MN DNR's New Trail Planning, Design, and Development Guidelines

Recreational Value and Sustainability through Sound Planning and Design Practices

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Introduction

- Presenter: Jeff Schoenbauer, Brauer & Associates, Ltd. Principle Author and project manager

- Provide a snapshot of new *MN DNR's Trail Manual*
  - Importance of quality
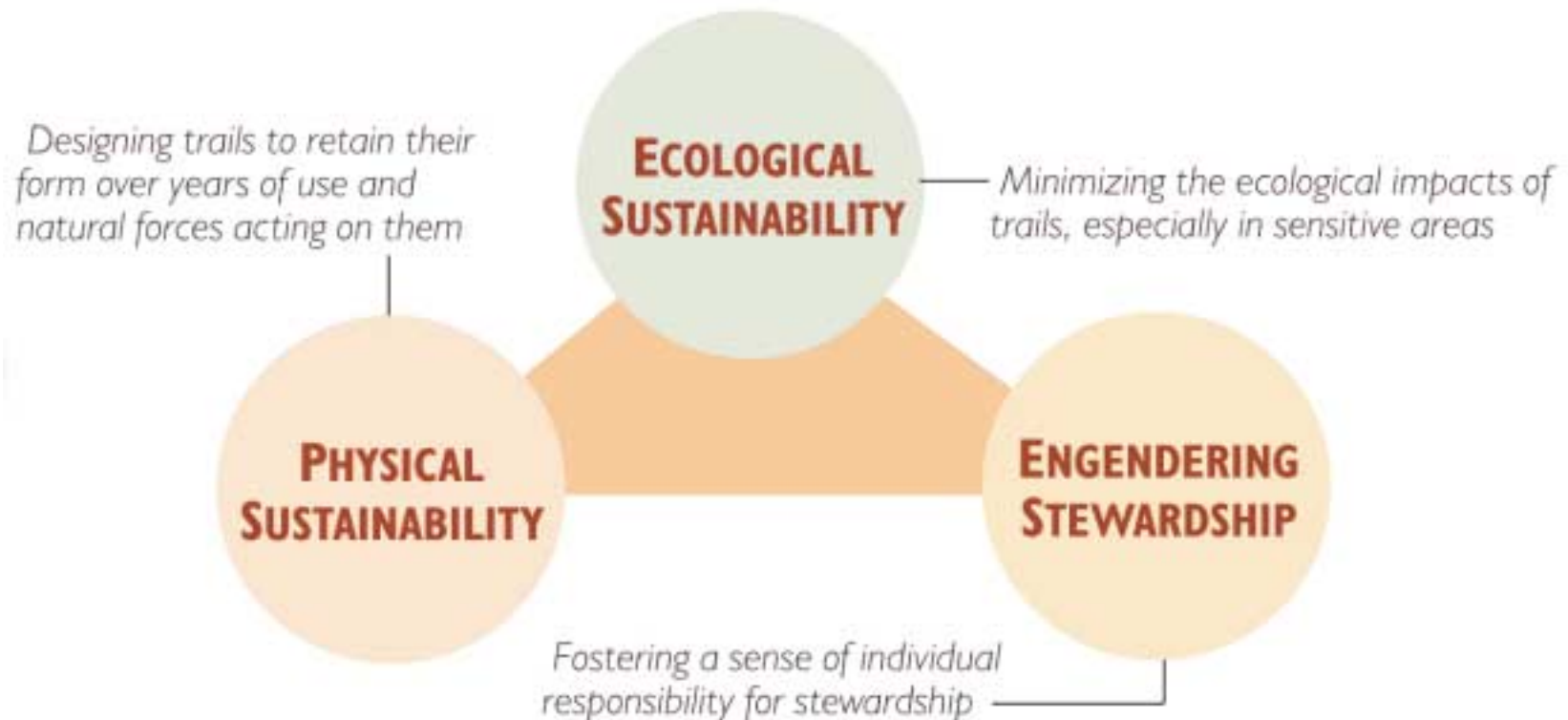 - Importance of sustainability

- **Status: *Publication is now available!***

Overview of Trails Manual Goals

□   Provide a consistent set of guidelines and common language for trails

□   Fill gaps in best practices and techniques

□   Emphasize proper trail planning and design as a means to ensure sustainability

□   **Seven sections** –
1. Planning,
2. Design Principles
3. Ecological Sustainability
4. Trail Classifications
5. Shared Use Paved Trails
6. Sustainable Natural Trail
7. Winter-Use Trails

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Key Factors in Developing Sustainable Trails

Three key factors in trail sustainability:

Designing trails to retain their form over years of use and natural forces acting on them

ECOLOGICAL SUSTAINABILITY — Minimizing the ecological impacts of trails, especially in sensitive areas

PHYSICAL SUSTAINABILITY

ENGENDERING STEWARDSHIP

Fostering a sense of individual responsibility for stewardship

Underpinnings of Sustainability

Sustainability is a function of:

☐ **Properly defining users and their expectations**

☐ Using sound techniques for designing specific types of trails

☐ Respecting the nuances of ecological sustainability and the fact that all development, including trails, have an impact

☐ Using well-tested best practices to build trails

The MN DNR trails manual repeatedly underscores the importance of all of these factors in creating sustainable trails of all classifications

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Principles of Designing Quality Recreational Trails

