# ATV and UTV Trail Guidelines
# Wisconsin Department of Natural Resources

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# TABLE OF CONTENTS



# TABLES AND FIGURES

## Appendix A – Trail detail drawings

- Trail detail 5.0 – Trail cross section (elements)
- Trail detail 6.0 – Trail boardwalk, pier support
- Trail detail 7.0 – Trail boardwalk, pan support
- Trail detail 8.0 – Trail drainage, full bench construction (outsloped tread), contour trail
- Trail detail 9.0 – Trail drainage, crowned tread (flat ground, both sides ditched)
- Trail detail 10.0 – Trail drainage, existing footprint (insloped, ditched uphill)
- Trail detail 11.0 – Vegetative clearing
- Trail detail 12.0 – Typical maintenance

## Appendix B – Resources and references

- DNR Administrative Code NR 44 References
    - Table 1.0: Trail Classifications
    - Table 2.0: Recreational Use Settings
    - Table 3.0: Land Management Classifications
- Wisconsin DNR Wetland General Permit for Recreational Development (https://dnr.wi.gov/topic/Waterways/documents/PermitDocs/GPs/GP4.pdf)
    - Checklist & instructions
- Ford General Permit
- List of resources
- Water ePermitting System Storm Water Permit Application help document (https://dnr.wi.gov/permits/water/documents/ePermittingGuide-ConstructionSite.pdf)
- WisDOT FDM 11-10, Attachment 5.4 – Sight Distance for Crest Vertical Curve (https://wisconsindot.gov/rdwy/fdm/fd-11-10-att.pdf#fd11-10a5.4)
- WisDOT FDM 11-10, Attachment 5.6 – Sight Distance for Sag Vertical Curve (https://wisconsindot.gov/rdwy/fdm/fd-11-10-att.pdf#fd11-10a5.6)

# INTRODUCTION

This guidance is intended to provide a consistent statewide framework for the development of ATV and UTV trails with the goal of managing environmental and social impacts, providing a reasonably safe operating environment for riders and machines, and providing quality recreational experiences. Efforts to build sustainable trail systems should focus on satisfying the broad range of user preferences while applying sound principles of trail design that incorporate physical, social, and ecological capacities. Ideally, a full range of quality riding experiences can be provided throughout the state.

> ***Q. What is a sustainable trail?***
> *A. Sustainable trails are designed, constructed, and maintained for the long term. They are able to be maintained within available resources and do not exceed the capacity of the land on which they are located.*

Providing a quality trail experience involves an assessment of current site condition and a thorough consideration of options. Site factors such as topography, existing road or trail corridors, soil types, amount and type of wetlands, water and road crossings, ownership patterns, surrounding land use, restrictive deed language, and zoning can greatly influence the location, safety, and both the initial development and long-term maintenance costs of a trail system.

On Wisconsin Department of Natural Resources (DNR or department) lands, ATV trails are open to UTVs with few exceptions; on county and other non DNR lands, the decision is made on a case-by-case basis. On trails open for UTV use, the differences between ATVs and UTVs needs to be considered when planning and managing a trail system. On average, UTVs are wider by at least a foot, twice as heavy, and often carry more than one rider. The additional weight and width of these machines needs to be considered both in determining trail width and surface material.

All ATV (hereafter references to ATV shall include UTV unless otherwise indicated) use on DNR lands will be limited to facilities (e.g., trails) designated as open for such use. These facilities may include trails and internal roads. Exceptions to this rule are ATV use as a means of personal conveyance as provided under DNR Manual Code 2527.7[1] for persons with disabilities and for authorized official department business.

This document can be used as a resource when making determinations about ATV use as an appropriate activity on a property ("designated use" in DNR terms) but is not designed to

[1] This is an internal DNR policy. If you are unable to access the link, please request a copy from the department: dnr.wisconsin.gov/contact.

be the instrument used to determine by itself if ATV use is appropriate on a property or not – that should be determined through a planning process.

On department-managed lands, all designated ATV trails will be established following the criteria and process in Chapter NR 64, Wis. Adm. Code and Chapter NR 50, Wis. Adm. Code. This process provides for public review and disclosure of impacts related to ATV trail development and use. The determination for allowed uses on a property, in addition to the five activities automatically allowed on department lands, are determined in accordance with department master planning administrative code (Chapter NR 44, Wis. Adm. Code). The five automatically allowed activities are defined in statute as nature-based outdoor activities (NBOAs – hunting, fishing, trapping, hiking, cross-country skiing; s. 23.0916(1)(b), Stats.). The department master planning process determines the land management activities and recreational settings within each property.

ATV trails on county and other non DNR lands are regulated by local ordinances and plans.

## DEFINITIONS

**ATV:** "All-terrain vehicle" means a commercially designed and manufactured motor-driven device that has a weight, without fluids, of 900 pounds or less, has a width of 50 inches or less, is equipped with a seat designed to be straddled by the operator, and travels on 3 or more low-pressure tires or non-pneumatic tires" (s. 340.01(2)g, Wis. Stats.).

**ATV route:** means a highway or sidewalk designated for use by all-terrain vehicle operators by the governmental agency having jurisdiction as authorized under this section (s. 23.33(1)(c), Wis. Stats.).

**ATV trail:** A marked corridor designated for use by all-terrain vehicle operators by the governmental agency having jurisdiction, but excluding roadways of highways except those roadways not seasonally maintained for motor vehicle traffic (s. 23.33(1)(d), Wis. Stats.). ATV trails prohibit the simultaneous use of ATV/UTVs and public motor vehicles except maintenance and emergency vehicles. Logging operations are permitted provided the trails are properly signed while logging is taking place.

***ATV/UTV Troute:*** *A troute, or hybrid trail (hybrid of a trail and a route), is a classification created for financial purposes only. It is a forest road that allows ATV/UTVs. (SS. NR 64.02(9m) and 64.14(2r), Wis. Adm. Code.)*

**Contour trail: A trail** following the natural topography of the land (contours). Elevation changes are gradual and dependent on the contours of the land the trail traverses.

**Forest road:** Any road constructed and maintained within a forest. Forest roads occur in a broad range of conditions. These can include roads from two way highly developed, with a distinct crown and ditching, to very primitive "two – rut" roads that have one lane of traffic and receive minimal maintenance. Forest roads can be managed in an open state or closed

### *When is a road not a road?*

***The department's definition of a road for the purposes of s. 23.116, Wis. Stats., commonly known as the motorized road access law, defines "road" very broadly, and may or may not mean there is existing public, "street vehicle" access. It generally refers to a "linear feature" that is currently drivable, may be drivable in the future, and was driven on in the past. This is a more broad definition than "highway" (s. 340.01(22), Wis. Stats.), which is the common terminology outside of the department's implementation of s. 23.116, Stats. Other jurisdictions may have their own definition. For example, the Washburn County Forest Plan defines a road as "a mapped road constructed by leveling or grading, originally intended to provided motorized vehicle access by cars, trucks or other equipment."***

**Forest road (cont.):** off and only re-opened when needed for a timber sale. *Note: When adding ATV/UTV use to an existing forest road, the current condition and expected use levels must be considered. Needed improvements may be as simple as adding appropriate signage or may require considerable improvements based on their current state. In determining what improvements are needed the same criteria used in considering a new trail would be appropriate.*

**Highway:** All public ways, thoroughfares, and bridges. It includes the entire width between the boundary lines of every way open to the use of the public as a matter of right for the purposes of vehicular travel. It includes those roads or driveways in the state, county or municipal parks, and in state forests which have been opened to the use of the public for the purpose of vehicular travel. s. 340.01(22), Wis. Stats.

**Intensive Use Area:** A place (park) designed, developed, and managed for use by multiple off-highway motorized vehicles (generally including motorcycle, ATV, UTV), and the place is operated by an entity or entities that perform maintenance and upkeep on a regular basis during the riding season. This area will have tracks and trails offering varying levels of difficulty and appeal to riders of diverse skill levels. Single direction traffic management is often preferred.

**Land disturbing activity:** Any man-made alteration of the land surface resulting in a change in the topography or existing vegetative or non-vegetative soil cover that may result in storm water runoff and lead to increased soil erosion and movement of sediment into waters of the state. Land disturbing construction activity includes clearing and grubbing, demolition, excavating, pit trench dewatering, filling, and grading activities.

**Managed use:** Trail use(s) actively managed

## Resources

Recommended publication for intensive use area development

- Fogg, George E. 2002. Park Guidelines for OHVs. National Recreation and Park Association.

Recommended publications for motorized trail development include

- Duford, Dick 2015. Great Trails: Providing Quality OHV Trails and Experiences. National Off-Highway Vehicle Conservation Council.
- Meyer, Kevin G. 2013. Designing Sustainable Off-Highway Vehicle Trails. USDA US Forest Service.
- Wagner, Carmen and Holaday, Steve 2010. Best Management Practices for Water Quality. Wisconsin Department of Natural Resources.

Recommended web applications

- WIDNR Surface Water Data Viewer: www.dnr.wi.gov, keyword "SWDV"

and appropriate for a trail based on its design and management. Differs from "designed use" which is the managed use of the trail requiring the most demanding design. Both managed use and designed use may differ from the allowed uses on a trail. Trails have the ability to allow multiple uses; however, the managed uses for a trail may not include all allowed uses. Further, the result of the designed use combined with the breadth of allowed uses may not result in the desired user experience for all allowed uses.

**Trail corridor**:The trail tread plus the clearing limits on either side of ("cleared width") and above ("cleared height") the tread. This area should be free of brush and obstacles.

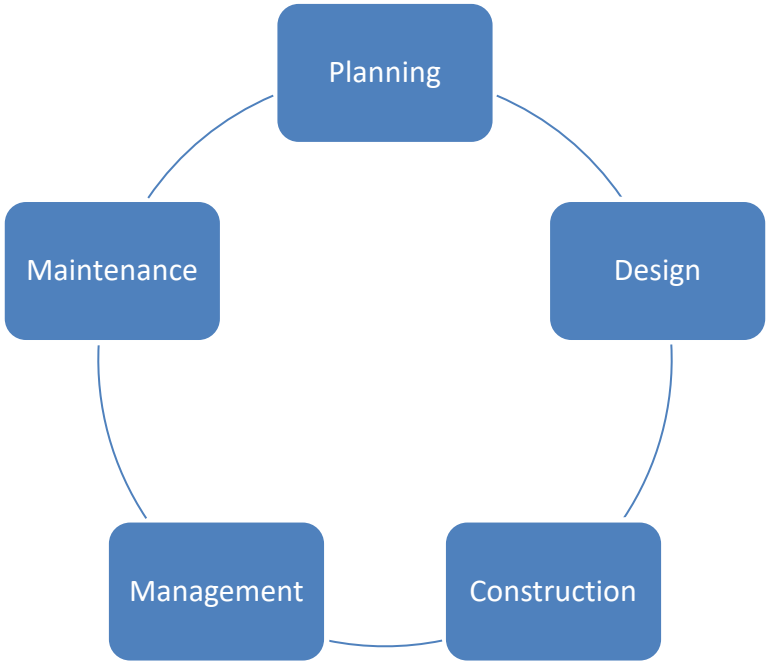
**Trail tread**:The portion of the trail corridor upon which trail use is designed to take place.

**UTV:** "Utility terrain vehicle" means any of the following:

1) A commercially designed and manufactured motor driven device that does not meet federal motor vehicle safety standards in effect on July 1, 2012, is not a golf cart, low-speed vehicle, dune buggy, mini-truck, or tracked vehicle, is designed to be used primarily off of a highway, and has, and was originally manufactured with, all of the following:
   a) A weight, without fluids (i.e., dry weight), of 3,000 pounds or less.
   b) Four or more tires.
   c) A steering wheel.
   d) A tail light.
   e) A brake light.
   f) Two headlights.
   g) A width of not more than 65 inches as measured laterally between the outermost wheel rim on each side of the vehicle, exclusive of tires, mirrors, and accessories that are not essential to the vehicle's basic operation.
   h) A system of seat belts, or a similar system, for restraining each occupant of the device in the event of an accident.
   i) A system of structural members designed to reduce the likelihood that an occupant would be crushed as the result of a rollover of the device.
2) A commercially designed and manufactured motor driven device to which all of the following applies:
   a) It does not meet federal motor vehicle safety standards in effect on July 1, 2012; is not a golf cart, low-speed vehicle, dune buggy, mini-truck, or tracked vehicle; is designed to be used primarily off of a highway; and has, and was originally manufactured with, a weight, without fluids, of not more than 3,000 pounds.
   b) It has a width of 65 inches or less as measured laterally between the outermost wheel rim on each side of the vehicle, exclusive of tires, mirrors, and accessories that are not essential to the vehicle's basic operation.
   c) It is equipped with a seat designed to be straddled by the operator.
   d) It travels on 3 or more tires.
   e) It is not an all-terrain vehicle, as defined in s. 340.01 (2g).

s. 23.33(1)(ng), Wis. Stats.

# TRAIL VISIONING




**First things first. Think about the following.**

- **Planning**
  - What does the master plan or other type of property plan say? What sideboards or constraints already exist? What resources are available? Why does this trail need to be built?
- **Design**
  - Who will the users be? What's feasible on the ground? What water resources may be impacted – can they be avoided?
- **Construction**
  - Who will perform construction? How detailed do construction instructions need to be? How will it be funded?
- **Management**
  - Who will manage the day-to-day? Who will be eyes and boots on the ground? Who will handle law enforcement?
- **Maintenance**
  - How will the trail be maintained? By whom? With what equipment? How big is that equipment?

