speed
Technical Features



Clear Sightlines on
Faster Trail Sections

To successfully create a high-quality trail experience, attention to detail needs to be at the forefront of the design and planning process. This is evident in the way that trails and trail features are placed on the landscape. Illustrations are a key element of this process and are used to define and describe trail user objectives and illustrate how these can be translated into physical trail features. The following renderings show how a rider interacts with the feature to elicit a specific experience as well as how the feature functions as a management element. The effect on rider behavior is clearly evident from the renderings in that each directly influences the way a rider experiences the elements of challenge, playfulness, escape, and risk.



NATURAL OBSTACLES

NATURALLY OCCURRING OBJECTS, SUCH AS ROOTS AND ROCKS, WHOSE PRESENCE MAKE THE TRAIL MORE TECHNICALLY CHALLENGING THAN THE SURROUNDING TREAD.

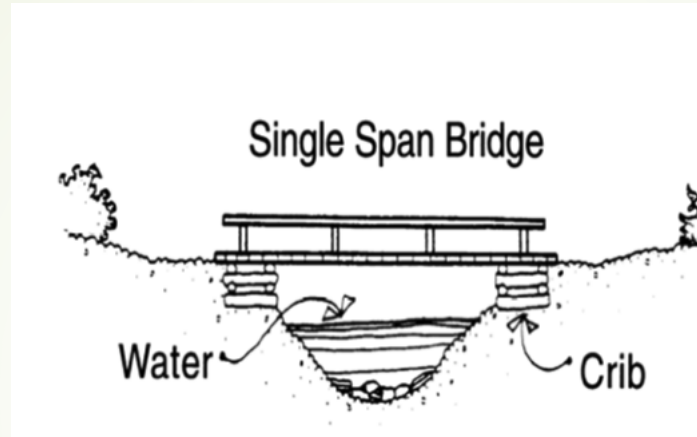


Alsea Falls Trail System
Monroe, Oregon

BRIDGES



Works for bikes and pedestrians, but not horses



Works for pedestrians but not bikes or horses



Figure 5-22—Wearing surfaces are a relatively easy and economical way to prolong the life of bridge decking. The tapered pattern guides stock to the wearing surface in the center of the bridge.

Works for bikes, horses and pedestrians but very expensive to build and very difficult to get materials into site, not fun or interesting for bikers.



Fiberglass bridge in Newark, Del.

**Sample bog crossings:
boardwalks,
stone.**



Bog bridge in Huntington SP , Redding, CT

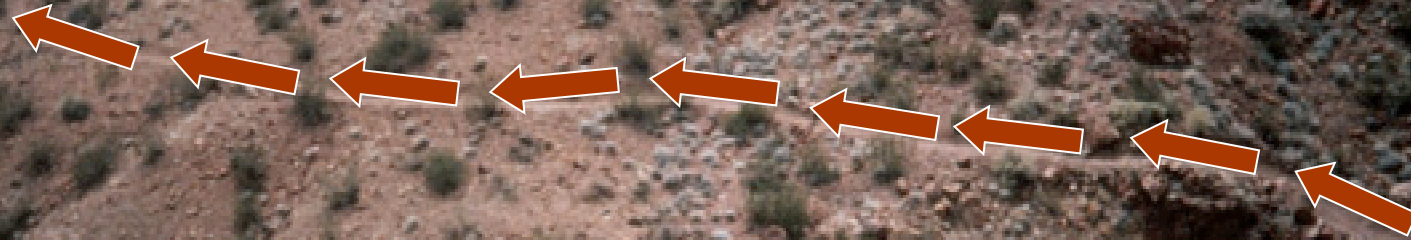
Great for all users- raised tread way



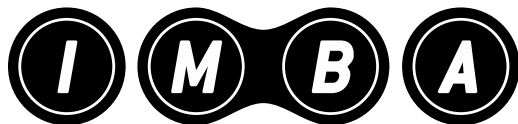
Sample Control Points



The Contour Trail



A pathway that gently traverses across a hill or SIDESLOPE, allowing water to SHEET across the tread, impact-free.



INTERNATIONAL MOUNTAIN BICYCLING ASSOCIATION



SPEAK



BUILD



RESPECT



RIDE

Management Controls

In addition to influencing rider experience, trail features can be integrated into the trail planning and design process to function as a tool to accomplish a range of management objectives, including resource protection. For example, constructing a backslope that is blended with the prevailing slope allows soil to stabilize and vegetation to grow. This reduces erosion and creates a more natural trail feel. It also allows the rider to be more in the center of the trail where the tread is most durable, rather than pushed to the edge. The following illustrations depict trail features that serve the dual purpose of providing for a distinct rider experience while simultaneously achieving important management objectives.


BACKSLOPE

PREVAILING SLOPE TO BACKSLOPE RATIO, FOR SLOPES >20%. VARIES BASED ON SOIL AND VEGETATION, SHOULD APPROXIMATE A NATURAL ANGLE OF REPOSE.



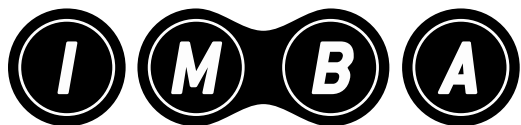


Slope and Grade

- 1) Keep water off the tread
 - 2) Build on the contour and use grade reversals
 - 3) The grade should be no more than $\frac{1}{2}$ the side slope
 - 4) Maximum grade should be 15 %
 - 5) Average grade of no more than 10%
 - 6) The harder the surface, the steeper the grade can be
- 



Poor design, water, and users can cause an undesirable trail.