Paying attention to user values is important to creating enjoyable, safe, and sustainable trails that engender stewardship
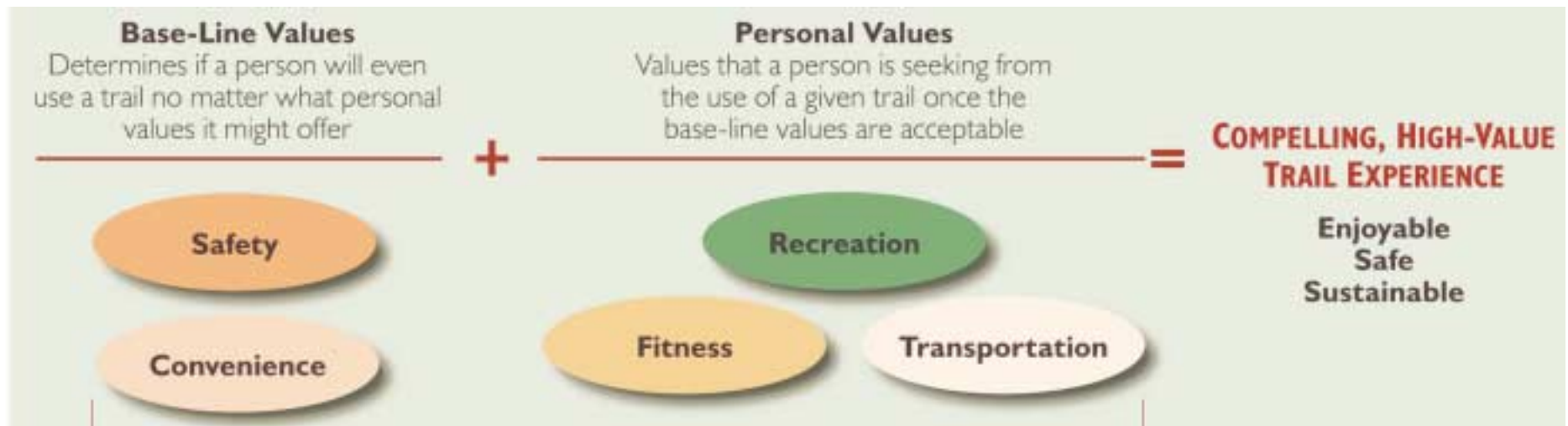
People tend to use and take care of what they value … so design quality does indeed matter!

Example User Profiles – Paved Trail

The needs and expectations can be quite different between trail users!

Trail Use Pattern

Recreation Setting Preferences

Motivation/Activity Style Elements

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User Profiles – Paved Trail

User profiles help define the physical design requirements for a given trail

Ignoring them will diminish the trail's value
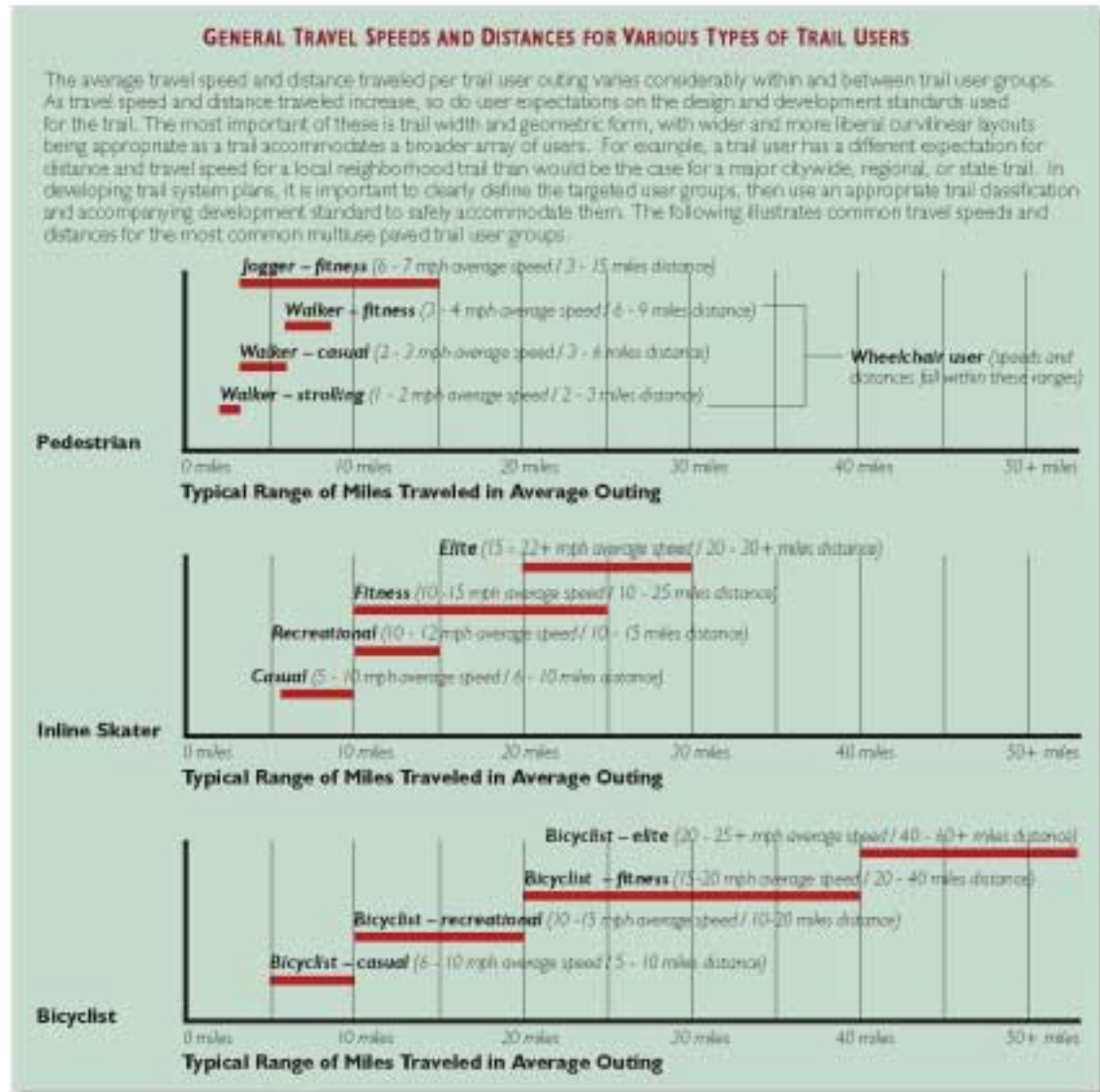
Trail Classifications

Trail classifications help discriminate between different types of trail users

…. and help ensure that the trail that is built will actually meet the needs of the intended user group(s)

TRAIL CLASSIFICATION CATEGORIES

Trails within Minnesota fall into four categories based on type of use, surfacing, location, or season.