# TRAIL PLANNING

The first steps in planning a trail are to determine the trail's **purpose and objectives**. Why do we want this trail? Who will use the trail? What needs will the trail meet? (Examples of needs a trail could be intended to meet: local economic development, regional recreational demand, transportation, connectivity.) Next, is the trail **concept** – generally, where will the trail go. How will it be managed, maintained, constructed, and funded? Funding considerations should include initial investments and long-term maintenance needs. This can be dictated by a number of factors, but available resources for construction, maintenance, and management should be key factors.

A trail, or trails, cannot provide every type of experience desired by diverse user groups. Take time to consider and determine what kind(s) of trail you are going to provide – what will the allowed uses be, what will the managed and designed uses be? Further, recognize and acknowledge this will likely not result in the ideal experience for all of the allowed trail uses.

The excerpt below represents the viewpoint of some motorized trail entheusiasts. There are many other viewpoints to consider when planning a trail, on both the user side as well as trail management and maintenance. Factors such as available resources, trail concept, and setting must be looked at wholistically when determining the kind of experience to be offered and maintained on a trail.

***One user's perspective…***

"User preferences need to be a principal concern when managing recreational trails. We must strive to provide the full range of quality experiences that riders want to enjoy.

"Doctrine requires that trail systems be designed with varied opportunities based on user preferences that are broadly part of ATV and UTV riding. Managers must understand and account for user preferences that go beyond the desires of the local land manager or the local club that is affiliated with the trail. The goal is to provide the desired range of riding experiences proximate to where people live. To have a trail system that only offers a single narrow range of riding experiences does not serve riders or the program well. This problem is exacerbated when neighboring trail systems also offer the same narrow range creating what is essentially a large and uniform regional trail system that ignores the desires of a significant number of riders.

"Within the physical, social, ecological, and facility capacities of a trail system, it is important to recognize and pursue the varied preferences of trail users. Ecological concerns can be managed to accommodate the more challenging trail preferences. People buy off-road recreation vehicles to use their off-road capability. Over-developing trails detracts from this experience.

"Providing for the full range of preferred rider experiences should be the first concern. Our efforts to build a sustainable and otherwise sound trail system should be focused on satisfying the broad range of user preferences while applying sound principles of trail design to account for the physical, social, and ecological capacities of the system."

Planning efforts should include considerations for addressing increasing levels of use over and above planned traffic volumes. Not every trail should seek a high level of use. However, recognize the reality that "if you build it, they <may> come." Be up front with users about the kind of experience your trail seeks to provide. Riders can and will travel to meet preferences. Consider the bigger context in your region – are other trail types or challenge levels are offered in the area? Is it likely that users will seek the same or different types of experiences? Decide and document these decisions to avoid unmanageable "mission creep" with the purpose of your trail, which can lead to an unmaintainable situation. Seek resources within and outside of the department. A trail, or a certain type of trail, may only be feasible if you partner with other providers or with user groups on maintenance, for example.

The type of trail must be appropriate for the trail's location. Trail planning must incorporate local trail classifications and potential designations for recreational uses with the property or unit. Many public land agencies incorporate these classifications into local and regional planning documents. On private lands, landowner desires and objectives need to be considered. All DNR lands have assigned trail classifications, recreational use settings, and land management classifications (see Appendix B, DNR Trail

Classifications and Recreational Use Settings). For non-DNR public lands, the local land manager should be consulted for classifications.

Planning a quality ATV trail involves an assessment of current site condition and a thorough consideration of options. Site factors such as topography, existing road or rail corridors, soil types, amount and type of wetlands, water and road crossings, ownership patterns, surrounding land use, restrictive covenants, and zoning can greatly influence the location, safety, and the initial development and long-term maintenance costs of an ATV trail system. During the planning process, access and maintenance considerations must be addressed. Trails must be wide enough for required maintenance machinery to travel along the trail for grading and excavation work, for placement of gravel or other surfacing, and for installation of culverts and bridges. Visitor parking and highway access will also need to be addressed at this stage.

## *New Trails*

One of the first elements to consider when planning a new trail is to identify the type of trail use to be served. A trail running between communities serves as a connector route, allowing trail users a convenient and fast route to access retail services and other trail riding destinations.

Destination trails usually provide a network of trails within a property, allowing riders to experience a variety of trail riding challenges and sightseeing opportunities. Different trail types are laid out variously to provide challenges based on the rider skills, ranging from casual riders to expert technical riders.

Any land-disturbing activity, from installing sign posts by hand to constructing new trail with heavy machinery, requires a call to Diggers Hotline, a free service that will identify underground utility lines. Mark the location where work will take place and then call Digger's Hotline at 811 or 800-242-8511 at least three working days prior to work.
→ **diggershotline.com**

## *Existing Trails*

Over time, regular trail use will shed light on problem areas such as trail rutting, loss of surfacing at corners, or areas not draining properly. When planning for existing trail upgrades, a comprehensive approach is recommended to improve the trail user experience. Enhancements to consider include increasing the radius of corners, widening the trail width at corners, and adding gravel or other hardening at the corner. Trail surfacing is often needed to improve ride quality and widen the trail to meet current width standards. Improvements to address drainage problems can include ditching along the edge of the trail and re-grading to enhance water movement away from the trail. Keep in mind that any old railroad grades and public property have buried utility lines.

ATV and UTV Trail Guidelines – Wisconsin DNR

It is important to evaluate existing forest roads for suitability when planning designation as ATV/UTV trails. Many older forest roads were constructed primarily for timber harvest activity and for short term use, so they may not support the traffic demand of an ATV/UTV trail. Reconstruction and upgrades may be necessary.

**HELPFUL HINT**: Avoiding water resources is always the best alternative. Rerouting or initially designing trails to avoid waterways, wetlands, floodplains and other sensitive areas can decrease project time and cost (permitting and structures) and long-term maintenance needs (costs and labor), as well as helping to protect the resources by minimizing impacts.

# PERMITS

**Waterway and Wetland Regulations:** Wetlands are nurseries for fish and wildlife, purifiers for lakes, rivers and groundwater, and storage for floodwaters. Local, state, and federal wetland regulations are in place to help protect these important landscape features. The DNR regulates the placement of fill in wetlands such as soil, gravel, construction materials, woodchips or other materials. The DNR also regulates many waterway activities to maintain water levels and flows, protect lake and stream habitat, and keep streams free of navigational obstructions. Designing projects to minimize waterway and wetland impacts can not only streamline the regulatory process and reduce environmental impact, but also reduce maintenance costs associated with trail subsidence and washout.

If your trail project may impact a wetland, a wetland delineation may be required. There will likely be clues such as the presence of water-loving plants around a trail location or near wetlands, but only a professional wetland delineator can verify wetlands and establish their boundaries. Knowing the boundaries of a wetland is essential to be able to properly permit a trail project.

Many regulated activities, such as installing bridges or culverts or impacting wetlands, have general permits for projects that fit certain criteria. Your best bet is to try to design your project to fit the criteria of these general permits. If you do not, an individual permit may be reqired. General permits are granted for projects meeting pre-speficied design, construction, and location requirements. Requirements and fees for individual permits are more extensive. A summary of fees can be found online (https://dnr.wi.gov/topic/waterways/documents/PermitDocs/feesheet.pdf). Permit information is available here (https://dnr.wi.gov/permits/water/).

**Repairing existing trails:** Did you know that previously permitted trails and support structures can be maintained or replaced within the existing trail footprint without the need for additional wetland or waterway permitting? In-kind replacement or repair of previously permitted infrastructure does not require permitting. Contact your local water management specialist for more information. Information about existing permits can be found in the Surface Water Data Viewer.

**Identifying Waterways and Wetlands:** The first step to make strategic planning decisions for the trail system is to know where navigable waterways and wetlands are on the property. Wisconsin's surface water data viewer provides reconnaissance level information to begin. On-site investigation is important to confirm navigable waterways and wetland boundaries.

- *Navigable waterways* have a defined bed and bank with a waterway flowing on a reoccurring basis at sufficient volume to float a personal watercraft.

- *Wetlands* have one or more of three components: wet soils, plants that grow in wet conditions, and the seasonal presence of enough water to support those plants.

If you are unsure whether a waterway on your property is navigable or a portion of your

**HELPFUL HINT:** The department's Surface Water Data Viewer is an excellent web-based interactive mapping tool for a variety of data including existing permits, mapped wetlands and wetland inidcators, mapped floodplains, and soil types. Check it out!

➔ https://dnr.wi.gov/topic/surfacewater/swdv/

property is a wetland, the Wetland Identification Program provides helpful information. Wetland screening and delineation procedures guidance may also be a helpful document.

## *Examples of navigable waterways*

## *Examples of wetlands*

**Q:** When do waterway regulations affect your trail project?
**A:** Anytime part of the project disturbs the waterway below the ordinary high water mark (OHWM) of a navigable water. Michigan DNR has a video that explains OHWM(https://youtu.be/9li40DGxRNE). Sometimes, above the OHWM is wetland. This can come into play with bridge approaches, which can require a separate permit for wetland disturbance (*see Wetland disturbance section*).

Find out more about waterway protection. → https://dnr.wi.gov/topic/waterways/

Find your Water Management Specialist (https://dnr.wi.gov/topic/Waterways/contacts.html).
General questions about the waterway and wetland program? Email DNRWMSPublicInquiry@wisconsin.gov.

## *Waterway Crossings*

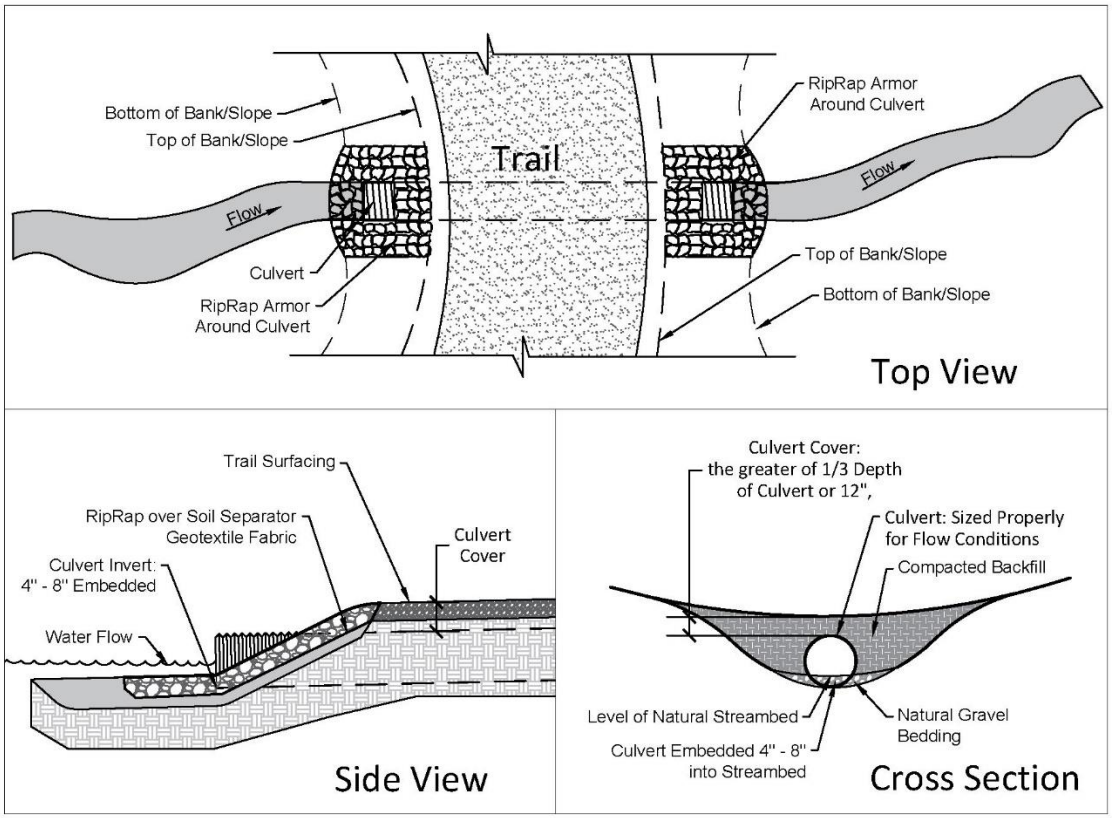
To select an appropriate waterway crossing structure, consider the grade, width, and turns needed to accommodate not only the trail uses but also maintenance equipment. Load rating should be based on anticipated trail maintenance equipment weight for all designated trail uses, as this will be the heaviest anticipated load. It is also important to consider how the structure will intersect with the waterway:

- Look for a straight section with natural narrowing and moderate flows.
- Do not place a crossing near a sharp bend in the stream or river channel.
- Try to maintain the natural waterflow and path when placing the crossing.

- If possible, all bridges and fords should cross at right angles to the water feature or flow to minimize environmental impact, provide a safe crossing, and reduce costs.

***Culverts:*** Culverts are one of the most popular ways to cross small streams or narrow connections between lakes. In order to minimize the impact a water crossing has on the environment, culverts require the proper size, design, and installation to ensure they don't cause erosion downstream, flood upstream properties, alter stream habitat, or block aquatic organism passage. Culverts also require maintenance over the long term. If a culvert is no more than 20 square feet in area and is not located on land designated as a public rights feature, a general permit is available. Otherwise, an individual permit may be necessary. Visit this website for more information.