INTERNATIONAL MOUNTAIN BICYCLING ASSOCIATION



SPEAK




BUILD



RESPECT



RIDE



Problem Solving

- Problem will arise (parking, garbage, after hours riding, unofficial trails)
- Most problems are lessened by being proactive
- Having a community of connected users creates a feeling of ownership and stewardship of the park
- Education vs Law enforcement
- Open lines of communication and involvement of recreational users in the solution
- Replacing negative uses with positive uses
- Meeting the needs of the users for challenge and progression
- Assessing existing trails for sustainability and rehabbing, closing, realigning those trails to meet the goals of the trail system

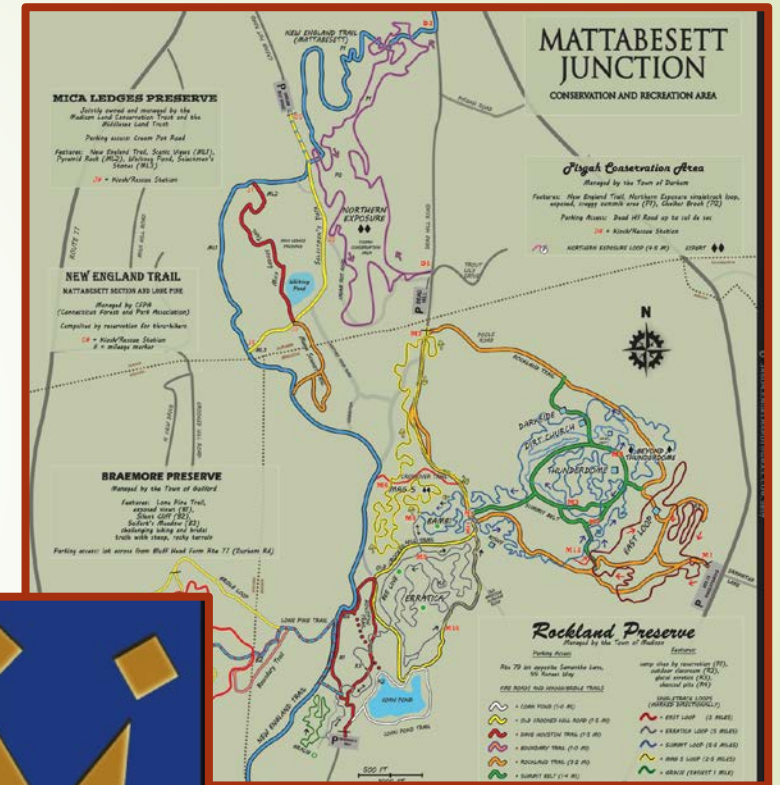
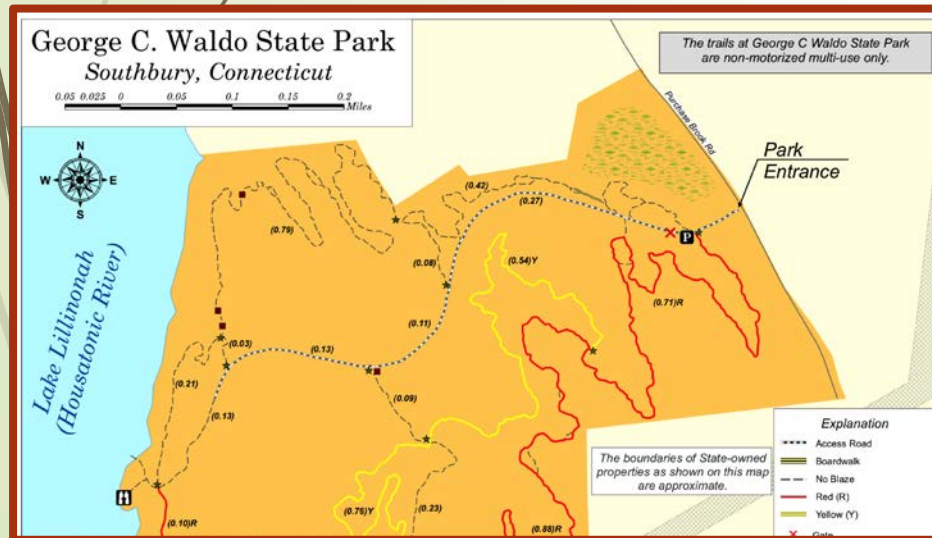


Final thoughts 3-2-1

- Talk to two or three people sitting next to you
- List three concepts you think are important in a quality trail system
- List two methods you might use to increase engagement and create connections among recreational user groups
- List one action you might take in the next three months at your park or open space or forest

Samples of Quality Trail Systems

- Rockland, Madison, CT
- Kingdom Trails, East Burke, VT
- Session Woods, Burlington, CT
- George Waldo, Southbury, CT





Resources

- ▶ Trail Solutions, IMBA's Guide to Building Sweet Singletrack, International Mountain Biking Association
- ▶ Managing Mountain Biking, International Mountain Biking Association
- ▶ Guidelines for a Quality Trail Experience, Bureau of Land Management (BLM)
- ▶ Website :New England Mountain Bike Association NEMBA.ORG
- ▶ Website: STRAVA Heatmap , STRAVA.COM
- ▶ PDF (TRAIL STRUCTURES FOR HIKERS)
https://www.nps.gov/noco/learn/management/upload/nct_ch5.pdf
- ▶ Equestrian Design Guidebook for Trails, Trailheads, and Campgrounds , United States Forest Service