Shared-Use Paved Trails
Hard-surfaced trails for non-motorized uses

Natural Surface Trails
Natural-surface trails for nonmotorized and motorized uses

Winter-Use Trails
Groomed trails for nonmotorized and motorized uses

Bikeways
Bicycle routes and lanes that are part of the roadway

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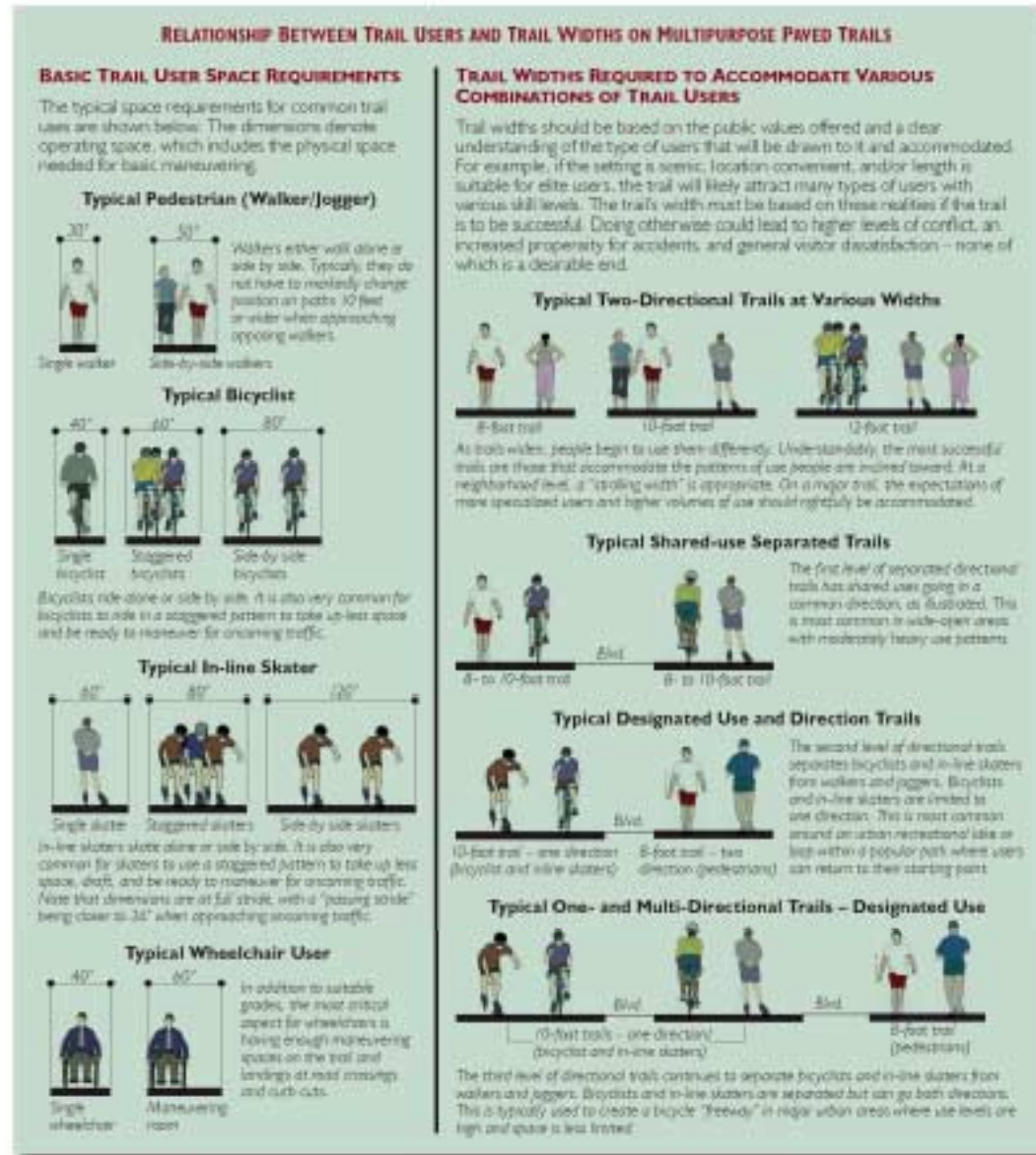LAND USE PLANNING AND DESIGN

Hierarchy of Trails to Accommodate User Profiles

Within each classification, there are other standards to consider

Paved trails:
- ☐ Neighborhood trail
- ☐ City-County trail
- ☐ Regional trail
- ☐ State trail

Sub-Classifications – Shared-Use Paved Trail

Destination trail classification reflects focus on quality and recreational

…. while linking trails offer less recreational value (and often result in less use)

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Example: Oak Grove

PARKS, OPEN SPACE, AND TRAIL SYSTEM PLAN

Example: Oak Grove

Elements of Quality Trail Design

To keep users content, the trail design must:

- Create compelling sequences
- Manage viewsheds
- Be shaped (laid out) consistent with user expectations

All elements of design need to be used to full advantage in creating fun, sustainable trails

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Technical Design – Vital to Long-Term Sustainability

Adhering to sound technical practices and designing around the target user groups is critical to success and sustainability

Shifting Gears – ATV Trails

Understanding the expectations of the trail user is especially important with OHV trails

ATV riders often seek very different experiences:

- Recreational Rider
- Long Distance Rider
- Technical Challenge Rider
- Local Access/Utility Rider
- Excitement Seeker/Careless Rider

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OHV Classifications

OHV classifications helps inform the type of trails needed in a system to meet user demand and foster sustainability

Example: Beltrami County, Northern Minnesota

OHV trail classifications were used as a means to accommodate all user groups in a more sustainable manner

CURRENT SITUATION

FUTURE SITUATION

Formally designated trails are currently very limited and therefore are not available to absorb any of the use pressure!