***Trail Detail 1.0: Example Culvert Design***



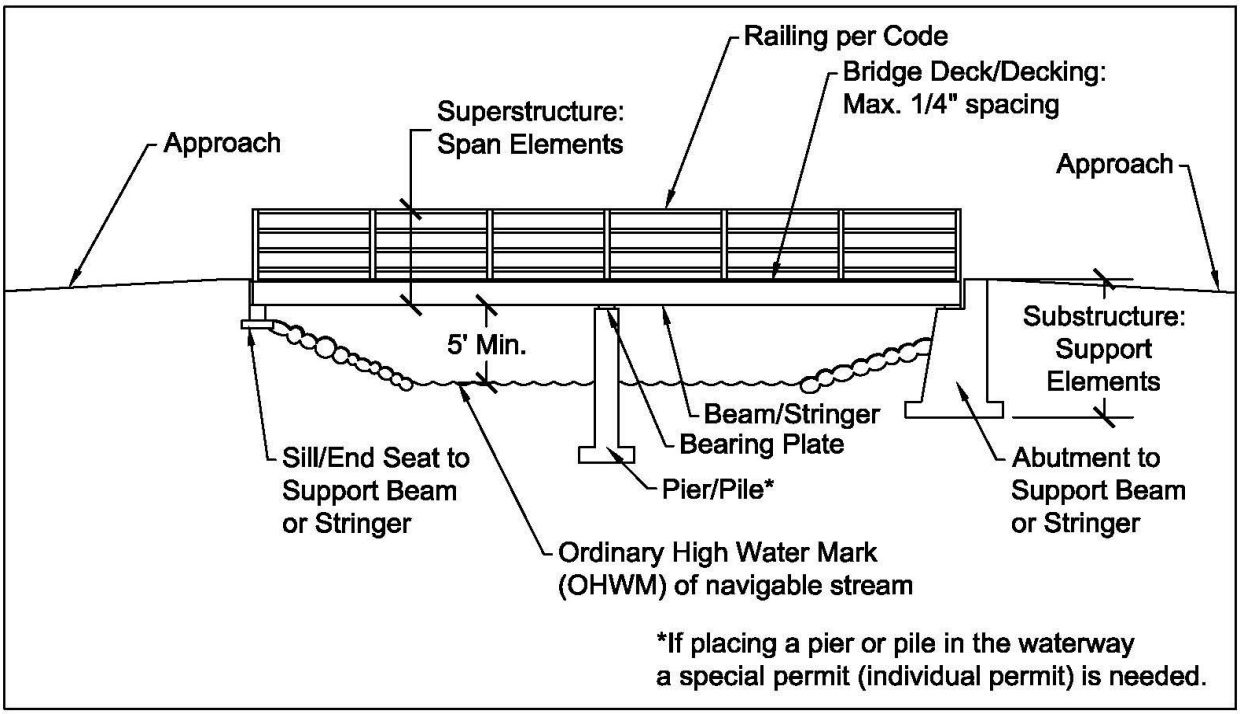

HELPFUL HINT: A perched culvert occurs when the elevation of the culvert outlet is higher than natural water level of the stream or channel creating a freefall condition. A perched culvert is an incorrectly installed culvert and can lead to resource impacts as well as trail maintenance issues. Perched culverts have significant impacts on fish and aquatic life by impeding their movement and migration in streams and waterways. Proper culvert design and placement is *critical* to avoid these adverse impacts.

***Bridges:*** Bridges are the most effective and environmentally friendly way to cross water. A waterway general permit is available for bridges spanning a waterway is less than 35 feet wide with no support pilings in the waterway below the Ordinary High Water Mark (OHWM). Other larger bridges may require individual waterway permitting. Here are some factors to consider when designing a bridge crossing:

- Bridge clear width for those funded with ATV registration grant funds (ATV trail aids) must be a minimum of eight feet, 10 feet on railroad grades (NR 64.14 (8)(b), Wis. Admin. Code).
- Bridge load rating for ATV/UTV trails is generally 14,000 pounds.
  - *Note that the DNR's snowmobile trail aids program requires a bridge load rating of 25,000 pounds to accommodate heavier grooming equipment.*

- If possible, choose a site with upland (higher) banks as opposed to a sectional with a wetland edge. This will minimize the impacts to wetland along the stream.
  - Navigable waters typically require five feet of navigation clearance (top of water to lowest chord [part] of the bridge).
  - State administrative code allows grant funding for bridges up to 14,000 pounds. Variances are granted for up to 25,000 pounds.
  - Bridges on DNR lands are to be inspected in accordance with DNR policy.
  - Load ratings (weight limits) should be posted on every bridge in a visible location on both ends of the bridge.
  - **Trail maintenance equipment, including attachments (weight, width, etc.) must be considered.**

***Trail Detail 2.0: Illustration of Basic Bridge Design Elements***

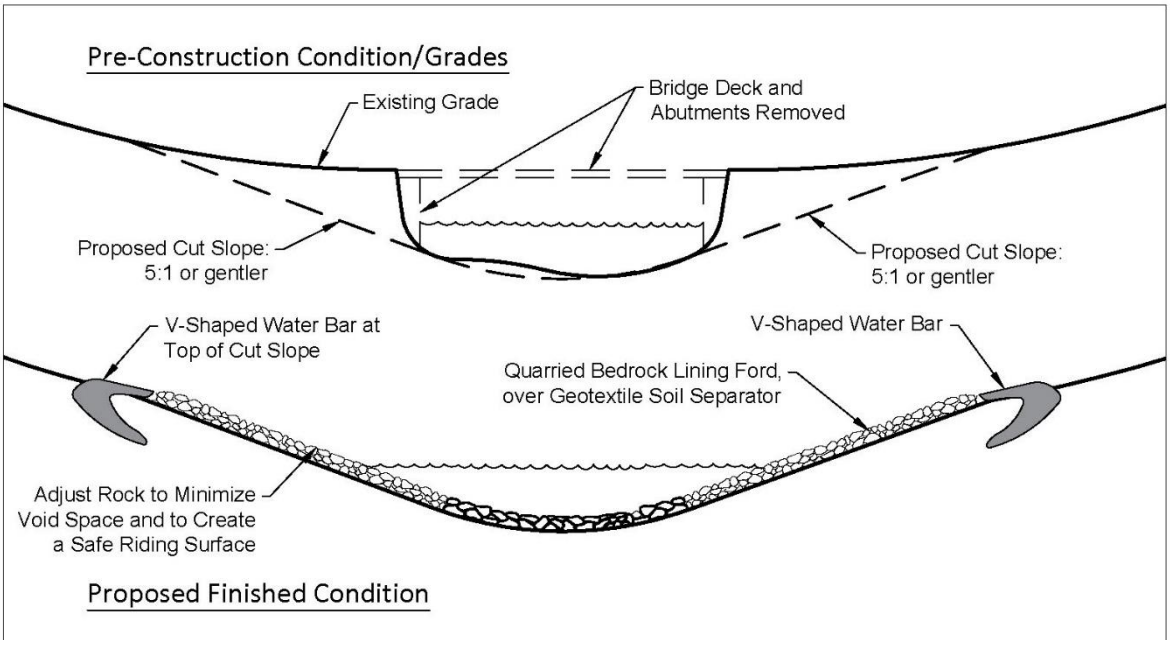


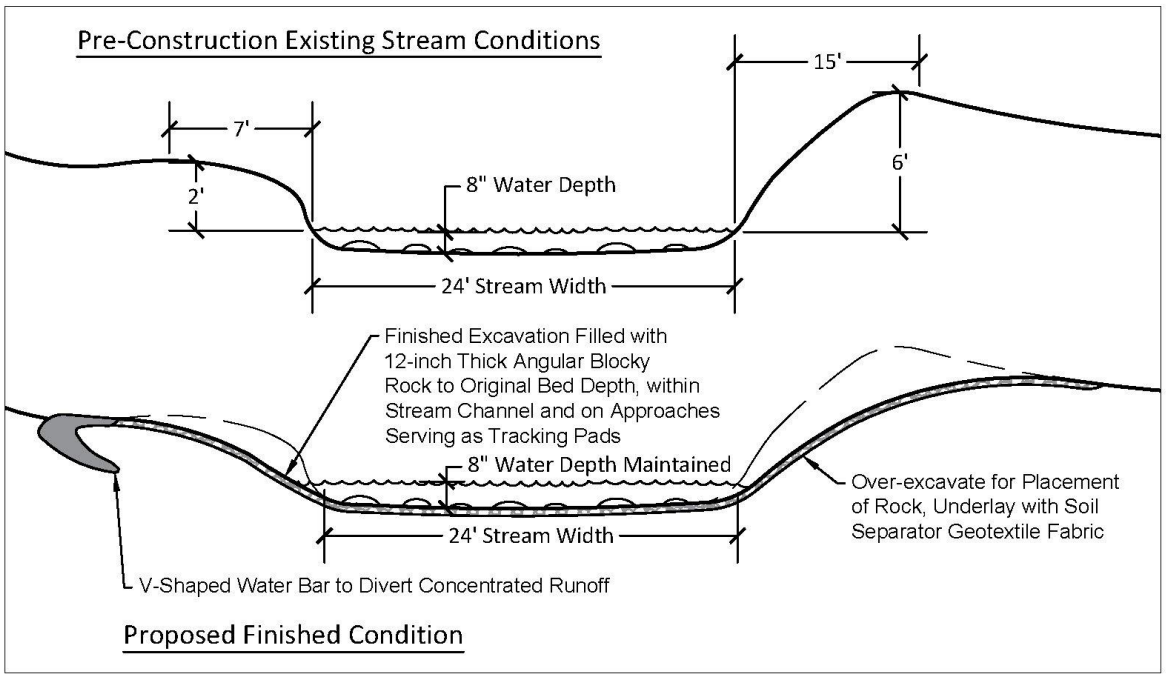

HELPFUL HINT: Start with the narrowest spot. Check out page 67 of the department's *Best Management Practices for Water Quality* for other helpful waterway crossing BMPs: guidance on design, installation, and maintenance of waterway crossings.

Don't forget about the trail leading up to the bridge – grade, width, turns must all be considered and accommodate not only the trail uses but also maintenance equipment – or alternative routes must be identified. Sometimes the areas through which a trail passes leading up to a bridge are low-lying – this can mean they're wetlands and additional permits must be obtained.

***Fords:*** A ford is material, like rocks or timber, that is placed flush with the stream bed to aid vehicles in driving through the water while crossing the stream. Do not place fine materials like sand in ford crossings as these materials will quickly transfer into the stream and will destabilize the ford structure. A waterway general permit is typically available for fords that are less than 100 ft. wide and less than 2 ft. deep. For more information visit here.

***Trail Detail 3.0: Ford Design Examples***



## *Project Example: Plum Creek Crossing*

*Infiltration Trench along Toe of Bench*

*Relocated Bridge*

The Plum Creek Crossing project combined several best management practices to address a range of trail issues, including the relocation of a bridge and use of infiltration trenches (sometimes called interception trenches) along the toe of the trail bench to capture storm water runoff. These infiltration practices are gravel-filled trenches, lined with geotextile filter fabric. In this application storm water runoff infiltrates into the trench, flowing along the path of least resistance, reducing sheet flow of water across the trail, and deterring trail surface erosion and rutting.

## *Trails in Wetlands*

The placement of material in wetlands is regulated by the U.S. Army Corps of Engineers, the Wisconsin Department of Natural Resources, and by local counties, cities and villages. If locating ATV trails in wetlands is not avoidable, the DNR recommends installing elevated boardwalks with vertical piers or pilings (which extend into and below the surface of the wetland). These elevated boardwalks are not considered fill material so do not require permitting. Placing materials like gravel, bark, or soil directly in a wetland, or a footing directly on the surface of the wetland will require permitting. If less than 10,000 square feet of wetland is impacted, a general permit is available. Larger impacts to wetlands will require individual permitting and mitigation. For more information visit the wetlands website.

**Artificial wetlands**: Newly formed wetlands created as a result of human impacts to landscape or hydrology may not be subject to the same permitting requirements as naturally formed wetlands. An example could be an existing but long unused logging road through heavier soils where the area within the footprint of the corridor now collects water (hydrology) and plants like woolgrass or reed canary grass take hold (aquatic plants). With hydrology in tight soils (low water permeability), hydric soil indicators also form. See the Soils section of the Trail Layout chapter of this document for more informaiton.

Under the artificial exemption, if the area did not have definitive wetland history prior to 1991 and the wetlands were created as a result of a human modification to the landscape or hydrology (road building), then the wetlands formed as a result of the human modification would be exempt from state permitting requirements.

This scenario would need to be submitted through the wetland exemption review process and evidence would need to be gathered as to whether wetland history existed in the area prior to 1991, but a strong case can be made that the wetlands formed as a direct result to human modification to the landscape.

If you might have an artificial wetland on your property, contact your local wetland exemption specialist or visit the permit exemptions website for more information.

## *Waterway and wetland permitting*

DNR utilizes an e-permitting system for all waterway and wetland general and individual permit requests. Please visit this site for more information.

**Wetlands don't have to always be wet:** Many wetlands are seasonal and may be wet only periodically. Wetlands help absorb floodwaters, absorb excess pollutants before they reach waterways, and serve as home and nesting sites to animals. Three-quarters of Wisconsin's wildlife species depend on wetlands and since the late 1800s 50% of Wisconsin's original 10+ million acres of wetlands have disappeared.

## *Storm water permit*

Under ch. NR 216, Wis. Adm. Code, construction sites where a total of one acre or more of land will be disturbed require coverage under a construction site storm water permit from the DNR. For example, if the footprint to create a recreational trail will disturb a six-foot wide path for a length of 7,260 feet or more, then construction site storm water permit coverage is required since that area equals one acre (43,560 square feet). Chapter NR 216 of Wisconsin Administrative Code and the corresponding permit require the development and implementation of a site-specific erosion and sediment control plan to prevent sediment from discharging to waters of the state during construction until the project reaches final stabilization (vegetation is established as planned). In addition, ch. NR 216 and the permit require post-construction storm water control to prevent pollutants from discharging to waters of the state after construction is complete. To obtain permit coverage, a complete Water Resources Application for Project Permits (WRAPP, Form 3500-053) must be submitted to the Department a minimum of 14 working days prior to the anticipated start date of construction (or any land disturbance). Permit coverage is valid for three years and can be renewed. More information on the permit and how to apply is available from the DNR's construction site storm water permits webpage. The DNR has also

created program guidance specifically to assist trail developers with design considerations for post-construction storm water control. The construction site storm water permits must be applied for on the e-permitting system. Please visit the water permit page for more information on the e-permitting system.