Designated Recreation Trails

Use pressure becomes more evenly distributed

Forest Access Routes

Forest Access Routes

Restricted Forest Access Routes

Restricted Forest Access Routes
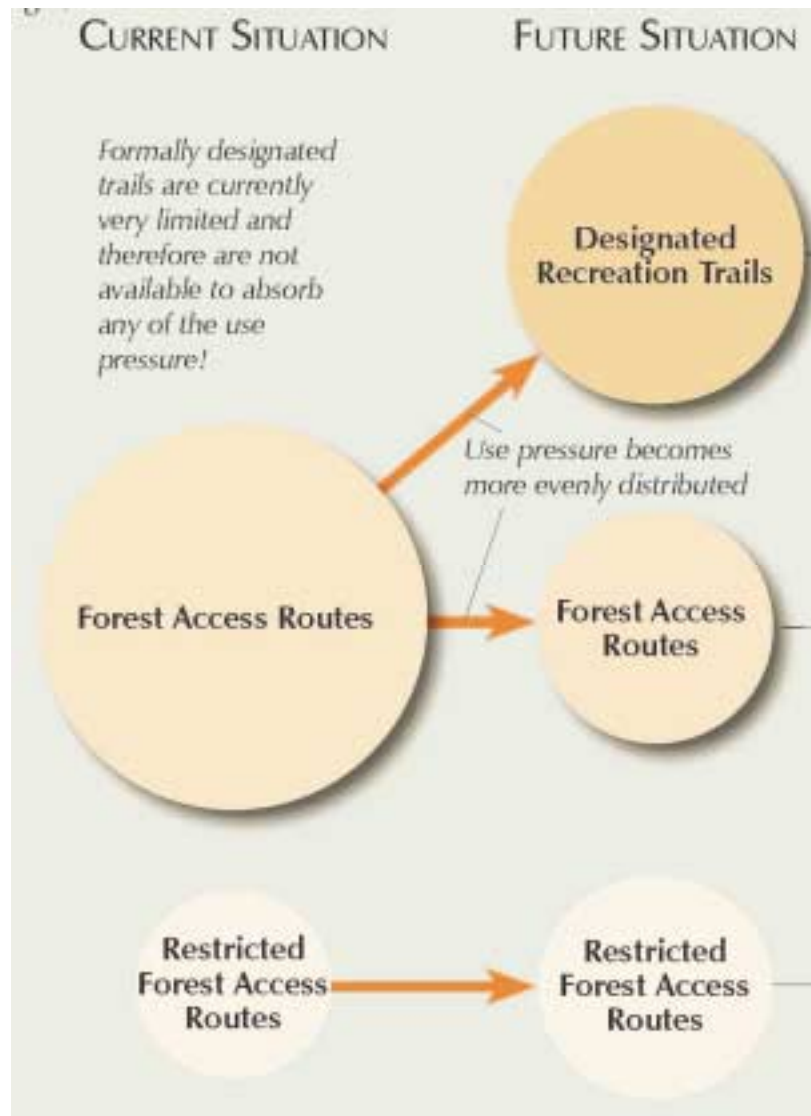
Example: Beltrami County, Northern Minnesota

Intent is to shift ATV use level and intensity out of the forest over to a designated OHV site ……
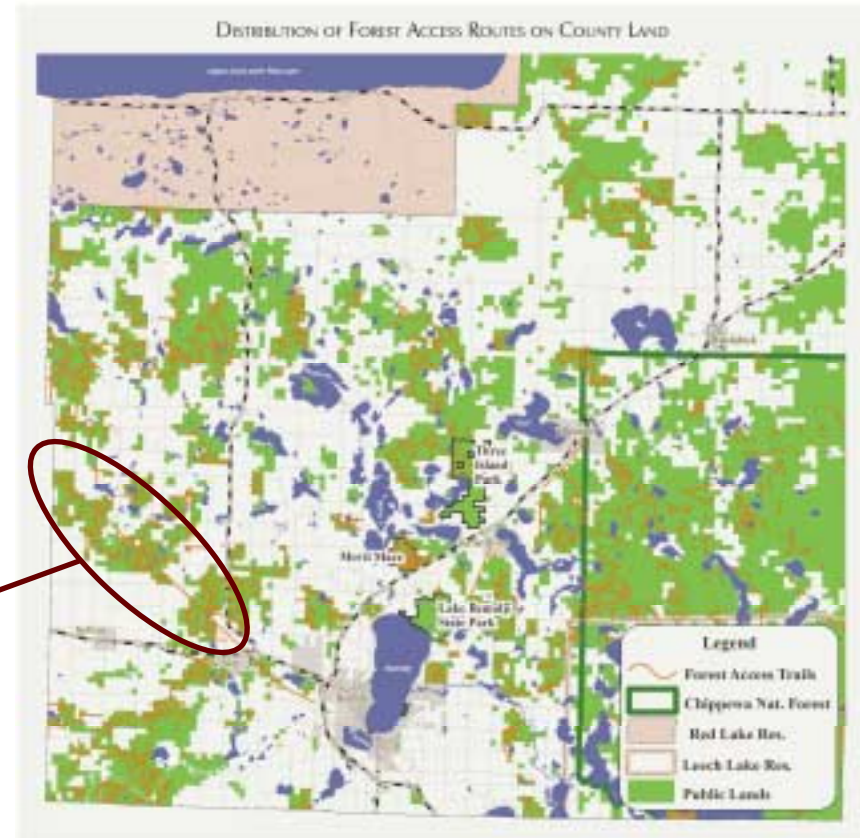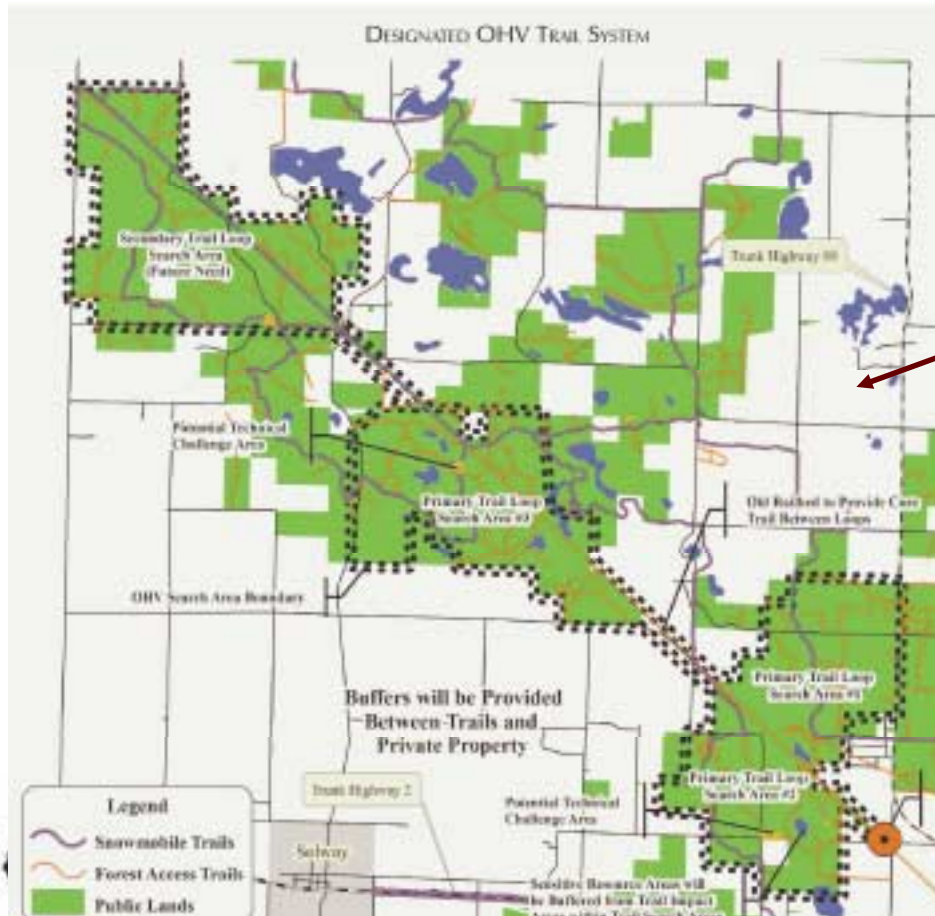
…… then hold users accountable for actions and to retain the privilege of riding in the forest

Example: Beltrami County, Northern Minnesota

Outcomes of reasonably accommodating OHV trail users:

- More aggressive users become more confined and manageable

- User's sense of responsibility goes up

- Peer pressure can be leveraged to help enforce rules

    To leverage peer pressure, responsible users have to be reasonably accommodated and be part of the process …. not outside it and thus being perceived as "part of the problem"

    In turn, responsible users will be more diligent in exerting pressure on abusers in order to preserve their privilege!

Example: Beltrami County, Northern Minnesota

Shifting uses from one trail opportunity to another will only be successful <u>if</u> there is adequate reason for an OHV rider to change their habits – which centers directly on the quality of the experience

Example – OHV Trails

Attention to detail matters…. without which controlling use and tangential ecological impacts becomes much less assured

This….

versus →
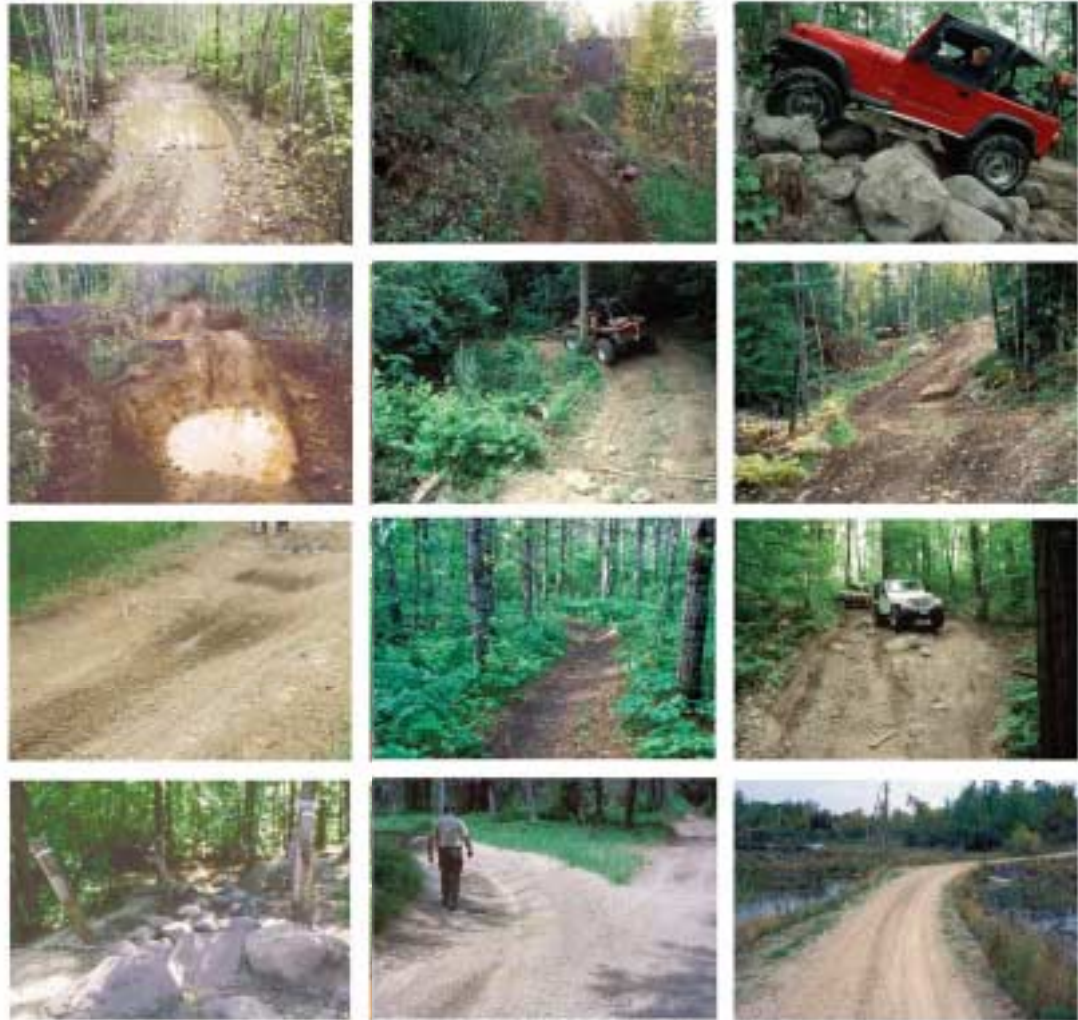
Technical Design – Vital to Long-Term Sustainability

Proper use of rolling grade ensures a trail will be interesting and sustainable

OVERVIEW OF ROLLING GRADE AS THE PRIMARY DESIGN PATTERN FOR NATURAL SURFACE TRAILS

Rolling grade is the primary pattern for designing and building natural surface treads. Rolling grade trails are a series of tread dips, crests, climbs, drainage crossings, and edge buffers. In this illustration, rolling grade is used for portions of a trail traversing a sideslope.

Sideslope (fall line slope). Rolling grade is most effective when the trail is traversing slopes of 20% to 70%. On sideslopes of less than 20%, draining dips becomes more difficult. On sideslopes greater than 70%, traversing the slope with a trail becomes too difficult.