### *When is a construction site storm water permit needed?*

➔ Will your project disturb one acre or more of land?

If no: Construction site storm water permit coverage is not required.

If yes: A site-specifc erosion and sediment control plan and post-construction storm water management plan are required for the project and are submitted with the application materials. The plans must take into consideration the impacts of storm water runoff from the project area to nearby waterways and wetlands. Waterways and wetlands need to be identified and protected as required under the construction site storm water permit.

*Maintenance* is routine work needed to maintain trail to original specification. If a trail gets into major disrepair and the intended layout or specification cannot be restored, this work may not qualify as maintance. If less than five acres of maintenance, no permit is required.

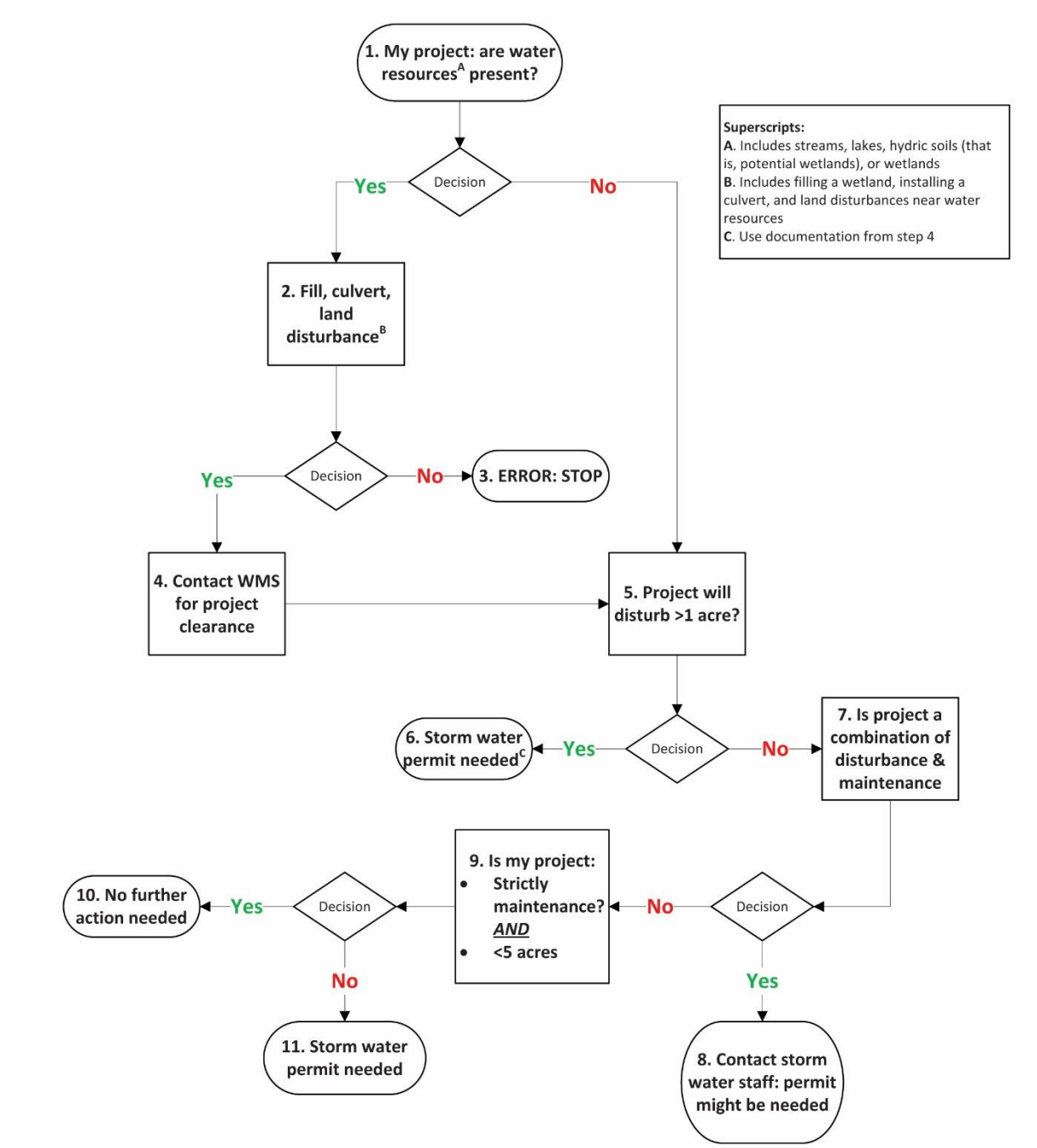
*Project* means the entirety of the ultimate plan for the trail, regalrdless of how long it takes or how many phases there are.

## How to figure acreage for a trail project

There are 43,560 square feet in an acre and 5,280 feet in a mile

To determine acreage for a trail:
1. Get length down to feet (E.G. 5.25 miles = 27,720 feet)
2. Multiply length * width: 27,720’ * 50’ = 1,386,000’
3. Divide 1,386,000’ / 43,560 (feet in an acre) = 31.82 acres in 5.25 miles of 50’ wide corridor (corridor width will vary with project)

*Useful estimate: One 40 acre (square) parcel is about ¼ mile of trail (1,320 feet)*




**Tips for storm water compliance.**

- Stabilize disturbed soil as you go.
- Don't disturb any more land than necessary and only what you can stabilize within seven days.
- Use appropriate construction site and storm water best management practices.
- Use slash to your advantage; it can be used to stabilize work site and close off old trails.
- Build the trail to minimize hydrology changes. Build in erosion and sediment control

and storm water management features to your budget.
- Think about what makes sense; the ultimate goal is to keep the dirt where it is!

More information about many of these techniques can be found in storm water technical standards: dnr.wi.gov, keywords storm water technical.

## *Shoreland, Floodplain, and Other Local Zoning Ordinance and Regulations*

Towns, cities, villages and counties regulate activities through zoning ordinances. All counties, except Milwaukee County, have shoreland zoning ordinances in place regulating activities within:

- 1,000 feet of the ordinary high water mark of a lake, pond or flowage; or
- 300 feet of the ordinary high water mark of rivers and streams or to the landward side of the floodplain, whichever distance is greater.

Floodplain zoning ordinances and shoreland-wetland zoning ordinances are also typical in many locations and apply in those areas mapped as floodplains or shoreland-wetlands. General zoning ordinances apply to the entire area within a governmental unit.

Counties and local municipalities must follow local zoning requirements for floodplain zoning. Under Wisconsin law (s. 13.85, Wis. Stats.), state agencies are not subject to local zoning ordinances except for floodplain ordinances or when constructing buildings, structures, or facilities exclusively for state employee use. However, the DNR has a policy of complying with local ordinance regulation as much as possible while still achieving the goal of a project. The DNR's "good neighbor" policy is to try to comply with the substantive standards applying to similar projects completed by private entities.

DNR staff should not apply for zoning permits (except when constructing buildings, structures, or facilities for exclusive state employee use), pay fees, or appear before boards of adjustment/appeals or planning and zoning committees to apply for conditional use permits or variances. Regardless of a whether a project and its design meet local ordinance requirements, the property manager should advise local zoning officials about the proposed project. The manager should then provide zoning officials with detailed information about the proposed project so they can provide comments and suggestions on how the proposed project might be improved.

For managing entities other than the DNR or on non-DNR lands, check with county and local zoning offices for any regulations specific to the trail project location.

## *Roadways:*

**Trails within State Trunk Highway Right-of-Way:** Anytime a trail is planned to cross or run longitudinally in a state trunk highway (STH) right-of-way (ROW), the first step for obtaining a permit is to visit the Wisconsin Department of Transportation's state ROW permits web page. Scroll down about halfway to the "STH connection permits" section (or directly using this link). The fifth bullet item under the "Classifications" section covers trails.

Fill out form DT1504, Application/Permit for Connection to State Trunk Highway, and follow the instructions listed under the website section, "Apply for a STH connection permit" and on the permit form itself. If a DT1504 permit is already in place and additional work on the trail is desired (for example, changing the trail surface from crushed stone to asphalt), only aform DT1812, Application/Permit To Work on Highway Right-of-Way may be needed.

Trails approaching paved roads (public highways) may be required by WisDOT to be paved back 20-30 feet from the roadway.

Snowmobile trails do not typically require these WisDOT permits. Section 350.02 of Wisconsin Statute gives snowmobiles authority to ride within and across non-Interstate/freeway STH ROW without a permit. Permits are typically obtained when special treatment application (e.g., an epoxy coating) is to be used for road and bridge crossings to prevent wear and tear on the highway. Permits are sometimes required for longitudinal trails in STH ROW when a unit of government or club desires to regrade or do other trail work.

- Questions about WisDOT trail permits may be directed to WisDOT staff.

Note that WisDOT ROW varies greatly depending on the highway. On many two-lane highways, the average ROW width is 66 feet (33 feet either side of the centerline). Due to the variance, contact the WisDOT region office involved and request a ROW plat for accuracy.

- Wisconsin Department of Transportation's state ROW permits web page

# TRAIL DESIGN

The design of a trail includes the guidelines for the layout, construction, and maintenance of a trail based on its designed use and other factors.

ATV trails can be categorized into three general types: loop trails, regional trails, and connector trails.

Linear or connector trails are the most common on state properties. These are typically the fully to moderately developed trails and are often on old railroad beds or timber extraction routes.

Most linear, state-owned ATV trails are also regional\connector trails. These trails can serve as important connectors between county and federally owned trails. Most of these occur on state forests and range from fully developed to primitive trails.

***Table 4.0 – Example of Trail Challenge Levels / Types***

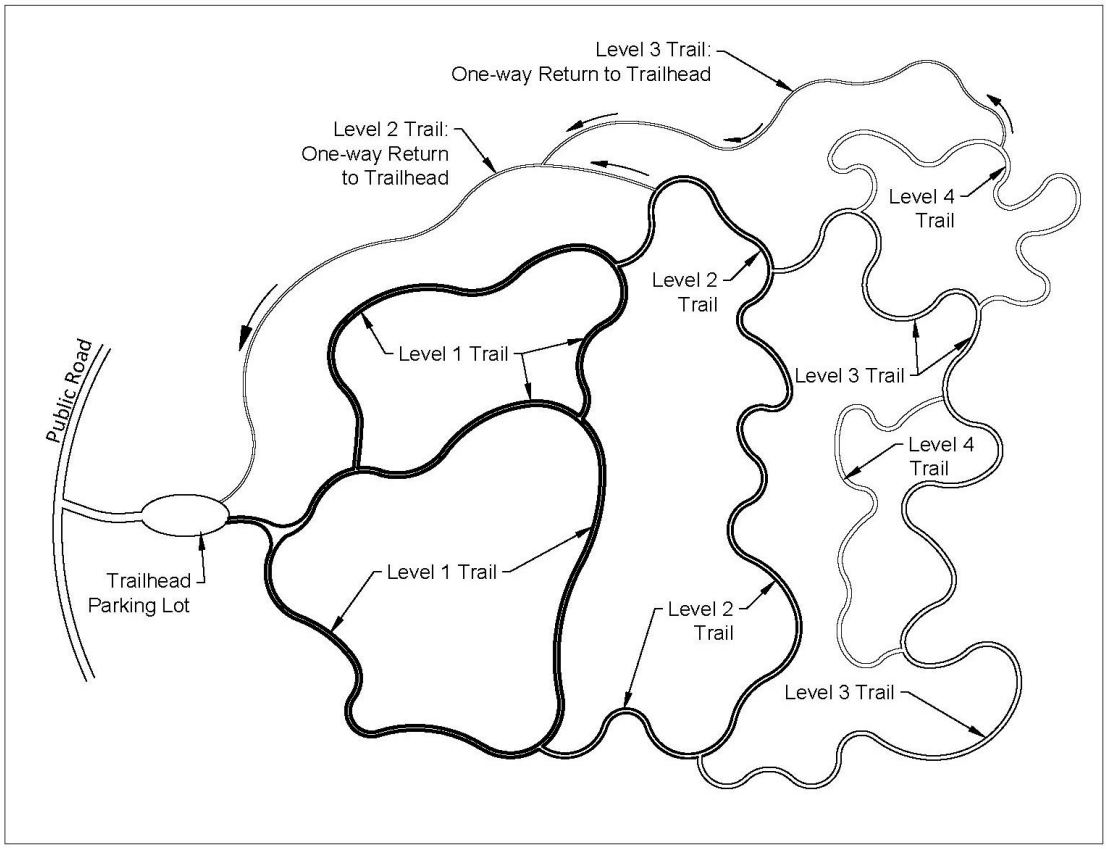
| |
|---|
| Level 1 trails are intended to be suitable for novice riders and those who don't have the skill or desire to ride more difficult trails. Easiest trails are often used as mainline or "trunk" trails providing the principal access to a large trail system |
| Level 2 trails are intended for a majority of the enthusiast population. They require well-developed skills and trails at times proving a challenge to the average rider. |
| Level 3 trails are intended for a skilled rider. They require above average skills and can tax the skills of an average rider. |
| Level 4 trails are intended for expert riders and dedicated enthusiasts. At times these trails will tax the skill of the dedicated enthusiast. |

*Note that a trail can contain multiple challenge levels within its length, and that challenge level can change over time, for example due to lack of maintenance.*

**Loop ATV trails**: Loop ATV trails are typically eight to 10 miles long but can be any length depending on conditions, challenge level, and experience provided. They can be singular or composed of a series of looped trails (a "stacked loop" system - see graphics). These types of trails are designed to provide for a range of recreational riding experiences. A logical design is for the first loop (closest to the trailhead parking area or entrance) for beginner skill level, second loop for moderate skill level, and third loop for advanced riding experience. The layout allows the rider to loop back to the trailhead on a trail they judge to be appropriate for their skill level. This type of trail system will be designed principally for ATV use and will usually have a trailhead with support facilities, including toilets, drinking water, and car trailer parking dedicated to ATV use. In addition, this type of trail can be modified to provide scenic corridors with vistas or overlooks and provide activity nodes including day use, camping, fishing, etc., in addition to a riding recreational experience. Not all loop trails need to be stacked loop systems with increasing/varying challenge levels. Depending on conditions, a location may only offer one or two different challenge levels. This should be planned for from the beginning of the project. Topography is

usually the biggest factor in challenge level, followed by trail width.