Tread grades. Rolling grade is most effective when tread grade is less than 1/4 to 1/3 of the sideslope (fall-line slope). To avoid drainage problems, no part of the trail should be completely level.

Tread dip. Local low point that drains tread runoff to the downslope side.

Tread crest. Local high points that divide the trail into separate tread segments for drainage control.

Hardened tread. Used where native soils and rolling grade techniques cannot be effective.

Sustainable native tread. Shaped from native soil and rock.

Drainage crossing. All natural drainage channels and swales, no matter how small or intermittent, are crossed with a tread dip. This ensures that site drainage continues on its original course instead of being intercepted and diverted down the trail, resulting in erosion problems.

Tread climb. The steepness and length of the tread is determined by the soil type, type of trail use, and site drainage characteristics.

Edge buffer. Refers to an optional berm or shoulder on the outside edge of the tread. Used to increase the sense of visitor safety on steeper sideslopes. Also relates to general clearance guidelines.

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# Guiding Principles of Ecologically Sustainable Trails

Guiding principles provide the underlying rationale for actions related to protecting, restoring, and managing natural environments associated with trail development

ADHERENCE TO THESE PRINCIPLES WILL ENSURE ECOLOGICAL SUSTAINABILITY

Guiding Principle #1
Avoid Sensitive Ecological Areas and Critical Habitats

Guiding Principle #2
Develop Trails in Areas Already Influenced by Human Activity

Guiding Principle #3
Provide Buffers to Avoid/Protect Sensitive Ecological and Hydrologic Systems

Guiding Principle #4
Use Natural Infiltration and Best Practices for Stormwater Management

Guiding Principle #5
Provide Ongoing Stewardship of the Trails and Adjoining Natural Systems

Guiding Principle #6
Ensure that Trails Remain Sustainable

Guiding Principle #7
Formally Decommission and Restore Unsustainable Trail Corridors

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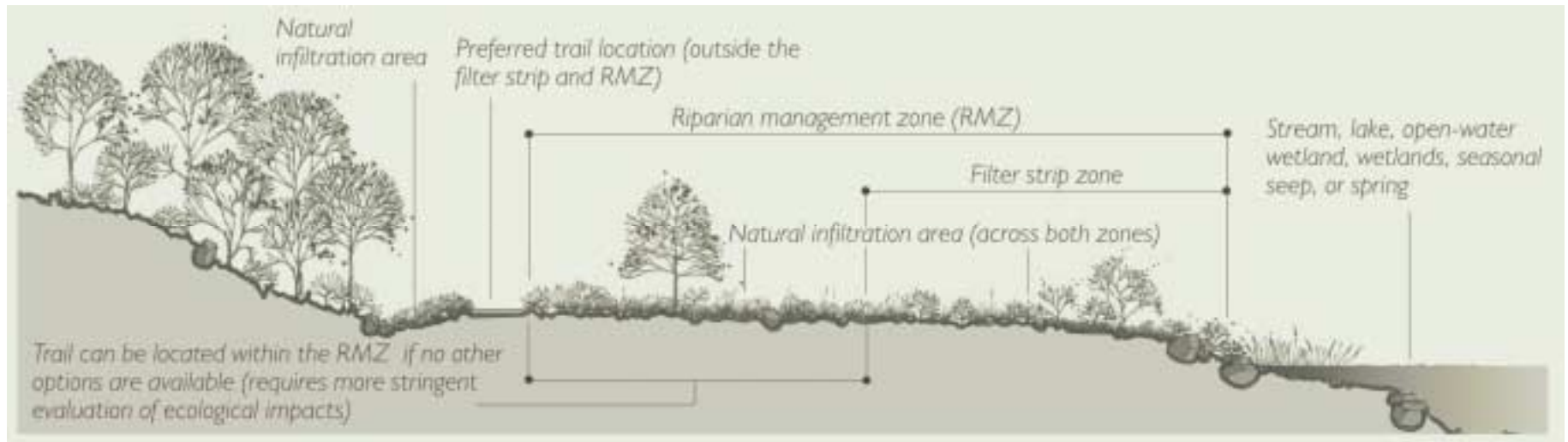LAND USE PLANNING AND DESIGN

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#2 – Trails in Areas Already Influenced by Humans

Trail type and site circumstances affect a trail's location in relation to sensitive ecological areas
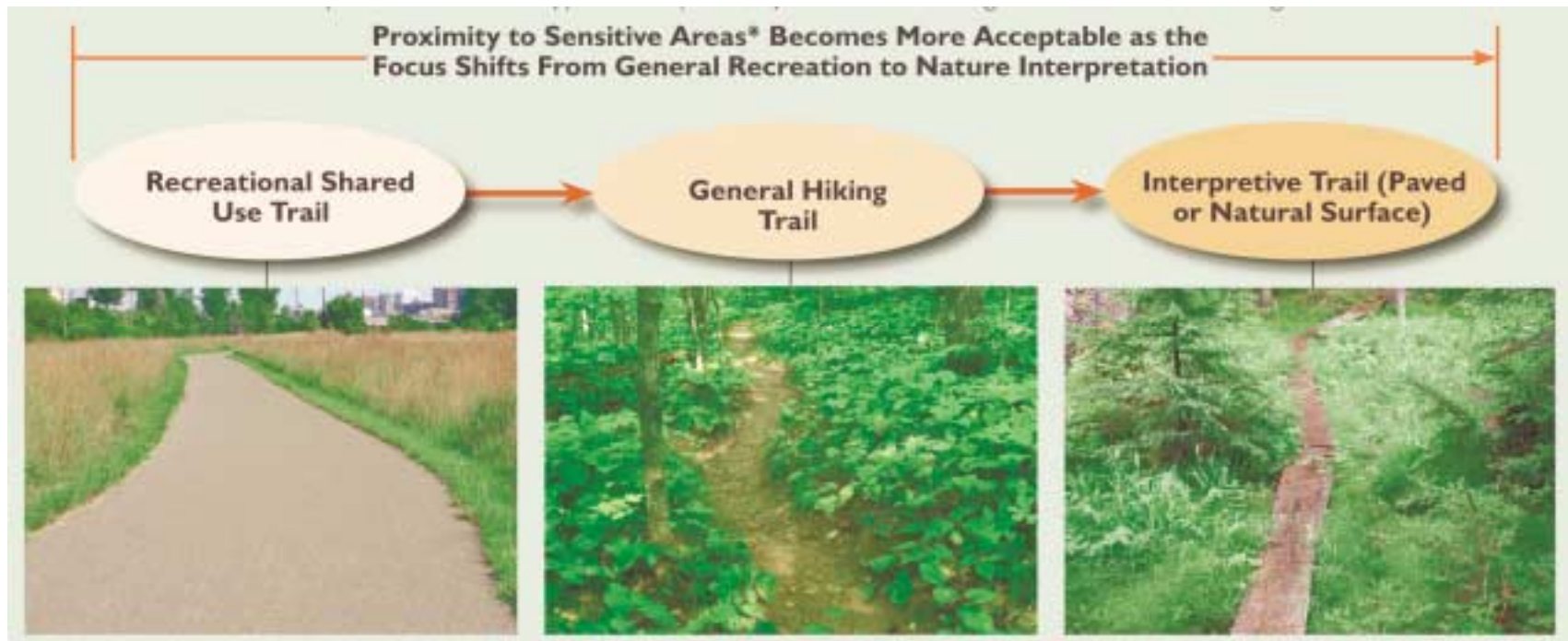
#3 – Provide Buffers to Avoid/Protect Ecological Systems

The use of buffers is important to limit ecological impacts – especially trails prone to erosion and increased site runoff
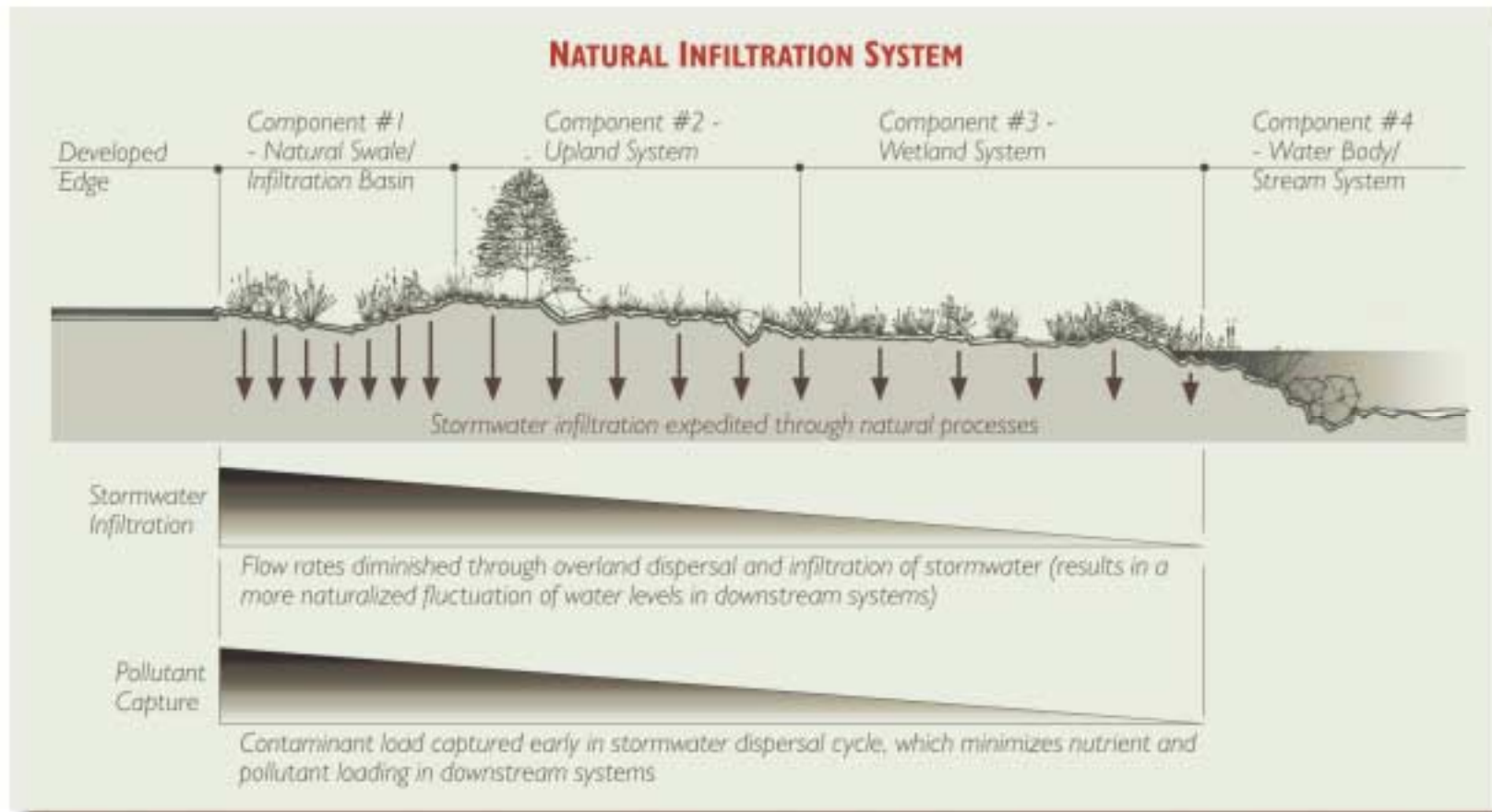
#3 – Provide Buffers to Avoid/Protect Ecological Systems

#4 – Use Natural Infiltration for Stormwater Management

Managing stormwater is one of the most important trail development considerations

#5 – Provide Ongoing Stewardship

The level of stewardship that will be provided should be defined during the planning and design phase because it will affect outcomes

INTENSITY LEVELS ASSOCIATED WITH ECOLOGICAL STEWARDSHIP

Least intensive approach – refers to taking care of existing systems and encouraging the growth of natural communities already in place on a site. Also relies more on natural processes to restore disturbed areas associated with trail construction or to take over once a trail has been closed or realigned – although some remedial work (e.g. grading rutted areas, stabilizing erosion) is often needed to establish the conditions for natural processes.

More intensive approach – refers to undertaking a process of restoring a degraded natural community that is consistent with its original structure and species composition. Areas to be restored usually offer the "basic ingredients" necessary for a natural system to thrive, but the quality of the overall community is less than what it should be. Restoration efforts focus on enhancing what is already present and improving the overall quality and long-term viability of a given natural community.