### *Figure 1.0: Trail Design Concept – Stacked Loop Trail Layout*




Multiple factors must be considered during the design process for an ATV trail. As noted above, one of the first questions to address is the trail type, because this impacts other design elements. The example in Figure 1.0 shows the hierarchy of trail types from more highly developed (Level 1) to more primitive, technical sections (Level 4). The following table shows the recommended trail types together with the associated design parameters that should be followed.

## *Table 5.0– ATV Trail Design Matrix*

| Trail Standards Matrix | | | | | |
|---|---|---|---|---|---|
| **NR 44.07(3) Description** | **Primary Surface** | **Design Speed** | **Grades** | **Widths** | **Notes** |
| Level 1 trails are intended to be suitable for novice riders and those who don't have the skill or desire to ride more difficult trails. Easiest trails are often used as mainline or "trunk" trails providing principal access to a large trail system. | | | | | |
| Fully Developed Trail | Gravel | 45 mph | 0-100' <15% >100' <8% | 12-16' surface; 5' clear zone each side 6:1 shoulders; Corners – Widen to 18-20' | Railroad grades Connection routes |
| Level 2 trails are intended for a majority of the enthusiast population. They require well developed skills and trails at times proving challenging to the average rider. | | | | | |
| Moderately Developed Trail | Gravel, native soil | 35 mph | 0-50' <25% >50' <12% | 10-14' surface on corners, native soils on tangents; 3' clear zone each side 6:1 shoulders; Corners – Widen to 16-18' | "In – woods" experience; Limited surfacing at corners and problem areas; 1-2 Yr shakeout period to identify problem areas for remediation |
| Level 3 trails are intended for a skilled rider. They require above average skills and can tax the skills of an average rider. | | | | | |
| Lightly Developed Trail | Gravel, native soil | 25 mph | 0-25' <25% >25' <12% | 8-12' Native soil surface with limited (8' for one way) hardening; 3' clear zone each side 4:1 shoulders; Corners – Widen to 14-16' | Moderate technical challenge experience; Limited hardening to address problem soils; 1-2 Yr shakeout period to identify problem areas for remediation |
| Level 4 trails are intended for expert riders and dedicated enthusiasts. At times these trails will tax the skill of the dedicated enthusiast. | | | | | |
| Primitive Trail | Native soil | 15 mph | 0-25' <33% >25' <15% | 8-10' Native soil surface (6' for one-way); 2' clear zone each side 4:1 shoulders; Corners – Widen to 10-12' | Technical challenge experience; Very limited hardening to address problem soils; 1-2 Yr shakeout period to identify problem areas for remediation |

## *Table 6.0– UTV Trail Design Matrix*

| Trail Standards Matrix | | | | | |
|---|---|---|---|---|---|
| **NR 44.07(3) Description** | **Primary Surface** | **Design Speed** | **Grades** | **Widths** | **Notes** |
| Level 1 trails are intended to be suitable for novice riders and those who don't have the skill or desire to ride more difficult trails. Easiest trails are often used as mainline or "trunk" trails providing the principal access to a large trail system. | | | | | |
| Fully Developed Trail | Gravel | 45 mph | 0-100' <15% >100' <8% | 16' surface; 5' clear zone each side; 6:1 shoulders Corners – Widen to 18-20' | Railroad grades Connection routes |
| Level 2 trails are intended for a majority of the enthusiast population. They require well developed skills and trails at times proving challenging to the average rider. | | | | | |
| Moderately Developed Trail | Gravel, native soil | 35 mph | 0-50' <25% >50' <12% | 14' surface on corners, native soils on tangents; 3' clear zone each side; 6:1 shoulders Corners – Widen to 16-18' | "In – woods" experience; Limited surfacing at corners and problem areas; 1-2 Yr shakeout period to identify problem areas for remediation |
| Level 3 trails are intended for a skilled rider. They require above average skills and can tax the skills of an average rider. | | | | | |
| Lightly Developed Trail | Gravel, native soil | 25 mph | 0-25' <25% >25' <12% | 12' Native soil surface with limited hardening; 3' clear zone each side; 4:1 shoulders Corners – Widen to 14-16' | Moderate technical challenge experience; Limited hardening to address problem soils; 1-2 Yr shakeout period to identify problem areas for remediation |
| Level 4 trails are intended for expert riders and dedicated enthusiasts. At times these trails will tax the skill of the dedicated enthusiast. | | | | | |
| Primitive Trail | Native soil | 15 mph | 0-25' <33% >25' <15% | 8' Native soil surface; 2' clear zone each side; 4:1 shoulders Corners – Widen to 10-12' | Technical challenge experience; Very limited hardening to address problem soils; 1-2 Yr shakeout period to identify problem areas for remediation |

ATVs and UTVs function in a manner similar to cars and trucks operating on gravel roadways. The laws of physics applying to a car on a gravel roadway also applies to the UTV operating on a trail.

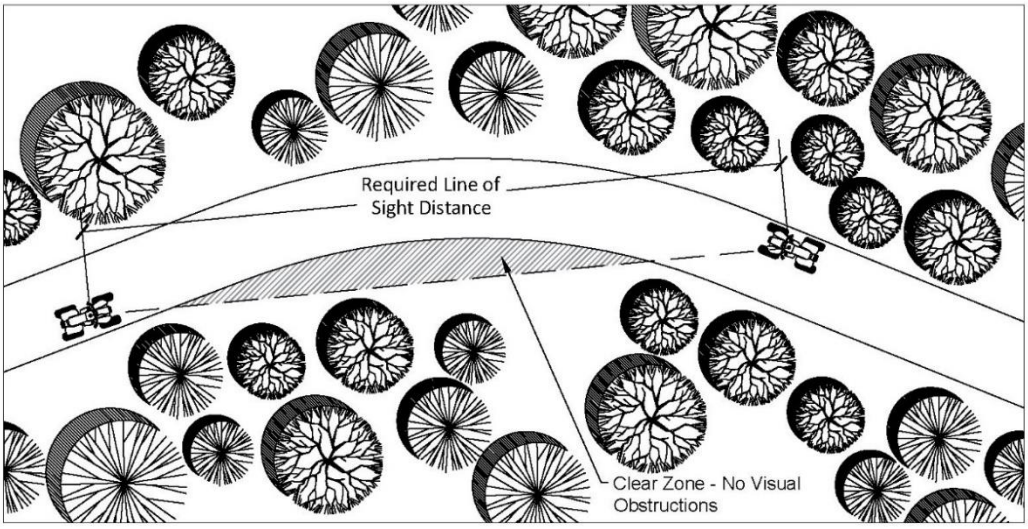
Design speed is a term used for road engineering that can also be applied to trail design. It is a speed used to determine the various geometric features of the roadway, and is based on the topography, anticipated operating speed, adjacent land use, and the functional classification of the highway. Equally, user speed can be controlled by trail design. Design speed is not the speed limit. For more on design speed, this Federal Highways Administration (FHWA) guidance may be helpful.

## *Horizontal and Vertical Curves*

To address the design elements impacting rider safety, trails must be engineered with appropriate horizontal (turn radii) and vertical curves based on likely operating speeds. For a trail with long straight sections (Type 1), a rider might travel at speeds approaching 45 mph, while a section with multiple curves, hills and dips (Type 4) requiring a highly skilled rider could only be navigated at speeds of 15 mph. Higher operating speeds also mean riders must be able to see longer distances so they can slow or stop for trail features such as an intersection, a highway crossing, or a narrow bridge.

The horizontal trail alignment (straight sections and curves) will need to accommodate trail challenge level. Generally, Level 1 trails will be wider and have fewer turns, Level 4 trails will be narrower with more turns. On all trail levels, corners will need to be designed to accommodate maintenance equipment, volume of trail use, and user skill level. For example, corners on lower level trails may need to be widened to accommodate user skill level (e.g. inability to hold a line through a curve.)

## *Figure 2.0: Sight Distance on a Horizontal Curve*



## *Table 7.0 – Horizontal Curves*

| Trail Challenge Level | Design Speed | Minimum Curve Radius |
|---|---|---|
| Level 1 trails | 45 mph | 485 feet |
| Level 2 trails | 35 mph | 230 feet |
| Level 3 trails | 25 mph | 100 feet |
| Level 4 trails | 15 mph | 15 feet |
| *Table values based on WisDOT FDM 11-10, Exhibit 5.1 (6% max., 2 lane)* | | |

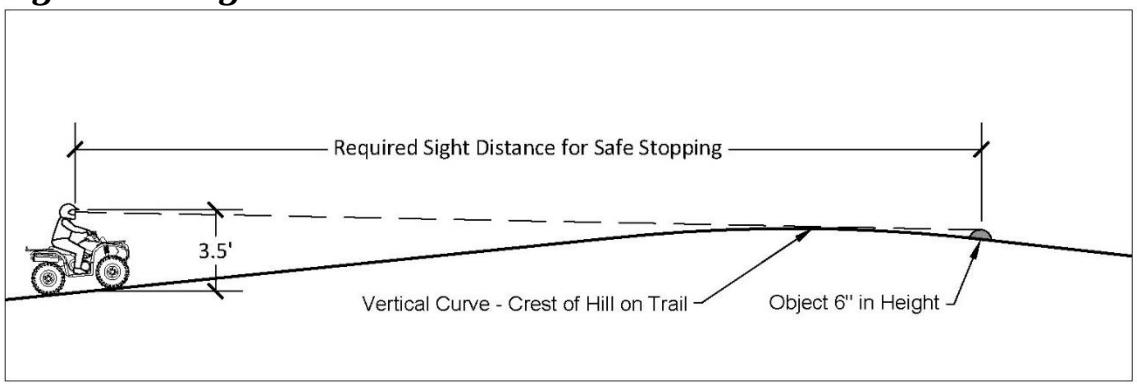
Curve radius recommendations are based on navigating the change in trail direction with a speed reduction of five mph. If site conditions limit the curve radius to a smaller curve, appropriate advance signing should be placed before the curve to warn operators of the speed reduction needed to safely negotiate the curve.

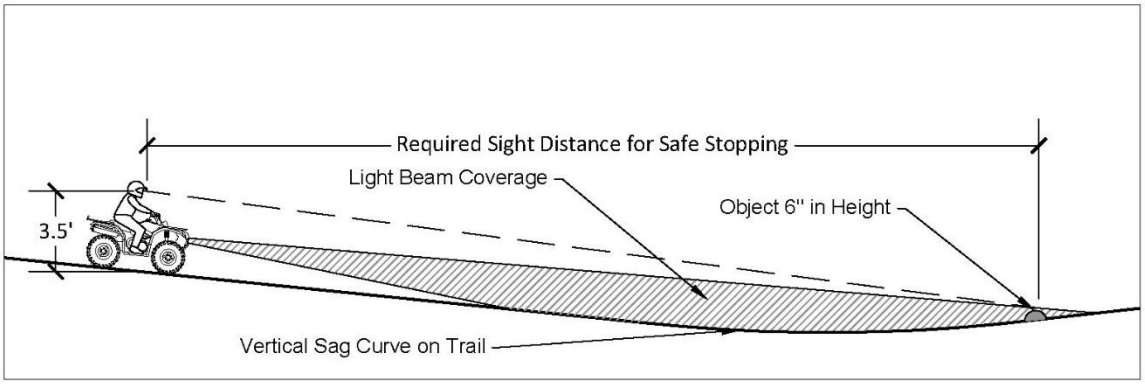
Signage for speed reduction at curves shall follow the requirements of the Manual on Uniform Traffic Control Devices (MUTCD), current edition by the Federal Highway Administration, Chapter 2C – Warning Signs and Object Markers.
For hilly areas of the trail, the grade of the trail needs consideration. When the trail crests a hill, the view of the trail is limited by the hill. Rider sight lines need to be taken into consideration. Riders on trails accommodating higher speeds need to see further, allowing the rider to adjust speed if the trail turns, if the rider must stop for a roadway crossing, or for an object on the trail such as a fallen tree.

A sag in the trail (when the trail runs down a hill and then turns uphill) has the potential to pose a danger to the rider. During "hours of darkness" operation, the vehicle headlight(s) must illuminate the trail ahead and allow adequate time for the rider to stop or adjust the vehicle speed if an obstruction or dangerous condition lies ahead on the trail. Proper sight lines reduce the risk by allowing time for the rider to recognize potential risks and to either stop or adjust vehicle speed to minimize the risk.

The following figure shows sight lines for the vertical curve on the crest of a hill and a sag condition.