Most intensive approach – refers to attempting to reestablish natural plant communities on a disturbed site with few, if any, native plant remnants remaining. Of all the approaches, this is the most challenging because it entails reestablishing something that no longer exists in its historic form. A reestablishment approach to stewardship is usually undertaken within the context of an ecological stewardship program for a site that goes beyond that of a trail corridor alone.

MANAGEMENT LEVEL

RESTORATION LEVEL

REESTABLISHMENT LEVEL

#6 – Ensure that Trails Remain Sustainable

All design, management, and maintenance factors influencing a trail's sustainability need to be carefully considered and defined during the planning phase

FACTORS INFLUENCING TRAIL SUSTAINABILITY

Interlinked Factors Associated With the Sustainability of a Trail

Trail Classification + Trail Management + Trail Stewardship (Maintenance)

Thresholds provide
a sense of clarity in
determining if a
trail is sustainable

Each threshold
triggers a
predetermined
action

Unsustainable Use
– Action Mandated

Sustainability of Use
Questionable – Action
Required

Sustainable Use – No
Action Required

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Sustainable use -
no action needed

#6 – Ensure that Trails Remain Sustainable (cont.)

Questionable use – action required

Unsustainable use
– action mandated

Technical Design – Vital to Long-Term Sustainability

Anticipating how trails change over time must be factored into their initial design
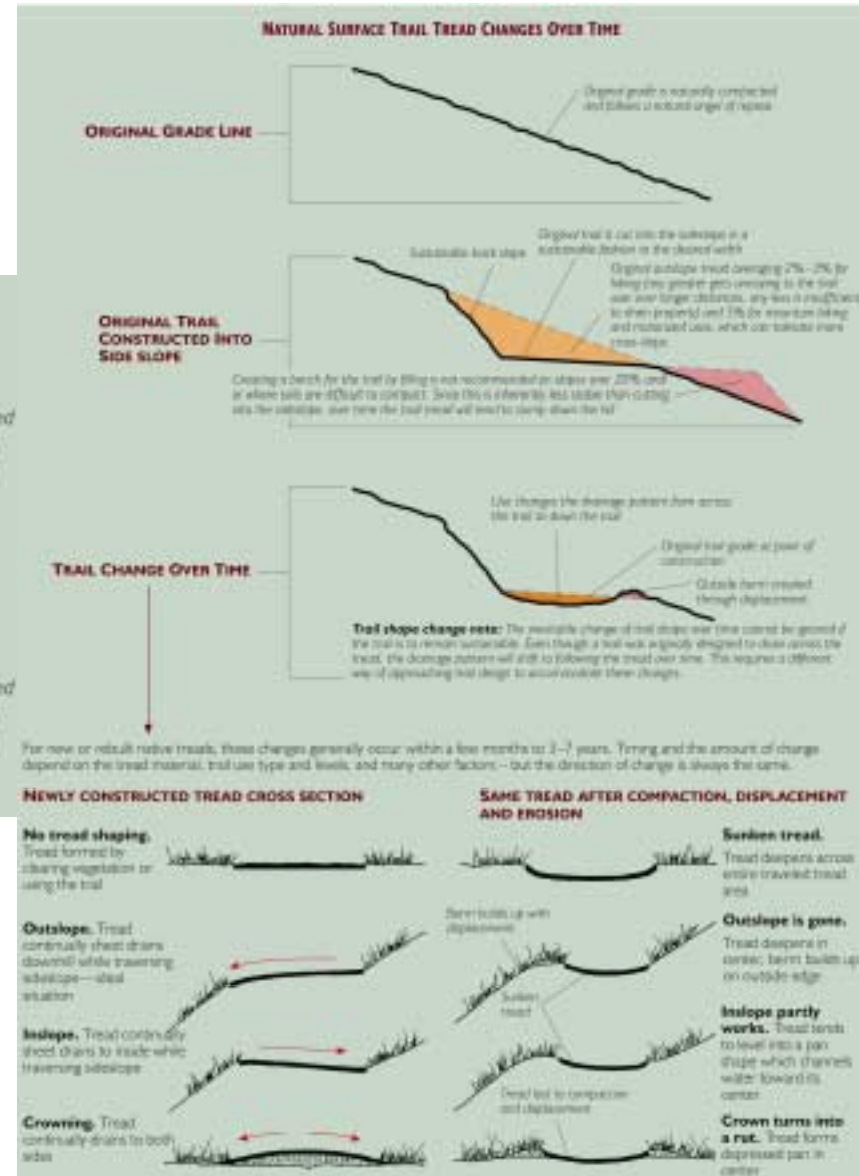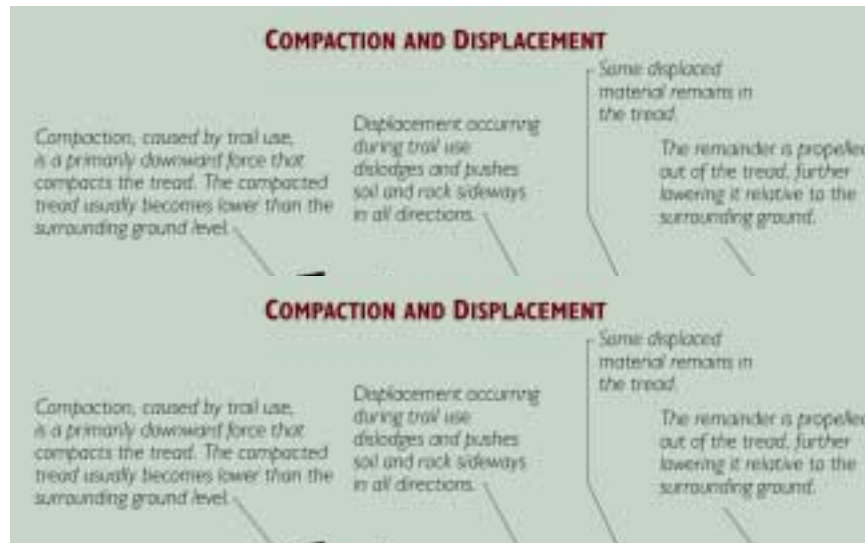
MN DNR Trail Guidelines

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Thank you!

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