### *Figure 3.0: Sight Distance on a Vertical Curve*




### *Table 8.0 – Vertical Curves*

| Trail Challenge Level | Design Speed | Minimum Sight Distance |
|---|---|---|
| Level 1 trails | 45 mph | 360 feet |
| Level 2 trails | 35 mph | 250 feet |
| Level 3 trails | 25 mph | 155 feet |
| Level 4 trails | 15 mph | 70 feet |
| *Table values based on WisDOT FDM 11-10, Attachments 5.4, 5.6* | | |

For additional information on proper sight distances for vertical curves, see Appendix B.

### *Sight Distance at Corners and Crossings*

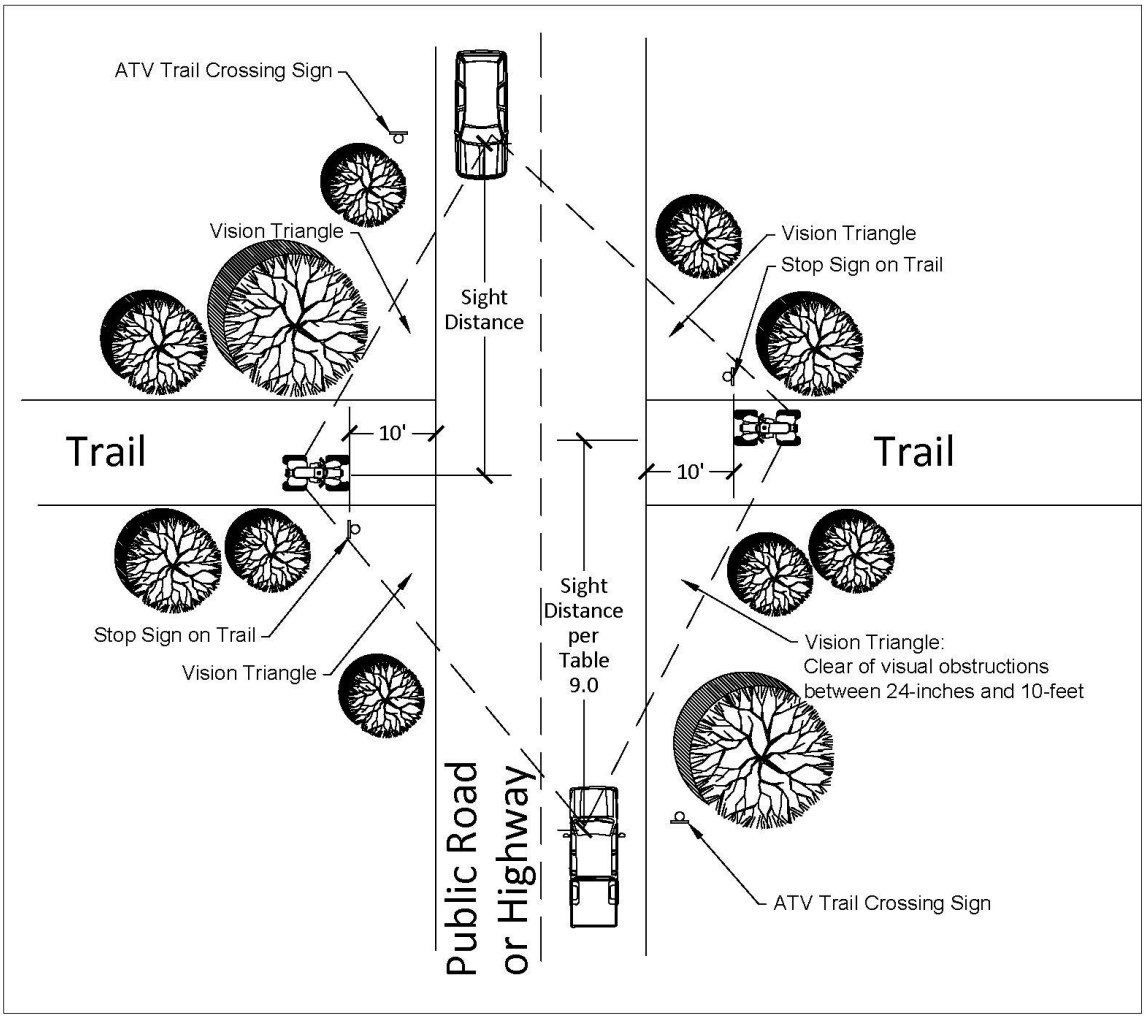
As riders approach a corner or a road crossing, the view of the trail can be limited by vegetation or other obstructions. Having adequate sight distance allows the rider to adjust speed if the trail turns or if the rider must stop for a roadway crossing. To allow adequate sight distance at corners and road crossings, an appropriate area must be kept clear of vegetation and other obstructions, including large signs.

### *Table 9.0 – Vision Triangle Sight Distance*

| Trail Challenge Level | Design Speed | Minimum Sight Distance |
|---|---|---|
| Level 1 trails | 45 mph | 180 feet |
| Level 2 trails | 35 mph | 150 feet |
| Level 3 trails | 25 mph | 120 feet |
| Level 4 trails | 15 mph | 90 feet |
| *Table values based on WisDOT FDM 11-10, Attachment 5.13* | | |

The following figure shows sight lines for the vision triangle.

### *Figure 4.0: Vision Triangle at Trail and Road Intersections*




## *Typical Sections*

The width of a trail is dependent on the trail type. Higher speed trails need to be wider than lower speed trails and one-way trails can be narrower than two-way trails. Tables 5.0 and 6.0 show the recommended trail width for each type of trail. In

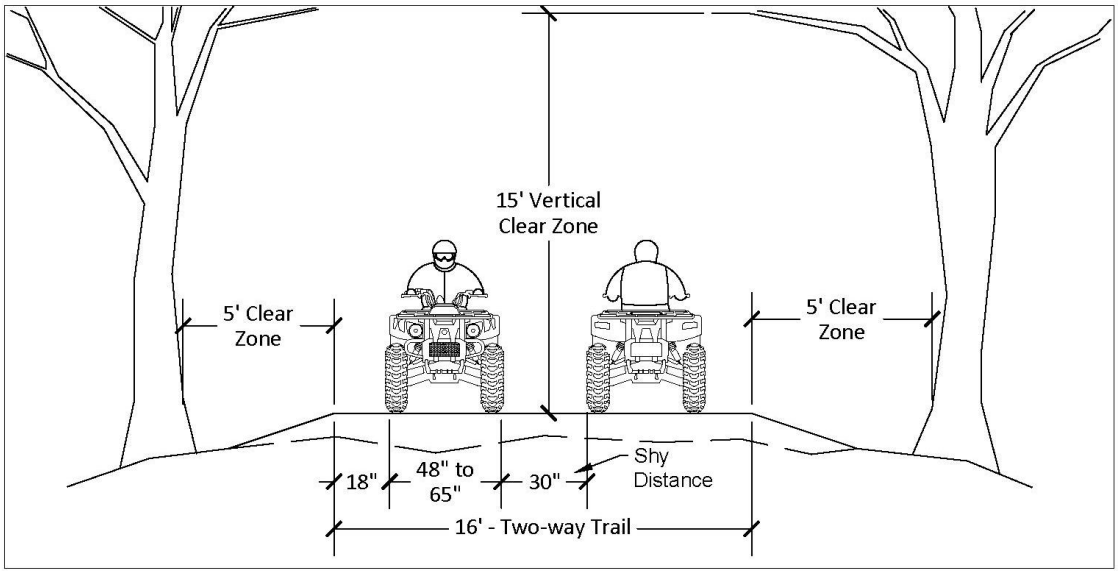
addition to the width of the trail surface, a safe trail is designed with shoulders allowing for recovery if the rider gets off the edge of the trail, and has clear zones (areas clear of trees and obstructions) in case the rider leaves the trail surface. The following shows recommended typical sections for each trail challenge level.

Trail widths should be adequate for intended uses; one-way trails can be built to a 8-foot width. It is recommended two-way trails have a minimum 12-foot-wide maintained trail running surface with a minimum two feet cleared on each side. Trails should be wider where turns/corners are required. Adequate width may also be dependent on slope, aspect, and visibility on curves. Please note that in most cases, total trail width must accommodate periodic maintenance equipment such as graders and dump trucks.

The trail width guidelines should be applied when constructing new trails or when an existing trail is upgraded with improvements to the trail surface material or when horizontal or vertical curves are improved to meet sight distance requirements.

The normal straight or slightly curved trail tread for a one-way ATV trail should be a minimum of eight feet wide for a one-way trail and 12 feet wide for two-way ATV trail. The trail tread will require additional widening of the tread at turns, bridges, water crossings, and intersections.

***Figure 5.0 –Typical Section - ATV Trail – Two-way Level 1***



# TRAIL LAYOUT

An ATV trail has many of the design considerations typical of laying out a light-duty road. The principal difference is that ATV trails are often designed to provide a recreational experience.

The following are major items to consider in the layout of potential ATV trails.

## *Topography*

Topographic maps USGS (maps) at 1:24,000 scale are the most useful tool in laying out and evaluating an ATV trail. The maps provide preliminary information on an overall trail system, water features, elevation change, roads, railroads utility corridors, and cultural features.

Another useful source of information is recent air photos. They can provide information about current vegetation, wetlands, local development, areas to stay away from, and features that might be beneficial to the trail. The proposed trail and alternatives should be plotted on these maps.

The soil conditions along a proposed trail are an important indicator of the cost of development and maintenance of a trail.

The ideal ATV trail would be located on upland well-drained soils; coarse, gravely soil would be least expensive to develop for an ATV trail.

The second most desirable soil types are sandy and loamy soils. They may require gravel fill and/or limestone screenings, along with armoring to prevent erosion, especially on heavily used trails and moderate slopes that might exceed 6%.

The least desirable soil types are peat and other wet organic soils that are water saturated at least part of the year. These will always be the most expensive to develop and will require bridging or some types of special construction (see wetland and water crossing section). In Wisconsin, crossing a wetland will require state and sometime federal permits along with special construction to mitigate impacts to the wetland.

Solid ledge rock can be found at or near the surface in some parts of Wisconsin. It can make a desirable trail, provided the area is reasonably smooth – free of fissures or faults. A word of caution: some rock surfaces can become quite slippery when wet; however, with cautionary signing these areas may still be appropriate for ATV trail use.

Almost all soil conditions can be developed into ATV trails with the expenditure of money, but development of these difficult areas will also require long-term maintenance costs. In short, these trail segments with adverse conditions should be kept to a minimum for both long-term cost and environmental reasons.

## *Drainage and Protection from Soil Displacement*

Control of surface water runoff is one of the significant impacts of trail development; it should be the goal of a trail to be hydrologically invisible – to minimize disturbance to natural (or pre-existing) water movement as much as possible. Minimizing the collection or concentration of surface water on the trail tread to the greatest extent possible is key to long-term trail maintainability. The following are techniques that can help minimize water problems by the maintenance of natural surface flow across the trail, the frequent use of drainage dips, and proper use and placement of culverts.

Additive or disturbed surface or sub surface material should be compacted and incorporated into native soil. Depending on soil type, additive surfacing such as 1 ½ inch fractured rock to a desired depth, incorporated with appropriate amounts of gravel or other suitable material, may be needed to accommodate the long-term viability (maintainability) of the trail.

## *Slopes*

The running slope conditions along an ATV trail are also a good indicator of development costs and, to some extent, long-term maintenance cost. Slope should be considered in combination with soil type; one soil type may allow for greater slopes with less maintenance than another soil type on the same slope.

A quick way to check slope conditions is to use a 1:24,000 scale topo map for swift evaluation of the slopes along the trail, i.e., 10-foot rise over 100 feet equals 10% slope on a topo map. Flat to mild slopes can be challenging for trail construction as water management features must be built into the trail tread, and water management must be a constant consideration in trail construction and maintenance.

Moderate slopes of six to12% are workable but may require additional construction and maintenance measures depending on soil type. These slopes combined with good trail layout can offer moderate challenge to ATV riders. The maximum sustained grade on ATV trails should be 12% in most situations.

Steep slopes from 13-25% will be problematic for long-term maintenance. A steep trail over even a brief distance can provide a high degree of difficulty for ATV riders.

## *Soils*

The soil conditions along a proposed trail are an important indicator of the cost of development and maintenance of a trail. Soils data is available from county soil surveys. County soil survey data can also be researched and viewed within the DNR Surface Water Data Viewer. More detailed information on soil types, profiles and suitability ratings can be viewed here. Click on the Soil Data Explorer tab, then the Suitabilities and Limitations for Use tab →Recreational Development →Paths and Trails. View these suitability ratings as advisory only; they are not functional judgements from a trail perspective.

Generally in Wisconsin, soils are categorized into sand, silt, loam, clay, muck, or peat soils. Soil profile descriptions can be identified by their components or a combination of components. Common usage of soil types across a majority of the state identify soil groups as sand, loamy sand, sandy loam, silt loam, clay, muck, or peat. It is important to note that there are a number of individual soil types that are complexe with numerous soil types present. These sites may vary greatly in their characteristics across the site.

Soils fall into four broad categories, Hydrologic Group A, Hydrologic Group B, Hydrologic Group C, and Hydrologic Group D soils. The characteristics of each soil affect how the native soil will support a trail, the cost of initial construction, and may be a predictor of the future maintenance needs of the trail.

**Hydrologic Group A Soils**

Generally, these are well drained and are comprised primarily of sands. These types often have a very shallow organic (topsoil) layer (A-horizon). They also contain limited amounts clay or silt materials. This absence of clay or silt components limits the ability of the soil to "bind" together in a sufficient way to accommodate motorized trails on native soil surfaces. Unmaintained ATV trails on native sand soils can fail under heavy traffic, with rutting, soil displacement during heavy rains, and loss of tread material at corners. Underlying soils are extremely loose and often deep.

Imported soil materials, primarily crushed aggregate, are often necessary on many of these soil types in order to provide safe riding conditions and to minimize erosion and water quality issues.

*Recommendations/observations from entities managing trails on group A soils*

- Trail surfaces often require six inchs loose / four inches compacted gravel on a majority of trail systems occurring in this soil type, especially on those soils with shallow "A" horizons and little rock or gravel components in the soil profile.

- Deep sand pockets and corners may require underlying road fabric or geo-textile. Any fabric applications should be covered with a minimum of 10 inch rock, crushed aggregate, or a combination of materials.

- Some trail managers have had better success stabilizing trail surfaces by installing deeper courses of crushed aggregate rather than fractured rock. Larger fractured rock can work its way through the trail surface, causing rough riding conditions. This may be an important consideration when ATV trail surfaces are shared with groomed snowmobile trails.

**Hydrologic Group B Soils**
Generally, these are moderately well drained and are comprised of loamy sands and sandy loam soils. These soils often contain significant amount sand, gravel and/or rock but also contain higher amounts of clay and silt. The soil characters within this group provide a better opportunity to utilize native soils as a trail surface.

Hydrologic group B soils may be associated with topography and slope (end moraines), which presents a higher risk of erosion. Trail construction and maintenance should include designs calling for water to shed away from trail surfaces before it can gain enough velocity to cause erosion.

*Recommendations/observations from entities managing trails on group B soils.*

- Trail projects often allow for at least portions of the trail to lie on native soils.

- Pockets of heavier soils, especially on the soils containing more clay and silt, often require crushed aggregate surfaces. In many cases, traffic wear patterns will dictate where these applications are needed.

- Particular attention must be paid to slopes on these types. In areas with substantial topography, erosion potential is high and surface water management is an important consideration in order to prevent movement of trail surface and other materials in to adjacent areas.

- Soil types with larger rock components may require more aggregate in order to facilitate trail maintenance and grading activities.

**Hydrologic Group C Soils**
Generally, these are moderately to poorly drained and are comprised of silt loams, loams and clay soils. These soils contain limited amounts of sand and higher percentages of clays and loams. While a native soil trail surface may support light or periodic traffic, more extensive use often results in rutting and soil compaction.

Rutted and compacted soils within this group often results in water pooling on the trail surface and rapid deterioration of the trail due to ponded water. Unmaintained

trail surfaces on these soils often lead to impassable trail conditions and extensive trail tread "creep" into adjacent areas. These soils provide a marginal foundation for trails and often require more extensive construction methods in order to create a foundation for the trail.

Given the high percentage of finer soil materials present in group C soils, water infiltration is slow, and the poorly drained soils tend to pool water in depressions. Trails need to be crowned to minimize pooling. The ability for water to shed off of the trail surface and into adjacent vegetation is an important component of trail design.This includes limited ditching with culverts in some locations where the water cannot sheet off and away from the trail with grading or natural topography or where it is required for storm water permit compliance. Trails should be designed in a way to allow water to flow into areas adjacent to the trail before it has the ability to increase velocity and cause erosion.

*Recommendations/observations from entities managing trails on group C soils.*

- Projects on these soils typically require a minimum of six inches loose/four inches compacted crushed aggregate.
- Areas of heavier group C soils may require four to six inces crushed aggregate over a six inch base of fractured or coarse stone.
- It may be more appropriate on certain sites, especially those with long distance slopes to add a larger diameter crushed rock as a base layer and a lighter crushed aggregate cap over the top. Rock armoring on these slopes is intended for spot applications and not over an entire trail surface.
- Wetlands can be present within these types and careful analysis and planning is important to minimize or avoid impacts to wetlands (and waterways).

**Hydrologic Group D Soils**

Hydrologic group D soils are poorly drained and contain significant amounts of clay and organic materials. Wetland/hydric soils, such as muck and peat, fall into this group, adding to the environmental sensitivity of these soils. These soils may provide a poor foundation for trails and require expensive roadway-like construction methods to build a foundation for the trail. Trails built on these soils often require extensive maintenance and expensive structures.

Hydric types within this group may be regulated by the federal, state, or local government. Trail development on hydric soils should be considered only after all alternatives have been considered and deemed impossible. Cost for trail development, both in terms of initial construction efforts (e.g. permit fees, time, necessary structures) and long-term maintenance costs must be considered.

There are also silt loam soils within this group, some with large amounts of rock, which may present opportunities for trails, and they present similar challenges as group C. Given the higher probabilities of wetlands within group D soils, it is often important to consult with wetland professionals before considering trail projects.

*Recommendations/observations from entities managing trails on group D soils.*

- Trails traversing hydric soils should be considered as a last resort option.
- Evaluate trail routing alternatives to avoid trails on hydric soils within this group D.
- Trail proposals involving wetlands should be done in consultation with DNR water regulations staff to determine options and feasibility.
- For existing trails with wetland impacts already occurring and less than 10,000 square feet in size, consider a wetland fill permit (WDNR-GP4-2018).
- For short wetland crossing distances (generally less than 40 feet) consider a clear span bridge.
- For longer wetland crossing distances, evaluate the use of puncheon/floating bridges with considerations for other trail uses (such as snowmobile) which may require structures capable of carrying heavy loads and long-term maintenance costs.
- Non-wetland sites in group D can cause significant frost heave/shrink impacting culverts and other structures.
- Some silt loam group D soils contain significant amounts of large rock which can result in extremely rugged trail systems when finer soil materials are washed away from the trail surface.
- Trails can be constructed on non-hydric group D soils, but there are special challenges involved with maintaining water flow off the trail surface and preventing erosion.

It is highly recommended trail sponsors research and understand soil types in project areas. Consult county soil survey data or NRCS web soil data for reference in determining soil suitability for motorized use. When relying on information contained in soil survey data, keep in mind mapped soil types in an individual county or specific area may not always accurately depict actual on-the-ground conditions. Recreational trail projects require on-site visits and knowledgeable managers. Most ATV trail systems require soil surfaces that can accommodate vehicular traffic for adequate maintenance. This often means accommodating

loaded dump trucks and graders. In some cases, the best alternative for maintenance access will be to perform maintenance activities such as brushing (vegetation clearing) during frozen ground conditions. Another option would be to create access roads off of the trail tread to accommodate tread maintenance minimizing the need for on-trail access of equipment which may change the nature of the desired trail experience.

Soil type should not be considered in a vacuum; soil type needs to be considered with other factors such as use topography, geographic setting (likelihood to attract high or low volume of traffic over time), weather, and machine weight and power, which will inevitably change over time. Maintenance costs must be considered.Any time materials are brought in to a trail, for tread or for structures, maintenance requirements (costs of labor and supplies) increase.

# TRAIL CONSTRUCTION

## *Clearing and Grubbing*

The first step in construction of the actual trail will require clearing of vegetation and removal of stumps and roots, loose stones, and other debris from the trail corridor. The area to be cleared should be a minimum appropriate width on straight-a-ways and wider on turns. At intersecting ways, additional clearing may be needed to provide clear visibility in several directions (see table 9.0). Clearing height should always be a minimum of eight feet, though higher clearing may be necessary to accommodate maintenance equipment. Cleared width will depend on the trail uses and level (see tables 4.0 and 5.0).

Additional clearing but not grading may be needed along trails to remove hazard trees, create aesthetic views, provide wildlife openings, or restore some native plant community type and manage water runoff.

If the trail construction activity will disturb one or more acres of land, a DNR storm water construction site permit is required. See information in the permits chapter.

## *Grading*

Grading will be required on most new ATV trails. This involves clearing topsoil; usually the darker organic soils are bladed to one side to be used in finish grading of side slopes and shoulders of the trail. The goal is to minimize the movement of soil and create a trail blending with the topography and creating generally smooth arcing trails designed for the average ATV rider.

Trails should be built with a slight crown (on flat ground) or outslope to the downhill side (on contour trail) to allow for adequate and proper water dispersal. Trail surfaces need to be conducive to periodic grading or restoration promoting water runoff from the trail surface and eliminating the opportunity for water flow to gain velocity causing material displacement.

On level ground, trails will be crowned from the center to provide drainage. With ATV trails crossing a hill, the trail tread should be pitched toward the downhill side with an outslope to facilitate natural sheet drainage. In some situations, due to storm water considerations, a trail will need to be insloped with ditching to the uphill side to manage runoff. This should only be done when a trail cannot be rerouted to a location (trail layout) maintaining a grade that will not significantly change the natural hydrography (the way the water acts when it encounters the trail – water should exit the trail as quickly as possible and prohibited from runing down the trail, gaining volume and velocity while increasing soil displacement).

## *Surfacing*

Depending on conditions, trail surfaces may be rock or native soils but should provide for the ability to grade/reshape/restore the trail surface and cross drainage patterns periodically. Consider grading trail surfaces based on traffic load and surface materials. All trail surfaces should be adequately maintained to ensure longevity and address environmental and safety concerns.

The final top dressing of the trail may be of local soil, which can require frequent maintenance (grading) to maintain trail tread and surface drainage. However, if local soil conditions are unfavorable and trail surfacing must be ordered, crushed gravel or crushed stone in gradation number three (No. 3) WisDOT mix (1 ½ inch to one inch sieve) is recommended for the trail surface. Surface hardening may also be required for short stretches. If more than short section, this treatment may be cost prohibitive and a reroute of the trail location should be considered. In some circumstances, if a reroute cannot be achieved, trail closure may be considered. Surface hardening may include paving (asphalt, concrete) short sections or use of concrete pavers. All tread hardening techniques can fail over time. Many hardening techniques are improperly installed. For example, a hardening technique is installed too shallow or with improper compacting or amount or size of material (gravel fill) used.. Filter cloth is a common material for trail surfacing projects. It can be a successful fix to hold material in place when properly installed. The use of breaker run is another common way to try and stabilize a trail's surface. Breaker run is large crushed rock (five inch (sieve size) 90-100%, 1 ½ inch 20-50%, #10 0-10%), used primarily for subgrade correction and improvement. However, the larger size of breaker run can lead to the large fractured rock working its way up to the tread surface, which can then catch on grooming equipment. Smaller breaker run (three inch minus) is recommended but can depend on available rock features such as hardness. Regardless, consider breaker run with less than five inch sieve size for sub-surface material. Successful use on an ATV trail requires compaction and sufficient material be placed on top of the breaker run to allow for top dressing to filter down over time to fill in gaps between the breaker run while still covering the top of the breaker run. Otherwise, by its nature, the large, fractured breaker run will work its way up to the trail surface (or the top dressing will work its way down into the breaker run) and stick out of the trail surface. This can cause issues for both trail users and trail maintenance (e.g. some trail graders have tines that will get stuck on the protruding breaker run).

Look for successful surface hardening projects in similar conditions. If not available, try piloting sections before investing heavily.

Be sure to take into account other uses of the trail. For example, if bicycles will also use the trail, it is unlikely most bicycles will be able to use a trail with stone

greater than one inch. This must be balanced with the tendency for some rock (particularly limestone) to break up under heavy motorized use (i.e., rock too small and too soft turns to dust under ATV tires; rock too big and too hard means difficult pedaling and on flat bicycle tires). ATV "trails" placed on active (or those that may be active in the future) logging roads usually require additional surfacing and maintenance considerations. ("Trails" is in quotes because existing logging roads were not designed or built as ATV trails.) A full logging truck can weigh 80,000 pounds, four times that of a 20,000 pound ATV grooming rig. Close communication with the forester and contractor is required to ensure logging and ATV use successfully coexist during and after a timber harvest.

## *Invasive Species*

Invasive species are nonnative plants, animals, and diseases that can cause harm to the economy, environment, and human health. They tend to reproduce and grow quickly and displace, weaken, or kill desirable plants, resulting in loss of biodiversity. They degrade wildlife habitat, shelter, and food sources by reducing native plant populations which also leads to soil erosion. Millions of dollars are diverted annually for control of invasive species.

Invasive plant seeds, insects, and diseases can be moved on equipment, such as mud on tires or seeds with burs on clothes and shoes. Recognizing and considering invasive species should be part of trail planning. Trail routing to avoid spread of invasive species should be considered. During construction, it is most critical to operate in such a way to avoid spreading invasives, both from other locations to the trail construction site, within the trail construction site, and from the trail construction site to other locations.

Recommended best practices:

- Avoid unnecessary soil disturbance
- Minimize the offsite transport of materials that may contain invasives
- Prior to relocating equipment, remove soil and debris by scraping, brushing, or washing
- Remove soil, seeds, and other debris from shoes, clothing, and tools prior to leaving an area
- Reduce the introduction of harmful insects and diseases by avoiding unnecessary wounding of trees and other vegetation

ATV wash stations are an excellent idea to locate at popular trailheads. The U.S. Forest Service Technology & Development Program has designs for a self-contained wash station. Temporary wash stations can serve the same purpose and be moved around. They can also be considered as a requirement

for an event permit.


*Photo of U.S. Forest Service-Designs Portable ATV Wash Station*
*Chequamegon-Nicolet National Forest*

*Photo of Temporary ATV Wash Station*
*Northwest Invasive Plant Council, BC*

## TRAIL MANAGEMENT, MAINTENANCE & MONITORING

### *Trail Inspections*

Biannual designated use area inspections are required to be completed for facilities on DNR lands, pursuant to section 23.115(2), Wis. Stats., further described in DNR Manual Code 2527.20. Environmental inspections and monitoring of trail conditions should be recorded at that time, as well. For Bureau of Parks and Recreation Management properties, all completed inspection forms should be uploaded to the district designated use inspections SharePoint folder.

## *Trail Surface & Drainage Structure Maintenance and Rehabilitation*

Motorized trail maintenance is as important as trail planning and design. An effective monitoring program is key to a successful trail. Trail maintenance is intended to restore the surface and tread area to the original or modified design setting to sustain the corridor for the enjoyment of the trail users. Failure to conduct proper trail maintenance results in erosion of the trail surface, collection pools of water, and trail width "creep" as users try to avoid undesirable consequences from unmaintained or poorly maintained trail sections. Ignoring problem sections of motorized trails ultimately results in significant reconstruction costs avoidable with proper maintenance.

Trail maintenance is more than grading or back blading the trail surface to smooth out the tread area. In fact, some improper trail maintenance exasperates the problems caused by overland flow of water from precipitation events. Every effort should be made to maintain the trail tread above the immediately surrounding ground surface to facilitate quick removal of water from the trail. As noted earlier, water volume and velocity are trail maintenance's worst nightmare. The sooner water is removed from the trail area, the less chance water has to displace top dressing and subsurface layers causing gully erosion of the trail and unwanted deposit of valuable trail material into woods, wetlands, or surface water.

Proper trail grading techniques should emphasize keeping the trail tread above the surrounding ground surface by maintaining and restoring the trail crown, eliminating side berms, and recovering displaced trail material caused by trail use or past improper grading activity. In some cases, this may require using bladed equipment with the ability to adjust the angle and camber of the blade to simultaneously recover side berms and restore trail crown. Some trail surfaces are pitched, rather than crowned, as they follow the ground contour. The trail pitch provides riding variety for the user and facilitates overland flow of precipitation/spring run-off to cross the trail without collecting on the trail surface.

Knowing and communicating where trail construction contains water conveyance devices is critical. The most common, cross drain culverts, are familiar to most. Less obvious to maintenance personnel are such structures as diversion ditches, broad-based dips, or infiltration trenches. Failure to inform trail maintenance staff of the location of these key features can result in grading activity rendering these water conveyance structures useless and cost additional resources to re-establish effectiveness.

The key in proper trail maintenance is effective communication and coordination of efforts. Spending time and field visiting trail sections with maintenance staff to identify proper grading techniques to restore and maintain the original trail grade

and identify water conveyance structures (including the purpose of such structures) will minimize the potential for future trail failure.

ATV trails should be regularly inspected (at least every few weeks) for tread and drainage conditions. Inspections should be done more frequently at the outset when determining proper maintenance schedule. Work out a regular maintenance schedule and adhere to it. Regular maintenance can help prevent costly maintenance and repairs later. Trail grooming may need to take place as often as biweekly to maintain trail surface and drainage. Investment at the outset (a well-designed and constructed trail) takes less maintenance work in the long run.

The use of rock for armoring ATV trails is becoming more popular as the weight, width, and number of machines using public trails continues to increase. This is readily apparent on trails shared by UTVs which are much heavier than a standard ATV.

Selection of the type and depth of rock is often dependent upon soil type, topography, amount of use, type of machines, and the layout of the trail. Trails with sharp corners and curves often require additional material to facilitate grading and maintenance on these sections. The use of rock for armoring reduces the long-term maintenance costs on trails and can prevent the closure of trails during weather-related events and result in an economically and environmentally sustainable trail.

Sizing of material should be limited to rock with a gradation of less than two inches whenever possible. Use of larger rock such as breaker run, rip rap, or pit run material creates long-term maintenance problems, especially on multi use trails shared with snowmobiles. Where breaker run or larger material is used, it is imperative to place enough material of two inch gradation or less as cover to prevent contamination of the upper layers of the trail. If this is not done properly, the larger material will mix with the smaller material due to frost action, grading and heavy use by ORVs. When this occurs, the trail is often impossible to groom with tow-behind grading equipment, can damage snowmobiles, and create dangerous situations for winter grooming equipment. The larger rock often freezes to the trail and is thrown towards the pulling units when the spring-loaded blades of the groomer break large pieces of rock free from the trail surface. This is especially evident on corners where the turning action of larger machines cause contamination and the placement of larger material should be limited to straight (or relatively straight) sections of trail. This may require realignment of the trail tread but will save on long-term maintenance costs. Hydric, clay, or loamy soils may require the increase in the thickness of material placed but will create a uniform profile gradable without the possibility that contamination occurs. Jackson County, which hosts one of the busiest trail systems in the Midwest, has experimented with the use of 1 ¼ inch material of varying thickness in several different soil types and has had good success in providing the surfacing necessary to safely pass the heaviest of UTVs and grooming equipment.

Selection of material is important to the success of the surfacing project. The binding material of different types of material is important in the compaction of the final trail surface and is more resistant to movement by off road tires. For this reason, WisDOT specifications should be required when bidding material.

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### ❖ *Trail Maintenance – One County's Story*

*Note: This is an example of the typical required maintenance for a trail on a railroad grade.*

The initial trail development on our cooperative state trail was done in the late 1980s through the mid-1990s. By about 2008, the trail needed a major trail surfacing project. Limestone screenings here have about a 10-year life cycle. In open, above-grade terrain, the original 1998 trail surface is still in good condition. In areas where the trail passes through cuts and heavily wooded areas, the trail deteriorates more rapidly. County staff wrote and submitted a stewardship grant application in 2017 for work on 6.8 miles of trail regrading and resurfacing mostly targeting those areas more susceptible to weed growth and surface deterioration. The application included 1.5 miles of side-ditch cleaning (both sides of the trail) and 0.2 miles of new stone base raising the trail surface about six inches on a section of trail. That side-ditch cleaning alone was inadequate for keeping the trail surface dry and firm.

By early 2018, the DNR made a grant award and the county signed grant contracts. County staff updated bid specifications originally written by DNR staff in the 1980s and the county advertised for sealed bids with an opening in late May. Bid specifications included a 45-day completion time and bids came in at twice the anticipated cost per mile. Our county highway department, a reliable bidder in the past, did not submit a bid due to a full construction calendar. Phone calls to prospective bidders determined that area contractors were booked for much of the year, accounting for the high bids. Revisions to the bid document with a November 16 completion date resulted in new bids within budget. By October/November in Wisconsin, the asphalt-paving season is over, which frees up contractors to take on jobs like recreation trail resurfacing.

## *Pre-Construction Work Sequence*

Our pre-construction sequence is as follows.

1. Public notification. Our county uses posts on the county homepage and on the county parks and trails Facebook page to make trail users aware of the upcoming trail work. We have a local user group with a Facebook page and we post on their page as well. We follow up the initial notification of work

with periodic updates including photographs of the work in progress. A number of individuals and groups share or repost the county's posts.
2. Diggers Hotline. Always. We have an AT&T fiber optics line buried adjacent to the trail near the ditch line. We have never had an incident and we plan to keep it that way.
3. Drive the trail with the contractor. This can be time consuming on the front end, but it saves time and surprises during construction. There are always questions regardless of how thorough you think you wrote your bid specifications. We talk about timing, start-stop points, safety, keeping the trail open to users as much as possible during construction, leaving the work site each day with the trail usable, etc.

## *Construction Work Sequence*

This sequencing is largely up to the contractor. Our contractors typically follow a similar work sequence.

1. Scraping organic matter from the 12-foot trail bed and reshaping the base to shed water to the sides. Loading and trucking the waste material to a local fill site. Compacting the freshly graded base with a vibratory roller. On this project, the contractor used a small road grader doing a pass on each side of the trail and pulling waste material into a windrow down the center of the trail. When complete, the graded surface is approximately 12 feet wide.
2. Using a small rubber tired loader with a push blade, scoop windrow waste and load into a tri-axle truck for hauling to an off-trail fill site.
3. Using a vibra-compactor, roll the graded base that is now a combination of railroad ballast and old limestone screenings.
4. Using a small rubber tired loader, scoop debris from side ditches and load into a tri-axle truck for hauling to an off-trail fill site.
5. Using a string guided asphalt-paving machine, lay a 10-foot by one-inch compacted course of damp, crushed limestone screenings. Leave a one-foot shoulder of base material on each side of the trail surface. Roll the edges of the surface material to bevel the edges. The rolled edge provides a reasonable transition should someone ride off the edge of the trail. Make sure your contractor picks up the string guide when done.
6. Post construction inspection. We all do this from in a vehicle. I add to the inspection by riding on my own down the trail and back. I do this alone because I cannot ride, carry on a conversation, and look for construction issues all at the same time. Getting outside the shell of a truck seems to work better for me, and riding the finished project gives me the same feel as our trail customers.

## *Equipment Used*

1. John Deere 70 Grader
2. Volvo 180 Excavator, rubber tired

3. Kubota U55 Excavator w/edge bucket
4. New Holland 227 Skid Loader w/tracks
5. JCV Compactor, smooth drum roller
6. 2-drum smooth mini roller

*1. Trail after vegetation clearing work, but before surface improvements*

*2. A small road grader was used to remove organic material from trail edges*


*3. Equipment used to clean up and remove windrowed organic material: skid steer (bucket shown in the lower right), a small rubber tired backhoe, and a tri-axle dump truck.*

*4. After re-surfacing with a six-inch compacted course of three-inch minus stone laid on the regraded trail. The original trail screenings below were still white and clean.*

## *Final Thoughts*

I learned three things on this project. One, advertise for bids in early January, when contractors are looking for work. Two, do not hold back on side ditch cleaning. In an effort to cut costs on the project, I omitted ditch-cleaning work on a 0.2-mile section of trail surfacing. After seeing the regraded base on this section of trail without ditch cleaning, it became obvious the graded surface was holding too much water. We issued a change order and the contractor cleaned the ditches on a T & M basis before laying the final trail surface. Three, safety issues. Although the bid package

included a paragraph on safety, the paragraph was not adequate. A pre-construction meeting is needed to stress the importance of safety on an open public trail.

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## *Trail Vegetation Maintenance*

All ATV trails will require at least yearly vegetation maintenance. The work is best accomplished in the dormant seasons of late fall or winter but may require some summer maintenance due to heavy vegetation growth. Vegetation should be cleared to 12 feet over the trail and two feet on either side of the trail. Particular attention should be paid to hazard trees and limbs along the trail. Overhead and side limbs clearing should take into account the wet and ice-covered limb vegetation that may block the trail. See vegetative clearing detail.

Aesthetic qualities should be taken into consideration – refer to draft guidance Wisconsin Forest Management Guidelines – Chapter 4.

## *Monitoring*

A monitoring plan, formal or informal, is crucial to ensuring the investment made in a trail does not go to waste. A monitoring plan should be determined during the planning phase. Benchmarking during construction should take place, and a formal system to observe, record, and report conditions at regular intervals in the life of the trail should be developed and documented. For more on monitoring plans, see pages 28-29 and 179 of NOHVCC's *Great Trails: Poviding Quality OHV Trails and Experiences* (more in the resources section on page seven of this document).

## *APPENDIX B*

### DNR Trail Classifications, Recreational Use Settings, and Land Management Classifications

All DNR lands are assigned a recreational use setting (ss. NR 44.07(4-7), Wis. Admin. Code). In general, Type 3 and 4 recreational use settings will be most appropriate for ATV trails. Recreational use settings usually vary within a property. Trail classifications (ss. NR 44,04(3)(e-h), Wis. Admin Code) are not dictated by the recreational use setting but may guide the appropriate level and type of trails offered.

### *Table 1.0 – Trail Classifications*

| | |
|---|---|
| Primitive trail | Minimally developed or undeveloped, narrowest trail type; obstacles likely present in tread |
| Lightly developed trail | Natural and native (rock, soil, or other naturally occurring materials found on or near the trail) surface, tread continuous and discernable but narrow; obstacles may be present in tread |
| Moderately developed trail | Relatively smooth tread, may include aggregate/crushed stone; wider tread surface |
| Fully developed trail | Stable, hard tread surface, asphalt, aggregate; widest tread |

### *Table 2.0 – Recreational Use Setting*

| | |
|---|---|
| Type 1 | Purpose is to provide a remote, wild area where the recreational user has opportunities to experience solitude, challenge, independence, and self–reliance. Substantially isolated from development and be managed to maintain or enhance a perception of remoteness from human activity. Occasional sights and sounds of motors and other human activity may be present but are typically distant, exceptduring hunting seasons. |
| Type 2 | Purpose is to provide a remote or somewhat remote area with little development and a predominantly natural–appearing environment offering opportunities for solitude and primitive, nonmotorized recreation. |
| Type 3 | Purpose is to provide readily accessible areas with modest recreational facilities offering opportunities at different times and places for a variety of dispersed recreational uses and experiences. Landscapes within the setting may vary from natural–appearing to highly altered. Public access and recreational use by motorized means is authorized on roads and trails as provided by the master plan,except within designated non–motorized recreational use areas. |
| Type 4 | Purpose is to provide areas offering opportunities for intensive recreational use activities and experiences. Facilities, when present, may provide a relatively high level of user comfort, convenience, and environmental protection. |

## *Table 3.0 – Land Management Classifications*

| ***Classification title*** | ***Goals*** | ***Possible recreational use settings (will depend on multiple factors, including the description in the property's master plan)*** |
|---|---|---|
| Forest production area | Timber production & harvest | Type 1, 2, 3, 4 |
| Habitat management area | Habitat manipulation for the benefit of plants and animals | Type 1, 2, 3, 4 |
| Native community management area | Preserve, protect enhance, restore native communities | Very limited |
| Special management area | Purposes other than those covered by other classifications | Type 1, 2, 3, 4 |
| Recreation management area | Outdoor recreation & education | Type 2, 3, 4 |
| Scenic resources management area | Natural aesthetics, scenic management | Type 2, 3, 4 |
| Wild resources management area | Natural setting, minimal human impact | Type 1, 2 |